



# The lonesome cowboy: A study of the usability designer role in systems development

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## Abstract

This paper reports on an evaluation of the usability designer role as applied in two Swedish systems development organisations. The role was initially defined by us, but evolved in these two organisations. We conducted interviews with usability designers, project managers and a user representative. Our main research question was whether or not the introduction of a usability designer has been successful in terms of changes in the systems development process and the impact the role has had on products, projects and organisations. To some extent, the role has met our expectations and intentions for instance, in helping the usability designers shift their focus towards design, and assume some kind of "users' advocate" role. But in other ways, the role "failed". The usability designers in our study are still facing the kind of problems and obstacles that usability professionals have always had to deal with.

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## 1. Introduction

Usability professionals operate under many different names; HCI (human–computer interaction) expert, usability engineer, interaction designer, user experience architect, cognitive scientist, etc. When visiting the available jobs booth at the CHI 1999 conference

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we found as many as 52 different names for the ‘usability’ profession. The large variety in titles and educational backgrounds opens up a number of questions. What should the usability practitioner/professional do? How does usability work fit into the systems development process? What happens if you introduce a specific usability role in practical systems development?

This paper describes the usability designer (UD) role and how it has evolved in two Swedish organisations developing IT systems.<sup>1</sup> Initially, we defined the UD role in Göransson and Sandbäck (1999). Our aim was to find a practical way of transferring HCI knowledge and introducing usability issues and user-centred systems design (UCSD) in systems development. This has been further described in Gulliksen and Göransson (2001) and Gulliksen et al. (2001). We then introduced the role in one large in-house systems development department in a government authority (organisation A) and in one IT consulting company (organisation B) in Sweden. The role then evolved fairly independently in these two organisations. In this paper, we briefly describe the process of defining and introducing the role, and report and discuss the results of an evaluation of it.

## 2. Background

Usability is a multi-faceted aspect of a system in use. Usability cannot be seen as a separate quality that is put on by means of, for instance, an aesthetically appealing interface, or by means of usability evaluations. In this paper and in our work, we use the usability definition provided in ISO/IS 9241-11 (1998) emphasising the utility of the system along with efficiency and satisfaction:

“The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use.”

Usability can be achieved by means of a user-centred systems design (UCSD) process, and a focus on usability issues throughout the entire systems development process (Gould et al., 1997; Gulliksen et al., 2003; Landauer, 1995). There are several user-centred approaches and frameworks, such as the international standard ISO/IS 13407, ‘Human-centred design processes for interactive systems’ (1999). Such approaches and frameworks provide general advice and guidance, but not that much practical support for the actual design and development of usable systems.

There are many obstacles to usability and user-centred approaches in systems development. Rosenbaum et al. (2000) identified several major obstacles to strategic usability including resource constraints, attitudes and resistance to UCSD and usability, lack of understanding and lack of trained usability experts. Clegg et al. (1997) identified a number of problems in the systems development process preventing a focus on the users’

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<sup>1</sup> In this paper, we use the term “system” or “IT system” to denote the kind of products and/or applications developed in the organisations that we have studied. We consider “software” too limited a concept, being only a part of the IT system.

real needs. They argue that changes involving IT development are predominantly technology-led and existing project management methods and tools neglect human and organisational issues, thus helping to maintain a technical focus. They further report that: “[U]sers are rarely influential in the actual design of new systems. [...] this has been made worse by the use of structured methods and tools for systems development.” (p. 860). McCoy (2002) argues that users are virtually powerless in systems development, and moreover, ‘captive’ in that they have no choice but to use what is installed on their computers. And therefore, he argues, the system developers do not have to worry about usability.

In our own research, we have come across similar problems, for instance, that usability often is taken for granted and therefore does not get any specific attention or that there is not enough expertise in usability and UCSD. Moreover, some of the major commercial development processes do not support a usability focus and UCSD (Gulliksen et al., 2001). In many cases, the organisations we have worked with have not been committed to usability or even aware of its importance. Since it has been virtually impossible to make these organisations abandon their development processes, we have had to try to fit user-centred activities into their existing processes, or the processes they believed they were using.

We believe that one of the main difficulties with incorporating UCSD in existing processes is that it requires a great deal more than simply adding a few activities to existing processes. It requires new development approaches, new methods, new roles, new ways of planning and allocating resources, etc. Moreover, a user-centred approach changes the relationship between the user/client organisation and the development organisation since it may require more commitment and time from the users/clients, and/or the reallocation of resources. UCSD requires a shift of focus and attitudes among all parties involved in the development process, moving the development closer to the users. Thus, a user-centred approach requires more than just a new development process—it is to some extent an entirely new development paradigm. In the words of Mirel: “[T]echnical efforts for imposing usability require contextual and user-centred approaches that rattle many developers’ core beliefs, methodologies and claims to control and turf” (Mirel, 2000, p. 186). Although we would like to argue that it is not so much a matter of the individual developer’s beliefs and claims to control, but values and mechanisms that are embedded in the current approaches to systems development.

Despite all the reports on obstacles and problems related to UCSD, we believe it is essential not to be discouraged. On the contrary, with the increasing computerisation of working life and in society at large, the need to address usability in systems development has become increasingly important. The potential benefits and gains of applying UCSD by far outweigh the problems. Thus, we have felt the need to identify practical methods, roles, tools and work practices for integrating a user-centred approach into systems development.

When we defined the UD role we considered it as one step towards a UCSD approach. We did this, well aware of the limitations of such an approach. One role alone cannot shift an entire organisation to user-centred design. As pointed out above, that requires major shifts in processes, organisational culture, attitudes and relations. We see the UD role as one possible starting block, a way of concentrating usability efforts within an organisation

or a project. The UD role was part of a larger research effort covering key principles for UCSD as well as a usability design process (Gulliksen et al., 2003; Göransson et al., 2003). This paper, however, focuses on the role and the evaluation of it.

### *2.1. The role of roles*

Our starting point for specifying the UD role was the need for identifying ways of transferring knowledge and expertise from the HCI area to practical systems development. The HCI area, in particular cognitive psychology, has often been criticized for producing results that are not applicable in practice (see for instance, Bannon, 1991; Landauer, 1990). The results from HCI research must be presented in such ways as to be applicable in practice. We believe that roles, processes and methods provide such practical means for integrating HCI knowledge, or usability, into systems development. We further believe that usability issues require a ‘specialist’ role.

Introducing a role that specifically addresses user-centred activities and usability in the systems development process seemed natural, given the fact that many systems development models are based on roles for distributing responsibilities and labour among the team members. A role can be seen as a set of responsibilities and activities. In the Rational Unified Process (the RUP)<sup>2</sup> roles are described as: “...an abstract definition of a set of responsibilities for activities to be performed and artefacts to be produced. [...] Roles are not individuals, nor are they necessarily equivalent to job titles; instead, they describe how individuals assigned to the roles will behave in the context of a software engineering project.” (Rational Software Corporation, 2003). Roles are used to separate the individuals from the set of responsibilities and activities that they are expected to assume and perform.

Naturally, there are other approaches to integrating usability, for instance, that usability should be a concern of everyone in the project team. However, in the context of the organisations in our study, we believed it would be more effective to introduce a usability role than training the systems developers in usability to the extent that they would assume a shared responsibility for usability issues. In our experience, shared responsibility tends to become nobody’s responsibility. Bevan and Earthy (2001) describe a process-oriented approach, using the Usability Maturity Model in ISO/TR, 18529 (2000) to assess and improve the usability capability of the development processes in two organisations. The UD role is partly a result of such a process-oriented approach, involving the ‘reengineering’ of the development process in one of the organisations described in this study (Gulliksen and Göransson, 2001).

### *2.2. The usability designer*

The purpose of the UD was to introduce a role with the power and authority to work for UCSD in the organisation and in the projects. We wanted the role to be a ‘users’ advocate’

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<sup>2</sup> The RUP (Kruchten, 1998) is currently one of the major systems development processes used in Sweden. It is, for instance, applied in organisation A.

in the development projects, not just another user interface designer. We hoped that the role would facilitate knowledge transfer and help in placing usability on the agenda in systems development and in maintaining a focus on the users' needs throughout the development process.

Other researchers have discussed the need for specific 'usability' roles. Kapor (1991) argues that the computer industry needs to acknowledge the critical role of software design, and suggests the software designer "...as a champion of user experience". The idea of a users' or usability 'advocate' also appears in the key principle on integrated design defined by Gould et al. (1997, p. 239): "In order for this to happen successfully, all aspects of usability should be under one focus or one person". A similar concept, the stakeholder' advocate, is described in ISO/TR, 18529 (2000, p. 8):

"Act as advocate for end users and other stakeholders in the system development enterprise and the development team. NOTE 1 The stakeholder' advocate reminds the staff in the system development enterprise that the system is intended for use by real people and has to achieve quality in use. This role includes championing human-centred approaches, arranging for end-user involvement in conceptual studies, investigation and dissemination of context of use issues".

We have based our UD role on the ideas of the usability/stakeholder advocate and the scope of user-centred design activities defined in ISO/IS 13407 (1999). As discussed above, ISO/IS 13407 provides general guidelines for the activities required in human-centred design, but does not say much about how these guidelines should be applied in practice. It is, for instance, not particularly clear about what the usability practitioner can and should do in the process. Usability practitioners could, in fact, shoulder a number of different roles in the process (Kirakowski, 2004). Moreover, we based the UD role on our own research in and experiences of practical systems development in a large number of organisations in Sweden. We were also inspired by other roles, described in literature (see Section 2.3). The Scandinavian approach to cooperative design (see, for instance, Greenbaum and Kyng, 1991) also provides important background to our UD role.

