Issues for cooperative design: A procurement perspective

Stefan Holmlid
Santa Anna IT Research Institute
581 83 LINKÖPING, Sweden
holmlid@nada.kth.se

ABSTRACT

For system design and development to be successful, cooperation and participation from several different actors need to be assured. Within a triad of roles consisting of user, developer and procurer, we have put the role, influence and perspective of the procurer in focus, especially considering use quality and usability. In doing this we have identified a set of issues with implications for cooperative design. We exemplify these issues with two illustrative cases and by theoretical grounding. We conclude that the competence and pro-activity of the procurer is an under-valued asset when setting the action space for development of systems with a high degree of use quality.

Categories and Subject Descriptors

H.5.2 [**Information Interfaces and Presentation**]: User Interfaces – *theory and methods, user-centered design.* K.6.1 [**Management of Computing and Information Systems**]: Project and People Management – *strategic information systems planning, systems analysis and design, systems development.* K.6.3 [**Management of Computing and Information Systems**]: Software Management – *software selection.*

General Terms

Management, Design, Economics, Human Factors, Theory.

Keywords

Procurer, cooperative design, action space, use quality, usability

1. INTRODUCTION

In the *Procurement Competence* project we wish to critically analyse established relationships between users, developers and procurers. We wish to reassess the role of the procurer for the development of usable systems, by reintroducing the procurer as an active equal to developers and users. By doing so, we argue that the provisions for performing good cooperative projects will be better. We also argue that concerns arising from PD research, such as the tradition/transcendence trade-off where users wishes to preserve old practices [5], the lack of management opportunity to learn about the role of systems in everyday work-practices [10], or issues of handling multiple arenas and relationships [6], could be better understood and treated with the inclusion of a specific procurer perspective. In this paper we provide a descriptive account of some of the issues that has surfaced during the project since its inception in 2001.

The *procurer,* to us, is a role that has as its task to distribute and manage resources, create and provide action space, for someone else, (an individual, group or organisation) to design, develop, or construct a system. This means that the procurer is the person or the group of persons who have a more or less sketchy idea of the system to be developed, who are responsible for its fulfilment, who have the power to distribute resources before and during the execution of the project, who have the authority to sign off payments and contracts, and who have responsibility to implement and realize the results of a project in the organisation.

We are aware that the term procurer is not so common and that one could prefer the terms acquirer, customer, purchaser, or others like it. According to Webster's online dictionary procure means "to get possession of: obtain by particular care and effort". The sense of care and effort is precisely what we are looking for. We also prefer the term *developer* before contractor, deliverer or producer, when talking about system development, because it describes what these people actually are doing.

1.1 UCD, PD and the procurer

During the last decades the interest has increased for UCD and PD practices in systems development. The relationships between these traditions are complex and will not be dealt with in detail here. Taking a closer look at cooperative approaches, especially Participatory Design, reveals some interesting aspects regarding the procurer as an agent in development of usable systems.

In the Scandinavian approaches (e.g. [8][14]), during the 70's and 80's the rationale for user participation was partly based on the fact that developers rarely or never met the real users. The developer mostly met the technical personnel or the procurer, who no longer were the primary users. Another argument was that end-users best know how to change practice, not management. This proposition has found varying support throughout the years [5] [11]. In the tradition following, the discourse called for emancipation of end-users and thus for end-user participation in and contribution to the design with the developers.

Kensing and Blomberg [10] conclude that the discourse within PD has been focusing on provisions for execution of individual projects, and only recently on organizational and company issues. Relating to this is the general argument within UCD, that it is important to involve usability and users as early as possible in the design and development process. The solution proposed is to involve usability experts and designers in requirement phases and in product strategy decision-making [4][3].

Gärtner and Wagner highlight the importance of the relationships between actors, such as consultant, customer and client, but focus on the analysis from the system development project perspective. Although the importance of organizational issues and management is acknowledged, it is not further elaborated, and sometimes even excluded from the analysis [2][6][9].
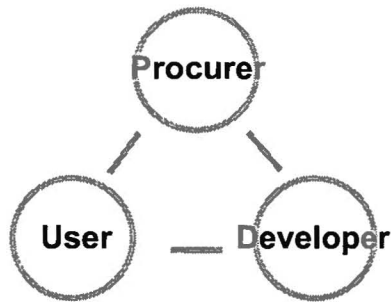
Figure 1. The three roles and their relationships

2. CASE DESCRIPTIONS

In order to better understand user centred design from a procurer's perspective we have performed a handful of cases in which we have taken the procurer as a focal analytical viewpoint. The two cases reviewed here are written to clarify relationships between the organisations and actors involved in a system procurement and development process (see fig 1). In that sense they are instrumental descriptive cases [16].

