Making a difference – a survey of the usability profession in Sweden

Jan Gulliksen, Inger Boivie, Jenny Persson
Dept. Of HCI/IT, Uppsala university
PO Box 337, 751 05 S-Uppsala, Sweden
Jan.Gulliksen@hci.uu.se
inger.boive@it.uu.se
jenny.persson@it.uu.se

Anders Hektor, Lena Herulf
National IT-user centre, Uppsala university
Observatorieparken, Kyrkogårds gatan 2 C,
S-751 20 Uppsala, Sweden
anders.hektor@nita.uu.se
lena.herulf@nita.uu.se

ABSTRACT
Poor usability in interactive systems/products is still a major problem for users and buyers, despite efforts made by an increasing number of usability professionals. How come this is so and what are the main obstacles to usability work?

In this paper we report the results of a survey of usability professionals in Sweden, conducted in 2003. The survey identified, e.g. their background and experiences, the type of employment, organization, and products/systems, the software development process being used and some key success factors for usability work. The results indicate, among other things, that management support and project management support are essential for the usability worker. Moreover, they face problems such as, usability and user involvement having low priority in the projects.

Author Keywords
Usability, software development, usability professionals, UCD methods, development processes

ACM Classification Keywords
H.5.0. Information interfaces and presentation (e.g., HCI): General

INTRODUCTION
This paper describes and discusses the results of a survey of the work practices of usability professionals in Sweden, in 2003. The purpose of the study was to investigate where and how usability professionals work in the Swedish industry, their skills and background, what methods and techniques they use and what impact usability issues have in their organizations and on the systems/products. We were also interested in key factors for successful usability work.

Sweden has a fairly long tradition of user-centered design (UCD) and participatory design (PD), going back to the UTOPIA project [3, 4, 10, 11] as well as a strong tradition of workplace democracy. From this, one would perhaps expect the Swedish software industry to be particularly progressive as regards UCD and usability issues. In 1995, Katzef and Svärd [14] conducted a study of the usability maturity in the Swedish software industry. The results indicated, however, that the usability maturity was fairly low, and that usability issues were only sporadically and non-systematically addressed in the development projects. Knowledge about the users and their needs was elicited by means of subjective and informal conversations. And only a few of the organizations in the study conducted usability evaluations of their systems/products. A majority of the organizations did not have a specific group of people working with usability.

Since then, things have presumably changed for the better. There are, for instance, an increasing number of education programs and courses in Human Computer Interaction (HCI) on offer at universities and other education organizations. The number of research centers and departments working within the HCI field has increased as well as the number of conferences and specific networks addressing HCI. There is furthermore a rather lively debate concerning usability issues in media. The question is what impact the increasing attention on usability has had on IT development in practice since 1995 [14]. It is our impression that the usability profession has made progress over the last number of years in that it has become more widely recognized in industry, not least owing to the dotcom boom.

LITERATURE REVIEW
There are several surveys of usability professionals and their work, primarily in the US (at the annual conference for the UPA (Usability Professionals Association) and CHI conferences (Human Factors in Computing Systems)). Rauch and Wilson [17] conducted two surveys, among UPA members in 1993 and at CHI ’94, showing that usability professionals had a low profile in the development
process, and that usability was not considered a key quality factor. Vredenburg, et al. [21] conducted a survey of user-centered design practice at the CHI’2000 conference and among UPA members. Their results indicated that things had improved since the mid 90’s. UCD methods were becoming more widely used and gaining impact in industry. They were considered to have improved product usability but to have little impact on product development time. Moreover, informal, low-cost methods, e.g. informal expert reviews, were fairly widely used, but not necessarily ranked high as regards their impact on product development. Field studies and user requirements analysis, on the other hand, were not widely used, but considered having more impact. One interesting finding in their study was the narrow application of UCD methods to user interface related issues only.

