

# Interaction Design as Experienced by Practitioners

In this paper the questions 'what is interaction design' and 'what does interaction design mean to interaction designers', are posed. We both look at the way people from within university/academia discuss interaction design as well as how people who label themselves interaction designers understand the area and describe their own practice. The empirical material presented is based on an interview study and a series of workshops. In the data three perspectives on interaction design emerged. This study illuminates that people who label themselves interaction designers assume a more holistic view on their endeavour for making interactive systems usable, they also describe their practice as being more progressive- and design oriented rather than construction- or usability oriented. In their work, respondents report on having acted almost as if they were project leaders, having an insight into the whole design process. Interaction designers build a repertoire of solutions and methods are reused.

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## INTRODUCTION

The progressiveness of design has struck the computer interface and is contributing with design practice and design theory. This is a challenge to the established field of Human-Computer Interaction (HCI), having had a more defensive approach towards the concept of design. Often this has meant that HCI has leant on evaluations of interfaces or the design in close cooperation to and according to users' wishes. To some extent HCI has been driven either by an engineering perspective or a psychology oriented perspective and thus to a larger extent having valued measurable progress than creativity. The challenging field has been labelled Interaction Design. But is there a difference between interaction design and user centred design or is it just two different words for the same thing? Marion [22] posed the questions 'What is interaction design' and 'What does it mean to information designers'. We pose the questions 'What is interaction design' and 'What does it mean to interaction designers'?

In order to answer these questions we both look at the way people from within academia discuss interaction design as well as how people who label themselves interaction designers understand the area and describe their own practice.

The literature does not present a unified account regarding the relations between HCI and interaction design. In the HCI-text book labelled 'Interaction design' by Preece, Rogers and Sharp [24] the term interaction design is emphasized, and to some extent challenging the more traditional notions of Human-Computer Interaction and User Centred Design. The main challenge is to focus on design rather than presenting a radically different perspective for how to design interactive systems. Much of the book 'Interaction design' withhold a more traditional view of usability and user centred design focusing on the design of interfaces and involving the user in the design work. In Winograd [29] the author views the aim of interaction design to be a new way of thinking of interactive systems, to design interaction with and through computer-based systems. HCI is through the use of approved scientific methodologies focusing on analysing, comparing and evaluating current system designs while interaction design is focusing on creating something that is sound from a use point of view (by mending different stakeholders goals). Arvola [4] is elegantly following such a path and defines the object of interaction design to be "the interaction with, through and by means of the interactive system" (p.23). The focus is slightly directed towards how the reflective designer works rather than the user, and also from interfaces to activities. Is the concept interaction design a sign on a

development of the engineering tradition more than a new way of working and thinking?

There seems to be at least two different traditions grounding how interaction design is perceived, a traditional system engineering perspective and a theoretically driven design perspective with architectural design and industrial design as its base. In Löwgren [17] engineering design and creative design is discussed. Engineering design focuses on a comprehensively and precisely described problem to be solved. The mission of engineering design is to find a solution to the problem. The creative design is rather oriented towards working with parallel suggestions to a problem with a designer that is reflectively making conscious design proposals and is allowed to be inspired from different parties and take own design decisions. The designer might even question and critique the described problem.

Lundeqvists [15] presents developmental phases design disciplines go through. The first phase is a problem-solving phase where problems are broken down into smaller and easier bits to handle. To measure usability criteria, or, to perform a heuristic evaluation can be activities performed during this phase. The second phase looks upon the development of products as an integration of problems and solutions that are reciprocal actions throughout the process. Here the focus is on the needs of the users, requirements and ideas and see the designer as a pedagogical leader. In the third phase the focus is on the design. Here design is explored and the skills and knowledge that a designer is expected to have are described. The designer is in the centre of the process of creating and has a large freedom in choosing theories and scientific methods the designer think are best suited. The main aspect is that the designer uses design competence that is reached through training and experience from other specific designs and design projects.

In Atwood, McCain and Williams [5] a design taxonomy based on an author co-citation analysis is presented. The review was made on citations in the literature during 1990-2000. Their results are that *"the design community sees "/" seven clusters of ideas within the global topic of design"* (ibid, p.130). The authors further state that there is no central focus that holds the design community together and that some view design as strongly focusing on people, some build theories and some build successful systems. The seven clusters found are: cooperative and participatory design (focus on the need for designers and users to work together, design in use is focused), user-centred design (the common aspect in this cluster is the balanced focus on users and their tasks), cognitive engineering (focus on cognitive properties and on how these properties determine how people interact with systems in some environment), design rationale (here design is viewed as a process of argumentation and focus on the communication that supports design), design complexity (ways to help designers manage the complexity of a design

problem), design taxonomists (this cluster has in common the collection of different views into a single source), design theorists (approach design and designers from a theoretical level and do not deal extensively with concrete applications of those theories). Interaction design as presented by [4, 16, 26] would probably be akin to the latter category.

### **HCI and Design - Design and HCI**

Since the year 2000 design has been a topic more and more in focus in the HCI area. What Atwood et al. [5] pointed out about publications was true then but now new areas can be added. Examples of doctoral theses, articles and books that have been written on the topic of interaction design and that have been published since 2000 are: [4, 8, 9, 13, 16, 21, 24]. A more extensive search would easily make this list longer.

