Joonas Harjamäki

Polarpersonaltrainer.com Online Training Software

A user experience study

This thesis study was made in co-operation with Polar Research & Development department in order to find out how polarpersonaltrainer.com online training software meets the needs of Polar Fitness customer group. Serving their customers and providing them quality products that meet their needs is an important factor for Polar. The primary goals of this study were to get to know Polar Fitness customer group better and to study how polarpersonaltrainer.com pleases the customer group and how it could be developed to better meet the customer group's needs in the future.

A group of six study participants were recruited using Polar's tester bank. The research period consisted of a three phased probe. The first phase was a start-up interview in order to collect information about the study participants. The second phase was a three week online diary. During the diary phase information was collected using selected open-ended questions to figure out developmental needs for the main features of the service and a set of standardized questions to find out information about the basic web service using the habits of the users. The third phase was a final observation and interview meeting. In the meeting the study participants demonstrated their basic use of polarpersonaltrainer.com, talked about their developmental ideas, commented on the ideas made by other study participants, and gave feedback about the research. The final interviews were also recorded for later examination.

The results of this thesis study were considered comprehensive by Polar Electro and the results will be helpful in further developing polarpersonaltrainer.com.

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Introduction

In modern web service design good user experience is a key factor in trying to make a web service successful. Internet users have started to expect good service experiences from the web services in the same way as they do when they go shopping for clothes, for example. In the internet user experience is created making user-computer interaction as easy and effective as possible and making the web service visually pleasing for the user. Companies have also started to notice the importance of user experience among the web service markets, through toughened competition. The actions in trying to improve user experience can be seen from increased amounts of user experience and usability research made by companies (Jokela, 2010: 7).

Polar Electro approaches their product design and development processes in a customer centered way. This was also the main reason, why I ended up with this topic for my thesis. Polar wanted to go "outside the box" and use somebody from outside the company to study the matter of how Polar Fitness customers actually use polarpersonaltrainer.com, Polar's online training monitoring service.

1.1   Introduction of Polar Electro

Polar Electro is a global designer, manufacturer, and marketer of electronic measuring devices including supporting services and programs for these devices. In this study the focus is on Polar Fitness heart rate monitors and a supporting web service, polarpersonaltrainer.com. Polar is currently employing over 1300 people and has 26 subsidiaries worldwide. Polar products are sold in over 35,000 outlets in more than 80 countries. During the financial year of 2010, Polar's revenue was slightly over € 152m. (Kauppalehti; Polar Electro)

Polar was founded in 1977 in Oulu, Finland, after an idea of a portable heart rate monitor in the late 1975. Before 1975 there were no possibilities to accurately record heart rate during workout. Since their starting days, Polar has filed several patents, the first one for a wireless heart rate monitor in 1982, for example. Polar's slogan "Listen to your body" is what Polar tries to help people do with their products. Actual listening to a human body cannot be done without correct measuring devices. Polar's product

range includes measuring devices for everybody, including top athletes and regular people, who are just interested in learning about the effects of training on their body. (Polar Electro)

1.2 Business problem

Polar Electro launched its polarpersonaltrainer.com training monitoring web service in 2001. The basic features of the web services have stayed relatively same throughout the product life cycle. With the help of this thesis Polar Research & Development wanted to check the current situation of how polarpersonaltrainer.com web service serves its customers' needs, and especially the needs of Polar Fitness customer group. They also wanted to know how the customer group actually uses polarpersonaltrainer.com.

1.3 Objective and deliverables

The objective of this thesis was to collect qualitative data in order to support the work of Polar Research & Development in further developing polarpersonaltrainer.com. A specified goal was to map out developmental ideas concerning center themes of polar-personaltrainer.com, including training programs, weight monitoring, and information sharing, and so on.

Polarpersonaltrainer.com is an open web service for all the Polar and non-Polar heart rate monitor users. Another objective of this thesis was to obtain deeper information about Polar Fitness customer group, get to know their web service using habits, find out which features of the web service are most important for them, and collect ideas on how they would like to develop polarpersonaltrainer.com. The basic web service using habits were collected using partly quantitative methods.

As a result of this thesis, in addition to the actual thesis paper, Polar wanted me to provide them with a project report including an overview of the project phases and a full and exact result report about the research. By achieving these research goals, this study will offer Polar Electro a better chance to cater to its Polar Fitness customers by offering a more user friendly and specified web service based on up-to-date information about the customer group's needs.

1.4   Research process

Polar did not want to guide my work too much at the beginning of the process, so I had a good chance to use the skills learned at Metropolia for creating and planning the research.

The actual research data collecting period started with interviews with each of the study participants separately. The goal of these interviews was to collect basic information about the study participants in order to create a better and deeper view of the participating group. The main information collecting period, i.e. the diary phase, lasted three weeks. The diary was carried out using the Google Documents web service. The study participants received a standardized diary form in their e-mail every day (the night before). The questions dealt with basic daily use of the web service and a special weekly theme. After the diary phase a meeting with each of the study participant separately and one or two Polar representatives was arranged to summarize the information collected during the diary period.

In his doctoral thesis, Jokela describes the phases of carrying out an assessment (Jokela, 2001: 136). My research process follows Jokela's assessment steps (described in figure 1) closely with a slight modification in order to better meet the needs of this particular process.
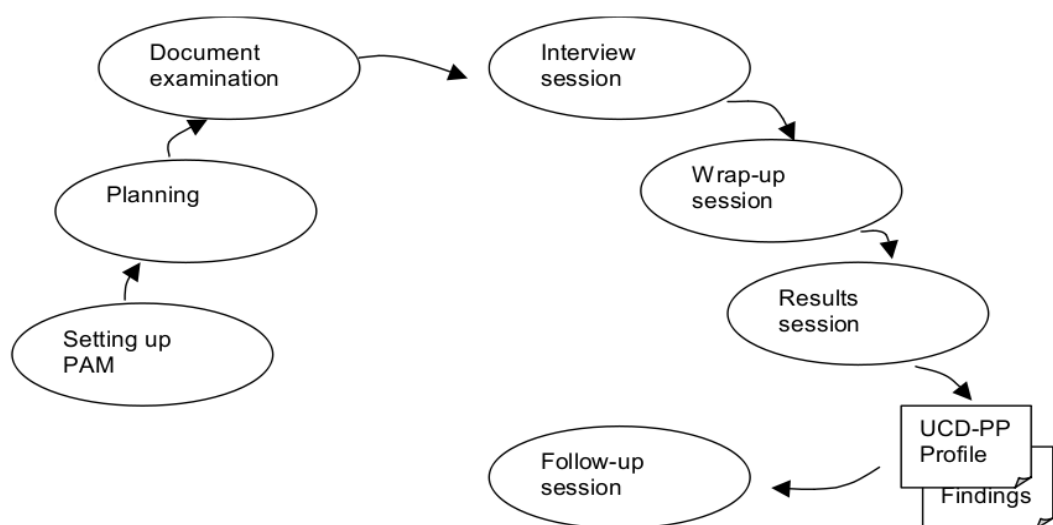
Figure 1: Phases of carrying out an assessment (Jokela, 2001: 136)

Step list, of my user experience research:

1. Setting up process research management team
2. Planning the process and exploring relevant theory
3. Examining current user interface of PPT
4. Recruiting the study participants
5. Start-up interview with each of the test group member
6. Collecting information
7. Final meeting including wrapping up the research and collecting information through observation
8. Result session with Polar Research & Development team

Steps 1 – 3: Planning the project and evaluating PPT

Planning the project started at the end of December 2010 with a meeting with Polar representatives in Polar facilities in Vantaa. In the meeting, the preliminary project goals were set and a schedule estimation was made. The first draft of the project plan was released at the beginning of January 2011 and the final version at the end of January 2011. In figures 2 and 3 I have presented the original project schedule.
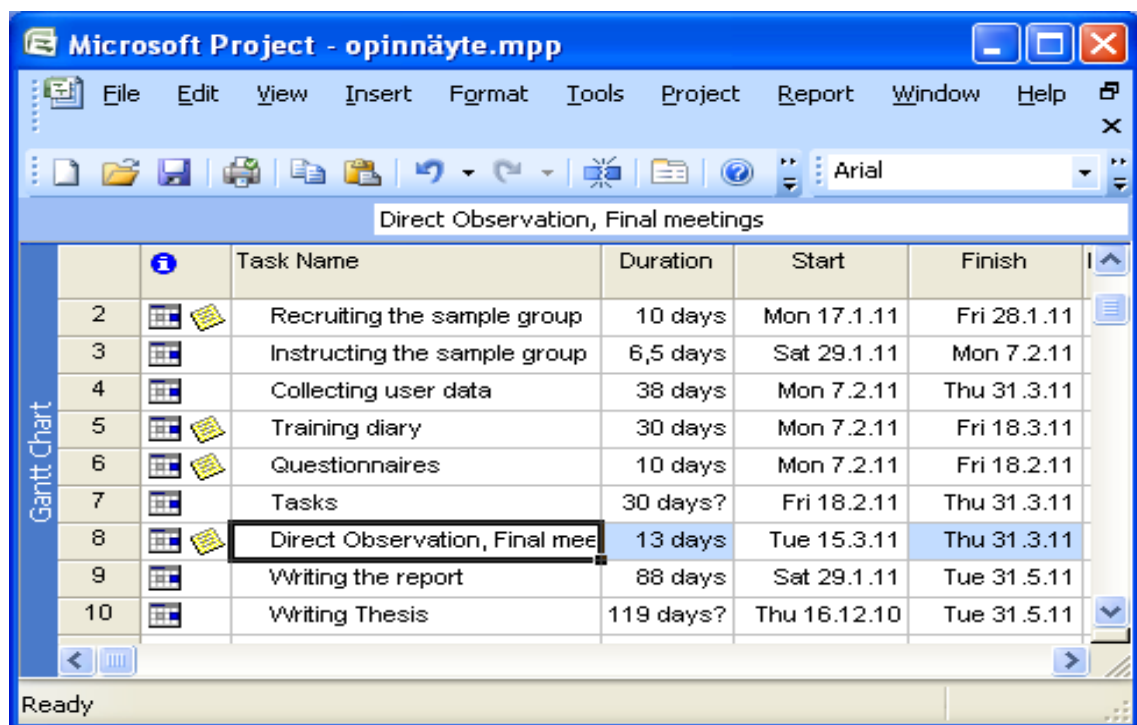
Figure 2: Original research schedule 1 / 2
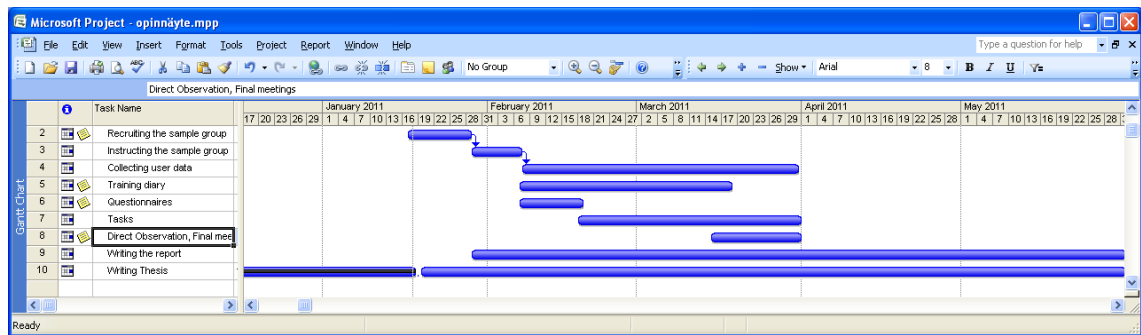
Figure 3: Original research schedule 2 / 2

I studied the user interface of polarpersonaltrainer.com so that I was capable of creating targeted questions about different areas of polarpersonaltrainer.com. I also wanted to get a deeper knowledge about the service, so that I was capable of better co-operating with the study group

Step 4: Recruiting the study participants

For this study a group of six FT customer group members were recruited. The recruiting was carried out by using Polar Tester bank and personal contacts. The goal was to recruit a group of experienced polarpersonaltrainer.com and Polar product users. The objective was that the group would represent the whole Polar Fitness customer group. In the recruiting process, in addition to the things mentioned above, demographic factors like age and gender were among the most important recruiting factors. The most important recruiting factors are listed below:

- gender: goal 50 % men 50 % women
- age: a wide range including people between the ages of 20 and 60
- heart rate monitor: equal amount of FT40, 60, and 80 users
- experienced PPT and Polar product users

The final study group consisted of two women and four men. The youngest member of the group was 22 and the oldest over 50 years old. The group included runners, team sports enthusiast, and people whose main form of exercising was gym training. The original recruiting goals, listed above, were met.

Step 5: Start-up interview with each of the test group member

In the start-up meetings all the study participants were interviewed one at a time. The meetings were mostly held at the work places of the study participants. The main reasons for the meetings were to introduce the project to the study participants and to collect information about their training habits and habits of using PPT. This information was later used to create user profiles of typical PPT users. In the meeting the study participants also received a handout where all the phases of the project were explained and some basic instruction was given.

Some feedback about the web service was also collected in the first meeting. The participants who had used the web service for a longer period of time already had some strong opinions about the service and heart rate monitors. The information collected from these meetings is presented in the project report among other developmental ideas (project report).

