TAMPEREEN TEKNILLINEN YLIOPISTO
TAMPERE UNIVERSITY OF TECHNOLOGY

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EVALUATION OF THE USABILITY SERVICE OFFERING OF SUUNTAAMO: THE CUSTOMER´S VIEWPOINT

Master of Science thesis

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Suuntaamo on Hermia Oy:n kehittämä palvelu, jonka tavoitteena on yhdistää tamperelaisia asukkaita ja yrityksiä saaden aikaan entistä parempia tuotteita ja palveluita. Suuntaamo on osa Uuden Tehtaan kokonaisuutta, joka on kehitysalusta uusille innovaatioille sekä uusien työpaikkojen luomiselle. Suuntaamossa on kehitetty ketteriä käytettävyysmenetelmiä palvelemaan erityisesti aloittelevien eli startup-yritysten tarpeita.

Nykypäivänä yritykset usein kertovat, että heidän tuotteensa on helppokäyttöinen ja sitä on ainutlaatuista käyttää. Lupaus helppokäyttöisyydestä ei tarkoita sitä, että tuote olisi testattu loppukäyttäjillä ennen tuotteen tuomista markkinoille. Diplomityössä selvitettiin, kuinka paljon ja millä tavoin tuotekehitysprosesseissa loppukäyttäjä otetaan huomioon. Työn päätavoite oli selvittää, miten Suuntaamon palvelut soveltuvat yritysten käyttöön ja miten Suuntaamon palvelutarjontaa tukisi kehittää. Työtä varten haastateltiin kymmentä yritystä, joista viisi oli startup-yrityksiä. Lisäksi 23 yritykselle tehtiin kysely, jossa selvitettiin, kuinka tärkeänä käytettävyystyötä pidetään yrityksissä, mitä osia yrityksen näkökulmasta olisi kannattavaa ulkoistaa käytettävyyden osalta sekä mitä haasteita yritys näkee käytettävyyden ulkoistamisessa. Haastattelussa selvitettiin yrityksen tapaa tehdä tuotekehitysprojekteja sekä kuinka niissä loppukäyttäjät otetaan huomioon.

Keskeisimmät tulokset olivat, että yritysten sisäiset käytettävyystyöhön liittyvät rutiinit poikkesivat toisistaan todella paljon. Startup-yrityksissä ei ollut yhtäkään käytettävyyden ammattilaista palkkalistoilla kun taas osalla haastatelluista yrityksistä oli oma yksikkönsä käytettävyydelle. Käytettävyyden ulkoistamisessa suurimpana haasteena yritykset kertoivat olevan kommunikaatiokatkokset ja se kuinka käyttäjiltä kerätty tieto saadaan vietyä eteenpäin vääristymättä. Mitä enemmän käytettävyystyötä ulkoistetaan, sitä enemmän saattaa esiintyä ongelmia tiedon siirtymisessä talon sisäisten kommunikaatiohaasteiden lisäksi. Ulkoistamisessa haasteena on myös uusien asiakkaiden luottamuksen voittaminen. Startup-yrityksillä on tavoitteena kehittää omia tuotteitaan sekä omaa liiketoimintaa loppukäyttäjiltä saadun palautteen perusteella, minkä vuoksi startup-yritykset eivät kokeneet, että käytettävyystyön ulkoistaminen kokonaisuudessaan tuo heille lisäarvoa. Kuitenkin startupit kokivat, että käyttäjärekrytointi- ja konsultaatiopalveluita ovat hyvin hyödyllisiä.

Työn lopussa esitetään ideaali asiakkaan case esimerkkejä, joiden avulla esitetään kuinka yhteistyö Suuntaamon ja yrityksen välillä ideaali tapauksessa voisi toimia.

ABSTRACT

TAMPERE UNIVERSITY OF TECHNOLOGY
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Suuntaamo is a publicly funded initiative that is coordinated by Hermia Ltd. From the beginning, the users have had an essential role in Suuntaamo's work. The goal of Suuntaamo is to build business involving people in innovative product development for its customer companies. Suuntaamo´s goal is to spread the benefits of improved usability in the technology field and to include user-centered design in product development in industry. The most important goals for Suuntaamo are that it should be self-financing by the end of the initiative and that it should generate new jobs by creating a sustainable environment for the usability business. Suuntaamo has developed methods and processes (Suuntaamo usability service offering) to achieve these goals. The aim of this thesis was to evaluate how well these goals have been achieved and how well Suuntaamo's service offering answers industrial companies' needs. Based on this evaluation, the Suuntaamo service offering can be developed and Suuntaamo´s future cooperation with its customers will be clearer.

In this study, 10 companies were interviewed and 23 companies filled in a survey. Five of the interviewed companies were start-ups while the other five were established companies. The interviews with the start-up companies were included because Suuntaamo's services were first designed for start-ups. The main aim of the interviews and the survey was to assess how well the services that Suuntaamo provides meet the customers´ needs

Suuntaamo's services, which include user recruitment, an assistance service and usability training were seen as both positive and valuable. The greatest challenges in outsourcing usability work were seen to be communication problems between the company and the usability subcontractor, and how the knowledge gained from the end-users can be brought into the development process in a correct format. Outsourcing usability work may also lead to challenges in winning the trust of the companies' own customers. The main goal of start-up companies is to develop their products and business based on their end-users' feedback. This is why the start-ups felt that outsourcing usability work does not give them added value. Nevertheless, the start-ups admitted that the user recruitment and consulting services are very useful. Two ideal customer cases are described at the end of the thesis in order to show how Suuntaamo and a customer company should cooperate in a mutually beneficial manner.

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Tampere March 22, 2013

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ABBREVIATIONS

Startup company	A new company that is developing their first products and services.
ENoLL	European Network of Living Labs
iOS	iPhone OS is a mobile operating system developed and distributed by Apple Inc.
ROI	Return on investment
UX	User Experience
UI	User Interface
UCD	User-Centered Design
ROI	Return On Investment

1 INTRODUCTION

The introduction explains the motivation for conducting the thesis and its background, the reason why this study was done, the research questions, and the methodology and structure of the thesis.

1.1 Motivation

Knowledge about usability has grown in the past few years in industry. Companies know that this is an important aspect of any business, and it needs to be taken into account in product and service development processes. Many companies advertise their products as easy to use, but this does not mean that the product is tested or developed with end users. Nowadays, all electronic devices need to be easy to use, otherwise people will not buy them.

Allowing for usability in the product development process is not that simple, first of all because the idea needs to be sold to the customer company, since it is the customer company who must foot the bill. Some customers are more aware of the benefits of user-centered product development than others.

Suuntaamo is a publicly funded initiative coordinated by Hermia Ltd. Suuntaamo´s function is to promulgate the benefits of User-Centered Design (UCD) and help companies to involve test users in their product development processes. Usability is not yet a factor involved in every product development process. Sometimes, the challenge lies in the fact that the customer company doesn´t know how to add usability in a cost-efficient and agile way. For this reason, Suuntaamo has developed agile methods for integrating UCD into the product development process for industrial companies as part of its usability service offering. In this thesis, the usability service offering is evaluated from the viewpoint of the customer companies. A customer company is a potential Suuntaamo customer, meaning customers who can benefit from incorporating Suuntaamo's service offering in their product development process.

Suuntaamo´s goal is to promote the benefits of usability for technological development and to incorporate a more UCD viewpoint in industrial product development. The Suuntaamo initiative's most immediate goals are for it to be self-financing by the end of the initiative and to generate new jobs. Suuntaamo has developed methods and procedures (the Suuntaamo usability offering) to achieve these initial goals. The function of this thesis is to evaluate how well these goals have been achieved and how well the Suuntaamo service offering meets the needs of industrial companies. Such an evaluation will aid development of the Suuntaamo service offering and point the way forward for Suuntaamo to work with its clients in the future. Suuntaamo´s other goal is to help

companies with their own usability procedures and, ultimately, to get more usable products on the market. It is therefore important to evaluate the strengths and weaknesses of Suuntaamo's service offering. At the same time, it is necessary to be aware of the broader usability consultation offering in Finland, in order to make sure that Suuntaamo can develop its own offering to support larger usability studies and, in addition, to develop its service offering for both established companies and start-ups.

1.2 Research questions and methods

Suuntaamo´s service offering had been developed in cooperation with the customer companies by analyzing the usability tests conducted with the customer companies. This has included discussions with the customer companies and observation of the customers' needs. In this study, the service offering development process and the Suuntaamo working environment are described from the close-up perspective of a Suuntaamo employee, one who has been involved with Suuntaamo from its very beginnings. The work thus encompasses the development of the Suuntaamo service offering. The aim of this Master's thesis is to evaluate the Suuntaamo service offering in a study based on interviews and a survey. The aim of the interviews and the survey are to figure out how well Suuntaamo's services meet the customer´s needs, and to ascertain whether there are any missing elements in the Suuntaamo service offering, in order to define how Suuntaamo's service offering can be developed further. The research questions are:

Are the Suuntaamo usability services suitable for the local software industry?
What are the customer companies´ usability needs?
What are the development opportunities for the Suuntaamo usability service offering?

As stated above, the main aim of this thesis is to evaluate the Suuntaamo service offering. The research is focused on software companies operating in Finland. Although the Suuntaamo service offering has been developed with start-up companies in mind, much of the focus in the interviews and in the survey is on established companies. Whilst the thesis does describe the service offering process, this is not an essential part of the study. In fact, the Suuntaamo service offering described here is from December 2012, since when the service offering has already undergone further development.

The research methods used are partly descriptive and partly normative. Suuntaamo's services are described from a descriptive perspective and from the personal perspective of a Suuntaamo employee. The evaluation of the Suuntaamo services is based on the customer interviews and the survey, and the recommendations for the actual customer cases are made from the customer's point of view. The thesis concludes with two example cases which illustrate how companies can get the most out of Suuntaamo's services. The function of these 'ideal' case studies is to help companies understand how Suuntaamo can add value to their product development process.

1.3 Structure

This thesis is organized as follows. Chapter 2 describes the main features of the environment in which the work was conducted. Chapter 3 presents the user experiment practices and how usability is cost-efficient for companies. Chapter 4 illustrates the development of the Suuntaamo service offering and the evaluation methods, that is the interview and the survey, which were used to analyse it. Chapter 5 evaluates the level of usability maturity and the need for this in industry, and outlines a few ideas for Suuntaamo´s future development. Chapter 6 presents the conclusion of the thesis.

2 SUUNTAAMO AND ITS ENVIRONMENT

Chapter 2 describes Suuntaamo´s environment. Suuntaamo is part of the New Factory, consisting of Suuntaamo itself Demola, Protomo, Accelerator and Manse Games.

2.1 The New Factory as an Innovation Environment

The New Factory is an innovation center and business incubator that consists of innovation platforms. These currently comprise Suuntaamo, Demola, Protomo and Accelerator, all of which have been developed by the New Factory staff. An innovation platform is a platform whose methods have been established and are working in practice. In addition to the platforms, there is Manse Games, which is a cluster development project. The working community plays a central role in the New Factory. The value of the innovation center is that the platforms can work better and more efficiently together than they would individually. The idea is that the platforms interact together. This is perfectly exemplified by the fact that a number of Demola teams have decided to continue working through the Protomo platform, their aim being to build a company based on an idea that originated from the Demola project. At the same time, there is the opportunity for some of the Protomo teams to start a Demola project, in order to enrich their business. (Matikainen 2012)

One of the functions of the New Factory is to develop new platforms in addition to the existing ones. It is not impossible for a particular platform to be implemented from outside sources, as long as it fits in with the operating model and supports the project as a whole. The vision is that new platforms should be developed continuously as needed. The New Factory gives established companies an opportunity to renew themselves, and new companies a supportive environment in which to start and build their business. (Matikainen 2012)

> ”[The] *New Factory provides students, self-employed entrepreneurs, researchers and developers with an environment for open innovation, allowing them to process ideas into prototypes, pilot projects, products and services, new business and new jobs. Seeds of ideas can come from businesses, students, researchers or local residents. Besides ideas, enterprises in the Tampere region supply the Factory with coaching and financing. In return, the New Factory offers enterprises new talent, business ideas and concepts.”* (New Factory)

> *“Operations are characterized by [the]acceptance of new ideas and people, inspiration and encouragement.”* (New Factory)

Ultimately, the aim is to create new jobs in an innovative way. The operations are kept customer-focused, down-to-earth, agile, cost-efficient and effective.

Demola
In Demola, students develop demonstration concepts for products and services in cooperation with companies. The concepts are mainly solutions to real-life problems. Students from different universities encounter new learning opportunities and gain practical experience working with industrial companies. After an approximately four-month development process, the companies can purchase the rights or the license for the products or services developed by the students. So far, Demola has allowed over 1500 students to participate in 250 projects. (Demola)

Protomo
Protomo is a platform for setting up new businesses. Protomo offers facilities, equipment and tools as well as community support and business consultancy from experts. The idea is to help new companies to start their business and to allow them to focus on building it. Since its inception in 2009, Protomo has so far created 171 new startups nationally and given employment to 467 people. (Protomo)

Accelerator
This StartupStairs platform offers coaching and sparring to potentially growing enterprises by supporting them in raising funding. (New Factory)

Manse Games
The goal of Manse Games is to speed up the gaming industry in Tampere. Manse Games organizes workshops and events to help local games companies to network with and benefit from the local professionals in the mobile game industry in order to further the computer gaming business in the Tampere region. There are currently over 100 gaming industry experts employed by 25 game companies in Tampere. (Manse Games)

2.2 Suuntaamo of the New Factory

It is Suuntaamo's operating environment in the New Factory that has shaped Suuntaamo into what it is today. The New Factory and the Living Lab philosophy have helped Suuntaamo to achieve its goals. These networks have also helped Suuntaamo in its every-day working practices.

The needs of the test users have played an essential role right from the beginning of the Suuntaamo initiative. Suuntaamo wanted to be an organisation which places a premium on the needs of the general public, while simultaneously providing companies with ideas on how to improve their products and services. Suuntaamo has succeeded in creating a large pool of active users who have been described as high-quality test users.

Suuntaamo is a publicly funded initiative begun in January, 2010 and planned to run until June, 2013. The goal is to build business by involving people in innovative product development through the creation and continuous improvement of a sustainable environment. Suuntaamo has focused on ICT-related product and service development projects. It has created value for its customer base through its user recruitment services, research assistant services and by carrying out studies of the industrial process from design to implementation. Among Suuntaamo's many achievements are the conducts of 60 agile user studies involving 31 partners and 1500 user participations. The studies have been related to games, mobile app/software and service design (living and environment, healthcare etc.). Besides developing its offering in the start-up environment, Suuntaamo has also worked with large established companies and with the public sector. (Suuntaamo)

The attraction of the initiative for the test-user is that one can participate in testing new innovations and products that are not yet available on the market. Suuntaamo also co-operates with non-profit organizations. The members of these organizations can do some voluntary work by participating in the Suuntaamo sessions. Taking part in a test session can also be a function of charity work.