We named the role 'Usability Designer' in order to emphasise the importance of both the usability concept and the interaction design process. Often, the term UCD professional is used, but we wanted to avoid that, considering UCD (UCSD) an approach to systems development, rather than the skills and expertise of one single individual or group in the development process.

Our key concerns underpinning the role are listed below:

- *Facilitation*. The UD should be responsible for maintaining a user-centred approach in the development process and for focusing on usability aspects. The UD plans and performs usability and user-centred activities, and makes sure that the results of these activities are used in the development process. The UD works in close cooperation with the users focussing on their needs and requirements.
- *Design*. The UD should take active part in the design and development process, i.e. the UD should generate design solutions and participate in the process of trading off different aspects in the design. In other words, the UD must have "skin in the game" (Cooper, 1999).

- *Continuity.* The UD should participate on a continuous basis throughout the development process, including the implementation and deployment phases.
- *Communication.* The UD should participate in all the user-centred activities, to prevent valuable information from being lost in the transitions between the activities, in accordance with the principle of integrated design (Gould et al., 1997).
- *Quality.* System quality consists of a number of factors including reliability, maintainability and usability (ISO/IS 9126-1, 1999). The UD should be responsible for addressing such quality aspects in the product that are related to usability. This includes continuous evaluations<sup>3</sup> of design solutions and making sure that the results of the evaluations are appropriately addressed.
- *Resources.* The UD should be given sufficient authority, as well as action space, in terms of time, money and access to users to fulfil the responsibilities described above.

The above items are primarily applicable on the project level. In some cases they are applicable on an organisational level as well. We have defined and studied the UD role in contexts that are concerned mainly with bespoke systems for a defined user group. We nevertheless believe that it is applicable in other contexts. We have, for instance, applied the role in product development projects.

We believe it is important to have an *explicit* role with an overall view of and responsibility for usability aspects. Having an explicit role helps place usability on the agenda and increases the awareness of usability in projects and the organisation—usability becomes visible. Having a UD role may also help initiate and facilitate user involvement in the development project.

In our experience, it is often difficult to deploy a full multi-disciplinary team for usability-related issues in systems development. The UD role therefore combines several skills and types of expertise in one role, e.g. analysis, design and evaluation. We also believe it is important that the UD has basic mastery of the technical matters in systems development in order to be able to communicate with system developers, test engineers, etc. The interdisciplinary characteristics are essential for the UD role in that it requires technical knowledge in addition to HCI knowledge and skills. We also think that the UD role requires several years of experience of UCSD since the UD must be able to drive the UCSD process also in adverse circumstances, and know when and how to back down, without compromising core usability issues.

The UD role places the responsibility for the UCSD process on one person or group. Depending on the project size, the UD role may be held by one person or by a group of usability and design professionals. It is important that the role is flexible and that one finds an appropriate level of ambition in each project. Fig. 1 illustrates the role and position of the UD. The role facilitates the UCSD process by bringing users and developers together as well as by providing a communication link between them, i.e. acting both facilitator and mediator.

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<sup>3</sup> This does not necessarily mean that the UD evaluates his/her own design, just that it is the responsibility of the UD to make sure that the design is continuously evaluated with regards to usability.

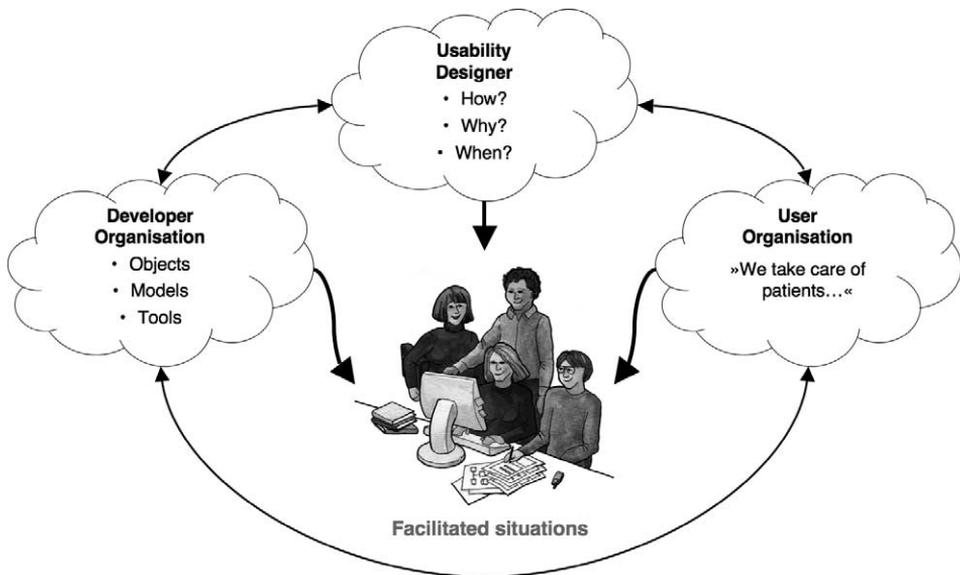


Fig. 1. The UD role facilitating the user-centred system design process and communication between users and developers.

It is often argued that a usability professional has a useful role to play in acting as an independent specialist who is able to take a fresh and objective view of the design. With our UD role, we take a different stance emphasising the importance of continued and active participation in the project, and doing design instead of just evaluating it. As mentioned earlier, this does not necessarily mean that the UD evaluates his/her own design solutions. It is, of course, desirable that independent usability specialists are involved in the evaluations, in order to avoid bias and the ‘my-baby-syndrome’. However, in some cases, budget and time constraints may put a stop to involving several usability professionals in a development project, in which case we believe it more effective to have a UD on a continuous basis, doing the design (including evaluations), than to have a usability specialist conduct separate evaluations.

### 2.3. Other roles

The UD may be seen as a way of implementing the ‘software designer’ as described by Kapor (1991) or the stakeholder advocate described in ISO/TR, 18529 (2000) in terms of a role with the overall responsibility for usability and UCSD. According to Kapor, the software designer “...should be the person with overall responsibility for the conception and realization of the program [the IT system].” bringing the two worlds of technology and users together (see Fig. 1).

The UD, as we have defined it, is also akin to the exceptional designer described by Curtis et al. (1988), but on an interaction design level and on a smaller scale. Curtis et al.,

describe complex, very large projects, integrating several disciplines—for instance, military avionics software—where the exceptional designer has deep knowledge in all or several of the disciplines involved in the project. The exceptional designer becomes a communication focal point in the project, “...educating others about the application domain and its mapping into computational structures.” (p. 1272). We see the UD as a focal point in the project, educating the team members about the users’ needs, and the context of use, integrating knowledge from the application domain with knowledge about usability and systems development, in particular UCSD.

There are several other usability roles suggested in the literature, for instance, the interaction designer (Cooper, 1999), the usability engineer (Mayhew, 1999) and the product usability champion (Mrazek and Rafeld, 1992). These roles share a number of characteristics, mainly concerned with the emphasis on usability, but there are also differences. Cooper, for instance, emphasises the importance of design, placing the interaction designer in the ‘driver’s seat’ in the development process, but discourages from involving users in the design process: “Real people are of great interest as raw data, but they are frequently useless and often detrimental to the design process.” (p. 129). Moreover, Cooper believes in providing the system developers with a ‘blueprint’ of the interaction design, arguing that programmers do not think and act like users and therefore should be kept out of the design process. In our experience, ‘blueprints’ are difficult to specify in systems development since it is virtually impossible to make all design decisions up-front in the process. We therefore argue that the design process must be a collaborative and continuous effort involving both users and developers, as well as other expertise, with the UD leading the process. For example Buur and Bødker (2000) describe a process in which users, developers and designers participate, with the usability specialist facilitating the process.

The usability engineer in Mayhew’s usability engineering life cycle (Mayhew, 1999) does not design. The role is responsible for the user profiles, context of use analysis, requirements and evaluations, but not the design. Mayhew instead introduces a user interface designer who is responsible for the interaction design. We argue that the UD should be responsible for the interaction design as well, since we firmly believe that you can only *design* your way to usability.

The product usability champion described by Mrazek and Rafeld (1992) is entirely different to our UD role. Mrazek’s and Rafeld’s product usability champion is a person (e.g. a user or a system developer) who is interested but not necessarily skilled in HCI and usability. He/she acts as a link between the human factors engineer (of which there are only a few in the organisation) and each development team. The purpose is:

“To enable the Product Usability Champions to act as the usability focus for their teams, and for the Human Factors Engineer to provide the teams, through their Champions, with the appropriate consulting, training and tools for them to be successful.” (p. 566).

We strongly believe that only skilled and experienced usability professionals, acting continuously in the projects, can have long-lasting and significant impact on the projects and the usability of the systems/products being built. In our experience, the authority and expertise of a user or a developer ‘with interest in usability’ is not enough to create

the necessary leverage for usability issues and the users' needs in a systems development project.

To sum it up, our UD role may be described as a *combination* of the interaction designer (Cooper, 1999) and the usability engineer (Mayhew, 1999). We have been inspired by Cooper in placing a stronger focus on the interaction design, but do not agree with his views on user involvement and 'blueprint' approach to systems development. Moreover, we have been inspired by Mayhew's life-cycle perspective and systematic approach to usability work, but feel the need to address design issues more strongly. In addition, we have based our view on usability and the UD role on the strong tradition of user involvement in Scandinavia.

