Untangling the mess – A redesign of a technical environment for a telecommunication company call centre. Part I: Understanding user needs.

Margrét Dóra Ragnarsdóttir, Síminn and University of Iceland (mdr@hi.is)*

The technical environment in a call center for a telecommunications company has exploded in the past years and is now in bad need for a redesign. This paper discusses how to address the redesign of such an environment and the method used for the first step in the redesign; understanding the user needs. Here user centered design is applied with the aid of probes that were designed in order to facilitate the discussion on user needs and focus it on the right level. By administering three probes in focus groups with users from the call center the researchers were able to find patterns in the needs of the users and thereby elicit a high-level design for the technical environment that will guide further detailed design.

Keywords: User centered design, usability, probes, call center

Siminn is the incumbent telecommunications company in Iceland. It was originally founded in 1906 with the arrival of the first telecommunications cable to Iceland. For the first 80 years, the company providing solely landline services. With the advent of the first mobile phones (NMT, later GSM) the company started to diversify. Shortly afterwards the company also started offering internet services (through dial-up) and in the past 10 years the product offering has become increasingly varied and complex. Now Siminn offers landline and mobile telephone service, internet services and interactive television for a residential and a corporate market. At the same time the company has moved from being a state owned monopoly to being a privately owned company in a competitive market environment.

Our research focuses on the situation that has evolved in Siminn's call centre during this time of rapid extension and growth. In time with the increased complexity in product offering, the technical environment in the call centre has exploded. With each new product, new tools have been introduced to handle orders, troubleshoot or configure. Currently there are over 60 different software tools available for the call centre, each with its own unique user interface and functions. Each customer representative (CR from now on) may need to use up to 40 of these different tools to service the customers. It is important to note that these different software tools do not share authorization (the user must log in multiple times) and they do not share databases (the user must search for each customer multiple times).

For a telecommunications company, service is a powerful differentiator. Customers take great store in good service and it directly influences their loyalty (Eshghi, Haughtona, & Topia, 2007). Bluntly stated it is not good service to expect the customer to wait for a simple request to be fulfilled because of a complex technical environment. That is a disrespectful waste of his time. It is also a waste of the company's resources since this situation directly and negatively influences the productivity of the CRs as each task takes unnecessarily long to execute.

Solving this problem is not easy. The complexity here described only reflects the intricacy of the systems that are needed to support Siminn's product offering. The CRs should not have to deal with this complexity and so the task here is to simplify the situation in order to provide a seamless and effective customer service. To attain that goal we must redesign the technical environment for the call center so that it supports the CRs in their work. First step in doing so is to understand what the CRs actually do and what they need to do it.

This paper discusses the methodology used in gathering the information in order to reach this understanding. We present preliminary findings and discussion of these findings.

Methodology

For the redesign of the technical environment in the call center we propose to use *user centered design* (Sharp, Rogers, & Preece, 2007). User centered design emphasizes that the focus in technical design should be on the users and his needs and with their help answer questions such as:

- Who are the users of the system?
- What are the users' tasks and goals?
- What is the context of the system and the usage?
- What functions do the users need from the system?
- What information might the users need, when and in what form?

User centered design is an iterative design process, which means that the design starts with a high-level view of the users' needs in order to get the full picture and then it iterates down to the detail (Sharp, Rogers, & Preece, 2007). In our discussion it was therefore important to get the users to discuss their work on a high level. In order to do that we compared our discussion to viewing a mountain: When you stand on a mountain, you don't see it, you only see the next rock in front of you. You need distance to see the mountain. This adjustment in focus was crucial in order to get the users to think of the technical environment in a new way and to get the discussion away from the current ailments of the technical environment. Such a discussion would not have led us to learn anything new.

To aid the discussion we decided to use probes. Probes are concepts (often objects) that can be used to help users draw the bigger picture that is needed before detailed design can be started. This methodology was selected precisely because it aids the participants in thinking out of the box; to bring the conversation away from the current problems and over to what is needed. This is a strong point for this method that is difficult to attain with other methods such as observations or surveys (Jaasko & Mattelmäki, 2003; Gaver, Dunne, & Pacenti, 1999).

