

Procurer Usability Requirements: Negotiations in Contract Development

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ABSTRACT

This article describes a case study that examined one procurer's reasoning about and work with usability-related issues as well as the contractor's response to those requirements. The aim of this study was to examine the procurer's power to direct the system development process according to user-centred principles and indeed to point out its responsibility to use that power. The study elucidated the procurer's and the contractor's differing views of usability. The results suggest that the project leaders from the two organisations examined in this study had differing views of usability and that both approached usability more from a business perspective than from a user perspective. Furthermore, we found that the procurer valued user-centred activities less for their results than for the opportunity they gave to come in contact with the user's point of view and then to visualize the requirements concretely. We conclude this article with an analysis of some contradictions within and between the two organisations from a socio-cultural point of view. We suggest some mundane but nevertheless important requirements that procurers should think of when contracting consultants.

Keywords

Procurement competence, usability, system development, human computer interaction, contracting.

INTRODUCTION

All usability professionals know that the results of their daily work are ultimately in the hands of the procurers. Procurers should require usability. However, they seldom do—not even in contracting (Buie, Winkle, Norloff, Shafto, Bevan, Cohen, Hawkins, Hix, 1994).

Achieving usability requires competence, effort, and resources on the part of both procurers and contractors. Contractors often have difficulty incorporating usability into their general production models (Carlshamre, 2001). If the contract does not contain explicit requirements for usability, it is generally one of the first considerations to be cut if time or finances are constrained. When time is short, the contractor fulfils only those requirements specified in the procurement agreement.

Except for in a few discussions (Grudin, 1995; Buie et al., 1994), the issue of procurement has not attracted the Human Computer Interaction (HCI) community. Except for Keil & Carmel (1995), Ives & Olson (1984), and Forsgren (1996), who all emphasize the importance of user involvement and usability, there are virtually no empirical studies of how procurers reason about usability, involve users, and make these issues a production requirement. Studying the general literature of HCI, one discovers that the focus is on the production of the user interface in product and in house development (Helander et al., 1997; Preece et al., 1996; Shneiderman, 1998; Dix et al, 1998; Cooper, 1999). System development methods and models for user-centred system development have also mainly focused on the developmental side of the contract (see Newman & Lamming, 1995; Greenbaum & Kyng, 1991; Constantine & Lockwood, 1999). The implicit reasoning seems to be that it is the contractor's responsibility to ask the right questions and produce the right design (see Pohl, 1993; Dorfman och Thayer, 1990; Macaulay, 1996). This means that procurers have only a passive voice in the development of usable systems. Even if we applaud the consultancy industry for addressing usability (many of the larger consulting companies today employ at least one usability professional), we should recognize that the procurer in a system development project is the one who defines the goals, distributes the resources, and who possibly also defines the work process. Contractor-driven usability might create an illusion that the procurer is in

good hands and need not worry about usability requirements. However, the fact that contractors hire usability professionals who perform usability activities and advocate usability is not simply a sign of good will. This trend is driven by economic factors, since usability is often seen as a supplement to traditional system development. At the same time, most procurers assume that anything developed will be usable or at least have a relative degree of usability. One might speculate that if procurers do not ask for usability activities, they simply will not get it.

We have found some system development literature that works from the perspective of the procurer, although such literature generally does not explicitly focus on usability issues. Dahlberg, Lundgren, and Stiberg (2000) focus on identifying the utility and value of an Internet investment. Their perspective is organisational and economic and does not include functional requirements or quality-based usability issues. They seem to leave usability requirements for the system developer, who then has to place these requirements upon the project. Forsgren (1996) focuses on the technology environment and the fit between new and old systems. This is, of course, a very important usability issue, since one has to consider coupling to former systems that may have other designs. However, Forsgren's objective is to focus on strategic and organisational issues concerning technical connectivity, rather than to focus on usability.

Clark & Heivert (1999) present another system development procurement model. They spotlight functions and properties in order to fine tune the procurement and the product. Although this is a very important aspect of procurement, it does not in itself say anything about the *relation* between the supplier and the procuring organisations, nor does it say anything about the *relation* between technology and organisational development or emergent requirements. The supplier and the procuring organizations define the function of the final product abstractly. This makes it difficult for developers to visualize actual usability and organizational issues. A technical and functional analysis can render abstract everything that makes technology lively and viable, specifically the activity the technology should perform for the user. Secondly, an abstractly specified function can take on any number of different forms that are not necessarily accessible for the specified user or that do not attain organisational goals.