Gunther et al. [13] also report about UCD/usability methods and their practical applicability. In their survey, comprising 100 UCD/usability practitioners, usability testing received the highest rating, followed by prototyping and heuristic evaluations. Gunther et al. further report about obstacles to usability, including, resistance to usability, usability unawareness, and time constraints.

In another survey, Rosenbaum et al. [18] identified a number of obstacles to strategic usability including, resource constraints, resistance to UCD/usability, lack of understanding of the usability concept, and lack of trained usability experts. Rosenbaum, et al. also found that informal, low-cost, UCD methods, in particular heuristic evaluations were widely used but ranked less effective than more costly methods.

Given this background, we saw the need to investigate the current situation for usability work in the Swedish software development industry. Our main purpose was to identify obstacles to usability work and based on that to conclude what efforts are needed to make usability activities have a greater impact on IT development in practice.

THE SURVEY
We conducted the survey by means of a web questionnaire posted on the Nita (Nationellt IT-användarcentrum, National IT user centre) website. The questionnaire was open to anyone who was interested and recipients were asked to forward the invitation to other people with a potential interest in the questionnaire. Invitations to fill out the questionnaire were distributed via email to the personal networks of the researchers involved, reaching 412 target respondents. In addition, invitations were published on several email lists, potentially reaching another estimated 2000 individual addresses (Nita; ACM SIGCHI Swedish membership list; IT-Företagens list MailIT). Our objective was to distribute the questionnaire to as many respondents as possible to get as broad a picture as possible.

We cannot comment on sample size or quality. Nor is it possible to analyse loss, since the population is not well defined. Those performing usability work do not have a professional nomenclature but use a plethora of job titles, and have a variety of educational backgrounds and areas of professional activity (usability specialist, usability expert, interaction designer, systems analyst, interface architect etc.). But, based on our quite extensive network within the field, we do not think that we missed any major groups of potential target respondents.

The target respondents were usability professionals and people considering themselves responsible for usability within an organization or for a particular system/product regardless of their title. As an incentive for participation a small number of book gift vouchers were distributed by means of lot-drawing to those respondents who submitted their names and email addresses.

The respondents were promised anonymity. We did not ask the respondents to identify their organization since that might have prevented some of them to disclose certain information that may be negative for the organization.

The questionnaire contained a number of questions on
- The background and experiences (related to usability and HCI) of the respondent
- How much time they spend on usability-related work
- The type of employment, the size and type of organization, and the type of products/systems being produced
- The type of development projects and products/systems they work with and how usability work is funded.
- The software development process used in the organization.
- The usability methods and techniques they use.
- Key factors for successful usability work.

194 people responded.

RESULTS
Respondents' Profile
59% of the respondents were male (N=194, 115 men and 79 women). Their mean age was 38.9 years. On average the respondents had worked 15.1 years in total and 6.71 years with usability work. They had spent, on average, 5.26 years in their current employment.

The majority had a degree in computer science or engineering. The chart below (figure 1) summarizes the background data. A majority of the respondents had a background in engineering or computer science (94) in comparison to design (8) and other non-technical university degrees (36).
To get an idea of how HCI knowledge is disseminated, we also asked where and how they had received training in HCI and usability. Appr 50% of the respondents had attended HCI programs or single HCI courses as part of their formal education. Appr 30% labeled themselves “usability autodidacts” and the remaining 20% had received on-the-job training in usability.

As a proposed indicator of how usability issues are valued in real-life settings we asked about the time spent with usability-related issues. Only 26% of the respondents reported spending all or almost all their work time on usability-related work. 19% spent more than half of their work time on usability. The remaining 55% spent less than half their work time or rarely worked with usability.

Another possible indicator of how usability is valued is the range of job titles, which may help in drawing a map of the usability area. Job titles implicitly describe what the usability professionals do, how they work and how they portray themselves. The respondents were therefore asked to state their job title, which gave a great variety of titles as illustrated in table 1. The table contains only titles that were cited by 3 or more respondents. There were also system analysts, test engineers and operations and maintenance managers as well as an art director a graphics designer and a QA specialist.