In a technical working environment such as a call centre, tasks are abstract and it is difficult to point them out. For a carpenter or a sculptor this is easy because their work is tangible. The probes gave the users and researchers a vocabulary and common ground; something solid to discuss the users' work and what they need to do it.

There is a limited experience of applying probes in professional settings, they have more traditionally been applied in a less formal settings (Jaasko & Mattelmäki, 2003). The risk here is that they are not structured enough to yield reliable results that could be compared between different groups of CRs. This risk was reduced by introducing the probes in a focus group setting. In the focus groups the probes were administered like in an ethnographic study. The questions leading the discussion were indirect and open, refraining from any suggestions or guidance (Cooper, Reimann, & Cronin, 2007). The problem with a focus group in such a setting is that they tend to be too consensual (Sharp, Rogers, & Preece, 2007; Cooper, Reimann, & Cronin, 2007). The researchers tried to mediate this risk be playing devil's advocate and moderating the groups systematically. The members of the groups also knew each other well and therefore they were not as prone to silently agree.

The probes were designed specifically to discuss first the technical constraints (non-functional requirements) the users require of the system and then lead the discussion into tasks and hence the functions of the system. Any design of an interactive system must take both functional and non-functional requirements into account in order to understand the full scope of the system. Such non-functional requirements include requirements on availability, safety, usability and reliability (Sharp, Rogers, & Preece, 2007).

The probes were presented to four groups of about ten members in four sessions each. Each group represented a unit within the call center and included both experienced and novice staff members.

First probe, car.

The groups were asked to describe the technical environment in terms of a car, both current and ideal environment.
This probe gave them a vocabulary to describe what is most important to them about the technical environment, irrespective of the task; the so called non-functional requirements. Discussing non-functional requirements such as maintainability or reliability with people that are not software developers is very difficult. We needed a probe that would be common enough for everybody to be familiar with and epitomized common non-functional requirements. Therefore a car was selected. Everybody knows how to describe these concepts in terms of a car; all participants had driver's licenses and had at least second hand experience of owning and maintaining a car.

Second probe, house.

The groups were asked to describe the components they need to solve their tasks in terms of Lego©-bricks. Each color brick described a component such as a particular type of information or tool needed. Tasks, information and such concepts are very intangible and this was done to make them more tangible and ease discussion. The Lego©-bricks were selected because they intrinsically represent components that you can make something out of. They also have a positive connotation, being a popular toy.
To emphasize that the bricks were parts of a larger structure the groups were asked to build a house that represented a typical task and make the order of the bricks signify the relative order of the components in a task and their number the importance of each component. After discussing the components and the house we discussed their tasks and discussed how best logically to group the tasks and components into relevant tools that would support their work. Finally the groups were asked to map the tools to current user interfaces so as to understand in more detail the information and functionality required of these newly defined tools.

Third probe, postcards.

In between the regular research meetings we asked the groups to send us postcards that we gave them. This was a selective exercise, encouraged but not mandatory. The group members were given pre-printed cards, three of which had specific questions:

1. What is your favorite gadget?
   This question was asked to get the users to think about good user interface design.
2. Name an incident which made you proud to work for Siminn.
3. Name an incident which made you angry as a Siminn employee.
   These two questions were asked to get examples of extreme cases and to shed some light on whether the technical environment was in some way a player in these cases.

A fourth card was left blank with only 'Leave a message'. This was done in order to give the participants an anonymous way to express their feelings about the study or anything that was on their mind.

Results

The probes proved to be highly effective in getting the groups to talk about their job, what tasks they do and what components they need. Using the probes removed the discussion from normal office bickering that the dialogue between users and technical people is often reduced to and offered a new way of looking at things. All participants were positive in using the probes and enthusiastic about the work.

Cars

The groups' description of the current environment in the form of a car surprised us. We expected a description of a broken down car, not functioning, ready to be sold off for parts. A description that reflected frustration and even anger towards the technical environment. Instead we got a description of a car that was still going strong. A car that had a lot of mileage, was in need of some repair and maintenance, was not entirely reliable but mostly to got the passengers from point A to point B. This was a car that the users were ready to show incredible patience for, like you would for a car that you cared for. The descriptions that best caught the essence of our current environment involved home-made cars such as Chitty-chitty-bang-bang. A car that is custom made of many ill-fitting parts and needs special training to operate but has a lot of character.