The material for the cases was collected during a period of two years by researchers within the *Procurement Competence* project, and are based on interviews with key personnel, reading of central documents, and participant observation of meetings.

2.1 Case 1, large government agency

The large government organisation case was derived from the development of a large system for citizen registration, called Folke (see also [15]), at the National Tax Board.

An IT investment in a typical large government agency in Sweden is driven by a directive from the director-general (GD). This directive often is a fairly concise document, sometimes based on the results of an earlier pre-study. The development of the detailed requirements and the basis for development or procurement decisions is handed on to another part of the organisation, which may be the IT-department. Here the requirements are formulated, the business case and need established. The GD or the steering group acting on behalf of the GD confirms the final, or definitive, directive. While the final directive is underway a project organisation is formed.

The National Tax Board organisation is divided in three parts: *Central Management, Business*, and *IT-department*. The local branches are free subsidiaries (the Tax Authorities).

Central Management, based on a pre-study, issued the directive for the development of Folke. Already in this first brief directive ease-of-use was mentioned. As a receipt to the directive the project delivers two steering documents: a Software Development Plan, and a Vision. The Vision describes in an overall manner the new functionality that will be developed. The official requirements specification is a set of usage cases written by Tax Authority staff (potential users), employed by the project. For this project it was gained approval to aim for using user centred design best practices. Within the IT-department there were a usability group that were keen to take on this challenge.

The steering group confirmed the detailed directive and decided that the Folke project should be a user centred design best practice project. The usability group had a central role in requiring what

steps and measures should be taken in the development process. Central Management and the steering group did not contain specific usability competence.

In the beginning of the project *Central Management* was the »formal» procurer, while *Business* was »acting» procurer. When the detailed directive was written the steering group was »acting» procurer, with limited authorities – the budget and amount of time was set at the *Central Management* level. The *IT-department* then is to be viewed as developer.

During the Folke project the Swedish government issued a policy about coordination of Government Agencies and availability of Government services to citizens over the Internet. This was interpreted as a call for web-technology solutions at the National Tax Board, with the initiative coming from the technology driven groups of the IT-department. As a consequence of this Central Management decided that the future platform for all systems, internal as well as external, should be web-based. For Folke this meant that, given its launch date, the project had to adapt to this and platform. The IT-department then claimed that the solutions the usability group suggested and required was impossible to implement given the new platform, and project restrictions. The effect was that the IT-department took control over the development process and disqualified the usability work performed in the project. The new platform required new usability work to be performed, but due to project time and budget restrictions this had to be done quickly and subordinate to the technology development driven by IT.

2.2 Case 2, large market oriented complex technology development organisation

The large market oriented complex technology development organisation case was derived from Ericsson, from the perspective of procurement of mobile network systems. The details of the material refer to Ericsson in 2000-2001. This is a cross cutting study to acquire a picture wider than focusing on a single project execution for a release of a product.

Ericsson is a market oriented large telecommunications company. Some customers are large and have been customers for a long time, and were active in sharing risks during the development of the GSM standard and networks. Ericsson's customers have in turn customers that utilize and populate the mobile networks.

The abstract way of describing Ericsson's organisation is by using three boxes; one for *Market & Supply*, one for *System & Product Management* and one for *Project Management & Execution*.

At Ericsson there is a requirement formulation chain that goes from customers over several internal actors before a system is actually developed. In a typical high-level requirement specification there is a section dedicated to Usability/user interface requirements. The number of requirements is quite low. They are typically expressed in general terms pointing towards consistency in terminology, compliance towards an internal style guide, or an overall product idea. Spread out under other sections one finds requirements that a usability engineer would interpret as usability requirements, but have not been identified as such.

When broken down into requirements for specific products there is a huge variation in amount, scope and formulation. From fairly user oriented "Times and dates in the applications shall represent the local time at the client" use-cases to prototypes. This points

towards the reliance on guidelines, the process and the developers to ensure the usability of the systems.

