CROSSING THE BORDER

Redefining Early in User-Centred Design

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Abstract: One of the most common problems we face as usability professionals today is that of not being involved early enough, or not having the desired impact on the systems development. In this paper we propose that one reason for this may be that we in client-supplier relations in contract- and in-house development unconsciously only seek solutions from a supplier perspective, where “early involvement” marks the beginning of the supplier’s engagement.

In this paper we propose that usage-centered design may instead be viewed as a tool for clients to define what system to purchase, and what requirements that are appropriate for both the business as a whole, and for the individual users. We present a model how to work with User-Centered Design (UCD) in procurement and describe two case studies that followed this work model.

The results from the case studies suggest that this approach effectively deals with issues of early involvement and integration of user requirements in systems development. The clients in the case studies valued the UCD work and based their forthcoming systems development on it. Apart from integrating a UCD perspective before a contract for the development was signed, a number of other benefits were accomplished, including an integration of business and user requirements and a facilitated communication among stakeholders. We discuss some of the preconditions for this approach to be successful, based on experiences from the two case studies.

This approach requires us to reconsider the role of UCD in systems development. We believe a change will come, but slowly, since it challenges established conceptions in UCD.

Key words: Procurer, Procurement, User-Centered Design, Politics of usability, Cost-benefit, Interaction design, Contract Development, In-house Development, Personas.

1. INTRODUCTION

As usability consultants we have often experienced that we have to explain what we do and why it is important, even to those in our own companies. This occurred even when we worked in companies that value usability. In our experience, most companies and system development projects do not even consider involving a usability professional. We believe that this is one of the greatest problems that we face today as practitioners – not being involved at all, or being involved too late to have any serious impact on the requirements and the end product or service [7,8].

The origin of this problem is seldom discussed, but the body of cost-benefit and "Politics of usability" literature indicate that it exists [e.g. 4,5,17,28,29]. In this paper we will address this problem from a new approach and describe how it worked out in two case studies. Before we do this, however, we need to define the context we are talking about. In the case studies presented here a procuring client organization specifies and acquires a systems development project from an external supplier organization. In Grudin's [14] account of different development contexts this would correspond to *contract development* or software acquisition.

In contract development the client and supplier organization are not the same, and a contract is used to regulate the relation between the two. As we will describe later on we believe the challenges for integrating usability in systems development is greater here than in other development contexts, such as in-house or product development, where one and the same organization owns the whole process from acquisition to delivery. This might seem strange, since the users are often known from the outset in contract development, even before the developers. Furthermore, as highlighted by Grudin [14], the procuring organization has the power of authoring the contract and can, hence, require user involvement. However, even though over a decade has passed since Grudin published his paper, this is still not done other than in a very general manner, such as "the system should be user-friendly". Most other obstacles that Grudin list also remain; there is little incentive for supplier organizations to add usability activities since contract compliance is based on conformity to the written specification and any deviation from the specification is to be avoided [e.g. 30]. This is particularly true in government contracting where there is usually a fixed price and the contractor cannot charge for usability activities if they were not requested in the contract [14,35].

1.1 Background

In both theory and practice the work of the usability professional is commonly perceived of as activities that should be incorporated into a system development process [12,16,31,32]. In client–supplier relations it is therefore often the supplier that has access to usability competence, if any. In contract development this is usually an IT-consultant company that delivers tailored systems to clients. In in-house development it is often the IS/IT department. Since User-Centered Design (UCD)[1] is associated with development, the concept of "early involvement" in UCD is also interpreted from a supplier and system development perspective. "Early" is commonly understood as the beginning of a supplier's engagement, after a contract with a procuring organization has been signed[2].

What often seems to be forgotten in these discussions is that a lot of work has already been done when a contract is in place. In order to acquire a new system the procuring organization *must* to some extent define the business goals of purchasing it, and specify what they are looking for. Although this is not perceived of as system development activities it constitutes the first requirements specification work. Particularly in contract development (and in larger and more formal in-house development projects), the contract, which is based on this work, regulates what can and cannot be done during the systems development project.

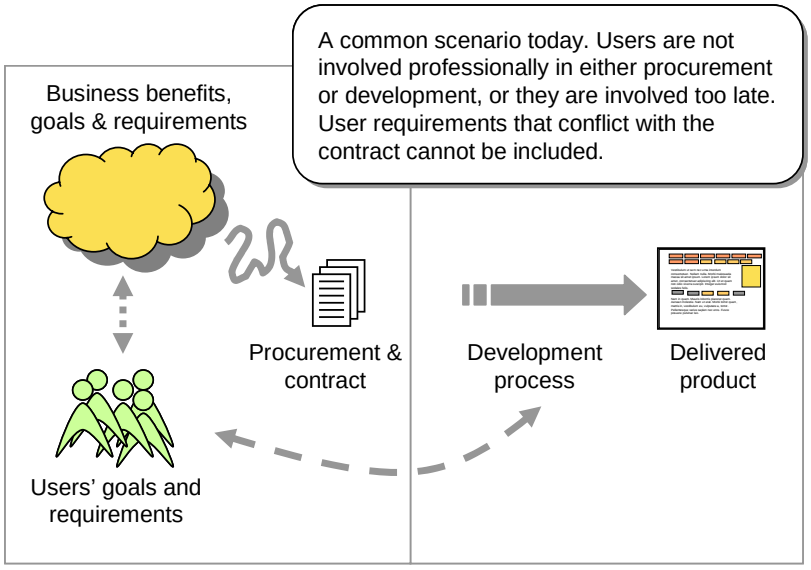

Figure 1: How development projects are commonly acquired and run today. Procuring organizations try to go directly from business objectives to technical requirements. The users' perspective is not included professionally in either procurement or development.

