Applying Interaction Design in a Software Development Project: Working out the general user for Messaging Systems

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Abstract

It is a challenge to work in a software development project. People with different backgrounds are together working towards the goal of delivering a run able piece of software. The influences to the design are many and all of them will affect how the program will be designed. During this spring we have been involved in a large software engineering project. Our part of the project has been focusing on interface design and using the design method persona. In this bachelor thesis we describe our experiences of participating in a software development project. We will explain how our design work was affected by the organisation of the project and how we have worked with adjusting the method of persona to the conditions given in the project. We will also describe the importance of communicating the design within the project. The main purpose of the report is to show how we during the project have become aware of the importance of tracing design decisions back to its origin. Many attributes has come to inform our design and this has made us aware of the importance of having a traceability of our work.

Keywords

*Interface design, personas, development process, software engineering project, traceability*
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1 Introduction

When we are designing a commercial product we decide the use for hundreds of people. Some parts of the design may delight while others irritate and it’s only for the user to accept both good and bad parts of a program. As designers we have a lot of power, since every new feature first is approved by us. The essence of design is about making choices and as interaction designers it is our task to take decisions that is as well grounded as possible.

“(...) design in inevitable involves making choices and these can never be any guarantee that the choices made are the right ones in an ultimate sense. What they can be are choices made in the light of the best information available at the time.” [10, p. 139]

It is a common place notice especially between interaction designers that if the end-users’ are listened to, the program will be easy to use. However while some of this is true, this isn’t the entire picture. We believe that many other things also affect the design.

During this spring I, Therese Westerlund Karlsson, have together with Kristina Hellberg been involved in a large software engineering project. Our part of the project has been focusing on interface design and using the design method persona. We have been writing most parts of this report together. My part of the work will result in this bachelor thesis. Kristina will continue working on this report and her part will end with a thesis on master degree.

In this thesis we will present the result of our work in a software development project. The work process can be seen as a journey and has come to result in this picture showing the many influences that have affected our design. The influences we discovered during our journey were the persona, the UIQ Style Guide, technical limits, developmental limits, testing, IM-applications, interviews and research. Being conscious of the things
influencing our design has given us an awareness of the influences to our design. We believe that if these influences are made explicit in the design process, we are in a much better position to take the right design decisions.

Users’ of a commercial product can be divergent both in ways of interest, motivation, experiences and use. At a first glance their goals can look quite the same, but the motives behind each goal can be different. Knowing what motivates different users’ helps designers decide how to prioritize and present different features in the interface. Some user group can for some reasons be more important to support than others. Designing with the inexperienced user in mind may be successful but some times designing for the more experienced user can produce an easy to use program. Experienced user’s often know what to demand and may also have higher demands on the existing design. For the users the only important thing is that they can achieve their goals [1].
1.2 MDA-students

As students at the Blekinge Institute of Technology and the MDA-program (Humans, Computer technology, Working life), we have during this last semester of education chosen to do our Bachelor/Master thesis as part of a software development project. The MDA-program is an interdisciplinary education that integrates Computer Science with Workplace studies. It aims at developing software with a special focus on the user.

"MDA is an education with a focus on use and design. It’s about developing new technology supporting cooperation and learning what will work in different contexts. Within the Software business IT is today, more than ever, a big need for them who have the right skill for designing good technique." [17]

The development project we were part of (a 3rd year course at the Software engineering program) is a course where students learn to develop a software product for a real customer. Our role in this project has been to focus on the use and design of the graphical user interface.
2 The Project

The project we joined consisted of fifteen software engineering students and two MDA-students. It was part of a project course where every Software Engineering student worked more than 700 hours in the project to get a Bachelor degree in Software Engineering. The goal of the course is to establish a way of working with software development that builds on commitment culture and project – and quality planning. In the course the students also will gain experiences in professional project planning, project organization and in the use of development models.

Other aims of the course are to give students experience from working in an interdisciplinary team. The first time MDA-students joined these projects were in 1994 and since then they have complemented these teams within the area of users and design. We participated as full members in the project during the first 10 weeks. During the following weeks we were writing on our report. Since we were located in the project room most of the time also during these weeks we could still be at hand if the project team needed our help.

The project was assigned by the customer, UIQ Technology (see part 2.1) to develop an Instant messaging application (an application for sending and receiving short messages over the Internet). The application should support different messaging clients and was to be designed for use in a mobile phone. We gave the project the same name as our product, “Quill”. The name originates from an association of writing messages with a “quill-pen” and also connects to the “Q” in UIQ Technology described in the next part.
2.1 UIQ Technology

UIQ Technology AB is an international company with more than 100 employees, situated in Ronneby, Sweden. The company develops the product, UIQ, which is a user friendly and customizable pen-based user interface for media-rich mobile phones based on Symbian OS\(^1\). UIQ Technology was established in 1999 and is a fully owned subsidiary of Symbian Ltd. Symbian Ltd is a multinational telecommunication company developing operating systems, the Symbian OS and applications for devices connected to the mobile Internet, so called WIDs\(^2\). Symbian Ltd is cooperatively owned by the telecommunications companies Sony Ericsson, Nokia, Matsushit; Motorola and Psion [22].

2.1.1 - 3G – Communication devices for the future

We are now are in the position of beginning the use of mobile services for 3G standard. Devices and services needs to be connected to each other in order to make the mobile internet happen. In 2001, Ericsson, Motorola and Nokia set up to work actively on the instant messaging systems in mobile phone. The objective of those industrials is to promote mobile services that integrate the best of existing messaging and notification services on a network. Every mobile phone user of any given brand should be able to send any kind of message, independently by service or device [14].

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1 Symbian Operating System
2 Wireless Information Devices
2.2 Project task

Customer goals

We (the project group) were assigned to the task of developing an Instant messaging application with a unique technology by our customer, UIQ Technology. The application was going to be part of Symbian OS. The overall goal was to add credit to the mobile phone as a communicational device and through this increase the sales of mobile phones. Another goal was for our program Quill, to attract new categories of users. During the first meeting with our customer, Peter Molin at the UIQ technology he introduced us to a new concept of users so-called “Early adopters”. Early adopters are a group of users always adapting to the newest things available on the market and they are also the first buyers when a new product like Quill arrives at the market. This group is rather small though and in the long run, a developer like the company UIQ will have to adapt their product to a larger group of users. A special focus needs to be put on attracting ordinary people, both in their private use and at work.

Project task

The customer wanted a small, stable instant messaging program. It was important that the application could send and receive messages independently of the users’ protocol or device. The other part of our task was to build an application that could independently switch connection between GPRS\(^3\) and Bluetooth\(^4\). When the mobile phone would come near a Bluetooth node (device for access to the Internet), this ‘seamless part’ would switch to Bluetooth and when out of reach for the node it would simply switch back to the GPRS. Bluetooth makes it possible to transfer more information and at a lower cost. The picture below shows the ‘main view’ of Quill in the skin of UIQ Technology. You can also see how the connection of Bluetooth/GPRS is indicated in our application.

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\(^3\) General Packet Radio Services (GPRS) is a packet-based wireless communication service with continuous connection to the Internet. It transfers up to 114 Kilobits per second.

\(^4\) Bluetooth is a short-range wireless connection that makes mobile phones, computers, and personal digital assistants (PDAs) interconnect with a maximum range of 10 meters. It transfers 1 Megabit per second.
In addition to the seamless part, the plug-ins of messaging protocols was a big technical part of the project. Many different messaging protocols exist today, but yet no mobile application supports sending and receiving messages from more than one protocol. The idea of Quill was to be an application hosting other messaging protocols. If a user wants to communicate with a contact using another protocol, he/she only has to connect the protocol to Quill. To control the communication between Quill and external protocols, a plug-in platform was implemented. Since we needed to demonstrate the functionality of the platform we (the project) agreed on implementing two different plug-in protocols, Jabber\(^5\) and MSN\(^6\). We chose the MSN protocol since it was the dominant instant messenger in use and the Jabber protocol because it is an open source protocol. The idea of using plug-ins is to open up for mobile independency making it possible to communicate with contacts using other types of Instant messaging (IM) protocols, MSN, Jabber or ICQ\(^7\). With a plug-in platform new protocols could easily be added to the design.