### 3. Introducing the usability designer

The interview study described in this paper is part of an action research project comprising the introduction and evaluation of the UD role in two organisations. Action research has the "...dual aims of action and research" (Dick, 2001, p. 4). It combines action to bring about change and improvement in some community or organisation and research to add to the body of knowledge within a particular research area. In our case, the action comprises the introduction of the UD role into the two organisations, as described below. Our aim was to bring about improvements in the systems development processes in these organisations, towards an increased focus on usability and the users' real needs. With the role came the need for a specific process to support its activities, responsibilities and authority. We therefore defined the usability design process, which has been tested and evaluated in one of the two organisations described in this paper (Göransson et al., 2003).

Furthermore, action research is an iterative process of repeated actions and evaluations resulting in knowledge about the research topic. The UD role has been iterated and modified several times over the years, based on the experiences the organisations have made from applying the role in different projects. It is in no way a 'finished' role, and will never be, as modifications and adaptations to the current development context will always be required.

#### 3.1. The organisations

Organisation A is an in-house IT development department in a large government organisation, with some 13 000 users, working with administrative case handling. The IT department has some 670 employees and approximately 100 consultants. Organisation A adopted the idea of the UD role in the late 1990s. It was to a large extent based on a proposal from us about a 'usability' role. Their initial idea was that the usability role would develop and be in charge of usability-related tools and methods, e.g. a style guide and interface components. Organisation A soon employed their first usability expert, with the explicit task to form and manage a group of UDs. Now, 6 years later, there are 4–5 UDs in the organisation. In addition there are about five user interface designers, also involved in usability work. The UDs are no longer a separate unit or team. Instead they belong to

different parts of the organisation—some of them work in the client organisation, and some belong to a project support function within the IT department.

We have co-operated, on a research basis, with the UDs and others in organisation A during the build-up of the usability team and subsequently (Sandblad et al., 2003). We have been available as discussion partners, and the UDs have from time to time used us to find support for their work and specific issues within the organisation. Therefore, our influence on the UD role cannot be neglected. But the main contribution to the way the role has evolved comes from the work carried out by the UDs in organisation A. They have been deeply involved in shaping their own role, in particular those who have been involved in specifying and adapting their systems development process (the RUP). Over the years, the focus of the role has shifted towards working within projects, having the explicit responsibility for usability issues and user involvement in the development projects.

Organisation B is a consultant company, focusing on contract IT development and UCSD. Currently, there are four UDs, out of 35 consultants, one of whom is a part-time researcher in our research group at Uppsala University. Organisation B primarily works with complete development projects, building administrative IT systems for specific organisations, similar to the systems built in organisation A. The company tries to avoid expert consultant assignments, such as separate usability evaluations. Therefore, the UDs are primarily engaged in long development projects.

The management of organisation B explicitly supports UCSD and the company has adopted the key principles for UCSD suggested by us (Gulliksen et al., 2003). Further, their aim is to have a UD in every project, combined with a high 'lowest level' of UCSD awareness among all the consultants. To that end, all consultants have received training in 'basic' UCSD. The company uses the process for usability design described in Göransson et al. (2003).

The approach to defining the role can be described as a mix of bottom-up and top-down in both organisations. In both cases, management has to some extent initiated and supported the efforts for introducing usability and the UD role into the development process and organisation, but the main initiative has been that of the individual UD on the 'shop-floor' level. In organisation A, management identified the need for a usability role/unit and then hired a usability specialist to take ownership of the issue and set up a usability team. In organisation B, the initiative originally came from an individual usability specialist in the organisation, but management support has been strong throughout the process.

#### **4. The study**

We have conducted an interview study to evaluate the outcome and effects of the role in the organisations and in individual projects. Our main research question was whether or not introducing the UD role has been 'successful', in terms of changes in the systems development process and the impact the role has had on products, projects and organisations.

We interviewed UDs in organisations A and B. With a few exceptions, we interviewed all the UDs in these two organisations. In addition, we interviewed project managers

Table 1  
Roles in the organisation

	Org A	Org B	Other	Total
Usability designer	4	3	2 <sup>a</sup>	9
Project manager	2	1		3
User repr	1			1

<sup>a</sup> One of the respondents worked in an in-house development organisation, and the other one was a web designer/consultant.

(PMs) and one user representative, who have worked together with one or more UDs in development projects in these two organisations. We were directly in contact with some and knew of the existence of other UDs in these two organisations, having followed them for quite some time. We got the names of the project managers and user representative through our contact persons (UDs) within the organisations. Our criteria were that they had worked with one of the UDs that we interviewed.

We have also interviewed two UDs in other organisations. We conducted these two interviews to make comparisons between ‘our’ UD role and a UD role that had evolved independently of our ideas and research. These other UDs have not modelled their roles on our initial idea of the UD role. Rather, they have come up with the concept and modelled the role on their own accord without knowledge of or reference to our work. We interviewed 13 people in four organisations (see Table 1). Nine of these were UDs.

The interviews were semi-structured based on interview guides. The interview guide for the UD interviews covered the below items:

- Educational background and professional experience.
- Impact on the projects and the organisation, and on the resulting system, according to their own judgement.
- Failures and successes in development projects—obstacles and success factors, lessons learned.
- Methods and techniques, development process, user involvement, and how these were applied in the projects.
- Time spent on different activities (analysis–design–evaluation–other).
- Work products (outcomes) and how these were communicated.
- Relations to other roles in the systems development process, in particular the project manager (both formal and informal).
- Areas of responsibility and powers.
- Stress in terms of demands, control and support, pressure in the work situation.
- What it takes to be a ‘good’ UD.

The interviews with the user representative and project managers covered topics, such as what were the main contributions of the UD, what difference did the UD make, what obstacles did the UD meet, and what project/personal characteristics were important.

The interviews were conducted by two researchers, none of which had been involved as a UD in any of the organisations. The interviews were taped and notes were taken.

The interviews were then transcribed (non-verbatim). In addition to this, notes were taken during the interview on a laptop computer and subsequently sorted in accordance with the interview guide. Two of the interviews were conducted by one of the researchers only (for practical reasons)—these interviews were taped and transcribed as described above.

One of the researchers analysed the transcriptions of the interviews, categorising the data and sorting it in accordance with these categories. The categories were not pre-defined but emerged during the analysis of the data. The other researcher based his initial analysis on the notes taken during the interview, and on the transcribed interviews. Thus, the data was analysed by the two researchers independently, the results were then compared and compiled. A third researcher, who was central in the definition of the role in both of the organisations, used the transcripts as the starting point for his analysis, adding his own reflections on the interview data to the comparison and compilation of the results.

We chose to conduct semi-structured interviews for several reasons. Prior to this interview study, we followed one of the projects in organisation A to evaluate the effects of introducing a UCSD process and the UD role (Gulliksen et al., 2003). We wanted to add to the picture with more data from other UDs and from people having worked with them. Semi-structured interviews provide rich qualitative data in that they allow for elaboration and follow-up questions. There are, however, a number of weaknesses with using interviews. The data may be biased by the interviewers, in this case ourselves. We appreciate that we may be prone to over-estimating the effects of the UD role, having introduced it into these organisations. One of the interviewers/researchers, however, was never part of the initial efforts to define and introduce the role, and thus, should be less partial to it. Another major weakness is the bias of the respondents. First of all, it is natural to want to come across in a positive light—causing the respondents to overrate their impact and contributions, and/or to underrate those of others. Secondly, the respondents may feel concerned about criticising projects or people they work with or about expressing their views freely. The respondents were, of course, promised anonymity, but there are only a few UDs in these two organisations. People within the organisations know who they are, even though the statements cannot be traced back to the individual UD. We did get the feeling, however, that the respondents felt fairly free to express their views and criticism. Some of them were very outspoken about the short-comings and problems in their organisation. Another weakness of interviews is that the data are based on recollections of events rather than the events in themselves, weakening the reliability of the data. However, we have followed these organisations over a period of time, and the views and statements expressed in the interviews are consistent with what we know from earlier and parallel studies.

## **5. The results**

Even though the roles and backgrounds of the UDs differ between the organisations, the results are presented together. The similarities turned out to be greater than the differences. In the compilation of the results we identified five major themes:

- 5.1 (i) Background and experience.
- 5.2. (ii) Role description and work practices.
- 5.3. (iii) Processes and projects.
- 5.4. (iv) Impact, success factors, problems and obstacles.
- 5.5. (v) The role—various aspects, e.g. personal characteristics and the role's relationships to other roles in the organisations.

The themes are described below in five different sections. Each section summarises the results from the interview studies. We illustrate some of the points made by the respondents with translated and 'sanitised' quotes from the interviews.

### *5.1. (i) Background and experience*

#### *5.1.1. Age, educational background and experience*

Five of the UDs were women, and four were men. Their average age was approximately 32 years. They all had less than 10 years of experience in industry, averaging just about 5 years. Three of them had worked as programmers/system developers a number of years and then changed jobs in order to get a usability-related position. The number of systems each UD had designed in terms of having contributed substantially to the interaction design varied between 1 and 40. The number of proper usability evaluations each UD had conducted was larger but equally varying, between 10 and 50. The figures are approximate, partly because the respondents did rough estimations, and partly because they interpreted 'design' and 'proper evaluation' in slightly different ways. But the figures nevertheless serve to illustrate the amount of experience of usability-related work they have.

The UDs had academic degrees mainly in cognitive science<sup>4</sup> or engineering/computer science (with an HCI profile). One UD had a degree in human resource development, one in 'People, computer and work' and one in computational linguistics. The computer scientists/engineers had either attended HCI courses as part of their program, or on an optional basis. Organisation A had primarily employed UDs with a degree in cognitive science, whereas the UDs in organisation B all had engineering/computer science degrees.