In Preece et al. [24] interaction design a topic is presented in the centre. It is fed by other disciplines (e.g. psychology, informatics, computer science) and design practices (e.g. graphic design, product design and film industry). Interaction design is described as having a mutual offer with e.g. information systems, HCI, cognitive engineering and human factors.

This is supported in Fällman [8] where the author reflects on design and HCI and states that design should not be thought of as being on a continuum between science and art but rather considered essentially as a tradition guiding action and thought which span across many disciplines of which HCI is only one. The process of interaction design is described as identifying needs and to collect requirements, to develop alternative designs that meet these requirements, to build interactive versions of the design solutions so they can be communicated and judged. This can be viewed as an HCI perspective to interaction design where the involved parties are interaction designers, usability designers, graphical design, information architects and experience designers.

Fällman [8] describes design oriented HCI as three accounts. The first is the conservative account (i.e. traditional HCI focusing on a problem to be solved). Here the designer is viewed as an engineer or a scientist who works in a process with structured methods in an impersonal and rational manner. The second is the romantic account in which the designer is seen as a creative genius. Here the design process is guided by the designers' values and taste. And the third is the pragmatic account where design is about being engaged directly in a specific design situation. Design takes the form of a hermeneutic process of interpretation and creation of meaning and it is a reflective conversation with the design materials of the design situation [26]. Thus the taxonomy presented in Fällman [8] is guided by a shift of perspective regarding the role of the designer, much in line with shifts of perspectives that have occurred within cognitive science [30]. I.e. that it is not only practice that is changed but also an analytical understanding of how to view the designers work.

Design can be viewed as a process of unfolding the setting/problem solving pair and here, according to Fällman [8] it makes sense to see the designer as being involved in a conversation, a dialogue, rather than in a structured, linear process. Fällman [8] describes the designer as an engaged and embodied actor who stands in a dialectical relationship with the design material and design situation, rather than a rational problem solver. The activity is directed towards understanding, re-framing, the design gap in new ways, rather than finding a solution to a given problem. But then how are designers dealing with this more open-ended and creative design gap?

### **Representations, communication, imagination**

How does a designer work and how are ideas and design suggestions at various stages in the design process communicated to others? Sketches and different kinds of prototypes are frequently used representations and tools for testing, evaluating and communicating ideas and concepts within HCI. It has been suggested that sketching in HCI differs from sketching in other areas since this domain deals with interactivity, temporal aspects, tangibility, immersion, sound and haptics [8]. In interaction design, sketching has been ascribed an important role to handle the dual nature of a digital material that is equally spatial and temporal [18, 19]. Pen and paper sketching is where the design process nearly always starts. These static sketches grow into storyboards when temporal aspects start to take shape. Hand-drawn storyboards and sketches are versatile: any use situation, and physical environment can be expressed as long as you can draw it. Three more particular functions of sketches are presented by [20]; 1) to form ideas, (to stimulate creativity, i.e. to see new possibilities and combinations), and a way to structure thoughts, 2) an instrument that enables the designer to communicate with her-/himself, to enable seeing and inspecting own thoughts more readily at hand, they supply with something to react and reflect upon, and 3) they serve as a tool to communicate with others, it enables taking the next step based on something that exists.

Sketching as the process by which the designer works on her design idea has been proposed to serve several purposes. It serves the purpose of understanding the design problem and what it requires, it enables exploring its particular circumstances and problems that must be tackled, and to experiment with different approaches to a solution and eventually to work out the final design [9]. In this view and also in the view presented by Löwgren and Stolterman [20] above, sketching is regarded as an important instrument or a technique that the individual designer needs to learn and practice upon. Sketching, drawing, i.e. representing design ideas and learning to represent ideas have even been found to be crucial to the design process and also to development of design ability [20].

Sketching has further been ascribed the role of reflecting the way designers think rather than merely looking upon it as useful tools and techniques available to designers [8]. This view on

the role of sketching is also pointed out by Löwgren and Stolterman [20] *“we can not analyse a problem first and then solve it via design. Already during the first contacts with the mission a vision for the solution is formed”* (ibid., p.63). Solution and problem go hand in hand during the process and over iterations. In the authors’ perspective of design, it is a dialogue with the situation and as an experiment where designers have to be good listeners. Such material as sketches and drafts can be regarded as external representations of the first ideas to a design that is in the thoughts of a designer. Many designers start to sketch in the same situation as they start to think on a design situation. Sketches do not necessarily follow a plan or a method. In most cases the sketching is about getting enough material to work with, or a way of shaping new ideas.