Unfortunately the clients' efforts to define what to acquire seldom involve a usage perspective, but focus on business processes and/or technology [25,30]. In Figure 1 we try to illustrate a common scenario: A client goes to a technical supplier with some idea of a how a technical solution could enhance business, but without involving a usability perspective. The supplier then specifies and implements the system, also without involving usability professionals. In this way the users are, in the worst case, left out both in the acquisition and the development process[3]. Unfortunately the worst case is rather common.

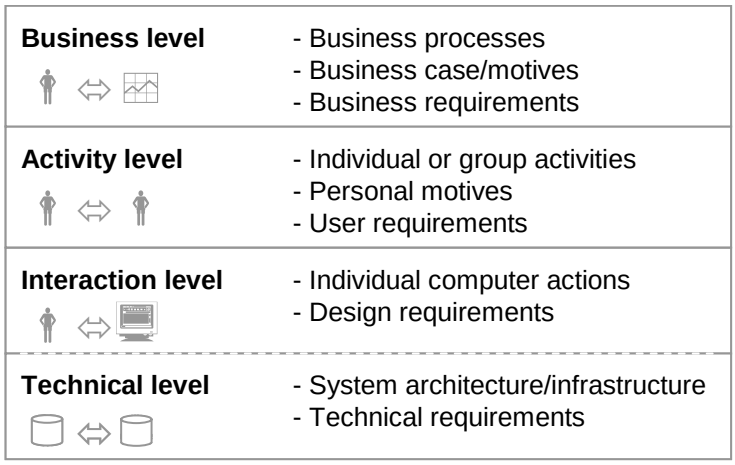

Figure 2: Levels of system requirements

From this perspective we would like to argue that "early" is not enough. No matter how well a supplier manages to integrate UCD in their development processes they will often have to agree to contracts where the client organization has already decided what they need. But when these decisions are made without a professional investigation into actual usage needs and focus more on a business process or economical level, there is still a need for the supplier to involve usability competence. The problem that suppliers with a UCD focus encounter in these situations is that their usability initiatives partly collide with what the client organization think they have already done. After all, the UCD process is mainly a requirements process. The goal is to define what system, functionality and interaction is most appropriate to the usage requirements. In many ways this is also the goals of the procurement process – to define what system best suits the business's needs. But while procuring organizations today often focus on a more abstract business process level, usability professionals focus on an activity level of what people actually do and need (see also Figure 2). In this paper we argue that both perspectives are equally important for a successful investment in new technology.

Given the common goals of UCD and systems acquisition we propose that UCD has some important contributions to procurement processes. There are today no methods for requirements elicitation that are developed specifically for procuring organizations. Instead they often have to use methods such as the Rational Unified Process (RUP) that have a technical focus and that were developed mainly for suppliers. Procuring organizations must today invent their own methods for how to make the leap from abstract business goals to concrete system requirements. Without an effort to focus on actual everyday usage the procurement will run the risk of being based on abstract and idealized models of usage, and/or have a technical focus [25]. As argued above, both of these directions may hinder possible future activities that focus on usability.

2. THE MISSING LINK

In Figure 2 we try to present the different levels that we believe are necessary to analyze, in order to be able to define the requirements when acquiring a system. First of all the customer has to be clear of why the business as a whole need the new system. When a bank decides to go online the motivation for this can, for example, be decreased costs, better knowledge of customer patterns or increased customer satisfaction. These are business benefits that may motivate the acquisition of a new system. A business case may show that the cost of developing the system is lower than what it gains in decreased costs or increased productivity.

On the next level, the Activity Level, user requirements are identified that correspond to user goals. This results in proposed system functionality. In the online bank example a user goal may be to keep track of the interest rate on one's loans and a proposed system function may be a text messaging service that notifies the user when the interest rate changes. Furthermore, the interaction with this feature may be designed and evaluated in an effort to establish the requirements for the system. Finally, by knowing what functionality is sought for it is possible to specify technical requirements that support the desired functionality. The decision to develop this functionality is, of course, still a business decision. The technical solution it requires may, for example, be too expensive, but in uncovering user needs and goals it is possible to establish a link between a) what the business wants to achieve, b) what features that may realize this in actual usage and, finally, c) the cost of developing it in relation to what it would gain.

Today, many procuring organizations only analyze their needs on a business level and then go on to acquire a system. It is assumed that the purchased technology automatically will realize the business objectives.

Some technical requirements may also be included but requirements based on users' needs are seldom incorporated. In short, the activity and interaction level are often skipped, or at least not defined with professional usability and interaction design competence, as depicted in Figure 1. Given this, we would like to argue that there is a missing link in current procurement processes. This missing link is that between abstract and idealized business goals and requirements that a procurement project starts from, and concrete technical requirements that a procurement project aims at specifying.

In this paper we argue that user requirements and interface design (UCD) may serve as a bridge to this gap. The reason is that user and business goals are interrelated - business value is generated through product usage. Whether it is a business to consumer, business to business or an internal system that is procured, the aim is to realise some business goals. But as pointed out by Balic, Berndtsson, Ottersten, and Aldman [2, p.1] an interactive system can never realise such goals by itself - someone has got to use it.