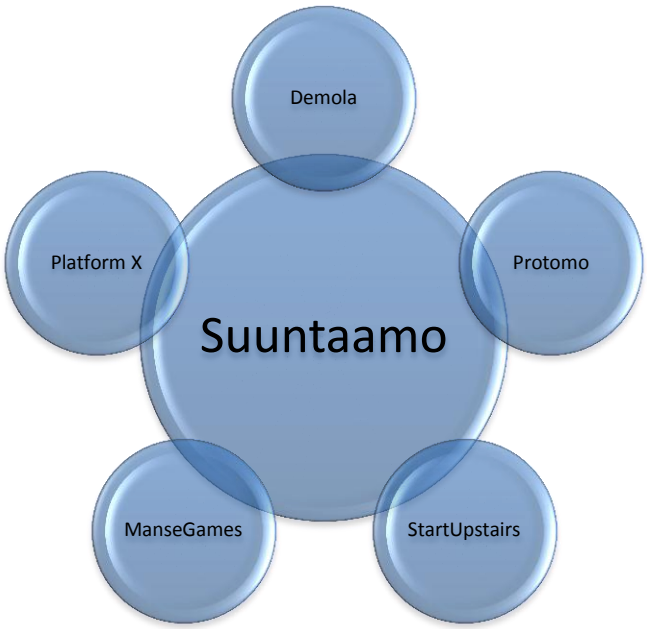

Figure 2.1. *Suuntaamo as a support tool for the other platforms in the New Factory*

Suuntaamo is a Living Lab and has been a member of the European Network of Living Labs (ENoLL) since 2009. The main characteristic of a Living Lab is that it involves users in the product development process, especially in the actual context of the product. ENoLL offers Suuntaamo a support network comprising over 300 members from other Living Labs all over the world (ENoLL). Suuntaamo's international collaboration with ENoLL has in turn improved the strength and effectiveness of the international alliance. There is more about Living Labs in Section 3.1.

2.3 The Suuntaamo Usability Service Offering

Figure 2.*2* illustrates the services that Suuntaamo provides from the customer´s viewpoint. The top of the figure presents Suuntaamo's services, these being knowledge, resources and the user pool. The left-hand side of the figure shows potential customers for Suuntaamo and the right-hand side shows Suuntaamo's offering as products. The figure not only gives potential customers a view about which segment they might belong to, but also gives examples of the kinds of services Suuntaamo can offer them.

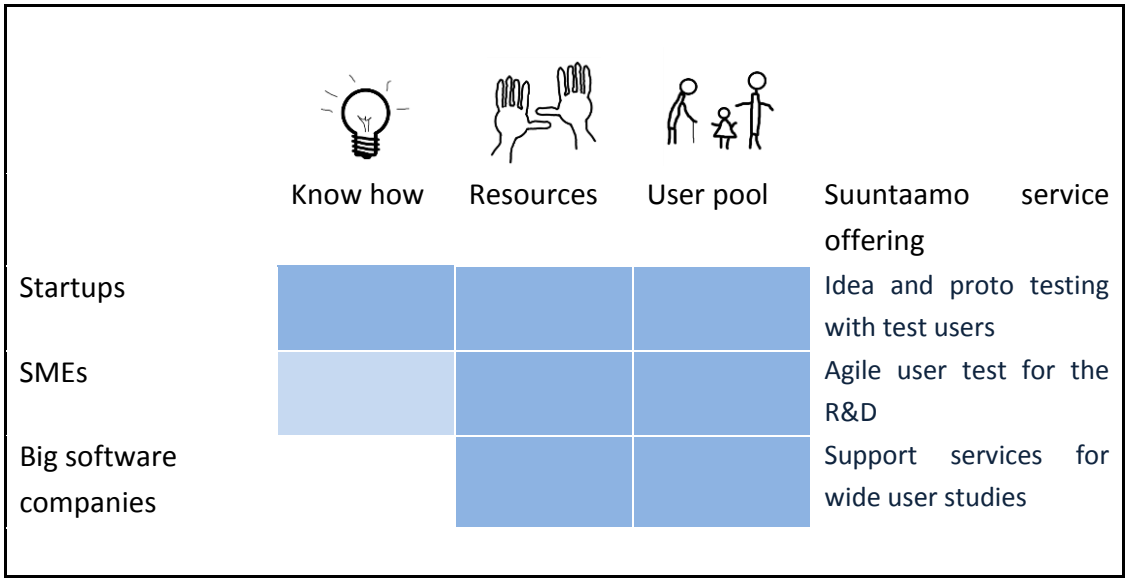

Figure 2.2. *Suuntaamo usability service offering from the customers´ viewpoint*

If a customer has no knowledge of user-centered design, or lacks the resources to use it, Suuntaamo can help with for example designing user tests, as well as in other areas which will add usability to the customers´ product. Suuntaamo's highly-experienced and professional staff are an additional resource for their customers. In addition, Suuntaamo has a user pool of 400 users and contacts with over 2000 potential test-users via its association with user-test participants. This pool is constantly being increased and improved to meet the changing demands of user recruitment. Suuntaamo's customers can access these specialised services in order to improve the usability of different products, while still focusing on their core competencies. The service offering for start-up companies is mainly concerned with testing ideas and prototypes, while small and medium enterprises (SMEs) can benefit from agile user tests for R&D. Suuntaamo also offers support services for extended user studies needed by larger software companies. For example, these services may include user recruitment, planning the test sessions, conducting the user tests and gathering and summarizing the resulting data.

Test methods used by Suuntaamo

Suuntaamo utilises traditional user-centric methods, such as heuristic evaluations, individual user tests and concept evaluation (for example, with focus groups). Suuntaamo also offers a test method that has been developed to provide cost-efficient user tests. Figure 2.3 shows the methods that are used in Suuntaamo. The literature contains a plethora of articles and books about different user-centered design methods, such as Isensee et al. (2002) and Holtzblatt et al. (2004). The Suuntaamo service offering is largely based on adopting and adapting the most fitting methods referred to in the literature on the topic. The usability methods used by Suuntaamo are chosen from the literature according to their fitness for purpose and through the painstaking process of trying out these methods in practice. The Suuntaamo testing method is a test method developed by Suuntaamo itself for agile and cost-efficient usability testing. The in-context testing has been adopted from Belam (2012) and is used to test prototypes in their own context in an agile way.

Figure 2.3. *Usability methods used by Suuntaamo*

With the in context testing –method, the test can be conducted in, for example, parks, shopping malls and train stations. Usability training for the customer companies

can include training in how to conduct user tests and gather data from the end-users. In an ideal case the company would have several training sessions, during which, for example, the company's programmers would learn more about usability and develop their own usability skills. Between these training sessions, the workers would try out their newly-acquired skills in practice. Individual user-tests, heuristic evaluation and idea & concept evaluation are among the more common and familiar methods used to evaluate the usability of a product.

3 USABILITY PRACTICES IN INDUSTRY

Chapter 3 presents the theory underlying this work. It describes the theory of Living Labs, the usability methods used by existing companies, the cost-justification for usability, the Return on Investment ROI of usability, and discount usability.

3.1 Living Labs

Eriksson et al. (2005) have described a Living Lab as a user-centric research methodology that can be used for prototyping, validating and refining complex solutions. Ståhlbröst identifies the key Elements of Living Labs as being user participation in real-life context, customer services, methodology and infrastructure. Participation refers not only to the users but to all the concerned stakeholders. The difference between a Living Lab and more traditional user involvement lies in the interaction with the users in their own context. A methodology must be chosen which supports the user's perspective, rather than seeing the user as a guinea pig. (Ståhlbröst 2008) and Bergvall-Kåreborn et al. (2009a) have created the following definition of a Living Lab:

> "*A Living Lab is a user-centric innovation milieu built on every-day practice and research, with an approach that facilitates user influence in open and distributed innovation processes engaging all relevant partners in real-life contexts, aiming to create sustainable values*". (Bergvall-Kåreborn et al. 2009a p. 1)

Bergvall-Kareborn et al. (2009b) describe a Living Lab as being a gathering of public-private partnerships in which different stakeholders come together to take an active part in the innovation process. Stakeholders, such as business researchers, governmental authorities, and the general public, work together to create, test and validate new services, business ideas, markets and technologies in a real-life context. A Living Lab can be seen as a methodology, an organization, a system, an arena, an environment or simply any systemic approach to innovation. Whatever the definition of a Living Lab, all the descriptions seem to have in common that Living Labs involve the potential end-users and the context is real life.

The Hague Living Lab at Leiden University in Holland is an excellent example of the complexity of a Living Lab. Here, the Living Lab is described as a "Golden Triangle" (Figure 3.1). The golden triangle demonstrates the collaboration between the students, researchers and colleagues of The Hague Living Lab, and the representatives of international organizations and companies, and other knowledge institutions and international partner universities. This stimulates business activity and innovation in the

Hague region and furnishes advice and support for young and talented entrepreneurs on starting their own businesses. (The Hague, 2011)

Vicini et al. (2012) state that engaging users in the development process is essential for the ideation and deployment of successful ICT-based products and services. This is due to the fact that the needs and requirements of the end-users differ according to their level of IT literacy, their age, their demographic profiles, and their cultural attitudes. The earlier the stage at which users are involved in the development process, the more the product or service will match the needs of the user, and the better it will fit the user's expectations. Furthermore, if the users are involved from the beginning, there is more time to take account of their opinions, ideas, behaviors and preferences. The City of the Future Living Lab (Vicini et al. 2012) has been described as a Smart City which emphasizes user-driven methods in a real-life context and has a significant role in shaping future technologies.

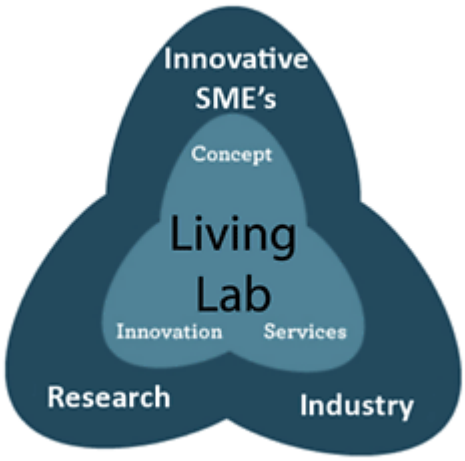

Figure 3.1. *The Hague Living Lab model (The Hague, 2011)*

The Living Lab concept has been further described by Eriksson et. al. (2005) as a new way of the understanding future opportunities requiring a very open approach. This concept may sometimes be at odds with the dictionary definition of the specific business model for a company. Nevertheless, Living Labs are a reality, and Eriksson et al. (2005) list 18 different Living Labs in Europe.

Ståhlbröst (2008) also notes that different stakeholders are motivated by different factors that are not necessarily important to other stakeholders. For example, for a researcher, the main focus may be on producing scientifically verifiable results, while for companies and start-ups, success may be measured by how much money can be earned by developing a new IT system. These different perspectives and views of reality are often cited as reasons why it is necessary to involve the users and as many different stakeholders as possible in the development process for any new product.

When working with customers, the model of co-operation has a significant effect on the results. It is important to combine both short-term and long-term relationships with partners. Whereas the long-term relationships add stability and allow the evolution of trust between the concerned parties, the short-term relationships may contribute new perspectives and innovative ideas. One of the principles behind the Living Lab is to be open to new ideas and new ways of performing tasks. In addition, this reliance on openness means that the development process itself should be open to feedback from multiple stakeholders. As Ståhlbröst (2008) has pointed out, openness can stimulate new and innovative business ideas.

Ståhlbröst (2008) has also presented a methodology called FormIT. The name refers to the fact that the methodology affords an opportunity for users to influence future IT-solutions. The methodology has been developed to support user involvement in Living Labs projects in a real context. FormIT concentrates on defining and distinguishing between needs, requirements, functions, dreams, and values in order to stimulate the development process. Usually, in the field of software development, the goal is often to understand the users' needs and requirements and to design a software system based on these. FormIT starts this process by focusing on the users' needs, rather than the requirements of the systems. This approach allows the developers to be more creative and innovative, since the final solution has not been determined at this stage. In addition, FormIT acknowledges the importance of user involvement through the use of the general public as voluntary users. The user involvement procedures used in FormIT are implemented in the users' real-world settings, with all the opportunities and threats that are involved in that context. Not only are the system's users totally voluntary, but they are involved in the development process from the very beginning, before the system (or idea for a system) actually exists. This process gives inspiration to the development team.

Indeed, nearly all the articles and papers on Living Labs describe environments where the users are involved in developing a new environment. The environment could be, for example, a test-bed, a test network, a new infrastructure or a Smart City that stimulates new business or increases the services for its citizens. It should be further noted that the papers on Living Labs are usually focused on specific Living Lab projects, so the results are often not generalized.

3.2 Usability Methods Used by Companies

Gulliksen et al. (2003) conducted a survey in which usability professionals were consulted about their use of usability methods and techniques. The respondents rated the methods and the techniques they use, or have used. The five most used methods/techniques were: 1) thinking aloud, 2) prototyping, 3) interviews, 4) field studies and, 5) scenarios. The respondents indicated that their responsibilities are mostly concerned with:

- Details of the GUI
- Details of the functionality of the system
- Usability and functionality at the product level
- Guidelines for the organization

Gulliksen et al. (2003) also pointed out that the greatest challenges in usability work are a lack of respect and support for usability issues and the professionals working with it, particularly from management, but also from other stakeholders involved in the process. The three success factors for usability which had the highest ratings were: support from the project management, support from the management of the organization, and usability being part of the project plan from the beginning. Over 60% of the respondents answered that, in their opinion, they do not spend enough time with users during the development process.

Gulliksen et al. found that existing usability methods need to be adapted and adjusted to the task in hand, and to the development process. This can be achieved through, for example, iterative design with continuous analysis, or design and evaluation until a specified goal is achieved. However, in practice this is more or less impossible due to the fact that most projects need to be finished within a scheduled time limit. In reality, usability-related work tends to be scheduled for the end of a project. At this stage, the primary focus is often on getting the system to work at all, leaving a minimum of time for usability-related work. (Gulliksen et al. 2007)

The planning and conduct of the user-tests places a high workload on the testers, which is contrary to the basic principles of Scrum, such as simplicity and speed. Larusdottir et al. point out that Scrum's sprint iterations are so short that formal usability tests cannot fit into Scrum project work. Some examples from their study show that practitioners would like to do formal usability testing on extensive parts of the system, and Larusdottir et al. have pointed out that there is a need for further development of usability testing in Scrum, and that there is still a need for ways of integrating agile usability testing into each Scrum sprint. All the respondents to their survey would have liked to perform more usability testing, at least occasionally, if they had had the time and the money. All of the respondents appreciated the importance of usability.(Larusdottir et al. 2010)

Jia et al. have researched usability methods used in Scrum projects. The result showed that about 75% of the respondents rated formal usability evaluation with users as very good method of assessing a product's usability. In addition, about 60% thought field studies and digital prototyping were also very good methods. Around half of the respondents said a lo-fi prototyping method worked very well. The techniques were rated on a five-point scale from very good to very bad. The top five rated usability techniques used by IT practitioners were listed as: 1) workshop, 2) informal usability evaluation with users, 3) meetings with users, 4) scenarios, and 5) formal usability evaluation with users. (Jia et al. 2012)

3.3 Cost-justification for Usability and the ROI of Usability

Bias et al. describe how the cost-justification for usability can be used to show whether usability work is indeed profitable for a company. Cost-justification methods for usability allow profit estimates to be calculated, which means that the usability work can be justified in terms of cost and efficiency. Such cost-justification can help a company to make decisions about introducing and implementing usability work at the beginning of its development processes. (Bias et al. 2005)

In order to calculate the cost-benefit ratio of usability, a cost-benefit analysis technique is applied. This, in turn, means that a detailed usability plan is required for a project in order ascertain the requirements that need to be calculated. Once this has been done, the next step is to calculate the benefits of the usability project. Although calculating the usability benefits is not as simple as calculating the cost of usability work, in the end the costs and the benefits can be compared, giving a profile of the project's cost-effectiveness (Bias et al. 2005). If the results are satisfactory, then the usability project plan is cost-justified in terms of the predicted effort involved in implementing the plan.