In Nelson and Stolterman [23] the design process is described as having two major ingredients, imagination and communication. According to the authors, every design communication phase begins by triggering of design imagination within each individual designer. An image is formed based on a creative imaginative idea and this is a type of skill that can be practiced and trained. However, the designer also needs to be able to communicate that image. Thus, every designer is demanded to conceptualize and give form to ideas so that these can be communicated and understood by others involved in the design process. Representing design ideas thus serve several purposes to the individual designer in terms of e.g. reaching an understanding of the design problem, getting enough material to work with, providing with something to communicate with others. Although we agree with Nelson and Stolterman [23] in their stating that sketches and other visual representations are important but far from sufficient in design communication, sketches provide with something to talk about. The need to propose, discuss and evaluate different ideas, design proposals, etc. is crucial to the practice and learning of design. Especially, in the conceptual stages of design, negotiations between different designers (system architecture, database, interaction design) are important. The importance of talking, evaluating, and critiquing ideas, sketches and of keeping an imaginative and creative stance in envisioning a future situation of use (and training of this) has been argued for elsewhere [25, 27, 28].

### **The professionals’ role**

In Nelson and Stolterman [23] it is stated *“Design has always been, and will continue to be collaborative at its core; even if that collaboration only includes one designer and one client. Design activities are typically carried out in groups, with roles involved in complex relationships. Still, the bearer of cultural norms, and the source of design imagination and agency, will always be the individual”* (p.290). This view on design on the one hand highlights the importance of collaboration in design and that design is not an individual process and at the same time places the creative or imaginative characteristics of design and the design

process on the individual. For sure, the design process consists of both collaborative and individual work but placing characteristics such as creativity and imagination on the individual is giving witness to a very individualistic perspective on such processes. Another view regarding the origin of these characteristics is that these can be found in the dynamic transaction among the individual, the physical environment and the socio-cultural context. In this view these characteristics are part of the individual-environment transaction and as such an opportunity that is available to all, but may be actualized more often by some [6]. The environment of course includes artefacts as well as other people, for instance in collaborative design situations [27].

However, the role of the interaction designer includes contemplating and judging a complex situation and from a creative thought composing a design that fulfils the situational, technical, functional, ethical and aesthetical requirements [4]. To give form demands a creative and analytical skill, it stipulates demands on ability to make critical judgement and a client demands rationality and communication skills. Functional characteristics demands insight and knowledge about use, structural characteristics demands insight and knowledge about technique, ethical characteristics demands insight and knowledge about the world and ideals, and last, aesthetical characteristics demands skills to gestalt and compose.

In a series of workshops on user centred design the role of the designer was debated. The designer was described as someone that acts as a mediator between user and developer. Problems encountered were grounding the usability work, communication, roles, attitudes, and competence [11, 12].

Gulliksen, Boivie, Persson, Hektor and Herulf [14] report on a survey on usability professionals in Sweden. The aim of their study was to shed light on how usability professionals' work, their skills and background, methods and techniques used, and the impact on usability issues in their organisation and on systems and products. In the study reported on in [14] the population consisted of men in their 40ties with a background in computer science or engineering. Fifty percent of them had taken HCI programs or single HCI courses and the rest were autodidact or had received on the job training. The respondents worked in e.g. authority, internet e-commerce, computer industry and usability HCI. One recurring comment from the respondents was that the development process used does not in itself contain any support for usability activities, or user centred design. The usability perspective is severely neglected. The five top rated methods used were think-aloud, low-fi prototypes, interviews, style guides and questionnaires. Areas of responsibility were on a product level – design, on a general level – guidelines, details in GUI and functionality.

In Boivie, Gulliksen and Göransson [7] an interview study with usability designers, project managers and user representatives is reported. The usability designer is described as a lonely person working in-

between users and developers. The activities performed are analyses, evaluations and introducing design. The results indicate that the respondents rather work together with graphical/visual designers than performing graphical/visual design themselves. The authors talk about three phases that the usability designer is involved in; analyses, evaluation and design. The way the three phases are presented they can be understood as separate phases placed on the system development process when needed. A somewhat negative picture is presented and some usability designers expressed doubts about the impact they have had on the product and on the user situation. A user representative reported that the development team did not pay any attention to the design created by the usability designer and the user representatives. What the usability designer did was not really a part of the project. Neither did they have any formal rights to make design decisions.

The top five qualities associated with the role of the usability designer are, communication skills (ability to communicate with users and developers), being a good team worker (flexible, diplomatic, able to argue for your case), having skills, experience and expertise within the area, being analytical, and being creative (ibid.). How does a shift from an engineering- and usability approach to interaction design influence the role of the designer (i.e. usability expert, usability facilitator to interaction designer)? Is the designer a lonesome cowboy working in between users and programmers, are interaction designers having a dialogue with the material and how is interaction design perceived? Our interest to shed some light into these questions is on the one hand strictly academic, i.e. to try to contribute to an ongoing discussion regarding interaction design, its origin and various interpretations (which of course may have consequences for how educational programs are or should be drawn up). And on the other hand more instrumental since learning more about how interaction design is actually practiced in the field can provide us with information on the kind of tools interaction designers lack.

## **A STUDY ON INTERACTION DESIGNERS EXPERIENCE OF THE PRACTICE**

The empirical material presented below is based on two sources of information: an interview study and a series of workshops. There are different respondents in the two sources of information.

In total 13 persons (five from the university/academia working as teachers and researchers, four persons working as internal consultants (three of them project leaders or the project leaders' right hand), four work as external consultants. University/academia, private companies and authorities are represented.