ISO standards for usability (e.g. ISO 9214–11; 13407) have become a popular and convenient way to approach usability. ISO standards, like most other models and methods in the field, also focus mainly on the contractor's craft in producing technology. A possible risk in using ISO standards exclusively is that procurers routinely demand that contractors work according to them. This

can be a way for the procurer to secure the contractor's accountability and alleviate its own. However, every organisational development project and every system development project needs a unique approach to introducing new technology, both in terms of the attributes and properties of the system as well as in terms of system development strategies. The procurer must be able to anticipate and to analyse the specifics of his or her organisation—and not merely ascertain whether or not the supplier is in fact working according to standard. For the procurer to be able to make a reasonable evaluation of the contractor's fulfilment of standards, its project leaders must have a very good knowledge of those standards. This, in turn, probably means that the project leaders would have to have adequate competence in usability procurement in the first place.

If we look at other construction-based branches such as architecture and construction work for buildings, we find that people working in these branches separate analysis, design, and actual construction. Within such branches, authorities often prescribe requirements. The traditional practice is to engage an architect who draws up blueprints that take into consideration various requirement compositions, ranging from aesthetic aspects and use qualities to construction. But there are also cultural differences in these areas. The typical Danish architect, for example, is the main project leader throughout the project, even through construction. In Sweden, architectural planning and labour intensive construction are clearly separated, and the architect has no responsibility for construction as long as the blueprints meet the requirements of the authorities. Even if there are companies within the Internet sector that focus on procurement, most contractors work with prestudies in order to detail requirement specifications from which *they* then can produce technology. This is the IT equivalent to asking construction site workers to draw up blueprints.

We regard the procurer as the person or the group of persons who have a sketchy idea of the system, who are responsible for its fulfilment, and who have the power to distribute resources during the completion of the project. In our view, high procurement competence must include an awareness of usability issues as well as organisational goals. It must also include the ability to plan, communicate, monitor, and evaluate of the process of reaching these goals.

THEORETICAL FRAMEWORK AND AIM

For the analysis of this case study, we work from a socio-cultural view of human conduct (see Wertsch, 1991; Engeström, 1987). A socio-cultural perspective assumes that human conduct is mediated through tools. This means that one's understanding of something, sometimes called the "object," is always viewed as being structured

by the tool, which can be physical or psychological. For example, Näslund (1997) has shown how different subjects within a system development team have different views of the system. Persons working with usability might understand the what, when, and how of system development in a way that differs from someone who focuses on databases. Within HCI literature, there is also clearly a difference between process and product focus, each of which frames usability in different ways. Other important issues from a socio-cultural perspective are motives for action and activities. Motives may be dynamically layered. Activities seldom have a single motive, but are rather multidimensional and variable. At one point, one might focus on one goal; at another point, one might focus on another. Moreover, these motives structure the way in which one employs tools. Subjects are linked to *communities* of some kind. At any given moment of activity, the subject is related to at least some kind of community, either psychologically or directly, by coordinating some *division of labour* with the object. Thus, the people one identifies and associates with also affect one's reasoning and conduct. If these aspects are not consistent in the project conflicts and contradiction may occur, which halt or redirect the activity.

In this study, we look at the interaction within and between the development organisation and the procurement organisation. The subjects we are particularly interested in are those individuals who have the power to distribute resources: in most cases, the project leaders or those who are responsible for conducting business.

We are interested in instances of cooperation and conflict between and within the two main organizations involved. In particular, we are interested in conflicts that constrain opportunities to develop computer systems that adapt user-centred design and usability principles. These constraints can be physical, economical, social, or cognitive. Our aim is to understand which constraints affect subjects within organisations, especially when it comes to the task of articulating emerging requirements.

Rationally, one can understand that there are several differences between a procurement organisation and a development organisation: they have different business aims, impose different organisational constraints upon employees, have different standards for evaluating and assessing practice, and have different goals and objectives. What is more, a system development project might have an objective that transcends technological concerns. These are all important issues that might constrain or determine opportunities for usability. In what follows, we will contrast the project leaders' views on and work with usability.