"What often seems to be forgotten is that the generated business value corresponds to the level of usage (number of users who actually use the product) and the product's quality-in-use (effectiveness, efficiency and user satisfaction when the product is used). In other words, business value is generated through product usage."

Whether it is a consumer that purchases something over a website or an employee who registers a transaction the actual *usage* is central in realizing the desired business goals of e.g. increased sales or increased productivity. Consequently, understanding usage should be a central task in procuring any interactive system. In order to be able to specify what to acquire a client organization needs to understand the requirements of both the current and the future usage of the system being procured. This may seem obvious but is surprisingly often forgotten.

The key here is to analyze the investment of using the future system rather than simply analyzing the cost of the particular project. Even though such investments analyses are made today, they are often made on a business process level rather than on an activity, or usage level (Figure 2); but in the end it is on the activity level that the business goals are realized.

The responsibility for ensuring that the system helps in realizing the desired business goals is not possible to delegate to a supplier organization – procuring organizations must see to this themselves. In theory this implies that HCI and requirements engineering should approach organizational and business development, rather than only system development, which has been the focus until today. Practically this means that the UCD process may act as a bridge between business goals and systems requirements in procurement projects.

Thus, as illustrated in Figure 3, we propose that the UCD should cross the border from development to procurement. By understanding current usage through user research and predicting and evaluating requirements on future usage through methods and tools such as scenarios, prototypes and evaluations, procuring organizations will be better equipped to order a usable system that meets overall business goals. With a UCD approach to procurement business and user requirements can advantageously influence each other when specified in parallel, rather than being specified sequentially with a contract separating the two [26].

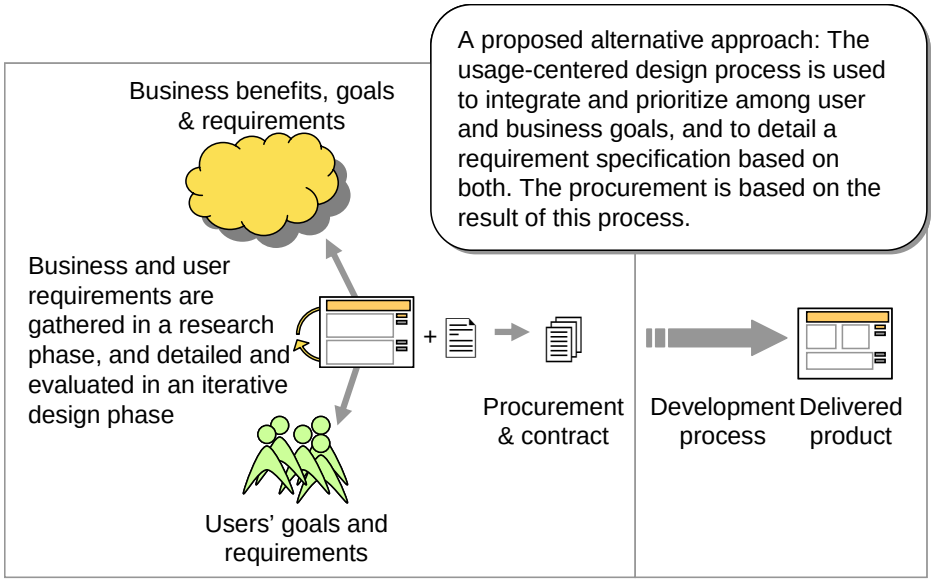

Figure 3: A proposed alternative model: user requirements and UCD are used as a bridge between business objectives and technical requirements in the procurement.

2.1 Relevant development contexts

A direct link between the usage of a developed system and the overall business goals requires that the system is somehow connected to business processes. This is often the case for systems developed in contract- and in-house development. The actual usage of e.g. an online bank or an internal system is directly connected to the performance of the organization. In product development, on the other hand, there is often only an indirect link between the usage of a particular end customer and the profit of the product development company, in that usable systems *may* lead to higher satisfaction and increased sales. For this reason, our main focus in this paper is not on product development contexts.

As mentioned in the introduction one reason that we have focused on contract development contexts is that the organizational barriers are more evident there than in the other development contexts. We do, however believe that the problems and solutions we describe in this paper are often equally applicable to both contract and in-house development since internal organizational barriers between a procuring and developing department may often be as strong as those between two separate organizations [5,14]

To summarize, we believe that UCD, which is commonly perceived of as a development activity, could play an important role in the acquisition, or procurement, of interactive systems. When UCD activities are part of the development many clients perceive it as an additional cost to the actual developing. This is particularly so when UCD has got it's own terms, teams and methods in the supplier organisation rather than being integrated as a quality perspective on the requirements elicitation [7]. By crossing the border to procurement we believe that usability may be viewed as an asset rather than a cost - a tool for making better procurements and cost-benefit analyses *before* deciding whether to plunge into a development project. This requires however, which we will soon describe, that the UCD process is shifted from the supplier to the client organization.

Although it is a bold statement we argue that usability issues will always come in too late in the process if they are involved in the implementation stages after procurement, since usability is really about defining what to develop rather than about how to build it. Given that we tend to perceive usability as a system development process it is hard to switch perspective and see it as a business development process, or as part of systems procurement. However, as we try to present in this paper there are several benefits in switching perspectives and crossing the border to procurement.

2.2 A tentative model

Before presenting our case studies and the main conclusions from these we will describe our general model for how to *acquire* or *procure* usable systems in practice. As mentioned before we suggest that the UCD process should be done as part of the procurement to find out about user needs and to specify what to procure based on both user and organizational goals and requirements. A way of doing this is presented in Figure 4.