### **The interview study**

Eight interaction designers, one industrial designer and one architect in Sweden were interviewed. This group consists of young persons (around 35 years of age) educated in cognitive science, human computer interaction, interaction design, industrial design, and

architecture. All except from the architect label themselves as interaction designers or interaction architects. The architect was included to contrast different design perspectives. Four of the ten respondents were women.

The purpose of the interviews was to further our understanding regarding; how interaction design as a field of practice is understood and practiced, how the work is performed, what the role of the professional interaction designer looks like, how the work conducted is represented and communicated to others.

Each interview took about one hour and was tape-recorded. The interviews, that were performed individually, took place at the respondents' office or in a neutral office if asked for. The interviews were transcribed and the material was sorted following the questions and areas in the interview guide.

### **The workshops**

Two workshops were arranged. These aimed at getting a picture of how interaction design as a field is understood and practiced and also getting feedback on a technology rich meeting environment at one of the schools at KTH in Sweden.

At the first workshop two PhD-students teaching in interaction design were invited. At workshop two one senior researcher from the interaction design area was invited. From our project group four researchers were participating. The workshop consisted of an introduction phase in which the project, the environment and the workshops were explained. Each workshop took about 3 hours. Notes were taken during the workshops and the material was analysed with the interview data.

### **RESULTS**

In this section the results from the analysis of the two sources of data are presented. The following areas are presented; how interaction design is perceived, the interaction designer (role, skills and competences), the practice of the interaction designers – focusing on artefacts and representations, and finally, repertoire of solutions-tradition and sustainability.

#### **How interaction design is perceived**

Interaction design is expressed as being the cement between technical solutions and graphical design. The term "interaction design" is, according to the respondents, in Sweden used as a way to express that "*it is not design aspects your work with, you are not a copy- or an art director and usually you do not work with the graphical design*" (Margret).

The latter includes more aesthetic and compositional aspects and the education of interaction designers can often be found at technical schools.

The opinions about interaction design in comparison with HCI and design is divided in the group and in the data 3 perspectives emerged:

1. Interaction design as one sub-area among many others within HCI.

*"... interaction design to me is a part of usability, when you work with interaction design you should get a good usability "//" it is everything from sketches, structure and flows, navigation. It is design in a way but not graphical design"* (Rolf).

2. Interaction design is viewed as taking on a larger and more holistic perspective than HCI.

*"It takes on a larger perspective than usability engineering, heuristic evaluations and computer-human interaction, my view is that it focus on the situation"* (Per).

3. Interaction design is close to design where aspects of graphical design are included.

*"...it was about shaping everything from flows and structures to separate moments of interaction, buttons. Sure it is about the form too, you experience the flows quite clearly via the form that is communicating the function. It is not really possible to separate..."* (Kurt).

The industrial designer that was interviewed looks upon interaction design as being a part of industrial design. It is "*about people and artefacts "//". Interfaces are not really correct, it is to general. It's about letting others do their job with as little problems as possible. It's about the whole situation, the user has an intention and shall also understand the possible choices that can be made*" (John).

To design something can also mean to design communication among people, as we see above. The three perspectives presented above are partly overlapping with the description of perspectives on interaction design given by a senior researcher attending one of the workshops. In this researchers perspective, interaction design can either be looked upon as emanating from HCI (interface design and traditional HCI), or as physical interface design emanating from industrial design, or finally as a design perspective on IT that regards IT as a design material. This latter perspective has been developed from an intellectual tradition with background in communication and communication studies.

#### **The interaction designer**

The view on the role of the interaction designer can vary from looking upon the role as mainly consisting in working with usability and use to a focus more close to graphical design and e.g. branding. Some view interaction design as an area building on HCI and usability, a sequential way of working, normally not focusing on graphical design and aesthetic expressions.

*"The interaction designer is taking part in the whole process in contrast to a more cultivated HCI expert or usability expert that can enter the process, perform a short assignment during the process"* (Rolf).

Others work from the start to the end of a project (evaluate, analyse, design interfaces, interaction, form and function, aesthetics), in a process that

includes problems and possible solutions iteratively, at one and the same time.

*"Since you work alone or together with one partner (then) you have the overall picture. Then you are the one that everybody turns to. How does this work and have they done that? Then you will be the project leaders' closest support" (Margret).*

To both work as an interaction designer and a project leader can also be experienced as problematic. *"I have had the role where I was responsible for the interaction design and also acted as project leader in the same project and I think it is a disadvantage. A great disadvantage. You both have to have the strategic contact towards the customer and at the same time pose limits towards the project group. At the same time you shall be open, creative, find all the solutions and argue for the solution towards the customer. You must sit on two chairs at one and the same time. It leads to a conflict of interests. I can not suggest a certain solution knowing it costs more money than we can afford but I would like to do it because it is funnier and considerably better" (Frida).*

During the interviews, the question if it is important to be a skilled programmer, to know the "IT material", in order to work as an interaction designer was posed. The view on necessary skills of an interaction designer varies. Some of the respondents, both in the interviews and during the workshops, present the opinion that an interaction designer has to know the material i.e. programming language and technical aspects. Others say that what is most important is that you can communicate with the different actors around you i.e. all the project members (e.g. programmers, developers, graphical designers, art directors) and of course also the customers and end-users.