CASE DETAILS

The procurement organisation examined in this case study worked within a branch of organisational change. It had developed a product that analysed an employee's assessment of his or her psycho-social work environment. Users answered several questions regarding different organisational issues that ranged from the physical to the socio-psychological. Thereafter, the user was presented with a table that shows how his or her work environment compares with various norms. Findings could be used for personal or organisational development.

The product was sold on a floppy disc, which each user installed locally. Although the utility of the product was very high, its usability was low in all regards. Users had problems installing and using the system. Although there seemed to be a degree of willingness to learn how to use the system, few users bothered to go through the entire learning process. As a consequence, the system did not achieve its intended effect.

The project we studied aimed at redoing the program for the Internet with the aim of making it more accessible and thus usable. Internet access and centralized databases introduced some new issues that had to be considered. First of all, the procurer sought to assure users of the program's integrity, so the database had to be secure from intruders. Statistical analyses had to be preformed in order to ensure that no single user could be traced and the results of his or her analysis explored by anyone other than the user him or herself. These requirements were of utmost importance, since they touched on technical issues pertaining to security and usability issues associated with security, most importantly, trustworthiness. While the technical requirements were explicitly included in the contract, the usability requirements were not. Nevertheless, the procurer regarded traditional issues of usability such as ease of use and learning as implicit and important requirements.

The project leader for the procurer was an experienced leader and had been trained in marketing. However, she had no former experience in usability and user-centred design. She came in contact with us through a workshop on requirement engineering and usability, which was suggested to her by her organisation's senior management. At this point, the contract with the supplier specified no firm usability requirements, process requirements, or usability competence. She quickly understood the importance of usability issues and saw them as something that her organization must include as emergent requirements or in a renegotiation of the contract.

The company that won the contract was a start-up company in Sweden with roots in the USA. It was set up as a company network, in which designers and programmers were employed through the mother

company. The head of the network took on the role of project leader for this particular project. He had a background in sales rather than in system engineering. The company had references from other associated companies within the branch. It had a good record in security-related work, but it had no experience with projects focusing explicitly on usability. Its contract with the procurer included maintenance and support of the forthcoming system. The project had a fixed price.

The project was started in 2001 and was to be finished in September of that same year. At the time of writing this paper, June 2002, the product was still not in use.

METHOD

We used three different methods to collect data during this case study. The main method was participant observation. A student participated in the project by doing usability-related activities. Both the student and myself participated in meetings between the project leaders and in other project-related meetings on the procurer's side. We took notes on the interaction and focused on how both parties constructed an idea of the user-centred process and usability in general. We discussed these issues on a continuous basis with the procurer project leader. It is important to understand that we worked more closely with the procurer than with the contractor.

Two months into the project, we did an interview with the two project leaders. These interviews were semi-structured and based on about forty questions. The interviews were focused on usability issues and user involvement in the system development as well as the relation between the organisations. Our aim was to get a rough idea of how each party viewed the system development process: how they understood usability, how important it was to them, and how it fitted into this project.

The project leader of the procurement organisation kept a project diary, in which she made entries when she had the time. We had access to selected parts of the diary.

RESULTS

Prior to this case study, which started at the beginning of 2001, the project leader of the procurement organization did a user survey in which she asked the users what they would like to see changed in the program. This survey was not systematically focused on usability, but rather on aspects of functionality, utility, and the feel of the system. It was initiated in response to some changes that the users had said that they wanted, but also with the forthcoming change to Internet access in mind.

The procurer project leader was beginning to learn about usability. Shortly after having met us, she did a short course in ISO usability and user-centred design. Below,

we discuss the project leader perspectives on usability and then see how it materialised through the project.

Usability Perspective

This section describes how the project leaders from the respective organisations understood and reasoned about usability in relation to the system development project.

Understanding Usability

As mentioned above, neither of the two project leaders had any systematic experience with achieving or evaluating usability. During interviews, they demonstrated a lay understanding of usability.