Step 6: Collecting information

During the follow-up period the study participants gave feedback daily using an email diary. The diary consisted of three standardized questions:
- The first (1) question was on how the users had used the web service today.
- The second (2) question asked the user to evaluate how the web service met his or her expectations today on a scale of $1 - 7$
- The third (3) was an open-ended question where the user had a chance to explain the number he or she gave in the previous question

The daily diary form also included special theme question(s). Each week of the three week follow-up period had a different theme. The theme questions were based on the weekly themes. The goal of these weekly themes and theme questions was to collect information on how the study participants felt about the most important applications and features of polarpersonaltrainer.com. A secondary goal was to direct the users to deeper explore the basic features and applications of the web service and find out if this exploration had any effect on their polarpersonaltrainer.com using habits. The

changes in the using habits could have been seen in the answers dealing with how the study participants used the web service today. The weekly theme introductions and questions are attached at the end of the thesis (appendices 1 – 3).

Step 7: Final meeting including wrapping up the research and collecting information through observation

Final meetings were held in Polar facilities in Vantaa at the end of March 2011. The meetings were held separately with each study participant. The settings of the interview situation were as much the same as possible for every study participant. The reason for standardizing the settings was that I did not want them to have any effect on the interview situation. The interviews were arranged in the same place and all the equipment used stayed the same. The make-up of the persons taking part in the interview was:

- interviewer (Joonas Harjamäki)
- the interviewee (study participant)
- one or two (1 - 2) Polar representatives, who also acted as typewriters

Polar personnel, taking part in the interviews, mostly followed the interviews as silent observers and made notes based on the interviews. But, as this was a unique chance for them to collect information from experienced polarpersonaltrainer.com users, they also had a chance to ask targeted questions about the areas of the study. I think Polar personnel being present in the final meetings did not have any negative impact in the feedback given by the study participants. The amount of information collected in the final meetings was so extensive that if there was an impact it was more of a positive one.

Exceptions in the final meeting settings:

With one study participant the interview was arranged elsewhere due to scheduling problems. In this particular interview Polar personnel was not present.

Final meeting tasks:

1. In the final meeting, study participants had a chance to comment on developmental ideas and comments made by other study participants. The most important comments made by each study participant during the research period were collected to a separate Power Point file prior to the final meetings, so that they could be presented to the rest of the study participants.

2. The study participants were asked to demonstrate their polarpersonaltrainer.com basic use to support the material collected during the follow-up period.

3. The study participants demonstrated the main problems or positive things they found regarding polarpersonaltrainer.com during the diary period.

4. The study participants gave feedback about the research.

In addition to writing down (by typewriters) the comments study participants made in the final meeting, the whole meeting situation was recorded using Camtasia. Camtasia is a sound, screen, and mouse pointer movement recording service provided by TechSmith.

Step 8: Result session with Polar Research & Development team:

After the final meetings a period of two months was reserved for analyzing the material and writing the project report. The project report was presented to Polar Research and development team in Polar facilities in Kempele on the 24th of May 2011. The results will also be presented to the evaluating board of the thesis.

1.5 Content of the thesis

The introductory section presents the background and goals for the thesis. It also describes the target company and the research process. The second section includes the theoretical frame of the study. The theoretical part consists of a presentation of human-centered web service design methods and the standards used in the study. I also added a marketing point-of-view in the theory, because I believe the marketing branch has a big impact on human-centered web service designing process. Marketing related

comments are added as part of the commentary I have made about the standards and methods.

Section three and four include the empirical part of the thesis. In chapter three I have fully presented polarpersonaltrainer.com web service in the light of a combination of the ISO 9241-210 standard, JFunnel model, virtual windows model, and marketing commentary. The fourth section discusses the results of the study and finally the fifth section includes the conclusions and summary of the study.

1.6   Abbreviations used in the study

CPV	Customer perceived value
CDV	Customer delivered value
FT	Polar Fitness, a Polar customer group
GUI	Graphical User Interface
HCI	Human Computer Interaction
HR	Heart rate
PPT	Abbreviation for polarpersonaltrainer.com web service used in this thesis
SZ / FZ	Sport Zone / Fitness Zone: a Polar term describing strenuousness of exercising from $1 - 5$ / $1 - 3$
USB	Universal Serial Bus

Human-centered web service design theories and models with a hint of marketing knowledge

The means of human-centered design, user studies, and development of products using prototypes or product evaluation methods are pretty much the same in service, product, or even in a car. (Sinkkonen, 2009: 35).

In this chapter I will present the human-centered standards and models I used in my user study. The primary question in this study deals with improving the user experience of PPT. What is user experience then? Sinkkonen (2009: $27 - 24$) divides overall user experience in two parts usability and using experience (in this study I will use Soren Lauesen's (2005: 9) term user friendliness to avoid confusion between terms).

Back in the 1980's and 1990's usability was the only word used. Good usability meant that the service pleased the customer or user. ISO 9241-11 standard defines usability as the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use. (FSF, 1998: 7)

Soren Lauesen (2005: 8) has another definition for usability. He divides good usability in two parts, i.e. ease of use and functionality. Ease of use means that the designers provide the features in such a way that the system is easily learned and that tasks in the service can easily be carried out. Functionality means that the system provides all the features so that carrying out the user tasks can be done. Lauesen (2005: 9) further explains the terms and divides usability into six factors:

- Functionality: The system can support the tasks that the user has in real life
- Ease of learning: How easy is the system to learn for various groups of users
- Task efficiency: How efficient is it for a frequent user
- Ease of remembering: How easy is it to remember for an occasional user
- Subjective satisfaction: How satisfied is the user with the system
- Understandability: How easy is it to understand what the system does? Especially in error situations the user needs to have an understanding of the service to be able to react in the right way.

The ease of use mentioned above is a combination of the factors ease of learning and understandability. Lauesen's description for usability covers some of the problems in the general usability definition in the ISO 9241-11 standard. Often good usability is reinforced by the term user friendliness to create overall user experience. User friendliness means the feelings user is having during the service using experience. These feelings are affected by the features of the service, situation of using the service, old opinions about the service and service providing company, usefulness of the service, and so on. (Sinkkonen 2009: 17 – 24). In this study I use the term user experience as a combination of Lauesen's usability and Sinkkonen's user friendliness (using experience).

In the following text I will present the standards and models I used in my study, so that the reader can understand the reasoning, structure and methods of my research. Due to the human-centered nature of the models and standards, I have added some deeper marketing knowledge when I found that marketing has something to offer for the model or particular phase of a model.

2.1   ISO 9241-210

The ISO 9241-210 standards for human-centered design for interactive systems replaced the old standard (ISO 13407) in 2010 (Travis, 2011). The idea of the standard is that the needs of the users are taken into account in all the phases of product life cycle, from designing phase to product development to ending the product life cycle. (SFS, 2010)

One of the main differences compared to the old standard is that the new standard describes six basic principles for human-centered design instead of the four included in the old standard. The principles in ISO 9241-210 standard are presented and explained below:

1. *The design is based upon an explicit understanding of users, tasks and environments:* The main idea of the standard is fully understanding the context of use. In the design process all the different users and user groups have to be taken into consideration and handle as a separate case. In the ISO 9241-210 standard an example is given were a young user uses a mobile device to download music and a business man uses the same system to access corporate information. This is an example where context of use is drastically different among the users.

2. *Users are involved throughout design and development:* The old standard suggested actively involving users in all levels of the design process. This format was loose and gave the designer a bigger possibility to create an opinion what actively involving users actually meant. The new standard says that the users are involved throughout the design and development of the process. The description of the principle does not give too much chance for loose interpretations like the old standard did.

3. *The design is driven and refined by user-centered evaluation:* This principle highlights the meaning of user-centered evaluation throughout the design

process. David Travis (2011) suggests that all the possible faces of the process should be tested and evaluated. On the other hand, Timo Jokela, who took part in designing the new standard, says that this principle puts too much emphasis on evaluation. He says that the reason for this is that in several cases, user-centered evaluation just becomes too expensive, and although it would be good to test all the possible process phases it just is not possible.

4. *The process is iterative:* In most of the design processes, iteration is necessary. It is hard to think that using user-centered methods, your first draft of a design would pass all the tests. Of course iteration is not necessary, if the unexpected happens. Iteration should not be done without any good reason. "Try to achieve appropriate design without unnecessary iteration"; this is how Timo Jokela (2010: 89) puts it.

5. *The design addresses the whole user experience:* Jokela (2010: 89) says that the concept of usability used in the new standard includes the user experience as a whole. In the design process, all the components user interacts with must be taken into account in order to achieve good overall usability and user experience. This also includes such features as online help.

6. *The design team includes multidisciplinary skills and perspectives:* The designing team should include a variety of experts from different fields, such as users and other stakeholder groups, usability, HCI-experts, marketing, and so on. (Jokela, 2010: 88 – 89; Travis, 2011; SFS, 2010)

The design process in ISO 9241-210 standard is based on four basic activities, like in the old ISO 13407 standard. Actually the activities are pretty much the same than in the old standard, but the content of the meanings has radically changed. The new process chart has a big emphasis on iteration between the different process phases. The design model suggests iterating whenever appropriate. The process phase circulation is presented in figure 4 on the next page. (Jokela, 2010: 89; SFS, 2010: 26 – 41)
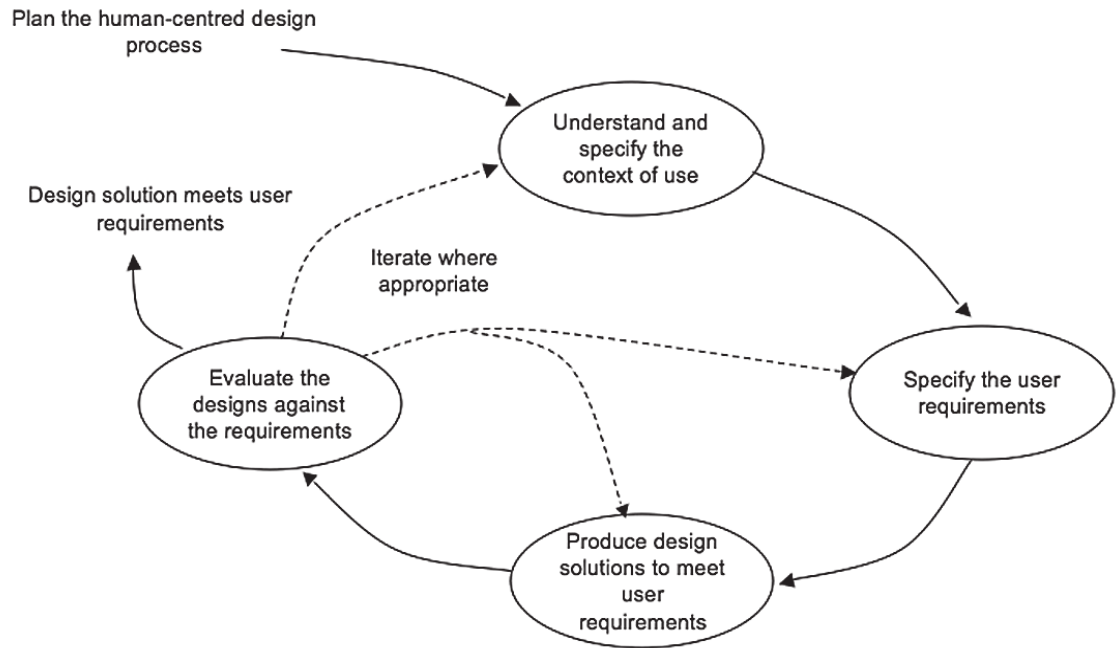
Figure 4: Design process according to ISO 9241-210 standard (Jokela, 2010: 90, modified from FSF, 2010: 29)

Design process activities in the ISO 9241-210 standard:

1. *Understanding and specifying the context of use:* the goal of this activity is to define the future context of use. This activity should be done explicitly for all the different user groups of the service.
2. *Specifying the user requirements:* in this activity user requirements are specified in relation to business goals and intended context of use.
3. *Producing design solutions:* as a result of this activity possible design solutions are created. This includes thinking through the whole user experience, including description of context of use, user tasks, and user-system interaction.
4. *Evaluating the design:* in this stage of the design process, the design is thoroughly evaluated. The best, but often most expensive way to do this, is to use user evaluation. This includes, for example, task modeling and simulation test. Other way to collect information about the design is to use professional usability evaluators. (Jokela, 2010: 90 – 95; SFS, 2010: 26 – 41)

2.2   JFunnel model of usability directed interaction design

The history of the JFunnel model can be tracked down to the year 1997 when Nokia and TeamWare started doing their usability maturity tests. For this testing, they used a process model created in the European INUSE conference. The model is described in ISO 13407 standard. An updated model was later published as ISO 18529 standard, or ergonomics of human-system interaction (UsabilityNet, 2006). (Joticon)

Timo Jokela studied the ISO 18529 and ISO 13407 standards in his doctoral thesis and on the basis of these standards created the KESSU model. The model was widely used during the early 2000's. Because of its wide use, it continued evaluating. In the year 2008 its visual shape was developed from circle to a funnel shape. This is how JFunnel model was developed. (Joticon)

Special characteristics of JFunnel model are:
- possibility of combining usability and business aspects
- clarifying and emphasizing the cap between usability and interaction planning
- importance of defining usability goals (squeezing through the funnel)
- the model gives the designer a chance to pick design methods freely (free from methods used) (Jokela, 2010: 24)