The architect describes the work as very regulated, the architect communicates a lot with the customer and procurer in order to solve the right problem. Architectural drawings are very much regulated by authorities and when the work is done it is handed over to the constructors. The opinion the architect has concerning necessary skills is that *"you need to be an engineer in order to know the strength in the material"* (Lisa).

### **The practice of interaction designers – focusing on representations and artefacts**

From the data and other sources we know that an interaction designer often works alone in terms of not working with other interaction designers. Also, several report on having acted close to project leader and having an insight into the whole process making it possible to signal when it is important to discuss interaction design aspects. How does the interaction designer work in practice, how do they represent and communicate their ideas, suggestions and solutions in an understandable manner, both within the project and towards the customer and end users?

Sketches are reported to being used for different purposes during the design process. Early in the process the interaction designer needs to create order in own ideas and thoughts and get them externally represented. This is done by using paper and pencil, i.e. starting to sketch. These initial sketches are not presented to others since they fulfil a personal and private purpose – to bring order in chaos of thoughts and ideas.

*"Initially paper and pen but it is mostly for me. To start with it is about making the project members thinking about this and that and posing notes on the whiteboard. As soon as you take the second step e.g. when the basic parts are ok and someone has to look at them, then it is always digitalized. Mostly because you want to send them out and also make them updated "/" my sketches turn into story boards (screens and flow) they are used as maps by the programmers, the map that show them how to build" (Tess).*

To work with colleagues, other interaction designers, is not common but when it occurs, white boards are mentioned as a tool for representing things. *"You work together with another interaction designer and make sketches and discuss possible suggestions and solutions. Information structure and architecture, tree structure or similar can be something we discuss back and forth" (Kurt).*

Another example given when colleagues work together is; *"We almost always sit at a table using PowerPoint and drawing sketches to each other" (Margret).*

During a project meeting, presentations that have been prepared in PowerPoint are made and discussed in the group. If presented on a white surface there is a possibility to, during a meeting, collectively go through a suggested solution and look at the flow.

Experiences with using different tools (PowerPoint sketches, scenarios and personas) for representing ideas are mentioned during the interviews and workshops.

*"With documents I do not mean text documents but a lot of sketches and above all PowerPoint-sketches, grey models (that consist only of lines). I work very much and nearly exclusively with it and use them as a tool for communication towards customer and technicians and art directors. Text is very easy to misinterpret and one person is creating a model of what the text stands for and I create my model. But if you get it on a picture then it is so much easier to feel that you have a common understanding" (Margret).*

*"Written scenarios do not work at all but prototypes work well. A 30 pages scenario can be presented to someone but it is difficult for the person to see the point with it – to grasp the whole picture. Stone-dead as a communication medium. In order to make scenarios work, the group has to create them*

themselves. With sketches, graphical design, you can explain a scenario. When a group had created a scenario it worked well. When you have shared representations it works well, when you don't have them it poses too much strain to use them" (Max & Martin).

Another experience with scenarios is that they are hard to bring out to users since they tend to be interpreted positively. "A document with pictures, it was not enough that the interaction designer tried the idea and solution but it has to be explored in the real context in order to investigate the use, real or simulated, role playing with games as one example." (Ken).

The industrial designers' work consists in finding out "How it is now and how you want it to be. Personas are most useful in order to understand how the product shall be experienced. They are used together with for instance core values that come from marketing" (John).

Questions concerning the use of concepts originating from HCI or interaction design that the respondents were taught during their educational training in the area were posed. HCI concepts and concepts closely related to interaction design are used but when the interaction designer works alone in a project they adapt to the person or group they are communicating with. Towards customers and end users it is always an everyday language that is used.

"When I worked at x some colleagues came directly from the university "///" you could use the concepts and the discussion was held on another level. It goes much faster and you get a much more interesting and rewarding discussion" (Frida).

"I use a lot of the concepts I learned during my education but I try to use them more in an everyday manner. On the other hand, the more HCI people or interaction designers that will enter the work area the easier it will be to communicate" (Tess).

It is not only the professional concepts that are adapted to an everyday language. The content of the message can also be simplified in order to be interpretable by "non-interaction designers". "Towards our customers we present it in a different manner. We think that usability is a quality in use not a quality in the interface. But it is too complicated to explain so we say that we work with user friendliness, usability" (Kurt).

Interaction designers often work as consultants in projects. In some projects they work throughout the whole project and in others they perform only a minor part at one or a few occasions during the whole project. This leads to the fact that it is not always the interaction designers that take part in or feel responsibility towards the final product. The final result in such cases is rather a trade-off between different stakeholders' claims and wishes. This leads to a serious problem as the customer or client ascribe the design to the interaction designer,

whereas the interaction designer sees his/her efforts as being down played by other objectives. The interaction designer does not own the final design as the power of making crucial decisions is often situated on other levels in an organization or project.