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\(^5\) Jabber is an open source, XML-based instant messaging platform and the Jabber client and server can be downloaded for free.

\(^6\) Microsoft’s MSN Messenger

\(^7\) The ICQ messaging protocol: “I Seek You”.

\[\text{Picture 2}\]
2.3 Our task

2.3.1 The instant messaging application

Our task was to develop the design of the graphical user interface of the instant messaging application. We were also responsible for tasks connected to this, like finding out requirements, doing user investigations, develop a design proposal and conducting user tests. Features, usable in today’s messaging programs, could be used if appropriate but needed to be specially assigned for use in a mobile phone. Since Quill would be only one of many programs in Symbian OS, it was important that our design of the graphical interface design was in agreement with the UIQ Style Guide (see part 4.2).

2.3.2 Personas

One of the tasks given by the course leader was to try out the design tool personas [7]. A persona is a fictional person that holds the interests of a particular user group. It is an abstract representation of the users and was originally used when marketing products to different target groups. Later on personas was also used in product design, where it’s most famous pro-speaker, A. Cooper, a consultant in Software Engineering, extended the method and put an even stronger focus on finding the users’ goal with a program. A persona helps designers taking design decisions, since more specific goals are presented in the persona. Since our product meant designing for a general user (any person using a mobile phone) our persona had to capture the goals of different types of users. A persona also serves as a tool for communication when developers and designers are reasoning about the design.

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8 With our task we refer to the task of the design group.
2.4 Project organization

A requirement from the project course was that different roles should be given to members in the project. These roles were: project leader, architect, test leader and quality coordinator. After the first half of the project, the roles shifted and other members were assigned to them. The project also had access to a Head of Department (HoD), a person with a lot of experience from software engineering and project management. He functioned as a mentor to the project team and the project leader.

We were 17 people working together in the project. In a group of this size, having an overview of the ongoing work and progress was vital. To get an overview of our work we divided the project group into smaller sub-groups. Based on our interests we could choose between the groups of: design, architecture, quality, test, implementing and border group (see figure 3). Every sub-group announced their own sub-group leader which together with the Project leader joined the Border group. The Border group was responsible for the coordination between the groups.

![Diagram of project organization]

Figure 3
The sub-groups have to coordinate their work with each other since they are working towards the same goal. The border group is an integrated group with one member representing each subgroup.

Each of the groups was responsible of the work in their sub group and had contact with other groups when there was a need for this. The project leader had the responsibility of following up individual activities and keeping everyone working towards the same goal.
2.4.1 The design group

When referred to ‘we’/us or our work in this thesis, we mean us, the design group and the work done in the design group. The design group consisted of the two of us, Kristina Hellberg and Therese Westerlund Karlsson and one software engineering student. As MDA-students we had the most experience with user investigations and designing for an end user. The software engineering student complemented the group by having a technical view on design problems. With this knowledge both technological and user issues were taken into consideration before deciding on any design. This way we got a better overview of the problems. During the first half of the project our group, the design group, worked together developing the interface design. In the second half we spent most of our time writing on this report. The software engineering student instead became the project leader of the team.

2.5 The EVO-model

One of the requirements from the course leader was for the projects to plan their work after the Evolutionary development model. The work in this model divides the project work into smaller easy to handle so-called EVO-steps. The idea of the steps, described by Gulliksen and Göransson [9], is to add increments (run able system parts) to a functioning software product. The evolutionary model is organized around incremental cycles and is developed incrementally 9 and iteratively 10. Experiences from earlier increments are used to define requirements of the following step. Within the cycles the development is organized iteratively. Each cycle consists of analysis, design, testing and implementation followed by analysis, design, testing and implementation finally followed by integration and maintenance.

Every cycle is delivered to and approved on by the customer. This way the customer can give important feedback on the product. Experiences from each delivery are incorporated to the requirements for the next step and changes in the requirements are seen as a natural part of the project.

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9 Incremental development – Each steps (analysis, design, testing and implementation) are done many times
10 Iterative development – New things is added to the program during the entire project
Our project was organized in an evolutionary way with development cycles (in our project mentioned as EVO-steps) and deliveries of runnable products for every step. However working with analysis, design, testing and implementation iteratively in each EVO-step as described by Gulliksen and Göransson [9], wasn’t done in our project. In the project, we divided the work into smaller EVO-steps. The incremental grow and iterative process was only partly implemented. We approved on having four deliveries throughout the project time and this gave us EVO-steps of between 3-5 weeks. In the table (figure 4) our development plan is described. For each EVO-step, new contents were added. Important to notice is that GUI implementation was mainly performed during the first two EVO-steps. Since we, the design group, were responsible of the design of the graphical user interface this had a direct affect on our work.

<table>
<thead>
<tr>
<th></th>
<th>EVO 1</th>
<th>EVO 2</th>
<th>EVO 3</th>
<th>EVO 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GUI</strong></td>
<td>The main views and 20% of the total GUI are done.</td>
<td>Some functionality is implemented.</td>
<td>90% of the total GUI is implemented.</td>
<td>Full functionality in the GUI.</td>
</tr>
<tr>
<td><strong>Jabber</strong></td>
<td>Research</td>
<td>Send a message over the Jabber protocol.</td>
<td>Authentication for requests.</td>
<td>Taking care of errors.</td>
</tr>
<tr>
<td><strong>MSN</strong></td>
<td>Research</td>
<td>Classes and methods are declared. No functionality</td>
<td>Start up the framework.</td>
<td>Full functionality.</td>
</tr>
<tr>
<td><strong>Seamless</strong></td>
<td>Research</td>
<td>Creates a socket towards a plug in server.</td>
<td>Find Bluetooth access points</td>
<td>Switch between Bluetooth and GPRS.</td>
</tr>
</tbody>
</table>

**Figure 4** Table over the content in the different EVO deliveries.

The project team studied developmental environments like the programming language, the architecture and the technical limitations of the project before agreeing on the first increment. Meanwhile we, the design group, worked on identifying what functions was the most important considering use of our program. With this collected knowledge we could agree on the contents of our first delivery (EVO 1).
3 Research areas

Our primary task in the project was to develop the interface design. In the table of deliveries for every EVO-step (figure 4), we can see that the plan was to implement the majority of the interface in the first two EVO-steps. This meant that the design work had to start at once. We knew already from the start, that the small display of the mobile phone was going to put constrains on the interface design. A small-sized interface can easily get overcrowded. The solution was to have only the user’s primary functions visible in the views. Functionality with less priority was hidden behind menus. One of our interviewees, working with usability questions at a company developing applications for wireless devices, expressed his view of what characterizes a good interface:

"(...) a well-designed tool on a computer should have such an intuitive interface that it will be obvious of how to do things."

We needed to develop an interface that would have a lot of functionality and in the same time be easy to learn. As help we used knowledge coming from the research area of Human Computer Interaction.

3.1 Human Computer Interaction

Human Computer Interaction (HCI) is an interdisciplinary field with interests in the design, the development and evaluation of computer-based user interfaces. The area also applies research around the major phenomena that surrounds the human use of computer systems [3]. Within this area we found practical advice on how to design the interface of Quill. J. Preece and D. Norman, both researchers within the field of HCI, are describing six design principles in their texts; Visibility, Feedback, Constraints, Mapping, Consistency and Affordance. Those are all practical advises of how to design a useful interface. When following these principles we would ensure that everything was provided in our interface [3]. Here is a short presentation of the design disciplines and some of their use in our application:
• **Feedback** – the principle of feedback was used to help the user know what is going on in the program and also to tell the user what to do next. We used both the principle of Feedback and Visibility to help guide the user’s interactions when we were constructing the dialogues of Quill.
• **Visibility** – one example of visibility is the placement of an information icon in the ‘base view’ of our program. This icon guided the user to find the contact information in the ‘detail view’.
• **Constraints** – this principle constrains the user’s interactions for example through deactivation of menu items.
• **Mapping** – the use of the “go-back arrow” in the detail view (see picture 4.4.1) is one example of a mapping between the users learned experience of this symbol and the effect of his/her action.
• **Consistency** – similar operations use similar elements for achieving the tasks. Since Quill should work together with other program in Symbian OS (see UIQ Style Guide, part 4.4) this principle was very important in our design.
• **Affordance** – to afford mean – “to give a clue” [3]. We used icons (email, SMS, phone) in the ‘detail view’ to guide the navigation to other programs in Symbian OS (see picture 4.5.2).