The procurer project leader preferred to use the term "user orientation," rather than usability on the grounds that this term was consistent with her organisation's business goals. As she put it, making employees' voices heard was their business idea: *"our business strategy is to make employee voices heard, so we must have a user-oriented system development [...]."* She maintained that it was not only the final product that mattered, but also the *"process of engaging prospective users."* She also explained that she had high expectations of this project and admitted that she may be too demanding. Her outspoken demands may have made the contractor overly relaxed. As she put, he *"stopped thinking on his own and just followed my orders."* She insisted that the final product be easy to use and to understand and that it be accessible for the functionally impaired.

The contractor, on the other hand, confused the user and the client, often defining usability as the utility of the product for the client. He wanted to familiarise himself with the company by *"understanding their business."* He was very devoted to understanding of his client, its business, and the content of the system they wanted. Achieving usability was a part of meeting those objectives, rather than an objective in itself. The contractor said that he had a network of friends that would serve as his testing group. The group consisted of about seven people from different branches and classes, who gathered every once in a while for personal support. He felt confident that the group would help him evaluate the system at these meetings. He was not sure how the group should go about making such an evaluation, but he mentioned that he would give each member a task to complete. He did not have a more formal test group, nor any other ideas about ways of involving users proactively during design.

The contractor said that he had a list of ten requirements for the product. However, he failed to produce this list either during our interview with him or during his negotiations with the procurer. During the interview, he defined usability loosely as pedagogical: *"as not having a lot of things that blink such as banners that distract people [...] as well as visual ergonomics."* During

project meetings he presented a system development model that he described as user centred. From our point of view it was a more or less a traditional waterfall model.

The two project leaders thus had a different conceptual model of usability, both of which was more framed by business goals than ease and efficiency of use. Comparing their views, we find that the contractor had a more product- and interface-oriented view, while the procurer defined usability in a wider sense that included and even emphasized design processes and the user community.

Formulation of the Project and the Developmental Process

The project was planned to be concluded within a year. During that time, the procurement organisation had several informal and formal discussions with the contractor. As mentioned above, the project had a fixed price and no specified requirements for usability either as a process or as a product quality. As a consequence of the procurer's matured interest in usability issues, the details of the project were renegotiated and motives altered. The project plan now detailed the system development process as follows: *"The project will at an early stage involve clients, users, and people from different disciplines in order to gather as many aspects of user orientation as possible."*

During interviews, the procurers and the contractors demonstrated that they had very different understandings of how detailed the requirements were. The procurer claimed that the requirements were *"very wide-ranging,"* while the contractor maintained that requirements were *"well specified by both parties."* We may note that the procurer and the contractor were referring to somewhat different aspects of the project. The procurer referred mainly to usability requirements and the contractor mainly to the overall project its technical specifications. In any case, both project leaders said that the requirement specifications should be a living document that was continuously updated and revised.

According to the procurer project leader, her initial specifications for usability requirements were mainly based on *"former experience, but, as I come to think about it now, they were quite [...] sporadic. They were not very systematized."* The procurer project leader also claimed that she and other members of her organisation continuously explored requirements and discussed them directly with the contractor. She was not sure about what kind of requirements one could set and how they should be phrased. She felt that the contractor became a bit confused by her search for appropriate requirements: *"they probably wondered what I was doing, but they were helpful and supportive."* She also claimed that it was *"a bit frustrating to be so uninformed [. . .]. It is frustrating not to be able to be systematic and*

unambiguous." At the same time, she felt it was imperative for the formulation of the project that the requirements were not too detailed and that the contractor really understood the aim of the project and procurer's business goal. Basically, her position was that the new system must be usable and that the project should work from user-centred principles in order to ensure that users could easily learn and understand the system. This working strategy would allow both parties to achieve the aim of the project.

During his interview, the contractor said that he wished to learn more about *"user friendliness"* and *"to work with user-centred methods in a more academic way"* in order to improve his professionalism. For the contractor, the project was very clearly defined, and the discussions with the procurer gave him a firm understanding of the procurer's business goals and the technology it required. In the contract, the contractor specified a requirement that procurer project leader must be accessible for at least four hours each week for discussion and negotiation. He did not require access to users, which indicates his motive and his understanding of usability.

The two project leaders had a different view of the project's formulation. The procurer found open-ended requirements important but frustrating, since she maintained that final requirements are, in the end, defined by users. The contractor framed the project according to *his* understanding of the clients' business and looked upon the project as a way of gaining access to their perspective. For both, the on-going dialogue was meant to be one of the prime motors for a successful project and requirement specification. Here, we find it interesting that the procurer was concerned with the user's views and needs, while the contractor was concerned solely with the views and needs of the procurer. Thus they associate to different communities.