### **Repertoire of solutions - Tradition and Sustainability**

Is every design situation new and solved with new solutions or do the interaction designers build a repertoire of reusable solutions? Guidelines for usability are mentioned to be the basis for design. The respondents say that they take inspiration from others' examples, regarding for instance navigation. Graphical profiles are important to many web sites and the interaction designers' work has to be adjusted towards them and it can sometimes lead to problems with usability. Methods are reused and adjusted depending on the specific purpose of the activity.

"There are many interactive things in Power point but I don't use them so much. I use it more to make sketches, draw boxes. The advantage with Power point is that it is so easy to make copies. When I work on a web site there are very many pages that are very similar, or I just want to have a part of a page to go back to. Templates, you try to work with templates as much as possible" (Margret).

To reuse solutions are not only positive but can sometimes lead to drawbacks. "Now we have done the same solutions. The way we see it, it is boring for the client that assign a consult in order to get an adjusted e.g. a web site for the organisation, their profile. Then it should not look like the solutions did for our four latest customers" (Margret).

The architect that was interviewed reports that customers are often taken out to look at different solutions e.g. house fronts or windows. The view of the architect on tradition within architecture vs. interaction design is that architecture is more sustainable. Industrial design and architecture are both about form and function but architecture is regarded as the more sustainable of the two. Design is more temporary. Compare for instance a car and a building; the building is built in order to function, maybe several hundreds of years while a car might have a lifecycle of about fifteen years. In architecture, businesses on the market have their own profiles and tradition. "If you would like to have a very modern house you contact firm x and if you want something traditional and with high quality you contact firm y" (Lisa).

One of the respondents says that "software development contra constructing buildings... then software development comes in a lot earlier in the process and have fewer standards "///" different parts in software development, then the different parts are sustainable to different degrees "///" graphical form is the least sustainable, it changes, it is like fashion. Technology might not be so sustainable either since new technology arrives all the time. While interaction design is the most

*sustainable since it builds on work on user behaviour that is going to be supported and it is in itself sustainable” (Margret).*

*“Genres and use quality is something that might have been used rather much within architecture, I think we will have that too in our area. Maybe we are going to talk about different sorts of systems” (Kurt).*

Within interaction design this division in “branding” based on traditions has not been seen yet but maybe it will come, (see [16]).

## DISCUSSION

It is quite a varied picture of interaction design that is presented through the results in this article. Practitioners that label themselves as interaction designers do not have a shared view on what interaction design is nor on the practice of it. The perspective of system development is represented in one of the groups. This group is close to the description given in Boivie et al. [7]. One example from the results that point in this direction is the example given by the industrial designer. Here interaction design is described both on an interface- and individual level, and on a more holistic level, taking people, artefacts and the whole situation into consideration. Although this is not an unusual decomposition within HCI, the change in opinion seems to be that the designer is taking a more holistic responsibility.

To describe design in this step-by-step manner that Boivie et al. [7] do is signalling a traditional HCI perspective. The iterative process where design, analyses and evaluations go hand in hand throughout the process is rather the existing perspective within interaction design today. In the study presented here interaction design as a concept is used in a broad sense by the respondents. Some of the interaction designers that were interviewed are in their reported roles close to the role associated with user centred design discussed in [7], working in parts of the project, a consultant role. Other interaction designers that were interviewed are in their reported roles close to being a project leader working throughout the project often as internal consultants. Even so, the view on solving the problem not by finding the right solution but by offering parallel solutions is still the dominating one. In the literature it is discussed that within interaction design the problem should be problematized, reflected on and maybe even criticised. This has not been explicitly expressed by the respondents in our study. But some of them talk about a process that includes problems and solutions at the same time. This can be interpreted as there being an interplay between the two. Noteworthy though is that the respondents focus more on designing than on evaluating designs made by others, a role often faced or taken by usability professionals. The evaluative work seems to be less formal and more focused on progressive design imperatives than regressive directives of what is wrong.

In the literature the designer is often described as working alone and having a dialogue with the material. The respondents in this study reveal that they as designers initially work alone with sketches in order to bring order in their thoughts and premature ideas. When this stage is passed the designer presents the ideas and suggestions in order to discuss them or at least make them understandable to others. So there is a dialogue with the material but also a dialogue with other actors, an interplay between a level of detail and having a holistic picture during the project where communication is the key word. The interaction designers work a lot with sketches and start with paper and pencil and continue to use different kinds of tools. These tools are not developed in order to support interaction design activities but are of the shelf software. There seems to be a need of tools that can support the interaction designers’ activities both during phases where the designer works alone but also when collaborating with or presenting to others.

Since the interaction designer works with a number of different actors they do not have a common language and therefore the language spoken is more of an everyday character. An important skill is therefore to be able to re-phrase the design proposal to different stakeholders (see also [1]).

In Nelson and Stolterman [23] it is stated that *“Design has always been, and will continue to be collaborative at its core; even if that collaboration only includes one designer and one client. “//” the source of design imagination and agency, will always be the individual”* (p.290).