There are eight activities In the JFunnel model. The activities are covered in the order they should be executed in the actual design process. The iterative nature of the design process, on the other hand gives the user of the model a chance to consider the order of doing the activities so that it suits his or her project in the best possible way. Thus the actual order of execution might differ during the process, for example, if iteration happens between the activities 4 − 6. The process chart is presented in figure 5. User tasks in the process chart are divided into three categories: (Jokela, 2010: 28 − 55)
- Orange circles are activities of usability design
- Grey circle means interaction planning
- And finally dark grey means technical execution of the interaction design
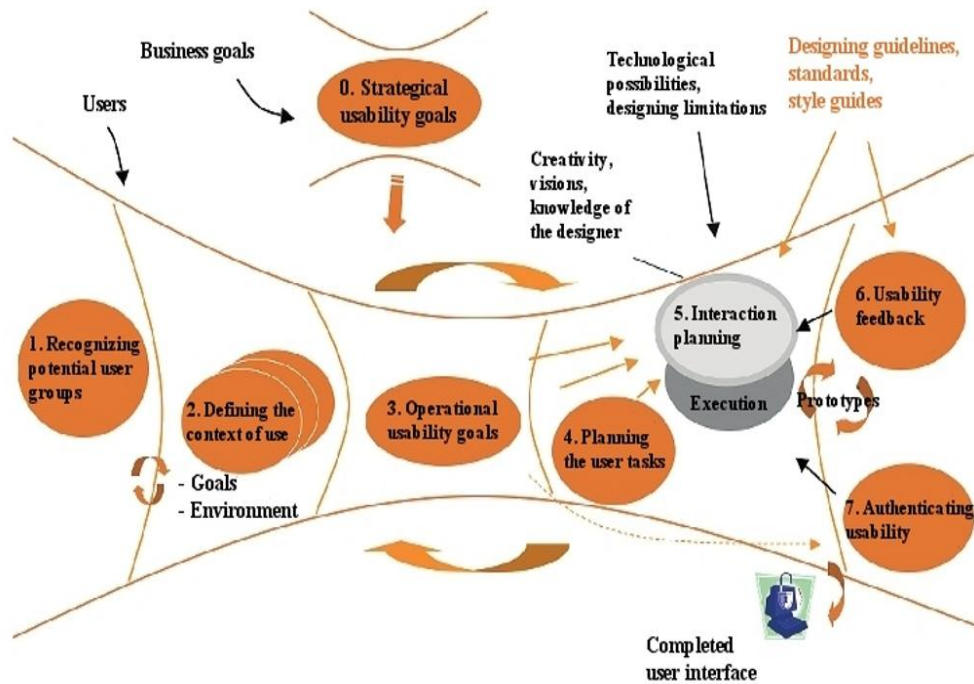
Figure 5: JFunnel model of usability directed interaction design (modified from Jokela, 2010: 30)

Activities of the JFunnel model:

0. *Strategical usability goals (business aspect):* the strategical aspect is not included in most of the human-centered design models, including the two standards talked earlier in this chapter. By adding the strategical goals to the design process it is easier to define how the usability of the service or application would need to benefit the company. More specific subject are:
   - product and its benefits for the customers
   - who are the customers, what markets
   - market differentiation of the product
   - business (organizational) goals of the product

   The marketing themes for human-centered design, are covered later on in the thesis (starting from 2.4)

1. *Recognizing the potential user groups:* who are the actual users of this service? It is impossible to know exactly who will use the service during its life

cycle. This is why the service must be planned so that it takes into consideration all the possible users, and thus makes it as accessible as possible for most of the potential users or user groups. Because of the difficulties of defining the specific users, the design group should try to categorize the biggest user groups and try to answer to the needs of these groups. The basic categorization criteria are: demographical, physical, and personal factors. It is also important to know how experience the users are with the web service. The most important factor for the design group to figure out is the question of primary and secondary users. One more factor is the role of the user, student – teacher: same program, but different point of view.

2. *Defining and specifying the context of use:* in this activity all the user tasks are determined. User tasks include goals that user might have regarding the service, all the environments user might have associated in using of the service, including technical, social, and physical surroundings. The context of use must be defined separately for each customer group, if the surroundings are different. In this phase the user tasks are defined in a general level. Deeper, step-by-step planning is done later on in step four of the JFunnel design process.

3. *Operational usability goals (bottle neg between users and usability):* if the goal is to create a web service from usability point of view, operational goals are the most important part of the whole process. In this activity all the standards for desirable operational level of the service are set. Without having these standards or reference values calculated, finding out, if the service has good enough usability is impossible. These standards form a criteria for activity number 7, verifying of usability.

4. *Planning the user tasks:* this activity uses information collected in activity three (3). In this part, some decisions are made in terms of figuring out which task will be left for the user to do and which will be done by the user interface of the service. Planning of the user tasks does not concentrate in the activities done by the user interface or interaction methods. The goal of this task is solely to concentrate on illustrating the user tasks. The methods

used in this task include written scenarios, storyboards, videos or short films, and formal models.

5. *Interaction planning / executing the design:* In the fifth activity of the JFunnel process the interaction solutions for the application are produced. Designing interaction is divided in two parts: designing the interaction elements and architectural design (programming). Although the model is about human-centered design of interactive systems programming and planning often goes hand-in-hand and the actual programming process, or prototyping is going on during the planning process. In user interface planning the results are often programmed prototypes.

   The nature of interaction planning is innovative based on the knowledge from activities 1 – 3 and evaluation of feedback gained from activities 6 – 7. Other guiding factors are general planning guidelines, technological possibilities and limitations and the experience, expertise, vision, and creativity of the design team

6. *Usability feedback:* feedback about usability is usually collected after the first prototypes of the product or service concept has been launched. Feedback can be collected in many ways, but straight feedback from users in a form of qualitative usability testing is considered of being the best way. In this method users are asked to perform a series of tasks. Then the design team analyzes how the tasks were performed and does conclusions about how the features of the web service work. Design team can collect information by asking the users about the tasks, or observing the performances during testing, for example.

7. *Usability authenticating:* in the last part of JFunnel model the operational goals set in the bottle neg (activity 3) phase of the process are tested. The test is successful, if all the goals that were set are met. The test can be done by using qualitative user testing. The measure of the test can be number of tasks passed or time spent looking for certain features of the web service.

All of the phases listed above have strong iteration with each other as can be seen from the process chart.

2.3   Soren Lauesen's user Interface design – Virtual Windows

The main focus of Soren Lauesen's design models is in trying to narrow the gap between programming and creating a functional user interface from a user's point of view. He states that programming a user interface is easy, but creating it so, that it answers user's or customer's needs, is much harder. (Lauesen, 2005: ix)

Lauesen states that the programmer, or design group is fully responsible for everything the customer can do with the service. All the pages and attributes in the service are designed and decided by the design group. This is why it is the designer's and programmer's responsibility to make the usability of the web service as good as possible.

The basic problem among the programmers, in Lauesen's opinion, is that if you ask a programmer how user interface is programmed, he or she will answer that the user interface will be figured out after the most important parts of the service or program are implemented. If thinking about the problem from a human-centered point of view, the answer should be that the user interface serves as a basis of all other product or service programming. It offers the platform or stepping stones in trying to achieve a good service. Lauesen wants to teach how user interface can be programmed down to the smallest detail.

Lauesen calls his approach the Virtual Windows method. Virtual windows are early graphical illustrations of the data included in the web service. The windows are created after the user tasks of the service are analyzed and designed. After creating the virtual windows, the designing team starts to design the user-system dialogue. (Lauesen, 2005: preface x)

In my study I already have a functional web service. I started to consider the web service from Lauesen's point-of-view. Later on in my thesis, I have defined the user tasks of PPT, cut down the user interface into pieces (virtual windows), and thought about the user-system dialogue. The objective in my research using Lauesen's approach is to

study the virtual windows and user-system dialogue in order to try to give the PPT designing team tools to further develop the user tasks and thus improve the usability and overall user experience of the web service.

2.4   Basic marketing skills needed in different phases of the models presented above

The designing process is based upon an explicit understanding of users, tasks and environments. The user will also take part in every stage of designing and development process. The design must address the user experience as a whole, and the designing team must also include multi-disciplinary skills and perspectives. (Jokela, 2010: 88). The last comment is the main reason why I decided to add a section about marketing to my thesis. Human-centered web service designing and developing requires a wide range of marketing knowledge. In this section I want to show that marketing is among the most important, if not the most important, subjects in human-centered web service designing.

If we think about marketing, it may mean a lot of different things to people working in different fields. This is what Kotler, one of the most studied marketing experts, has to say about marketing:

> Marketing is everywhere. Formally or informally, people and organizations engage in a vast number of activities that could be called marketing. Good marketing has become an increasingly vital ingredient of business success. And marketing profoundly affects our day-to-day lives. It is embedded in everything we do – from the clothes we wear, to the Web sites we click on, to the ads we see.

> Marketing deals with identifying and meeting human and social needs. One of the shortest definitions of marketing is "meeting needs profitably". (Kotler, 2006: 3)

As Kotler says, marketing is everywhere, in the internet as well. Even a single click of mouse may have something to do with marketing. This is the reason why marketing needs to be covered when talking about human-centered web service design.

During my study, I had to cover a wide range of different marketing themes, including:

- customer segmentation
- how can the product benefit the customer, creating customer value
- customer satisfaction
- developing deeper customer bonds

Basic marketing knowledge gives a great deal of help in working with human-centered web service design methods. For example, think about a group of computer programmers who notice that their service does not attract enough customers, although they think that it is a master piece in terms of programming. Now, throw in a marketer to bring a different approach. He might notice that, first of all, the service is too hard for the customer to use and secondly the basic service, the site offers, is hidden behind all the brilliant programming decisions.

2.4.1 Customer relationship management (CRM)

According to Kalle Airo, the CRM-coordinator of Helsinki School of Economics, the field of CRM is extremely wide spread, which makes it difficult to approach. Different CRM theories can be divided to five sectors:

- CRM as a process: CRM divides to macro processes, like recognizing the customers. Macro process divides in to micro processes like specifying the workshops that work on recognizing the customer groups. This approach is widely used for research purposes, because all the processes are time concerned. This way the effect of each micro process can be to the overall process can be specified.
- CRM as a strategy: The goal is to maximize the profits by segmenting the customers, getting to know the value of the customer for the company, and maximizing the customer lifetime value.
- CRM as a philosophy: This approach is based on the findings of Reicheld (1996), who realized the connection between customer loyalty and profitability. The primary goal for companies using this approach is to create value for the customer. These companies believe that with customer value, comes profitability.

- CRM as technology: Using technology is almost a necessity in order to create effective and competitive customer databases and CRM systems
- CRM as capability: Company starts to develop its CRM system based on its own skills, routines, and experiences. A commonly used approach when moving from product centered strategies to customer centered ones. (Airo, 2007)

The main goal of CRM is to create tight customer bonds. CRM means the process of handling deep individual data of specific (each separately) customer. Kotler speaks about touch points. By touch point he means situations where customer is in touch with the company. Part of a CRM process is to be sure that each touch point will give customer positive feelings about the company and the service it provides. According to Kotler the biggest advantage in using CRM is that, when executed correctly, it offers a chance for the companies to serve their customers and fill their needs in real time and even beforehand. The more accurate and deep the customer information database is the further CRM can be taken. (Kotler, 2006: 152 – 153)

Kotler defines the rules of qualitative CRM on the basis of Don Pepper's and Martha Rodgers' book series:

1. Notice your customers and possible future customers
2. Do customer differentiation based on customers' needs and their value for the company
3. Build co-operation with the customers by getting knowledge about their personal needs. Have straight contact with your customers
4. Modify your products and services to meet the individual needs of your customers
5. Limit your customer loss to its minimum
6. Favor long customer relationships
7. Take the biggest possible benefit of the purchasing potential of individual customers (cross-selling, for example)
8. Recognize low-profit customers and work to make them more profitable or get rid of them
9. Use the most resources in meeting the needs of the most profitable customers and take good care of these relationships.

CRM has an important role in all of the human-centered designing process because the aim is to have customer participating in all of the phases of product life cycle, this also means research and developmental work. In this study the goals were closely related to developing the general CRM rules, numbers three (3) and four (4) of the list above.

2.4.2 Setting up product strategy

In the first activity of the JFunnel model the strategical goals for the web service will be set. The goal of this activity is to figure out how the usability factors of the web service should benefit the main business. Strategical goals define what good usability means in the businessmen point of view. (Jokela 2010: 30)

In my study the main product was specified to Polar Fitness heart rate monitors and PPT. Before starting to create specific goals for the human-centered development process of PPT, it is important to figure out where the product places in the customer value hierarchy (Kotler, 2006: 372). Placing the product in the value hierarchy, helps in figuring out the input company should put in the product. It also helps in figuring out the current status of the product and setting future developmental goals and probably changing the role of product in the hierarchy. The biggest question is how the product will support the company's (Polar Electro) and its main product's brand (Heart rate monitors) as well as possible.