The benefits of usability work can be calculated by identifying potential benefit categories. For example, in organizations that develop services for internal use, the benefits of usability might be increased user-productivity, a decrease in the number of user errors, reduced training costs, savings gained by making changes earlier in the development lifecycle or a reduction in the number of customer service calls from users. In a similar vein, Bias et al report that the benefits of usability for a vendor company might be increased sales, a decrease in the utilization of customer services, reduced costs achieved by making changes earlier in the development lifecycle and minimal costs for training, at least in those cases where training is offered by the vendor.

It is clear that companies, especially vendor companies, value ease of use. For example, many newspapers evaluate user interfaces. Potential customers read those evaluations and often base their purchase decisions on the newspapers` evaluations of the product. There are also many product evaluations on the internet, where both the user interfaces and the functionality of the product are reviewed. Customers are accustomed to reading such product evaluations before making their purchasing decision (Bias et al. 2005), which adds to the pressure on software companies to produce well designed products and services.

It is not easy to predict the extent to which added usability will affect sales. While there is no doubt that usability engineering is used as a tool to increase sales, market forces such as market share, trends in the market, and the strengths and weaknesses of the competition need to be taken into consideration. (Bias et al. 2005)

Rajanen (2003) summarizes four different studies of cost-benefit models. He first describes the challenges of bringing usability activities into the product development process, stressing that the benefits of usability are difficult to identify and to calculate. To convince the management to allocate resources for usability engineering, it is necessary to first carry out a cost-benefit analysis. Rajanen identifies four main benefit cate-

gories: product development, marketing and sales, customer support and the customer as end-user. Although all these studies showed increased sales as one of the benefits for the more usable products, only one of the studies identified increased customer satisfaction as a potential business benefit.

Table 3.1 summarizes the main benefit categories for cost–justifying usability as described by Rajanen (2003) and Bias et al. (2005).

Table 3.1. *The main benefit categories of cost-justifying usability*

Cost-justifying Usability categories	**Rajanen**	**Bias et al.**
Faster product development	x	
Increased Marketing and Sales	x	x
Decreased need for customer support	x	x
Benefit for end users	x	
Customer satisfaction		x
Ease of use factor		x
Reduced cost gained from taking chances earlier		x

The Return on Investment (ROI) for usability describes how much is gained in relation to what was invested, that is the profitability of the investment. The return on investment formula is:

$$ROI = \frac{(Gain\ from\ Investment - Cost\ of\ Investment)}{Cost\ of\ Investment} \qquad \text{(ROI 2011)}$$

Rosenberg (2004) states that ROI calculations for usability are questionable because most of the existing data is vague. Mayhew and Mantei (1994) have written a book on the ROI of usability, "Cost Justifying Usability" but there have not been many comprehensive follow-up studies since then. Although there are many published articles on the ROI of usability, there is a shortage of empirical case studies with original and detailed financial data, and those that do exist are largely out of date. In addition, the ROI of usability, as a term, is often over-generalized and used inconsistently.

Bias et al. believe that UCD practitioners need to understand both perceived ROI (the belief that UCD adds value to a product) and measured ROI. In some cases, the perceived ROI will sustain the practitioner when factors beyond his control, such as economic conditions or system reliability, counteract the improvements that were predicted for the usability activities, and thus have a negative effect on corporate ROI metrics.

Bias et al. divide the ROI of usability into three subcategories: internal ROI, external ROI and social ROI. Internal ROI focuses on perceiving the effectiveness of usability during the development of a product or a service. Internal ROI is concerned with the

personnel performing the UCD, in that it measures those UCD activities that improve the development process itself. These are the promotion of clear product requirements, the elimination of major problems early in the development process, improved communication among the product team, support for the re-use of design components, and a reduction of the costs of the development.

External ROI occurs when the UCD performing personnel produce products or services that are more profitable for the company. The profit can be measured as increased sales and revenue, reduced support calls, increased customer satisfaction and brand awareness.

Social ROI is related to the perceptions of internal stakeholders, such as managers, developers, and other members of the production team. Social ROI is about understanding what is important to other team members and the development of support networks that perceive value in UCD. (Bias et al. 2005)

Usability in Start-ups

Having a new business idea and creating a new business from the beginning is very difficult, since all the work needs to be done simultaneously but resources are limited. After coming up with the business idea, the entrepreneur needs to convince the investors, as money is required to develop the technology and build the product itself. Not only is the business concept under-resourced, but there are many administrative procedures which need to be dealt with.

For start-up companies, it is very important to focus on essentials, so that the business starts to perform as soon as possible, which will, of course, ensure that the business is able to continue. User-centered methods can help entrepreneurs identify well-defined customer issues and limit the product's complexity to only its essential features (as defined by the customer). Start-ups need to start selling their product as soon as possible. Usability methods and early customer involvement will help start-up companies provide value to customers and to investors.

Customers and investors are looking for a short-term return on investment. For this reason it is important to secure the customer value early. (Bias et al. 2005)

3.4 Discount Usability

Kane (2003) describes discount usability engineering as an approach that was originally presented by Jacob Nielsen, although over time the term has come into common use. The main goal of discount usability is not to find the best and most usable design, but to make the usability of a system good enough to add customer value and user productivity.

User-centered design is usually time-consuming and expensive, and discount usability engineering is valued for its ability to minimize the cost and the time required for user-testing, and to maximize the benefits gained from those tests**.** Many researchers have conducted studies to define the most effective method of evaluation for usability,

or the minimum number of user tests needed yield maximum benefits for usability. There is the risk that the methods used in discount usability are not worthwhile or are even scientifically invalid**.** The question is where you draw the line. Discount usability engineering methods need to be fast and cheap while maintaining the scientific validity of the methodology. (Marty et Twidale 2005)

Kane (2003) lists four principles that are common to discount usability engineering and agile software development engineering. These are individual and group interactions, working software, customer collaboration and response to change. The first principle is concerned with understanding the users and the interactions between them and the key elements of the software. The test venue could be a company´s conference room, or any quiet corner, as no laboratory facilities are required to conduct these user tests. Working software means, for agile software engineering, that computers are able and capable of operating the software. Paper prototypes are an effective and economical way to get usability feedback, especially if the software is not yet working. Customer collaboration is very important for developing usable software. Discount usability is about responding to the results even if the results are different than the developers expected. It is necessary to devote time and flexibility in order to make software usable enough.

Marty and Twidale (2005) report that they have developed an agile user-testing method which only requires 30 minutes per user from test design to analysis of the results. They point out that an experienced researcher is needed to conduct the test sessions and to guarantee the quality of the results. Their goal was to explore the nature of user testing when time is at a premium. They aimed to use their evaluations to find a non-zero number of usability flaws in a minimal amount of time. The idea was to conduct a ten-minute user test and to constantly try out different tasks until useful findings could be found. One of the results was that it was the number of usability flaws or design recommendations they were able to make that was more essential than the number of tasks that were successfully completed. Marty and Twidale (2005) underline the importance of focusing on the testing process in order to figure out what are the concrete improvements that can reasonably be implemented. According to Marty and Twidale, it is not that important how many tasks were successfully completed in order to improve the overall usability of the product.

Nielsen is aware of some infrequently-used usability engineering methods which have actually been used on software development projects in practice. Nielsen points out that the initial approach to user centered design only needs a minimum of usability methods, in that “anything is better than nothing”. Nielsen uses the term “guerilla HCI” for simplified usability methods. He states that it is easier to start with a few lightweight methods, before moving on to more demanding and systematic methods when the usability evaluation has become more an integral part of the development process. Nielsen believes that it is perfectly acceptable to begin the development process with simplified usability methods. Consequently, Nielsen uses the three following methods for discount

usability engineering: scenarios, simplified thinking aloud and heuristic evaluation. (Nielsen Norman Group, 1994)

On his webpage "Quick and Dirty Remote User Testing" Nate Bolt presents three different, agile, cheap, guerilla-style user-testing methods with real users. In the first method, the user is connected via the internet to the test conductor. The test user needs a high-speed internet connection, (now usually available everywhere), Skype, and a link to the web page sent to him by the test conductor. The test conductor needs a screen-sharing software tool to see what is happening on the test user´s computer screen during the session, and a screen-recording application. There are directions on the webpage which explain how the test participant can use the recommended test tools. In order to be able to start the test itself, the participant needs to be invited to a test session via the web page. The second method is one in which there is no contact with the test user at all. It is an automated research study. Online tools can be used to create quick, task-based usability tests, to perform card sorts and to measure the results. Such methods are sometimes also called "unattended user research". They automatically gather the feed-back without any need for human-to-human interaction. This method highlights the places on the interface where other users have had issues, but it does not say why they have had issues. This method only works for webpages. The third method is for those cases where the test conductor wants to hear what the users are saying about the product or the service, but does not want to communicate directly with the test user. The test material is recorded via webcam where the user can add images and/or spoken feedback about the service or product, and send this feedback to the test organizer. (Bolt, 2010)

Table 3.2 shows the different discount usability methods suggested by various authors.

Table 3.2. *Discount usability methods*

Authors	**Method name**
Nielsen, 1994	Guerilla HCI
Bolt, 2010	Quick and Dirty Remote User Testing
Marty and Twidale, 2005	An agile user testing method (only 30 minutes / user)
Belam, 2010	Ambush guerrilla user testing
Kane, 2003	"Discount usability: responding to the results"

Belam (2010) describes 10 tips for "Ambush guerilla user testing" in his blog on us-ability. Belam does not describe the method as a formal research technique, but rather as a method for gathering valuable data about the tested product or service. This method can be used to obtain data from complete strangers in public places, as described below:

1. The basic equipment is a portable computer or other device linked to the in-ternet including a video and voice recorder.
2. A clean desktop on the device, with any additional programmes switched off in order to avoid disturbance during testing.
3. A new browser profile without cookies, stored passwords or browser history.

4. Another researcher to assist in looking for test candidates and to conduct the test professionally and without interference.
5. The necessity of being prepared and looking professional when engaging the cooperation of the test subjects.
6. Sometimes the testing needs to be improvised when the conversation turns to other topics which may engage the test users' interests.
7. After a few hours gathering data in this way, a short video clip can be made to show to the concerned parties.
8. Permission to use the videos for the appropriate purpose is required.
9. The researcher must be consistently polite to everyone.
10. The method is not regarded as a scientific method.

(Belam, 2010)

3.5 Usability Consulting Offerings

Companies whose webpages offer any usability services were selected for this part of the study. In addition, not just local companies were included, but also those that offer their services nationwide in Finland. All of the following information about the companies' service offering were gathered from their webpages, which were the only source of information. Therefore, the data might lack details about their other offerings.

Etnoteam´s webpage shows that they have three main services: research, design and evaluation. They describe their services in detail, and also the benefits that the customer can obtain from the study. Etnoteam conducts user research to define product target groups and to assess the needs of the end users. In addition, Etnoteam helps companies to identify product competitors and to analyze the data to obtain meaningful information. Etnoteam offers concept and user interface design for products and services. They also offer common user interface guidelines that will help the whole organization to create uniform products. One of the primary aspects of their approach is the involvement of the end users. Etnoteam offers usability testing, concept evaluations and testing for user interfaces, as well as the environmental impact. (Etnoteam)

The main offering of **Idean** is research and design, consultation, and concept creation. Research and design includes user experience, user interface and interactive design and usability. Consultation means workshops, benchmarking, product strategies, and go-to-market plans. A concept creation is the initiation of a new product concept innovation. The Idean website presents a brief introduction to their offering and a lot of sample cases from companies they have been working with. These sample cases have been divided into three categories, these being mobile, web and industrial solutions. Idean has delivered over 1500 projects to nearly 200 clients globally. The webpage highlights the company's understanding of current topics like icon design, location based services and mobile search. (Idean)

Adage offers customized services for usability evaluation, user research and design. Adage promises to use the most appropriate methods for the needs of the customer companies in order to evaluate the usability of the customer's product. In other words, Adage evaluates the usability and user experience of their customer's product with methods that best suit the situation and the need. Adage not only reports the findings of the evaluation, but also makes suggestions as to how to improve the quality of the product. (Adage)

LeadIn's webpage presents their offering visually. Their service offering consists of concept creation, research, user-interface design, user-interface evaluations and usability strategy. The company assures its potential customers that collaborating with LeadIn leads to great usability "Stand out from the competition with a great user experience" and they claim to deliver premium quality usability services for their customers. The company has been growing since 2009, both in terms of personnel and revenue, and is making rapid progress. (LeadIn)

The main services of **Tutkimustie** are qualitative and quantitative research, including survey planning, analyzing, lettering, recruiting and translating, including language planning. The company also offers research assistants for data gathering and analysis. The company advertises that it conducts broadly-based surveys via the internet and surface mail, which will make their customers' work easier. Their objectives are 100% customer satisfaction, confidence, reliability and openness. (Tutkimustie, 2012)

KarpaloGroups´ goal is to help their customers to achieve their aims. Typically, this means sales promotion for a product or a service, a brand upgrade, or launching a new product or service. Their service offering can include user testing, focus groups, marker research or direct marketing. As an example, the company uses Brunberg's brand reshaping. The company works from a consumer's point of view and takes up the gauntlet for the customers. (KarpaloGroup)

The company called **Linja** focuses on well-designed mobile device software. Their main offering is in design and consulting services and mobile applications. The company delivers concept descriptions, interactive prototypes, finished assets like icons and finished and tested software. Linja has 10 years of experience in touch-screen user interfaces. Linja promises to fulfill the customer's need for usability design for professional needs. (Linja, 2012)

Cybercom is an international company for software solutions that also offers usability services. There is a usability manual on their webpage which explains a bit more about usability. It describes why and how usability brings value for the customer. Cybercom gives two examples of usability work, heuristic evaluation and usability testing. They describe heuristic evaluation as a fast and a cheap method to assess the usabilit of a product. Usability testing provides the customer with informatics and reliable infor-

mation about the tested product. The customer receives a report of the results with a concrete proposal for improvement. (Cybercom)

To summarise the service offerings of Finnish companies offering usability services, Etnoteam, Idean, Adage, LeandIn and Linja offers broadly-based usability services in every area of usability, including research involving users, user interface design and user interface programming. Cypercom concentrates on all areas of software development, from designing to programming the whole system, and also the follow-up support after delivering a software system. KarpaloGroup is more involved in the marketing field than the other companies, while Tutkimustie conducts wide market research studies. It seems that all of them do large projects for established companies.

4 EVALUATION OF THE SUUNTAAMO SERVICE OFFERING

Chapter 4 describes how the Suuntaamo service offering has been developed, and which companies were selected for the interviews and survey conducted for this study. This chapter also explains how the interviews and the survey were carried out.

4.1 Service Offering Development Process

The Suuntaamo service offering was developed between January, 2010 and December, 2012. Right from the outset, Suuntaamo has offered user recruitment services and involved users in product development. However, it was quickly established that this was not enough for start-up companies. They also needed consultancy services regarding the design, conduct and analysis of user tests. This description of the development of Suuntaamo's service offering is made from the personal viewpoint of a Suuntaamo employee.