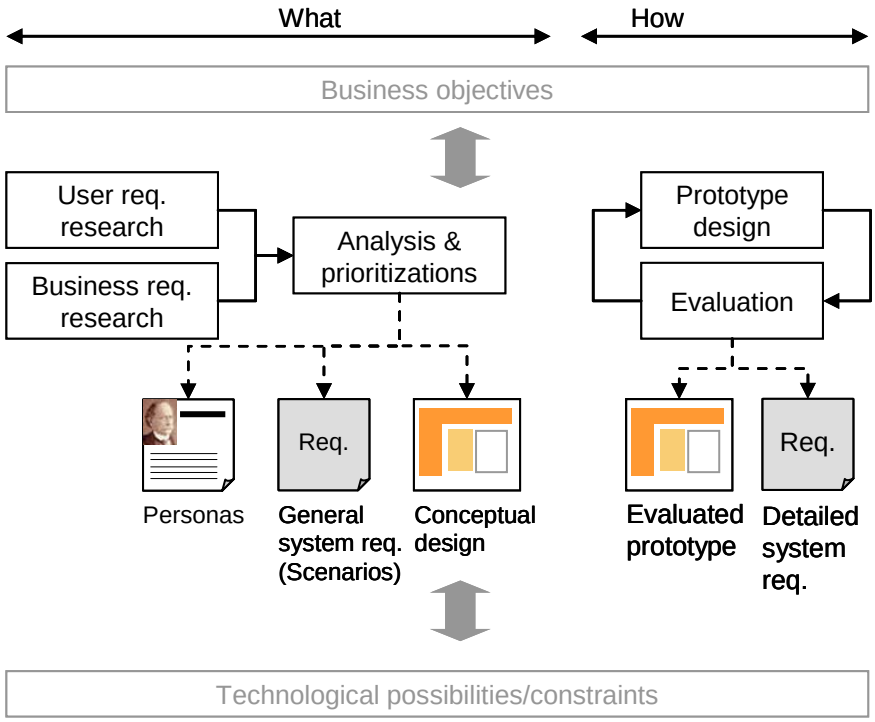

Figure 4: An overview of the UCD activities that were used in the case studies.

Our intention with the model is not to prescribe any particular method or tool to use, but rather to illustrate some general characteristics of the UCD process with user research and iterative design. It is up to each usability professional to decide which methods or tools suit the particular project and circumstances. There are, however, some general characteristics of the model we have studied that can be worth mentioning.

- We have found it useful to separate the process in two major phases: "what" and "how". In the first phase the aim is to understand needs and goals and what system services are appropriate. In the second phase these services are specified further. Prototypes are designed and evaluated with users.
- As illustrated in Figure 4 the process takes both user and business requirements into account and helps in prioritizing and integrating the two into a more concrete specification. In the evaluations the prototype (i.e. the requirements) is not only evaluated with users but also with the procuring organization. Business goals direct the overall work but certain user requirements may be more highly

prioritized than certain business requirements, if they help reaching the overall business goals.

- Although we do not prescribe any methods the deliverables in Figure 4 include personas (see [10,11, 15,20] for more information). We included these since the tool was used in both our case studies and played a central role both in the projects and for the procuring organizations [26].
- The final requirements are represented both textually in a report and visually in an interactive prototype.
- User requirements drive the definition process but are continuously synchronized against overall business objectives and requirements, as well as technical constraints and possibilities.

What, then, does this demand from the procuring organization? First of all, it requires procuring organizations to divide the systems development project into (at least) two parts – one for defining what to procure and one for developing the system. Today procuring organizations often decide on a budget and then let a supplier define, implement and evaluate the system. Sometimes it is even the supplier that defines the budget as well. We propose that the procurement organization should instead themselves define the systems requirements using user centered design (UCD) and let the result of this process guide the contracting and budgeting of the development project (Figure 3).

Secondly, procuring organizations need access to professional usability competence. We want to emphasize that it is not enough to only perform the UCD activities but it is necessary that this is done professionally by trained usability practitioners. If not the result is often of poor quality and may not support in the way that it could have done [25,1]. For large procurement organizations this only requires a shift in competence. They often use a team of procurers/purchasers today but they are seldom trained as usability professionals. For smaller organizations it is hardly cost efficient to employ a full-time usability professional. Small organizations maybe only procure one large system per decennium. For these we propose a role that we refer to as *the Interaction Architect*.

The idea of the Interaction Architect, using the metaphor of the construction architect, is to provide UCD competence when needed, without having any interest in also implementing the specified system. The comparison of the usability professional to the construction architect is quite common in the UCD literature (e.g. [9,21,23,35]). For example, Kapor [22, p. 4] write:

"Architects, not construction engineers, are the professionals who have overall responsibility for creating buildings. Architecture and engineering are, as

disciplines, peers to each other, but in the actual process of designing and implementing the building, the engineers take direction from the architect. When you go to design a house you talk to an architect first, not an engineer. Why is this? Because the criteria for what makes a good building fall substantially outside the domain of what engineering deals with."

There are many similar comparisons with other lines of business, such as product development and filmmaking (e.g. [6]). Of course, there are many differences as well, but in using it as a metaphor we would like to stress the *point in time* in which this role is involved. The responsibility of the Interaction Architect, as we see it, is to secure quality issues of interacting with the system *before* a contract with a technical supplier is signed, as well as to monitor the progress during the systems development.