What Kotler says about setting product strategy can be transformed into what was discussed in the previous sentences:

> At the heart of a great brand is a great product. Product is a key element in the market offering, Market leaders generally offer products and services of superior quality (Kotler, 2006: 273)

An important problem to think about in setting product strategy is also thinking about the biggest rivals the product has. What can be done to differentiate the product in the markets and make it appealing to the customers? What can we offer to make our product stand out among all the rivals? Deep examination of all the features rivals offer in their service is one of the most important factors in order to strike the right zone in product differentiation and setting correct product strategy. (Kotler, 2006: 378)

2.4.3   Customer segmentation

Unlike creating market sectors, for example female University students at the age of 20 – 25, customer segmentation means the art of finding the already exciting groups of customers that share similar needs and wants. A good example is car buyers; it is hard to create clear market sectors based on customer profiles (age, ethnicity, and so on) that correlate with customer needs and wants. Customers of totally different age and background may share similar wants and needs when shopping for cars. Marketers need to realize this and base their marketing for this existing group of people, or customer segment.

According to Kotler, to make market segments effective they should fill the following guidelines:

1. Measurable: size, purchasing power, and the qualities of the segment all have to be measurable
2. Accessible: Segments can be effectively served and reached
3. Actionable: Effective marketing programs can be targeted to meet the needs of certain market segments
4. Differentiable: Market segments can be differentiated and they react differently to changes made in marketing-mix elements
5. Substantial: Segments alone are so productive and profitable that creating special marketing plans for them is reasonable (Kotler, 2006: 262)

Rope (1998) gives another perspective to customer grouping or segmentation. According to him, the volume of total sold products to customer groups can be used as a basis of customer segmentation as follows:

- Volume customers: 20 % of the total customer volume, 80 % of the products sold (quantity or value)
- Occasional customers: 80 % of the total customer volume, 20 % of the products sold (quantity or value)
- Group of not-yet-a-customer: Group of customers that the company is trying to attract by concentrated marketing
- Former customers

Kotler (2006) provides a list of marketing preference segments caused by companies marketing segmentation strategies. Homogeneous preference means that companies are concentrating their marketing to similar kinds of customer groups with similar kinds of products. Every day grocery products are a good example of this. People would probably buy milk regardless of whether it was marketed or not. In a clustered preference situation a couple of big market segments have formed and companies fight over customers inside these segments. In a diffused preference the market is full of small customer groups with specified needs. In this kind of a situation market segments need to be extremely carefully created in order to meet the small customer groups' specified needs. (Kotler, 2006: 240 – 242)

According to Rope (1998) marketing can be concentrated or selective. Selective marketing strategies are used especially in the larger companies with bigger marketing resources. In selective marketing the company concentrates on several different customer groups or segments in order to try to cover a large overall market sector. In concentrated marketing, the company, as the name says, only concentrates on meeting the needs of one or a few market segments. The advantage of this strategy is that the company can gather a large amount of information about the market segment to further develop the marketing strategy. The biggest downside is if a serious change in the market field happens. In this kind of situation a company that has concentrated on one single segment may need to do a total change of its market targeting and strategies. (Rope, 1998)

One of the goals of this study was to collect information about the Polar Fitness customer group. The information collected can be used to check the existing customer groups.

2.4.4 Customer needs and creating customer value

How can we make our product matter to the customer? What can we offer that gives customer value, compared to our competitors, and in a scenario of a new product or service compared to what the customer had before? In the area of service and consumer products the thinking should be: customer first. We must first think about what the customer needs, if we want to be successful in our web service marketing.

Polar's new products are often technical innovations so thinking about the customer first may be rather hard, if the customer does not know what he or she can demand. But why not take customers or users as part of your innovation process? In 2009 Ministry of Employment and the Economy had a workshop which goal was to create general guidelines and suggestions for using human-centered methods in the innovation process of all levels of public and private business. The workshop wanted to show that, because of the growing power users and customers have in the economy, they should be taken as part of the innovation process to get better results. (TEM, 2009 & 2011)

By taking customers as part of the innovation process, it would also be easier to take their needs into consideration and thus create better customer value.

If we consider polarpersonaltrainer.com as an additional extra to the heart rate monitor customers, we still need to be sure that additional products will create more customer value. This is often a problem with free, additional products, such as PPT. Does the additional product actually give any more customer value? This is an issue that must be thoroughly solved before inputting too much money in developing such a product. In a worst case scenario, the additional product may have a negative impact on total customer value. Kotler (2006) defines the term total customer value which is divided into customer perceived value (CPV) and total customer cost as follows:

> Customer perceived value is the difference between the prospective customer's evaluation of the benefits and all the costs of an offering and the perceived alternatives. Total customer value is the perceived monetary value of the bundle of economic, functional, and psychological benefits customer expects from a given market offering. Total customer cost is the bundle of costs customers expect to incur in evaluating, obtaining, using, and disposing of the given market offering, including monetary, time, energy, and psychic costs. (Kotler, 2006, page 141)

2.4.5 Customer satisfaction

Customer always has his or her expectations for the product or service. After perception, the customer either buys or does not buy the product or service. Customers form their expectations based on several different factors including opinions of friends and associates, promises, and so on. Making promises that are too lavish will give customers negative experiences and probably have an effect on their future buying behavior. If the promises are too meager, on the other hand, the offering will not be tempting enough for large masses of customers. The biggest challenge for the marketers is to set the promises at the right level. As a result of buying the product, slightly exagger-

ating, there are only two possible outcomes the customer can have, either he or she is happy or not. (Kotler, 2006, page 144)

In the case of free products like PPT, setting product promises can be rather hard. What would be the best possible marketing strategy for such a product? Should it be strongly tied to the heart rate monitors and should it be marketed as a feature of heart rate monitors, for example: "FT-60 Polar heart rate monitor gives you a chance to monitor your training effectively. Just register online to polarpersonaltrainer.com". This kind of marketing would of course have an impact on the main product's product offering as well. If marketing PPT as a free addition to the main product, the main product would also need to include a free transfer tool. A definite negative customer experience creator would be, if the customer would notice that, to make PPT work, he or she needs to go buy a USB data transmitter device, or something similar. If PPT would be marketed as a separate product, it could not be marketed as free. If one needs a Polar heart rate monitor to use it, it actually has quite limited using capabilities and high price. Also, if PPT would not be marketed as an extra application for Polar heart rate monitors, like in the above situation, the marketers would also need to think about other factors in the price setting, data transferring tools for example.

2.5 Research methods in human-centered designing and user studies

In this chapter I will explain the theory behind the methods I used in my user study.

2.5.1 Probe (and diary) method

Probes are an excellent way of collecting information in a longer study where the researcher cannot be present all the time. This is a definite advantage of probes. Probes are especially used in testing situations of new services or products. A small diary can also serve as a probe. In the diary a user can write comments about his or her web service using experiences and situations. The probe method also includes a feedback session at least once a month, where the researcher has a chance to collect mid-term information. Interviews can be arranged for individuals or for bigger focus groups. Interviewing several people at the same time gives the researcher a good chance to collect information about the user experience when conversation flows between group members. (Sinkkonen, 2006: 317 – 319)

A partly standardized probe was used as the main information collecting method in my study. The probe consisted of interviews at the beginning and the end of the research period and a three week follow-up diary period.

2.5.2   User personas

Personas are used as tools when defining and comparing web service using habits of different customer groups. Personas can also be used to figure out how different design solutions work. It is easier and cheaper to use well designed personas than to conduct a user study when simulating web service prototypes and functionality of them.

A user persona can be created on pure intuition or based on collected information. A good persona gives a good overview of the user group it is representing and has interesting features that make the web service design team to think about the subject matter from customer's point of view.

When creating user personas for web services the designers should design at least the following factors:

- Identification information: including name, age, picture, and so on
- Lifestyle, psyche: how is the persona as a human, what he or she values, what is important in life
- Role and using interface: what is the user role of the persona? Where he or she uses the service
- Goals and needs: what does the persona want to achieve by using the service, long and short term goals? What are the needs for using the web service for this particular persona? The needs often are the reason why a particular person uses the web service.
- Tasks and knowhow: what do people do with the service and how well do they understand it? Are the users aware of competing products?
- Comments: what is said about the product by the persona? (Sinkkonen, 2006: 124 – 135)

In my thesis I collected information about the study participants in order to give tools for Polar to create valid user personas to help their future product developmental processes.

2.5.3 Interview

An interview can be personal, between the interviewer and interviewee, or a group situation with several interviewees. An interview can be free, themed, or structured. A free interview is one where the interviewer has decided on a subject he or she wants to talk about, but the conversation flows like a normal conversation. The interviewer does not strictly try to stay in the subject, but allows the interviewee talk more freely. In a theme interview situation, the interviewer follows a specific question list to be sure that all the subjects he or she wanted to talk about gets covered. A structured interview is close to a questionnaire with open-ended questions. The interviewer always asks the same questions and tries to use same words and voice tones trying to avoid affecting the answers in any way.

The questions in an interview can be divided to three groups. The groups are:
- Closed question: answer is picked from a limited list of options. What car model do you like the best?
- Limiting questions: two choices to answer, yes or no.
- Open questions: the interviewee can answer without limitations. Used when asked an opinion about something. What is your favorite subject at school, and why? (Sinkkonen, 2009 pages 83 - 86)

In my study, I used interviews during the start-up meeting and the final meeting. I used mainly open-ended questions.

2.5.4 Observation

This method is a tool when testing new user interfaces, for example. In this method the person under observation uses the web service as he or she is used to and the person observing takes notes. The user might be given a list of tasks he or she needs to do the way he or she is used to doing them. This way the developing group can see how the usability factors of the web service works. (Sinkkonen, 2009, page 100 – 106)

In my research, I used observation during the final meeting, when study participants were asked to demonstrate how they use certain features of the web service.

2.5.5 Questionnaires

Questionnaires are the fastest, easiest, and in most cases, cheapest method of collecting information. Questionnaires can be used in product launching, developing, and in the phase of checking the status of the service. The biggest problem concerning questionnaires is how to make each of the respondents to understand the question exactly the same way. The questions can have all the forms interview questions have. In a questionnaire the user only has more time to answer and think about the questions (except for pressure tests). (Sinkkonen, 2009, page 107 – 114)
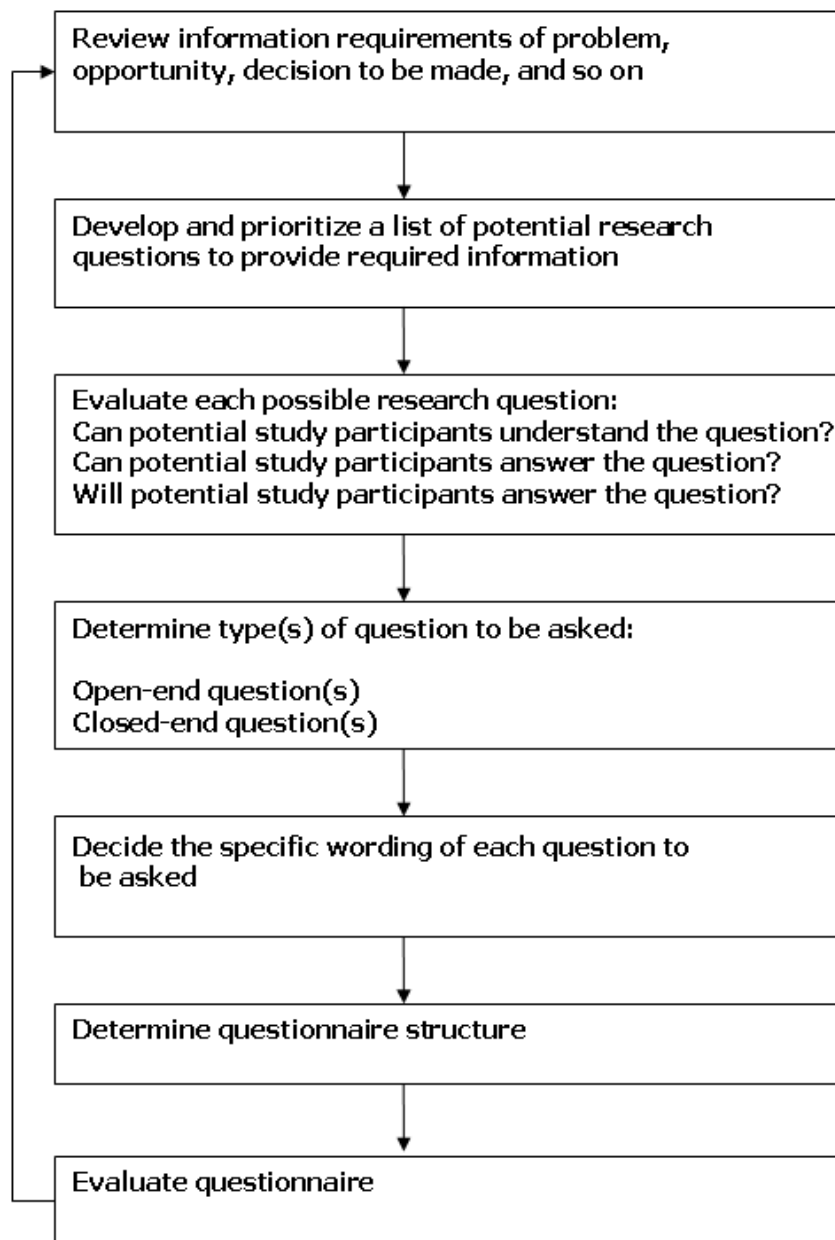
Figure 6: Building questionnaires

Research questions asked in the user experience research were evaluated using the questionnaire building guide presented in figure 6 above.