The start-ups at the New Factory described the lack of test users as one of their main challenges. The companies told Suuntaamo representatives that they need users iteratively, and it is not enough to conduct user tests just a few times a year. Instead they need users every week, or every other week. In order to satisfy this customer need Suuntaamo has started to develop agile user-test methods that suit start-up companies. The agile test method was piloted at the beginning of 2012, and since then the agile method has been developed further in co-operation with the start-up companies. Great care has been taken to ensure that the method is cost-efficient and effective, since the start-up companies needed tools suited to their very limited resources. This process is shown in Figure 4.1.

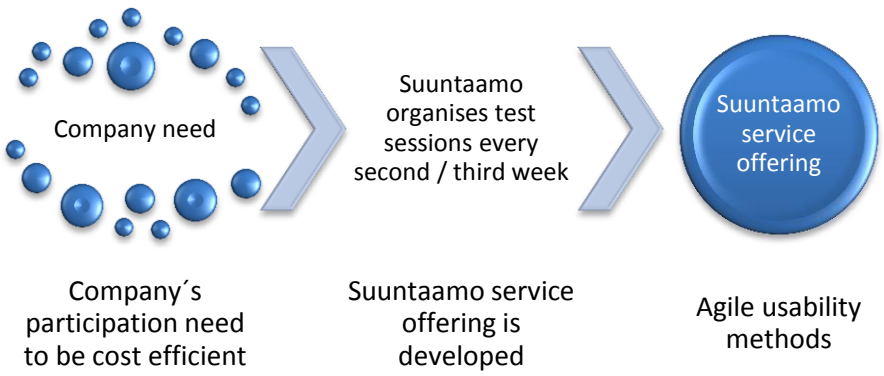

Figure 4.1. *Suuntaamo´s service offering development process*

Suuntaamo has been working in co-operation with the companies identified as numbers P1 to P5 (see Appendix A). One of the companies had several products that needed to be tested simultaneously. Another request was to have a test session day where many companies could participate and test their prototypes, while sharing the organizational and facilitating costs. This meant organizing a test session where many companies and many tests users come together and benefit from the interaction with each other. This allowed the test-user to test more than one product or idea in the same test session. The New Factory's spacious premises allowed the test sessions to be arranged based on this idea.

The method developed by Suuntaamo was aimed at satisfying the customers' need for a more cost-efficient user test service. The method was piloted and developed together with a customer company. More information is available in Appendix A: Company 1. After every test session there was a discussion session with the customer to discuss how to improve the method. The previous test session's follow-up discussion was analyzed before the next test session was conducted in order to improve the user study method. See Figure 4.2.

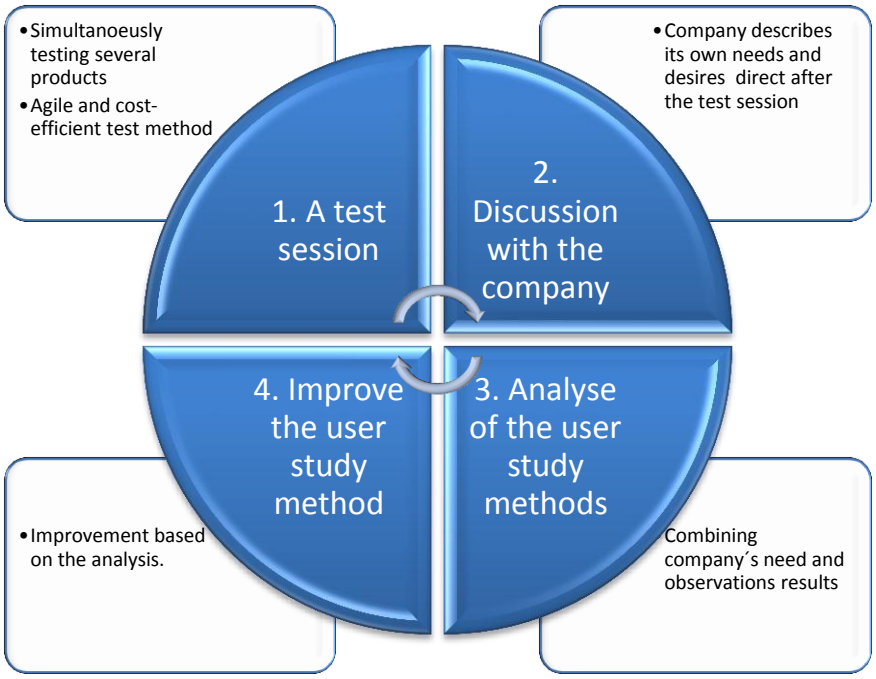

Figure 4.2. *Iterative user study development process in cooperation with a company*

Many of the start-ups in the New Factory do not yet have a clearly formed concept, since their business idea is just about to start. In order to clarify the business or concept idea, Suuntaamo has organized focus groups where end-users with the desired demographic background are invited to develop an idea or to do proto-testing.

Co-operation with the New Factory start-ups has helped Suuntaamo to realize the customers' needs for usability services, which has enabled Suuntaamo to further develop its usability service offering. Suuntaamo has discovered that different companies have different needs. Start-up companies need more usability training services to con-

duct their own usability work themselves, while more-established companies need more support and resource services.

The New Factory environment has influenced the Suuntaamo service offering, as it gave Suuntaamo the opportunity to try out different ways of utilising the usability methods, thus innovatively creating value for the customers. These circumstances have shaped the service offering of Suuntaamo, and will be discussed further in Section 4.2.

4.2 Assessing Customer Companies' Needs and the Created Service Offering

In this study, 10 companies were interviewed and 23 companies filled in a survey (see Appendix C). Because Suuntaamo's services were initially designed with start-ups in mind, five of the interviewed companies were start-ups and the other five were established companies. In addition, Suuntaamo wants to offer services relevant to the different needs of industry. Therefore, the main aim of the interviews and the survey was to assess how well the services that Suuntaamo provides meet the customers' needs. The interviews also gave an insight into the usability maturity level in the selected companies, and their need for usability services.

4.2.1 Selected Companies

The interviewed companies are software companies operating in Finland, all of which have an office in Tampere. A more detailed description of the interviewed companies is available in Appendix A, but the main feature is that half of them were start-up companies and the other half were established companies.

Table 4.1 presents a summary of the companies that were interviewed and Table 4.2 shows all the companies that filled in the survey. The tables show whether the company was a start-up or an established company, how many workers they had in total, the number of years they had been in business, the number of usability experts, and whether the company was interviewed or responded to the online survey. In addition, Table 4.1 describes the profiles of the persons that were interviewed. All the interview participants are identified with a Px code, where P means interview participant and x is a number.

Table 4.1 *A summary of the selected companies that were interviewed*

Company identity number	Profile of the interview participant	Nature	In operation since	Workers	Usability experts	Survey / Interview
P1	CEO	Startup	2010	5	0	Interview
P2	CTO	Startup	2010	10	0	Interview
P3	Software developer	Startup	2011	2	0	Interview
P4	Manager	Startup	2011	4	0	Interview
P5	CEO	Startup	2012	4	1	Interview
P6	UX Designer	Established	1998	220	9	Interview
P7	Software developer	Established	2000	60	1	Interview
P8	UX Designer	Established	2001	50	30	Interview
P9	Research Director	Established	2002	50	1	Interview
P10	UX Designer	Established	2000	270	5	Interview

The survey respondents are identified with Sx, where S means survey and x is the number. The information is based on the companies' own webpages and on information gathered from Taloussanomat webpages.

Table 4.2. *A summary of the selected companies that filled in the survey*

Company identity number	Nature	In operation since	Workers	Usability experts	Survey / Interview
S11	Established	1980	2200	20	Survey
S12	Startup	2012	2	2	Survey
S13	Established	2000	120	15	Survey
S14	Established	2005	4	0	Survey
S15	Established	1893	27	0,5	Survey
S16	Startup	2012	2	1	Survey
S17	Startup	2009	5	0	Survey
S18	Established	1990	500	30	Survey
S19	Established	1997	-	0,5	Survey
S20	Established	2008	-	3,5	Survey
S21	Established	2008	60	0	Survey
S22	Startup	2009	5	0,5	Survey
S23	Established	1994	35	5	Survey
S24	Startup	2012	2	1	Survey
S25	Established	2010	2	1	Survey
S26	Established	1896	-	-	Survey
S27	Startup	2012	-	1	Survey
S28	Established	1945	1200	0,5	Survey
S29	Startup	2012	4	0,5	Survey
S30	Established	1991	70	1	Survey

S31	Established	2006	2	1	Survey
S32	Established	2007	65	2	Survey
S33	Established	2007	-	1	Survey

4.2.2 Interview

Interview planning

The purpose of the interviews was to figure out what kind of user involvement methods companies' use in their product development processes. Through these interviews, Suuntaamo also wanted to understand the companies' product development processes in order to gather information about their needs.

Interview questions

The interviews were what Vuorela (2005) has described as semi-structured thematic interviews. The themes of the interview were:

- Description of the company.
- Description of the development process of the company.
- Usability work in the company.
- Discussion of how Suuntaamo's service offering fits the company.

Pilot interview

The pilot interview was conducted with company participant P6.

Selection of the companies

The selected companies were the ones Suuntaamo has been working together with in order to develop its service offering. Five of the companies are start-ups. The other five companies were selected according to their field of business and level of attraction. All the companies develop products or services for end-users.

Contacting the companies

The initial contact with the companies was made via email or Facebook. After that, an email was sent to arrange the interview appointment. In some cases, personal contacts were used. Most of the interviews were easy to arrange. It was explained to the interviewees that the interviews were aimed at improving Suuntaamo's service offering and that they were to be part of a Master's thesis for Tampere University of Technology. The interviews were held in November and December 2012.

Progress of the interview

The first interview was a pilot interview agreed with the interviewee. The appointments were arranged in informal settings like cafés or company meeting rooms. A voice recorder was used in all the interviews to facilitate the study. Most of the interviews were held with a Suuntaamo representative and one representative from the customer company. The interview took less than one hour. After the interviews, the voice recorder audio tapes were transcribed and stored. The equipment used in the interview was:

- Printed semi-structured question framework (see Appendix B)
- Pen for the most important notes
- The voice recorder
- Two cups of coffee

Analysis of the interviews

The interviews were analyzed with a qualitative analysis method in three phases (see Figure 4.3). After the interviews, the material was read many times to get familiar with it. The material was sorted into start-ups and established companies, and thereafter into different categories. In order to complete the analysis, the various categories were combined into larger units. (Vuorela 2005)

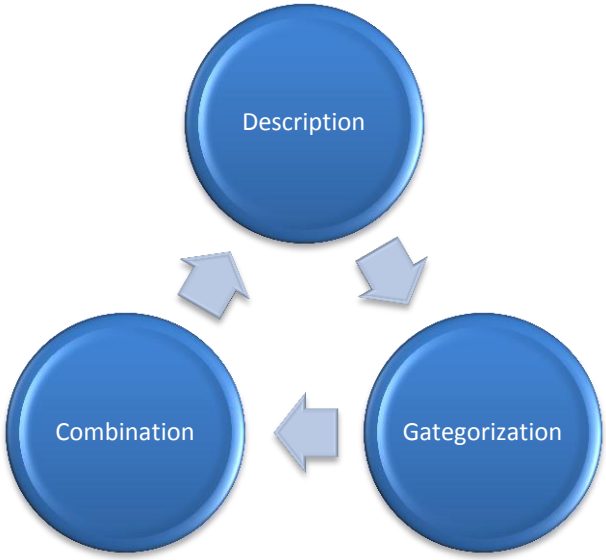

Figure 4.3 *Qualitative analysis method in the three-phase process (Hirsjärvi and Hurme 2001)*

4.2.3 Survey

Survey planning

The survey is in Appendix C. The goals of the survey were to find out the level of usability maturity in the companies and whether the companies were willing to buy usability services. The survey had 23 responses from 23 different companies. Seven of the 23 companies were start-up companies. All 23 companies who responded to the survey were different than the ones which participated in the interviews. The survey used different questions than those which were used in the interviews. The time required to fill in the survey was 5-10 minutes as the survey was planned to be to be lightweight and fluent. A tool called Webropol was used to gather the data and to help analyze it. The survey was conducted in Finnish, but the results have been translated into English. The survey was designed to give information about the companies' outsourcing of usability work.

Survey questions

Since all the respondents were volunteers, the survey needed to be as short as possible. It needed to be simple and not too time-consuming to fill in in order to encourage as many people as possible to respond. Another requirement was that it could not ask directly about Suuntaamo's services. For this reason, it was decided to make the questions generally applicable to all aspects of usability outsourcing. The aim of the survey was to figure out how the respondents felt about outsourcing usability work, and what are the issues that concern them with regard to usability. Three of the questions used the Likert 7-point scale. Questions 3 and 5-11 were to indicate the right answer with a cross. (Vanhala 2005) The questions were:

1. The title of the respondent
2. Responsibility of the respondent
3. How much usability work is there in the company (Likert scale)?
4. How many usability professionals are there in the company?
5. How often does the company purchase usability from outside sources?
6. How does the company react, if there is a need for more usability resources?
7. Should the company´s usability work be increase or downsized (Likert scale)?
8. How significant is the usability work (Likert scale)?
9. What are the challenges regarding usability work (multiple-choice question)?
10. Which parts of the usability work can be outsourced (multiple-choice question)?
11. What issues can occur with usability outsourcing (multiple-choice question)?
12. Other issues?

Pilot survey

The time needed to fill in the survey was assessed in the pilot survey. The pilot survey was conducted with a person who was not involved in designing the survey, but understood survey design, which also meant that the intelligibility of the questionnaire was tested.

Selection of the companies

The companies for the survey were selected in the same way as for the interview.

Contacting the companies

Contact with the companies was made via email or Facebook. Only company personnel who knew about the development process were asked to fill in the survey. If someone did not fill in the survey in a week, they were sent another email to remind them about the survey. No other emails were sent after the first reminder. All the surveys were filled in between December 2012, and January, 2013.

Progression of the survey

The survey was first sent to the appropriate company representatives via email and they were asked to fill in the survey. In some cases the company representatives were

emailed again and reminded about the survey. If no-one had responded to the survey after two emails, the company representatives were not contacted again.

Analysis of the survey

The Webropol –tool offered a method for analysing the data. The quantitative data were fed into an excel worksheet. The figures in Chapter 5 were produced with the help of an MS Excel tool. The qualitative data from the survey was sorted into the same categories as the interviews in order to confirm the results of the interviews. The material in the categories was analyzed and the results are written up in Chapter 5. (Vanhala 2005)

5 RESULTS

Chapter 5 presents all the results gathered from the interviews and from the survey. The results are categorized and combined in themes. Chapter 5 has three sections: usability needs in the studied companies, evaluation of the Suuntaamo service offering and identified opportunities and ideas for development.

5.1 Usability Needs in the Studied Companies

Start-up companies

Usually, all start-ups have the same issues in that they have a lot of work to do and few resources. Their resources need to be divided into building the business model for the company and developing the product itself. According to the interviews, the start-up companies work closely with their customers and their products' end users. All the start-up company interviewees said that they had developed their products in co-operation with their customers, utilising interviews and observations. None of them said that they would not use any usability methods. According to this study, it seems that all the start-up companies do usability work, even if they do not call it as such. The interviewees said that they gathered information from their clients and developed their products in cooperation with their customers. There were no dedicated usability professionals in any of the start-up companies. However, feedback from the potential users was gathered all the time. The interviews all confirmed Marty and Twidale's (2005) observation that there is a need to conduct usability work in a cost-effective way, especially in start-up companies.