#### *5.1.2. Knowledge and expertise in design, systems development, domain knowledge and programming*

We asked the respondents about their expertise and knowledge within four different areas, and how they rated the importance of each area. The four areas were design (interaction design primarily, but also graphic design), systems development processes, domain knowledge and programming.

Most of the UDs claimed they have little or no skills and expertise in graphics/visual design. They also seemed to agree (saying so explicitly or just omitting the area in their rating) that skills in graphic/visual design are not important. If such competence is

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<sup>4</sup> Several universities in Sweden offer programs in cognitive science with an HCI focus. The first students to graduate from these programs appeared on the labour market about 5 years ago.

required in the project, the UDs would rather work together with a graphics/visual designer than do it themselves. Some of the UDs said that they are good at interaction design, conceptual/structural design and ‘flows’ and some rated skills in interaction design (concepts, structure, etc.) important or very important.

A few UDs said that they have a fairly deep knowledge of systems development processes, but the majority said that they are familiar with, e.g. the RUP, to the extent that they know what they have to do and when. Those who rated knowledge about systems development processes as important had been involved in integrating UCSD activities in the development process used in their organisation or in process adaptation in general.

Domain knowledge ranged from fairly good, to adequate, to little. The consultant UDs, in particular, had little domain knowledge, unless they had been involved in a project/domain over an extended period of time. But also some of the in-house UDs (organisation A) felt that they have little domain knowledge. Most UDs rated domain knowledge important or at least that it makes things a lot easier.

Knowledge in programming ranged from fairly good (has worked as programmer) to little. For some of the UDs, their programming skills have deteriorated since they started working as a UD, mainly due to lack of practice. Some UDs said that they want to improve their programming skills.

In addition to the four areas discussed above, and explicitly addressed in the interviews, almost all the UDs mentioned the knowledge and methodology they had acquired in various HCI and/or cognitive psychology courses as very important and very useful.

## 5.2. (ii) *Role description and work practices*

### 5.2.1. *Title and role description*

The UDs have either ‘IT employee’ or ‘usability designer’ on their business cards. The majority had been employed as either a UD or an HCI expert. Organisation A has a formal role description as part of their customisation of the RUP (development case in RUP terminology). The UD role has been added to the list of roles that comes with the RUP. The role is described in terms of required skills and expertise, artefacts and activities, including user analysis, conceptual design and interaction design. When acting as a UD in a project, the UD orders, but does not necessarily conduct formal usability evaluations.<sup>5</sup> Organisation B has a brief description of the role.

In spite of the definitions and descriptions, some of the UDs said that they have to establish the role, its activities, responsibilities, etc. at the beginning of every project. The consultants in organisation B said that even though the role was well known within their own organisation, their clients rarely know anything about it and rarely have a corresponding role in their organisation. Clients do not ask for the UD role specifically. They either purchase entire development projects or the experience of the individual consultant.

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<sup>5</sup> Such evaluations are conducted by one of the usability people in the organisation, who is not acting UD in that particular project (but may well work or have worked as a UD in other projects. The UD role is a project role, not an organisational role).

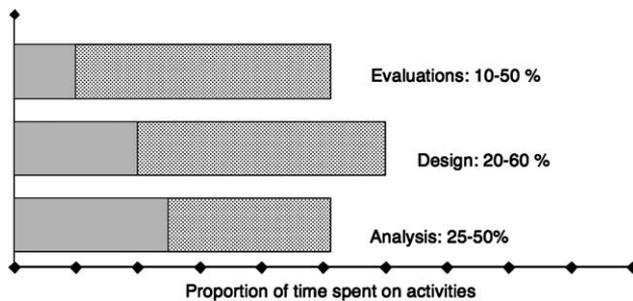


Fig. 2. Proportion of time spent on design, analysis and evaluations, respectively.

### 5.2.2. How the UDs spend their time

We asked the UDs to estimate how much time of their total working hours they spend on usability-related activities. The in-house UDs work exclusively with usability, primarily as UDs in projects (from 40 to 90%). When they are not involved as UDs in projects, they work with methods and process development, ‘missionary’ activities or conduct usability evaluations as part of a ‘project support’ function in the organisation. The consultants in organisation B spend a varying amount of time on usability-related activities, in accordance with the project and the phase of the project. On average they spend between 50 and 70% of their time working with usability in projects. They spend the remaining time on sales and marketing activities, and internal meetings. A majority of the UDs said that they would prefer to spend more time in projects.

The UDs reported spending roughly between 25 and 50% of their time on analysis, between 20 and 60% on design and between 10 and 50% on evaluations. Those who did much design, spent little time on evaluations, and vice versa. The figures are very rough estimations and should be seen as indications of what the UDs do at work and how much, rather than ‘hard facts’. Fig. 2 illustrates the proportions of time spent on the three activities.<sup>6</sup>

Almost all UDs said that they spend a lot of time on ‘missionary’ activities—both on an official level, such as sales and marketing activities for the consultants, or on an informal level in justifying their role within the project. The majority of the UDs said that it has become somewhat easier in the last couple of years. Some of the UDs mentioned that it is a problem that only the people in the specific projects where the UD is/has been involved get to know what the UD is and does. Other projects and people know nothing about the UD role. Some UDs indicated that they found it stressful to have their skills and role constantly questioned by the others in the project.

<sup>6</sup> One of the respondents reported spending roughly 80% on evaluations and 10% on analysis and design, respectively, and is not included in the figure. We chose not to include the figures from this respondent in the graph, since we felt that they were not representative. One respondent did not provide an answer at all.

### 5.3. (iii) *Projects and processes*

#### 5.3.1. *UD participation in projects*

The UD participants in the projects to various degrees—from full participation throughout the project (although there is always a ‘dip’ during construction) to single activities, e.g. evaluations or user analysis. A majority of the UD participants were involved in one or more projects on a full-time or part-time basis. Virtually all the UD participants and two of the project managers emphasised the importance of involving the UD participants in the projects on a continuous basis, preferably from the beginning to the end. One of the project managers particularly discussed the construction phase and the need to involve a UD in that phase as well. Two of the project managers mentioned that the UD participants in their projects needed to work fulltime and even more. There are, however, many projects in these two organisations where there are no UD participants involved at all since there are not enough UD participants for all the projects.

In the projects, the UD participants mainly conduct typical UCSD/usability activities covering one or more of the three phases analysis, design and evaluation. One of the UD participants mentioned being involved in other activities for which there is no explicit role in their development process, for instance, online help and user training. Some of the UD participants mentioned documentation as making up a large part of their work, which they considered a problem.

“I produce lots of documents, write profiles and scenarios.” (*from a UD*)

In the early phases the UD participants conduct user analyses and capture requirements by means of typical UCSD methods, for instance, field studies and interviews. Some of them mentioned that they want to spend more time and be more involved in the analysis phase, in order to create better designs, or to put usability on the agenda from the beginning. The UD participants use use cases<sup>7</sup> in their work, but do not write them. The interaction design is tightly connected to the use cases. Often they are produced in parallel.

“No, I usually don’t write [the use cases,] but they are connected to the interaction design document and they have to agree—the use cases and the ID document. We try to be careful not to do the use cases first, and then the user interface from the use cases - that doesn’t work. We do them simultaneously.” (*from a UD*)

This description was confirmed by two of the project manager—they argued that the UD participants were primarily responsible for doing the interaction design for the use cases, in parallel with the specification of the use cases.

The UD participants do design, mainly conceptual design and interaction design, on an overall level, and sometimes on a detail level. The user representative described how the UD participant had created ‘pictures’ of the future system together with the users. One of the project managers discussed how the UD participant in that particular project had specified every little detail in the interaction design, down to the single buttons and input fields, and how this had become a problem in that it was extremely time-consuming and the UD participant ended up working overtime. Moreover, the user interface developers handed over all decision-making to the UD participant.

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<sup>7</sup> A use case is a “complete course of events in the system, seen from the user’s perspective” (Jacobson et al, 1995, p. 157). Use cases are used to capture requirements, and describe user tasks.

As discussed above, the UD's prefer not to do the graphic or visual design. The graphic design is sometimes done by a separate graphic designer.

Prototyping is an important tool for the UD in communication with users as well as other designers and developers.

“The prototypes were the solution to everything. The interaction prototypes provided an incredibly good way of communicating with both users and visual designers, but also with the developers.” (*from a UD*)

Some of the UD's that were involved in projects said that it is difficult to get the time to do formal evaluations. Informal evaluations are common and important, for instance, showing a design solution to user representatives and asking them about their opinions. Formal evaluations were more difficult to fit into the project plan. If they were included in the project plan from the start, they were sometimes abandoned later on in the project, because of time constraints, or because there was no system/prototype to use in the evaluations. The situation in projects *without* a UD seems quite the opposite. Some of the UD's in organisation A said that the demand for *separate* usability evaluations was quite high and increasing, i.e. when one of the usability people is called in to do a separate evaluation in a development project but is not involved in the design.

### 5.3.2. *Development process and the RUP*

The in-house UD's use a customisation of the RUP. Several of the in-house UD's have been involved in the customisation of the RUP and are very familiar with the process. The consultant UD's use either the client's development process, or a process specifically tailored for the project, in such cases where the client does not have an explicit process. If the client process is not user-centred, the consultants try to add activities and artefacts to make it more user-centred.