Apart from the architect metaphor we have chosen this term over others, such as "Usability Architect" to emphasize that we do not want to focus on usability in isolation from other issues, as is often the case. Rather, we want to focus on use-qualities of the interaction in connection to overall business goals.

Although things are changing it is still very rare in Sweden, where we are based, that procurement departments employ usability professionals. Therefore both case studies are based on projects where the client organization hired an Interaction Architect through one and the same usability company. We will present the case studies briefly, and then describe what we have learnt from them, as well as some general conclusions about the feasibility of integrating UCD as part of the procurement rather than the development of an interactive system.

3. CASE STUDIES

The work with the Interaction Architect followed the process as described in Figure 4 in both case studies. We will begin with accounting for some general similarities in the work process, whereby we will also discuss some important differences.

The goal of the project in the first case study was to define the requirements for a new intranet. An internal analysis had revealed that many employers did not have time to use the internal information and that it was hard to get an overview of the information flow. To deal with this they ordered a pre study to gather usage requirements and suggest an information structure and interaction design that would support these requirements. The strategy was to use the prototype and requirement specification that the Interaction Architect delivered to procure the actual development project of the new intranet.

In the second case study the goal was to specify a new information architecture for a large website for employment exchange. When Internet usage got widespread the organization started to develop employment exchange services on the website. This had traditionally been handled by assistants in the local offices around the country. The website had, until recently, mostly been seen as separate from the local offices, and it had been managed and developed by a specific department within the organization with much authority of its own. During the last year, with up to 700,000 visitors every month (approximately 8% of the Swedish population), the management wanted to create a new organization in which the website would be the main channel for the matching process, and employers and unemployed would handle the process themselves. A new call centre and the local offices would mainly deal with those that needed more support and that could not get by on their own. In this way it was envisioned that the organization's resources could be used more effectively.

A procurement group representing all major departments was put together with direct contact to the management. Before the procurement group decided to involve an Interaction Architect they worked intensively by themselves gathering business requirements for the new website. This project had been initiated once before but had crashed, due to internal disagreements about solutions, so the procurement group was heavily motivated to succeed. A more detailed account of the second case study can be found in [26].

3.1 The work process

In both case studies the Interaction Architect proposed a process as described in Figure 4 with an initial phase to define personas, scenarios and a conceptual design, followed by a detailing phase with prototyping and evaluation activities.

In the first phase 20 contextual interviews were conducted with current users. These were analyzed by the Interaction Architect and transformed to personas describing different user groups and scenarios that described their needs. In the intranet case study the respondents were chosen to represent the different roles in the organization. In the website case study a persona hypothesis was put together in an initial workshop with the procurement group, and users were selected based on this hypothesis. The procurers were very engaged in the process in both case studies and attended on almost each interview to get an insight into the results. The scenarios and personas were used to create a draft requirements specification that described general system functionality that corresponded to business and user needs, as well as a conceptual design representing the initial design ideas.

In the next phase a prototype was designed and evaluated in two iterations based on a card-sorting exercise with users. In the first iteration a low fidelity prototype was created but a more inclusive version was done for the second iteration. Both evaluations were done with users. The procurers continued to be engaged in the process. Although they let the Interaction Architect design the prototype and analyze the results of the evaluations they participated as observers on the evaluations and had recurrent meetings with the Interaction Architect during the design activities.

After the second iteration the Interaction Architect updated the prototype and wrote the final requirement specification. Since the procurers had participated in the activities they were already familiar with the requirements and could start the review process immediately.

3.2 What happened?

When the intranet project finished, the idea was that the results would be presented to the General Director as basis for a decision of whether to start a development project or not. Unfortunately a decision could never be taken due to organizational changes that started to occur shortly after the project. The General Director decided to change jobs, and there was no new person available for the position immediately. When a new General Director was appointed she only lasted for a few months until the position was changed again. In the meantime a downsizing program was initiated in the organization due to cuts in the appropriations. This, in turn, forced the procurement group to lower their ambition for the new intranet and only make minor changes to the interface, rather than redesigning it completely according to the prototype. Today not even the minor changes have been implemented. The most recent General Director has informed the procurement group that they may get a budget to develop a new intranet if they can argue that the investment will pay off. However, the goal with the UCD process was to design a prototype that embodied and supported user and business requirements, not to cost-justify the development project. Since the procurers are unsure about how to predict cost/benefits of the decision for development is postponed.

In the website case, the procurement group had worked a lot with anchoring the results in the organization. Both during the UCD process, but in particular afterwards, they had meetings with their respective departments to report the progress and explain the design. This seemed to be a successful strategy since the review process ended with a positive decision by the General Director that the prototype shall represent the vision for the new website and the requirements will now be investigated further.

Even though only one of the projects actually continued into development both were successful from a UCD perspective. User-Centered activities were the driving force in the procurement process, but they were subordinated overall business objectives. Even in the first case that did not continue UCD played a vital role. By working so thoroughly with requirements of actual usage in the procurement the procurers were quite conscious about what they decided *not* to develop, which might be as good a decision as a green lightning.

3.3 Differences between the case studies

Although the work process was generally the same in the two case studies they also differ in some respects.

In the intranet case study the procuring organization had formulated the project to be divided into one “What” phase where the users’ needs and corresponding system functionality was specified, and a “how” phase where the requirements were detailed and evaluated. If they wanted they could stop the project after the first phase, or continue with another company, and they also had an option to use the Interaction Architect in an eventual implementation phase after a systems procurement.