When we studied Human Computer Interaction we found good practical advices on how to build a usable interface. We found little though, on how to connect design with different influences such as; user proposals, style guides, technical constraints and existing similar applications. HCI also concludes that design is more than just an interface and proposes further research in the area of interaction. In the next part we will explore the area of Interaction Design, and see how this research influenced our work.

### 3.2 Interaction Design

Interaction Design is a mixture of different research disciplines like for example the interdisciplinary research of Human Computer Interaction (HCI), Software Engineering and Computer-supported cooperative work (CSCW) [3 p. 8]. There are other disciplines concerned with interaction design but we have chosen to mention only these ones, since
they are of most interest to our work. Research in these areas connects interaction design to software development. Central to practicing Interaction Design is a user-centred approach to design [3]. This means that the designer have a detailed knowledge about the user goals before the design can begin. The idea is that; the more details a designer knows, the better the software will be. As we mentioned before (see part 2.3.2), we had a problem with being specific, since our users could be any future owner of a mobile phone. The method personas helped us in being both specific and general. Since one persona is holding the interests of many persons it can represent a general user. By giving this persona a detailed description, with specific needs it can also represent the specific user. Interaction Design stresses the importance of being precise when presenting user goals to a software development team. One idea within Interaction Design is that the software should be built, based on the users’ goals. Information about the users that is presented in close connection to the design itself will make it easier to solve the design problems of the development process. In literature by J. Grudin, J. Pruitt and A. Cooper we found different examples of how to use personas. Below is an example of Cooper describing his persona Clevis: Notice how the description of Clevis easily can be related to design:

“Clevis had no experience with computers and no patience for the typical attitude of delayed gratification that most programs have. The solution to Clevis’s navigation problem was simple: He could not and would not “navigate,” so there could only be one screen.”

[1, p. 144]

Cooper’s way of describing Clevis showed us that in being specific about a persona it is important to collect information both on personal needs and goals and to relate it to the context of use. We decided to present our persona with both personal and context specific details that could be derived to single design decisions.
Research within Interaction Design points out that the design has to come before the implementation. Not having a ready persona from the beginning, didn’t affect our work in a negative way. Instead the tool of personas was merely amplifying other methods used to inform the design. Many different things became influential in the design of Quill, our program. As long as the development proceeded new attributes were constantly discovered. Every product’s design will be influenced by a unique set of attributes that informs the design and in our project new attributes were constantly discovered. In the following we will take you on a journey (our work on Quill) to describe how these different attributes were affecting our design. An important issue to bear in mind before starting this journey, is that finding users needs may take a different path than software development per so. The result from this is that these two ways of working i.e. (1) producing software and (2) producing design incentives have to work to inform each other. This will be apparent in the following presentation. This circle presents all of the attributes that has informed our design:

11 With attributes we simply mean different things or influences in our design.
A short description of how the attributes contributed to design:

1. **Persona,** based on interviews with users, amplified the result of other methods and helped prioritize between functions towards the project end.
2. **UIQ Style guide,** contained rules for the design and helped organize the interface in accordance with other programs in Symbian OS.
3. **Developing limitations,** the knowledge within the team limited what could be implemented.
4. Comparison of different **IM-programs.** Functions and design ideas were taken from existing programs.
5. **Testing,** mock-up sessions with users and testing of the prototype, gave feedback that informed the design.
6. **Technical limitations,** technical limits of the mobile phone and the plug-ins, influencing what to present in the interface and which functionality to support.
7. **Interviews** with users from different categories, directed the choice of functionality and how to present it in the design.

### 4.1 The Design process

#### 4.1.1 Research, Interviews and IM-applications

Investigations on existing research, interviews and IM-applications played a central role in the first design. It took place before the actual design process started and gave us some knowledge about what kind of program we were going to design and. To get more knowledge about Instant Messaging programs we also studied some of the today existing IM-applications; **ICQ, MSN, Trillian, Miranda and Exodus.** Some of these programs (Trillian, MSN and ICQ) were used also as a base in discussions with some of our interviewees. During these interviews, conducted with experienced IM-users, we discussed what features was important to have for the usefulness of the program. We also discussed what solutions parts of the graphical user interface they liked/did not like. By discussing how they used these programs we could get more knowledge about what’s important to have in mind developing a useful IM-application.

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12 **A Jabber application**
Below you can see examples of how on ICQ, of the IM-applications has influenced our design.

**Functions** we have been inspired by from existing IM-applications:
- History (contains old conversations)
- Contact information (real name, phone nr, e-mail)
- Status (away, online, offline)

**Interface design**
- Contact list (see picture 6)
- Separating online contacts from offline, using lines and colours.
- Use of status icons
- The message (having history in message)

When the functionality had been valuated and discussed, two categories of users arose; (1) one group that merely used the application to send short messages and (2) the group that used the application merely as a source of information, looking at the contact list.

Published papers, today available on the Internet [8, 11, 12, 13, 15] were part of our first investigation. They presented both statistics and research investigations describing the use of IM-applications in different settings. The below examples, point to the second group of users, using IM-applications as a source of information. From one of the papers we have used in our work:

"Several individuals reported that it was in fact the presence awareness feature, rather than chat or IM that brought them to the tool." [12 p. 7]

"An application that shows when colleagues are available, and makes it easy to non-intrusively signal the desire to communicate should facilitate this type of communication.” [12 p. 2]
This use of Instant messaging is confirmed also by one of our interviewees.

“When I’m arriving at work in the morning I can see if a colleague in Australia is still at work or if he/she has left for the day. Is the person available, than I can send a short message about something, to find out if I can call to discuss an important matter and then it’s good to check first through MSN.”

[Interview 10 rows 70-74]

The information in the research papers helped us gain a better understanding of the target group. It also confirmed our prior information about what’s special when IM-applications are used in the workplace. In order for our program to be successful we knew that these parts of the program needed to be well supported in the design.

### 4.1.2 The prototype

The first design proposal was visualized through a paper-based prototype of the program, a so-called mock-up. A mock-up is used to show the functionality of the program but has no logic. The interviews had revealed two main uses in IM-applications (1) sending and receiving messages, and (2) the use of contact information through the contact list. Since these seemed to be important to our program we wanted them to be available from the ‘main view’ of our program. Below is the first version of our mock-up (picture 8). As can be seen in the picture, both the ‘message view’ and the ‘detail view’ can be reached from the ‘main view’. The ‘detail view’ with contact information is available through a tap on the contact name/nickname and the ‘message view’ (for sending a message) through a tap on the status icon of a contact. The ‘status icon’ in the ‘main view’ itself indicates when a new message has been received.

*Quill icon* for showing status, linked to ‘Send message’ view. A blinking status icon with a letter and a Quill indicates that a new message has been received.

*Nickname* of your contact, linked to ‘Detail view’ of that person.

*Picture 8, The first Mock-up*
One of the things that came up during the first interviews was easy access to information about contacts. This seemed to be especially important to our target group; people at work. We added information about name, IM-identification, mail address and phone number to the ‘detail view’ of Quill. We decided to link information from the Contacts program (the address book) of the mobile phone to our program. In the next part we will see how the user tests informed the design and revised the first design proposal.