2.6   Testing usability and user experience throughout products life span

The idea of human-centered web designing does not only cover the "pre-launch" era of the web service or product. The theory includes using human-centered methods

throughout the service's life cycle. The usability should be tested every once in a while, especially in web services case, since the technological development is so fast. Another reason is that web markets are growing so quickly that new competitors can come up almost daily to interfere with your business. This means that your product's or service's environment is in a constant whirlwind of changes. Planning how to deal with the new and constantly changing environment is vital.

Testing usability and user experience comes cheaper than noticing that the service you are trying to sell has lost so much ground in the markets due to competition and better solutions that the whole web service design has to be redone.

2.7 Theoretical frame of my research

In figure 7 below I have combined the use of theory with the phases of the user experience research and this way created an overall theoretical frame for the thesis.
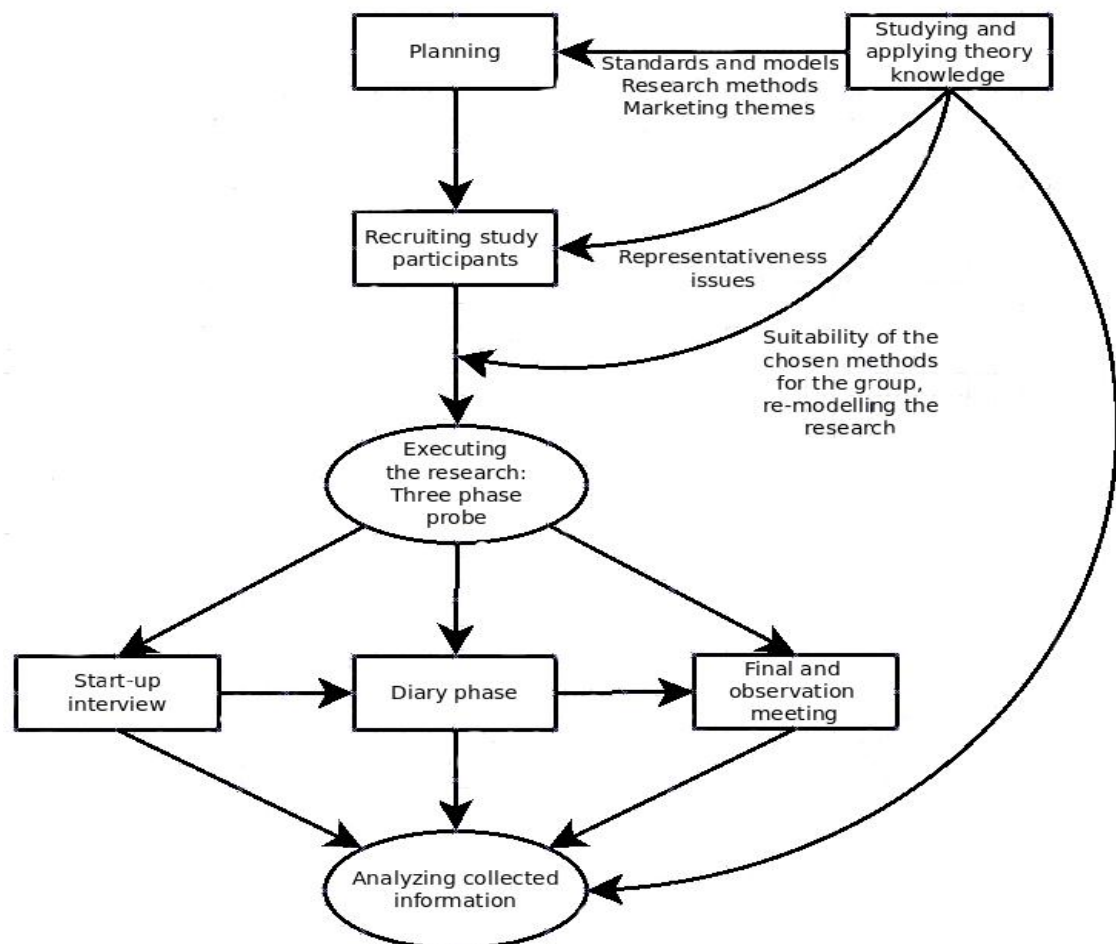

Figure 7: Theory frame of my thesis

Polarpersonaltrainer.com

PPT is a web service that gives tools to users of all performance levels to follow their training and get feedback from it. Polarpersonaltrainer.com is a multi-sport service, so it is not limited to any particular sport. By choosing the correct training, or heart rate monitor, the user can follow how training translates into better shape, lower weight, fat percentage, or whatever one wants to achieve. The service is fairly old in the field of training monitoring web services. It was first introduced in 1999 and was re-launched in 2001. After re-launching, users have had a chance to transfer their training data from heart rate monitors to personal online training diaries.

3.1   Strategical goals of polarpersonaltrainer.com

Setting strategical goals is activity number zero (0) in the JFunnel model of human-centered design for interactive systems. (Jokela, 2010)

About PPT:

PPT is a training monitoring solution for people who are interested in following their training. Polar Electro heart rate monitor owners can get deeper analysis about their training but also non-Polar users can add information manually and build training archives. The web service's main features are:

- training monitoring possibilities
- training planning support
- training feedback, for example training load
- social network, that consists of Polar staff and other PPT users

The main idea of the product is to offer personal guidance to training. PPT is mainly a personal training monitoring solution. According to some experts (Sirkiä, 2010), it is not even considered a social sports media, although it has some social features. Instead of comparing PPT to other social sport media, it should be compared to actual training monitoring softwares like Polar ProTrainer.

If we compare PPT to other social sports media, its main competitive advantage is that the user can choose the level of socialization he or she wants to have. In PPT, the amount of information the user will get from his or her training is comparable to actual training monitoring softwares like Polar ProTrainer. In this field of products PPT's main advantage is that it is not software you need to download to a specific end device. You can log on to your PPT account anywhere. The biggest disadvantage is probably the same thing; you cannot use PPT, if you are not online.

Referring to Kotler's product levels PPT is somewhere between augmented product and expected product. PPT has been around for ten years already, and among Polar users it is quite well recognized. Buyers expect to get the benefits PPT has to offer, when buying a new heart rate monitor. But still many of the new buyers of Polar products get surprised when they hear about PPT. Even among these users, the first time buyers, it is not evident to talk about pure augmented products, because most of them still expect some kind of a training feedback and monitoring solution. (Kotler, 2006, page 372)

PPT goals:

Sinkkonen lists 20 reasons for creating a good web service. With good quality in a web service, the company signals good overall quality knowledge, talent of working, and buying talent from outside the company.

With the points listed above Polar wants to:
- Improve functionality and quality of the web service
- Improve trust that customers have for the product. According to Sinkkonen trust in products lead into deeper stage of customer loyalty, patience, and satisfaction
- Achieve competitive advantage in the training monitoring solutions markets
- Polar also wants to offer its users a more complete training monitoring experience (Sinkkonen, 2006, pages 28 – 29)

3.2   Users and user groups of the web service and rivals of PPT

Defining users and user groups is activity number 1 in the JFunnel model. (Jokela, 2010)

Everyone who has the possibility to log online can use PPT, but all the benefits of PPT can only be achieved by the Polar heart rate monitor owners. The web service has small differences in the amount of feedback one can get using different devices. Some of the PPT user factors are listed below:

- Polar heart rate monitor and a data transfer tool, for example FlowLink (in order to get full advantage of the web service)
- People who are interested in training monitoring, planning, and getting feedback from training
- Internet using capabilities
- Basic computing skills

In my research I concentrated in the users of Polar Fitness products, the FT group. In table 1 below, I have listed some of the general factors of the FT group members that took part in my research.

Table 1: Estimated general factors of the fitness customer group. Created on the basis of information collected from the study participants

Age	All ages, but the majority of the user group falls into category of 20 - 55
Sex	Male and female, < 50 % men
Education	All education levels
Work	No limitations
Training habits	Especially people who exercise for better basic fitness. Usual amount of exercises per week is 3 – 4 and usually from 30 to 90 minutes at a time
Sports played	All forms of cardiovascular exercising: running, walking, hiking, cycling, swimming, gym training, and so on
Computing skills	None – top
Polar HR monitor experience	None – experienced Polar HR monitor users
HR monitor in use	Polar FT40, FT60, FT80
PPT experience	None – experienced user

Polar Fitness heart rate monitors used in this study were FT80, FT60, and FT40. FT40 is a basic monitor for a person who wants to get the basic information out of his or her training. FT 40 provides the user heart rate during exercise, time spent on different Fitness Zones, and calories burned, for example. FT60 goes a little deeper in analyzing training effect. With FT60 the user can perform a variation of tests to measure current stage of condition. FT80 is the most versatile of the Fitness heart rate monitors. With this wrist unit, in addition to what was listed above, the user can get, for example, gym training support.

With the help of table 1 presented earlier and the knowledge of PPT and heart rate monitors, I created a division table of PPT users that is presented in table 2. In the table I marked down some of the challenges the users of the different divisions might

face in using PPT. The challenges listed are inclusive; all the challenges listed for experienced and moderately experienced users also apply for the less experienced ones. I used PPT experience as a dividing factor between the divisions.

Table 2: User levels of PPT. PPT experience used as a dividing factor

PPT experience	
Low	- User interface problems → active use of help features - Problems in understanding the benefits of PPT - Information transfer problems **Potential lost user**
Moderate	- Uses basic features of PPT - Has tried most of the features, but does not want to change habits or learn new things **Every day or occasional user**
Experienced	- Using PPT is easy - Gets full benefits of the features of PPT - Uses product version update news to notice new features **Everyday user (motivates others to try PPT)**

With the help of these divisions, a layered help feature ensemble for users with different experience levels can be created.

Examples of other training monitoring solutions, and also PPT's main rivals, are systems like: SportTracker, and other mobile phone applications, Suunto MoveScout, Adidas, Nike, Garmin, and ForeRunner.

3.3 The context of use

In this study, I consider the FT customer group as one user group with a common context of use. The basic web service user environment is the same for all the different FT heart rate monitor users. The differences between the users come in the detail level of the web service. How to achieve different user goals is explained later on in the section on PPT user interface.

Service using environment:

PPT can be used everywhere, if the user only has an internet connection. The user can follow training wherever he or she is, at work, vacation, school, for example.

User goals:

1. Building training archives: With PPT the user can build deep training archives. The web service automatically saves all the different exercises in the diary.

2. Training planning: Using PPT's training planning feature, the user can create a training program meeting all the individual needs the user has.

3. Training monitoring and getting feedback: The more the user adds exercises in the web service the better chances he or she has to follow how his or her training is effecting. The user can monitor training using several different progress reports PPT has to offer. The user can also do straight comparing between similar kinds of exercises.

4. Socialization: PPT offers to its users a couple of chances for socialization. The user can create and participate in public or closed challenges and take part in discussions in Polar Forum.

3.4 PPT user interface

User interface (UI) means the combination of all the elements that allow the user to interact with an interactive device or program. In this case we are talking about the user interface of an interactive web service. The user interface of PPT is a graphical web interface (GUI) that is based on basic WIMP attributes. The basic idea of WIMP is that the interaction between the user and the device is based on four basic elements:

- Windows: information can be organized better using windows (information in PPT is divided to several different pages, or windows)
- Icons: used to represent different features of the user interface, for example folders, text, etc.
- Menus: offer the user a structured way of handling information and view the piece of total information he or she wants at a certain time or place

- Pointing device: mouse, or some other kind of device used to operate the inter-face. (Rodgers, 2011: 160 - 162)

In the following chapters I have presented the user interface of PPT. When I refer to a specific function or feature of PPT I have italicized the name of the feature to avoid spelling confusion.