### 5.4. (iv) *Impact on product, project and organisation*

The majority of the UD's could point to concrete designs or details in designs where they felt that they had contributed, based on either ‘anecdotal evidence’—e.g. that users called them up to say specifically that they were happy with the design—and/or usability evaluations during design and construction. One UD talked about having conducted evaluations after the system had been delivered, in real use. Some of the UD's expressed doubts about the impact they have on the product, and on the user's situation.

“You can see what you've done in the product—but not effects in terms of improvements. The developers say that they would have done the same thing without you. Some projects with UD's have failed (not on account of the UD) and some projects without UD have delivered useful products.” (*from a UD*)

The project managers were quite positive about the impact of the UD. All three of them claimed that they could trace the work of the UD in the product.

“Oh, yes, definitely. If you compare [product A] and the first release of [product B] you can see the difference quite clearly. [...] I may be a bit proud of my product...”

but the first release of [product B] radiates some kind of professionalism that [product A] doesn't." (from a project manager)

The user representative, on the other hand, said that the development team had not paid any attention to the design created by the UD and the user representatives. What the UD did was not really part of the project.

"... it felt as if it [the design workshops with the UD and the users] was not really a part of the project. It was the project that had asked her to join, but I felt that they did not... I do not really know, but I felt that they were not particularly interested in it. But I may be wrong." (from the user representative)

The UDs also discussed the impact they have in the projects where they are/have been involved. Some of them were positive about the increased attention that usability received and said that participating in one project often opens up for participation in other projects. One of the project managers talked explicitly about how the UD had managed to secure support for the usability issue from the project management. One of the UDs and two of the project managers talked about the importance of the UD contributing with artefacts (deliverables) that are useful to the developers, primarily interaction design specifications.

Other UDs were less positive about their impact, for instance, when conducting separate evaluations. One of the consultant UDs discussed how, as a consultant, the UD has little say in the development projects. The user representative was very positive about having a UD in the project, but said that when the UD left the project, everything 'went back to normal' as if the UD had never been there at all.

"Well, everything went on as if nothing had happened. Things had happened with us, but the meetings went on in the same way, and the work with the use cases—a few sentences were changed, things were removed or added, and there were different versions." (from the user representative)

Two of the in-house UDs talked about two specific projects in the organisation, where the input from the UDs was partly or largely ignored, which to some extent was confirmed by the project manager in one of these projects.

Most of the UDs were optimistic about the impact they have had on the organisation at large. They felt that the awareness of usability and its importance has increased. The UDs are given more time and action space in the projects and the demand for their expertise has increased. For instance, the UDs in organisation A get more time in the project plans to run proper evaluations. Previously, they were often restricted to doing 'quick and dirty' expert evaluations. Moreover, integrating usability into the systems development process has helped in making the issue more visible. But there are problems as well. There is, for instance, still a lack of awareness about usability on management levels. Some of the in-house UDs said that they have limited control over what projects they get involved in, which sometimes has the effect that they 'waste their time' in projects where they have little or no impact. One of the project managers (from the consultant company) discussed the impact of their user-centred approach in the client organisations.

"We are only in the very beginning; there is so much to improve. But I still think that we've come a long way at [name of client organisation]. Perhaps that is frightening.

I know what it's like in other projects, there are no traces whatsoever of [user-centred design]." (from a project manager)

#### 5.4.1. Areas of responsibility and powers

We asked the UD's about their responsibilities and powers in the projects and who is responsible for the usability of the system. Only one UD (in one of the other organisations) claimed to have full responsibility for the usability of the system, even though the client had the right to veto decisions. The answers from the remaining UD's ranged from no formal responsibility at all to responsibility for planning and conducting usability-related activities. Two of the project managers confirmed the view that the main responsibility of the UD is to conduct certain activities and to make sure that usability is taken into account in the development process, including making trade-offs when necessary. The third expressed a similar view:

"The UD's area of responsibility is telling us what the system should look like, based on what the users need and want." (from a project manager)

As for powers, they were equally vague—most of the UD's either did not have any formal powers or did not know what they were. They did have informal powers to make design decisions though, within the limits of the project plan and budget. In one case, the powers were defined on a project-to-project basis—although in very vague terms, such as "the power to influence what information is presented on the screen".

The project manager was pointed out as being responsible for the usability of the system, sometimes together with the client and/or some steering group. The project managers confirmed this. Two of the project managers particularly pointed to the steering group:

"We do not choose, we are ordered by the steering group." (from a project manager)

One of the project managers said that ultimately, it is the client/user representatives who approve the design solutions and set priorities.

#### 5.4.2. Success factors and obstacles

We asked the UD's to describe important success factors, i.e. factors that facilitate usability work and working as a UD in the projects. We also asked the UD's to list some of the major obstacles to their role in the projects, and to usability work in general. The answers could be sorted into four groups—process, communication, attitudes and the UD role. The below figures summarise the main success factors and obstacles/problems in each group. The items on both sides are listed in accordance with the number of people that mentioned them in the interviews (nine UD's, three PM's, project managers, and one user representative in total). The dotted lines connect related items on the 'positive' side and the 'negative' side.

Fig. 3 shows that the main issues relating to the process included: user participation, for instance, having access to the users; that the UD participates on a continuous basis in the project; time constraints and that the development process supports usability and user-centred activities. The UD's in organisation A specifically discussed their RUP

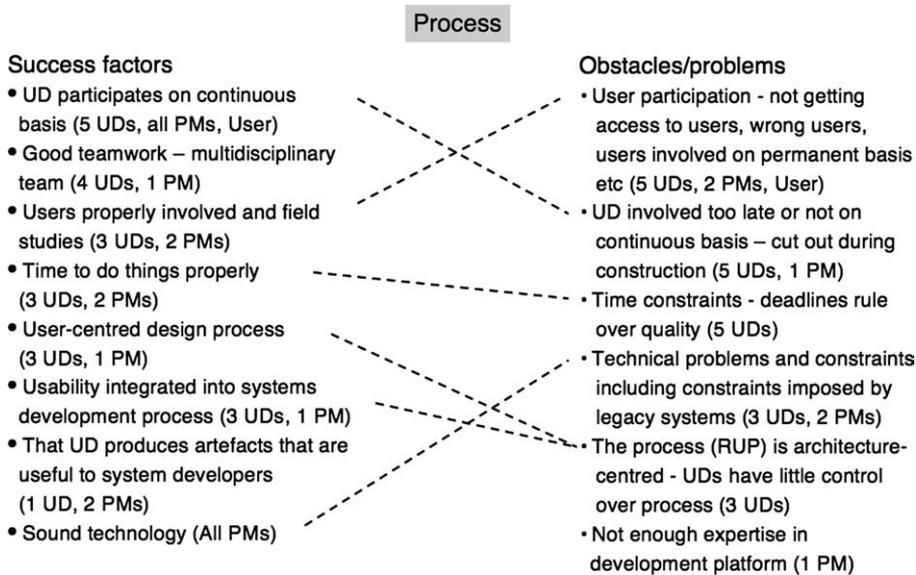


Fig. 3. Success factors and problems related to the *process*.

development case. They had, for instance, problems with many projects that did not bother to involve a UD, despite it being a mandatory role in their RUP development case. Other problems were the lack of usability requirements and that the client does not have enough knowledge and expertise to make demands on the process.

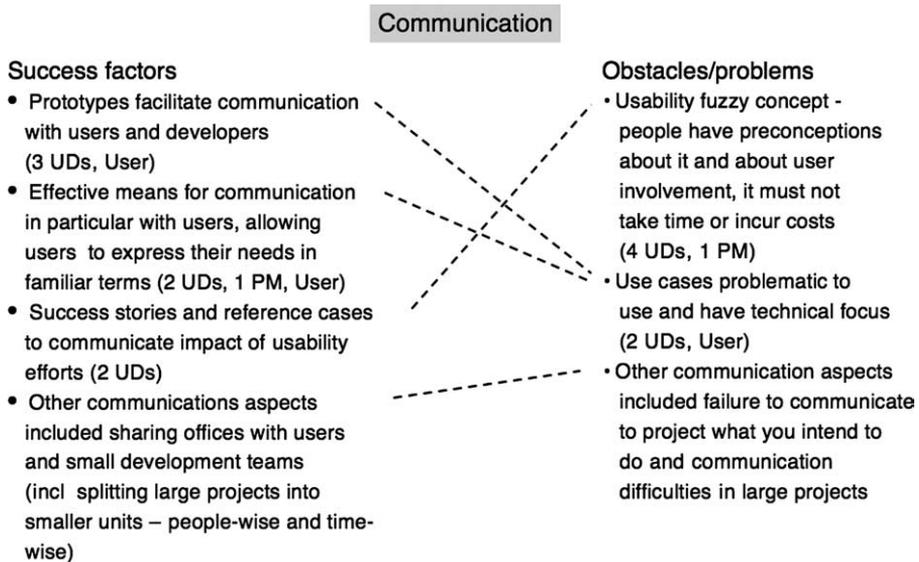


Fig. 4. Success factors and problems related to *communication*.