A majority of the job titles contained concepts relating to the HCI field. The others were e.g. project manager, system developer, consultant or titles either referring to an academic discipline or relating to the administrative hierarchy within their organization. The HCI related titles typically consist of combinations of two concepts in which the first is usability, user interface, user experience, interaction or web. The second concept relates to;

- educational background; e.g. engineer, developer
- level of expertise, e.g. specialist, expert, or
- the activities they perform, e.g. analyst, specifier, coordinator, strategist.

<table>
<thead>
<tr>
<th>Job title</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usability expert/architect/designer/engineer.</td>
<td>32</td>
</tr>
<tr>
<td>Interaction designer/architect</td>
<td>17</td>
</tr>
<tr>
<td>Owner, manager, supervisory position</td>
<td>17</td>
</tr>
<tr>
<td>IT consultant, consultant</td>
<td>17</td>
</tr>
<tr>
<td>Project managers</td>
<td>15</td>
</tr>
<tr>
<td>PhD students, university teachers, professors</td>
<td>13</td>
</tr>
<tr>
<td>Software/system designer/developer</td>
<td>11</td>
</tr>
<tr>
<td>Web designer/master/editor/etc, info master</td>
<td>8</td>
</tr>
<tr>
<td>Administrator, investigator</td>
<td>7</td>
</tr>
<tr>
<td>System administrator/engine/architect/mgr</td>
<td>6</td>
</tr>
<tr>
<td>Designer/UI designer</td>
<td>5</td>
</tr>
<tr>
<td>IT strategist/employee/engine/investigator</td>
<td>5</td>
</tr>
<tr>
<td>Business analyst/developer</td>
<td>5</td>
</tr>
<tr>
<td>User experience analyst/designer/manager</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 1. The different job titles of the respondents.

Organization and project profiles

On the questions of where, in what kind of organization and with what kind of systems/products and business the respondents work, a majority of the respondents (73%) answered that they were employed in companies or other types of organizations, e.g. authorities. 18% were self-employed and/or hired as a consultant for a company or an authority. 9% were university employees.

Since we were primarily interested in practitioners, university employees were asked to omit the questions about the organization and projects. Figure 2 shows the size of the organization where the respondents were employed.

Figure 2. The size of the company or organization.

Regarding the type of systems/products a majority of the respondents answered that they were involved in developing bespoke software (55%). Consumer products accounted for 16% (14% software and 2% hardware). 16% worked with standard systems and 13% had checked Other or Don’t know.
Table 2. The type of business.

Table 2 shows the type of business. “Other” included, for instance, biotechnology, consultants, defense industry, transportation services and entertainment industry.

The development projects were typically staffed by internal staff (60%), 9% worked in projects staffed by external consultants. Another 9% worked on their own. And 22% said that their projects were a mixture of both internal staff and external consultants, and/or that it varied with the different projects. A few respondents did not work in projects at all. A majority of the respondents (52%) worked in one or a few projects at a time. 37% worked in several parallel projects and 10% worked in the line organization.

Usability work was either funded on a bill-back by project basis (appr 98 resp) or by means of an annual budget (appr 75 resp). Other, but less common types of funding were government funding (appr 19), part of R&D budget (appr 15), part of marketing budget (appr 10) or funded via research foundations (appr 10). The respondents could check more than one option, which means that their work may be funded by a combination of two or more of the above options.

Software Development Processes

The predominant software development models were Rational Unified Process™ (RUP) or some internal development model. Table 3 summarizes the software development models used.

Table 3. The software development process used.

Several respondents checked the Other box, but answered that they used either an internal model, or a variant of the RUP or eXtreme Programming™ (XP). Other respondents answered that they use whatever software development model the client uses, or that they do not use any software development model at all:

“None – just “finger in the air”.

About 50% of the respondents answered that the software development model worked very well or fairly well (i.e. in general terms). Another 24% were neither in favor of or adverse to the development model whereas 26% put down “Fairly poorly” or “Very poorly”. The RUP received more comments than the other development models, including internal models. The comments ranged from fairly positive about the RUP to quite negative, where the negative comments primarily concerned the complexity and inflexibility of the process.