Planning for User-Centred Activities

Together with one of our students, the procurer planned various user-centred activities. Without the student as a resource, she would probably not have planned to perform the activities, but instead would have let the contractor perform them – of course, at some additional cost. By planning and performing these activities together with our student, she felt that she could monitor the system development process from within as well as take the initiative on usability issues. During planning, she continuously asked the contractor if these activities were all right, thus adapting to his view rather than requiring him to understand hers. The procurer paid for most of the additional activities but wanted to be sure that the contractor agreed to the consequences of specifying usability at this stage. On the whole, the contractor accepted the procurers' proposals without making any claims for additional money for adapting to user

requirements. He also gave the impression that he usually worked in a user-centred way. Thus, the main risk the contractor took was that the user requirement would be very detailed or hard to adapt to. The contractor project leader did not at any time give any advice or offer any ideas about how the activities should be synchronised with other system development matters, nor did he consider how these activities jacked in with system architecture or databases. Usability, according to the contractor project leader's view, seemed thus to be a purely front-up interface issue that was clearly separated from more technology-centred issues.

Phases of System Development

In this section, we describe the various user activities that the project performed and how the results of these activities affected the relation between the project leaders. The planned user activities included focus groups, formative evaluation, and a final acceptance evaluation.

Focus Groups

The project conducted two half-day focus test groups with eight persons in each group. The procurer sat in on both groups and took notes. The contractor project leader participated in one of the sessions. No other people from the contracting company participated. Participants in the focus groups discussed their visions of the best ever Internet application and its characteristics as well as general aspects of what would make the system being developed by the procurer good.

According to the procurer, the results were not overwhelming and could probably have been read in any general human computer interaction literature. She maintained that she was aware of what kind of results such focus groups could give; nevertheless, the importance of the focus groups was to understand the user population better. She wanted to get *"a better understanding of the product we are to develop."*

By participating in the meetings, the procurer project leader felt the users' positions became concrete. She claimed that she developed an understanding of the users' general requirements and could visualize the forthcoming system more concretely. In this way, the focus groups were very important and promising. For her, the focus group discussions gave arguments and motives for resolving tensions between user requirements, on one hand, and technical requirements, on the other. They also gave her a quick understanding of how users articulate their wishes.

As such, the results were not of such detailed granularity that they could be used for writing up a list of formal requirements. They spoke of more than just functional requirements.

The results of the focus groups were summarised and sent to the contractor for distribution to the programmers and designers. The document was intended to be inspirational.

At the same time, the procurer explicitly asked the developers to produce several sketches in paper format, which she wanted in order to be able to use them to evaluate the system with the users. She assumed that these sketches would be rough and give only outlines of the general layout, headings, and navigational structure as well as some overall information architecture. She derived this expectation from articles in human computer literature in which many rough sketches are one of the first iterations described. She maintained that it must be much quicker and easier to produce some rough sketches than electronic prototypes. She also asked for some different alternatives, rather than one fully comprehensive and aesthetic version. In her own words, *"I have also asked them to produce four or ten alternatives rather than produce a single proposal and then sell that to me."* In other words, she wanted to be in control, rather than to be persuaded.

First Version

The contractor sent three, reasonably comparable electronic interfaces with subsequent interfaces. They looked alright and quite uncomplicated in design with fairly traditional left-sided navigation. It was hard to really see if the designers had been able to make use of the results from the focus group, which were very general. As the information structure was not very deep, it was not really possible to assess how comprehensive it was. The procurer was quite satisfied with the result just by looking at them. She had requested for paper sketches, but did not get them. However, she had no formal contractual requirement for that request. The upshot was that this emergent requirement was not rewarded. The procurer felt that her forwarding of the results from the test groups and her request for paper sketches and several versions of the interface *"turned the system development process upside down for the contractor [organisation]."* *"They were not negative to this process,"* she continued, *"just not accustomed to a process in which user requirements were put forward."* This procedure meant that they had to think in new ways. The designers did not have single-sided power over the user interface; they were not expected to design the most satisfying and aesthetically pleasing design from the outset, but rather to consult and to negotiate with users as well as the procurer and to create several iterations for an acceptable result.