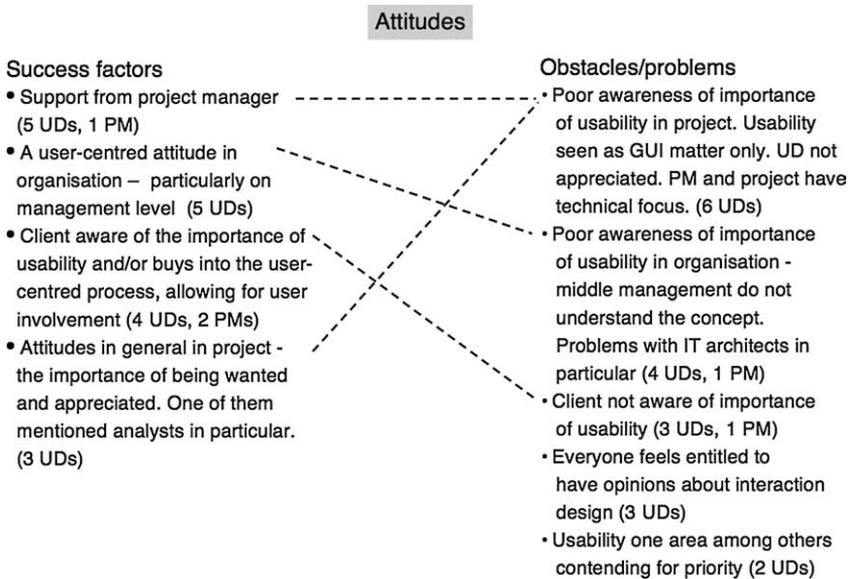


Fig. 5. Success factors and problems related to *attitudes*.

Fig. 4 shows that communication issues included the need for effective means for communicating the design solutions to the users as well as the developers, e.g. prototypes. Use cases were particularly pointed out as being difficult to understand and to use.

“...not to start with, then I found it [use case modelling] very difficult, but now I start to get the hang of it. It’s taken a long time... if I worked with this, I would work with more practical means....pictures and everything...” (*from the user representative*)

Other issues were related to the usability concept as such—e.g. some UDs said that it is rather ‘fuzzy’ and that there is a need for ‘good examples’ to serve as inspiration. In addition, one project manager firmly believed in the UD providing design guidelines for the system developers, communicating usability knowledge within the project.

Fig. 5 shows that support from the project manager is very important, as is support within the project, and from management in general. Another issue was the lack of usability awareness in the project, in the organisation and/or at the client’s.

Some of the UDs complained that new team members joining the project often express lots of opinions about and new ideas for the interaction design, but they do so without having the ‘history’, the background of the design.

Finally, one of the project managers and one of the UDs reported that the UDs in organisation A have seen themselves as usability police conducting evaluations, rather than being involved in the projects. But this attitude has changed of late.

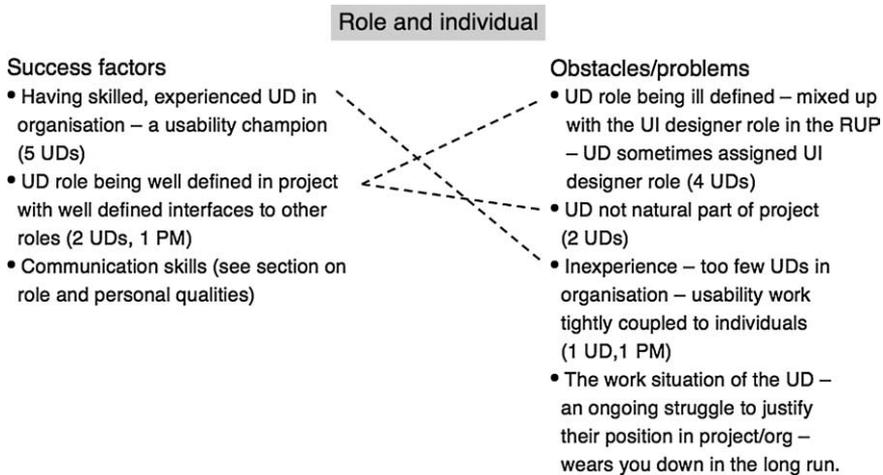


Fig. 6. Success factors and problems related to the UD *role* and the *individual* holding that role.

The UD role and the individuals holding the role are further discussed below. But Fig. 6 shows some of the issues related to the role and the individual that emerged in the discussions about success factors and problems. These issues included the need for a well-defined role within the projects and skilled, experienced UDs.

“You can’t keep fighting an uphill fight for ever. It takes incredibly much energy and wears you down not being respected.” (*from a UD*)

### 5.5. (v) *The role—various aspects*

The UDs and the other respondents brought up some aspects that are related to the UD role as such, as well as aspects related to the individual holding that role.

#### 5.5.1. *Personal qualities—important qualities and the qualities the UDs said they have*

We discussed personal qualities with the UDs and asked them to list the qualities they think are important for the UD role. The top five qualities, rated in accordance with how many UDs mentioned them were:

- (1) Communication skills, e.g. the ability to communicate with users and developers.
- (2) Being a good team worker, i.e. flexible and diplomatic yet able to argue for your cause.
- (3) Having skills and expertise within the area, and experience
- (4) Being analytical, i.e. liking problem-solving
- (5) Being creative

Other important personal qualities included being a good listener and being open-minded.

We also asked the UD to describe themselves. A majority claimed they have good communication skills, and that they are good team workers, flexible and analytical. Two said that they are creative, and three particularly emphasised that they are good listeners. Some of them were very explicit about their short-comings—describing themselves as having none or few of the qualities that they felt are important.

The way the UD described themselves did not correspond completely with the personal qualities that they listed as important. One reason for this discrepancy may be that some of the UD had done personality tests and discussed the results from these tests rather than the qualities they had listed as important. Two of them mentioned, for instance, that they are emotional, which was never identified as an important quality. The UD also brought up personal qualities, such as decision-making (slow or intuitive), being introvert, being stubborn and being too consensus-minded.

### 5.5.2. Relationships

The UD discussed a number of aspects that can be connected to their relations to other people in the project. The ‘relationship map’ in Fig. 7 provides a summary.

Fig. 7 shows that the UD claimed to have good relations with the system developers. The developers were said to appreciate the input from the UD, e.g. design specifications and prototypes. Instead, the UD reported about problems with IT architects, analysts, and (in one case) art directors. As mentioned in the success factor and obstacles section, the project manager is important to the UD. The UD also needs a contact network within the organisation, including other, experienced, UD. The UD often works more closely to

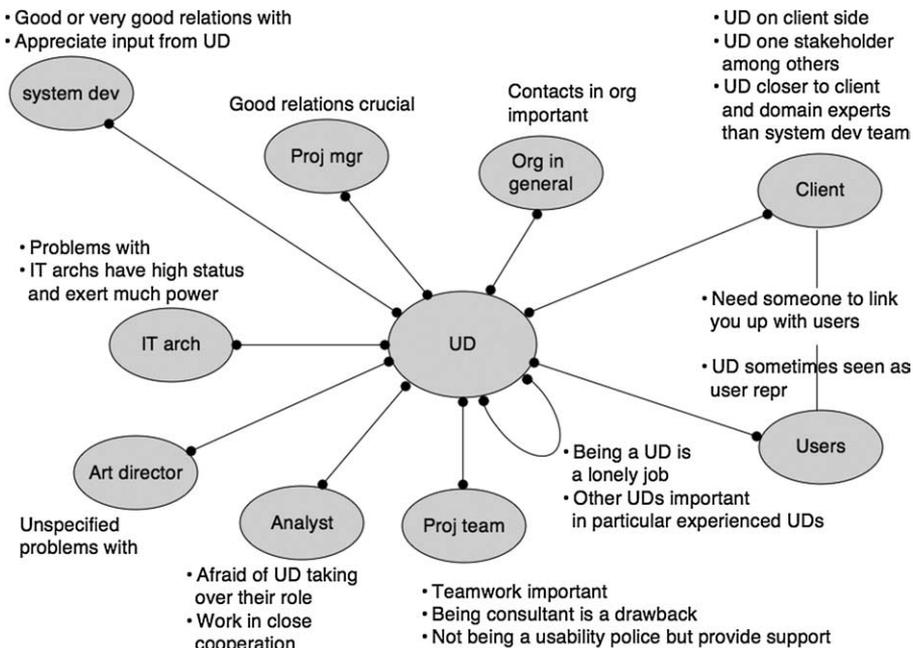


Fig. 7. Some of the relationships the UD has with people in project or organisation.

the client and the users than the other project team members do, and they sometimes see the UD as a user representative.

Two UDs particularly pointed out problems with IT architects, claiming that they exert much power and influence within their organisation. The UDs said that the IT architects make decisions about technology and technological platforms without taking usability into account. The UDs have no decision-making role in that process.

### 5.5.3. *Support and follow-up*

The UDs primarily turn to their UD colleagues in the organisation or, in rare cases, the project when they need support, for instance, in conflicts with other project team members. If they work with a project manager who considers usability important, they turn to him/her in case of difficulties. In organisation B, the UDs said that they have support from management. In organisation A, the UDs said their supervisor knows little about usability but is kindly disposed towards it and leaves it up to the UDs to do what they think is best.

The UDs are supposed to put in a certain number of man-hours in the projects, conduct certain activities and deliver certain artefacts (deliverables) on time. Some of them reported feeling that they have to keep up with the rest of the project, since the artefacts they deliver are used as input in other activities, for instance, delivering detailed user interface design for implementation. There are no formal reviews of the quality of their work and the artefacts/documents they produce.

### 5.5.4. *Stress and pressure*

The pressure varies with the projects and the phase of the project. Only one of the UDs complained about working too much overtime in the current project (about 130%). Three of the UDs mentioned that working in several, parallel projects may be stressful. Four of the UDs brought up the design phase as particularly stressful. They said that as a UD you have to be creative and produce a design solution in quite a short time, and regardless of the quality of the input.

“I know that I have to produce a design solution till Thursday. You can’t wait for inspiration - we can’t cancel the only meeting we have [with the users]. That wouldn’t do.”