“The RUP does not feel complete from a usability perspective. The RUP is complex and (too) much of the project time is required for learning and complying with every detail of the process. Therefore we often make shortcuts, of which some are less successful. Processes are subject to fashion and replaced too often.”

Overall the respondents see the benefits of having their work controlled by some sort of process.

“I think that the RUP has facilitated my work, particularly in making my role in the project clearer.”

However, there are risks involved in having rigid role descriptions.

“The RUP role User Interface Designer is far from ideal for usability work with far too much computer design prototyping and too little user contact and usability evaluation.”

---

1 The table contains only the types of business that were cited by 10 respondents or more.

2 PROPS is not so much a software development model as a project management model.
One recurring comment was that the development process used does not in itself contain any support for usability activities, or user-centered design.

“[…]the usability perspective, which is SEVERELY neglected.”

There seems to be general agreement that the systems development models must be complemented to address usability and interaction design.

“We’re working on developing our own complement to the RUP, since the usability part is missing“.

Eight respondents reported using a complementary usability plug-in to the RUP. Another 20 used an internally developed model for addressing usability issues in their software development.

All in all, the systems development models raised a number of questions and comments both positive and negative:

“Not that interesting. […] Models fail sooner or later and then there are only people left”.

Usability Methods
When asked about what methods they use for addressing usability, they answered as follows:

• **Plug-ins** – 29 respondents reported using plug-ins to the existing systems development process.

• **General frameworks** – 18 respondents based their usability work on general frameworks, such as, ISO 13407 or user-centered systems design as described in [1 or 12]. Eight respondents reported basing their usability model on user involvement.

• **Generic HCI methods** – such as, user studies, user tests, and field tests. (A total of 16 respondents.)

• **Process-oriented methods** – 11 respondents use methods that cover some parts or several parts of the development process, for instance, contextual design [2], goal-directed design and personas [8] or the Delta method [5].

• **Heuristic methods** – such as basing design decisions on guidelines provided by Nielsen [16], or web accessibility initiative WAI [20]. (5 respondents).

• **No model** – 28 respondents did not use any usability model at all.

“We used to do it, but the area is being somewhat neglected at the moment. Often, it is the functionality that counts, the human being has to adapt to the system, unfortunately. (price/time/cost/usability – pick 2).”

User involvement
Users are involved to some extent in most phases of the software development process. Figure 3 shows how many respondents involved users in the software development on a per phase basis. Note, that this does not mean that users are continuously involved, only that they are involved at some point in time during that phase.

![User involvement in SW development](image)

**Figure 3. User involvement in the different phases of the software development process.**

The comments on user involvement indicate that a majority of the respondents are not happy with the extent to which users are involved in the software development process. 62% of the respondents answered in ways that indicate that they, in their opinion, do not spend enough time with users, as commented:

“Too little during the development process.”

The rest reported spending a fair amount of time with users, using terms such as “once or several times a week” or “continuous cooperation”. Some 70 respondents commented on how and when users are involved. About 20 of these reported that user involvement varies a great deal between projects. Another 14 reported continuous involvement. 7 reported involving users primarily during the early phases, i.e. analysis and requirements capture, whereas 2 involved users primarily during design, and 3 reported user involvement primarily during or after acceptance test and introduction. 8 respondents reported involving other people than users, e.g. test staff or “internal application specialists” or no users at all. One of the respondents commented as follows:

“To me, user involvement is very important. But unfortunately, the company and the IT manager do not see things in the same light. Instead, they want to develop the system first, and then involve the users. Completely wrong approach, if you ask me!”
Rating of methods and techniques

The usability professionals use a large number of methods and techniques. We asked the respondents to rate the methods and techniques they use or have used. Figure 4 summarizes the answers. Adding “very good” and “fairly good”, the “top five” methods/techniques are 1) think-aloud, 2) lo-fi, prototyping, 3) interviews, 4) field studies and 5) scenarios. The bottom five are (counted from the bottom and up) 1) benchmarking, 2) check lists, 3) personas, 4) style guides and 5) questionnaires. Some respondents commented that the appropriateness and usability of a particular method varies with the situation.