Outsourcing in start-up companies is more difficult than in established companies

According to the interviews, in the start-up companies the outsourcing of usability work is more problematic than it is in the established companies. This is because the start-up companies are very closely involved in the development process, so their employees are reluctant to outsource the usability work. The start-up workers are sometimes personally involved in the development of their product, in addition to which, they develop their product in close cooperation with their partners and their customers. In established companies, the product might pass through several different departments during its development, and for this reason the employees are less personally involved with the development of one particular product. In start-up companies, the developers may oversee the whole development process, thus enabling them to follow how an initial idea develops into a product. In established companies the development process is more formalised and predictable than it is in the start-ups. The start-up companies develop their

product by balancing the information that they get from their customers and end users. The start-up companies do acknowledge that they need some help with usability work, as they seldom have the knowledge required to conduct, for example, professional usability tests. The start-up companies also said that they need help in recruiting end-users for usability tests. At the beginning of the development process the start-up companies rely on their family and friends in order to conduct usability tests. This type of the testing is usually just a quick test and comment, rather than a systematic usability test. Often it is good to conduct some product test right after feature integration in order to obtain the impressions of the users. Interview participant P1 described the three levels of testing used in his company as follows:

- Prototype testing with friends and colleagues from the same field of business
- Suuntaamo testing with strict focus on the users
- Evaluations of the published product

Interviewee participant P1 has used Suuntaamo services.

Integrated usability in the development process

The usability work is integrated into the development process, particularly in the start-up companies. Although they might not do any usability work as such, it is integrated into the development process. This statement from P3 is typical, *"We do not do any usability work, but we have interviewed our interest groups about how the product should work and what effects the product should have."* This shows that it is totally unclear to some people what usability work actually includes, or what usability means. This is one topic that should be researched further, since some companies had more integrated usability work that others. In addition, it would be interesting to assess what are the positive and negative aspects of this.

Many differences in usability work in industry

One of the findings of this study was that the routines of usability work vary considerably from company to company. One company has routine practices for usability work and a real usability team in the company. Another company was on its way to building a usability team. Some companies have no set routines for usability work.

User involvement

Table 5.1 shows how the interviewed companies involve users in their development process. The level of user involvement level is assessed on a scale of 1 to 10. One means very low user involvement and ten indicates very high user involvement. These levels were estimated by the researcher according to the results of the interviews.

Table 5.1 *User involvement in the interviewed companies*

Company interview participant	**Description**	**User involvement level**
P1	Interview participant described their three levels of testing as follows: Prototype testing with friends and colleagues from the field of business, Suuntaamo testing with strict focus on the users, and evaluations of the published product	5
P2	Iterative user involvement many times during the development process.	5
P3	The product has been developed with the interest groups.	4
P4	User involvement is an exception, although it has occurred. The company is building a new product that is less visible to its end users.	1
P5	The company has been using Suuntaamo´s services. Their own work does not include much user involvement.	4
P6	Usually the user comes from the customer company. Or a couple of users are recruited. In the company, there is a new usability team that still is developing and growing.	9
P7	Users are involved in the Scrum sprints. User involvement is quite rare in the development process.	3
P8	Users come usually via the customer companies. In the company there is a lot of user involvement.	10
P9	Every year, there is a new version of the product. During the year, feedback is collected from the customers and other interest groups. The feedback is sorted and the most important improvements are implemented in the following year's version of the product.	2
P10	There is usually user involvement through user interviews, some of which come through the customer. There is a usability team in the company, with five workers. The usability team works on 50% of the project involving users.	10

Customer decides at the end, not the end-user

The interview participant P8 explained that customer company representative's opinion counts more than the opinion of the end user with regard to the UI solution decision. It is important that the customer company is involved in the product development process, but sometimes the customer does not trust in the skills of the usability professionals. In

some cases the customer company demands solutions, even though the test users have said something contradictory. Participant P8 said the reason for this is that the customers often do not understand the usability team's working methods.

There is a desire among the companies to develop their own usability routines that are more integrated into the development process

All the company interviewees said that they want to do more usability work, but their resources are limited.

The concerns of the companies regarding the Suuntaamo service offering

The main concerns of the customer companies with outsourcing usability work were communication issues between the usability test conductor and the product development staff, as well as delivery liability and reliability. The customer company was concerned about how to find a reliable partner. The customer company described that the partner for usability work needs to be reliable in terms of quality and product delivery deadlines. In addition, the companies were concerned about outsourcing usability work because they were not sure if the results of outsourcing usability work were useful in improving the product's usability. Another concern was that when somebody other than a direct employee of the company conducts the tests, the gathered information may be overlooked in some way after the project. When the test conductor is from outside the company, the results are passed to the customer via a written report. At the end of the project, it might be difficult to get the big picture by only reading the report.

When starting business with a new partner, there might be issues of mutual trust, because there are no structures and routines in place to guide the co-operation. One development idea for the Suuntaamo offering is to figure out how to convince prospective partners of the quality of Suuntaamo's usability work.

In this study, the companies were asked which parts of their usability work could be outsourced (see Figure 5.1). None of the companies indicated that none of their usability work could be outsourced. Many of the companies indicated that recruiting test users and conducting usability tests could be outsourced, and 26% of the surveyed companies said that all their usability work could be outsourced.

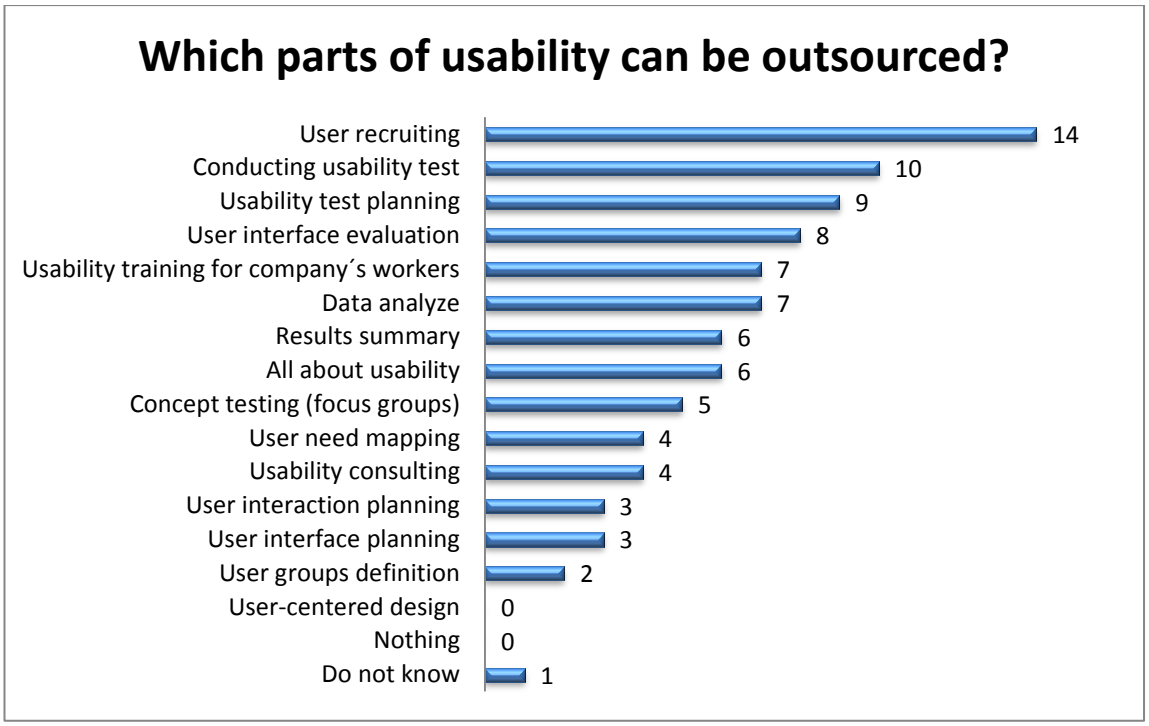

Figure 5.1 *Customer companies' opinions about outsourcing parts of their usability work (N= 22)*

Design style guidelines

Interview participant P9 said that their company's usability work is limited, since they use design style guidelines for the UI design. The company is compelled to use the style guide in the design process for better or for worse. Although these style guidelines might result in there being less need for usability professionals, not all the UI solutions in the guidelines are the most usable and intuitive ones. Whilst a UI style guideline might regulate the UI design work, it does not always guarantee a well-designed solution.

Unexploited usability results

Many companies said that sometimes the results of the usability tests are not exploited. This might happen when the customer receives too much data and the company does not have the time to use it immediately. As P1 stated, "*We collected a lot of data from the users, but we did not have the time to implement them.*"

Implementation of the results

The development team might think that the usability data is wrong and not want to accept the result if they were not personally involved in the tests. This is especially true of small and start-up companies.

Criticisms of usability work itself

Interview participant P1 said that in the past his company's workers were concerned about usability work and user feedback, because they regarded the usability feedback as

a criticism of their work. Therefore, the employees were reluctant to collect feedback from the end users and did not see any benefit in it. However, the company has now conducted many usability tests on their products and the employees have now adopted the usability working style. Interview participant P1 said that nowadays the company employees have evolved as they have experienced the positive effects of usability work.

The internal challenges in the companies with regard to usability work

Some companies feel it is more important to develop new features for the product than to use their limited resources for usability work. Although these companies see that usability is important, there are no structures or procedures in place to carry it out. The interviewed companies said that some of their customers are more demanding than others regarding usability work. Most of the companies said that usability work is something extra that can be done if there is time. However, often there is no extra time in a project. Nevertheless, 96% of the surveyed companies said that usability work is either significant or very significant (see Figure 5.2). Only one company said that usability does not

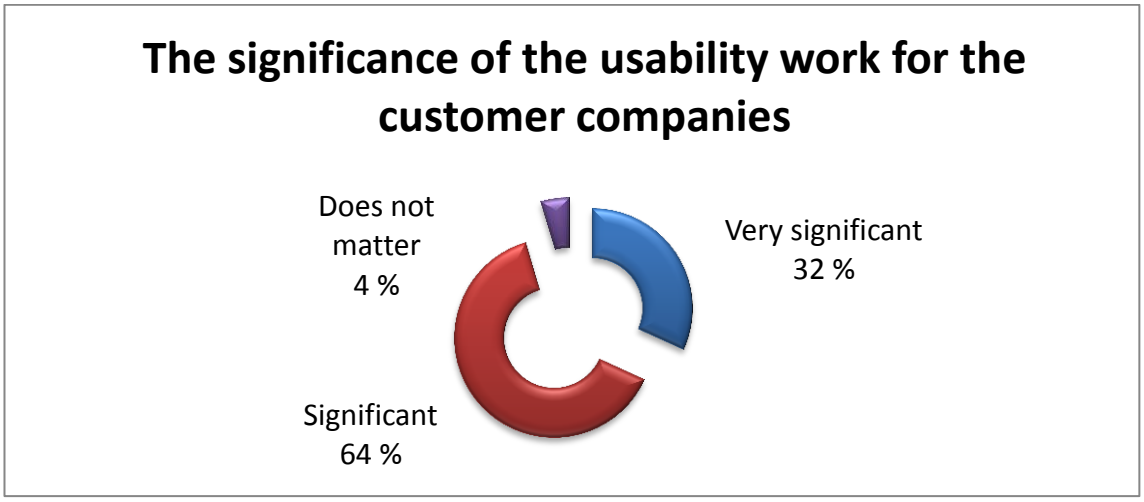

Figure 5.2 *The significance of the usability work for the customer companies (N=22)*

matter. The scale for the options was: very significant, significant, little significant, does not matter, little insignificant, insignificant and very insignificant. According to the respondents, the most significant internal challenges to usability work are that usability takes a lot of time and there are no established practices for it, as shown in Figure 5.3.

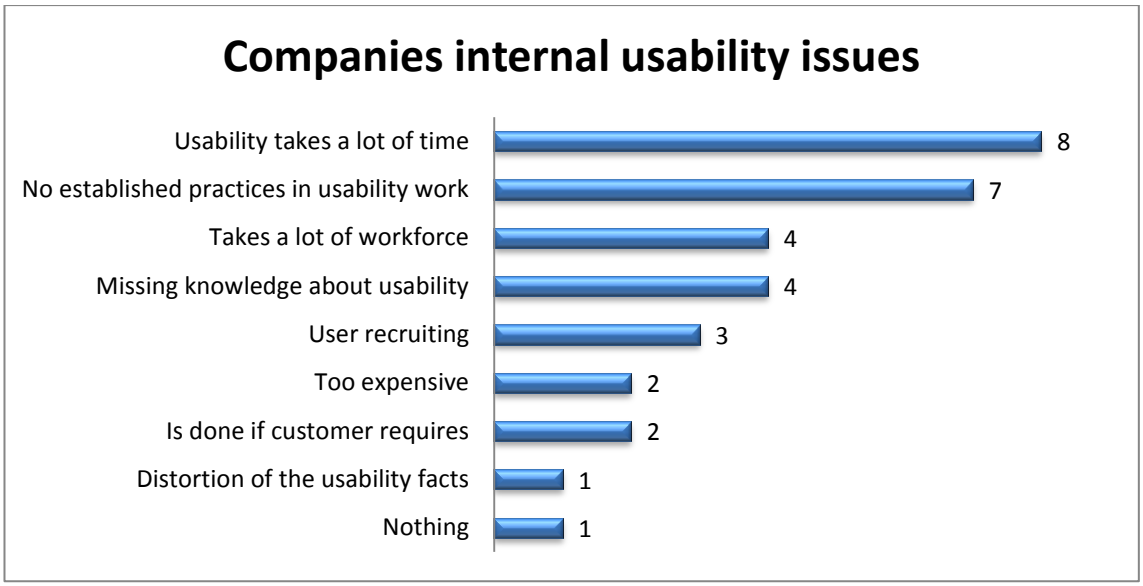

Figure 5.3 *The internal challenges to usability work in the customer companies (N=20)*

Trust in usability work

One internal issue regarding usability work is that when it is done the development team does not want to take the results into consideration, as they do not trust the usability professionals. For example, they want to implement the user interface in the way the development team thinks is best, rather than the way the usability professionals have assessed it in their study. As interview participant P7 said, *"Occasionally it would be good that somebody from outside the organization would conduct some evaluations of the product objectively, since the developers themselves do not see their own mistakes and incoherences, since the eye becomes accustomed to the product."*

If the customer does not complain about bad usability, it's good enough

Interview participants P7 and P9 pointed out that the reason they do not do more usability work is that their customers seem quite content and do not complain about the UI usability, in addition to which the number of customers they have is growing all the time. As P9 said, *"If the customer does not complain about bad usability, does not this mean that the usability is good enough?"*

Game industry-related development needs

There has been a need for a pool of gaming professionals since 2010. This need also came out in the interviews. One possible solution is to build a tool suitable for all game companies, but Suuntaamo itself has not had the time to implement this idea. The idea could be developed through mutual cooperation between Manse Games and the game-related companies. In the game industry, the usability issues are as common as they are in the general software industry, meaning there is a lack of knowledge about how to conduct and analyze user tests in an agile and cost-efficient way.

Outsourcing

There are various issues in outsourcing usability work. One of the biggest issues in outsourcing is communication. The companies were concerned about how to retain the data gathered from the users during the development project, and how ensure that this data was delivered in an undistorted form to the UI programmers. The companies already have internal issues about how to deliver the information gathered from the user research to the UI programmers. Therefore, it is inevitable that they have similar concerns about communication when outsourcing their usability work.