### 4.1.3 User testing

User testing conducted both on the mock-up and the mobile phone, played a vital role in the design of Quill. During one of the first mock-up sessions, navigation between different views was discussed. As mentioned in the previous part (4.1.2) we needed to have a good support for especially two of the views in our program; the ‘detail view’ and the ‘message view’. Since we wanted to capture the best way to design the graphical user interface of those views we needed to get have opinions of our users. The user was presented to the first design proposal (picture 8). He found the navigation between the ‘main view’ and the ‘detail- and message view’ a bit awkward. Here is a quote from the mock-up session:

"It’s that you should click on the name of a contact when you want to write a message. It is the message that is the most important and the most frequent used. To be able to see information about a contact is of a lower priority. Contact information should be reachable from menus or by clicking some icon just beside the nickname."

![Mock-up session](image)

After the mock-up session we discussed this part of the program. We understood the user’s confusion of seeing the ‘quill icon’ as a symbol for the action: ‘send message’. It was also apparent that the icons for navigating between the ‘message/detail views’ probably where placed too close to each other (see picture 8). The users where throne to make mistakes in navigating on the touch screen of the mobile phone. The solution to
our problem was to make both the name and quill icon link to the message. A small icon was added to the right of the contact name for linking the user to the ‘detail view’ (see picture 10).

User testing on the mobile phone

Our user tests started as soon as the first running version of the program was ready for testing. Equipped with a mobile phone and the latest version of the program we went to meet some people interested in using a product like ours in their work situation. When you are designing a tool for people at work certain aspects need to be taken into consideration. If the program will be accepted as a new tool it has to fulfil the users’ needs. During one of these tests the ‘detail view’ was discussed. A comment from this meeting was that the information presented in our ‘detail view’ (name, IM-identification, mail address and phone numbers) would not be enough for professional use. To be able to use our application in their work, they needed to have information about company name and work title (of a contact) added to our program. When we discussed this matter in the project group, we decided to link more information from the address book of the mobile phone to the ‘detail view’ of Quill. Other important tools during especially the
early faces were the UIQ Style Guide, presented below and the use of the Emulator following the Symbian SD02 K\(^\text{13}\) (see part 4.2.1).

### 4.2 UIQ Style Guide

The UIQ Style Guide has influenced the design since the first draft of the mock-up. It consists of guidelines developed by UIQ Technology. These guidelines will ensure all products of UIQ to look and work in a similar way. The Style Guide controls both (1) high-level regulations (like the design of a *main/detail view*) and (2) more detailed guidelines (such as, words to use in a program, placing of buttons and so on). In the beginning of the design process the Style Guide, in combination with the “Emulator” (containing all Symbian OS programs and a visual representation of the UIQ Style Guide, see part 4.2.1) helped us in organizing the views of our program. Besides that we were also guided in how to place different items in the GUI. Here is one example from the Style Guide:

> “The interaction style of UIQ is to tap an entry from the base view, which immediately opens the detail view for the entry, as shown below on the right. The detail view is where the user can view an entry and make changes. The user can then close this window by tapping the ‘Go back’ button in the lower right corner.”

[From: UIQ Style Guide/Views]

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13 Software Development Kit.
We sometimes found the rules of the Style Guide frustrating because they left us with little alternatives. They could even be in conflict with both our own and the users’ ideas. One example of this is how the use of the third menu in the Contacts program conflicted with the consistency (see part 3.1) of the menus. The third menu, ‘All’ menu, looks the same but has different functions depending on if it is being used in the ‘main view’ or in the ‘detail view’. In the ‘main view’, the menu decides for what group of users will be visible in the interface. If for example the group work is chosen in the ‘main view’, all users belonging to that group will be visible in the ‘main view’. If you make the same movement in the ‘detail view’ (showing details of one user) you will not decide for what group to be visible in the ‘main view’. Instead you will change the belonging of this specific. He/she will be added to the group work.

The unique use of our application and the goals of our users had to be taken seriously and weigh heavier than the guidelines. But in this specific case we chose to follow the solution from the contacts program. We had decided to follow the existing design as much as possible since we didn’t want to confuse our user. That is why we decided to chose this solution also for the menus in our program.

The persona pro-speaker, A. Cooper stresses the importance letting the use context govern the design.

“Although style guides can help, they really don’t address Goal-Directed interaction design problems. These need to be treated on a case-by-case basis. Users with different goals use the various applications and each product’s interaction must address the appropriate goals.”

[1, p. 199]

In cases when the Style Guide wasn’t in accordance with the goals of the users, the pros and cons of either solution were discussed. Going against the Style Guide would require a very good reason. Our program was only one of many programs in Symbian OS. Since an important usability goal was to make every program in the mobile phone work in the similar way, the Style Guide could guide us in our design work. The Style Guide turned out to be a more important tool than we had first expected.
4.2.1 The Emulator

The Emulator, following the Symbian SDK\textsuperscript{14} contains all Symbian OS programs and therefore is the UIQ Style Guide in practice. This tool was very useful to help render the guidelines in the Style Guide. Besides that it presented good design solutions that could be used in the design of Quill. The Contacts program had several similarities with Quill, which will be presented in the following example.

\begin{figure}[h]
\centering
\includegraphics[width=0.4\textwidth]{figure13.png}
\caption{The ‘detail view’ of the Contacts program}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=0.4\textwidth]{figure14.png}
\caption{The ‘detail view’}
\end{figure}

The picture to the left (picture 13) shows the ‘detail view’ of the Contacts program. When we were building the ‘detail view’ of Quill (picture 14) we used the Contacts program as a starting-point. However there were important differences between the programs. The main goal of the Contacts program was to store information, while the primarily idea with Quill was communication. The information presented in Quill was therefore cut down, because (1) information should only exist in one place (the Contacts program) and (2) people use programs efficiently. Unnecessary information can confuse or even irritate the user.
In the next we will see how influences from earlier work (in this case the interviews) continued to play a role in the design. In this example the idea of not having too much information in the ‘detail view’ is amplified with research coming from earlier investigations. This example shows that when taking design decisions not only one parameter alone decides the design. Influences from tools like the Emulator were used together with other attributes informing the design, when decisions where made.

Here is a quote from an earlier interview:

“Interviewer: Do you have much information in your address book?
Interviewee: Yes, the funny thing is that I actually use the Outlook on the computer and have the address book actually in the mobile phone. In the phone I only save phone numbers and in the Outlook I also have mail addresses and other things. I don’t have any more than phone numbers in the address book of the phone and that is because I find it cumbersome and time consuming to add them.”

[From Interview 8 row 67-71]

It is clear that people use applications efficiently and only use those features that are unique for the application. This is why Quill only got information and features connected to the use of instant messaging. Other ‘nice to have’ features and unnecessary information were left out. The final solution to the design of the ‘detail view’ therefore was to give users the opportunity to reach information or functionality through links to other Symbian OS programs. We chose to link the ‘detail view’ of our program to the Contacts program where information about the user is saved. This way we could avoid having this information in our application from the beginning instead let the user decide whether he/she wanted this information in our program.
4.3 Technical limits

Different technical circumstances also had an influence on the design of Quill. Especially characteristics in the different plug-ins MSN (Microsoft Messenger protocol) and Jabber (an open source protocol), but also the limitations of the mobile phone put constrains on the design. Both external and internal technical circumstances affected the design, which will be described below.