”You can’t have a bad week.“ (*from a UD*)

## 6. **Lessons learned**

Our main research question was whether or not introducing the UD in these two organisations has been ‘successful’, in terms of changes in the systems development process and the impact on products, projects and organisations. It is, however, not possible to answer such a question with a straightforward ‘yes’ or ‘no’. Instead, we discuss some issues related to the key concerns underpinning the role listed in the introduction of this paper and finish with a discussion relating our findings to the ‘bigger picture’ and their

transferability to other contexts. The reader should keep in mind that this is a case study where generalisations cannot be made.

### 6.1. Facilitation

One of the main areas of responsibility for the UD is to facilitate the UCSD process, i.e. to make sure that user-centred activities take place and to maintain a user focus throughout the process. The interview data indicate that the UDs had succeeded to some extent in that aspect. Most of them claimed to have the responsibility for user-centred *activities*, which was confirmed by the project managers. There are, however, problems with ‘concentrating’ that responsibility to one role.

Our results indicate, for instance, that the UD became a user ‘substitute’ in some projects, a ‘go-between’ rather than a facilitator. A certain degree of user-developer mediation is inevitable, and even desirable. But we argue that it is important that everyone in the project knows who the users are, what their situation is like, and have met users and talked to them (see the first principle in Gould et al., 1997). The UD cannot make all design decisions pertaining to users’ needs and usability. Therefore, it is essential that everyone in the project has, at least, a basic understanding of the users and their needs.

### 6.2. Design

The usability engineering approach (Mayhew, 1999; Nielsen, 1993) promotes analysis and evaluations as the main means for attaining usability. This approach has, however, been repeatedly criticized. Recently (Siegel and Dray, 2003) stressed that usability professionals need to contribute more actively to design solutions and product ideas. “UCD professionals who focus on doing ‘studies’ as opposed to generating designs and products, will always be perceived as peripheral.” (p. 20). With the UD role we wanted to shift the focus from analysis and/or evaluations to a more design-oriented approach, where the UD would take an active part in the design process, and generate interaction design solutions. The UDs in our study seemed to have succeeded in shifting their focus to some extent. They reported distributing their time fairly evenly between analysis, design and evaluations—although with great individual variations.

This shift may be explained partly by the fact that design has received more attention in general within the software industry in the last few years, particularly during the dotcom boom. It is very much in line with our intentions with the role—we named the role usability *designer* in order to emphasise the importance of design in the user-centred approach. We believe it essential that the usability professional takes part in design as well as in analysis and evaluations. Some of the UDs and the project managers discussed the importance of the UD doing something ‘useful’ in the project, i.e. that the UD contributes to the progress of the project and moves it forward to the solution. It is important that the UD creates artefacts that are part of the solution, rather than criticizing the solutions of others. Well defined deliverables, such as a conceptual design or an interaction design structure, may also help in clarifying the UD role in the projects.”

However, some of the UDs expressed concerns about their responsibility to produce designs under time pressure. Design is rather elusive as a concept. Atwood et al. (2002, p. 125) argue that “Design is a term that brings many people together.... But, design is also a term that pushes people apart.”. For instance, it is difficult to reconcile the software engineering approach, relying on structured processes, and the creative aspects of design requiring less rigid approaches. Preece et al. (2002, p. 6) claim that design is “...about finding ways of supporting people. This contrasts with software engineering which focuses primarily on the production of software solutions for given applications.” It is therefore difficult to integrate less formal activities like design and the iterations required in the design process in many software engineering models. It is difficult to create enough space in the project plan for an activity that does not lend itself to strict planning. Many processes are not particularly clear about when and how design should take place. Some of our respondents emphasised the importance of doing design in parallel with early activities such as use case modelling. Based on our own experiences of and earlier research on systems development, we are inclined to agree with this, and believe that design activities should start early, as early as possible in the process. We also believe that design activities can and should take place prior to use case modelling, providing input to the modelling activities.

### 6.3. *Continuity*

The UDs spend most of their time in projects, and less time on non-project activities, such as sales and marketing/missionary activities, style guides, and methods development. We believe it is essential that the UD takes active part in the projects, and participates on a *continuous* basis, a position that was shared by the majority of the respondents in our study (continuous participation was one of the success factors). Firstly, it is virtually impossible to make all design decisions up-front in the project. Systems development is iterative to its nature and there are changes and modifications throughout the development project. It is important that the UD is there, continuously, maintaining the focus on the users’ needs. Secondly, the UD must have “skin in the game” (Cooper, 1999), i.e. the UD has to make design decisions and apply his/her ideas to practice instead of criticizing the design of others in order to create leverage in the projects. This requires ‘presence’ in the project, that the UD is there acting as an “... advocate for end users and other stakeholders in the systems development enterprise and the development team.” (ISO/TR, 18529, 2000, p. 8).

The construction phase is particularly important. Our study, and the results of another parallel study (Gulliksen et al. 2004) shows that the UDs, and other usability professionals, are typically involved to a small extent or not at all in the construction phase of the project. This was considered a problem by some of the UDs and project managers. It seems inevitable that there are changes affecting the design and the usability throughout the project. It is therefore virtually impossible to hand over a ‘blueprint’ to the developers and walk off. Based on our experience, we argue that the chances that what gets delivered from the construction phase adheres to the designs from the early phases are slight, unless the designer (UD) stays on in the project throughout the entire cycle (see for instance the case study discussed in Gulliksen et al., 2003).

#### 6.4. Communication

Communication skills were considered an important personal quality in the UDs by almost all the respondents in our study. The UD must be able to communicate his/her ideas and designs to other people, users, project managers, developers, etc.

Communication with system developers (programmers) has sometimes been made out as being particularly fraught with problems (see for instance Cooper, 1999). The interview data indicate, however, that the UDs had few problems with system developers. On the contrary, the developers in one of the projects were described as being happy with the UD doing the interaction design, i.e. producing more or less detailed sketches of the user interface (in terms of contents, structure, functionality and navigation, rather than look-and-feel). Presumably, because that allowed them more time to use their creative talent for doing *technical* design and solving *technical* problems. This indicates that the UD role met a real need in the projects. UD or no UD, interaction design is done anyway, by the developers if nobody else is around to do it. However, some of the respondents pointed to the risk that the developers become ‘passive’ handing over all interaction design decisions to the UD. This would probably require one or several full-time UDs in any project of moderate size or more.

#### 6.5. Quality

System quality consists of a number of factors including reliability, maintainability and usability (ISO/IS 9126-1, 1999). The UD should be responsible for the activities addressing such quality aspects in the product that are related to usability. However, introducing a new role into systems development is likely to involve stepping on toes as regards the areas of responsibility and decision-making power.

According to the UDs in our study, usability is a ‘fuzzy’ concept. Despite the ISO 9241-11 definition, it seems that the concept is ‘open to interpretations’. The UDs complained about people having preconceptions about it, misunderstanding and mis-applying it. Other studies point in similar directions (see for instance Rosenbaum et al., 2000). Usability being open to interpretations increases the risk of other participants in the project feeling that the UD is encroaching on their own area of responsibility, e.g. requirements analysts and business analysts. Utility or usefulness is very much part of usability as we see it. Who should assume responsibility for the usefulness of the system, i.e. the adequacy of the services provided by the system—the UD or the requirements analyst? When introducing the UD role one has to address such roles where there may be overlapping responsibilities in order to avoid conflicts, for instance, the requirements analyst, and/or the graphic designer. It is, however, impossible to define such delimitations as general rules or guidelines, they have to be defined for each project, depending on the context and the people involved.

#### 6.6. Resources

The interviews indicate that the UD role is not yet a natural part of the development process. The vagueness of the role was evident in that the UDs had to justify their role in

the projects and their organisations and in the general lack of impact in the projects and organisations. Moreover, the UD's were not sure about their responsibilities and powers in the projects. This indicates that the UD's are not given or are not able to attain sufficient authority and action space within the project or organisation, making it difficult for them to fulfil their responsibilities.

The interviews furthermore indicate that support from the project manager was very important for the UD. The support from the project manager seemed to help the UD in establishing the role, and creating 'space' in the project for usability. The attitudes of the project manager towards usability seemed to be important for its status, i.e. whether it is considered a user interface issue alone, or a quality of the system/product as a whole. Reducing usability to a matter of user interface design only, severely circumscribes the UD's possibilities to have real impact on the product and in the project. He/she is restricted to designing the user interface (or creating guidelines for designing the user interface) for services specified by others. In such a case the UD becomes little more than a user interface designer<sup>8</sup>, contrary to our intentions with the role. The UD should be (in line with the software designer described by Kapor) "...concerned primarily with the overall conception of the product." (Kapor, 1991). Thus, it is important that the project manager not only believes usability to be important, he/she must also see usability as an essential quality in the system/product as a whole, and not just a user interface matter.

It was also evident from our interviews that the UD's face very much the same problems that usability professionals have complained about in other studies (for instance, Rosenbaum et al. 2000). In addition to the ones discussed in the sections above, they mentioned resource constraints, for instance the lack of experienced usability experts, and time constraints. There is often not enough time to do things properly. The UD's in our study also discussed the importance of active user involvement and the problems related to it, but there are plenty of obstacles to user involvement see, for instance Clegg et al. (1997), McCoy (2002) and Wilson et al. (1996, 1997).

## 7. Discussion

Our starting point in defining and introducing the UD role was the need for identifying ways of transferring and applying knowledge from the HCI area in practical systems development, and in particular the urgent need to address usability issues in the two organisations in our study. We wanted to find a way of introducing usability and user-centred design in these organisations and defined the UD role, in combination with other measures described elsewhere (Gulliksen et al., 2003; Göransson et al., 2003).