After the first “what” phase the requirements specification and prototype was sent for review in the procuring organization and opinions were collected from different departments. Furthermore, the project was planned to begin with the UCD process but to synchronize the results with technical and legal requirements later on. The procurers consciously made this decision to define what they wanted, or needed, first, and then start a discussion what would be technically feasible. In this way they expected to not be constrained by technical details too early in the process. However, even though they had planned activities for integrating user and business requirements by the end of the intranet project, this was not their only possibility to do this. Their engagement in the process and the possibility to reflect on the requirements between the phases also made it possible for them to evaluate to what extent their business requirements were incorporated in the design.

These strategies, as well as the procurers’ engagement in the work process, also made it possible for them to understand the results and the decisions that were taken. The review process between the two phases brought with it time for reflection, a possibility to explain to the organization about their progress, and get support for their results.

In the internet case study there was a very tight schedule and there was no time for a review phase in the middle of the project. Since the focus was not on defining new functionality but on reorganizing an existing

information architecture there were no clear phases of “what” and “how” as in the first case study either, but the project was planned as one continuous sequence of activities.

Partly due to the fast tempo, and because there was no planned pause for reflection, the procurement project leader announced that the project would halt temporarily shortly into the second iteration. The procurement project group had not been able to understand all user requirements and was also unsure about the connections between their abstract business requirements and the now concrete design. To remedy this, several workshops were planned where previous steps and decisions were explained and discussed. The business requirements were also discussed more than they had been before until they too reached the same level of concretization as the user requirements. In this process the procurers got more initiated in the results and important discussion about the relations between and prioritizations among user and business requirements were taken. In this way the design and information architecture was evaluated not only with the users but also with the procurers from a business perspective.

The work during this “halt”, as well as their general engagement in the activities of the project, ensured that they felt secure with and could understand the design decisions that had been taken. This was necessary for them to be able to act as promoters for the project and its results to the organization. Apart from keeping a continuous dialogue with the organization during the UCD process they had also planned a thorough review process after the project were the prototype and project report was sent for review in the organization. Based on the results from this review they updated the prototype themselves and presented everything for the General Director for a decision about the development.

4. REFLECTIONS

This section is divided into two parts. In the first section we discuss what is required by a client organization to be successful in procuring a usable system. This discussion is based both on the case studies reported here and our earlier research in the field. In the second part we describe some experienced advantages with a procurement approach to usability.

The idea that procuring organizations should actually perform the UCD activities themselves strikes many people as odd – is this not what they pay suppliers to do today? Well, both yes and no. Few suppliers in contract and in-house development bother about usability today, and often it does not get attended to professionally in either the procurement or the development process. If it does, however, it is most often by a usability professional in the

supplier organization, but frequently they get involved too late in the process.

By crossing the border to procurement it seems easier for UCD to take on the role it should, since it fits as a bridge between business objectives and technical requirements. As concluded in earlier case studies [1,25,26] the UCD process is, however, by no means sufficient by itself for a successful system acquisition. It is necessary for those responsible for the procurement to be active in the UCD work in order to be able to embrace and understand the results. This is likely particularly important if an external Interaction Architect is used, since it is the responsibility of the procuring organizations to continue work with the results by gaining acceptance for it in their own organization, as well as using it to procure a technical development project.

At the same time the UCD process and its deliverables helped the procuring organizations in these case studies to be active and act competently. It would have been difficult to act as competent and secure without the help of the UCD methods and tools, since they functioned as an important bridge between business and system requirements.

4.1 The active procurer

What, then, is characteristic of a competent procuring organization? We have earlier [18,19] defined high procurement competence as the ability to:

- *Plan* a systems development project
- *Communicate* needs and requirements
- *Monitor/manage* the process
- *Evaluate* the progress and the results

The case studies summarized here are good examples of competent procuring organizations in many respects:

4.1.1 Plan

The procuring organizations in the reviewed cases planned for involving a usability perspective from the very start. Even though usability issues are valued by procuring organizations in general they seldom plan to deal with it professionally, but may try to do their best without help [1,25]. In these case studies, however, the procuring organizations not only valued usability issues but realized that they themselves did not have the necessary competence to deal with it, and hired an Interaction Architect.

By planning for and using the UCD process to procure usable systems, the gained knowledge from user research and the iterative refinement of the prototypes let procuring organizations become more precise in their acquisition. The more we know of what we want, the easier it will be to decide how to get it, and how much it is worth. Or, as Buxton [6, p. 13] puts it:

"The higher the fidelity of the final design prototypes, the more we know on the what side of the equation. And, if you don't have a very clear idea of what you are building, how can anyone responsibly say if it can be built, how it can be built, when it can be built, or how much it will cost to do so?"

By performing a pre study with UCD the procurers in the case studies could define a clear vision of where they wanted to go. The UCD process supported them in their overall decision process to purchase a new system, and to plan future stages and activities.

The procurement groups also planned their own engagement in the procurement process, even during the UCD phase when they could have handed over all the responsibility to the Interaction Architect. This engagement is identified as one success factor for their ability to use the result of the UCD process.

Lastly, the procuring organizations planned a thorough review process to get support for the result of their work in the organization. Rather than isolating themselves as a workgroup they continuously reported back to the organization both during and after the UCD process. This was likely important for getting a green light for the development project in at least one of the case studies.