When describing the ideal technical environment, the groups surprised us again by not describing a flashy sports car, like a Ferrari. Their cars were quite exquisite, but they were all SUVs or small jeeps. Practical cars that are designed to get the job done rather than reflect on their drivers. Dependable car models, such as Volvo, were prevalent again with the focus on practicality, not speed or looks. The non-functional requirements are clear: Reliability, availability and effectiveness over functionality and performance.

Houses

When describing the components needed by naming the different colored Lego©-bricks, the groups found a way to think about their job without the details of each transaction. They were able to focus on the things they needed to get the job done. Each group built a very different house but they all were good representations of their tasks. An example here is the house the sales unit built.

When building this house the group members decided to have a three-layered foundation:

- The first layer in the foundation (green) represents product information; you cannot sell without an understanding of the product catalogue.
- The second layer in the foundation (red) represents information about the customer; you cannot service the customer without knowing who she is and what relationship she has with Siminn.
- The third layer in the foundation (yellow) represents the customer needs, understanding what the customer wants you to do for him.

On this three-tired foundation a thick layer of orange bricks represents all the software interfaces the staff needs in order to fulfill the customers' requests. Often they need to interact with other parts of the company to get the job done (gray bricks) and sometimes they need to hand out hardware (such as mobile phones) to the customer (white bricks).

Figure 1. The house of sales, front and back

What is especially interesting here is the second wave of yellow, red and green bricks. When the sales representatives have executed the customer's wishes, they use the opportunity to cross-sell/up-sell additional products or services and therefore they added another layer of product info, customer info and customer needs. This showed us how effective this probe is to describe the tasks at hand.

Post cards
The researchers handed out 120 postcards and received 57 back. Of these 29 described incidents, 13 positive and 16 negative. These were mostly normal accounts from the front line, about good and bad customers, and good and bad co-workers. There was no recurring theme about the technical environments in these accounts.

Conclusion

The method gave us the tools to discuss the users needs with regards to their technical environment and their work of servicing the customer. What was most satisfying to see was that not only did the researchers learn a lot about the call center's technical environment but the call center management and even members of the groups learned new things about their work and what they need.
Results in short:

- The environment should be reliable, available and effective (think Volvo SUV).
- All groups emphasized the importance of a full and easily accessible view of the customer, it was always represented by a layer of bricks as the foundation of the house.
  The second conclusion is to build a full customer view. The discussions detailed what it should include and we need to reflect that in the current customer relationship management efforts within Siminn.
- The most prevalent task for all units is information sharing with customer, be it about Siminn's product offering or directions to solve technical problems.
  Third conclusion is that we need a strong knowledge base with an excellent search engine. Our discussion shows what information is needed and we need to analyze our current knowledge base in order to understand how to improve this tool.
- Fourth conclusion is that proper order capture and order management tools are needed that guide the CRs in creating valid orders and allow them to follow the orders' progress.

The result of this work is being gathered and further developed to lead the redesign the technical environment for the call centre, work that is ongoing at the moment.

References

Cooper, A., Reimann, R., & Cronin, D. (2007). *About Face 3. The Essentials of Interaction Design.* Indianapolis, IN: Wiley Publishing, Inc.
Eshghi, A., Haughtona, D., & Topia, H. (2007). Determinants of customer loyalty in the wireless telecommunications industry. *Telecommunications Policy , 31* (2), 93-106.
Gaver, B., Dunne, T., & Pacenti, E. (1999). Cultural Probes. *Interaction , IV* (1), 21-29.
Jaasko, V., & Mattelmäki, T. (2003). Observing and Probing. *Proceedings of the 2003 international conference on Designing pleasurable products and interfaces t* (pp. 126-131). Pittsburgh, PA: ACM.
Sharp, H., Rogers, Y., & Preece, J. (2007). *Interaction Design (2nd edition).* Hoboken, NJ: John Wiley and Sons, Inc.