4.3.1 External influences

The two plug-in protocols, MSN and Jabber that was implemented in Quill had a rather large influence on the design. Since Quill should present one-interface only, differences between the protocols should not be visible in the design. This became an issue for discussion in the design of the ‘detail view’. Our first idea of how to get detail information of a contact was to make Quill collect the information from the protocols. The information would be collected every time the user went online. This way the information would always be correct and the user wouldn’t have to put in information twice. But because each protocol store slightly different information we had a problem. The consequence of getting the information from the protocols would violate to the rule of consistency [3]. Consistency means that everything in the program will work and look the same, independently of protocol. We needed to have a similar design in our program and also when compared to the different programs in the Symbian OS (see the UIQ Style Guide and Emulator, part 4.2, 4.2.1). The solution was a compromise. Information stored in the protocols, the UIQ Style Guide, our ideas for the application and the work involved all resulted in a final solution: (1) Only information accessible in every protocol would be saved in Quill. (2) A link to the Contacts program (the address book) of the mobile phone would give the user the opportunity to collect more information if necessary.
4.3.2 Internal influences

Since our program, Quill will run together with the other programs in the mobile phone, the limited memory capacity has to be taken into consideration. We added a feature that would let the user decide for him/her the number of messages he/she wants to save in the history. The history contains old conversations. This design would be help in avoiding the phone to be out of capacity. Since the size of our program could affect the speed of the whole mobile phone, it was important for our program to be kept small.

One feature that had a more indirect influence on the design was the seamless part. The customer wanted for Quill to switch independently between a connection on GPRS and Bluetooth. After weeks of work, it became clear to us that this technology didn’t work on the mobile phone (the Sony Ericsson p800) we had available for testing our program. That had the result that the implementation group developing the seamless part of the program couldn’t make any testing to see if the switch between the connection worked or not. Since a lot of effort was put on a feature nobody knew didn’t work, some user oriented features had to be deferred. One of the functions we could not add to our program was for example making possible to assign one contact to more than one group. Another feature we had to defer in our design was making possible for the user to visit a webpage just by clicking on an Internet link inside a message.
4.4 Developing a persona

4.4.1 Fantasy persona

The cyclic development of the evolutionary process had a demand of an agreement of the first delivery. This pushed us in making interviews about what functions were the most important for our program to have. The questions of who would be our typical user, what he/she would work with, how old he/she would be and so on still remained. We had experienced difficulties in finding enough people to interview for creating a persona. The limited number of people to meet with and the urgent need of getting to know our user was the reason why we started to build a fantasy persona. Our fantasy persona was an imaginary user, the way we believed him/her to be according to the information we had collected during our first interviews. To get a feeling of our future user, what kind of person he/she was, we put together information like age, profession, family and interests. The work of specifying our fantasy persona helped us in becoming more aware of our own thoughts about what person we imagined our future user to be. This awareness helped us in separating our own thoughts about the needs of the user from the personas needs.

4.4.2 Using a persona mall for developing a persona

We were inspired to the idea of using a persona mall by one of the articles written by Grudin and Pruitt. They presented their persona in a very detailed way and with connections to system functionality. This guided us in what information could be important to have also for our persona. We went through our interviews several times to be able to collect as much information as possible and to avoid getting the wrong information added to the malls. These are examples of how some of the information from an interview was abstracted to the persona mall:

(Extract from one of our interviews)

"Are you a sensation seeker or?"

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15 See Appendix 2
16 Grudin, Pruitt, Personas: Practice and Theory
17 See Appendix 1, the Persona mall
Yes, I learned to use a snowboard last week. ... So I made my first “grind” in the “Snow park” last week. I will not tell you how many times I hit my butt! ... Yes, I have always wanted to try new things out also in my work. “ (Row 247)

…” How often in a day do you use ICQ?

Often if you go to talk or phone people it will be a lot of noise, I mean you talk about other things than work. Therefore both email and ICQ or whatever program you like, is an advantage because you can be both short and precise in order to deliver the exact message and then off it goes.”

(Row 46)

…” (This shows how that information was abstracted to the persona mall)

“John is a very open person that easily talks to other people. He is curious and likes to test new things all the time; this is true also at work. (...) John also wants to be able to perform his tasks both quick and efficient. He wants to have creative and challenging tasks. He is likes to work with a focus on result and sometimes rather sends an instant message to a partner close by, than talking directly if the conversation concerns some detail.”

During our work of research, interviews were taped and transcribed into text. This made it possible to get the details of our persona right. We could also return to the transcriptions when we were in doubt of the exact goals and thoughts of a particular person.

4.4.3 Abstracting our persona: Toward the general user

When we started our work of abstracting our persona, the information from the persona malls was used as a starting point. The work was conducted stepwise and the whiteboard was used to get an overview when compiling information for every person. The first step was to write the name and age for every person and the next to add characteristics of his/her personality. Finally, goals/needs according to our program were added for every person. Here you can see an extract from our work at the whiteboard:
The picture above (nr 17) shows the compiled information of a 34-year-old male. It is based on the information from the persona mall. The red text shows personal information and characteristics; he is adventurous, curious, is focused on the result, fond of technique, has a family and so on. The word *availability* is marked as a keyword since we found that word to be the most important according to his personality. The most important features considering his needs of our program, *concisely* and *fast*, are written in blue. Those needs are related to his work situation above all. In his work it can often be important to get in touch with and get an answer from a colleague at the office, at once.

The next step was to identify different archetypes. Since none of us had any practical experience in developing a persona we found it difficult to know which people could together form one archetype and which people needed an archetype of their own. We were easily confused by similarities in peoples work situation, age and characteristics. We discussed the information from the persona mall several times to be able to separate those needs in a better way. We conducted this work stepwise and returned to our sketches on the white board several times. This helped us in getting some distance to our work and by that distance seeing more clearly which persons could together form one archetype. It also helped us in trying to in avoid pitfalls like forming groups of people on the wrong basis like grouping people of the same age, appearance or hobby. Despite these similarities those persona can have very different needs of our program.

We started with adding the most obvious persons we could find of each character. The picture below (picture 18) shows one of our first sketches of the work of dividing users into different archetypes.

*Picture 17. Our work of abstracting a persona on the whiteboard.*
So far we had identified five different archetypes. Each of them consisted of one or two persons. To form groups of archetypes we tried to find similarities in between them by marking keywords and linking them to each other.

We continued this work until we had formed as many archetypes that all of the persons were participating in one group. Some of our interviewees formed a group of their own. Now we had to identify which of the personas should be our main persona. We started by removing three of our archetypes since we didn’t find them to be them very typical users. By this we mean one archetype removed since it was not very fond of those kinds of programs. The other two groups removed were so advanced that they would be able to manage all types of program. The archetype we finally chose for our design persona was Archetype 1 (see picture 19). This archetype had a big need of being available to other people and of communicating with colleagues on the office.

The users of this group are only sporadic users and does not have a big interest of our program.

Similarities between these are for example an importance of being correct in their writing

These two groups are both having a big net of contacts

Picture 18, forming groups of archetypes

Picture 19, Archetype one
When we had finally decided for archetype one to be our main persona, we had to give our persona details with name and characteristics to mediate a picture of him/her. One way of making the persona feel more like a real person, is to present a detailed description about his/her characteristics and goals. You can give your persona a name, a description of where he/she lives, what car he/she drives, his/her family situation and so on. It can also be important to give a background of his/her work and family status. We started with compiling the needs and characteristics of our persona (see picture 20) and then continued with giving her a background with a profession and a family history (see picture 21).

The work of abstracting our persona continued during two weeks and finally we had identified our persona, Malin Sjöqvist, to present to the group.
4.4.4 Use of our persona

We used our persona in many different situations in our design work. Our persona was useful to our work also during development, since it was used as a base for discussions about our user and his/her needs. As the work of developing our persona continued we achieved more and more knowledge about our user. This helped us in focusing our design work on the user needs. When we had finally abstracted our persona Malin, we could get more specific guidance in discussion about the graphical user interface. Malin could give us answers to questions we had about details in the design. The specific description of Malin’s needs according to Quill helped us in getting a better understanding for who we were designing. It helped us also in seeing what was important to consider in our design. Design suggestions and adjustments for the design were compared to and evaluated according to the needs of Malin before changes were made in the design.

We have tried to follow Malins goals as far as possible when making the design. The following present one of about ten goals each connected to a specific user demand on the program. This is an abstract from the document of our main persona, Malin Sjöqvist (27)\(^\text{18}\). The goal is to quickly be able to change medium:

"Malin is interested only in seeing the information that is of most use to her. Efficiency is another keyword. One example of this is that she wants to quickly be able to switch between the contact list view and the detail view to get some information of her contact."