To what extent do we consider the introduction of the role 'successful' and would we recommend the UD role in other organisations? As discussed above, the role did meet our initial expectations and intentions to some extent, for instance, in shifting the focus of usability work towards design, in assuming some kind of 'users' advocate' role, and in placing usability on the agenda in the projects. Moreover, the UD's said that their workload

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<sup>8</sup> See, for instance, the use case specifier role and user interface designer role in the RUP (Kruchten, 1998).

had increased over the years, which may indicate that there is some kind of recognition of the value of the UD role. This, we believe, is an argument for using a role with specific responsibility for usability. Moreover, roles are commonly used for dividing labour and responsibilities in systems development, which makes introducing a role for addressing usability issues a natural choice.

It seems that the UD has filled a natural role in the organisations we have studied. The organisations differ in a number of ways, which of course influences the way the role has evolved. The role description in organisation A, for instance, specifies that the UD should have a background in cognitive psychology or some other behavioural science, whereas the UDs in organisation B all have a technical or computer scientist background. The UDs in organisation A belong within the same organisation as the majority of their users (unless they develop an application for the general public), whereas the UDs in organisation B are consultants, starting afresh with new clients and new users in every project. However, there were less differences between the UD roles in the two organisations than we had expected. We could not identify any differences in our results that we could directly relate to the differences in organisation and background. We had, for instance, expected that the UDs in the two organisations would conduct different types of activities, given their different backgrounds, but our data did not confirm the expectation. Moreover, the two UDs that had modelled their roles independently of our research ended up with fairly much the same role and set of responsibilities. This may indicate that there has been a natural ‘role’ out there in these organisations, that the usability professionals in our study could make their own.

But there are areas where the role did not meet our initial intentions. The UDs in our study are, for instance, still facing basically the same problems and obstacles as usability professionals have always had to deal with. They were not ‘protected’ by the role in quite the way we had hoped for.

We do not think that the problems faced by the UDs in our study disqualify the idea of the UD role. But, there are issues at multiple levels in an organisation that need to be particularly addressed when introducing such a role. Below, we discuss some issues that emerged in our analysis of the interview data. These issues are contextual/cultural to a high extent and hence related to the transferability of the role to other organisations, contexts and/or cultures. We have therefore included brief discussions on some contextual and cultural factors.

### *7.1. Individual level*

Introducing the UD role as part of the systems development process seems to have created a platform, or ‘space’, for working with usability, but the role did not automatically make usability a top issue in the project or the organisation.

A role is typically represented by a set of responsibilities and behaviour described in an ‘official’ document. But roles are also defined by sets of expectations (“role schemas” Clemmensen, 2002, p. 861) that we have and apply to people in specific role positions. These are based on our own knowledge and experiences (real or imagined) of people in that position. What a role can do and achieve can therefore never be

entirely defined by the ‘official’ role descriptions. The expectations and experiences of the people interacting with it will circumscribe its action space. They will choose to pay attention to, listen to and use the artefacts generated by the role in accordance with their own beliefs about it.

Therefore, the individual holding the role is an important factor. Borgholm and Halskov Madsen (1999) report, for instance, that personal characteristics, such as the ability to convince people, are crucial. The respondents in our study described a set of qualities that they considered important, for instance, communication skills, flexibility, and diplomacy but enough backbone to argue for your cause. One of the project managers in our study said

“It [the importance of the UD’s personality] mustn’t be underestimated. In the role, you have to, at least before it has become established in a project, you have to be prepared to fight for it a little. [The name of the UD] has been prepared to do that and I think it is a prerequisite.” (*from a project manager*)

In the organisations in our study, the role has become very much what the individual UD has made it. This means that the UDs have had to create their own role and the action space for driving the process of integrating usability and UCSD into the development process and projects.

We further got the impression from the interviews that being a UD is a lonely job—our respondents rarely worked with other UDs in the projects—which may have increased the insecurity felt by the UDs as regards their role. They were on their own, fighting for usability and the users’ needs—like the lonesome cowboy. The interviews also point to the need to consult others with the same role and background for discussing difficult problems. However, there was typically little time to meet with other UDs in these two organisations, partly because the workload of the individual UD seems to have increased over the years. Organising usability people as a team or unit may seem the obvious answer to address the situation. However, the UDs in our study spent most of their time working in projects where they were either on their own or worked in couples with another UD (in one project). So, it is primarily within the constraints of the individual project that the UD has to shape the role and its contribution, and create the action space needed for working with usability issues and users’ needs. (We discuss the matter of how to organise usability workers in more detail in Gulliksen et al., in this issue).

To sum it up, the role in itself is not enough; the individual holding the role and the individuals making up the project team ‘fill out’ the ‘space’ afforded by the role, creating the end result—the usability designer in the project. Moreover, the role, as it has evolved in these two organisations combines several skills and abilities in one and the same person, the combined generalist and specialist. It calls for a person with a great deal of stamina and backbone, and a strong belief in what he/she is doing.

## 7.2. Project level

Despite the ‘natural role’ discussed above, it seems that the problems faced by the UDs revolve around vagueness and insecurity about what, exactly, their role in the project is.

The UDs had to establish their position, their contributions and their action space in every new project, meeting resistance to and mis-conceptions about their role.

One explanation may be that the UD roles<sup>9</sup> in these two organisations were vaguely defined. But, this may not be the whole explanation. Other roles in systems development are perhaps equally ill defined. One of the project managers in our study discussed, for instance, the system architect role in a way that indicates that their responsibilities and their authority are equally vague. Robertson et al. (2003) report similar problems in their study of information architects, denoting it “A Role With No Edges” (p. 396). We believe that the problem may be put down, at least in parts, to the work practices in systems development. Everyone in the project team is subject to the same constraints and deadlines and has to make trade-offs and compromises. These trade-offs and compromises may make it difficult to maintain strict adherence to pre-defined ‘rules’ and notions about what is the best or right thing to do. This is not a unique situation for the UD. Although we believe that the difficulties and obstacles facing the UD are compounded by the technical orientation and attitudes in systems development (Clegg et al., 1997). Usability people, and other people with ‘non-technical’ roles, e.g. graphic designers or information architects, add components and ideas that are somewhat ‘alien’ to the technical orientation and structured approaches underpinning systems development. Components, such as user involvement and design activities add complexity and uncertainty to the process, and may therefore be resisted by the development organisation.

We believe that the need for support from project management expressed by the UDs in our study, is an indication of the ‘vagueness’ problem. The UD needs support from the project manager in establishing the role and its contributions to the process. And the project manager in turn, needs action space, methods and tools to address the increased uncertainty and reduced controllability in the development process. (We discuss this matter in more detail in Gulliksen, Boivie, and Göransson, in this issue)

### 7.3. Organisational level

One important factor is the way the UD role has been implemented in these organisations. In both organisations, the implementation is a mixture of top-down and bottom-up approaches, involving management initiatives as well as individual pioneers arguing for the importance of usability and the role as such. Their main body of work has been carried out on the ‘shop floor’, by means of active participation in development projects. There have also been activities on a meta-level, for instance, methods development and training efforts. Recently, top-down approaches have been given prominence; see for instance, Schaffer (2004) and Bevan and Earthy (2001). We certainly agree that management initiative and support are crucial, which was also evident in our study. However, management initiative often stops with appointing an individual or a team to take ownership of the issue. The mandate rarely extends to changing the way other people in the organisation work (Siegel and Dray, 2003). In organisation A, management initiated the process by employing a pioneer usability specialist and delegated the

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<sup>9</sup> The UD role is primarily a project role in the systems development process, not an organisational role.

responsibility to that person. In organisation B, management has been involved throughout the process, and usability and UCSD have received more attention throughout the organisation. This points to the importance of having an “executive champion” as described by Schaffer (2004)—providing leadership, resources and coordination.

We believe that it is rarely a question of either top-down or bottom-up, but a mixture. Nor is there a simple answer or cookbook approach to implementing usability. The success of the approach depends on the context and organisational culture, as well as the individuals making up the organisation and creating the implementation process.

#### *7.4. Contextual/cultural level*

The context in which we have defined, implemented and evaluated the UD role is primarily bespoke systems development in a work context, conducted by an in-house development organisation or a contractor. This has shaped the role in certain ways in the same way as it shapes the systems development process as such. Grudin (1991) distinguishes between product development, in-house development and contract development where in-house, bespoke, development is characterised by a focus on user participation, The Scandinavian tradition of user involvement and user empowerment forms a basis of our UD role, and they are in their turn, products of the cultural and historical features characterising the Scandinavian employer–employee relations. The role would probably have been quite different in other cultures, where user involvement has not received the same attention and emphasis. Nyce and Löwgren (1995) discuss the importance of cultural aspects in relation to cooperative design, arguing that there are certain basic assumptions underpinning the idea of user involvement that are particular to Scandinavia, affecting the transferability of the approach to other, non-Scandinavian contexts.

#### *7.5. Concluding note*

This study is part of an ongoing action research project, and as such, is a case study involving (primarily) two Swedish systems development organisations. Our results and discussion must therefore be considered in the light of the context in which the study was conducted. Moreover, the problems faced by the UDs in our study indicate that more research is needed on the topic of how to integrate usability and users’ needs in the development process. Nevertheless, we hope and believe that our findings can be helpful to usability professionals in that they add to the picture of what it is like to work with usability and fight for usability in systems development organisations.

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