Organizational matters

Finally, we asked the respondents some questions about their responsibilities and what factors are important for usability work to be successful. A large fraction of the respondents answered that they are responsible for details in the GUI and in the functionality of the system, as well as usability and functionality on a product level. A majority of the respondents were also responsible for general usability guidelines in their organization (see figure 5).

We did, however, get a fair number of comments regarding the areas of responsibility and corresponding powers that provide a slightly different picture. Fourteen respondents answered that their responsibilities vary quite a lot depending on the project and the system. Seven respondents said that responsibility is vague and not formalized.

“Responsibilities are very often vague.”

Another four said that the responsibility is shared between several different parties, for instance, software developers, client and usability professional. Four respondents were project managers and had the overall responsibility for the product/system. Three respondents said that they conduct evaluations only.

Figure 4. Rating of the methods and techniques.

Figure 5. Areas of responsibility.
Figure 6. The importance of some key factors for usability.

**Key factors**

Figure 6 shows the rating of a number of factors regarding their importance for usability work. Adding “Very important” and “Fairly important”, the top five key factors are 1) that usability is part of the project plan from the start, 2) support from project management, 3) support from management, 4) support from users and 5) acceptance from the software developers. The two least important factors were that usability does not incur any costs for the project and formal usability competence. Support from management and/or project management received a number of comments, for instance:

“Above all, it is important that the support that I perceive from management, is communicated to the software developers so that they do not have to doubt the importance of usability work, and above all, that it is a part of their work.”

Other comments pointed to the importance of “usability awareness” or to attitudes towards usability in general, e.g.

“... The main thing is that everyone in the project group and the steering group agree on the importance of usability work.”

**DISCUSSION**

The usability in interactive systems/products must be improved. There is a large number of reports describing problems that users face when using information technology (see for instance [6, 9, 19]. The potential of making/saving money as well as increasing the well-being and satisfaction of the users is significant. Recent research on usability and user-centred design has contributed to improving the situation to some extent, but there remains a lot to be done.

This survey aims to draw a preliminary map of the current state of usability competence in Sweden – i.e. where it’s at and how usability work is performed. We do not propose to provide a complete picture since the reliability cannot be commented given the heterogeneity of the usability population. We do, however, not see any reason to question the validity of the results.

**The usability profession – where it’s at**

We believe that there are some results that are worthwhile discussing. For instance, the fact that despite over 30 years of usability-oriented research and practice in Scandinavia – since the advent of participatory design – there are still as many as 30% of the respondents working with usability, that consider themselves autodidacts. This implies that the impact of cooperative and participatory design approaches (often referred to as the Scandinavian tradition [11, 4]) has
been limited to the research community. However, the general attitude towards more user involvement and user-centred design has changed.

There are another 20% who answered that they had obtained their knowledge from on-the-job-training. This implies that only half of the workforce working with usability matters have attended an HCI course during their education, or have attended an HCI education program. Developing new education programs is a time-consuming process and the people that have a specific HCI-related education (cognitive science students, interaction design students and engineers and computer science students with HCI profiles) have just about reached the labour market.

In addition, the results showed that more than half (appr 54%) of the respondents had a computer science or engineering background. The respondents also had fairly long professional experience though significantly shorter experience with usability-related work. This may indicate that many of the respondents have worked as software developers, before they started working with usability-related issues. Does that mean that usability is often the responsibility of a former software developer or someone who is still working as a developer, doing usability in addition to his/her ordinary work? It is sometimes argued that programming is such an engrossing activity that software developers are virtually unable to focus on the users’ needs (see, for instance, [8]). Thus, there may be a risk that the software developer-cum-usability worker will run into problems with conflicting goals and focus.

