

Chapter 3

Human-centered design process

The Human-centered design process, also known as the international standard ISO 9241-210:2010, is an iterative design process where multiple cycles of the same process is worked through. In the old version, ISO 13407, the design process has four central activities through the development [32]:

1. To understand and specify the context of use.
2. To specify the user and organizational requirements.
3. To produce design solutions.
4. To evaluate designs against requirements.

According to Don Norman, HCD is all about to solve the right problem by ensuring that people's needs are met, that the resulting product is understandable and usable for the desired tasks and that the experience of use is enjoyable [28]. With other words, HCD is a procedure for addressing these requirements. There are different variants of methods, but Don Norman defines four iterations stages (figure 3.1): (1) *observation*, (2) *idea generation*, (3) *prototyping* and (4) *testing* [28]. From the earliest stage of the project to the completion of the project, the activities should iterate until the project meets its requirements. This means that these four stages "are repeated over and over, with each cycle yielding more insights and getting closer to the desired solution" [28].

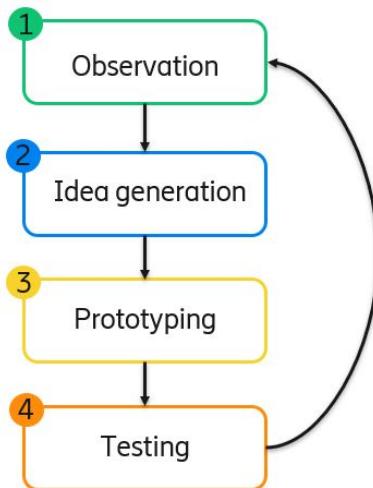


Figure 3.1: A model of HCD process.

3.1 Observation

The first stage of the HCD process is to observe the user who will use the product, attempting to understand the user's interests, motives and needs. This phase is the initial research to understand the nature of the problem [28]. It is also about to understand the user in general, their ethnography.

There are several ways to observe the users. The different methods and techniques used in this thesis are described below:

- **Focus group**

A focus group is led by a facilitator and normally 3 to 10 people are involved in the discussions. The participants are selected to provide a representative sample of the target group. The benefit of a focus group is to arise diverse or sensitive issues that might otherwise be missed. The facilitator's role is to guide and prompt discussions. It is also up to the facilitator to encourage quiet people to participate and stop the ones who are dominating the discussion [32, p. 302].

- **Observations**

During any stage of product development, observation is a useful data gathering technique. For example, in the design phase, observations help designers to understand the users' context, tasks and goals. Users can be observed as they perform their activities through indirectly records of the activity, direct observation in the field or in a controlled environment. This kind of technique facilitate the user/users to perform an activity or achieve a task without explaining or describing how and what they did [32, p. 321].

- **Online survey**

Questionnaires is a technique for collecting quantitative data as demographic data and users' opinions. A well-designed questionnaire is good at getting answers to specific questions from a large group of people, depending on the questionnaire's context,

target audience and data gathering goal. Online questionnaires are a more common way of creating questionnaires. They are cost-effective and effective for reaching large numbers of people quickly and easily. [32, p. 317] Online surveys also generates faster response and automatic transfer of responses into a database for analysis [1]. In that way it is possible discover trends and patterns that can support theories and arguments.

3.2 Idea generation

Once the design requirements are determined, the second stage in the design process is to generate potential solutions. There are different ways of generating ideas. In this project, the used methods are *brainstorming* (both individual and with experts), *bodystorming* and *workshops*.

- **Brainstorming**

Brainstorming is a generic technique used to generate, refine, and develop ideas [32, p. 503]. With this method usually two major rules are followed: (1) *generate numerous ideas* and (2) *be creative without regard for constraints* by avoiding criticizing ideas or premature dismissal of ideas. According to Don Norman there is a third rule: (3) *question everything* which encourages to ask "stupid" questions to question what might otherwise be obvious [28].

Brainstorming has been used multiple times during the thesis work, both individual and with a expert panel at Ericsson. This technique has also been used in focus group and workshop sessions.

- **Bodystorming**

Bodystorming, also referred as "embodied storming", is often considered a form of prototyping in context, and is enacted instead as a technology directly supporting collaborative embodied cognition [31]. This technique departs from ideational methods. Embodied storming can be applied as a design-research method, to help identify gaps and opportunities.

In this project, the used type of bodystorming can be called "use-case-theater", which means that the users where physically interacting/exploring the system to generate new ideas.

- **Design thinking workshop**

Design thinking is all about the importance of developing products that fit the users' desires, needs and capabilities. With other words, the fundamental issue needs to be addressed [28]. In this thesis a design thinking workshop means it is a hands-on, activity-based session [33]. The idea is through collaboration and problem-solving build empathy for the target users, generate ideas and in some cases also build a Lo-fi prototype.

In this thesis, this kind of workshop was performed together with an expert panel at Ericsson.