4.1.2 Communicate

In both case studies the UCD process enhanced communication in several ways. Firstly, the project groups could agree and work towards a common goal since they could ground their discussions in concrete things such as personas and a prototype. Hence, their own discussions about requirements among themselves, and with the Interaction Architect, became easier. Secondly, the tools that were used also facilitated communication with their respective organizations. Both groups conducted an effort to gain support for their results in the organization and the prototype and the personas were used extensively in this work.

Hopefully the results will also aid in communication with suppliers. Since none of the projects have continued into the development phase yet we cannot know if this is the case, but we have studied a case were the opposite occurred [25]. In that case study the procuring organization did not work professionally with UCD. They made some attempts to interview users in a

"What" phase (Figure 4), but mostly imposed their own ideal model of work on the users, rather than listening to actual user requirements. More importantly, though, they did not start the "how" phase at all. Since they had not got a firm grounding in user needs (a shaky what phase) they had different perceptions of what it was they were procuring. Furthermore, since they all had different perceptions of how the system would look like and behave (no how phase), they had a hard time selecting a supplier. All suppliers answered that their solutions would provide all the functionality that the responsible procurers had asked for. However, the solutions differed vastly in how they would look like and behave. Since the members of the procurement group had not worked through these issues themselves their judgment of the suppliers' presentations was ad-hoc and subjective, rather than uniformed and based on actual user and business requirements.

Thus, we believe that the UCD process can help procuring organizations become more sensitive to what they really need, both from a user and business perspective. Moreover, it can aid in communicating what they need both within their own organizations, and with supplier organizations.

4.1.3 Monitor/Manage

The case studies also demonstrate a competent management and monitoring of the UCD projects that were conducted. Both procuring groups were engaged in the process and aided the Interaction Architects completing their work, for instance by helping recruiting users for participative activities. Not only did the responsible procurers plan to be involved in the projects but they were actually involved continuously even in detailed design discussions.

On a process level the procuring organizations in the two case studies employed different strategies to monitor and manage the process. In the intranet case the project plan included a point for reflection and discussions with the organization in between the "what" and the "how" phase (see Figure 4 for details). This opportunity was used to gather comments on the emerging requirements and design concepts. In the Internet case study there was no such period in between phases. This resulted in the end in that the project leader from the procuring organization had to halt the project to get the project group back on track and ensure that everyone understood and could argue for the requirements.

4.1.4 Evaluate

Through their participation and engagement in the process the procurers could continuously evaluate the progress. For example to assess that the

design not only supported user requirements but also business requirements. The UCD process itself also ensured that the emergent requirements were continuously evaluated. During the contextual interviews the initial ideas based on business requirements were re-evaluated in the light of the emerging user requirements. The first concepts of an information architecture was evaluated against the results from the card-sorting workshops. In both projects more formal think-aloud evaluations with users were also made in two iterations.

4.2 Benefits for User-Centered Development

From this discussion it seems that it is a successful strategy for procuring organizations to use UCD as a requirements specification process in their procurement. But what is in it for usability professionals? Well, as we mentioned in the beginning of this paper we believe that this approach may help to solve some of our most common problems as practitioners in contract and in-house development.

4.2.1 Integration

As mentioned in the introduction, integrating their work into that of others is one of the most recurring problems for usability professionals. What is interesting about the case studies reported here is that even though an outside usability consultant was used to perform specific usability activities the resulting requirement specification was not perceived of as only focusing on usability issues. Instead, by performing the UCD process as part of the procurement the evaluated prototype and the accompanying requirement specification is *the* artifacts that will be used by the procuring organization to communicate what they need. Rather than having a separate document or deliverable for the UCD process and other activities the deliverables from this process are the ones that will be used to procure the technical development.

Moreover, although the UCD process was originally intended to gather user requirements it also helped to prioritize these against business requirements, as well as to detail both into a systems design. The “how” phase was used to transform both the abstract business requirements, and the user requirements, into an integrated specification representing both.

4.2.2 Early involvement

Both cases demonstrate an early involvement of usability competence. As mentioned in the introduction usability professionals often have to fight to be

involved early in systems development, and then early is still considered to occur after the system is procured. By viewing the UCD process as one of business development instead of system development it fit naturally as part of the specification process before the system is procured.

Early involvement is, of course, not only an interest of the usability professional, but also for the client organization, even though this will involve an additional cost. As summarized by Buxton [5, p. 9]:

"The primary assumption in advocating this [an insertion of a design process in the front end of the product development] is that the cost and time lost due to this additional stage will be significantly less than the cost and time lost due to the poor planning and over-runs that will inevitably result if it is not included (…) The process must reflect that we don't know and acknowledge that the sooner we make errors and detect and fix them, the less (not more) the cost."

One effect of introducing the usability activities at this stage was that a focus on actual usage was established in the procurement process. This will hopefully continue further into the development process. In any case the contract that is written for the development will be based on the evaluated requirements of user and business needs. In this way the chances that the overall process results in a usable system will likely increase, even if the supplier do not have access to usability competence of its own.

4.2.3 Independence

Since neither project has continued into procurement yet we cannot know whether the two procuring organizations will become more independent in relation to the supplier than they have been in previous projects. Our qualified guess is, however, that they will. We believe that their use of the UCD process to link business objectives to systems requirements through a focus on usage, the use of a prototype to define and communicate their vision, and their in-depth knowledge and understanding of the requirements will strengthen their position in relation to suppliers.