3.4.1 Site structure and functionality of PPT

Figure 8 presents the site structure and basic functionality solutions of PPT. Handling of data in PPT is based on a combination of a menu bar that is located in the top third of the web page and scrolling menus that are combined to the menu bar. The menu bar includes the main subjects that the site has to offer to its user. These subjects include *My Training*, *Community*, *Applications*, and so on. When the mouse cursor is moved on a specific subject a scrolling menu opens including all the features that belong under the subjects. An example situation is presented in figure 8. In the example the user has moved the mouse cursor on top of the main subject *Community*. This action opens a scrolling menu including features like *Challenges*, *My Messages*, and so on. When the user clicks the left command button of the mouse on top of a feature a new site opens including the information that is specific for this particular feature. Clicking on a feature also turns the scrolling bar to a menu bar that is located below the main menu bar. In Figure 8, the secondary menu bar includes such features as *Site map* and *Help*. The web service is programmed so that the internet browser does not open new windows or tabs when a new site of the service is opened, also there is no need for the user to need back command provided by the internet browser. The menu bar and the scrolling menus of the web service offer user a full possibility to navigate in the web service.
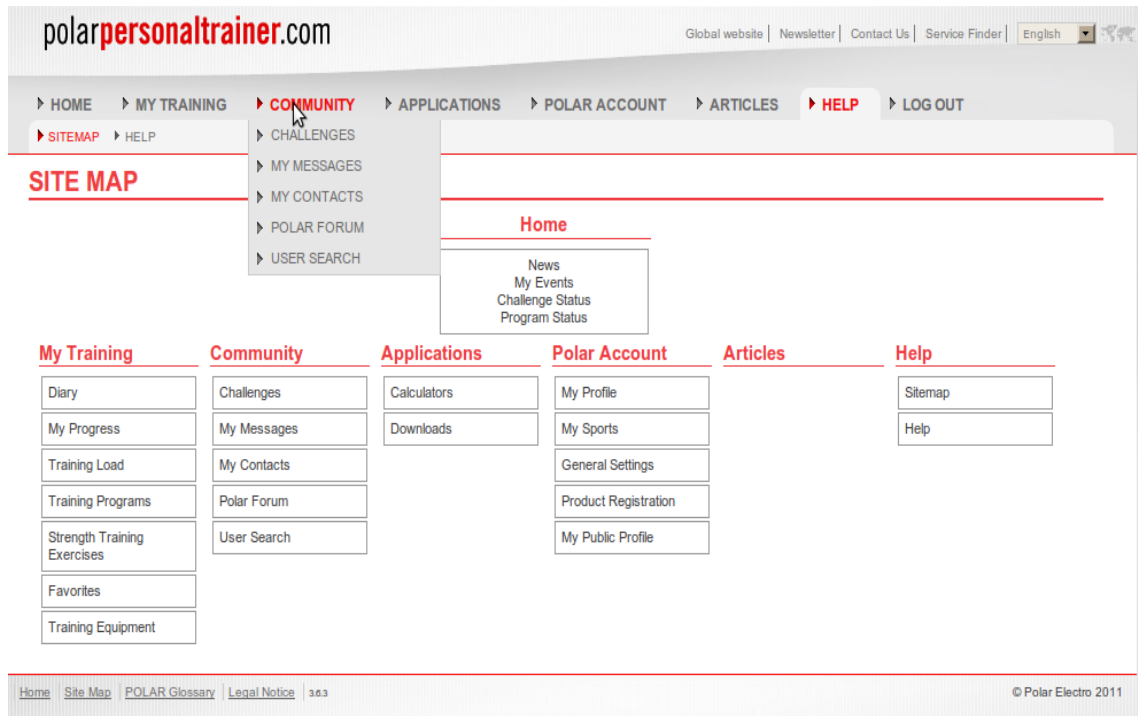
Figure 8: Site structure (www.polarpersonaltrainer.com)

In the top right corner of the web service the user has a list of selected links such as *Global Website* and *Newsletter*. By clicking on these links user opens Polar's main web page on top of PPT. By doing this action the user has no chance of going back to PPT without pressing the back button of the browser or selecting the correct site from browsing history.

3.4.2 Login

For being able to use PPT, the user needs to register as a user of the service. By clicking the *Register* link below the *Log in!* Button web service the user can access the registration window. The registration is done by filling in an information document. In the document the user has a few obligatory fields to fill and depending on his or her commitment to the service some additional information can be given. After registration the user can login, using user name and password. The login page, presented in figure 9, offers a link list in the top right of the web page offering access to Polar web pages and other informative pages. Polar web pages all use the same basic user interface, so it is easy for a user, already familiar to Polar's global websites, to start using PPT.

Figure 9: Login page (www.polarpersonaltrainer.com)

Home page that is presented in figure 10 opens after logging in. This page includes information about current activities. In figure 10 one can see that user has an on-going challenge. From links below the *Challenge Status* information note user can access on-going challenges or create new ones. In figure 10, the user is also encouraged to cre-

ate a training program. The home page also gives PPT update news, as shown on the left side of the site.
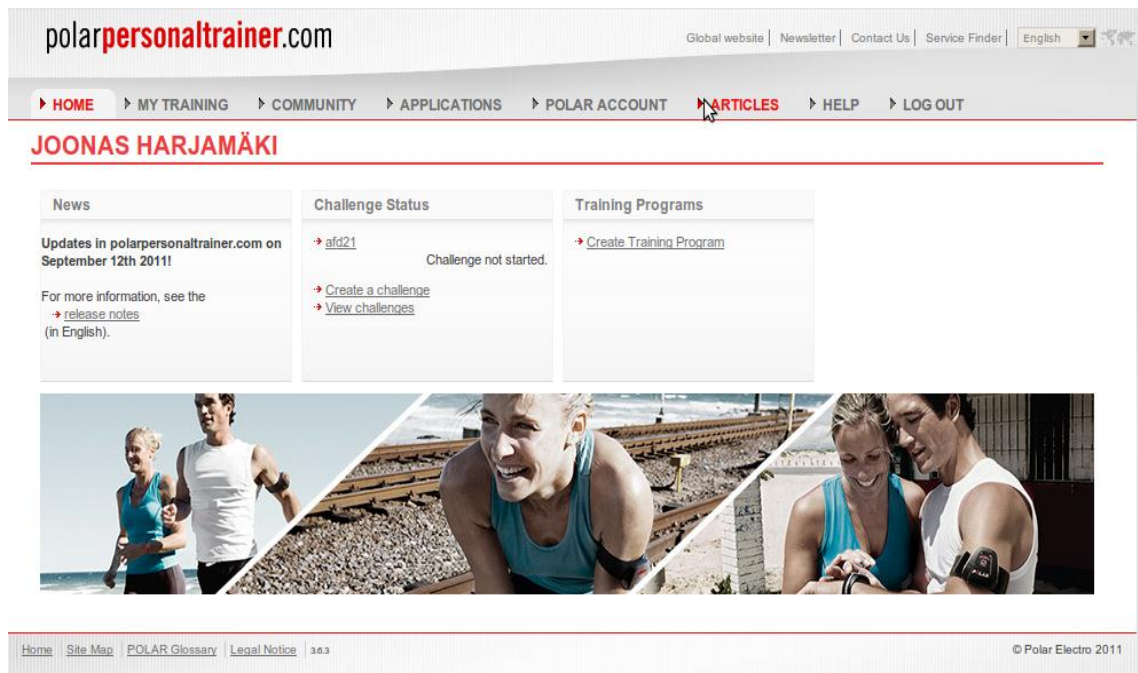

Figure 10: Home page of polarpersonaltrainer.com (after logging in)
(www.polarpersonaltrainer.com)

3.4.3   My Training

Figure 11 represents the training diary view that opens when the user clicks *My Training* in the menu bar or *Diary* in the scrolling menu under *My Training*. The diary includes planned exercises (grey color) and completed workouts (red color) during a selected time window. In this view the time window is one month. On the left hand side of the page, the user finds summary information about his or her training during the selected time window. On the top left corner of each calendar day, the user finds information about the state of recovery:

- Green color indicates that one is ready to do a strenuous workout
- Yellow color indicates that one should be a bit careful and listen to your body to avoid over training
- Red color indicates that one should rest due to over training
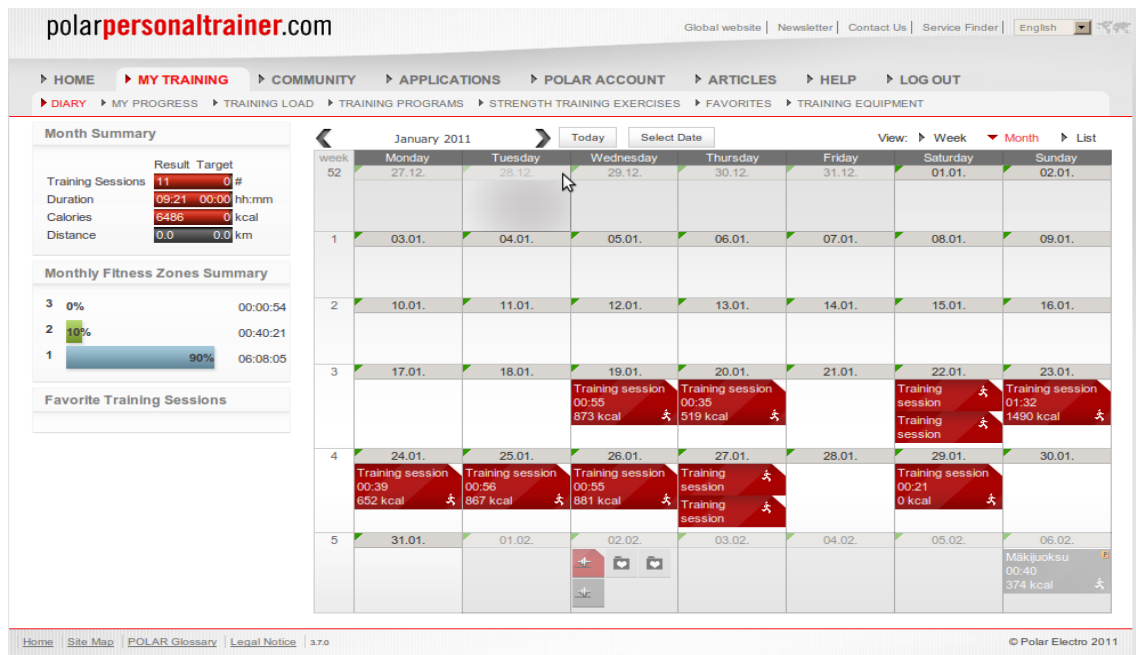
Figure 11: My Training main page, calendar view (www.polarpersonaltrainer.com)

By double clicking a training block (red color) or planned workout block (Grey color) in the calendar a new window opens, as presented in figure 12, with more specific analysis and information about the workouts. The information provided is dependable on heart rate monitor and measuring tools used during a workout. If the user has not used any measuring tools the information, for example distance, can be added manually.
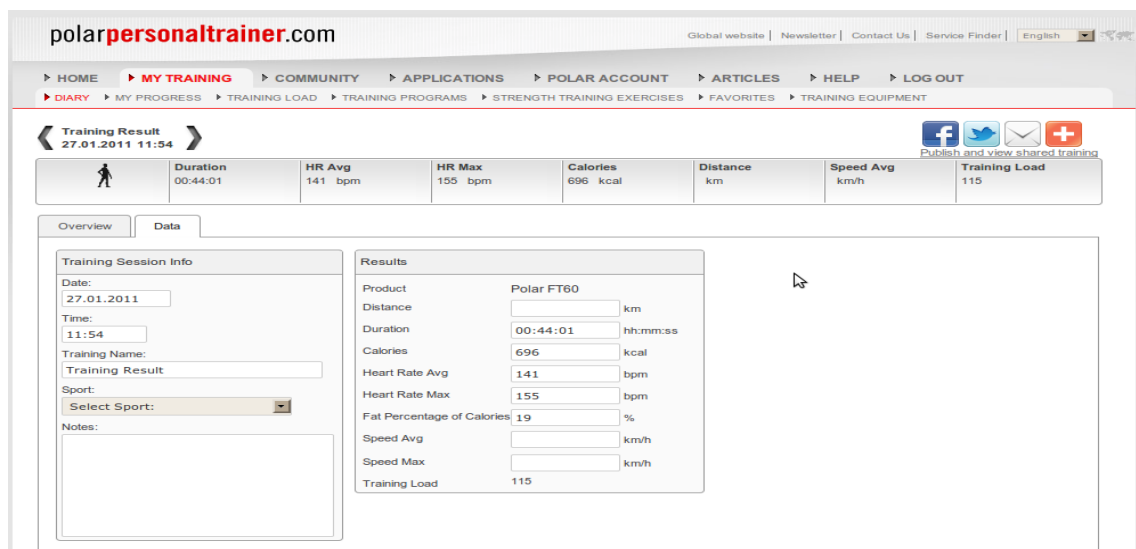

Figure 12: Training information window (www.polarpersonaltrainer.com)

My Training also gives the user a chance to follow recovery from training with *the Training Load* feature presented in figure 13. The red curve in the graph indicates actual training load from completed workouts. The black curve means the estimated training load from planned workouts. Both of the curves are cumulative. Cumulative stress due to hard workout and short recovery can be seen from the start point of the training load curve before the next work out. The higher the training load curve is prior to working out the more stressed your body is. The bar chart below the curves represents the amount of training load from single workouts.
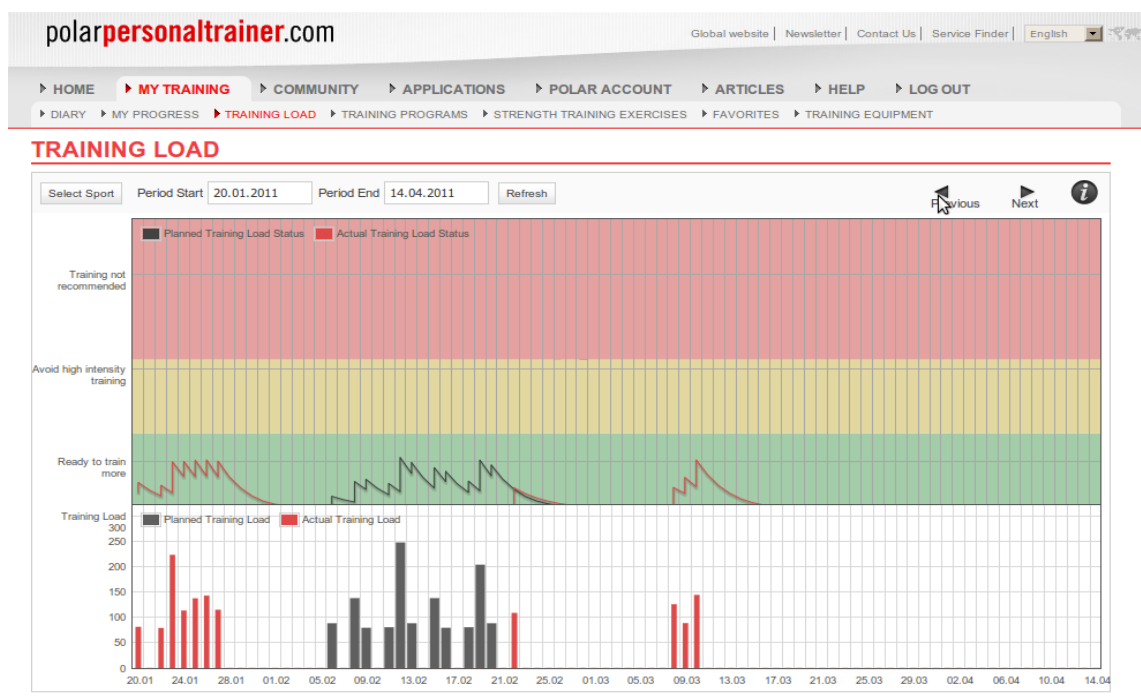
Figure 13: Training load graphs (www.polarpersonaltrainer.com)