This citation can be interpreted that the designer is working alone, as a lonesome cowboy with a counterpart (the client). The results presented above do point in another direction. The designer is co-operating with a lot of different actors during the project and is often engaged in a negotiation, trying to handle mutual constraints. Much work that could be done in collaboration in design activities such as sketching and making prototypes is still done solitarily. Results and mending of design proposals in order to find an appropriate compromise is done in collaboration with others.

In Gulliksen et al. [14] one recurring comment from their respondents was that the development process used does not in itself contain any support for usability activities. In the perspective of presented in [14] this process can be completed with usability and user centred activities. This contrasts with what Löwgren [17] expresses. Löwgren [17] states that there is something wrong with the software engineering perspective from a HCI point of view and that something new must replace it. The suggestion of the author is labelled interaction design and focus on making external design before making internal construction of the interactive system. Actual practice today does not seem to have come this far, still much of interactive systems design is done in a reciprocal process where internal construction is as much defining ways of what the external design can do, as the opposite. Markensten

[21] is elaborating on this theme even further and is suggesting that external design should be presented, and even offered as part of the requirement, before any contract with developers is initiated. Artman and Zäll [2] present a study where the client organization is designing and requiring external design without any professional guidance.

According to Nelson and Stolterman [23] the design process has two major ingredients; imagination and communication and that every situation has to be imagined anew. This is not in line with how the interaction designers in our study present their work. In their work they describe using different guidelines, patterns and also building own repertoires of solutions. These are described as a support during the design process but there is also a risk of being dull and doing more of the same. The problem of envisioning the future use situation, and in turn the appropriate design, is a problematic oscillation which is often constrained by the representations used in the design situation (see [3]).

A reflection on interaction design in the light of architecture reveals a fraction that is more close to architecture concerning aspects on graphical design and form. There are although also great differences. The architect makes the final drawing and delivers it to the constructor that starts to build. The architect that was interviewed describes how different existing solutions are presented to the customer and how the customer is taken on a presentation tour. For instance, looking at facades or visiting a window shop. Interaction design is not as mature as architecture concerning tradition and genre. Architect firms are often profiled in a sub genre of architecture while the same is not noticed in interaction design.

Conducting interviews is an appropriate technique in finding out about how interaction design is perceived but to use the same technique for studying a practice is not the best choice. During the planning of the study our ambition was to conduct observations of interaction designers during their work but it turned out to be impossible. The explanation to this is mainly that it is hard to get access to these situations since activities often take place in the office of a customer. Even if the interaction designer wants to participate the customer might not. The results reported on the practice of interaction designers are therefore based on how they describe and reflect on their work, not on how they actually act.

Löwgren [17], based on Grudin [10] discusses the different roles for designers and that they depend on the character of the user oriented perspective in software development and also a difference across the categories in-house, product and contract development. The results presented above might be more influenced of these aspects. The interaction designer, working in-house, work within the power structure of the organization involving several strong stakeholders such as e.g. users, management and systems administrators. The designer working in contract development is often in the mercy of the

client who sometimes has strong claims regarding the right design solution and who can forcefully direct several design decisions [21]. Product development on the other hand must direct focus to the third-party customer, which is not always known from the start of the project. The respondents in this study work in different design and development contexts and this may account for the multi-facet picture of interaction design.

As for the one million dollar question does Interaction Design as a discipline differ from more traditional notions of Human-Computer Interaction? This study illuminates that people who label themselves interaction designers take a more holistic view on their endeavour for making interactive systems usable, as well as that they describe their practice as more progressive and design oriented than construction or usability oriented. Although the tradition of systems engineering seems to withhold a strong and firm grip on what it means to solve problems within HCI, we at the same time see a quite strong move within academia to overcome the impediments of engineering practice and to more strongly, through new perspectives and new labels, reframe the solution to many problems of making interactive systems usable. Maybe the relation between Interaction Design and Usability is more of a label of roles than a critical breach of perspectives?

#### ACKNOWLEDGMENTS

We would like to thank the respondents for letting us know more about the practice they are a part of. We would also like to thank Mattias Arvola and Teresa Cerratto Pargman for comments on early versions of this report. This report has been written within a research project funded by The Swedish research council.

#### REFERENCES

- [1] Artman, H. (2002). Procurer Usability Requirements: Negotiations in Contract Development. *Proceedings of NORDICHI 02*. pp 61-70.
- [2] Artman, H., Zäll, S. (in press). Finding a Way to Usability: Procurement of a Taxi Dispatch System. *Cognition, Technology and Work*
- [3] Artman, H., Ramberg, R., Sundholm, H., Cerratto-Pargman, T. (accepted). Action context representations and Target Context Representations. Accepted to *Computer Supported Collaborative Learning (CSCL'05)*. Taipei, Taiwan.
- [4] Arvola, M. (2005). Shades of use – The dynamics of interaction design for sociable use. Dissertation No. 900. Department of Computer and Information Science at Linköping University, Sweden.
- [5] Atwood, M.E., MacCain, K.W. & Williams, J.C. (2002). How does the design community think about design? In *proceedings of DIS2002*, London ACM, pp.125-132.
- [6] Barab, S., & Plucker, J. A. (2002). Smart People or Smart Contexts? *Cognition, Ability,*