By using an Interaction Architect that did not have any interest in also developing the system their independence in relation to suppliers can also be strengthened. In the intranet case study this was even one of the reasons mentioned for involving an Interaction Architect in the first place. The procurement group wanted to focus on usability issues but decided that the supplier of the requirements phase could not also be allowed to implement the system. The reason was that they wanted to avoid being dependent on a single supplier that specified the requirements, decided how they should be evaluated, implemented and evaluated the system.

This is one important benefit of working with an Interaction Architect that does not have any interest in also developing the system, as was the

situation in these case studies. The backside of this is the separation of external and internal qualities, as highlighted by Löwgren [23, p. 94]:

"Software development informed by recent work in design methodology should aim at separating external design from internal design and construction. (…) This has implications for how we view the designer's role, as well as for the structure and management of software development projects. A problem which remains to be addressed is how to deal with constructional aspects affecting the use of the final product. Response time, reliability, maintenance, etc., all affect the users' experience of the product (see Gould, 1988, for a discussion). Yet they cannot be adequately addressed in the design work since they are determined by the final construction. A tentative answer is that the designer - much like the architect - is responsible for coordinating the construction work in such a way that it satisfies the design vision to the greatest extent possible."

Löwgren's conclusion of how to handle this is much in line with our ideas about the Interaction Architect, and it is something that we will continue to study in future case studies.

4.3 Other benefits

Apart from the benefits we raise in this paper there are some fundamental reasons why this approach should be appealing to procuring organizations. At least in Sweden, it is the procuring organization that is responsible by law to involve users in changes in the workplace and ensure that these changes are in line with workplace environment regulations. Furthermore it is also the procuring organization that is responsible to see that the investment actually pays off. Neither of these responsibilities is possible to delegate to a supplier.

General cost-benefit arguments also deserves mentioning, although they often tend to be superficial. Nevertheless it is the client organization and not the supplier that benefit from reduced development time, reduced cost for training and increased productivity. These are benefits that are often associated with projects that incorporate a UCD perspective.

5. CONCLUSIONS AND FUTURE WORK

We have argued that the common practice of usability professionals typically being involved in the development phase results in UCD activities being started too late. In order to be involved early we need to redefine what we mean with "early". We claim that there is today often a gap between procuring organizations' business goals of initiating a procurement project and their objective to define what to procure. In response to this we claim

that UCD must be involved even earlier than what is the general norm today, to bridge this gap.

By crossing the border to procurement we have suggested that the UCD process might instead be viewed as a part of business development. In doing this, we have tried to show how traditional problems, such as late involvement and integration of UCD activities, can be solved. In two case studies we have demonstrated how these and a number of other benefits were accomplished, including an integration of business and user requirements and a facilitated communication among stakeholders.

In particular, we account for how a particular strategy, inspired by the role of the construction architect, was employed in these case studies and how it worked out. Although none of the case studies have yet continued into development we can at least conclude that the strategy of the Interaction Architect was successful in establishing a user focus already in the procurement, and equipped the procurers with a more solid platform from which to acquire a usable system. An important condition for this strategy to work is that the procuring organization act competently by planning, communicating, monitoring/managing and evaluating the progress. They need to be active and engaged in the UCD work, even if they have outsourced parts of the process to an Interaction Architect.

The approach we advocate may seem like common sense – the earlier and more specific you define what you need the better your chances are for getting it. However, as highlighted in [6], consider how much it contrast with current practice where systems are purchased and products and projects are green lighted before we know what they should be for, without any design and a plan for evaluation. It is important to not forget that we get what we measure and reward, so it is critical that these criteria is in line with our objectives.

An adoption of this strategy and approach requires a shift in mindset for us as usability practitioners. We must recognize that the UCD process does not necessarily have to be viewed as a systems development process, but can also be perceived as a grounded business development process. Or, more to the point, an approach to systems acquisition that links business objectives and systems requirements while strengthening procurers' ability to order a usable and appropriate system. This shift in perspectives is not easy, but in our experience very rewarding. It can help us to become involved earlier in a more appreciative context in where our results are actually used. In a longer perspective we believe that this shift also should affect HCI educations to be more focused on organizational and management issues and theories.

5.1 Future work

Until today we have in our research focused primarily on understanding how procuring organizations think about and work with usability issues, and, to some extent, how a procurement-driven UCD process could be accomplished with the work model and roles presented in this paper. However, there is very little work done in this area, at least from a usability perspective, and we know that we have just started to investigate into this new approach of the role of HCI. In future research we will continue to study procurement projects, as well as follow up on the case studies reported here, once they get into the development phases.

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NOTES

[1] With UCD we refer to the general process of achieving high usability through 1) understanding who the users are and what they need, 2) designing appropriate solutions and 3) evaluating these with users in an iterative design process. This can be done practically through a number of methods that may differ depending on traditions and practical needs. See [13,24] for an overview of different traditions and [3,11,27,34] for example of different practical approaches.

[2] The term procurer is used frequently in this document. With "*procuring*" or "*client*" organization we refer to the acquiring and purchasing part in the client – supplier relation. Within this organization the person or team that is responsible for working with the procurement is often not the same as the one who pays for it. Therefore, when we refer to "*the procurers*" we mean those who were actually involved in the hands-on work.

[3] Note that we are describing the absence of *professional* usability competence. If asked, both procurers and suppliers would likely say that they value usability, and probably even that they work with it. However, our earlier case studies of procurement projects [1,25] indicate that usability is often considered as something that only requires an interest, rather than a professional competence. We do not believe that an interest is enough to create usable systems.