"... nice to see phone numbers of the contacts through one simple command."

Since efficiency is important to Malin we decided to make the linking between the ‘main view’ and the ‘detail view’ as easy as possible. With the use of an icon we could easily take user from ‘main view’ to the ‘detail view’ (see picture 21). The solution of being able to quickly change medium was to add an icon next to the phone number/ e-mail address in the ‘detail view’ of the contact. By tapping the icon next to the phone number/e-mail address the phone would dial the number or send an e-mail to that contact.

\(^{18}\) See appendix 3
Another example of how Malin contributed to the design is how the suggestion from one of our user tests of was evaluated to the needs of Malin. The suggestion was to add information like *work title* and *company name* to the program. Since we found that information also to be important to Malin we decided to add it to our program.

Our persona has also amplified design decisions in our design work by pointing in the same direction as other influences in the design. One example of this is how the *persona* together with *interviews, other IM-applications* and *user testing*; directed the way we connected the link of the ‘*main view*’ to the ‘*message view*’. The use of the contact name as a link to the ‘*message view*’ was suggested to during one of our mock-up sessions. Since the suggestion also followed Malins needs the suggestion was amplified by the persona.

### 4.5 Developmental limitations

Before agreeing on a requirement specification the design group had to take into consideration the *technical knowledge* in comparison to the *time available* in the project. Every function added had to carefully estimated and evaluated to make sure that the project would not break the time schedule.

The developmental limits have affected the design of Quill in many ways. This became especially apparent when new information came from the user tests. Changes that wouldn’t have any large affect on the program (like changes in menus or names on buttons) were suggestions that could be implemented in the next EVO-step. There was not enough time for making bigger adjustments, like adding new functionality to the program, even if this would be useful for our target group. Below follows an example of how the time put limits on what could get realized in the design.
When a program will be used professionally other things can affect the design. It’s for example common for a company leader to have many different contacts. He/she might want to sort the contacts after the company they belong to. Some of the contacts can be part of more than one network, which is why it can be important to have the possibility of assigning a contact to more than one group. This suggestion was one of the outcomes from one of our user test. Even though this was a wish from our users we had no possibility of adding this feature to our program because of the developmental limitations.

Many functions like the one in the example have been removed from the list of priorities because of our developmental limits. When prioritising between tasks also the programming skills of the project group had to be taken into account. Another function we weren’t able to have in our program was a sorting function in the contact list. This function would let the user decide for him/her in which way to sort the contact list; by first name or by last name. This function was also removed since it would be very time consuming to implement and when compared to the importance for the usability of our program, it was not considered to be necessary.
5 Discussion

We knew already from the beginning of this project that one part of our responsibilities would be to develop a persona. Because of that we could plan for how this should be done already at an early stage in the project. We believed that the developing of our persona would be the one thing in the project, demanding the most of our time. We also believed that the persona would have the greatest influence on the design; that most of the design would arise from the needs of the persona. But it turned out that working with the persona was only one of our tasks. Since our work was integrated with work in the rest of the project we had to prioritize working with the most stressing needs for the project at that time. We had to start the design work with identifying what functionality was important for our program to have. The work of developing a persona had to be postponed to the future. Since our work on the persona went on in parallel with the interface design we got aware of the many different attributes. Besides our persona these attributes came to influence our design: interviews, other IM-applications, technical limitations, UIQ style guide, developmental limitations, statistics and testing.

In the following part we will discuss our experiences of using a persona and our work of having traceability in the design.

5.1 Using persona as a design tool

In our project we used persona as a complement other methods. The persona contributed to our work in many ways and the benefits of using a persona were many. The persona functioned as a communication tool between the design group and the developers communicating the design within the project. Our persona has been used most of all within the design team for reasoning about design decisions as the prototype and system has evolved. The continuous work of developing a persona, made the user (represented by our persona) become a natural part in discussions about interface design. The persona gave us an awareness of the importance of working consciously with bringing the user into the design. Besides that it also helped us in keeping focused on user goals when reasoning about the design.
In exploring the area of design, Sharrock and Anderson highlights the design process as reasoning’s between individuals within the design team, in working out the design. In this sense the user plays the role of a scenic feature\textsuperscript{19}. As such it is more a concept for the designers reasoning about design rather than direct input. In our case the persona played the role of a scenic feature used for reasoning about the design. Since each goal/need of the persona was connected to a specific user demand on the program our persona could guide us in the design also of specific details of the program. Malin’s goal of availability can tell us a lot of her needs of our program. This abstract from persona description of Malin\textsuperscript{20} will give us an example of this:

\begin{quote}
During meetings she lets the mobile phone on, but without the signal. To be able to choose if it is a call she wants to take, it’s important to easily be able to see who wants to get in touch with her. On the Quill application she will be able to both read and answer a short message without disturbing any meeting.
\end{quote}

This abstract gives us three examples of how Malin needs had a direct affect on the design of Quill. To solve Malins need of availability the program the program needed to support these functions (1) being able to change notification (2) display the sender of a message(3) make possible of reading and answering messages without making disturbing noise.

The most difficult parts of designing for an undefined user are to (1) find the user and (2) to be specific about the users needs when the user can be anyone. The persona helped us in being both specific and general. During our work with developing a persona we could identify many different categories of user. Each of them became one persona and in that way we could identify one of them to be our most important user. A persona is built upon information from many different persons. That made it possible fulfilling many users’ needs just by designing for one persona. The persona became a “real” person, Malin Sjöqvist, with very specific needs. Another benefit of using a persona is that he/she is always “present”. Whenever design decisions have to be made you can get the answers you need from your “user” without disturbing the development process.

\textsuperscript{19} Anderson, Sharrock, \textit{The user as a scenic feature of the design space}, p. 10
\textsuperscript{20} See Annex 3
Drawbacks with using personas are that developing a useful persona takes time. First of all we needed to find people to talk to in getting to know their goals of using our product. It was not difficult at all to find students to talk to but we also needed to get in contact with people from the working life. We needed to talk to people from different professions and workplaces, to also get their point of view. This work was difficult and demanded a lot of our time and effort.

According to Cooper the persona should be developed before the design starts. This requires an initial investigation phase that can be both time consuming and expensive. Besides that it can be difficult to present a usable persona if you don’t know the details of the product being produced.

“Cooper’s approach can be effective, but our use of personas diverges in several ways. He emphasizes an “initial investigation phase” and downplays ongoing data collection and usability engineering: “Seems like sandpaper…Very expensive and time-consuming, it wasn’t solving the fundamental problem. [5]”[6, p. 1]

In our project we have chosen to work with the development of our persona in parallel with other tasks. In that way we could use the information collected for our persona also in other parts of the design. This way of working with many different tasks at the same time has given us a better knowledge of what information was important for our persona to have.

When you as a designer are working with abstracting a persona it is easy to be influenced by your own thoughts. When you are identifying groups of users that could form one persona it is easy to be confused by interviewees reminding of each other. Instead of finding two persons with the same goals you can easily be confused by people reminding of each other in age, interests or work situation. We found it difficult to identify the user’s goals from the interviews and sometimes it was also difficult to know how to interpret the answers of the user in a correct way.
In our project the persona was used as a complement to the other methods used\textsuperscript{21}. This is also emphasized by J. Grudin and J. Pruitt [7], both co-workers at Microsoft:

“We always design before putting up buildings” and claims that designers have an innate ability to make intuitive leaps that no methodology can replace [7] understate the value of user involvement.” Personas as used by Cooper can be valuable, but they can be more powerful if used to complement, not replace, a full range of quantitative methods. Personas amplify the effectiveness of other methods.” [6]

The process of developing a persona in parallel with the rest of the project work had the result of a better awareness and focus on design. We believe that persona is a very useful design tool if used as a complement to these other attributes informing the design. Our experience is that the persona has helped us in focusing on the users needs both during the development phase and when developed. When you as an interaction designer are working in a software development project you have to follow the work of the rest of the project. This means that you have to contribute to the design in the best way you can considering the time available.

