How usability practitioners can get their suggestions implemented in industrial software design

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ABSTRACT

This paper describes barriers that make it difficult for usability practitioners to get improvements implemented in interfaces, and it describes how work with usability and HCI best is fitted into product planning and software development. It is based on experiences from eleven years of practical usability work with 27 different projects including the development of mobile phones, professional electronic equipment, large professional systems and web sites and web-based applications.

Categories and Subject Descriptors

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms

Design, Economics, Human Factors

Keywords

Industrial software development, marketing, system design

1. Introduction

HCI and usability professionals have described the value of usability in numerous interviews and popular articles and in a number of books. However, it appears that these efforts have not led to the desired result: It is still common that managers of software projects do not include any user studies, usability tests or evaluations when they plan a project. Therefore it is worth investigating what the actual problems are and how they can be solved.

2. Method

This paper is based on my own experiences from eleven years of work with interface design and usability in two large companies (1987-1992 and 1996-2002). My work included field studies, interface design, coaching of interface programmers and usability tests. I worked on interfaces for professional electronic equipment, mobile phones, large software systems and web-sites and web-based applications. I have worked on at least 27 different projects, and I have worked with 19 different organizational units (7 development groups, 3 marketing groups, 4 sales groups and 5 internal support groups). To support my memories about the projects I have used notes where I had listed projects I worked on and activities I had done in each project.

The method used in this paper is close to the ideal anthropological study where the researcher is a castaway (shipwrecked) in foreign culture, forced to learn about it in order to survive, and in such a position that his or her presence as an observer does not influence the events [3]. Compared to interviews and brief observations, this method gives an understanding of a foreign culture (in this case that of industrial software development) that is deeper and more diverse.

3. It was difficult to get interaction improvements implemented.

In both companies a substantial part of all projects were done without any planned or professional usability work. In more than one third of the projects where I did usability work, my work did not result in any perceptible improvements of the interaction. See table 1. This is a high failure rate; in particular when taking into account that most of my work consisted of using well-defined methods to produce information that was requested by managers of the organizational units.

4. The value of usability and HCI was in general accepted

My lack of impact was in spite of a general positive attitude towards usability. The first company had a culture with a strong customer- and user-focus. In the second company I gave

Table 1: Distribution of results of usability projects analyzed in this paper

	Dev (eng.) group	Marke-ting group	Sales group	Int. support group
Very successful interaction implemented		1	1	
Perceptible improved interaction implemented	4	3	2	5
None or only insignificant improvements implemented	6	1	1	1
Usability work not completed	2			

lectures and briefings, and I felt my effort was supported. It appeared that most people, including managers and software developers, had been annoyed by usability problems.

In both companies sales managers and product managers, a marketing function, had to keep institutional customers as satisfied as possible, which included that they had to solve or smooth out any usability problems reported by customers.

Software developers in both companies often wanted to discuss their own theories about what might cause usability problems, and they expressed an interest in usability that seemed related to the widespread and common fascination with psychology and human thinking. I did not experience the hostility against usability that is reported by Cooper [1].

5. Other factors are often more important than usability

I experienced three web projects with fixed completion dates and tight schedules, but with only very general requirements, and where the project plans did not include any studies of the users' needs or any usability tests. I later did usability tests on two of the developed web sites, when a number of users had complained that it was difficult to use them (and my tests revealed significant problems).

However, from an organizational point of view the priorities made sense. If the management had opened for discussions and not set a fixed completion date, the projects might have dragged on for a long period and possibly never been completed. The project group knew at the same time that they only would get the assignment, if they agreed to a tight time schedule. If you believe that almost anything is better than nothing, it makes sense not to spend time on usability work.

I worked on a number of version 1 projects: Projects to develop software with new and valuable functionality that was not available from any competitors. In such cases the highest priority was to get a software without technical problems out as fast as possible. It is known in marketing and sales that customers will buy such software because they need the functions, almost no matter how bad the usability is.

I experienced in both companies how a core concept in product planning was the product live cycle [2] and the so-called window of opportunity: The time from you launch a product until you must cancel it, because it cannot compete with new and better products. The return on the money invested in the development depends on the length of the window, such that managers must avoid any usability work that may delay the release of a product.

I saw a number of cases where customers focused more on price or style than on usability. In two cases customers even preferred less usable but more stylish versions of a product. More usable products had probably resulted in lower sales.

I found that usability was considered important for the success of a product, when:

- The product was bought by organizational customers who demanded a certain level of usability. Such customers could demand modifications or threaten with legal action if they found that the usability was unsatisfactory.
- There were a number of competing products that offered the same functionality, and there was a public discussion of the usefulness of different products. I experienced that was the case for mobile phones (as it is for professional digital cameras and for software for web or graphical design).