Market and Supply have the early and late contacts with customers, that is, *Market* is responsible for finding out the needs of the customers and their internal users. Some of this is very high-level work performed by Key Account Managers. Such decisions are often not very precise or detailed, but carry with it a set of promises. *Market* has little contact with the actual development projects during the execution phase. *Market* composes and transfers a requirement list to *Product & System Management*, which in turn further specifies and then transfers the requirements to *Project Management & Execution*. During project execution a tollgate based project steering model with accompanied organisation is employed. Most actual usability work is performed during project execution. *Supply*, as the last station, supplies base stations and software to the customer's sites.

3. ISSUES FROM CASES

A naïve conception of procurers and managers in general is that they have no interest in usability and issues dealing with cooperative design. From our research it is clear that they do care about usability, but are given little understanding from the developers for this. One may also assume that procurers setting up cooperative design projects, and the like, have some interest in usability, but prefer to have someone else to take care of it.

3.1 The complexity behind and beyond the abstraction

Relationship diagrams sometimes are used to describe the complexity [9]. But, just as Näslund [13] they assume that the organisational border is important in itself. The simplifications they use reinforce the opposition between developer and procurer. We find no support for such a simplification in our cases. Instead we wish to focus on the abstraction of roles that occur. A role can be populated by different individuals from different organisations at different points in time, which make the description of actual cases sufficiently complex to be meaningful.

Greenbaum [7] describes the contradiction of roles for the developer as being a management consultant or a spokesperson or catalyst for user groups. This conflict is based on the assumption that the procurer and the user do not share visions and values and that there is a conflict in goals between them. There is only weak arguments provided that the conflict in goals between user and developer would be less and easier to overcome; on the other hand Cooperative/Participatory Design was developed precisely with the goal and intent that developers should share visions and values with users. In our cases both roles described by Greenbaum are important in the process of achieving usable systems.

As can be seen from the cases the model is not constrained by the organisational borders. The point is that the model should be possible to use for different business and organisational models. Most often one would expect that organisational borders would be drawn in-between nodes. This set-up can be seen in the Government case, in a case such as Markensten [12] and in a lot of the assumed models of usability [9][13]. Moreover, one interpretation of the Ericsson case, and in line with Artman [1], an organisational border is drawn through one node, with Ericsson's customers and Market populating the procurer node. In Artman

[1] it is the developer node that is divided. Grudin [9] tries to capture this in complex models of specific cases with multiple triangles, but the assumed opposition between user organisation and developer organisation is reproduced/reinforced in his models. The complexity of relationships for a specific case is clear but there is assumed a simple relationship model between organisations.

When presenting the three-actor model to practitioners as well as researchers within HCI and System Development we often get comments like; "but there need to be another role on the developer side; the salesperson", "the model is not symmetric, so it needs an additional role from the developer organization" or "you have missed to put in the CIO". The model we propose is not a model prescribing or describing all the possible roles and work-tasks that might be found in a specific case. Instead we have tried to provide an abstract model of relationships that need to be taken into account when discussing the possibilities and provisions for realizing the visions of developing usable systems. The explicit populated roles proposed are important in a specific case, and need to be handled when working with developing the abilities of a specific case to become better in achieving usable systems. This suggests that understanding usability process maturity across these roles could be an important aspect of how these relationships actually function.

3.2 UCD action space

From the cases above it is quite clear that the procurer is an active part in providing, prescribing and defining the actual action space for developers and their UCD practices.

The Folke project is an example of the importance of who is taking the initiative and responsibility for the development or introduction of new technology and its design. It has to be one of the central responsibilities for central business management to take the lead for such design decisions, and not leave it to one specialized department.

The formal procurer defined the action space twice during the project. At the beginning the project should become a best practice project with respect to UCD, which later was made impossible due to the organisation's political use of an uninformed platform decision.

So, if the strategy decision to move into a web-based platform had been supported by a wider competence base, some of the problems for the Folke project could have been anticipated or avoided. As it came out Central Management changed their position from procurer of systems to developer of systems. It is true that they may act as both, but switching from one to the other without considering that it actually is a switch in perspective limits the possibilities to procure and develop usable systems. With its superior role over IT as well as Business it becomes crucial for Central Management to act competently with respect to user centred design, simply because they direct and limit action space for projects by strategic decisions.

The simple interpretation of the Ericsson case is that the customer is procurer, and all the rest is development. It is definitely true to say that the customer in this case is the »formal» procurer. But another interpretation is also valid. Especially regarding the fact that Ericsson is a market leader within telecommunication systems and an independent company.