As the paper sketches were meant to be used as material for evaluation, the procurer did rough paper sketches of the electronic interface, which are generally considered to be better evaluative material as they are experienced as less complete. Users are more apt to make revisions

directly on the paper. At the same time, she did some sketches of subsidiary pages so that the evaluation would be able to say something about the information structure and assess how a user “*would go through the system.*”

Formative User Evaluation

The paper sketches of the electronic interfaces were assessed by five users in think-a-loud evaluations. The evaluation focused on what the users understood about the interface rather than effectiveness and efficiency. The results showed that the users wanted the information to be more short and snappy, rather than lengthy and inclusive. Most of the users emphasized that all concepts should be common¹ and wanted recognized functions and icons from other regular programs rather than unconventional alternatives. All of the users wanted more control over and feedback from the system. They wanted to be in control of the system and the information they put into it. They wanted to understand what they were about to do, where within the structure they were at any given time, and how they could move backwards and forwards within the system. The users did not feel that any of these requirements were fulfilled.

The procurer did not at first think that the evaluation would give much important information. She felt that it was “*frustrating and stressful not to know what the test would lead to.*” However, she became convinced of the value of the evaluation after seeing the results even if many of the users’ comments were general and obvious. The importance of the results was that the procurer project leader believed in them and could point to concrete users in order to make requirements of the contractor that fulfilled the users’ wishes. Empirical results from other studies always seem to be to less personal and too far from prospective users and their usage, she meant. The formative evaluations thus strengthened her view of usability issues. We might point out that this is not the usual way to give merit to evaluations in the human computer interaction literature, in which instrumental results are emphasised.

Requirement Formulation

The results from the evaluation were summarised as a document and were sent to the contractor as a requirement list. Many of the requirements were at this point concrete: for example, the requirement that all concepts be relevant and understandable for the user, rather than phrased in the Latin words commonly used as padding text by graphical designers. All the requirements were concretely focused on changes in the available interface. In other words, the requirement list did not

focus on the usage of the system in general or that specified each interaction with measurable attributes.

Together with the written documentation, she also sent a prototype of how she envisioned the design of the interfaces in order to fulfil the requirements. Her prototype presentation exemplified in practical terms how some twenty interface pages could look and be linked together in an information structure. In her view, this was a more concrete way of formulating requirements, as the prototype situated the requirements in the interface. The prototype was fairly provisional; some things were not explained clearly. She therefore also requested a meeting with the designers and programmers so she could explain the requirements to them in person. The contractor project leader was reluctant to put such a meeting together. The procurer project leader speculated that he wanted to be the prime link between the procurer and the designers. She respected this. In our view, however, his refusal can be seen as a clash between the objectives of the procurer and the objectives of the contractor. The contractor’s main objective was to have as close a relation to the client as possible. Nevertheless, he refused to let the designers work directly with the client since he seemed to think that this would render his own function as project leader extraneous, and he was not prepared to sacrifice his relationship with his client in order to maintain his role as mediator. For the procurer, the main objective of the project was simply to develop the best possible system.

Second Version

The second version of the system arrived two months later. This version was minimally modified in regard to the most recent set of requirements. Many of the required and most obvious changes were not made. For example, all functions and concepts were still in English or Latin. This made it impossible for Swedish users to assess whether or not the contents were short and snappy.

Moreover, the new version still only consisted of a few unlinked pages, which made it hard to assess if it was coherently linked. As a consequence of these two shortcomings, one was unable to get a feel of system interaction and test it.

The version had very few similarities with the prototype that the procurer had sent along with the requirement list—not even the most obvious features such as a site map and a diagram she had included. The procurer got quite upset and quickly explained her dissatisfaction. She also made it clear that she wanted a new version with revisions in the near future.

The contractor project leader admitted that he did not see all the required changes, although he maintained that the content of the system was not important at this point. The procurer thought that this was the wrong way to do

¹ For example, “begin here” instead of “login.”

design as she could not make detailed design decisions if she could not understand the program's form and content and assess whether or not it was in line with her users' requirements.

The contractor promised to deliver a new, revised version, which would be more complete – both structurally and in content.