Even though a higher level of usability may be valuable for the society in general, it is sometimes more advantageous for the developing organization to get something out fast; in some cases an increased focus on usability may even reduce the sales and the company's profits.

6. It is organizationally difficult to implement suggested improvements

I was surprised and frustrated by the many cases where I did usability tests or studies, and where almost none of the identified improvements were implemented.

In a number of cases, improvements to the interface required changes to the requirements that already were agreed with the customer, which meant that an implementation of the improvements required a new negotiation of the contract. That was difficult and increased the uncertainty of the project, so both project management and customers wanted to avoid it.

I was sometimes asked to test an interface that was under development. However, it is only possible to test an interface when the development of it is almost finished, and at that point there was only time to make minimal changes, for instance to change the wording of a text that users did not understand.

A similar problem occurred in some cases when I was asked to do a usability test when a project was finished. The project group agreed that the results seemed reasonable and that some changes should be done to the interface. However, it was not possible to get funding for a second project, which should correct the errors made in the first one.

All software projects I experienced was based on a platform or basic application, they were not developed from scratch. The selection of a platform was a high-level decision, it appeared to be based on an evaluation of the company who delivered it, the price of the software license, and the technical functionality offered. I did not observe any cases where possible usability problems were evaluated before a platform was selected, and even if there was a realistic choice between two or more platforms, it is likely that each came with a number of built-in usability problems.

Often problems identified in a usability test could only be fully solved by making changes in the platform or basic application. Even if it was possible to suggest such changes, and even if the suggestions were accepted, they could not be implemented before the project was finished and the result released.

Ironically, I have several times met usability professionals who worked on platform or basic application software, and who complained that it was almost impossible for them to do user studies, because their company had no direct contact with end-customers or end-users.

7. The position in the organization is crucial

When I analyze my results, it is clear that my success rate was strongly influenced by where I was situated in the organization. See table 1. I will therefore describe the advantages and disadvantages of being situated at different positions.

7.1 A separate usability unit is isolated.

In a period of almost three years I worked in an internal consultancy department in the second company; in essence I ran my own dedicated usability group. I experienced that such an organizational position made usability work more difficult:

- In a cost-center structure, which today is common in companies, usability work done by a separate department is a visible and additional cost for the group who requests it. This makes it more difficult to initiate new usability projects.
- It is difficult to get information about new projects. I spend a substantial amount of time trying to trace down coming projects, and in spite of that I frequently only got involved after the point where my results had been most valuable.

However, I found that a separate usability department or group is necessary when the organization consists of a number of small product groups. It is then not feasible for each group to employ their own usability specialist.

7.2 It is difficult to get improvements implemented in a development group

My experience is that the methods and priorities of software development make it difficult to do usability work as part of a development group.

I observed how industrial software development is focused on delivering software that fulfils a set of defined goals before a specific time and below a certain cost. This means that any sensible project manager will try to reduce the complexity and uncertainty and thereby the risk of not meeting the goals. In contrast, user studies or usability tests introduce new information, which in itself increases the complexity of the software development; it suggests that some of the design goals shall be changed and may even suggest that some completed work is modified, increasing the uncertainty and risk of the software development.

As described earlier, the situation is even more difficult, when the proposed changes only can be done after negotiations with the customer and changes to the agreed requirements.

The consequences were that my work in development departments in general only resulted in minor improvements. In particular it was never possible to change the structure of an application, even when it was well documented that the structure created usability problems.

In contrast, I found it very valuable when interface programmers wanted an informal review of their ongoing work. We would then discuss possible problems in the interaction in details, and I observed how a number of possible usability problems could be identified and solved during the design process.

7.3 Marketing and usability speak the same language

When I started working with usability and interface design in the first company it was as product manager in a marketing department. In the second company I did some of my most valuable work in or together with marketing departments.

I found that doing usability work in a marketing department offered several advantages:

- I was part of the group that made the decisions. I found that the easiest and most effective way of ensuring a sufficient level of usability was to get it defined as precisely as possible in the requirements for a new product (including how the level of usability should be tested).
- There was enough time to do usability work. It was possible to do a usability test of the last version of a product and to discuss what should be changed in the next one, and it was possible to do user studies as an ongoing process without being restricted by the schedules of different development projects. That was in particular necessary when the software consisted of components that were developed partly in parallel and combined in different ways to products, which were launched at brief intervals.
- Whereas computer science has a mathematical and technical background, both marketing and usability have adapted methods from psychology and anthropology; both use personas, scenarios, prototypes and interviews. I found it easy to discuss with marketing people, and I found that our work fitted well together. (The main difference was that I focused more on ease of use, whereas they focused more on the user experience.)