Following training progress or progress of any other collected information is possible under the *My Progress* page demonstrated in figure 14. *My Progress* offers the user a list of progress reports to choose from, including training time, calories, and distance. After choosing a report the user can add training related curves in order to compare how different attributes have developed compared to the progress made. As an example the user can compare how weight or any other health related information provided to the service by the user has changed compared to the time used in training. The

more committed the user has been and the more information he or she has provided relates to the depth of the information provided in the progress reports.
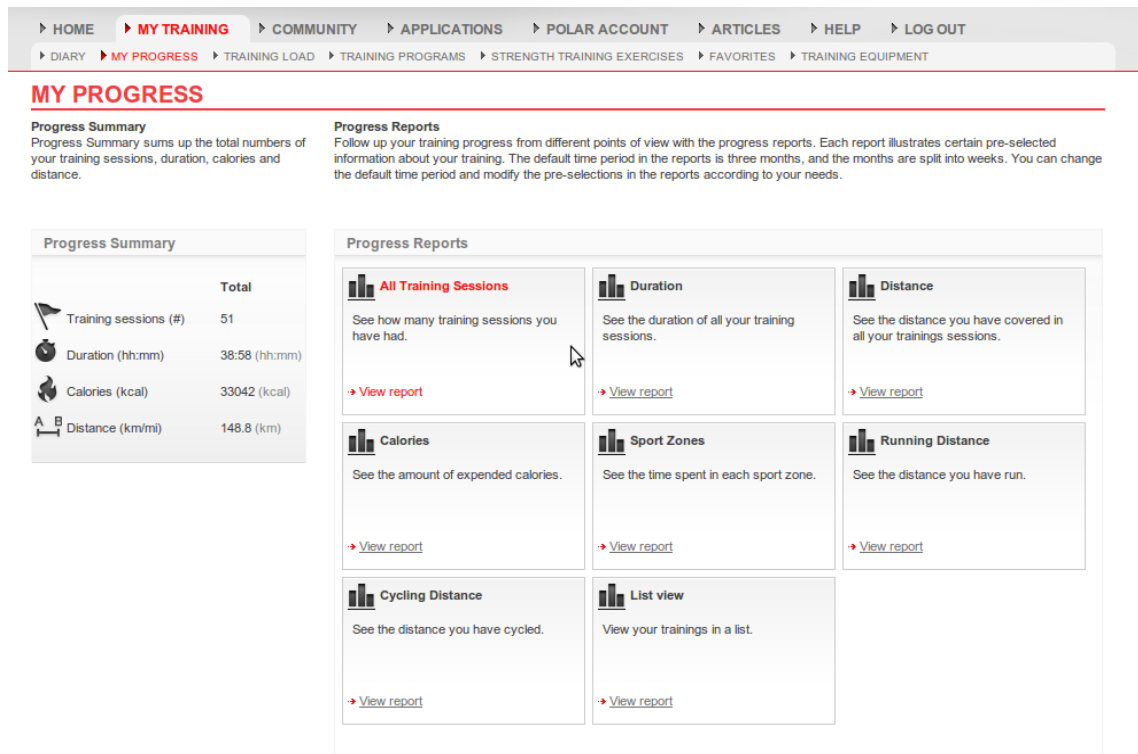

Figure 14: Progress reports (www.polarpersonaltrainer.com)

Training Programs are also created under *My Training* as shown in figure 15. The user has a variety of different training programs to choose from. The options are:

- Running program
- Cycling program
- Fitness program
- Outdoor program

After choosing a training program, the user has to accept Polar health policies. Polar uses health policies to make sure that the user knows what he or she is doing in starting a training program. Polar does not take responsibility of any injuries or health issues. The program suggestions are professionally made, but fully customizable for the user, so basically the user can create a program that does not match his or her actual needs. Polar suggests consulting a health specialist before starting any new training programs. After accepting the health policies the user needs to answer a series of questions about his or her current shape and to choose a target for the program. Also

the end date for the program needs to be chosen by the user. The user has a chance to overview the program after setting the training goal before accepting the program. Accepting the program moves the planned to workouts to the *Diary*. As written above, planned workouts are presented using grey training blocks. The user can get more information about the workouts the same way than getting more information about the completed workouts. After creating the program the user also has a chance to manipulate the training program by manually chancing the planned workouts. This kind of manipulation also affects the total training goals by automatically updating them.

Figure 15: Training programs (www.polarpersonaltrainer.com)

In addition to regular training programs, users can create strength training workouts with PPT. When the user opens the strength training view, he or she can either edit specific strength exercise information or create a new strength training session using the *Create Training* button in the low left corner of the page. Strength training information can be manually edited by double clicking a strength workout icon. Users can manually add exercises using the *Add Exercise* button in the low left corner of the

Strength Training Exercise window. Added exercises are automatically added under a selected muscle group as presented in figure 16. The created exercises can be used to create full strength workouts. *Create Workout* button is located in the low left corner of the main page. This feature allows user to combine a set of exercises to a full workout. The user can preset the goal repetitions and weights and transfer the workout to his or her heart rate monitor.
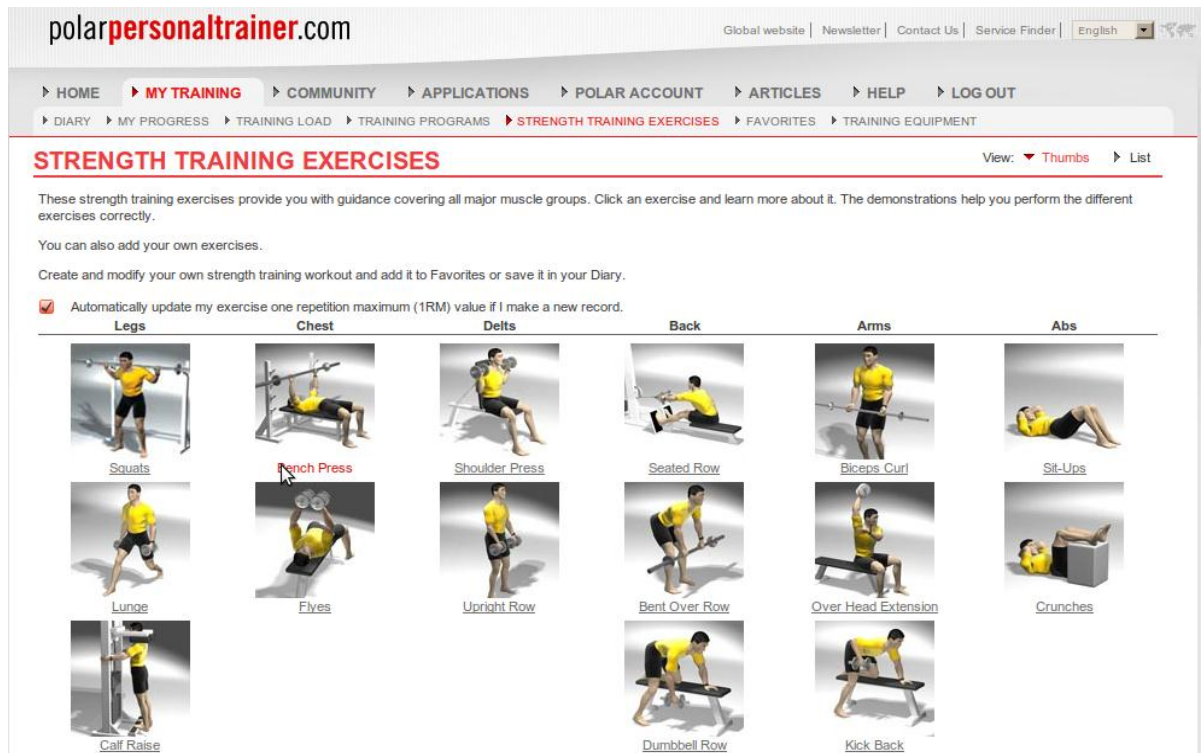
Strength training exercises (www.polarpersonaltrainer.com)

3.4.4 Polar Community and support features

PPT gives its users a change to create a social network around them. In the Community section of PPT users can create challenges or participate in them. Challenges offer a good chance for socialization among PPT users. Creating a Challenge follows the same pattern than creating a training program. First, the user has to answer a set of questions including the goal of the challenge and the start and end dates. After answering the user can select challenge participants (to whom the invitations are sent to). In this phase the user also needs to name and describe the challenge. Before the creation of the challenge an overview is provided as it was in the case of the training program. The Challenges view with one on-going challenge is shown in figure 17.

Figure 17: Challenges view (www.polarpersonaltrainer.com)

Polar Forum gives users a change to comment the service and discuss about their training. The forum is an independent site from PPT and it works under Polar's main page. By clicking the *Polar Forum* in the scrolling menu or in the secondary menu bar of PPT a new internet browser window opens as presented in figure 18.

Figure 18: Polar community (www.polarpersonaltrainer.com)

3.5   FlowLink data transmitter

Transferring data from a Fitness heart rate monitor requires a FlowLink device. FL is a USB platform that needs driver software to work. The software is easily downloadable from the support page of the Polar web page. To transfer data, the user simply places the heart rate monitor screen down on to the platform.

Results and findings of the research

Mainly qualitative methods were used during the study. The main method used in the study was a diary probe with standardized and changing questions, interviews, and observation. During the diary phase, quantitative information in the form of standardized questions was collected to find out the basic PPT using patterns of the study participants.

The study consisted of three main information collecting phases:
- Start-up meetings
- Follow-up period
- Final interviews

Based on my thesis study a full project report (appendix 5, hidden) was delivered to Polar Electro. The report included a short review of the research process and all the specified research findings and raw material collected during the research process. Because of the classified status of the results, I will only comment the results on a general level.

The goal of my thesis study was to collect qualitative data in order to support the work of Polar Research & Development in further developing polarpersonaltrainer.com. A specific goal was to map out developmental ideas concerning the central themes of PPT, including training programs, weight monitoring, and information sharing, and so on. Another goal was to get deeper information about Polar Fitness customer group, get to know their web service using habits, find out which features of the web service are the most important for them, and collect the ideas of how they would like to develop PPT. In this chapter I will give a general overview of the results of the study.

As a basis of six study participants it was hard to collect information that would represent the customer group as a whole. The recruiting, on the other hand, was so successful that the group can easily be said to be as representative as a group, this small, can be. The information collected about the study participants can be used as a helpful tool in defining future operational policies concerning the FT group. Thanks to the re-occurring first three questions of the daily diary questionnaire, the basic web service using patterns of the study participants were covered extensively. In the following sub-sections, I will talk about the representativeness, findings, and results of the study.

4.1   Representativeness of the results

The number of diary forms returned was extremely satisfying. The total percentage of forms returned was **96 %**. The make-up of the research including only six (6) study participants was probably the main reason for the high response rate.

In addition to forms returned during the diary follow-up period, the questions in the forms that did not get recovered by the study participants were covered in the final meeting of the research. Although the answers were not sent using the diary form, they were equally taken into consideration when analyzing the results. The number and recovery percentages of the forms returned by individual study participants are presented in tables 3 and 4 presented below.

Table 3: Diary forms returned by the study participants during the research period

Study participant	Forms sent	Returned	Recovery- %
1	21	20	~95
2	21	21	100
3	21	19	~90
4	21	19	~90
5	21	21	100
6	21	21	100
Average	*21*	*~20*	*~96*

Table 4: Questions answered by the study participants during the research period

Study partici-pant	Daily use questions answered	Recov-ery- %	Daily use ques-tions answered (empty answers deleted)	Recovery-%	Theme questions answered	Recovery-%
1	20	~95	14	~67	20	~95
2	20	~95	14	~67	21	100
3	19	~90	16	~76	19	~90
4	19	~90	18	~86	20	~95
5	21	100	10	~48	20	~95
6	21	100	14	~67	21	100
Average	20	~95	~14	~68	~20	~96,0

The information collected made it possible to create a good overall report on how PPT answers to everyday training monitoring needs of FT customer group. The good response rate also meant that most of the theme questions got covered by all of the six study participants. Comprehensive answers in the theme questions made it possible to deeper examine the needs for developing the web service in the future.