Figure 5.4 shows how the companies regarded the issues with outsourcing in the survey. The companies rated communication issues and finding a good partner as the biggest issues in outsourcing the usability work. The company that did not answer this question actually wrote to the survey that the issue in outsourcing usability work is that the subcontractor gathers all the knowledge about the usability of the product. At the same time, the human capital of the subcontractor grows, but not that of the developer company itself.

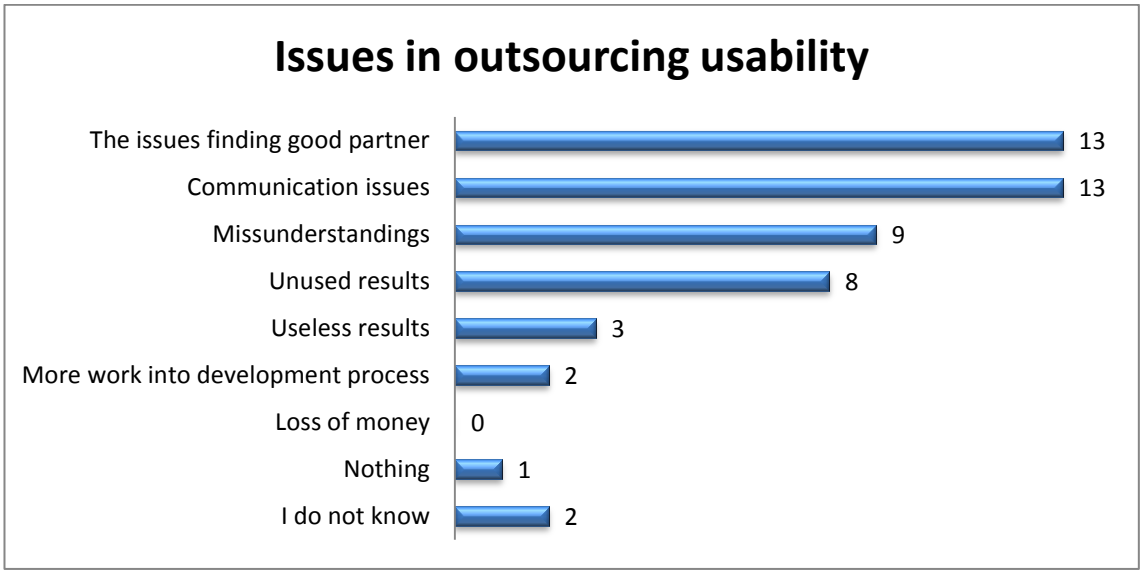

Figure 5.4 *The issues of outsourcing (Appendix C results) (N = 22)*

The usability practices in the development process

Some companies use scrum or other agile development methods in their product development and there is a growing tendency to use even more agile methods in the future. In all the companies, there were at least some routines followed during the product development work. However, only two of the interviewed companies had established routines for their usability work. In most of the companies, usability work is merely an adjunct to the other development work and is carried out by the company's own employees. Interviewee P7 stated that the management did not give any guidance about which usability methods should be used. Nevertheless, users are involved in the scrum process. Throughout the whole development process there are usually progress meetings with the customer every few weeks, during which the customer says what to do next. The com-

panies themselves decide how much usability work they do in their company. The options in the survey were on a 7–point Likert scale ranging from ‘nothing’ to ‘very much’. According to this, the companies were generally of the opinion that they do quite a lot of usability work (see Figure 5.5).

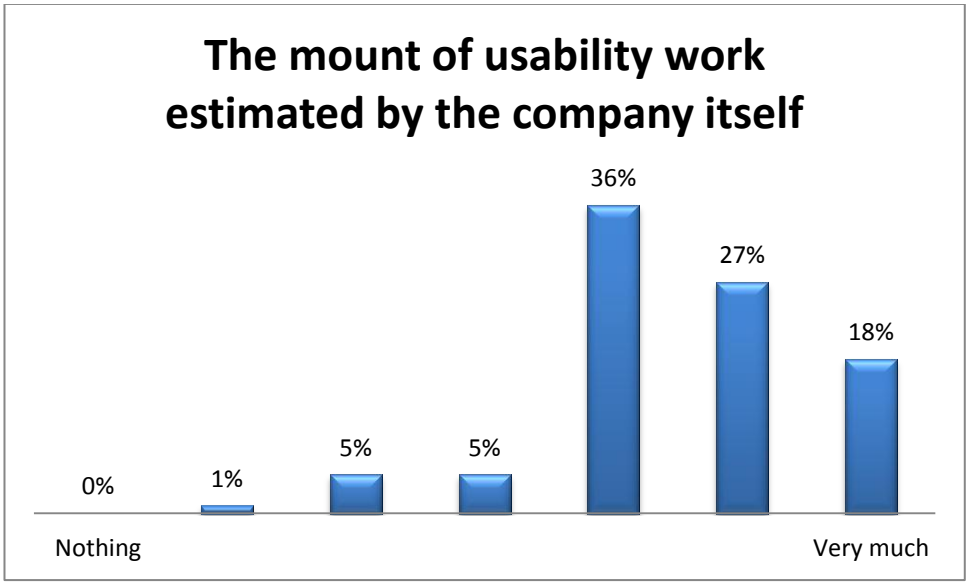

Figure 5.5 *How companies consider the amount of usability work they do (N=22)*

According to the interviews and the survey, most of the companies are very aware of the significance of usability work. The companies want to add more usability work, since they understand its benefits. The reason why they do not do so much usability work at the moment is that they have quite limited knowledge about how to perform effective usability tests in an agile way. One significant reason for the companies’ failure to factor in usability work into a project is that their customers do not require it, perhaps because they do not know much about it. When the companies are making a bid for a project, the usability work needs to be factored in, but this might require a lot of resources, and thus push up their bid price. Therefore, usability work is often omitted from the offer, in order for the company to have a better chance of winning the tender. It is often the lowest bid that wins the tender, so as little time and money as possible for extensive usability work are included in the bid preparation.

5.2 Evaluation of the Suuntaamo Service Offering

Some of the interviewed companies had already used Suuntaamo´s services, so it was simple to get feedback on the Suuntaamo service offering from the interview. The companies that did not already know about Suuntaamo were given a brief description of the service offering at the end of the interview. The company participant was asked if he could see any use for the services in any situation. The following categories were seen as useful.

5.2.1 Services of Suuntaamo which Were Found Useful by the Companies

Recruiting services

Suuntaamo's recruiting services answered every companies´ need regardless of the size of the company or whether they did a lot of usability work themselves. The larger companies might well have their own, routine usability work, so when using Suuntaamo's test-user recruiting service the company can focus on their core competencies. As for start-ups, they often need test-users with a very specific demographic background and it is enough that they know they can use Suuntaamo's recruiting services for this. Even other, competitor, companies can use Suuntaamo's recruiting services to obtain quality test-users so that they can focus on their own research work. The companies often recruit their test-users via the customer company, but then again the company might need users at short notice. Such is often the case when the company´s own recruitment process has failed.

Assistance services

Interview participant P10 said that Suuntaamo´s assistance services could be used when they are in a hurry and do not have the time to do everything by themselves. They saw the extra resource offering as helpful, and said they would sometimes require Suuntaamo´s help to plan and conduct the user tests. They also said that they use some specific methods when interviewing users and would like to stick to these methods.

Interview participant P6 saw potential in the full service facilitations, where the service provider customer hosts the test users, organizes the venue for the usability tests, and arranges drinks and snacks for the whole test session day. Nevertheless, to make use of these services, P10 pointed out that the customer needs to have established routines for usability testing in the company.

Usability work training for companies

Suuntaamo has been training the P1 company´s employees in order to plan and conduct usability tests for their products. Participant P1 saw this training as a positive development in their company. The employees in the company have become more confident in collecting data from the users and no longer regard the feedback as a criticism of the work they have done.

Evaluation of the usability of the user interface

Participant P7 said that they would sometimes need product UI evaluations.

In the survey, the respondents were asked how often their company uses outsourced usability services. Only one of the companies said that they use them continuously, and just 4 used them occasionally (see Figure 5.6).

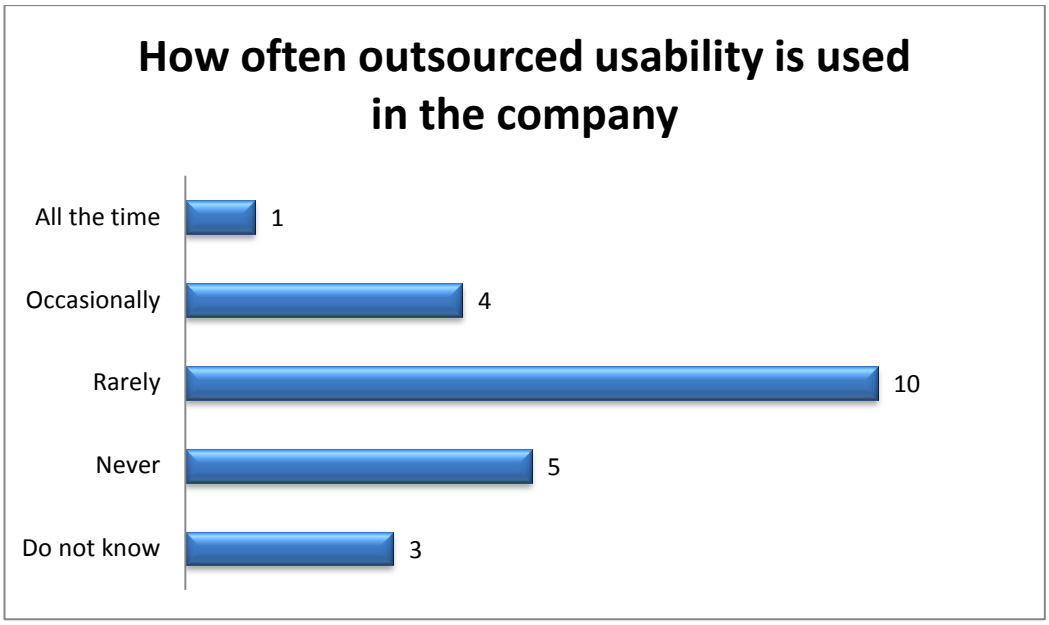

Figure 5.6 *How often companies use outsourced usability services (N=23)*

65% (15) of the companies said that they have never, or only rarely, used outsourced usability services. This indicates that the majority of the responding companies do not purchase usability services from external providers and it would require a lot of work to convince them to start buying such services from outside. On the other hand, 39% of the companies that filled in the survey said that if they needed more usability resources, they would consider purchasing them from outside sources, as shown in Figure 5.7.

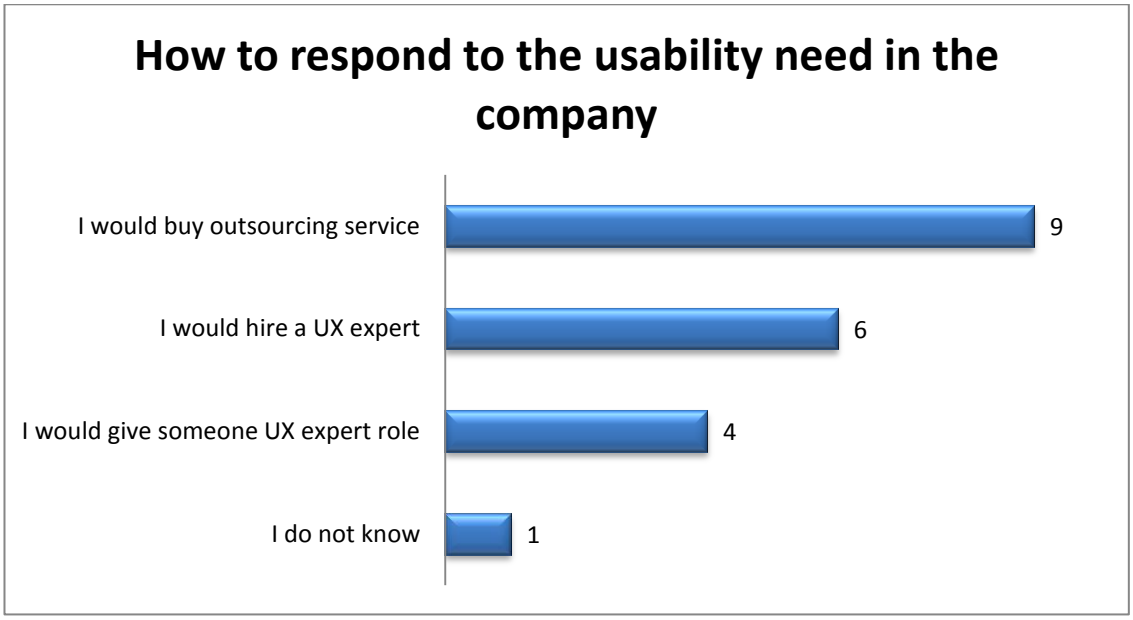

Figure 5.7 *How to respond to the usability need in the company (N=20)*

As Figure 5.8 shows, most of the companies stated that they do want to add usability work to their company, although 27% thought that they already did enough usability work. Not one of the companies felt that they should reduce the usability work in the company.

Agile usability methods

As Kane (2003) has shown, Suuntaamo's developed agile methods are effective and cost-efficient ways of testing products and services. They offer an economical way to carry out at least some usability testing even when the companies' resources are limited.

Market surveys

Suuntaamo has already successfully conducted large market research surveys and participant P4 indicated that his company would need Suuntaamo's services most when carrying out large market research surveys.

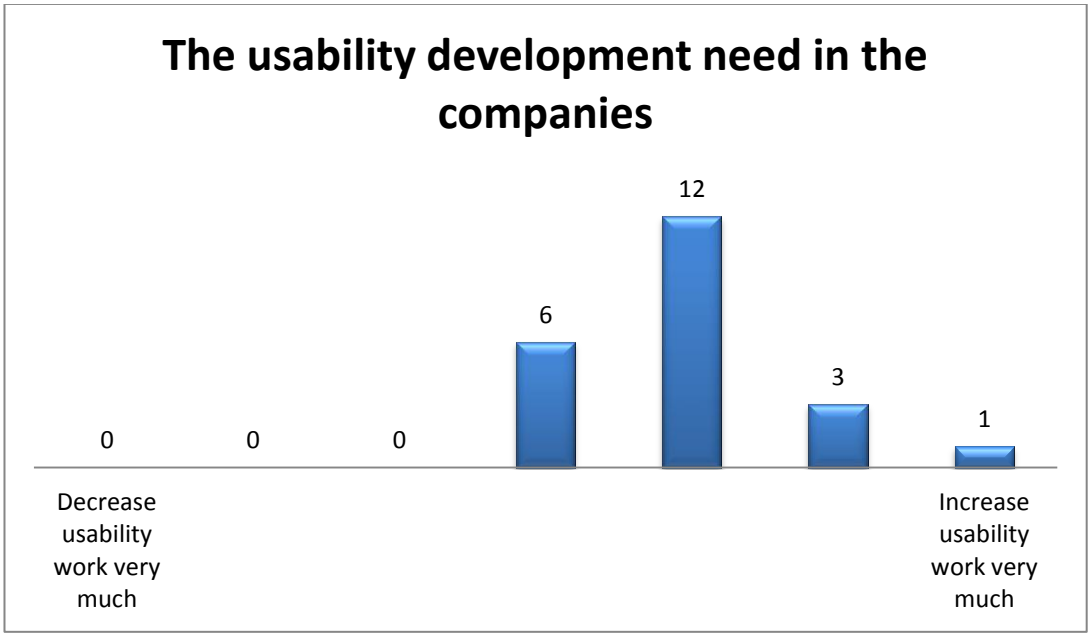

Figure 5.8 *How the companies want to develop their own usability work in the company (N=22)*

5.2.2 Improvements to Suuntaamo Services

The results of usability work are not exploited

Some companies said that sometimes the usability work results remain unused. Such results are often merely outlined in a document that is passed to the customer company. Exploiting the results is a vital part of any usability work and it is not enough just to carry out a few usability tests and then ignore the outcomes. Developing the product according to the usability test results is an important part of the product improvement process. Suuntaamo should develop tools showing companies how to make better use of the results of the usability tests.