Our results further indicate that although the usability “worker” faces a multitude of obstacles and problems, there are also important factors that facilitate usability work. The main problem seems to be that the priority of usability issues is fairly low. The main keys to successful usability work, on the other hand, are said to be skillful management and support for usability matters from the project manager, management and the users. These results are partly in line with, for instance [13, 17 and 18].

Processes and methods

There seems to be a general agreement on the necessity of integrating usability into the software development process. Some of the respondents, for instance, expressed disappointment with the RUP (the most commonly used development process in Sweden) saying that it is complex and cumbersome to use, and does not contain any support for usability. Many of the respondents reported having started to integrate usability roles, methods and activities into the development process.

“We have added usability as a specific discipline which has clarified and facilitated our work. In doing so we have also adapted the RUP to our work and decreased it’s complexity”

This means that even though the process does not in itself contain support for usability, the respondents have integrated usability activities into it rather than introduced another process. This may imply that the process and, hence, those in charge of the process (e.g. process owners) wield great power within the development organizations.

Regarding usability methods, the methods that received the highest ratings were those involving users, being comparatively informal, and being concerned with design issues. Methods such as expert-based evaluations, benchmarking and questionnaires, that do not involve users, received the lowest rankings. This implies that the user-centered perspective emphasizing the importance of involving the users as active participants, has made progress among the usability practitioners in Sweden. Earlier studies [21] show, for instance, that heuristic evaluations [16] have been extensively applied, due to their simplicity and low cost. Our results, on the contrary, indicate a preference for methods that actively involve users. We believe these results are promising since discount usability methods have been criticized for their lack of quality in the results [7, 15].

Management support

One of the main key factors is the need for support from management in the organization and in the project in order to be successful in implementing user-centered design. The three success factors that received the highest ratings were support from the project management, support from the management of the organization and usability being part of the project plan from the beginning. Several of the respondents also mentioned that the responsibilities and expectations of their respective roles were unclear. These are issues relating to management, which implies that managers are the most important category of people for creating action space for the usability professionals. Contrary to our expectations, cost factors were not considered important for the success of usability work.

Impact on education

The low priority of usability and the impact of an overall support for it call for a raised awareness of the importance of usability in software development. The education of system developers and programmers should emphasise the importance of usability, and promote a focus on usability in the actual development of software, as well as in defining processes for developing software.

It is, however, not enough to introduce HCI in education only. The awareness has to be raised on several levels at the same time. All parties involved in the development of interactive technology, e.g. stakeholders, managers, users, etc. need to acquire a minimum level of awareness about HCI and usability.

To sum it up

Comparing our results with those of Katzeff & Svärd [14] from 1995 we can see that major changes have taken place. Back then, the main problem was the dissemination of HCI
knowledge to the industry and the application of it in practice. Even though we are still waiting for truly usable interactive technology to emerge, it seems that there is no longer a lack of HCI knowledge within the industry. The main problems and obstacles seem to be a lack of respect and support for usability issues and the professionals working with it, particularly from management but also from other stakeholders involved in the process. We propose the below efforts and activities as some steps towards improving the situation:

- Increasing the knowledge about HCI and usability among all stakeholders involved in IT development.
- Increasing the explicit support for usability activities and roles in the systems development processes.
- Raising the awareness among management about their importance as supporters of usability activities and as a driving force behind the change process (for example by including support for usability work in their overall strategy and by providing enough resources for usability professionals and their activities).
- By emphasizing the importance of the users and buyers of software demanding usability and not accepting IT systems/products with severe usability problems.

ACKNOWLEDGMENTS
This work was performed partly with funding from the Swedish Council for Working Life and Social Research (FAS). The authors wish to thank all respondents of the questionnaire.

REFERENCES
8. Cooper, A. The Inmates are Running the Asylum. SAMS, Indianapolis, Indiana, the US, 1999.
20. Web Accessibility Initiative (WAI). http://www.w3.org/WAI/