4.2   Users and using patterns of PPT

As a result of this study I created PPT user personas from each of the six study participants. The basic information about the user personas is presented in table 5. In addition to the information presented in the table I wrote longer user stories about each of the personas. The information in the stories is based on the interviews with the study participants and the information collected during the research. In the stories I added deeper information about the basic information presented table 5 and also provided some center concerns or comments the study participant behind the persona made during the research period. (Project report, 12 – 17)

Table 5: Information presented about the user personas

Basic information	- Nickname describing the persona's motivations and personality - Age - Occupation (Pictures of the personas were presented in the result presentation for Polar)
Training habits	- Favorite sports - How often and for how long at a time - A sentence describing training habits - Training program in use
HR monitor and PPT	- HR monitor in use - PPT experience
Training motivation	Goal or benefit that the person tries to achieve by exercising

On the basis of the basic PPT use information collected during the diary phase of the research I created a table where I have collected the basic web service using patterns of the study participants. In table 5 I have used the same nicknames that were talked about earlier in this chapter. The information provided about the basic PPT using patterns can this way be easily added for deeper analysis of the user personas. (Project report, 18 – 19)

4.3 PPT needs for fitness customer group and developmental ideas collected during the study

In this chapter I will comment on the findings and developmental ideas of the research at a general level. The research results talked about in this chapter were mainly collected during the diary phase and the final observation meeting. Weekly themes during the diary phase clearly helped the study participants to concentrate in the most im-

portant subjects when looking at the amount of developmental ideas given that circulated around weekly theme subjects.

Deeper information about the results can be found using the references to the project report. In the project report a list of the most important ideas is always presented at the end of each chapter. In the end of the project report I have collected a list of the most important ideas to think about in the future development of PPT, and a list of the main reasons why customers use PPT (Project report, 60).

4.3.1 My training

According to the collected research material, the study participants feel that PPT provides them value in terms of training monitoring, planning, and feedback from training. In the project report I have concentrated mainly on writing about the ideas of how study participants would like to develop these most important themes.

The large number of developmental ideas presented by the study participants about the subject relates to the importance of it. The ideas included improvements in usability, small and larger adjustments to existing features, and ideas of totally new features. As stated earlier a test server version of PPT was presented to the study participants during the final observation meeting. Compared to the feedback given by the study participants Polar had made good work with the new version. In the new version most of the usability problems presented during the research period had already been fixed and the study participants were mainly happy with the new and / or improved features in the service. (Project report, 20 – 42; 60)

4.3.2 PPT as a social media

As stated earlier PPT is not considered a true social sports media, but more of a personal training software. The study participants were happy with PPT as it is, but during the theme week about PPT as a social media the study participants noticed the possibilities PPT has in this area. The research findings about PPT as a social media were mostly ideas of improving the existing social features of PPT. Some new features were presented that would give users a chance to improve the social dimension of PPT, for example posting results to Facebook. (Project report 43 – 49; 60)

4.3.3   Improving user experience

During the first week of the diary phase the study participants browsed through the web service and gave general feedback about the service. The most important subject of the week was to get to know the service better and to think about how familiarization of the service could be done especially in terms of new inexperienced users. Improving the overall user experience was another core theme of the week. The study participants came up with a good amount of new ideas how using PPT could be made easier and more appealing to the users. (Project report, 50 – 60)

Conclusions and summary of the thesis

The project as a whole was extremely rewarding. During the process I had an excellent chance to use the skills I have learned while studying at Metropolia University of Applied Sciences. The project was also demanding, even more than I anticipated. From the beginning, I had a clear view of what I was going to do and how I wanted to carry everything out. In the end I ended up doing most of the things differently. The biggest challenges were to form a group of six study participants to represent the large Polar Fitness customer group and to create a research that could be handled by only one researcher and would result in a maximum amount of helpful and useful information for Polar. Studying the theory started in December 2010 and the research period and results analysis lasted until May of 2011. The time frame of the research gives a good idea about the work load it required.

5.1   Evaluation of the research and its deliverables

The study I created is a good tool for Polar in their future product developmental processes and checking the current status of similar kinds of services. Having only one researcher limited the amount of material collected from the users during the research. If more researchers had been used, naturally a large quantity of information could have been collected in a short period of time. This way the tool is also helpful when performing quick status checks of services or more profound researches. The tool is flexible as well. The research period can be shrunk or extended and the amount of study participants can be changed.

The three phases of the research worked and linked fine together in order to provide meaningful and comprehensive information of the studied subjects. According to the feedback from Polar personnel the study met all the goals set for the project before-hand. The depth and specificity of the results surprised Polar personnel compared to their expectations. Polar was pleased with the project report and the final presentation. After the research project, during late summer and fall, it has been rewarding to follow news updates about PPT and notice that several of the findings made in this study have already had an effect on the development of the web service. In the next subsection I have presented the research feedback the study participants gave in the final research meetings.

5.2   Research feedback from the study participants

Research feedback was collected at the end of the final meeting by interviewing each of the users (the questions attached, appendix 4).

First meeting:

All the study participants thought that the first meeting was informative and provided accurate information about how much time the research will take daily. Nobody felt that misleading information was given about the research. The study participants felt that the overview handout of the research was informative and helpful.

Follow-up period:

In general, the users liked the basic questions and thought they provided a good chance to provide answers regarding their daily use of PPT. One third of the users thought that the fact one had to answer something every day became a little annoying in the long term. These study participants suggested that the questions should not have been obligatory. They thought it was hard and a little embarrassing to answer when no workouts had taken place. One user would have liked to have guidance on how to answer some of the theme questions.

The service, Google Documents + email, used as the basis of the questionnaires served the purpose well, according to the study participants. Only one user had some

trouble with the questionnaires. This study participant said that the questionnaires should have closed permanently after they were answered. For some reason she got mixed with the questionnaires in a couple of occasions and replied twice in the same questionnaire. On the other hand, one user said it was easy to answer and after submitting the answers the document replied that answers had been sent. After this the study participant could delete the e-mail.

Two thirds of the users thought that the three week research period was not too long. For one user it was of maximum length and one user would have wanted to fit the research in two weeks. This user stated that she started to feel tired about answering the same basic questions and started to feel that the theme questions did not bring forward anything new.

The themes and theme questions were interesting to the users and all six users mainly enjoyed the questions. The users felt that the subjects were important. The questions were also easy to answer. Two of the users gave credit about the fact that the daily questions were built around the themes. Only one user had some negative feedback about the theme questions. Towards the end of the research she started to feel that the questions started to remind each other too much.

Final meeting:

All the study participants thought that the final meeting was well organized, the overall mood was relaxed, and giving feedback was easy. All the members would be ready to participate in another Polar user research. One user said that it was rewarding to have a more personal chance to go through the research subjects.

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Theme and daily theme questions for research week 1

THEME FOR WEEK 1: Getting to know the service

The goal of this weekly theme is to give you better knowledge about polarpersonal-trainer.com web service and make you use features you have not necessarily tried before

There will not be any special answering box for this week's theme. You can answer the weekly theme questions using the answer boxes provided for the answers of your basic use ("How did you use the web service today" and "How satisfied were you on polar-personaltrainer.com today"). At the beginning of the week, however, tell what feature you are going to study deeper. Do not forget to write the comments about your basic use.

PART 1:

The theme of the first test week is getting to know the service. During the week go through the features of PPT and think about the following tasks with the help of the list provided in the next page:

- Is there any features missing from the service that you find extremely important
- Talk about the features that satisfy you the most

PART 2:

Examine deeper two of the features listed in page two. Choose features that you think are especially interesting thinking about your own training. Try also to choose features you have not used before.

You can use the questions below to help you in answering.

- What do you think about the functionality of the feature you chose?
- Is the feature useful?
- Is the feature well executed and how would you like to develop it?

DAILY QUESTIONS:

During the week daily questions are used to collected information about the opinions of study participants concerning the most important features of Training Monitoring in polarpersonaltrainer.com. Second goal is to collect more information about the motivations study group has for training.

HAVE A GOOD WEEK!

- Start page
- My Diary
    - Diary view
    - My Progress
    - Training programs
    - Strength training
    - My Favorites
    - Training monitors
- Community
    - Challenges
    - My Messages
    - My Contacts
    - Polar Forum
    - User Search
- Applications
    - Calculators
    - Downloads
- Polar Account
    - My Profile
    - My Sports
    - General Settings
    - Product Registration
    - Public Profile
- Articles
- Help

Follow-up week 1: getting to know the service and mapping basic PPT using and exercising habits
1. Why do you use PPT or any other training monitoring service
2. Name two (2) of the most important reasons that make you use PPT
3. How much do the following factors motivate you to exercise, evaluate using scale of 1 – 5: Getting into better shape, being able to handle daily tasks better, a single goal (for example marathon), losing weight, looking good, other (what?)
4. What kind of feedback from your training would you like to get so that it would motivate you to go on in your training
5. Do you exercise alone or in a group? Do you need group support in your training?
6. A: Evaluate the importance of following factors, use scale of 1 – 5: Weight monitoring, following of calorie consumption, following overall condition test results (for example Polar OwnIndex)
B: What kind of support would you like to get from PPT in following the listed factors?
7. What kind of effect did deeper examination of PPT have in your everyday using habits of the web service? What do you think is the best way of getting to know the web service

Theme and daily theme questions for research week 2

THEME FOR WEEK 2: Training monitoring

PART 1:

At the beginning of the week create yourself a training program using polarpersonal-trainer.com My Training feature. If you already have done this, you do not have to create a new one. If you are using a training program provided by your Polar heart rate monitor, you do not need to start following polarpersonaltrainer.com training program. In the previous situation you will still need to create a program so that you can make comments about it and how it was created. Help in creating the training program is provided on the next page.

You can comment the training program you created in the "How you used the service today?" answer box. Use the question list provided below to help you in answering.

1. How hard was it to create a training program?
2. Did the training program meet your needs?
3. Could you see yourself following the training program?
4. How would you develop the training program, was something missing from it?
5. How would you compare the training program you created to the one you are currently using?

ATTENTION! If you are using STAR training program and want to continue using it, you cannot create a new training program using polarpersonaltrainer.com. If you are using STAR make your comments about STAR program with the help of questions above. If you wish you can create a new training program, but after that your start program will be deleted.

PART 2:

The daily theme questions will deal with training monitoring, planning, and guidance

Guide: How to create and use a polarpersonaltrainer.com training program

Creating a training program:

Follow the path listed:

Main page of PPT → My Training → Training Programs → Create a new training program → answer the questions given → choose a goal you want to achieve

After creating, the training program will be visible on grey color in your diary. Weekly goals update on the right side of the screen.

Follow-up week 2: Training monitoring and planning
1. How do you monitor your training and why? What is the single most important thing for you in training monitoring?
2. How do you see your training as a whole? Do you also count normal daily activities as part of your training?
3. What is your goal in training? What do you do in terms of trying to achieve your goals? How far in the future do you place your training goals?
4. How do you monitor your development compared to your goals? What kind of support would you like to get from the web service in this matter?
5. What kind of conclusions do you make in terms of training by listening to your body? (For example, do you go training, if you have the shivers? What about after training, why did I not feel so good today?)
6. Are you willing to buy training programs? If yes, what kind and how much do you think you would be willing to pay? Would you be more interested in following a training program designed by a celebrity athlete?
7. How did the training program affect your training? Are you planning on using it in the future?

Theme and daily theme questions for research week 3

THEME FOR WEEK 3: How social media can support training

PART 1:

At the beginning of the third week a simple challenge will be created. All the study participants will be invited to this challenge. During the week study participants have a chance to comment how participating in the challenge effected their training and motivation towards training. Write your comments about the challenge and other experiences concerning Polar Community and its features in the "How you used the service today" answer box.

PART 2:

For being able to create the challenge, study participants need to add me as their contact person. Do this first thing on Monday.

My nickname is Badger_24

Adding a contact person can be done from Polar Community → My Contacts.

During the week, comment the adding of contact persons and the features that are related to having a contact person.

The daily theme questions during week three are related to social media and polarpersonaltrainer.com as a social media.

Follow-up week 3: PPT as a social media
1. What is your relationship to social media? How do you use them?
2. How do you show your athletic lifestyle in social media, give examples?
3. How social media could support your training
4. Do you have a habit of publishing your training or racing results in social media? What kind of information do you share?
5. To whom would you like to share information online?
6. Are you interested in following training information posted by other social media users? What kind of information interests you?
7. How did you feel about participating in a PPT challenge? What do you think about PPT as a social media?

Questions of the feedback interview

First meeting:

1. Did you get a clear view about the research on the basis of the first meeting?

Follow-up period:

1. What did you think about the diary method used during the research (daily email)?
2. Basic questions:
   a. Did you have a good chance to tell about your basic use of PPT by answering the basic questions?
3. Weekly themes:
   a. Were they clearly instructed?
   b. Were the theme subjects important for you?
4. Daily theme questions:
   a. Did you understand all the questions?

Final meeting:

1. How did feel about the atmosphere of the final meeting?
2. How did you feel about the final meeting in general?

Other questions:

1. How did you feel about that the daily time required for the research?
2. Do you have any other feedback about the research period?
3. Would you be ready to participate in another Polar research on the basis of this research?