Specified Requirements and Revised Version

Directly after the meeting, the procurer project leader documented the results of the previous studies once again, but this time she also made several detailed requirements, most of which were expressed in measurable terms and connected to the general requirements. She also commented on the priority level of each of the general requirements. She defined good text layout as “*easy to read and clear.*” Then she gave strict layout measurements in centimetres of maximum row length for clarity. She defined easy navigation as navigation that allows users to have access to various areas at various points in time and that is immediately comprehensible to at least eighty percent of all users. She took most of these requirements from the formative evaluations. The document was sent to the contractor after a few days.

Within a week, a revised version of the interface arrived. This version included many more changes than the former version even if it took significantly less time to produce. The version had a lot in common with the procurers' prototype and therefore many of the requirements were covered. The contractor project leader said, properly more in the voice of the designers than his own, that the version should be seen as very rough, even as a sketch of the final design. The procurer project leader was very satisfied with this new version and added only some minor suggestions for alterations. She felt, at this point, that she could finalize the interface requirements of the system.

In a sense, this example shows the difference between the procurers' and the contractors' view of the process and the system. The procurer was fully content with a rough aesthetic layout as long as the usability requirements were fulfilled while the contractor apologized for the design because it was rough. We might conclude that each party understood the purpose of prototypes and iterations differently. The procurer viewed prototypes as a means of evaluating the design according to user requirements as well as a means of formulating opinions and arriving at new requirements. The contractor's apologetic manner, on the other hand, indicated a view of the prototypes as something more finished and less dynamic, an attitude which perhaps reflected that of his employees. He may have looked on the prototypes as a way of persuading the procurer. The two project leaders

also used the word “design” in two very different ways. For the procurer project leader, design was assessed by requirements and interactive qualities; for the contractor, design connoted aesthetic values.

The project plan was, as is so common in system development, optimistic. The product could not be brought to completion by the deadline. The more thorough quantitative evaluation was put forward in time, however. At the point of writing this article, over eight months after the planned deadline, the project was still not completed. The reason for the delay is manifold and does not solely pertain to the usability issues. Another group of students did a heuristic evaluation of this same project with five user evaluations in late spring 2002 that showed that the interface was relatively well designed and that ambiguities pertained mainly to some smaller but nevertheless important concepts and visual cues. Nevertheless, the system is still not in use. A formal evaluation with real end users in context has yet to come.

Summarising the Contradictions

We have analysed the relation between the procurer and the contractor from the point of view of motives and tools for understanding usability. Of course, there are many tools, objects, and objectives in an activity as complex as system development. However, by taking usability as the focal point, we can get an interesting view of the differences and similarities between the project leaders and their respective organisations. Below, we summarize the main issues pertaining to the study.

The procurer and the contractor did not have the same view of usability. Furthermore, they did not even share the tools—conceptual or methodological—that are necessary for achieving usability. That means that they could not talk about the same issues.

We have called the procurer project leader's key tool for system development “user orientation” since she approached system development issues by and through users. She employed the views of users as a tool for specifying the requirements for the system. Her approach to usability and system development was to get a conceptual model of usability by taking a course in ISO standards as well as consulting actual, prospective users regarding conceptual modelling and evaluating purposes. Still, her understanding of usability and the aim and function of user-centred activities was quite limited and not really sufficient for specifying unambiguous requirements or explaining the aims of user-centred activities to the contractor project leader.

The contractor project leader's approach to usability was more focused on satisfying the procurer, his client. However, in order to fulfil promises, he was dependent upon his employees' understanding of usability while simultaneously being obliged to adhere to the procurer's

requirements. We might say that his limited understanding of usability in general and methodologies for achieving usability specifically was constrained to that of the designers. The contractor regarded usable systems as important, but did not have the competence required for achieving usability given the division of labour within his organization. Thus, even if he promised to adhere to user-centred design principles in a general way, the employees who interpreted such process and requirements were not involved in the negotiations with the procurer and did not have a usability perspective on their work. His unwillingness to include his employees in either the user-centred activities or in the discussions with the procurer severely limited their capability to adhere to a user-centred design process. This must be seen as a major drawback to system development as the designers could not get a first hand view of the users or understand their questions and wishes (see Keil & Carmel, 1995). We might see this as one method of working which the procurer project leader could have emphasized more strongly. We maintain that this catch twenty-two was a major problem, arising from a clash of objectives and tools. The designers' understandings (or misunderstandings) of usability and the processes of user-centred design was mediated to them by their project leader.