5.2 Traceability in the design

As interaction designers it is very important to be aware of why we have chosen the design solutions we have done. A first step towards developing user interfaces in a more conscious way is to map the design. That way you can trace and also be aware of were the design decision comes from. This way of working in parallel with many different tasks has helped our work in becoming more aware of the many things influencing our design. Because of that we have during the design process come to work consciously with tracing the attributes influencing our design. In this way we have become very aware of why we have made that decisions and what the result of that decision has been. In the beginning of this project we had no idea that this part in the design would become so important and influential to our work. We started the project with the belief that the one thing influencing the design the most would be our persona, but instead we ended up with a whole circle of attributes (see figure 24)

\textsuperscript{21} See chapter 4, Attributes informing the design
influencing different parts of our program. All of them were informing the design in one way or another (see part 4, Attributes informing the interface design).

When you are working with developing software you also have to consider how to integrate the technique to the interface design. New technique such as our messaging protocols/Bluetooth needs to be integrated to the graphical user interface without influencing the design more than necessary. The technique is to be invisible, only things of necessity to the user, needs to be visible in the interface. That is why we in our program have chosen to display information of protocol belonging (see picture 25) only in the ‘detail view’ of the program (where user specific information is presented). The reason why this information is visible only in the ‘detail view’ of the contact, and not in other views (like the ‘main view’ or the ‘message view’), is that this kind of information is not of interest for the user when sending a message or checking status.

We have also decided to indicate the connection used at the time, Bluetooth or GPRS. The technical part, i.e. the switch between GPRS and Bluetooth is not visible to the user, but since the change of connection will have an affect on the user (Bluetooth is both quicker and less expensive to use for connecting to the Internet) the switch needs to be indicated in the design (see picture 2).
For things to be visible in the interface it is important to be able to trace back the reason of why they are used in the design. In that way all the details can be traced back to its origin. We, as designers have to take the users needs instead of the technique as a starting-point when designing. In the picture above (picture 25) you can also see that many different attributes have influenced this particular view: the protocol, the persona, and the Contacts program (the address book of Symbian OS). This view has also been influenced by our persona with her need of being able to change medium in an easy way (see 4.4.4). The protocols were also influential to this view by the reason that our program had to support many different protocols. This made it necessary to keep the design general and display only the information being the same in all of the protocols (user ID and nickname). Only information supported in all of the protocols used could be added to our program. We have chosen also to follow the design of the Contacts program (the address book) by the reason that following the design of the UIQ Style Guide would make our program consistent with the rest of the programs in Symbian OS.

Being able to show what factors have influenced which parts of our design is not important only to the design; it also give us credibility in our work both according to the rest of the team and towards the customer. Awareness in the design shows the customer that we are aware of why decisions have been made. It will also explain why the software is designed the way it is when discussing design questions with the customer. Working with a tight time situation is not always bad. In our project the time situation had the unexpected effect that our awareness of were our design decisions came was invoked. The limited time made us become more focused on our task.
5.3 Conclusion

One of the issues of making design is that we have to be certain that we are making design for the user and not for ourselves. We all interpret things individually, based on who we are. This can make it difficult to separate our own wishes from the needs of the user. We sometimes end up apposing design decisions to the application based on ourselves, when we instead should be developing for the users. To work professionally with traceability can hopefully help avoiding doing design only for us. It is not wrong to use yourself as a tool in design, but we will be more professional as designers if we can say that we are aware of why and which of the design decisions comes from ourselves.

Working in parallel with the development of persona and interface design has helped us become aware of the many things influencing the design. It has also made us work more consciously with traceability in our work. Consciousness in working with the design has made it possible to point at details in the interface and to trace them back to the things influencing that specific part of the design. Being able to show what factors have influenced which parts of our design has given us credibility in our design. It has given us credibility also in our work as interaction designers.

We believe that a design persona is very useful as a design tool if used as a complement to other methods. The persona has contributed to our design in many ways but the belief that the persona would be the one thing influencing of our design the most, wasn’t true. Even though our persona was very useful to our design work, it was only one of many attributes influencing the design.
References

Literature

[1] Cooper, A. The Inmates are Running the Asylum. USA, 1999. p.144

Articles


**Websites**

[16] Blekinge Institute of Technology  
http://www.bth.se/, 2003-03-21

[17] Blekinge Institute of Technology  
http://www.bth.se/utbildning,

[18] Freydenson, Bringing Your Personas to Life In Real Life.  

[19] Goodwin, Perfecting Your Personas, newsletter Cooper Interaction Design  


[22] UIQ Technology Internet homepage  
Appendix

1 Persona mall, foundation document example

Each item in the lists below should be written as close to reality as possible. It is important to write all data as a rich and detailed story, without losing the important data.

Picture

(Real pictures preferably both face and full body.)

Overview

- **Name**: (John, easy but credible)
- **Features and Age**: (John is a wrinkled old mechanic with a glass eye. He has a green- and white-striped cap which he has worn since his 40:th birthday twenty years ago….)
- **Home address**: (16 Evergreen Terrace, Springfiled, which is a yellow mid-sized house with a red door. It has a small but gaudy fountain with goldfish on the front lawn. …)
- **Family**: (John has a heavy set wife who loves to bake. She runs around with an apron tied around her waist. She dabs at her round wrinkled face with a red kerchief tied to her apron. (dog, children)… )
- **Work**: (John has been a mechanic since his father retired from his firm and John took over, nineteen years old. … )

Typical day

(John wakes up as his wife leaves for the bakery at 6 o’clock. He brushes his teeth and… Every day at ten to seven John arrives to work in his green 75 dodge van. He greets Bob, Hank, and all the other workers a good morning. …)

Goals and Fears
(He is afraid of, hates, likes, goal in life)

**Technology skills**
(Hacker, technician, beginner, experimenter, manual reader....)

**Communication**
(How he keeps in touch with workers, family, relatives, friends)

**Quotes**
(Observations from real people and typical quotes)

**References**
(The documents and people that is the sources for this persona. Links and references.)
2 Fantasy persona: Designnisse Antagsson

Overview

Designnisse Antagsson
36 years, normal built, light brown hair (without a lot of styling).
He lives in an ordinary, small villa with his career wife and a five year old daughter.
He is working together with his colleagues in a team at Roxtech. They are producing isolators for cables and other accessories within telecom.

Personal, interests...

Designnisse is interested in his work, technique and of enjoying life. He drives his Volvo cross-country to the squash-hall together with his friends every Tuesday afternoon. Designnisse is a rather calm person, but he likes being efficient. He works now and then in his garden; when something has to be done. Now and then he watches a TV-program called “Äntligen hemma”. He sometimes gets inspired by the program and builds something that will make home more effective or that will increase the well-being at in the home. Designnisse watches the news at the television every evening. He reads the local newspaper eating his breakfast and drinking his coffee. At his lunch break at office he sometimes glances through the paper ”Dagens industri” to keep up with the development.

Goals and fears

Designnisse likes the word efficiency.
Designnisse likes to keep in touch with others; he is a team player.
He is a very social person and easily gets to know new people to associate with.
Designnisse likes to get an understanding of new stuff and to use new techniques.
He does not worry very much about money; he has enough and besides that sometimes more than that.

Technical knowledge

Designnisse is quite technical; he likes new stuff and has easy to learn since he is curious of most things, as many things he has time to learn about.
Communication

Designnisse calls his mother about once a week.
Han uses ICQ at office but not at home since he doesn’t use his computer very much at home, and he does not surf on the Internet very often.
The icq-messages sent at work are most of the times short - about meetings or questions about work ant the technical problems that occur.
Designnisse has a contact list of about 30 persons; most often he has contacts with 10 personas, 7 of them are in his team.
Designnisse communicates a lot; he makes a lot of phone calls since he prefers telephone contact instead of sending mails. He finds e-mail to be time consuming and besides that he doesn’t feel certain to get an answer.