However, I found that it was essential that software designers, hardware designers and other relevant developers participated in the group that defined new products. They often had a detailed knowledge about earlier products, and without them it was not possible to take all technical limitations into account.

I also found that it was important that there was an ongoing informal dialogue between marketing and usability people and the individual developers. Without such a contact details were often misunderstood or implemented in a less than optimal manner.

7.4 Sales groups focus on users

As earlier described, design details were often described in a requirement specification that was agreed with the customer. At one time I discussed with a sales group whether it was possible to do user studies before a proposal was made to a customer. They agreed that it was highly advantageous to know the needs and possible situations of use before a proposal or an agreement was made, but were hesitant because user studies at that stage might create legal problems in relation to the current rules for bids and proposals.

It was the task of a sales group to ensure a successful delivery to the customer. The sales group ran a delivery project, which might include training of customer staff, installation, configuration of each system, production of manuals and user guides and necessary technical support.

Each delivery project had its own budget; it was a profit as well as a cost-center, which made it easier to get money allocated to usability work.

I found that it was possible to improve the usability substantially during several delivery projects. Even when it only was possible to make minor changes to the interface, it was possible to make it easier for users to cope with it.

7.5 Internal support groups can be pressured

My analysis shows that the work I did for internal support groups was fairly successful:

- I was mostly asked to do usability work when a group felt they had a problem and that some changes had to be done.
- Users who complained were often supported by their managers and even by the top management. Even though they were forced to use the corporate systems, they had a certain amount of power.

8. The choice of methods does not influence the number of implemented improvements

When I started to write this article I thought about the occasions where I had discussed with a project manager whether a particular change should be made or whether a particular problem should be regarded as a minor or a major error. In such situations I frequently felt that I needed better arguments and more theories that I could use to substantiate my views.

However, when I went through the 27 projects analyzed in this paper, I found that that there was no relation between the quality of my arguments and how well they were accepted. In fact, the two situations where I was unable to finish my usability work were among those where I had the strongest arguments.

When managers or members in a project group thought it was possible to implement my results, they would accept them almost immediately and only discuss details. They would not discuss the methods, theories or observations my results were based on.

One reason was that my suggestions often were seen as common sense. I found that usability problems often appear to be obvious when someone has pointed them out. When I described how a menu-text could be misunderstood, it was rarely discussed whether it would be misunderstood.

In some cases where it was difficult to implement changes managers would also accept my results immediately, but the changes would not be implemented.

It was only in some of the cases with serious problems that it was almost impossible to solve, that managers and project managers asked in details about the methods and theories I had used to reach my results. In such cases I could not succeed, no matter how good my arguments were; The persons I discussed with were searching for something they could use to reject my results.

9. Discussion and conclusion

This paper is based on what I remember (with support from my notes). The projects were done at different times, they included different activities and were done in different organizational units, which make it easy for me to distinguish them. Daniel L. Shachter describes how the general outline or meaning of events tend to be remembered [4], such that my memory about the discussions in and relative success of each project should be fairly precise (even though I cannot remember all usability problems encountered in each project).

The usability work described in this paper was done in two leading software companies, and my own qualifications for doing it was above average. It is likely that other usability practitioners find it more difficult to influence software development and the design of interfaces.

The problems I encountered were in spite of a widespread interest in and acceptance of usability. It is therefore unlikely that a general promotion of usability will lead to a higher proportion of projects where usability work influences the design of interfaces.

It appears that better usability methods do not give usability practitioners more influence. (Even though the introduction of better methods can improve the value of the changes they suggest.)

I found that decision-makers that refused to implement the results of usability work in their interfaces in general had reasons that were rational and sensible considering the actual situation and their role in the organization.

Usability is only one of a number of aspects of a product, and often it is not the most important. It is even likely that some companies do usability work not because it can be justified by its value for the company, but because it is regarded as fashionable or good practice.

The goal of a development group is to deliver a product that fulfils a set of defined goals within a certain time and below certain costs. Usability work is then often seen as something that may delay the project and increase the complexity and risk of the project. In contrast, usability work done in parallel with contract negotiations in a sales organization or during the product planning in a marketing organization, can ensure that the goals of the project fits the needs of the users.

It is today common that software or web companies create new products by combining different components that are developed in parallel and more or less continuously. It is then not feasible to do usability work as an integrated part of different development projects: It must be done as a continuous process in close collaboration with marketing.

My experiences suggest that there are two ways in which usability practitioners can achieve more influence:

- Realize that usability work in some cases cannot add substantial value, and avoid spending any effort on them.
- Learn about marketing and organization and get into a position where it is possible to influence the planning of new products at as early a stage as possible.

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11. Literature

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