We think that the designers' view of system development, or at least the way their work with the design task was structured, stood in stark contrast to the procurer project leader's understanding of system development: that is, prototyping and sketches. The designers focused on making sketches that were nice looking, with form and function clearly separated. It seems that, to the designers, the prototypes were not provisional tools for system development, but rather something that needed the procurer's approval. The procurer project leader's desire for an iteration process was clearly foreign to them: she understood sketches and prototypes as a way of approaching users and specifying further requirements. This may be a minor distinction; nevertheless, it caused great tension between the two organisations.

Although they had some *overlapping* objectives, the procurer and the contractor did not share *overall* objectives for system development. The issue of usability and user activities was therefore formulated very differently. For the procurer project leader, user activities were a means to approach the object of system development and to create a system that was at once useful *and* usable. By approaching users through different methods, she was able to understand and require usability. The contractor, on the other hand, explicitly focused on his relationship with the procurer project leader, which he saw as necessary for a smooth and long-

lasting relationship between their organisations. The contractor project leader thus defined the object of system development in terms of his client's satisfaction. Usability was one among many other requirements and issues that he had to fulfil in order to please the procurer. Furthermore, since he was working in a network organisation, he may not have been able to share goals internally.

DISCUSSION AND IMPLICATION

This field study has described a project in which the procurer project leader took a strong position on usability. She took more responsibility than is usual for conducting usability activities. This strengthened her understanding of the users' requirements and put her in a better position to make those requirements explicit. With only one case study, it is impossible to say whether or not the procurer approached usability activities in the best possible way. It is worth noting, however, that she herself felt that this process made such requirements more clear.

It is apparently very important to synchronize the procurers and the contractors objectives, but we must also understand that objectives will never entirely overlap.

What, then, is the best allocation of objectives? Some obvious objectives are often specified in requirement specifications; this is one of the project leader's most important tools. However, if usability issues are to be considered, they must be explicitly required. We think that the way in which procurement and contractor organisations prioritise, organise, and correlate their objectives merits further study. The aims of these organizations and the means by which they achieve these aims will most likely differ. We would like to think that this study has given some understanding of this situation.

One might say that problems and differences would not arise if the two organisations were well versed in usability issues. Unfortunately, they seldom are. Procurement organizations are increasingly becoming aware of the importance of usability issues, yet consultancy firms consistently remain one step ahead in this trend. There is a risk that the procurers are adapting to the requirements of system development rather than forcing system development to adapt to their particular requirements for change.

We think that the HCI community should address management more directly and formulate that address rhetorically. It is important to orient a system development model from the procurer's point of view. Procurers obviously want usable systems. Often this desire is so implicit that they do not regard it as a requirement in proposal requests, or they simply hand over the task of requirement articulation and elicitation to

the developers. A system development model that seriously takes the procurer's perspective into account must therefore not only give advice on writing or evaluating requests for proposals, but it should also be phased out over time so that the procurer can be in control. First of all, however, the HCI community should formulate issues of usability in ways that make sense to management. Only then will usability people gain the resources and respect they need in order to be able to do more than just scratch the surface.

In conclusion, we would like to advise procurers to precisely define concepts such as usability and methods such as iteration and prototyping, and to precisely explain why such concepts and methods are used and by whom. These definitions should precede contracting. Moreover, contractors should be required to proactively participate in all usability activities. Also, it is important to ensure that not only the project leader participates in these activities but also other professionals within the system development team. Make the contract open for revisions and demand iterative requirement formulations. Make sure that the contractor shares the main objectives of system development by making clear requirement specifications that focus not only on the product but also on process and participation. In more administrative computer systems that depend more on the context of use and less on the described system, we think that procurers should request proposals that work from the angle of the activity and organisational change. Such proposals should describe the way in which the technology supports the activity rather than describe the technology itself. Specifying requirements that do more than merely suffice for interaction with the computer will force the contractor to understand user practice and the procurer's goal. Studying how the articulation of such requirements should be achieved and the consequences of their implementation will allow us to take a step beyond the concerns of HCI.

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