Somewhere along the requirements formulation chain at Ericsson it is feasible to say that the »actual» procurement is taking place. *Market*, and in some cases *Systems & Product Management* act as »actual» or »informed» procurers. They are informed in the sense that they work closely with the customers to formulate the customer's needs and requirements, as well as define the overall technological development within the market.

Usability work has largely been rooted in *Project Management & Execution*, although recently usability requirements have become more common earlier in the requirement process. The result has been that in some cases *Market* or *Product & System Management* performs usability or concept studies of future products or systems. So, the action space for usability work may increase when responsibility traverses towards Market.

The action space for user centred design at Ericsson is defined by the contents of the requirements specifications and the methods, deliverables and activities of the tollgate steering model. As soon as usability concerns and methods is transferred from Project Execution & Management over into the activities of the »actual» procurer, i.e. Market, the action space for user centred design radically changes.

In both cases the formal or actual procurer performs pre-studies or analyses in order to understand what the need is and what the goals should be. In this preparatory phase the coming action space for user centred design is taking form. Thus, the user centred competence could possibly have a large impact during such preparatory work, and provide fair action space for user centred design.

4. FURTHER WORK

With a pro-active and usability competent procurer, acting as a mediator of necessary or wanted changes of business process between user and developer, cooperative design will be enabled to evolve and set new best practices for system procurement and development. As a consequence of this, provisions for cooperative system development will probably change.

In the research project we are now turning towards normative knowledge development, where we hope to be able to describe some best practices regarding the pro-active procurer. We are especially interested in the cooperative, communicative and managerial aspects of the intersection between organizational development and use quality and UCD methods.

4.1 Acknowledgements

5. REFERENCES

[1] Artman, H. (2002). Procurer Usability Requirements: Negotiations in contract development. *Proc. of NORDICHI 02*. pp61-70.

[2] Buur, J., Bødker, S. (2000). From Usability Lab to "Design Collaboratorium": Reframing Usability Practice. *In Proc. of DIS 00*, pp297-307. New York, ACM

[3] Carlshamre, P. (2001). A usability perspective on requirements engineering – from methodology to product development. *Linköping studies in Science and Technology, diss. no 726*. Linköping: Linköpings universitet.

[4] Carlshamre, P., Rantzer, M. (2000). Dissemination of usability: Failure of a success story. *Interactions*, 8(1):31-41.

[5] Ehn, P. (1993). Scandinavian design: On participation and skill. In D. Schuler, A. Namioka (Eds.) *Participatory design*, pp41-77. Hillsdale, NJ: Lawrence Erlbaum.

[6] Gärtner, J., Wagner, I. (1996). Mapping Actors and Agendas: Political Frameworks of Systems Design and Participation. *Human-Computer Interaction*, 11:187-214.

[7] Greenbaum, J. (1993). A Design of One's Own: Towards Participatory Design in the United States. In Schuler, D., Namioka, A, eds (1993*). Participatory Design: Principles and Practices*, pp27-37. Hillsdale, NJ: Lawrence Erlbaum.

[8] Greenbaum, J., Kyng, M. (eds) (1991) *Design at work: Cooperative design of computer systems*. Hillsdale, NJ: Lawrence Erlbaum.

[9] Grudin, J., (1991). The Development of Interactive Systems: Bridging the Gaps Between Developers and Users. *IEEE Computer*, 24(4):59-69.

[10] Kensing, F., Blomberg, J. (1998). Participatory Design: Issues and Concerns. *Computer Supported Cooperative Work*, 7(3-4):167–185.

[11] Kraft, P. and Bansler, J.P. Privilege and invisibility in the new work order: A reply to Kyng. *Scandinavian Journal of Information Systems*, 6(1):97-106.

[12] Markensten, E. (2003). Procuring Usable Systems - An Analysis of a Commercial Procurement Project. In Proc of *HCI International 2003*.

[13] Näslund, T. (1997). Computers in Context – But in Which Context? In Kyng, M., Mathiassen, L. (eds), *Computers and Design in Context*, pp170-200. Cambridge, MA: MIT Press.

[14] Schuler, D., Namioka, A. (eds) (1993). *Participatory design: Principles and practices*. Hillsdale, NJ: Lawrence Erlbaum Associates.

[15] Svensson, J. (2002). Regera eller reagera, vem styr systemutvecklingen? [Who's in charge of the development project?]. *TRITA-NA-E02105. NADA, KTH*, SWEDEN

[16] Walsham, G., (1995). Interpretive case studies in IS research: nature and method. *European Journal of Information Systems*, 4:74–81