- and Talent Development in an Age of Situated Approaches to Knowing and Learning. *Educational Psychologist*, 37(3). Lawrence Earlbaum Associates, pp 165-182.
- [7] Boivie, I., Gulliksen, J. & Göransson, B. (submitted). The lonesome cowboy – a study of the usability designer role in systems development. Submitted to the journal *Interacting with Computers*.
- [8] Fällman, D. (2003). In romance with the materials of mobile interaction. Doctoral thesis at Department of Informatics, Umeå University. Umeå: Larsson & Co:s Tryckeri AB.
- [9] Gedenryd, H. (1998). How designers work – Making sense of authentic cognitive activities. PhD-thesis at Lund University. <http://asip.lucs.lu.se/People/Henrik.Gedenryd/HowDesignersWork/>. Last visited 041214
- [10] Grudin, J. (1991). The Development of Interactive Systems: Bridging the Gaps Between Developers and Users. *IEEE Computer*, 24(4), 59-69.
- [11] Gulliksen, J., Lantz, A. & Boivie, I. (1998). User-Centred design in practice- problems and possibilities. Workshop held at the PDC'98 and CSCW'98 conferences in Seattle. 14th of November, 1998. In proceedings of CSCW'98, 417.
- [12] Gulliksen, J., Lantz, A. & Boivie, I. (1999). How to make User Centred Design usable. Workshop held at INTERACT'99, Edinburgh. August 30th- September 3rd.
- [13] Gulliksen, J. & Lantz, A. (2003). Design versus design – From the shaping of products to the creation of user experiences. In *International Journal of Human-Computer Interaction*, Special Issue: NordiCHI – design versus design. Vol 15, Number 1, 2003, pp.5-20.
- [14] Gulliksen, J., Boivie, I., Persson, J., Hektor, A. & Herulf, L. (2004). Making a difference – a survey of the usability profession in Sweden. In proceedings of NordiCHI'04
- [15] Lundeqvist, J. (1992). About the origin of design theory (in Swedish). *Nordic Architectural research*. Vol.5, part 4, pp.7-18. Graphic systems AB, Gothenburg.
- [16] Lundberg, J. (2005). Shaping Electronic News: Genre perspectives on Interaction Design. Dissertation No. 918. Department of Computer and Information Science at Linköping University, Sweden.
- [17] Löwgren, J. (1995). Applying design methodology to software development. In *DIS 95 Ann Arbor MI USA*, 1995 ACM, pp.87-95.
- [18] Löwgren J. (2001). From HCI to Interaction Design. In Chen, Qiyang (Author), *Human-Computer Interaction: Issues and Challenges*, Hershey, PA, USA: Idea Group Inc., 2001, pp.29-43.
- [19] Löwgren, J. (2004). Animated use Sketches as Design Representations. In *Interactions*. Vol 11, Issue 6, pp.22-2
- [20] Löwgren, J. and Stolterman, E. (1998). Design of information technology – material without qualities (in Swedish, Design av informationsteknik – materialet utan egenskaper). Lund: Studentlitteratur. (An English version is published as *Thoughtful Interaction design*. MIT Press.
- [21] Markensten, E. (2005). Mind the gap – a procurement approach to integrating user-centered design in contract development. Licentiate thesis, NADA, KTH, Sweden, 2005. TRITA-NA-0447
- [22] Marion, C. (1999). What is Interaction Design and What Does it Mean to Information designers? <http://www.chesco.com/~cmarion/PDC/WhatIsInteractionDesign.html> Last visited 041015
- [23] Nelson, H.G. & Stolterman, E. (2003). *The design way*. New Jersey: Educational technology Publications.
- [24] Preece, J., Rogers, Y. and Sharp, H. (2002). *Interaction design – Beyond Human-Computer Interaction*. USA: John Wiley & Sons, Inc.
- [25] Ramberg, R., Artman, H., Sundholm, H., & C-Pargman, T. (2004). Creative Collaboration with Representations: A Case Study of Interaction Design in an Interactive Space. Proceedings of Kaleidoscope (NoE) CSCL-SIG conference.
- [26] Schön, D. (1983). *The Reflective Practitioner: How professionals think in Action*. Basic Books: New York.
- [27] Sundholm, H., Artman, H., & Ramberg, R., (2004a). Backdoor Creativity: Collaborative Creativity in Technology Supported Teams. In: Darses, F., Dieng, R., Simone, C., & Zacklad, M., (Eds.) *Cooperative systems design: Scenario-based design of collaborative systems*. IOS press, Amsterdam.
- [28] Sundholm, H., Ramberg, R., & Artman, H., (2004b). Learning Conceptual Design: Activities with Electronic Whiteboards. In: Proceedings of CADE04 (Computers in Art and Design Education).
- [29] Winograd, T. (1997) From Computing Machinery to Interaction Design. In P. Denning and R. Metcalfe (eds), *Beyond Calculation: The Next Forty Years of Computing*, Springer –Verlag, 149-162.
- [30] Winograd, T., Flores, F. (1986). *Understanding Computers and Cognition*. Ablex Corporation, Norwood, NJ.