Usability costs separated from other development work

As described above, usability work is still regarded as separate from the other development work. This is a general issue which applies to all usability work.

Disappearance of the gathered usability data
When a customer company is buying Suuntaamo's services, one of the main concerns of the companies is about the disappearance of the gathered usability data.

Convincing the customer of the significance of usability work
The companies need to factor in the cost of usability work when selling the development project. In other words, the benefits of usability work need to be sold to the customer company. If there is no budget for usability, no usability work can be done during the project. However, the problem is that if usability work is calculated into the project budget, the project will be more expensive. In this case it will be more difficult to win the tender. Companies have different perceptions about the benefits of usability work and not all companies even know enough about it to demand good usability.

The challenges facing Suuntaamo
Suuntaamo´s offering is quite restricted, so if the customer wants to conduct an extensive usability survey with a large number of test users, Suuntaamo´s resources may not be up to the task. The service offering is also limited in that, for example, UI implementation is not offered. In order to work on larger projects, Suuntaamo needs to extend its existing services.

5.3 Identified Opportunities and Ideas for Development

Usability ownership
Usability ownership ensures that the data collected from the users during the product development process is secure. In practice, this means that one person should be responsible for usability during the whole development process, from the initial concept to the product introduction. In this way, the collected data and other information about usability will not get lost during the development, since one person is responsible for it. This could also be an answer to the companies' communication issues outlined above.

Trust between Suuntaamo and the customer company
Many of the interviewed companies said that the mutual confidence between Suuntaamo and the customer company is both significant and important. Suuntaamo needs to really think about how to win the confidence of its customer companies and how to build long-term partnerships. Cooperation with the customer companies should start with smaller and shorter test-user recruitment activities. Once these have been successfully completed, it would be easier to plan further collaboration. Trust between business partners grows slowly and the customer will only gradually come round to employing Suuntaamo on more extensive projects.

Initiating co-operation with start-ups

One of the identified opportunities is that Suuntaamo can start working with start-up companies even if it does not initially charge for the work, a so-called loss leader approach. The idea is that Suuntaamo should have a deal with the company from the beginning that if the start-up grows and starts to succeed, then any new UCD cases between the start-up company and Suuntaamo will be charged for. Suuntaamo needs to take advantage of the start-ups' excellent business ideas and its potential to grow. Obviously, at the beginning, when a start-up's resources are very limited, Suuntaamo could undertake not to charge for its services, but if the start-up succeeds, Suuntaamo would gain a great partner to work with in the future, for which it could undertake larger usability projects.

Usability procedures

Establishing good procedures for usability work is one of the key elements to success. If companies have even a few usability procedures in place, it will help them to improve the usability of their product. This is because the company's employees will become used to the fact some usability work has to be done as part of the product development process. Once the principle of usability work is established, the methods can more easily be developed into better and more suitable ones for the product development process. On the other hand, if the company does not have any established procedures or structures for usability work, it is difficult to introduce them since there are no resources allocated for usability work in the development process. In this kind of situation, the company's employees might regard usability work as an optional extra. Although none of the surveyed companies stated this directly, this finding became clear through observations made during the interviews.

Data gathering and data storage routines

Although collecting usability data is important, storing that data systematically is even more so. Those companies which had a system for storing the usability data also had more systematically organized usability procedures and routines in place. Another advantage of storing usability data systematically is that it is then easier to return to a decision made during the development process in order to recall the motives for making that decision.

6 CONCLUSIONS

Chapter 6 offers a discussion of the results. It also contains development proposals for the Suuntaamo service offering, including two ideal customer cases. The study concludes with an analysis of the research limitations, areas for future work, and an evaluation of the work presented here.

6.1 Discussion

Suuntaamo's services, including its user recruitment, assistance and usability training were seen as good and valuable by the companies who participated in the study. The fieldwork revealed that the companies´ usability work routines differ a lot from each other. The companies that did less usability work during the development process said that they would like to do more, and they acknowledged the benefits of usability work. However they often had different reasons not doing more usability work in their development processes. The most common reasons given were that their own customer companies did not stipulate a requirement for usability work, or that their customer companies did not complain about the inadequate usability of the developed product or service, or simply that their customers were not willing to pay for usability work. Other reasons given were that the company's limited resources were needed to develop new features for the product rather than for usability, and often the companies simply did not know how to perform usability work in an agile and effective way.

Suuntaamo needs to develop its service offering for the different needs of different companies in the software industry. It needs one service offering for small companies inexperienced in the field of usability work and another for larger software companies which may already have their own established routines and procedures for usability work. Suuntaamo´s agile methods make it stand out from its competitors, largely because the service offering was originally designed for start-ups. The fact that start-ups, in particular, utilise user feedback right from the beginning of the product development process is an indicator of the economic potential for a business such as Suuntaamo which specialises in usability work. Once these start-ups are able to bring their products and services to the market, their businesses will move into profit, some of which would be ploughed back into using the service offering of Suuntaamo. In turn, the combined success of the start-ups will help stimulate other areas of the economy.

One of the limitations of Suuntaamo's service offering is that all the interviewed companies emphasized that working with subcontractors needs to be straightforward. Suuntaamo should offer a more complete services, including usability testing, user interface planning, and execution and graphics for the user interface. This has not yet been

done, simply because Suuntaamo has not had the resources to do it. However, such a wider service offering could initiate more enduring partnerships with its customer companies. Suuntaamo has had a good start, and is quite well known among local companies. However, it now needs to expand its service offering and market itself more aggressively so that companies all over Finland get to know about it. Suuntaamo has the potential to operate nationally. However, as a relatively new business it will need time to convince potential customers of the value of its services.

With regard to the results of the interviews and the survey, all of the interviewed companies were software companies that produce software solutions for other companies or have their own software development objectives. A total of 23 companies responded to the survey, but of course it would have been interesting to have had more responses. This might well have affected the results, since at least one of the respondents wrote that he did not comprehend the idea behind the survey and that he did not see how he could benefit from usability work in his company's product development process. This could indicate that there are a lot more potential users out there who as yet know little about the kind of service which Suuntaamo can provide.

On the other hand, it must be acknowledged that most of the start-up companies said that they would not use Suuntaamo's services because they were not able pay for them at the time the interviews were conducted. However, most of these companies indicated that they would use Suuntaamo's services if they could afford it. Even participant P4, who stated that usability testing would not be relevant to his company because their new product was not actually aimed at the end user, admitted that he would be interested in large market research surveys.

The participants P1, P2 and P5 had game-related products. Participants P6, P7, P8 and P10 produce products and services for other companies. The companies of participants P3, P4 and P9 have their own product that they retail for other companies. It is worth noting that the game-related companies often said that their work is a lot like producing art. This indicates that producing games software is different than producing other, more traditional software. The success of a game often depends on the imagination of the programmer and the idea behind the product. It is not enough just to design a game with nice user interface, since a successful game needs a hook, that is, something that is fun to learn to and which will induce the players to play it over and over again. In game-related software development companies the traditional rules about developing software no longer apply. This raises the question as to whether game-related software development and that of other companies can reasonably be compared in terms of usability, or is it a case of apples and oranges? For future research, it would be interesting to conduct the interviews and the survey only for game-related companies or vice versa, only for companies that produce products or services for a specific purpose.

The literature reveals that there has been a lot of research into how to make usability tests more efficient and cost-effective. Many researchers have also developed various discount usability methods to do usability work. Companies are definitely interested in doing usability work, but they still think that it is too time consuming. In addition, many

of the companies did not have any knowledge about how to conduct cost-efficient usability work. One of Suuntaamo´s future service offerings could be that it develops tailor-made usability routines. Suuntaamo could show how to carry out cost-efficient usability work and train companies´ workers to plan and analyze usability testing. Suuntaamo already has the knowledge about how to help companies to improve their own usability work. Companies do not need high-end research qualified methods, since they need some feedback from the users in some point of the development process.

6.2 Development proposals

The following ideal customer cases and the ideas for development are based both on the personal experience of the researcher as a Suuntaamo worker and the results of this study. Although not 'real' case studies, they give a good indication of future business models for collaboration between Suuntaamo and its potential customers.

6.2.1 Ideal Customer Cases

The ideal customer is a long-term customer, as this would provide the maximum benefit for both parties. After working together for a long time, each party will know each other better and mutual confidence would grow. Figure 6.1 illustrates the first ideal customer case.

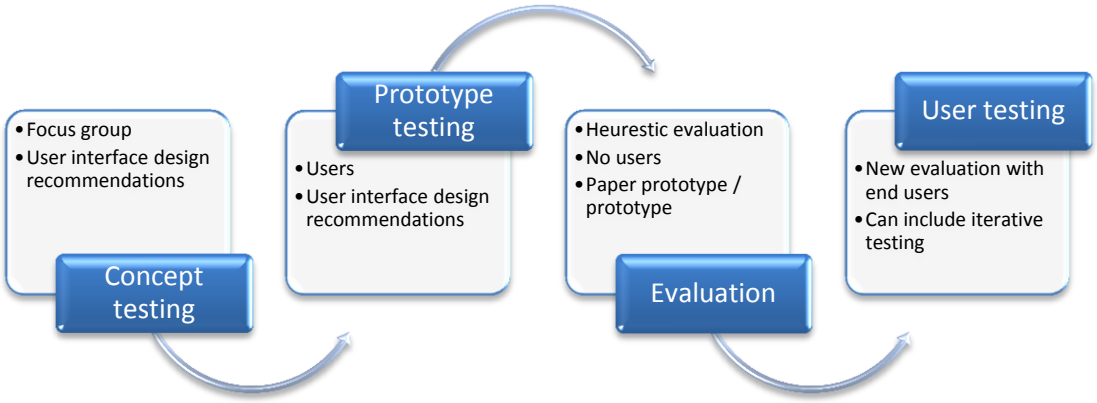

Figure 6.1 *The ideal customer case 1: Iterative concept and product testing with end users*

This ideal customer project includes iterative user testing with and without end users. The idea in Figure 6.1 is to show the steps that should be followed at different points in the development process. The concept testing step is to be used when there is not yet any product to test physically. Prototype testing can be carried out as many times as required. For instance, after some adjustments have been made to the product, a new

user test should be carried out. The number of steps is usually chosen case by case and as needed by the customer company.

Concept testing with a group of users, such as a focus group, helps developers to figure out what are the essential features of the concept. The users that are involved in the testing need to fit the demographic for potential users of the product that is being conceived. Even at this stage, the potential users may identify a basic need for the concept that the developers have not even thought about. When user-centered design is used from the beginning of the development process, many possible mistakes can be avoided. Once there is a prototype which has the basic features of the product or service, this needs to be tested with the same users, or new ones. Prototype testing can show, for example, whether the UI works intuitively and if the prototype works in the right context. If the prototype is not tested with users with the correct demographic background, the prototype may incorporate failures or missing features. If some essential features are not noticed until the end of the development process, the changes to the product might incur significant costs. Therefore, it is cost-efficient to identify possible failures as soon as possible. Prototype evaluations, for example heuristic evaluations, are an economical and fast method for revealing possible failures in the product. Such an evaluation needs to be carried out by a trained, usability professional. Even if there is no prototype available, this procedure can still be used with a paper prototype.

Before the product is brought to the market it should be tested again with potential end users to check that any solutions made as a result of the prototype testing and evaluations have had the expected effect. Sometimes wrong conclusions can be reached, even after the conduct of end-user tests. For this reason there should be test iterations which are continued until the user test no longer produces any significant findings. During this part of the development process, documentation of the user- test results is very important, since once a solution has been proved not to work, there is no need to try it out again. The usability test documentation should be written down and should contain a sketch of any proposed solutions and the reasons why they did not work. Once users are involved in the product development from the beginning, the number of failures decreases, because all the bad solutions are eliminated at an early stage in the product development. Occasionally, companies release bad products containing bugs onto the market. This can affect the company's reputation and, if the product flops, it may put potential users off buying products from that company in the future, since nowadays all products are evaluated and rated in magazines and blogs. If the product is well designed by professionals, using effective usability testing, the product can be released faster and the number of end-user test iterations can be minimized. This leads to a cost-efficient product development process and eventually a faster return on the initial investment of resources. Figure 5.3 showed that the companies who filled in the survey remarked that usability work takes a lot of time. In fact, usability work can speed up the whole development process since the bad solutions can be eliminated earlier and more time can be invested in producing solutions that users really want to buy and use.

The second ideal customer case is one in which the company wants to improve their own internal knowledge of usability testing procedures and routines with the help of Suuntaamo (Figure 6.2).

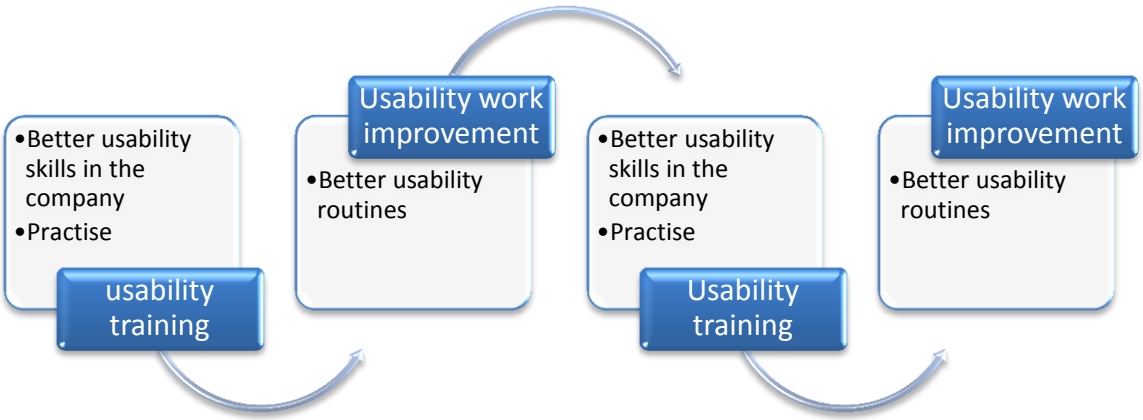

Figure 6.2 *Ideal case 2: Better usability routines through usability training*

In this case, all the gathered information definitely stays in the company. The employees of the company are trained to conduct user tests, for example, and to gather the data from the users. Suuntaamo can also help with analyzing this data. Such co-operation can start with quite small user studies, and as the customer company's employees develop their skills in practice, they undergo more usability training and learn more about the usability testing process. In such a case the customer´s employees would learn by doing their own usability work, benefiting both themselves, and the company.

The ideal customer cases illustrated here presuppose a good deal of mutual trust on both sides, meaning that the company trusts in the professionalism of Suuntaamo, and Suuntaamo trusts that there will be continued co-operation between themselves and the customer company. Communication between the partners plays a significant role in the relationship in order for the partnership to work effectively.