Quotes

References

Designnisse is created by the Design team. We, Joel, Kristina and Therese have in a brainstorming put together our views of who we believe to be our user and what he is like.
3 Persona: Malin Sjöqvist (27)

Background
Malin is a quote ordinary girl. She is born and grown up in Norrköping, Sweden. Malin has always been interested in technology which is the reason she chose to study at the Machine Technology program at KTH in Stockholm in 1995. She was rather happy with this and during the following summer she was fortunate to get a summer job at Ericsson in Södertälje. During this summer she also met her boyfriend, Anders. He was working with developing software at Ericsson. Since Malin and Anders had decided to live together she commuted between Stockholm and Södertälje during the following autumn. During the second year of education Malin got tired of studying and when the summer began she started to work at the customer support at Ericsson in Södertälje. She enjoyed working at Ericsson and when she got an offer to prolong her temporary summer post at customer service, she accepted. She made a pause in her studying and continued to work at Ericsson.

In the spring of 1997 the electronic business developed quickly and Malin got an offer from her boss to get an intern education at Ericsson. Being able to get an education for free and besides that keep her wages was an offer Malin couldn’t say no to. She started to work at customer service, and stayed there for one year. In the same time she attended Ericsson’s internal education in ALCX-shunts. Since 1998, Malin has been working with support and education of Ericsson’s many customers. Malin often gets in contact with telephone technicians at Telia and is today a highly appreciated person at the different companies she visits.

Family
Malin is living with her boyfriend Anders (30)
She lives in a 3 room apartment in Södertälje
She has many friends, and meets with both couples and single friends during her spare time.
**Spare time**
Malin likes to keep in contact with her friends. She can sit for hours talking in the phone. She also likes to go out to for a coup of coffee or go to a gym to work out. In the weekends she and Anders often invite friends for dinner. Most of all she likes to spend her spare time together with Anders and just relax. It is important to Malin to separate her work and privacy. When she is free from work she always keeps her job phone off.

**Characteristics**
Malin is a curious person. She is always is open for new things and this can be noticed both in her active private life as well as at work.

“(...) Yes, but it has always been like that I have always wanted to try out new things and this is also true at work.”

Since Malin is a happy and “chatty” girl, she is very liked among the customers at work. Most of her customers are middle-aged/older men, who appreciate when she keeps up with their jokes.

**Work**
Malin is quite content with her salary of 24.000 Skr., but she hopes to achieve more in the future.
At work she educates people in how telephone shunts work. She also gives technical support to customers.
She works in close connection to her customers, answering their technical questions.
It is important for her to be available to the customers most of the time and for this she has got a mobile phone from Ericsson. She uses her mobile mostly for brief communication with colleagues when she is out of the office. With her mobile she can be available to her customers all the time, answering their inquiries. The mobile phone is her most important tool at work. This makes her an experienced mobile user.
Malins demands of Quill:

To be available for others
In Malins work with technical support it is important that both the customers and colleagues can be able to reach her. They need to see if she is at work or not and how to get in contact with her. When she is at work she can always be reached through her mobile phone, which she never turns off.
One example from Malins everyday life shows how important it is to be “online”. Malin tells:

“Last week things were piling up at the office. I arrived as usual to work around 8 am and was immediately sent to a meeting where I became sitting during the entire morning. In the hurry I didn’t bring my mobile phone. After lunch several customers worryingly called to hear if something had happened to me. Some of them were really irritated and felt left behind.”

- Why do you not answer when I call? One shouldn’t need to search for you an entire morning without getting to know…?

During meetings she lets the mobile phone on, but without the signal. To be able to choose if it is a call she wants to take it’s important that she can see who is searching for her. On the Quill application she needs to be able to both read and answer short messages without disturbing any meeting.

To know how she can get in touch with others – to have an overview
Malin has several different types of contacts in which the customers have a prioritized role. She is often “on the run” and it can be important for her to quickly get in contact with a colleague to be able to answer question for a customer. Quickness and having an overview are key words. For example: Malin doesn’t want to spend an hour trying to reach a colleague and than find out that he/she in on a vacation.

Quick communication
When Malin is visiting a workplace and quickly needs to get hold on a colleague, she wants to be able to choose a communication that causes as little trouble as possible.
Since Ericsson is paying for her mobile calls a new media has to be easier than making an ordinary phone call. Otherwise she will not choose to use it. The advantage of using a messaging application for sending a question is that these kinds of messages usually don’t include much besides the question. Ordinary phone calls with colleagues back at the office can often get time consuming since they often start with a polite conversation. Instead she can go right at to the problem.

“Do you make your own settings? It’s more if I can see that I’m gaining anything of it, if I can see that it suits me better to have a setting in a special way.”

**Want to be notified when somebody calls**

As you already know, there can be consequences if Malin misses a message; especially if it is an urgent message from a customer. Sometimes the customer gets impatient or angry that he/she won’t be able to reach Malin. Since customer support is an important service in order to keep the customers confidence and positive towards to the company, she has the policy to rather answer one call too much than one too less.

“It’s important to keep good customer relations. I butter up my customers by being polite and available to them at any time. That I’m available is important to their opinion about me and our company.”

**Want to be able to choose how to be notified**

When Malin is at a meeting or pays a visit at a customer she doesn’t want to be disturbed by beeping sounds or ringing phones. But still; she does not want to miss any important calls since she knows that some of her customers dislike/are not very fond of leaving messages on her Eurovoice. The Eurovoice is an answering function on her mobile phone. Malin wants to make her own settings to be able to decide for herself how to be notified. At some occasions a blink in the status field is enough. A blink is discrete but will still let her know that she has got a new message. In other occasions a beep or signal is more effective and will help her noticing that she has got a new message.
Be able to change medium quickly

Malin is interested only in seeing the information that is of most use to her. Efficiency is a keyword. One example of this is that she wants to be able to switch between the ‘main view’ with the contact list and the ‘detail view’ of a contact to get information of one of her contacts.

"... it is good to be able to see the phone numbers of your contacts just by using a short command.”

From interview 3/2-2003 - row 54-55
(Search way: T:\designgruppen\intervjuer\intervju 1)

In the detail view she can easily choose what number she wants to dial. By tapping the icon (sms/email/ICQ ... is shown as icons for the simplicity) next to the phone number, the phone will dial the number automatically. The same is for sending an e-mail.

Wants to be able to sort contacts into groups (store many contacts)

Malin has many contacts in her contact list and that makes it important for her to sorting her contacts into different groups.

Important to see the history

Malin sometimes get in contact with many people at the same time. That makes it important to be able to see the whole conversation (the dialog of sent messages) for one contact. Using the history function helps her in not loosing any important information and not to misunderstand a conversation. The history will also make it possible to save important information until she arrives at her office.

Simple to use

Malin wants to keep things simple and not make them unnecessary complicated. She is not very fond of complicated menus with contents that don’t match what she wants to be able to do within a certain view. She finds it pleasant to use programs that are reminding of the ones she already knows, since she does not want to spend a lot of time in learning a whole new design.
"It is difficult to remember in which menus to find what functions. I always have to look for them if there are no quick commands to use in the program. This is the truth of all IM programs. One example of the importance of consistency is the way a send messages by using quick commands in ICQ/msn."
From interview - row75-76
(Search way: T:\designgruppen\intervjuer\intervju 3)

Malin finds icons to be easy to use since she doesn’t have to use complicated menus that often are looking different in different pages. She finds that too much information sometimes can disturb when she is searching for a something in the program.

**Wants to be able to make settings to make her work more effective**

Malin wants to get a quick overview of her contacts. Since she has many contacts in her list she needs to sort them into groups. She wants to be able to decide for herself what contacts or what group she wants to see. Sometimes she even wants to hide some of her contacts or to hide all of her offline contacts from the contact list. Now and then Malin has a need of filtering her contacts. In those cases she wants to receive messages only from one/some of her contacts. This can be an important feature if she is in occupied a meeting, waiting for an important message from one of her contacts.