Sometimes it might be difficult for a potential customer company to know at what point usability methods should be used in its product development process. Below are some examples of when and how Suuntaamo's services can best be used:

- Building a new UI for a product or service
- Building a new webpage
- Improving an old web page
- Developing a business idea
- Developing a new product or service

6.2.2 Development of the Suuntaamo service offering

The Suuntaamo service offering has its limitations, and the results of this study show that it needs to be developed further. The results of the interviews and survey indicate that UI design, UI programming and graphic services should be added to the Suuntaamo service offering (see Figure 6.3). UI programming could include, for example, user interface demos with which Suuntaamo could demonstrate the user interface to the customers. This would help the customer to understand how the user interface works.

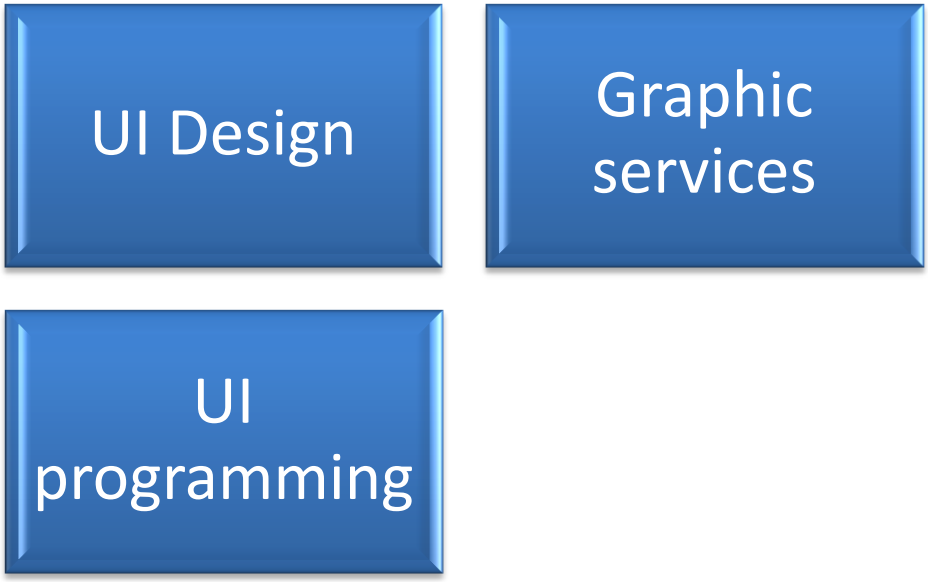

Figure 6.3 *Recommendations for Suuntaamo´s offering development*

Participant P10 said that his company would have a use for graphical services, since it is difficult to find good graphic designers to deliver icons and other graphics for user interfaces. Participant P9 also said that they buy the graphics for their user interface from external sources. Participants P8 and P10 said that nowadays their customers want a more unified service incorporating, for example, user interface graphics, design, and programming from the same company. Such services would help Suuntaamo to deliver comprehensive projects to companies that have wide needs for usability work.

Figure 2.2 shows the present Suuntaamo usability service offering. If the services recommended above were added to the service offering, Suuntaamo would not only be able to organize idea and prototype/product testing, but also to devel-op and deliver the prototype that is to be tested. Suuntaamo could also design the user interface in cooperation with the customer company. This would also help in winning the customer companies' confidence and building more long-term relationships. Never-theless, despite these recommendations, the Suuntaamo service offering must continue to be based on the agile testing procedures, which remain as Suuntaamo´s main selling point from the customer companies´ viewpoint. It is the inherent agility in the Suuntaa-mo service offering which makes it possible to deliver cost-efficient usability projects.

The main concerns of the customer companies with outsourcing their usability work were communication issues between the usability test conductor and the company's own product development staff, as well as delivery liability and reliability. The challenge is to convince new companies to start incorporating usability work into their development process in two ways. Some companies know what they are looking for and they simply want to enhance the usability of the product or service. On the other hand, some companies do not even know that their product or service has usability faults or that they even need usability services; while some of the responses to the survey reveal that there are still some companies who do not even understand the basic concept behind usability work. For example, one of the companies that filled in the survey did not answer all the questions because the survey participant did not know what usability is. This respondent wrote: "Usability is such an incomprehensible term that it is even hard to spell". This will explain to the observant reader of this study why most of the figures in Chapter 5 use N = 22, although 23 companies completed the survey. Bearing this in mind, Suuntaamo must persevere in its promotion of its service offering and concentrate on delivering all its projects on time and with the required degree of quality.

6.3 Research Limitations

The focus of this thesis was to evaluate the Suuntaamo service offering. The Suuntaamo service offering was originally developed for start-ups, but the interviews and the survey revealed that Suuntaamo's services are also of value to established software companies operating in Finland. The thesis has described the service offering process, although this was not essential for a Master's thesis. The Suuntaamo service offering described in this work is from December 2012, since when it has continued to develop. However, the continued development work on Suuntaamo's usability services which has taken place since 2012 is excluded from this study.

6.4 Future work

In the future it would be worthwhile interviewing companies about their good and established usability practices in order to see whether there are any common features in their practices. In this work, the best practices seem to be that some usability methods should be used iteratively and that companies should have a systematically organized facility for retaining and storing gathered usability data. Any future research should first identify which companies actually have any usability routines at all, although this might in itself be a challenging task as the companies' best usability practices might be a trade secret. Integrated usability in the development process is another very interesting topic worthy of research, since it might include some indicators of the best established usability practices used by Finnish companies.

6.5 Evaluation of the research

The conduct of the work can be judged a success. The companies revealed a lot of valuable information about their product development processes. In the final analysis, the gathered information was in accord with what was expected, and there were no big surprises in the results. The long process involved in producing this thesis may have meant that some of the conclusions that were noticed during the process have become obscured before they were written down. At the end of the data-gathering period of the survey, it was quite challenging to get companies to return the online questionnaires. On the other hand, conducting the interviews was more efficient. Having personal contact with the interviewees helped in making appointments with the people concerned.

The results are very positive with regard to Suuntaamo´s future. The interviewed companies and the survey respondents all revealed that there is a need for, and a willingness to invest in the usability of the products. Still, selling usability projects and services to companies will be hard work. The fact that the usability maturity level in the companies differs so greatly indicates that a lot of the effort needed to sell usability work to Finnish companies needs to be aimed at justifying the value of the usability work in the first place. As in the theory mentioned above, the ROI of usability is still very difficult to identify, and for most successful businesses, the ROI is the bottom line.

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APPENDIX A: SELECTED COMPANIES

Company 1:
This start-up company is in the mobile game-entertainment software business. The company has developed iOS games for global markets. They started their business in 2010 as a New Factory start-up. In two and half years they have developed four different iPad and iPhone games for 1 – 4 players that are available at the App Store.

Company 2:
This start-up company has developed a guitar learning game family for iPad and PC. The idea is to use an actual musical instrument as the game controller, and thus to use a computer game to learn to play an instrument. The goal is to improve the motivation and efficiency to learn to play an instrument with the help of a game. This game is available at the App Store.

Company 3:
This start-up is developing a web service for making announcements about faults and disorders in the environment. The idea is that a citizen can make an announcement when the fault or the disorder is discovered and the information goes to the appropriate quarter reducing bureaucracy and repair time for the fault or disorder.

Company 4:
This company is a mobile web technology start-up who provide customized map-based mobile guides. The guides can be designed for events, travel destinations, hotels and resorts and museums, for example. They give users local information as well as other information about the desired location or destination. The company is about to change their core offer to the advertisement business in mobile technology. The new idea is to enable banner campaigns for all platforms, such as PCs, tablets and mobiles at the same time, while the banner can change its format.

Company 5:
The company is an independent digital game development start-up. They provide games for iOS and Android platforms. For now the company has focused on a 3D gaming experience exploiting the use of an accelerometer. Control of the game is performed by physically changing the orientation of the mobile device.

Company 6:
The company is a Finnish IT service company developing software solutions. The company offers business intelligence and customized software solutions and online services. This established company has had a huge growth in personnel and turnover from the beginning.

Company 7:
This company is in the logistics and industry software business and provides solutions for logistics centers, mills and harbors, speeding things up by automating routines.

Company 8:
This company provides customer-driven user interface design, digital concepts, applications and platforms for the web, as well as mobile and integrated industry systems. Their solutions are aimed at being easy to use and relevant for the target audience.

Company 9:
The company´s core business is in enterprise content management systems that offer efficient and productive improvements to organizing and managing business documents, information and processes.

Company 10:
This international IT consulting company offers services in three areas: Connected Engineering, Connectivity Management and Digital Solutions.

APPENDIX B: INTERVIEW QUESTIONS

Peruskysymykset

1) Saako yrityksen nimen mainita kehitystyössä/diplomityössä ja sen esittelyssä?
    a) Tai tuotteiden nimiä?
2) Saako äänittää? Kysytään ennen haastattelua!!
3) Yrityksen toimiala:
4) Toimitteko
    a) Alueellisesti
    b) Kansallisesti
    c) Kansainvälisesti
5) Tuottaako yrityksenne tuotteita tai palveluita
6) Millä tavalla mukana tuotekehitystyössä?
7) Onko jotain osa-aluetta, jonka hankitte yleensä ostopalveluna?
8) Kuinka monta työntekijää yrityksessänne on?
9) Kuinka monta vuotta on ollut toiminnassa?
    a) Startup: Kyllä / Ei

Käytettävyystyöhön liittyvät kysymykset

10) Yritysten kypsyyttä tehdä käytettävyystestejä (omalle tuotteelle / asiakkaan tuotteelle)
11) Millä tavalla käytettävyystestejä tehdään (alihankinta/itse)
    a) Kuvaile
12) Tehdäänkö käyttäjälähtöistä tuotekehitystä enemmän
    a) käyttäjien kanssa
    b) vai evaluointimenetelmillä?
13) Kuinka paljon yrityksessänne tehdään käytettävyystestejä/käyttäjätestejä
14) Kuinka monta käytettävyysalan asiantuntijaa yrityksessänne on?
15) Onko jatkossa tavoitteena muuttaa edellä kuvattuja toimintatapoja?
16) Onko käyttöä käyttäjätestauspalveluille?
    a) Rekrytointi
    b) Testisessioiden fasilitointi / vuokraa henkilö
    c) Tuki- ja assistenttipalvelut?/
    d) Käytettävyysasiantuntijapalveluita?
        i) Käyttäisittekö?

APPENDIX C: SURVEY

Kysely käytettävyystyön merkityksestä

Tämä kysely tehdään osana diplomityötä Suuntaamon (Hermia Oy) toiminnan kehittämistä varten. Kyselyn tavoite on selvittää, kuinka paljon käytettävyystyötä tehdään yrityksissä ja mitä osia käytettävyystyöstä voisi ulkoistaa. Tutkimustulokset tulevat vain Suuntaamon henkilökunnan käyttöön. Tähdellä merkityt kysymykset ovat pakollisia.

Tässä kyselyssä käytettävyydellä tarkoitetaan mm. tuotteen tai käyttöliittymän testaamista käyttäjillä, käyttäjien rekrytoimista käyttäjätestiin, käyttäjätestin suunnittelua, läpivientiä ja analyysia, käyttöliittymän arviointia esim. heuristisella menetelmällä (ammattilaisarviointi), käyttäjätarpeiden kartoittaminen, käyttäjäryhmien/-tyyppien määrittelyä, käyttäjäkeskeistä suunnittelua, konseptin hyväksyttävyyden testaus esim. fokusryhmillä ja käyttäjäinteraktion suunnittelua.

1. Yrityksen nimi *

Vastaa kaikkiin kysymyksiin tämän yrityksen näkökulmasta. Yrityksen nimi ei tule esille tutkimuksen tuloksissa.

2. Titteli *

3. Vastuualue työssäni

4. Yrityksessä, jossa olen töissä tehdään käytettävyystyötä

Ei lainkaan ○ ○ ○ ○ ○ ○ ○ Todella paljon ○ En osaa sanoa

5. Kuinka monta käytettävyysosaajaa yrityksessänne on työsuhteessa?

Kirjoita vastaus lukuina. Jos joku tekee osa-aikaisesti käytettävyystyötä, voit merki-

tä sen "0,5".

6. Kuinka usein yrityksessänne hyödynnetään yrityksenne ulkopuolelta ostettuja käytettävyyspalveluja?

- Jatkuvasti
- Silloin tälläin
- Harvoin
- Ei koskaan
- En osaa sanoa

7. Yrityksen tarvitessa lisää käytettävyysosaamista

- Palkkaisin käytettävyysosaajan yritykseen
- Ostaisin käytettävyyspalveluita ostopalveluna
- Antaisin jollekin työntekijöistä käytettävyystehtäviä nykyisten tehtävien lisäksi
- En osaa sanoa
- Muuta, mitä?

8. Jatkossa yrityksessämme käytettävyystyön määrää kannattaisi

Kysymyksessä ei tarvitse ottaa kantaan, millä osa-alueella.

Vähentää todella paljon								Lisätä todella paljon	En osaa sanoa

9. Käytettävyystyön merkitys tuotekehitysprosessissa lopputuotteelle

Erittäin merkityksetöntä								Erittäin merkityksellistä	En osaa sanoa

10. Mikä hankaloittaa käytettävyystyötä yrityksessänne? (Voit valita useampia)

- ☐ Tulosten vääristyminen
- ☐ Käyttäjien rekrytointi
- ☐ Osaamisen puute yrityksessä
- ☐ Tehdään vain jos asiakas vaatii
- ☐ Liian kallista
- ☐ Vie paljon työvoimaa
- ☐ Vie paljon aikaa
- ☐ Käytettävyystyöhön ei ole vakiintuneita käytäntöjä
- ☐ Ei mikään
- ☐ Muuta:

11. Mitä käytettävyystyön osia mielestäsi voisi ulkoistaa? (Voit valita useampia)

- ☐ Kaikki käytettävyyteen liittyvä
- ☐ Käyttäjätestauksen suunnittelu
- ☐ Käyttäjätestauksen läpivienti
- ☐ Käyttäjien rekrytointi
- ☐ Tulosten koonti
- ☐ Tulosten analysointi
- ☐ Käytettävyyskonsultaatio
- ☐ Oman väen kouluttaminen käytettävyystyöhön
- ☐ Käyttöliittymän arviointi
- ☐ Käyttöliittymän suunnittelu
- ☐ Käyttäjätarpeiden kartoittaminen
- ☐ Käyttäjäryhmien/-tyyppien määrittely
- ☐ Käyttäjäkeskeinen suunnittelu
- ☐ Konseptin hyväksyttävyyden testaus (esim. fokusryhmä)
- ☐ Käyttäjäinteraktion suunnittelu

- [ ] Ei mitään
- [ ] Mitä muuta:
- [ ] En osaa sanoa
- [ ] Miksi?

12. Mitä ongelmia käytettävyyden ulkoistaminen tuottaa? (Voit valita useampia)

- [ ] Kommunikaatiokatkoksia
- [ ] Tuloksia, joita ei hyödynnetä
- [ ] Turhaa lisätyötä tuotekehitysprosessiin
- [ ] Rahan menetystä
- [ ] Käyttökelvottomia tuloksia
- [ ] Hyvän tekijän löytymisen haaste
- [ ] Väärinymmärryksiä
- [ ] Ei mitään
- [ ] En osaa sanoa
- [ ] Muuta:

13. Valitse

	Kyllä	Jossain määrin	En	En osaa sanoa
Päätätkö käytettävyyden ostopalveluiden hankinnasta?	○	○	○	○
Päätätkö käytettävyystyöhön liittyvistä asioista?	○	○	○	○

14. Vapaa sana: