Localization of Products and Services to New Markets

A cross-cultural usability approach

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KTH Computer Science and Communication

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Abstract

The objective with the thesis was to provide TeliaSonera with guidelines of how to perform localization in user-centred product development. Localization is the process of modifying a product or service to fit a distinct culture or market. Translation is a part of this process, but it also includes for example modifying formats as time, date, currency etc. One issue when localizing computer or mobile telephone software is that the lengths of the same word (string lengths) differ between languages. Research shows that people from different cultures have different problem-solving techniques and information search strategies and interpret symbols and icons differently. Social and cultural norms and values are also suggested to have an impact on what is working in an interface. In the thesis it is discussed how those differences can be discovered and considered when developing products and services.

Interviews were performed with localization experts in the Nordic countries. The results confirm that they are mainly working with linguistic and format problems. Most localization issues can be solved if the developer or service provider plans for localization early when developing new products and also with a better awareness of the involved parties’ responsibilities.

A case study was performed comparing young Estonian and Swedish users of a Mobile Instant Messaging service. Performance and user preference measures were collected. No distinguishing differences in performance which could be assigned to national culture could be found in the usability tests. Some differences in user preference and attitudes towards functionality were found, but the general impression was that familiarity with the Instant Messaging program MSN Messenger had a larger impact than national culture.
Lokalanpassning av produkter och tjänster till nya marknader
- ett interkulturellt användbarhetsperspektiv

Sammanfattning


Intervjuer utfördes med lokaliseringsexperter i de nordiska länderna. Resultaten bekräftar att de i första hand arbetar med format och språkliga problem. De flesta lokaliseringssproblemen kan lösas om utvecklaren eller tjänsteleverantören planerar för lokalisering tidigt i processen när de utvecklar nya produkter, och också med en bättre medvetenhet om vilka parter som är ansvariga för de olika delarna.

Foreword

We are living in a time of globalization. Me and most of my friends have studied or lived abroad several times and we all have friends in many countries. With services like Skype and MSN Messenger it is possible to stay connected even on geographical locations which are thousands of kilometres apart. When I studied abroad a couple of years ago in Sydney, Australia I met people from all over the world. I experienced how fun it was to get to know people from other cultures, but also how difficult and challenging it can be to collaborate in group work with people from very diverse cultures.

With the globalization in mind it might seem strange to suggest that national culture differences would be so important that they even influence the design of global products and services. But even though we travel more nowadays and have international networks, it does not mean that we are or should be alike. To me, understanding cultural differences is a way of showing respect for other cultures and learning from each other.

I have a background in human-computer interaction, interaction design and media technology studies and the concept of cross-cultural usability was completely new to me at first. However, my readings and studies of cultural differences and their consequences have put new ideas into my mind, which I in this case have applied to user-centred product development at the Swedish-Finnish telecommunications operator TeliaSonera. I hope that they are coming through in this report and that you find the reading inspiring.

Jenny Sundén

Stockholm 5/16/2006
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Introduction

This chapter presents the purpose and objectives of the thesis as well as the problem definition and its delimitations. The reader is also introduced to the concepts of localization, cross-cultural usability and to TeliaSonera, where the thesis was performed.

Localization is no longer only a technical or translation process. To keep up with competition all the companies with business in several nations need to account also for cultural differences, in order to deliver products and services with a high-quality user experience. This thesis is looking closer at the Swedish-Finnish telecommunications company, TeliaSonera and how they can incorporate a usability approach to localization in their product development process. In-depth interviews with localization experts have been performed, as well as a comparative usability study with potential users of a Mobile Instant Messaging service in Sweden and Estonia.

Background

TeliaSonera

TeliaSonera is the leading telecommunications company in the Nordic and Baltic region. It also holds strong positions in mobile communications in Turkey and Russia. 44 percent of sales come are coming from the Swedish market, followed by Finland (18 %), the Baltic countries (10%), Norway (8 %), Denmark (8%) and Eurasia\(^1\) (7%) (TeliaSonera 2006). Hence nearly one third of TeliaSonera’s sales come from markets outside of Sweden and Finland. However, the product development is still carried out mainly in Sweden and Finland. In order to minimize costs when developing new products, products and services are reused between TeliaSonera’s target markets. For a successful reuse in the company’s large organization, without sacrificing design and usability, effective and formalized methods are required.

Design and Usability, TeliaSonera Sweden

The department for Design and Usability at TeliaSonera Sweden AB (TSS) has noticed a demand for common guidelines within the company, outlining how to deal with localization. When an existing product or service is introduced to a new market an adaptation is made to fit local requirements in terms of technical standards and branding issues. This adaptation also consists of

\(^1\) At the moment Eurasia includes Turkey and Russia.
design- and usability issues, but since this process is not currently formalized, these issues are often forgotten and overlooked.

**Eesti Mobil Telekom**

TeliaSonera holds more than 50% of Eesti Telekom, which in turn owns Eesti Mobil Telekom (EMT). EMT is the market leader in mobile communications with 677,000 customers in Estonia. EMT has approximately 270 employees with its head office in Tallinn.

**Internationalization, localization and cross-cultural usability**

Software giants like Sun Microsystems, Microsoft and Apple have been introducing their products to an international market for decades. In the early 90s they started to develop documents describing how to translate and localize their products to target markets.

With an increasing globalization and exploding development and usage of Internet, localization is a reality for a substantial number of companies around the world. Localization is highly relevant for software and global websites, but also increasingly for other products and services. Telecommunication operators today are acting on a global market to a higher extent than before, but the product development is still most often taking place in the operator’s home country. That fact is creating a demand for the localization of services in a similar way to what is done with software, websites, printed media and IT systems.

Traditionally internationalization and localization are approached as a translation and format problem. Design practices from the 90s describe how to translate menus and dialogue boxes and how to deal with date, telephone number and currency formats (Aykin 2004).

With an increasing awareness of design and usability aspects in the product development process, more research has been done recently within cross-cultural usability. Also in design practices literature design and usability issues are more and more often argued to play an important role of internationalization and localization (Evers 2001). By comparing non-localized e-commerce websites with localized websites, it has been shown that localized websites sell more. Correlation between cultural factors and task performance in tests has also been shown. Earlier research within interaction design, human computer interaction (HCI) and usability have shown relations between usability and profitability. It is argued that cross-cultural or international usability is
more than just translation and format, it is a profound design problem, mainly because user interfaces are acted on, not just read (Aykin 2004: p. 17).

Recent articles, based on cultural models developed by recognized cultural anthropologists like Hofstede (1997), Trompenaars and Hampden (1999), suggest that a nation’s cultural profile has a direct correlation with user preferences and requirements (Marcus and Gould 2001; Choi, Lee, Kim and Jeon 2005). To be able to perform appropriate localization of products, identification of those cultural factors and their impact on design, is crucial (Beu, Honold and Yuan 2000; Evers 2001; Jagne, Guven-Smith, Duncker and Curzon 2004).

Problem definition
The main question at issue is:

- How can TeliaSonera perform localization of products and services to their target markets from a usability point-of-view?

  - Which approaches to product development in a cross-cultural setting are available?

    - How is localization practically performed in the Nordic countries today?

  - What factors influence the user experience and usability in a cross-cultural setting?

    - Does national culture influence the user experience and the usability?

  - What measures have to be taken and what methods can be used in order to successfully adapt a specific product to a specific market?

“Successfully” in this context means without sacrificing design and usability goals.

Purpose and objectives of the thesis
The objective was to suggest an appropriate localization model at TeliaSonera from a usability point of view. The aim was to provide guidelines for such a model that will cover a range of products and services and also apply for several target markets (for delimitations see ‘Scope of
the thesis”). The purpose was to provide guidelines for localization that can complement the current product development process at TeliaSonera.

A second aim was to contribute to existing research within the field of cross-cultural usability. For this empirical data will be collected through usability tests with Swedish and Estonian users of a Mobile Instant Messaging (Mobile IM) service. A Mobile MSN service was currently under development at TeliaSonera and will be targeted to Denmark, Sweden, Norway, Finland, Estonia and Lithuania2. The study will hopefully also help to identify which factors are influencing usability and the user experience.

Outcomes
In line with TeliaSonera’s existing product development process, supporting documentation will be produced to facilitate implementation of the localization model. The documentation will consist of checklists and possibly other supporting tools. These tools could be for example graphical or conceptual.

Scope of the thesis
The objective of the thesis was to suggest an appropriate localization process for TeliaSonera. This process will be general and cover a range of products and services as well as markets. However the final result will be targeted to a selected number of products and services at TeliaSonera which has a market potential in the future, in line with TeliaSonera’s internal policies. There are a range of possible factors influencing localization; for example behavior patterns, shopping behavior, paying habits, information search behavior, technical standards, social and cultural norms and values, language and conventions. The thesis was intended to primarily cover design and usability aspects of localization. Technical standards are important factors to consider when localizing, nevertheless this factor falls out of the range of this thesis due to time constraints. In the industry, there is already a deep and broad awareness of translation related issues such as terminology and language levels and there was no need to reinvent the wheel. It was assumed that it is possible to generalize the localization process at TeliaSonera to a certain extent. Since TeliaSonera is contracting suppliers to do the actual design of products, it will be possible to use general tools to assist the employees in making the right decisions (for example compiling appropriate requirements to suppliers and choosing the most appropriate supplier).

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2 In Sweden and Lithuania the launch is currently postponed.
Delimitations

- Branding and marketing issues are not considered largely. However, gathering information about a user group has some distinguishing features in common with for example target group analysis.
- Technical standards are not accounted for.
- The in-depth interviews are limited to localization professionals working in the Nordic countries.
- The usability test and interview are limited to young Swedish and Estonian users in the ages of 16-19 years.
- The study is not a “test-retest” study. No second test will be made in order to validate the results from the first usability test.
- The markets in Russia and Turkey will not be included in the study.
TeliaSonera

A framework for my recommendations to TeliaSonera is provided in this section. TeliaSonera’s organization, project model, the process for product and offering development and the focused service portfolio are described briefly.

Organization

There are currently 17 profit centers in the TeliaSonera group. Sweden is the largest profit center with its 44% of total sales (87, 661 million SEK 2005). Finland is the second largest with 18% of sales, followed by the Baltic countries (10%), Denmark (8%), Norway (8%), Eurasia (7%) and other operations (4%). Figure 1 shows the organization of the TeliaSonera group, with the profit centers highlighted. On group level, every project at TeliaSonera follows the TeliaSonera Project Model (TS Promo). The project model is outlined in Figure 2.

![Diagram of TeliaSonera's organization](image-url)

Figure 1. TeliaSonera’s organisation. The profit centres Sweden and Finland have Design and Usability departments (TeliaSonera 2006)
**TeliaSonera Sweden**

TeliaSonera Sweden consists of five “legs”, Consumer Segment, Business Segment, Products & Services, Network & Production and Customer Service. The five segments have Communications, HR and Staff & Management functions in common. The department for Design & Usability is part of Applications & Usability (in Products & Services). There is a recently updated (December 2005) application of TS Promo for Product and Offering Development (TSS POD) at TeliaSonera Sweden. TSS POD has in turn four main processes, Offering & Market process, Product Life Cycle (PLC), Infrastructure Life Cycle (ILC) and an IT process. Product and service development follows the PLC process.

**TeliaSonera Sweden Product and Offering Development**

TSS POD consists of eight phases and is outlined in Figure 2. Each phase consists of a number of activities. Each activity in turn is described with a name, input, description (what should be done), output, control, support and role.

![TSS Product Development Diagram](image)

*Figure 2. Model of TSS Product & Offering Development (TSS POD) – a TS PROMO application. The upper part shows the TeliaSonera Project Model (on group level) and the lower part is the application for Product & Offering development at TeliaSonera Sweden.*

**Decision Points and Quality Reviews**

The project model TS Promo consists of seven decision points (DP0-DP6). The decision points are business decisions with the purpose of steering company resources and requirements.
Sometimes the Consumer Segment or the Business Segment initiates a project. In those cases another decision, AB0 precedes DP0.

As outlined in Figure 2, Quality Review councils (QR) precedes DP1, DP2, DP4 and DP5. The council meets every Thursday and consists of representatives from relevant activities and responsibilities. The purpose of the QR council is to assure quality in the development process. The motto is to do right from the start and with the right conditions. The design plan is a mandatory document in every QR. The role of the representative from D&U is to review the user experience, which includes:

- Review that the design plan (when needed) has been made and updated (the design plan is explained in the next paragraph).
- Review that the activities described in the design plan has been completed before QR decision.
- In the cases where the design plan is not made, describe the consequences.
- Be the formal representative of the unit and be responsible for problem solving that concern the units’ responsibilities and results in the development work.

The Design Plan and the Customer Life Cycle

The department of Design and Usability (D&U) owns two documents, the design plan and the Customer Life Cycle (CLC). “The main objective of the design plan is to ensure a simple and efficient product or/and service that appeals to the defined target group”. The design plan is used foremost to define and plan the activities that should be carried out to ensure the user experience with the product or service. The CLC is the process of finding, buying, getting started, using and ending a product or service from the customer point-of-view. It helps the employees at TeliaSonera to think of the user’s interaction with the product or service throughout the whole process.

The Design Plan is a mandatory document in all Quality Reviews councils. If there is a need for a design plan, it should be established before DP0 and then updated and followed throughout the project. The project manager or pre-study manager is responsible for the design plan, but he or she can request an assessment from Design & Usability (D&U). In practice, the pre-study manager often contacts D&U between DP0 and DP1 and a design plan is established in cooperation between the pre-study manager and the representative at D&U (or in some cases of the pre-study manager alone).
Focused Service Portfolio
In 2004, the Focused Service Portfolio (FSP) was initiated at group level on TeliaSonera in order to adapt to the changes in the marketplace. The range of products and services provided is now smaller, some older products and solutions are phased out. The most important changes in the marketplace is the transition from fixed services to services based on mobility and Internet and increased competition with cost-efficient niche-operators for example. TeliaSonera’s objective is to take the leadership role in migration to the new marketplace.

The FSP is divided in five main product areas, Mobile Services, Broadband & Fixed Services, Communication Solution Services, Data Networking Services and Business Solutions.

Characterization of TeliaSonera’s products and services
Only the products and services that consist of an interface to an end user need a design plan. The interfaces can be either web interfaces or mobile interfaces and the end users can be either external or internal. External end users are all persons who use TeliaSonera’s external business or consumer products, services or solutions. Internal users are employees or others who use TeliaSonera’s internal solutions (as sale support systems etc.).
Theoretical Background

The theoretical background defines and explains the internationalization and localization processes and presents available approaches to global product development. The reader is also acquainted with the concepts of culture, usability, user experience and the research area cross-cultural usability. Finally, some cultural models and their application on the problem area are outlined.

The definition and depth of localization differs considerably depending on the viewpoint and work role of the person you are asking. Global business units and product development teams tend to favour consistent product solutions, because international variations are costly and increase the complexity of the design and development processes. Local business units and user experience teams, on the other hand, stress a deeper localization with unique features and designs that will work on a local market. This chapter covers both fields of knowledge. Below is an overview of the entire chapter.

Internationalization and localization (industry practice and guidelines)
- Internationalization
- Localization
- Global product development

Cross-cultural usability (empirical research)
- Definition of culture
- Definition of usability
- Cross-cultural usability research
- Cultural models and cultural dimensions

Knowledge about internationalization and localization originally comes from large multinational software development companies, who discovered the need to translate and adapt their products to their non English-speaking markets. At first, the knowledge was considered a competitive advantage and was hence not available for the public. When Internet emerged in the late 90s, several handbooks and guides were written on the subject. Those guidelines were mainly targeted for websites or software development.
Cross-cultural usability on the other hand is a research area with input from human-computer interaction (HCI), user centred design (UCD), interaction design as well as social and cultural studies.

First, industry and design practice for internationalization and localization is defined and explained, and then a summary of a common approach to global product development follows. In the second half of this chapter, the concepts of culture and usability are explained and research in the field of cross-cultural usability is outlined. Finally, a few cultural models and their applicability on interface design are investigated. Hofstede’s cultural model is applied on TeliaSonera’s target markets.

**Internationalization and localization**

**Definitions**
The process of internationalization separates the software in one culture-dependent and one culture-independent part. The culture-independent part is sometimes called the generic core (Yeo 2001, p. 104). The Localization Industry Standards Association (LISA) defines internationalization as “the process of ensuring, at a technical/design level, that a product can be easily localized... Internationalization helps define the core content and processes so that they can be easily modified for localization to specific markets” (Aykin 2004, p. 5). Localization is the next step and aims to deliver the culture-dependent part adapted to a specific target culture. Aykin defines localization as “The process of modifying products and services to accommodate differences in distinct markets”. She means that the aim of localization is to make products usable in a local market and makes the assumption that a usable product is also acceptable by that target culture.

An essential part of localization is translation, which is defined as “the linguistic component of localization. It is choosing the appropriate text in a target language to convey the proper meaning from a source language text” (Aykin 2004, p. 5). It is important to note that the same language does not accordingly mean the same culture. Locale is defined as “that part of the user’s environment that is dependent on language, country/region and cultural conventions.” Spanish is spoken in many countries, but represents different locals. In the thesis “target locale”, “target culture” and “target market” are used synonymously. Aykin’s definitions are the ones adopted in this thesis (in italic).
How are internationalization and localization performed?

Most often, product development takes place in the country where the company is located; hence, it is targeted to the company’s home country. If the launch of the product is successful, the company might decide to enter new markets. In this case, the aim of the internationalization process is to remove culture dependent parts of the product. However the most desirable approach is to account for internationalization already when developing new products. In that way, the developer can follow international design guidelines from the start, so that the product consists only of the generic core, free from culture-dependent elements. The process of developing the generic core consists of three steps (Aykin 2004):

1. Defining the software architecture
2. Defining the actual software
3. Defining the user interface elements (symbols, icons, menus, buttons etc).

The target locale’s specific elements like date, telephone numbers and currency variables are placed in a separate resource file (Aykin 2004). Other culture sensitive elements are dialogue messages, error messages and menu names. They are translated and placed in a separate message file (Yeo 2001).

If the demand is arising on new markets, only the localization part has to be done in order to produce a targeted product. In the case where the company knows that the product will be launched on several markets, Aykin suggests that a common global interface design is appropriate. This global interface design has to join different languages, text, navigation structures and content in order to create a common “look and feel”. A slightly different approach is suggested by O’Hagan who uses a conventional communication model when describing how to face the challenges of localization. The model consists of a sender, a receiver and a message. The message in turn can be broken down to package and content, where the package is symbolizing the interface and the content the language and the images (O’Hagan 2002). Typical things to consider when localizing the package are the position and function of the buttons and preferred paying methods.
When is localization necessary?

Localization is not necessary to the same extent in every case. Evers suggests that in some
countries, like Sweden for example, it is acceptable or even desirable, with an English version of
software. Therefore, companies with the aim of going global should always ask themselves to
what extent localization is necessary for every particular target culture (Evers 2001). That decision
is based on the organization’s overall globalization strategy (O’Hagan 2002). It is also a question
of finding the right depth of localization, i.e. the balance between costs and the potential increase
in revenue provided by a deeper localization.

Approaches to global product development

There are probably as many approaches to global product development as there are multi-
national software development companies in the world. However, it is possible to establish some
common features. The global-software development lifecycle (global-SDLC) is one approach
originally suggested by Fernandes (1995). Global-SDLC is the recommended process for global
product development and consists of three phases (Yeo 2001):

1. Design (localization and internationalization)
2. Implementation (actual coding)
3. Usability Evaluation

In the design phase, the software developers first identify the target markets, then produce the
generic core (the actual program) by internationalization and finally localize the program to
different target markets. Many authors (Trillo 1999; Yeo 2001; Aykin 2004) provide guidelines
and factors to consider when localizing to target markets. Guidelines often concern terminology,
local formats (date, time, currency, telephone number etc.), known objects and symbols (size of
paper sheet, symbol for trash can, mail box etc.), taboos (which numbers and colors to avoid),
aesthetics (color, geometry and typography) (Trillo 1999). The problems with those guidelines are
that they are usually not specific enough to be used when localizing to specific target markets.
The guidelines only serve markets considered having a substantial economic potential like Japan,
while smaller markets are overlooked (Yeo 2001).

After internationalization and localization, the design is tested with users from the target market
(or recently migrated natives) to ensure that the translations are understood by the users in the
right context. The tests are also used to make sure that the text messages are fitting on the screen.
After the design phase (including localization tests) and correction being done, the implementation phase starts where the actual coding is done. In the third phase, the usability of the software is evaluated.

Apple, Digital and Hewlett Packard (HP) and Microsoft, are using product development processes similar to global-SDLC in order to produce global software (Yeo 2001). However, their guidelines are limited to the target culture’s language and its language-related issues such as character sets, character display, sorting and data display format issues such as date, time, currency and telephone numbers. Deeper cultural issues such as cultural values and norms are not included.

ed realized the necessity of internationalization earlier in product development and gave the concept of internationalization a new meaning. They proposed possible solutions to common problems in global product development and also discuss the development of appropriate test methods. For this purpose, they established usability labs in China and the US in addition to the one in Germany (Beu et. al 2000).

Cross-cultural usability

As stated in the previous section, companies with the objective of gaining market advantage thought it would be enough just to translate language, currency, date, time formats and so on, when entering new markets. As concluded by a number of studies, that strategy is insufficient in order to successfully meet the needs of diverse markets (del Galdo and Nielsen 1996; Evers 2001; Marcus and Gould 2001; Sun 2001; Yeo 2001; O’Hagan 2002; Jagne et. al 2004; Choi et. al 2005). Those authors argue that it is necessary to include culture in the process of adapting products to local markets in order to make them useful.

Definition of culture

There are many definitions of culture, ranging from “high cultures” to “organisational cultures”. The intention here is neither to explain them all, nor to describe the origin of the word. Badre (2002) explains culture in general terms as “attributes belonging to a target audience that distinguishes it from other target communities”. Culture in this context is “identifiable behaviours, practices, conventions, signs, symbols, artefacts, values and beliefs that characterize a group” (Badre 2002, p. 214).
Cultural communities in this sense can consist of members of a subculture on one level and members of a nation on another. One person can be part of a national culture, a subculture and an organizational culture at the same time. In the thesis focus will be on national culture, hence the attributes which are unique for that particular nation’s society. Each one of TeliaSonera’s target markets is considered one national culture in this thesis. Strongly inspired by Badre I have formulated the following definition for national culture:

*National culture is identifiable behaviours, practices, conventions, signs, symbols, artefacts, values and beliefs that characterize the members of a nation.*

It is important to note that culture is learned, not inherited (Dahl 2004). Therefore culture is not constant, but changing and evolving all the time. The behaviour, values and beliefs of a person who was born in one national culture and moved to another will have characteristics from both cultures.

**Definition of Usability**

Usability is defined as “the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use” (ISO 9241-11 1998). Usability goals are objective measures like efficiency and effectiveness, while user experience goals are subjective measures, i.e. what the users think and feel of the product.

**Usability goals**

The two most frequently cited usability goals are efficiency and effectiveness. The ISO 9241-11 standard defines efficiency as “the resources expended in relation to the accuracy and completeness of goals achieved”, i.e. the way the product supports the users in performing their tasks. Effectiveness is defined as “the accuracy and completeness with which specified users can achieve specified goals in particular environments”. In addition to those Preece, Rogers and Sharp put forward safety, utility, learnability and memorability as well. Table 1 summarizes all six goals and their definitions (2001).
Table 1. Definition of usability goals

<table>
<thead>
<tr>
<th>Usability goal</th>
<th>Definition</th>
</tr>
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<tbody>
<tr>
<td>Effective to use</td>
<td>How good a product is at doing what it is supposed to do.</td>
</tr>
<tr>
<td>Efficient to use</td>
<td>The way the product supports the users in performing their tasks.</td>
</tr>
<tr>
<td>Safe to use</td>
<td>The extent to which the product prevents the user from doing mistakes.</td>
</tr>
<tr>
<td>Have good utility</td>
<td>The extent to which the product provides the wanted functionality.</td>
</tr>
<tr>
<td>Easy to learn</td>
<td>How easy a product is to learn how to use.</td>
</tr>
<tr>
<td>Easy to remember</td>
<td>How easy a product is to remember how to use.</td>
</tr>
</tbody>
</table>

User experience goals

The user experience can be described as the quality of the experience a user has when interacting with a particular product or design (Soegaard 2003). The term is now widely used and can refer to anything from the interaction with a digital product to the interaction with a washing machine. However, Preece et al (2001) defines a number of user experience goals, which are helpful in order to measure the user experience:

- Satisfying
- Enjoyable
- Fun
- Entertaining
- Helpful
- Motivating
- Aesthetically pleasant
- Supportive of creativity
- Rewarding
- Emotionally fulfilling

It is important to note that not all user experience goals can be fulfilled at the same time. Depending on product type, the user and the context, prioritization has to be made between them. User experience goals are usually measured with interviews or questionnaires where the user is asked to rate his/her experience on a scale.
Factors influencing localization in a cultural context

Studies performed by Barber and Badre (1998), Evers (2001) and Choi et. al (2005) suggest that culture has a strong effect on what users look for in an interface and how they interpret interfaces. Evers studied the influence of culture in a web context, while Choi et. al studied the influence of culture on mobile data service design. Barber and Badre identified a number of cultural markers and attractors, which are culture-specific.

The influence of culture on web interface understanding

In her doctoral thesis about cross-cultural usability Vanessa Evers concentrated her research on distance learning via a virtual campus on the Internet. Students from Holland, US, UK and Japan were asked to evaluate an educational facility by its website. She found three main levels of differences influencing the users’ understanding of the interface (and therefore usability of the interface) (Evers 2001):

1. Real world experiences influence understanding of the design metaphor and individual design items.
2. Knowledge of language(s) influence understanding of textual elements.
3. Information needs influence navigation and perceived usefulness of the website.

Even if all users in Evers’s study were speaking English to some extent, the users associated the text and graphics with familiar terms and aspects of their own lives. Despite the fact that all the students understood the words “student” and “centre”, the word “Student Centre” meant different things to the participants. They interpreted “Student Centre” in terms of real life expectations and value orientations. Another interesting finding was that each group had a different approach to information-seeking and problem-solving. The Americans used a very structured approach, while the Dutch used a much more unstructured way, randomly clicking around the site to form a general view of the website and then applied it to find the answer to their problem. The English used an approach in the middle of the two. The Japanese were unable to adopt an approach, because they doubted their own ability to solve the problem (Evers 2001). Evers suggests the reason for that is the Japanese are known to be collective problem solvers (not individual as in the nature of the task).

Cultural values were found to impact what the users’ were looking for on the website and hence influenced their search strategies. Examples of such value orientations are that the status of the
university was important to the Americans while the location of the university was important to the Dutch. Evers also found that national cultural differences influenced the users’ attitudes towards brands, available information, the visual design of the interface and the general topic of the website (Evers 2001).

Influence of culture on mobile data service design

Choi et. al (2005) performed a qualitative study and conducted in-depth long interviews with 24 people in Korea, Japan and Finland (those markets were considered mature or advanced for mobile data services). They propose a number of design attributes critical to the design of mobile data services. They found 52 attributes, of which 11 clearly correlated correlation with characterizations of the user’s culture.

Choi et. al argue that since mobile data services are designed to interface with wireless networks that operate only in local areas, cultural factors have a stronger effect on mobile data service use than the use of traditional stationary Internet applications. In the study, the authors adopted four cultural dimensions: uncertainty avoidance (UA), individualism vs. communitarism (I vs. C), context and time perception. Those are further explained on page 25. They argue those dimensions are the most general and most suitable ones for a study comparing cultures. The participants were asked to discuss their thoughts and preferences when they watched video clips of common tasks with a mobile phone (downloading ring tones and games, reserving movie tickets and reading sport news). Analyzing the interviews Choi et. al found that the users’ preferences of the design correlated with that group’s cultural characteristics. Table 2 consists of the 11 attributes that were found to be influenced by culture in the study (Choi et. al 2005).

Table 2. Design attributes influenced by culture.

<table>
<thead>
<tr>
<th>Attributes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal steps or keystrokes(^3) (time perception)</td>
<td></td>
</tr>
<tr>
<td>Efficient layout or space usage (UA)</td>
<td></td>
</tr>
<tr>
<td>Iconic menu style (context)</td>
<td>Variety of font sizes (context)</td>
</tr>
<tr>
<td>Secondary information about contents (UA)</td>
<td>Variety of font colours (context)</td>
</tr>
<tr>
<td>Variety of contents (I vs. C)</td>
<td>Large amount of information within a screen (UA)</td>
</tr>
<tr>
<td>Logical ordering of menu items (time perception)</td>
<td>Various options for contents (I vs. C)</td>
</tr>
<tr>
<td>Clear menu labelling (UA)</td>
<td></td>
</tr>
</tbody>
</table>

---

\(^3\) All participants preferred minimal steps and keystrokes, because it allowed them to perform the tasks in shorter time. Thus, this attribute can be generalized to all three countries in the study.
Korea and Japan have high uncertainty avoidance (UA) while Finland has low UA. 90% of the Korean and Japanese people preferred an iconic menu style, secondary information about contents, clear menu labelling and large amount of information within a screen. The Finnish on the other hand did not want secondary information about content.

According to Hofstede (1997), Finns and Japanese are more individualistic than for example Koreans. Finns and Japanese preferred a variety of options for contents, but Koreans had the opposite view. Neither of them wanted an actual variety of contents.

Hall (2001) argues that most Asian societies are high-context and Western societies are low-context. High-context means communication and events are implicit and in-direct. Low-context means communication is direct and explicit. The implications for interface design are that high-context cultures prefer graphical elements and symbols. In low-context cultures people rather rely on statistics and hard facts (Choi et. al 2005). The results in the study correspond with Hall’s theory, the Finns tend to prefer text mode. Finns did not care about different colours and font sizes.

According to Hall Asian countries have monochromic time perception while Western countries have polychromic time perception. In the study all three groups were found to have monochromic time perception (do one task at a time in a sequential or linear manner rather than multi-tasking).

**Cultural markers and cultural attractors on websites**

Barber and Badre (1998) studied cultural design differences of websites in terms of cultural markers. Cultural markers are the use of attributes that are common in that culture. It can be the use of certain colors, the reading direction, the use of graphics, the appearance of the text, the use of national flags, pictures, borders etc. (Sheppard and Scholtz 1999; Badre 2002).

Cultural markers are not surprisingly a function of the original design environment. Design developed in the United States often uses blue and red colors even if the predominant color of the target audience is green. Another usual mistake is to use a lot of graphics when the predominant mode of expression is text (Badre 2002). Barber and Badre also introduced the concept of cultural attractors. Cultural attractors can be for example national symbols, beliefs, religious iconography (or the absence of such).
The differences in cultural elements derive from both the environment and the user. Architecture, regional plants, wildlife, natural and adopted colors, symbols, signs, images and sounds are examples of influence from the environment. Cultural attributes like customs, practices and behaviors on the other hand are associated with the users. These attributes range from tangibles such as conventions, how people dress and how they express date and time to intangibles like power distance relations and individualistic/collectivistic mindsets for example (Badre 2002).

**How can cultural models assist in interface design and evaluation?**
Since there is little research about the influence of culture in a technology setting, many researchers and practitioners in the field of cross-cultural usability have based their studies and guidelines on existent models (Hofstede 1997; Trompenaars and Hampden-Turner 1999) about cultural value orientations (Evers 2001; Marcus and Gould 2001; Smith *et al.* 2001; Simon 2001; Choi *et al.* 2005). Those models emerge from research done primarily at workplaces and describe organizational culture foremost. Cultural value orientations are further explained on page 25. However, recent contributions in the field of cross-cultural usability and interface design suggest that those models are not always compatible with all interface design situations (Gillham and Maroto 2003; Jagne *et al.* 2004). Critiques also concern that the models are built on generalizations and therefore too stereotypical (Bourges-Waldegg and Scrivener 1998). They are also considered too rigid (Nocera and Hall 2003). Another objection concerns that the cultural models were originally designed for business or management settings and not in the context of interface understanding. Hall argues that it would be wrong to apply Hofstede’s work to a particular cultural group and try to predict how they would respond to a particular technology. “The difficulty is that these characterizations are descriptive and not prescriptive, they cannot be used deductively” (Hall 2001). Beu *et al.* (2000) acknowledge the work of Hofstede and Hall, but state that more information and understanding is needed in order to actually be able to design products.

**The use of existing cultural models**
Evers (2001) found that cultural models were useful in cross-cultural usability research, but to a limited extent. She found them applicable in order to describe the cultural groups, prepare data collection and to interpret the participants’ answers and relating them to their cultural background. However she also found that cultural influences were intertwined with other
influences and that culture should always be investigated in relation to other contexts in which the user is interacting with an interface.

Marcus and Gould (2001) outline a number of interface design guidelines on the basis of Hofstede’s cultural dimensions. Further information about Hofstede’s cultural dimensions is found on page 27. The guidelines concern metaphors, mental models, navigation, interaction and appearance and are tailored for the low and high extreme of each cultural dimension. Marcus and Gould illustrate their suggestions with pictures of existent websites. Their work, however, is not based on empirical research. Jagne et. al (2004) question the validity of Marcus and Gould’s guidelines. Their objections concern that the guidelines are not based on usability studies and that users born in the same country cannot necessarily be described properly with Hofstede’s five dimensions. Another objection proposed by Jagne et. al is that no other factor of website design has been taken into account.

**The use of an alternative cultural model**

An alternative approach is suggested by Jagne et. al. They propose an investigative strategic model, which is basically a strategic framework for design teams with the need of creating their own cultural model. The model includes steps to be taken when designing interfaces for cross-cultural use. Instead of relying on general cultural models, Jagne et. al suggest researchers and designers to interact directly with the people from the target culture. The model includes heuristics like usability, national formats like language translation, date and time and also cultural attributes (or markers) like colour. It also accounts for the concept of common design metaphors:

- Libraries to digital libraries (information categorisation, knowledge transfer etc.)
- Banks to online banks (trust etc.)
- Shopping to e-commerce (paying habits etc.)

Jagne et. al recommend the model to be used in the design phase of the project life-cycle (after the market demographics have been identified). It can be applied to most products or services which consist of a digital interface. The investigative strategic model consists of four main phases: *investigation, translation, implementation* and *evaluation*. It is summarized below in graphics and text (Figure 3). In order to clarify the phases and actions I have chosen to illustrate the model with an Instant Messaging service for the mobile phone.
Phase 1 Investigation

The purpose of phase 1 is to outline the existent users’ habits with Instant Messaging (IM) services. Jagne et al. suggest conducting an ethnographic study. The objectives of Phase 1 are for the designer to adopt a different cultural perspective, to learn to understand the thought processes of the users and to establish a native’s viewpoint. The users of IM should also be asked to fill in questionnaires.

Phase 1i

The purpose of Phase 1i is to be able to localize the product/service on a cultural level and to avoid developing a culturally offensive one. The objectives are to find out which social and cultural factors which are relevant for this particular product with this particular user group (in this case the use of IM and mobile phones). The factors should include cultural markers and cultural attractors. To identify cultural markers Badre (2002) suggests using a foraging study, i.e. categorizing similar products by country, language, visuals, colours and page layout. In order to identify cultural attractors Jagne et al. suggest interviewing cultural/usability experts from the target
culture or people that have a good understanding of the culture. Colours, banner adverts, trust
signs, metaphors and language cues are examples of such cultural attractors.

**Phase 3ii**
Identify user attitudes towards similar products/services in order to find the *performance*,
*preference* and *acceptance* levels and the factors affecting these levels.

**Phase 2 Translation**
Create a *cultural model* that consists of the similarities and differences found between the source
market and the target market. From this cultural model it is then possible to create a *customer
profile* of the target user group (Jagne *et. al* 2004: p. 6). In this example you would analyze the
differences in use of IM and mobile phones and then create a customer profile of IM users in the
target culture. Decide to which extent localization is necessary.

**Phase 3 Implementation**
With input from the ethnographic study and the cultural model, create a generic design of the
product/service. The generic design should be free from cultural-dependent parts and made in a
way making it easy to change it in response to different target markets. Select relevant cultural
and social factors (including national formats such as date, time and currency) from the cultural
model from Phase 2 and create a localized design (Jagne *et. al* 2004: p. 6).

**Phase 3i**
Implement the prototype and perform usability tests. Suggested methods to evaluate the
prototype are task analysis procedures, *usability questionnaires*, *think aloud protocol* and *observational
studies* (Jagne *et. al* 2004: p. 7).

**Phase 4 Evaluation**
Make adjustments to the prototype with input from the evaluation data and develop a working
product/service. This process should be iterative, i.e. implement the changes to the prototype,
evaluate the prototype etc (Jagne *et. al* 2004).
Cultural value orientations

As concluded in the sections about internationalization and localization, cultural norms and values are not part of the prevailing global product development process. However, a majority of the recent contributions to cross-cultural usability research refer to the theoretical frameworks developed by Hofstede, Trompenaars and Hampden-Turner and Hall. Those authors all have in common that they have developed cultural models based on empirical research. Geert Hofstede is a cultural anthropologist and he studied how values in the workplace are influenced by culture. Trompenaars and Hampden-Turner are both management consultants with experience from training organizations for international management. This section outlines the most important concepts and conclusions of Trompenaars and Hampden-Turner’s and Hofstede’s work.

Trompenaars and Hampden-Turner’s cultural dimensions

Trompenaars and Hampden-Turner’s opinion is that one can never fully understand other cultures. He has studied the effect of culture on management for fifteen years, resulting in data from 1000 cross-cultural training programs in 20 countries. An additional 30 companies with departments in 50 countries have been studied. At least 100 people with similar backgrounds and education have been heard in every country. 75 % of those were managers (Trompenaars and Hampden-Turner 1999). Cultures differ from each other in the way they solve problems or approaches dilemmas. Those dilemmas can be divided into three headlines; those who arise from our relationships with others, those which come from the passage of time and those which relate to the environment. Trompenaars and Hampden-Turner (1999) have identified seven different cultural dimensions.

Universalism versus particularism

A universalist believes that what is good and right can be defined and from the moment it is defined it can always be applied to anything. A particularist would pay greater attention to relationships and unique circumstances.

Individualism versus communitarism

This dimension refers to what extent people regard themselves as individuals or part of a group. Is focus on the individual or on the community?
Neutral versus emotional
In North America and north-west Europe business relations are expected to be formal and about achieving objectives. Humans are resembled to machines. In many other cultures showing emotions are acceptable and part of business.

Specific versus diffuse
Is the relationship with a business partner predescribed by a contract or is the whole person involved in the relation? Is it important to get to know people first or do people prefer to do business immediately? These questions answer to what extent a society is specific or diffuse.

Achievement versus ascription
In an achievement oriented society you are judged on what you have recently done whereas in an ascription-oriented society it matters who you are and status comes by birth, kinship, gender and age.

Attitudes towards time
In business settings Trompenaars and Hampden-Turner (1999) have identified differences in how people look at time. Is it important what you have done in the past or what your plans are for the future? There are also differences in how time is perceived. In America, Holland and Sweden time is perceived as a straight line, while many other cultures perceive time as a circle.

Attitudes to the environment
Which is the most powerful? The individual or the world? The differences in attitudes can be described with the iPod-analogy. In Japan, people would say that with the iPod they can listen to music without disturbing others. In western countries people would say “I can listen to music without being disturbed by other people” (Trompenaars and Hampden-Turner and Hampden-Turner, 1999, p. 10).
Hofstede’s cultural dimensions

Between 1967 and 1973 the cultural anthropologist Geert Hofstede interviewed 120 employees at IBM in 53 countries. Additional studies included commercial airline pilots and students in 23 countries, civil service managers in 14 countries, ‘up-market’ consumers in 15 countries and ‘elites’ in 19 countries. Analyzing the result he found patterns in the way people feel, think and act. From these patterns he identified four cultural dimensions, which are described below. Scores on the cultural dimensions are currently listed for 74 countries and 3 regions around the world (Hofstede 2003). A fifth dimension was identified later, but is excluded here because it has low relevance when comparing European countries.

Power Distance Index (PDI)
The PDI describes the degree of equality between people in the country’s society. In high PDI countries inequality is accepted and wanted. An employee in Japan does not expect the same treatment as his boss. Low PDI countries stress equality and the same opportunities for everyone.

Individualism (IDV)
This dimension shows to what degree society emphasizes individual achievement as opposed to collective achievement. A country with a high IDV index tend to have a larger number of loose relationships, while societies with a low IDV tend to have a few, tight relationships. In a group everyone also takes responsibility for fellow members of the group, while in an individualistic country everyone is expected to take care of themselves.

Masculinity (MAS)
To what degree does the society reinforce traditional masculine work roles, with control and power? High MAS index indicates a society with large gender differences. Low MAS indicates low differentiation and discrimination between genders. Females are treated equally to males in those societies.

Uncertainty Avoidance Index (UAI)
This dimension refers to the level of tolerance for uncertainty and ambiguity within the society, i.e. unstructured situations. High UAI index means a low tolerance for uncertainty and ambiguity, while low UAI means that there is less concern for uncertainty and ambiguity and more tolerance for a variety of options. The latter societies are less rule-oriented, accept change more readily and
take more and greater risks.

**Application of Hofstede’s dimensions on TeliaSonera’s target markets**

Studying the scores of these four dimensions of TeliaSonera’s target markets and comparing them gives indications of the differences in cultural values and norms between those countries. Figure 4 compares the scores for Denmark, Estonia, Finland, Norway and Sweden⁴. The minimum score is 0 and the maximum score is 100.

![Bar chart comparing cultural dimensions across countries](image)

Figure 4. Comparison of Hofstede’s cultural dimensions on five of TeliaSonera’s target markets Sweden, Finland, Norway, Denmark and Estonia (Hofstede 2003).

**Limitations and shortages with cultural models**

Cultural models are as the word indicates – just models. Culture is a complicated concept that is difficult to describe in figures or in text. One should be aware of that simplified cultural concepts are always interpretations of a variety of different cultural characteristics. Also, if cultural models are not used with care, they can contribute to stereotypes about cultural differences and distinctive features in national cultures. However, culture in this thesis is used as an applied concept, to support user-centered product development on a global market. My judgment is that the cultural models and concepts presented in this thesis are the “best” available for its purpose.

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⁴ Lithuaniania and Latvia were not included in Hofstede’s study.
Summary and conclusions

In this chapter the concept of internationalization, localization, culture, usability and cross-cultural usability have been brought up and explained. Practices from the industry of how to perform internationalization and localization were presented. National culture was defined as identifiable behaviours, practices, conventions, signs, symbols, artefacts, values and beliefs that characterize the members of a nation.

The global-software development lifecycle can be used as an appropriate outer framework for global product development. The investigative strategic model is even more useful in order capture all the details necessary when localizing products and services to new markets from a usability point-of-view. Evers’s extensive research is valuable in order to understand how culture influences for example problem-solving techniques and search strategies. The contribution of Choi et al. is interesting because of its focus on mobile data service design and user’s varying preferences depending on culture. Hofstede’s cultural dimension are often cited, but also questioned when it comes to its applicability on interface design. However it provides a starting point when trying to understand the cultural differences between the Nordic and the Baltic countries. In order to address my questions at issue, more information is needed about practices in the Nordic countries as well as a deeper understanding of cultural differences between TeliaSonera’s target markets.

The theoretical background has provided some answers to the first sub question (which approaches to product development in a cross-cultural setting are available?). It has also provided some research about the factors that influence the user experience and usability in a cross-cultural setting.

The following chapters describe my studies. The first study is intended to address how localization is performed in the Nordic countries today. The second study is a case study addressing whether national culture influence the user experience and usability.
Method

This chapter describes how the interview study and the usability study were performed.

In-depth interviews were carried out with five employees working with localization in various branches in Sweden, Denmark, Norway and Finland. The purpose was to get a better understanding of the existing processes and work methodologies in the localization industry and identify relevant factors influencing localization.

A thorough case study was performed in order to investigate cultural influence on the user experience and usability of a Mobile Messenger service. The study included usability tests among ten Estonian and nine Swedish students from secondary school (age 16-19).

In addition to the in-depth interviews and the usability tests I have studied the project models and work processes at TeliaSonera Sweden. The data collection has been done through informal meetings with employees at Design & Usability foremost. I have also participated in internal education about a new project model for product development, as well as acquainted myself with material from TeliaSonera’s intranet and studied relevant documents from other departments at Products & Services in Sweden and Marketing, Products & Services in the TeliaSonera group.

Interview

The interviews were semi-structured and performed by the phone or face-to-face when possible. The interview guide consisted of 16 questions divided into three main areas: process and work methodology, factors influencing localization and differences between target markets. The interview guide in Swedish is outlined in Appendix 1 and the interview guide in English is outlined in Appendix 2. Semi-structured interviews were chosen because they provide the opportunity to somewhat alter the questions depending on the answers of the respondents. Also, follow-up questions were posed when needed. All the interviews were recorded and transcribed before further analyzed. In the analysis the software XSight was used to sort the data into the three main question areas. The analysis focused on finding similarities in the process and working methodology and if there are any “localization factors” varying due to differences in products, services and cultures. The sample of respondents was selected among people with varying work roles at small to medium-sized enterprises specialized in translation and localization in Sweden (3), Denmark (1), Norway (1) and Finland (1). Table 3 describes the respondents and the
companies by which they are employed. Each interview took about one hour and all the
interviews were performed in Swedish except for the Danish one5. The interviewees were
selected randomly by contacting the localization companies which are members of LISA.

Table 3. Description of respondents and their employers.

<table>
<thead>
<tr>
<th>Work role</th>
<th>Work experience (in localization industry)</th>
<th>Products</th>
<th>Company location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Manager</td>
<td>2 years</td>
<td>Printed media, magazines, and online media.</td>
<td>Sweden</td>
</tr>
<tr>
<td>CEO</td>
<td>7 years</td>
<td>IT systems</td>
<td>Sweden</td>
</tr>
<tr>
<td>Localization Engineering</td>
<td>&gt;10 years</td>
<td>Computer software, mobile software</td>
<td>Finland</td>
</tr>
<tr>
<td>Manager</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-owner and Documentation</td>
<td>&gt;10 years</td>
<td>IT systems, web localization and technical writing.</td>
<td>Denmark</td>
</tr>
<tr>
<td>Documentation Manager</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Documentation Manager</td>
<td>&gt;10 years</td>
<td>IT systems</td>
<td>Norway</td>
</tr>
</tbody>
</table>

Usability testing

The idea of usability testing is to provide the researcher with the possibility to measure and
control the test variables and the circumstances around the test. Usability testing is appropriate
when time critical functions are important to evaluate. An assessment test is one type of usability
test which is usually performed early or midway in the product development life cycle. The
objective is to evaluate the usability of some of the more low-level functionality. Usually the user
is asked to perform tasks with the product and quantitative measures are collected. The test
leader is interacting with the user to a low extent, since the focus is more on actual behavior and
less on thought processes (Rubin 1994).

Design of test and choice of performance measures

An assessment test was considered most appropriate in order to compare the usability of Mobile
Messenger between the Swedish and the Estonian group. The test was a quasi-experimental
study, where the intention was to control as many independent variables as possible in the two

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5 Both the Norwegian and the Finnish respondent understood Swedish. The Norwegian respondent answered in
Norwegian and I translated to Swedish.
groups. A quasi-experimental study resembles an experimental study but has no random assignment of participants. This design allows researcher to look at relationships between variables rather than cause and effects (Dahmström 2000). The groups were compared with respect to two predefined usability criteria. With inspiration from Mattson’s study (2006) I have chosen effectiveness and efficiency as usability criteria. Effectiveness is measured with task timing (time to finish a task). Efficiency is measured with task accuracy (if the task was completed successfully with out help or not) and task efficiency (number of steps to finish a task). Table 4 shows the usability measures for each of the tasks in the test. The different measures for each task are further discussed in “Results from the usability tests with Swedish and Estonian users” on page 46.

The independent variable which is varied in the test is national culture. National culture will be varied through carrying out corresponding tests in Sweden and Estonia. Therefore the objective was to keep other variables such as age and education constant. The dependent variable is usability.

Table 4. Usability performance measures for each task.

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Measure</th>
<th>Task accuracy</th>
<th>Task timing</th>
<th>Task efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Download and install</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Open and log in</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Add a contact</td>
<td></td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Send a message to contact</td>
<td></td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Switch between two chats</td>
<td></td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>

Questionnaire

The purpose of the questionnaires was to cover the aspects that are not dealt with in the assessment test, hence the subjective measures. How well does the service support the tasks the users want to perform and the goals they want to achieve? What do the users think of the service? Three user experience goals were chosen in order to measure the user experience. Those were Satisfaction, Fun/excitement and Enjoyable/Emotionally fulfilling. The selection of the three user experience goals was based on a scenario workshop with usability experts and interaction designers. For each one of those, questions were constructed where the users could rate their
experience on a five-point scale. In Table 5 are the scales for each question. The questionnaire was semi-structured in order to collect both quantitative measures and qualitative comments.

Table 5. User experience goals

<table>
<thead>
<tr>
<th>User experience goals</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction</td>
<td>1 Very unsatisfying - 5 Very satisfying</td>
</tr>
<tr>
<td>Fun/excitement</td>
<td>1 Very boring - 5 Very fun/exciting</td>
</tr>
<tr>
<td>Enjoyable/Emotionally fulfilling</td>
<td>1 I disliked Agile Messenger very much -</td>
</tr>
<tr>
<td></td>
<td>5 I liked Agile Messenger very much.</td>
</tr>
</tbody>
</table>

Think aloud user testing

A common technique in usability testing is to ask the user to “think aloud” while using the product. The purpose is to find out when and why the user encounters problems or discovers good features with the product. The users are videotaped or recorded, so that their interaction and comments about the product can be analyzed afterwards. Advantages with this technique are a good approximation to real-life situations and it is also quite cheap, the latter because fewer users have to be tested in order to get usable results. The main disadvantage is that think aloud is always to some degree unnatural for the user (Gray and Salzman 1998).

Using the think aloud technique was a way of ensuring that the recorded material could be understood afterwards, despite possible technical problems with recording a small mobile display.

User profile

A typical potential Mobile IM user would use MSN Messenger daily. They are not likely to use Mobile IM if they are not users of IM in the computer. The dominant IM service is MSN Messenger. The user should have no earlier experience with any Instant Messenger service on the mobile phone.

Selection of users

Students have been chosen from upper secondary school, hence age 16-19. The schools are located in the center of Stockholm and in the center of Tallinn. Students from those schools are very likely to fit the user profile. The selection was made according to the user profile as long as it was possible. Through correspondence with a teacher at Norra Real in Stockholm city, I was able to gather 15 students whom were interested in participating. In Tallinn five students were
recruited from VHK Gymnasium, six from Tallinn Science School and two from other secondary schools. All the students in Stockholm were studying mathematics/computer science and all except two were studying science (mathematics, physics etc.) in Tallinn\(^6\). The purpose with the usability tests was to investigate cultural influence on usability and user experience with a particular service. The intention was to select corresponding user groups in two countries which are frequent MSN users well within the target group of this type of service (TeliaSonera 2006), not to select a representative group of all MSN Messenger users.

**Choice of mobile IM service and mobile phone**

Since the purpose of the usability test is investigating cultural influence on usability and user experience, a reliable and widespread service was considered the best choice. There are a number of commercial Mobile IM services available. Many suffer from “child-hood diseases”, while others are considered reliable, relatively mature and “user-friendly”. Agile Messenger is the best Mobile IM service available for third-party download at the moment (according to the Mobile Magazine “Mobil”, no 2 2006). It is available for all networked handheld devices which can handle third-party software. Supported platforms at the moment are Symbian Series 60, Symbian UIQ, Microsoft Smartphone, Microsoft Pocket PC, Palm OS 3.5+ and J2ME.

According to TeliaSonera’s internal statistics Sony Ericsson mobiles and Nokia mobiles are equally popular among teenagers between 16 and 19 in Sweden, while in Estonia Nokia is the clear market leader (TeliaSonera 2006). Therefore, Nokia 6681 was used in the usability tests.

**Outline of the usability test**

- Presentation of me and information about the evaluation
- Explanation of think-aloud protocol and short introduction to the Mobile phone used in the test (Appendix 5)
- First set of tasks (download and install, open and log in)
- Five-minute free tryout
- Second set of tasks (add a contact, send a message and switch between chats)
- Background questionnaire (Appendix 3)
- Evaluation questionnaire (Appendix 4)
- Short interview about the evaluation itself

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\(^6\) Those two were studying languages as their primary direction.
During the usability tests, the participants were asked to perform a set of predefined tasks with the service (Appendix 6). The participants were given sheets of paper with some instructions (Appendix 7). The instructions were on purpose quite restricted in order to resemble a real-life situation as much as possible. For example the participants were given the WAP address where the service can be downloaded, but not exact instructions describing how to open the web browser and enter the address in the field. If the participants did not succeed in downloading, installing, opening or logging in to the service, I helped them out with as few clues as possible. I also encouraged them to think-aloud with questions like “Where are you now? What are you doing now?”.

After the installation and log in with the participants’ regular MSN username and password, I told them to use the service freely for a while. They were encouraged to chat with their online contacts, try out the menu options and preferences\(^7\). About five minutes were enough to get to know the main functions in the service. In cases where the participants wanted less or more time, that was granted. The important thing was to give them enough time to get used to the interface.

After the assessment test the participants were asked to fill in two questionnaires. The first one was intended to collect background information about the participants, which later can be used in order to explain and analyze the results. Age, sex, mobile phone brand, usage of MSN Messenger and mobile services were investigated with eight questions. Questionnaire 1 can be found in Appendix 3. In the second questionnaire which consisted of seven questions (Appendix 4), the participants were asked to rate their opinions about Agile Messenger on a five-point scale. They were also asked to mention two good and two bad things with Agile Messenger and to select a preferred paying method.

Finally the users were interviewed briefly in order to capture their thoughts and feelings about the test. Questions were asked about what they thought about the test situation, about the camera, about being observed by the test leader, about thinking-aloud and about the tasks.

A video camera was used in order to capture the users’ interaction with the mobile phone. It was pointed solely at the display. The test leader operated both the camera when necessary and also took notes and instructed the participant when needed. The test leader and the participant were alone in the room. The usability test (including questionnaires) took about 45 minutes to one

\(^7\) In cases where a participant did not have any contacts online, I added him or her. This way they could always try out the chat function.
hour in total. All the tests were performed in English (in Sweden too) in order to bias the results as little as possible. The students were informed about the test via email some days in advance. The tests in Sweden were performed during three days in week 9 at the Royal Institute of Technology (KTH) and the tests in Tallinn in week 12 at EMT’s office. Two cinema vouchers were given to the students as compensation for their time and effort.

Figure 5. Usability test arrangement. The user sat by the table in the chair up front. A piece of paper, which was taped to the table, told the user to hold the mobile within a square. The test leader was sitting at the chair in the back with a clear view of the video camera’s display. The test leader was also equipped with a computer in order to be able to receive messages from the user when he or she was performing the tasks.
Analysis

This chapter describes how the data from the interviews and the usability tests were analyzed.

Interviews

Qualitative analysis

The MP3-recorded interviews were transcribed and then imported into the software X Sight. X Sight allowed the researcher to input ‘sample characteristics’ describing the respondents. In this case, the interviewees were characterized by work experience in the localization industry, employer, the company’s geographical location and its type of products. I imported the transcripts and created an analysis framework where it was possible to link verbatim from the transcripts to different headings. The analysis framework consisted of three main headings, further divided into seven sub headings: General (products, company principals and definition of localization), Localization process (client side and testing) and Localization factors (cultural differences and problem areas). With assistance from the software, queries were asked in order to extract verbatim and comments below a certain heading. The queries made it possible to analyze different parts of the material separately and to search for keywords.

Usability tests

Analysis process

The purpose with the quantitative analysis was to compare the Swedish and the Estonian user group in terms of performance and the subjective measures. The qualitative data was used to explain and further understand those results and to inspire later recommendations. In the Conclusions chapter, conclusions are drawn based on the total picture given by both types of data. The analysis process is described below in ten steps and graphically presented in Figure 6.

1. Coding the evaluation questionnaires in Microsoft Excel. Writing down the comments.
2. Watching the videotapes and timing Task 1 and 2 as well as counting the steps for Task 3-5. Coding the results in Excel. This step also included writing down interesting comments uttered by the users.
3. Calculating the mean values of the users’ rating of Agile Messenger (subjective measures). Calculating the percentage of users succeeding in completing Task 1 and 2 without help.
Calculating median values for the task timings for Task 1 and 2. Calculating the ratio between actual steps and minimum number of steps to complete Task 3-5. Calculating the mean value for the ratio. All calculations were done separately for the Estonian and the Swedish user group. This step also included comparisons of different sets of data, for example all Nokia users in one group and all users with other mobiles in one group.

4. Compiling a Word document with all the comments from the users and importing those to X Sight.

5. Producing diagrams and graphs of the calculated values, which compare the Swedish and the Estonian results.

6. Analyzing the qualitative results in X Sight. The analysis framework was divided into seven main headings, Relationship to Agile Messenger, Relationship to MSN, Problem-solving approach, Attitude towards payment, Functionality, Customization and Attitudes towards test situation. Keywords used to sort the comments were ‘option’, ‘feature’, ‘window’, ‘conversation’, ‘message’, ‘chat’, ‘MSN’, ‘computer’, ‘picture’, ‘smiley’, ‘ preview picture’, display picture’ etc. The queries were compiled into tables and reports and those were exported to Word-format. This step is explained in more detail below in Qualitative analysis of the usability tests.

7. Analyzing the diagrams and graphs along with the calculated values from step 3.

8. Compiling relevant information into result tables.

9. Writing summaries of the qualitative results in Word.

10. Make conclusions and recommendations based on the results. Compile those into a written report and a PowerPoint presentation.

Figure 6. Diagram of the analysis process and software used when analyzing data.
Qualitative analysis of the usability tests

In order to explain the results from the quantitative analysis and to be able to compare my findings with earlier research, a more thorough analysis were performed. This time qualitative data were considered as well. The software XSight was used for this purpose. A screen shot from XSight is shown in Figure 7. The analysis performed in XSight is described below.

- Input sample characteristics (age, education, mobile phone brand, national culture, MSN use).
- Import transcripts with verbatim and comments from the questionnaires and the videotapes.
- Sort the verbatim and comments in headings.
- Ask queries to the database in order to extract comments below a certain heading.
- Export those tables and text reports in Word-format.
- Use the sorted data when discussing the quantitative results and making recommendations to TeliaSonera.

![Screen shot from XSight. It shows the project explorer and the sample characteristics for the users on the left and some of the analysis framework to the upper right and a report on the lower right.](image)

Figure 7. Screen shot from XSight. It shows the project explorer and the sample characteristics for the users on the left and some of the analysis framework to the upper right and a report on the lower right.
Results

This chapter presents the results from the interviews and the usability tests.

Results from interviews with localization experts

The results are divided in four main headings, definition of localization, process and work methodology (includes testing), localization problems and cultural and linguistic differences. Table 6 on page 41 describes the localization process as the respondents describe it.

Definition of localization

In the interviews, the respondents were asked to verbalize their definition of localization. The process of adapting (or changing) a product to fit a local market recurred in all the respondents’ answers. Translation of the product to the local language was mentioned as an important part of the process, but all the respondents also talked about additional adaptation. Some were more precise in their answers and stressed the importance of analyzing the local market in order to understand the customers and make the product work on that market. Two of the respondents mentioned that the goal with localization is to make the customer feel that the product is produced locally. One of those respondents also included functional and religious differences. It was also evident that sometimes a straight translation of the text is not desired, but rather an adaptation of the text that works in the local context.

Process and work methodology

The respondents were asked to describe the localization process at their company. The processes that the respondents described were very much alike, especially for the firms that localize IT systems. Some differences were found however and they are described below. Table 6 outlines the general localization process and consists of the phases and steps that all localization companies have in common. Note that the process is described from the viewpoint of the localization companies. It will of course look slightly different from the client side. However, the table shows in which steps the client is involved and where in the process the client is supposed to deliver content to the localization company.

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8 TeliaSonera is representing the client when the process is applied to their circumstances.
Table 6. The localization process in general from the localization companies’ viewpoint.

<table>
<thead>
<tr>
<th>Plan</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Receive material from the client (software and graphical interface).</td>
<td></td>
</tr>
<tr>
<td>• Project planning and staffing of the project.</td>
<td></td>
</tr>
<tr>
<td>• Examine the material. Check text lengths and other limitations. Put in translation memory sticks.</td>
<td></td>
</tr>
<tr>
<td>• Receive or put together reference material.</td>
<td></td>
</tr>
<tr>
<td>Translate</td>
<td></td>
</tr>
<tr>
<td>• Send to translators (at the firm itself or to its partners in other countries).</td>
<td></td>
</tr>
<tr>
<td>• Proof reading and correcting (sometimes this takes place in the target country by the market department or the software developers).</td>
<td></td>
</tr>
<tr>
<td>Build</td>
<td></td>
</tr>
<tr>
<td>• Build and compile the software at the client or in-house. (With printed media, ‘build and compile’ is replaced by the graphical production).</td>
<td></td>
</tr>
<tr>
<td>Review &amp; Test</td>
<td></td>
</tr>
<tr>
<td>• Review of the text itself and the text in the right context (either at the client or in-house depending on the agreement).</td>
<td></td>
</tr>
<tr>
<td>• Test the software (sometimes at the client and sometimes in-house depending on the project and agreement).</td>
<td></td>
</tr>
<tr>
<td>Prepare help &amp; documentation</td>
<td></td>
</tr>
<tr>
<td>• Translation of help and documentation (follows same process as the software. It also includes taking screen shots of the localized version if necessary as well as formatting).</td>
<td></td>
</tr>
<tr>
<td>• Prepare the documentation for print. Compile and test the help systems.</td>
<td></td>
</tr>
<tr>
<td>Deliver</td>
<td></td>
</tr>
<tr>
<td>• Deliver to client.</td>
<td></td>
</tr>
</tbody>
</table>

Explanation of the details in the localization process

Two of the respondents stress the importance of a sound planning before sending the material off to the translators. It is important to provide the translators with as much information as possible so that he or she knows about the context and the limitations. The limitations can be for example that some of the words should not be translated, but remain in English or there could be limitations in terms of number of characters etc. Usually the translators use string editors where they can see how the text will look like on the screen⁹.

One of the localization companies works exclusively with the Swedish market commissioned by a large multinational software development company. The respondent explained that they in the planning phase spend time investigating the prevalent way of expressing something at the local market. They look at similar existing products on the market, especially the most common ones.

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⁹ Those string editors are not yet available for mobile applications.
Sometimes the client wants them to benchmark the localization to those or sometimes the localization company is responsible for inventing new expressions that will work in Sweden.

The biggest differences in the descriptions of the localization processes were found when comparing different products, like IT systems and printed media. The process of localizing printed media is more extensive in a way, but requires less testing. When producing localized printed media there are three important parties (instead of two as in the traditional software development case), the commissioning client, the localization company and the layout firm. In the building phase, the localization company receives layout material from the layout office and adjusts this according to the local language. Since printed media is quite often marketing material, the marketing department at the client’s local office has to review and approve the localized version as well. Localizing printed media also includes a proof print and another turn with proof reading after that.

A majority of the respondents explained that they often take on the role as a quality assurance team. Inconsistencies found during testing for example are reported to the client when there is a need for change in the actual software. In some cases, when the localization company is subcontracted, the client does not allow feedback because the software cannot be altered. In most cases, the client is responsible for some of the testing. Usability issues and usability testing is always taking place at the client. The building of the software is most often taking place at the client as well. The professional clients are suggesting that the content should be revised to fit the local audience. The goal is to make the end customers feel that the product is made for them.

Testing
It is not until the test phase that the testers are reading the text in the real context. Other purposes with testing is to check that everything looks nice and works properly of course, but also to check with local representatives that the product will sell on the target market. Hopefully localization problems and cultural problems that might occur are discovered during testing. Often the localization company has detailed instructions from the client when performing the testing themselves. The client often does tests on the original version with the end customers in addition to the tests performed by the localization company. The most common approach is that the client has a finished product that they have tested in different ways (including usability tests). Then the product is translated to many languages.
One multinational client prefers to put the software together and run all the tests themselves, because they think it is cheaper and more effective. The disadvantage with this approach is that it is not possible for the localization company to discover context errors early in the process. One of the localization companies performs “cultural tests” with people from the target culture. If it is for example a mobile software that is tested, the mobile is either shipped to the target country or emigrants from that particular country come to the office in the home country to perform the tests.

Localization problems
Table 7 summarizes localization problems the respondents have encountered in their daily work. They are divided into general problems and client problems. Client problems are problems which have a direct correlation to the client’s work processes. The general problems are problems that occur when transferring a product from one country to another. The Finnish respondent mean that the problems are similar whether they concern computer software or mobile software.

Table 7. Localization problems.

<table>
<thead>
<tr>
<th>General problems</th>
<th>Client problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>G2. Fixed number of characters for a specific word.</td>
<td>C2. Context and definitions are not provided to translators.</td>
</tr>
<tr>
<td>G8. Taboos like religion, sex, death, colors etc.</td>
<td>C8. Language and functionality or graphical interface and functionality are not separated in the code.</td>
</tr>
</tbody>
</table>

The respondents emphasize the importance of planning for localization early. “You have to have localization in mind already from the start, otherwise the result is not good”, says one respondent. If you do that many localization problems can be avoided. One respondent mention the Microsoft style guide, which is “like a bible to localizers in all countries, because when you have that standard you know how the graphical user interface will look like”. With help from the
Microsoft standard consistency and quality can be ensured.

Cultural and linguistic differences
The results of the interviews show that there are no differential cultural or linguistic differences between Sweden, Norway and Denmark (Scandinavia) and small differences between Finland and Scandinavia as well as between the Baltic’s and Scandinavia. The Norwegian respondent says that she has not experienced any cultural problems when cooperating with Swedes or Danish people for example. The way of thinking and working is quite similar. One example is the attitude to deadlines, which differ some in Southern Europe.

The differences that the respondents have experienced are mainly linguistic. The tone in the language is important as well as the terminology. The Finnish respondent has experienced the Finnish language as more precise and absolute than both Estonian and Swedish. In Estonia and Sweden, for example, small-talk is more common than in Finland. The Finns also are more flexible when it comes to language. They see no problems in abbreviating words, while the Baltics want the technology to adapt to the language, rather than the other way around.

All the respondents mean that most of the software localizations that are performed today is from American English and American culture to target languages and target cultures in Sweden, Denmark and Norway for example. The large American companies are highly aware of the consequences if something goes wrong. One respondent tell about an occasion when a large multinational software development company faced heavy lawsuits because they printed an image with a map where the border between two countries was in the wrong place.

Cultural differences between the Nordic countries and countries that were mentioned in the interviews, but do not belong to TeliaSonera’s target markets, are not included in the results.
Results from the usability tests with Estonian and Swedish users

Quantitative results

The quantitative results from the usability tests are divided in objective measures (performance measures) and subjective measures (user preference). The objective measures were collected through letting the users perform five tasks with Agile Messenger. The subjective measures were collected through watching the video tapes from the tests, the evaluation questionnaires and the usability test notes. Note that national culture is the dependent variable which is varied, not measured in the tests. Possible causes (cultural or others) to differences in usability or user experience between the user groups were searched for in the qualitative results.

User performance with Agile Messenger

62 % of the Swedish users and 90 % of the Estonian users succeeded in downloading and installing Agile Messenger without help from the test leader (except for the brief written instructions). The median time to fulfill the task was three minutes and 44 seconds in the Swedish group and three minutes and three seconds in the Estonian group. 56 % of the Swedish users and 44 % of the Estonian users managed to find, open and log in to the service without help from the test leader. The median time to fulfill the task was five minutes in the Swedish group and four minutes and 25 seconds in the Estonian group.

The Swedish users needed more steps (ratio 1.33) in order to add a contact successfully in Agile Messenger, compared to the Estonian users (ratio 1.04). However, when sending a message to a contact and switching between two chats the Swedish users required less steps in average (ratio 1.15 respective 1.06, compared to Estonian 1.27 respective 1.45). Table 8 summarizes the performance scores for both groups. Entire results with diagrams comparing the scores of the Swedish and Estonian user groups can be found in Appendix 8.
Table 8. Performance score summaries and median times comparing the Swedish (N=9) and the Estonian (N=10) user group (Ratio 1.0 would mean that the user performed a particular task with the minimum number of steps. N is the number of users.).

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Task accuracy: percentage of participants performing correctly (without help)</th>
<th>Task timing: median time (minutes and seconds)</th>
<th>Task efficiency: average ratio between actual number of steps and minimum number of steps to fulfil a task</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sweden</td>
<td>Estonia</td>
<td>Sweden</td>
</tr>
<tr>
<td>Download and install</td>
<td>62 %</td>
<td>90 %</td>
<td>3:44</td>
</tr>
<tr>
<td>Open and log in</td>
<td>56 %</td>
<td>44 %</td>
<td>5:00</td>
</tr>
<tr>
<td>Add a contact</td>
<td>100 %</td>
<td>100 %</td>
<td></td>
</tr>
<tr>
<td>Send a message to</td>
<td>100 %</td>
<td>100 %</td>
<td></td>
</tr>
<tr>
<td>contact</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switch between two</td>
<td>100 %</td>
<td>100 %</td>
<td></td>
</tr>
<tr>
<td>chats</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All the tasks were measured with task accuracy (whether the participants succeeded in the task or not). Task timing and task efficiency are both measures of the efficiency when performing a task (Rubin 1994). The researcher has some earlier experience of using Mobile IM and it turned out that the three last tasks (‘Add a contact’, ‘Send a message to contact’ and ‘Switch between two chats’) usually take very little time to complete; therefore it was considered irrelevant to time those tasks. Since the users were beginners with the test phone and the first two tasks (‘Download and install’ and ‘Open and log in’) requires some “browsing”, counting the number of steps were considered irrelevant for those tasks. This explains the empty fields in Table 8.
User preferences regarding Agile Messenger

The vast majority of both the Swedish and the Estonian users wanted Agile Messenger in their mobiles (Figure 8) and were satisfied with Agile Messenger. There was no remarkable difference between the two groups. The average satisfaction score was 4.0 in the Swedish group and 4.1 in the Estonian. The Estonian respondents answered more positively regarding the user experience goal fun/exciting, four Estonian respondents thought Agile Messenger were very fun/exciting. The average fun/exciting score was 4.0 in the Swedish group and 4.2 in the Estonian. The third user preference score demonstrated a notable difference between the Swedish and Estonian user group. The average enjoyable/emotionally fulfilling score was 3.7 respective 4.5. Figure 9 shows how the respondents answered these questions.

Do you want Agile Messenger in your mobile?

![Pie charts showing the percentage of respondents who want Agile Messenger in their mobiles.]

Figure 8. Demand for Agile Messenger among the Swedish (N=9) and the Estonian (N=10) user group.
How do you think it was to use Agile Messenger?

Figure 9. User experience goals, satisfying, fun/exciting and enjoyable/emotionally fulfilling among the Swedish (N=9) and the Estonian (N=10) user group.

Paying for Agile Messenger

Five of the Swedish and seven of the Estonian users preferred to pay for Agile Messenger per month (the alternatives were per month, per day, for messages you have sent or other
suggestion). One user suggested only paying for the application and not for using it, “because I don't use the phone to chat. I use the phone to call and chat on the computer”. Another user wanted the service included in the phone bill (as SMS and MMS are included in some subscriptions). Other suggestions were paying a one-time fee, paying only for data traffic or paying for chat hours. One user did not want to pay at all, because he could chat for nothing on the computer. Figure 10 shows the percentage of the users who would consider paying for downloading Agile Messenger.

**Would you consider paying for downloading Agile Messenger?**

<table>
<thead>
<tr>
<th>Swedish user group</th>
<th>Estonian user group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don't know</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>0%</td>
</tr>
<tr>
<td>Yes</td>
<td>30%</td>
</tr>
<tr>
<td>No</td>
<td>70%</td>
</tr>
</tbody>
</table>

Figure 10. User preference regarding payment among the Swedish (N=9) and the Estonian (N=10) user group.

**Qualitative results**

The qualitative results described in this section were collected from the evaluation questionnaire, the usability test notes and the video tapes.

**Attitudes towards customization of Agile Messenger**

A majority of the users in both user groups stated that they like customization, “I really like customization” and “I am a big fan of different skins. There could be an option to download new skins to Agile Messenger”. However, there were contradictory opinions as well, “I don't like all those unnecessary stuff on (regular) MSN, this one does not seem to have it, display pictures, nudges, videos and so on”.
Attitudes towards additional functionality in Agile Messenger

Seven of 10 of the Estonian users did not want any additional functionality, in addition to the one that is already provided in Agile Messenger. Eight of nine of the Swedish users did want additional functionality. Five of the Swedish users mentioned that they wanted to be able to add a preview picture; none of the Estonian users mentioned this kind of functionality. Three Estonian users wanted to be able to group their contacts (two of them because they had very large contact lists) and one Swedish user wished for the same. Two Estonian and two Swedish users wanted to be able to see what they have named their contacts (instead of the real name). One Estonian user said, “I am not used to these names; on the computer I use my own names”. When the Estonians wanted to chat with another person, most of them closed their current chat window, before opening a new one, “Many conversations at the same time may become really uncomfortable”.

Other functionality the users asked for were the possibility to send files, chat with several people in the same chat, customize smilies and an easier navigation through the contact list. One Swedish user said, “I have a lot of contacts, it would be good to have search for the letters like in the phone book”. The Swedish users also wanted to be able to customize the background in the chat window, change the color of the text and the font size.

Opinions about the usability test design

The participants in general had a positive attitude to the usability test itself. They were happy to help and found it interesting and exciting. Some pointed out it was their first time participating in something like this. No difference in attitude between the Estonian and the Swedish group could be discovered.

All participants but one was not at all bothered or nervous because of the video camera. Some of them did not think about it at all. A few of them felt somewhat uncomfortable when typing their password\textsuperscript{10}. No cultural difference could be found between the answers.

In the Swedish group the participants did not think much about being observed by me, their comments were such as "pretty natural" and "kind of natural". One participant with an Arabian origin, (five years in Sweden) felt awkward having me watching. The Estonian participants thought that being observed was "normal" or "not uncomfortable”. One did not feel observed and one did not think about it. Two referred to the atmosphere as "friendly”. One participant

\textsuperscript{10} In those cases, I turned off the camera or told them that nobody but me would have access to the videotape.
said, "I am used to taking tests and exams from school. Here there is a friendly atmosphere, not as at school".

In the Estonian group, the general opinion among the participants was that they are used to speak English and therefore it is not a problem. One participant said that speaking English is always a little bit uncomfortable because of lack of practice. A couple of the Swedish participants pointed out that they are not fluent in English and therefore they were not able to express themselves when thinking aloud to the same extent.

About half of the participants in the Swedish group thought that the tasks were "good" and "easy". The rest of the group thought that some of the tasks were difficult at first but as one participant expressed it, "when you done it once you know it". They also pointed out that it was slow to get started, because Agile Messenger does not save the username. Two of them said that it would be easier with their own phone. All the Estonian participants found the tasks relatively simple and easy. Comments concerned that it were difficult in the beginning and that it could have been easier with their own phone. Other comments were, "I haven't used WAP before, but I think I got the hang of it" and “First time is always awkward, but when I went around a second time I was already quite at home".

Some of the Swedish participants thought that thinking aloud was "strange" or "a bit weird". Comments were also about that, they were not very used to thinking aloud and hence sometimes forgot about it. Other comments were, "You can't say what you are thinking while you are chatting" and "I did not search so much in the menus since I needed to talk". The Estonian participants also stated that they were not used to thinking aloud. Two of them forgot about it and one thought it was weird.

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11 Agile Messenger does not save the username and password until you have logged in successfully once. After the first time you are automatically logged in when opening the application.
12 Only three Estonian participants answered this question because the researcher forgot to ask the question to the others.
Conclusions

This chapter presents bullet points with the conclusions from the two studies. Two of the questions at issue are answered.

How is localization performed in practice?

• The professionals working with localization in the Nordic countries have a mutual understanding of what localization is and how they work with it. There is no obvious competition between the localization companies, but they are rather cooperating with each other as partners in different countries.

• The localization process depends largely on the commissioning client and in many cases the localization process is tailor-made for the client (since they are often large and the relations long-term).

• Testing is a crucial part of localization, since it is not until then the text is read in the right context. Localization companies always reviews the text they have translated and in most cases (if it concerns computer or mobile telephone software) run some of the tests in-house. Therefore they have some of the quality assurance responsibility.

• The localization companies want to be contacted earlier in the product development process, but this is very seldom the case today. It is often too late to make changes in the software if cultural problems (with icons or symbols for example) are discovered during testing.

• Large multinational companies have local offices in the countries where they launch their products. This way they can have their products tested with local testers and discover cultural problems.

• The objective with localization, according to the professionals in the study, is to make the end user feel that the product or service has been produced locally (in that country), i.e.

• Most of the problems which arise during localization can be avoided or decreased if the involved parties in the localization process are aware of their responsibilities. The client needs to plan for localization early in the product development process and give clear instructions to the localization company. From the localization company’s viewpoint the client is responsible for the following; adaptation of content to fit the local market, appropriate use of icons, avoid taboos concerning religion, sex, death, colours etc.,
provide clear definitions and instructions about context to the localization company and provide well-written source material.

The localization company’s responsibility is to solve issues such as word abbreviations, language tune and adaptation of the meaning of the text to fit the local market as well as providing clear instructions to their translators.

The service/software provider\(^{13}\) is responsible for providing flexible string lengths (numbers of characters for a specific menu label, link, word etc.), the handling of double byte languages, the use of resource files with format and target units, to avoid hard-coded variables, to avoid machine-translated text, to provide easy and user-friendly error messages and to separate language/graphical user interface and functionality in the code.

**Does national culture influence usability and the user experience?**

- No distinguishing differences in performance could be found in the usability tests, which can be assigned to national culture. On the other hand, the differences in performance could not be explained by any other variables measured in the test. Hence, the influence of national culture on usability can not be excluded.

- The bigger the difference between cultures, the more important to account for those. If the cultural differences are small, other factors will have a bigger influence than national culture. The tests show that the most important factor when using Agile Messenger is the familiarity with similar services, like MSN Messenger. Task accuracy was 100 % for all tasks which are nearly similar in MSN Messenger. The log in flow in Agile Messenger is more complicated than the one in MSN Messenger. That particular task had the worst task accuracy and task timing scores.

- The tests show that both the Swedish and the Estonian users in the study are highly individualistic. The majority of the users had a positive attitude to customization; they wanted to be able to change the names and the preferences in the application. This result corresponds with Hofstede’s cultural dimensions where both Estonia and Sweden have high individualistic scores.

\(^{13}\) The software/service supplier was quite often the same company as the client, but the responsibilities are separated here since TeliaSonera in most cases is buying services from suppliers.
• The Swedish users wanted additional functionality (like adding preview pictures, change the colour of the text and change font size etc.) to a higher degree than the Estonians. Several of the Estonians wanted to simplify the use, with for example grouping of contacts. The majority of the Estonians also closed down their ongoing conversation before opening a new one, in opposite to the Swedes whom had several conversations open simultaneously. That could be interpreted as the Estonian users want to avoid ambiguity and uncertain situations to a higher extent than the Swedish users. This result also corresponds with Hofstede’s cultural dimension, uncertainty avoidance, which is the dimension where Sweden and Estonia differs the most.
Discussion

This chapter includes a general discussion about the conclusions and their similarities with earlier research, as well as a discussion of the results and the method.

The results from the interviews with localization experts show that localization in practice still mostly involves translation and changes related to linguistic problems, format and units. The localization companies are not involved in usability issues and usability tests. Rather the software company develops a product they are satisfied with, which sometimes includes usability tests etc., and then hand it over to the localization companies. Hence most global products and services are not targeted to a specific user group on a specific market, but rather to a “universal” user who speaks different languages and use different formats and units. In earlier studies by Barber and Badre (1998), Evers (2001) and Choi et. al (2005) (described in the Theoretical Background) users in quite diverse national cultures were compared. The usability study performed in this thesis compared users in two quite similar national cultures. According to Hofstede (1997) Sweden and Estonia differ very little in both the power distance dimension and individualistic versus collectivistic dimension. They differ more in the masculinity and uncertainty avoidance (UA) dimension and the results from the usability tests only resulted in differences that could be referred to the UA dimension and the individualistic dimension.

Estonia was not long ago part of the Soviet Union, but since they left, the country has very rapidly adopted a western life-style and the young people are eager to travel and learn English. In fact one could argue that the cultural differences in the Nordic and Baltic countries are so small that they will not impact the user experience that much. Another interesting idea is that with increased globalization and accessibility to Internet, people on different geographical places, are to a higher degree connected. This means it is easier for people with similar interests or hobbies to connect across the national borders and form subcultures. In fact, in a near future a user belonging to the same sub culture might have more in common with a fellow member than two members of the same national culture. A key to success for global companies would then be finding methods to identify subcultures, what products and services they prefer and the characteristics of those. Other factors like age, earlier experience with similar products or
services, university education, work role etc. might already today have a bigger impact than
national culture\textsuperscript{14}.

Nevertheless, models like the \textit{strategic investigative model} proposed by Jagne \textit{et. al} provides useful
tools and methods when working user-oriented and targeting markets in other countries. The
model is best suited for new product development because it includes everything from market
research to implementation and evaluation of a product or service.

\textbf{Discussion of the results}

A possible weakness with the results from the interview study could be that the localization
process was only described from the viewpoint of the localization companies. Interviewing
software development companies could have resulted in a slightly different picture and other
localization problems. In order to entirely outline the current state of the localization industry in
the Nordic countries, it would have been desirable to talk to software developers and service
providers as well. The thesis also covered usability and user experience aspects of localization and
hence much of the available time and resources were dedicated to the usability tests. Therefore it
was not possible to perform more interviews and analyze the data from them.

A small, but not distinguishing difference in performance and preference was found between the
Swedish and the Estonian user group in the usability tests. The biggest differences were found in
task accuracy for the first task ‘Download and install’. 90 \% of the Estonians performed the task
without help and 62 \% of the Swedes. The Estonians also completed the two first tasks faster
and liked Agile Messenger more as well as found the service slightly more fun and exciting than
the Swedes.

The differences in performance and preference can not with certainty be explained with the
users’ national culture, the mobile phone they use or any other variable that was measured. Other
explanations for the results could be the circumstances around the test. The general impression
during the tests was that the Estonians felt more comfortable in the test situation. One possible
cause could be that the Swedish users felt uncomfortable speaking English since both them and
the researcher speak Swedish. Therefore the situation was constructed to a larger extent than with

\textsuperscript{14} Note that this claim concerns the Nordic and the Baltic countries. National cultural differences may have a
bigger impact on design when comparing for example the US, Japan and a European country.
the Estonian users, where there was not a choice to speak anything but English. If the Estonians were more relaxed it could have affected their performance.

There is also a possibility that cultural differences could have an impact on the users’ attitude to the test and the test leader. The Estonians could be more used to performing tasks in school without help, while the Swedes could be more used to having a dialogue with the teacher and therefore asked for help rather than continued trying when they got stuck. Some of the answers in the interview indicated that the Estonians participants were more comfortable performing tasks under pressure. Cultural differences when it comes to honesty and politeness could be another issue. The Estonians could have been more eager to please the test leader and put higher ratings for that reason.

A probable explanation for the high performance values (100 % task accuracy) for the three last tasks is that all participants use MSN Messenger in the computer often and regularly. Agile Messenger is largely influenced by MSN Messenger and is a mature and user-friendly application. Hence a logical conclusion is that knowledge of similar products and services influence the understanding of a new product or service. The fact that the users know how to use MSN Messenger seems to have a bigger influence than national culture in this case. Therefore earlier knowledge of products and services could be an important factor to consider when designing for a target user group regardless of their national culture.

**Discussion of method**

When performing scientific research one should always strive for as high reliability and validity as possible. This paragraph will discuss the reliability and validity of my studies and the consequences of alternative methods.

Reliability is the extent to which a procedure gives the same results over repeated observations under the same conditions each time. Validity measures if a certain question, in an interview for example, is measuring or describing what is intended to be measured. Reliability is a precondition for validity, but high reliability does not imply high validity (Bell 2000).
Reliability

The reliability in the interview study is difficult to measure since it is hard to control the circumstances around an interview. The use of a interview guide is one way of ensuring consistency (which gives higher reliability) and also helps if other researchers want to perform the same study with the same results.

The reliability in the usability tests was relatively high since it was a controlled test. The same procedure was followed for each subject (the same introduction text was read out and they were given the same instructions and so forth). It was more difficult to make sure that the two user groups were alike in terms of education and previous knowledge about MSN Messenger and mobile phones. However, the participants did study similar subjects (maths/data versus science) and the mean age in the two groups were very close.

Validity

The validity of an interview study depends on which questions are asked and how they are phrased. The purpose of the interview study was to outline how localization is performed in practice in the Nordic countries. “How localization is performed” was divided into sub headings that later became question areas in the interview guide. This way the researcher tried to nail the important aspects and not miss out on anything. At the same time the interview guide made the interview more flexible, since follow-up questions could be posed.

The purpose of the usability test was to measure the influence of national culture on usability and user experience when interacting with a Mobile IM service. The usability measures in the test were based on the ISO 9241-11 standard and are well-known within human-computer interaction and interaction design. Therefore the validity is likely to be high for the test part. In the questionnaire the users were asked to rate their experience, in order to measure three of the user experience goals. One could question why those three goals were measured and not others, but since the study was comparative they gave an indication of the two user groups’ preference.

Alternative methods

Alternative methods to the interview study could have been a focus group or a survey. A focus group would not have yielded higher reliability, since it is even more difficult to control the circumstances in a focus group than in an interview. A survey is easier to control (higher reliability), but it is even more difficult to ask the right questions in a survey, since there is no
possibility of adjusting the questions to the respondents’ answers or adjusting them along the way. The latter could result in lower validity. Furthermore a survey would not have given the right depth in the interview study and it would have been cumbersome to analyze the data.

Common usability evaluation methods, besides think-aloud user testing, are constructive interaction, diary, focus group, expert review, expert walkthrough, heuristic evaluation and heuristic walkthrough (Axup 2002). Constructive interaction is basically the same as think aloud user testing, but with two users collaborating when using the service instead of one. The disadvantage with constructive interaction is that more users are needed; the advantage is that it produces more verbal feedback. Diary is when users write down comments about their use in a diary in association with using the product. At best the diary is capturing the users’ thoughts when they are using the product in the right context. However, a large drawback is that the researcher has no control. For a comparative test it is therefore not a good alternative. For the same reason a focus group is not an alternative in this case. Since the study is empirical the rest of the evaluation methods, which include experts and not real users, are not considered.

An alternative to asking the users what they think about the test situation, directly in connection with the test, is to send questionnaires afterwards. That would probably have increased the researcher’s influence on the answers, but on the other hand decreased the answering frequency.
Recommendations

This chapter outlines the recommendations for TeliaSonera that follows from the results and conclusions of the thesis.

Towards a localization strategy

In the problem definition, the following question was asked; what measures have to be taken and which methods can be used in order to successfully adapt a specific product or a service to a specific market?

Before going into the details, some general measures have to be taken in order to implement a localization process at TeliaSonera. The first one is establishing a globalization strategy making it possible to provide all target markets in the TeliaSonera group with localized products and services. In accordance to localization industry practice, the final objective should be to make every end customer/user feel that the product is targeted for him/her. Components in a globalization strategy should include guidelines of the depth of localization in relation to the associated costs.

Localization companies in general have vast experiences of performing tests; some even perform cultural tests with users from the target market. TeliaSonera could benefit from their knowledge of experience with testing, but also make an adjustment of whether testing should be performed in-house or at the localization company. In cases when TeliaSonera has a local office at the target market with competence in the area, testing could be performed there. It is also important to provide the opportunity for the localization company to provide feedback about functional and non-functional design to TeliaSonera. TeliaSonera should also have resources to take care of the feedback and feed it back into the product development process.

It is crucial to plan for localization already when developing new products. If a product is hard to understand for the customers, it will make more damage than good on the market. It is cheaper to do right from the start. Therefore planning and preparing for localization before DP1 (Investigate and analyze the prerequisites) should be mandatory, even if it is not on the road map to launch the product globally at that moment. Delaying localization to the end of the process can delay the delivery date because of any unexpected localization problems that require code changes.
What should be done and when?

The following are estimates of when in TSS POD (TeliaSonera Sweden Project and Offering Development), the different actions should take place. Figure 11 outlines the process.

**DP0-DP1 Plan and prepare for localization.**

Go through the localization factors outlined below and decide which ones are relevant. Do the necessary research (interviews, questionnaires, focus groups, expert reviews, foraging study etc.) and gather relevant information from TeliaSonera internally, in order to address the factors. *The investigative strategic model* (outlined on page 23) provides useful guidelines regarding applicable methods and can be used as guidance throughout the whole localization process. Use Checklist 1. Document the results from the planning in the Design Plan.

**DP1-DP3 Include localization factors in the requirements specification and in the GUI guidelines**

Use the results from the planning and preparation of localization to decide to what extent localization is necessary and which localization factors are relevant. Write down localization related requirements and GUI guidelines and provide the suppliers with this information. Use Checklist 3.

**DP 3-DP4 Prototype test with users or representatives from the target culture**

When a prototype of the service or product is delivered from suppliers, run usability tests with end users from the target market if possible (task analysis, usability questionnaires, think aloud protocol, observational studies etc.). If this is not possible due to a tight schedule or too high costs, at least run an expert review or a heuristic evaluation with a representative from the target market. Use the feedback from the tests to adjust the product or service, an iterative process is desirable. Produce a working product/service. If the product/service will be launched globally, you might consider producing a pilot prototype and test it with representatives from only one of the markets at first.

![Diagram](image)

Figure 11. A general and simplified picture of the localization process from DP0 to DP4.
Factors to consider when designing user experiences in global product development

The list of factors below should be regarded as a starting point when working practically with localization from a usability point-of-view. The list should be constantly updated and revised with new knowledge from projects.

- **ICONS/SYMBOLS.** How are symbols and icons interpreted in the target country? Example: What does it mean to tick something? That you select an option/activate something or that you are done with a task? Alternatively, that you have done something wrong?

- **BENCHMARKING.** What are the key features, functionality and design of competing products/services? Can they be copied or even improved in your service? If the service at hand consists of a mobile interface, is there an original web interface or computer application which precedes the mobile one?

- **HABITS.** What habits does the target group have with similar services? Are their any real-life experiences or metaphors that can be applied to the service?

- **SOCIAL AND CULTURAL NORMS AND VALUES.** Use for example Hofstede’s cultural model in order to get a general picture of the target culture’s values (a comparison between the Nordic countries and Estonia is outlined on page 28).
  - Is the target culture highly individualistic? Do they want to be able to customize the service/product? Alternatively, is the culture collectivistic?
  - Is there a small or large power distance between people in the society?
  - Does the target culture have large differences between males and females? If so, is it appropriate with a service targeted for women/men or is a general solution preferable?
  - Does the target culture have a low or a high uncertainty avoidance index? Do they want many choices for options?

When you have characterized the target culture according to those dimensions, decide the implications for your product/service. The design attributes at page 19 suggested by Choi *et al.*, can guide you to an appropriate solution, especially for mobile phones.
• CULTURAL MARKERS AND ATTRACTORS. How do websites or mobile phone interfaces look like at the target market? Do they use specific colors, metaphors, trust signs, visuals or page layout? Interview cultural or usability experts from the target culture in order to find out.

• TEXT LENGTHS. The localization process often changes the GUI layout because the length of the translated text usually increases from its original length. Finnish for example often requires more characters than Swedish do. Make sure that the orderer, as well as the service/software/GUI supplier thinks of this already from the start.

• GRAPHICS. Avoid text in graphics and pictures. Also, avoid pictures that are geared towards a particular target market.

Microsoft provides an overview of localization and some useful guidelines that can be applied to software localization, but also to other products and services:

• http://www.microsoft.com/globaldev/getwr/steps/localization/loc_overview.mspx

Aaron Marcus’s and Emelie Gould’s guidelines for user interface design on the web can be helpful in order to understand the implications of different cultural characteristics:

• http://www.amanda.com/resources/hfweb2000/AMA_CultDim.pdf

Checklists

Checklist 1. Project management.

• Will the product or service be launched globally or locally from the start? If the project is global, TeliaSonera might consider developing a consistent solution for all markets (with or without different language versions) or a more targeted solution. The decision should be made according to the overall globalization strategy.

• Is localization considered when contracting a supplier of the service/product/software? (See Checklist 2)

• Is localization requirements included in the requirements specification? (See Checklist 3)

• Go through Checklist 4 before DP1 and make a decision of an appropriate supplier of localization services.

• Check that the supplier of localization services is provided with information about the context-of-use of the product/service and the limitations (for example screen size).
Checklist 2. Contracting service/product/software suppliers

- Make sure that the supplier is following the guidelines and industry practice regarding internationalization and localization. I.e. make sure that the service/product/software is prepared for localization, even if it is not on the roadmap to launch it globally.

Example of questions:
- How do you handle variables such as date, telephone numbers, currency, measurements etc.?
- Do you store formats, target units and GUI elements in separate resource files?
- Is the service/product/software internationalized, i.e. prepared for localization?

Checklist 3. Compiling requirements specification and GUI guidelines

- Typically, TeliaSonera contracts a supplier of the product/service who does the actual software design and coding. Sometimes the supplier also has graphical competence, but in approximately 50% of the cases, another supplier is contracted to make the GUI. In both cases, TeliaSonera provides the supplier with a requirements specification and a production package as well as GUI guidelines. Make sure that the output from ‘Planning and preparing for localization’ in the Design Plan is included when compiling the requirements specification and the GUI guidelines.

Checklist 4. Contracting suppliers of localization services

- Contract an ISO certificated localization company.
- Choose a localization company that has presence in or reliable partners on TeliaSonera’s target markets. It takes time to build a relationship with a supplier; therefore, it is an advantage if the company already has presence or partners on incipient markets.
- The choice of localization company should be based on product/service type and the languages the localization company provide. If the firm for example has earlier experience of mobile data service design, it could be wise to choose them. Since the screens are much smaller on mobiles, the design of mobile telephone interfaces provides special challenges in terms of text lengths for example.
Further research

Most of the earlier research in cross-cultural usability has been done with either websites or computer software. The thesis has investigated cultural influence on a mobile service, but further studies are needed with other services and target groups, as well as other cultural backgrounds. It would also be interesting to study the concept of subcultures and those members’ performance and preference with a web or a mobile interface.

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**Abbreviations**

**CLC** Customer Life Cycle. A process created by D&U to facilitate user-centred work.

**DP** Decision Point.

**D&U** the department of Design and Usability at TeliaSonera Sweden.

**EMT** Eesti Mobil Telekom.

**FSP** Focused Service Portfolio.


**GUI** Graphical User Interface.

**HCI** Human Computer Interaction.

**IDV** Individualism. Hofstede’s individualistic dimension that shows to what degree society emphasizes individual achievement or collective achievement.

**ILC** Infrastructure Life Cycle.

**I vs. C** Individualism versus Communitarism. Trompenaars and Hampden-Turner’s cultural value orientation that shows to what degree society emphasizes individual achievement or collective achievement. Very similar to Hofstede’s IDV.

**IM** Instant Messaging.

**KTH** Royal Institute of Technology.

**LISA** Localization Industry Standards Organization.

**MAS** Masculinity. Hofstede’s cultural dimension that shows to what degree the society does reinforce traditional masculine work roles, with control and power.

**Mobile IM** IM in the mobile phone.

**MSN** Refers to Microsoft Network Messenger.

**PDI** Power Distance Index. Hofstede’s cultural dimension which describes the degree of equality or inequality between people in the country’s society.

**PLC** Product Life Cycle.

**QR** Quality Review Council which is held every Thursday at TSS.

**TS PROMO** TeliaSonera Project Model.

**TSS** TeliaSonera Sweden.

**TSS POD** TeliaSonera Sweden Project and Offering Development.

**UAI** Uncertainty Avoidance Index. Hofstede’s cultural dimension which refers to the level of tolerance for uncertainty and ambiguity within the society, i.e. unstructured situations.
References

Books


Journal articles and reports


Websites


Interviews and workshops

Workshop with seven employees at Design & Usability. (060123), Products & Services, TeliaSonera Sweden.

Interview with Sofia Hansson. (051215), Project Manager, Ord&Stil, Sweden.

Interview with Mattias Johannesson. (051217), CEO, Localeyes Sverige AB, Sweden.

Interview with Timo Nurmiluoto. (051216), Localization Engineering Manager, Translation Services Noodi, Finland.
Interview with Thomas Deibjerg. (060111), Director of Business Development, T.L.T Documents, Denmark.

Interview with Jorunn Seim. (060112), Documentation Manager, Ink Norge, Norway.
Appendices

Appendix 1 Frågeguide - intervju angående kulturell lokalisering

Datum:
Tid:

Introduktion
Resultatet kommer att användas till mitt examensarbete inom lokalisering och som jag gör på KTH (och som är en offentlig handling). Syftet med intervjun är att få mer information om hur lokalanpassning görs i praktiken i Norden och i Baltikum. Det är också att ta reda på vilka problem man kan stöta på vid lokalanpassning till dessa länder och hur dessa brukar lösas praktiskt, samt vilka kulturella skillnader som upplevs. Fokus i mitt arbete ligger på kulturell lokalisering.

Går det bra att jag spelar in intervjun så att jag kan lyssna igenom den efteråt? (Endast jag kommer att lyssna på den). *Sätter på bandspelaren.*

Warm-up
Okej, då sätter vi igång. Jag kommer att börja med några korta bakgrundsfrågor.

Vilken bransch skulle du säga att ert företag jobbar inom?

Vilka typer av uppdrag får ni in?

Vilka produkter/tjänster brukar uppdragen gälla?

Hur många anställda är ni?

Main session

Process och arbetsmetodik
Hur skulle du definiera localization?

Kan du i stora drag beskriva hur lokaliseringsprocessen ser ut på ditt företag? (Från det att ni får in ett uppdrag till leverans).

På vilket sätt jobbar ni med lokalisering bortsett från ren översättning (kulturell lokalisering)?

Faktorer som påverkar lokalisering

Har du stött på några praktiska problem i arbetet med lokalisering? I så fall, vilka och vad var orsaken till att problemen uppstod?

Kan du nämna några förändringar ni genomfört av ett ursprungsmaterial i ett lokaliseringsprojekt utöver ren översättning?
Vilka är det viktigaste faktorerna som man måste ta hänsyn till när man gör en lokalanpassning, enligt dig?

Skillnader mellan länder

Har du upplevt några skillnader mellan de nordiska länderna i ditt arbete?
(Till exempel skillnader i beteendemönster, shoppingvanor, betalningsvanor, hur man letar efter information, sociala och kulturella normer, konventioner etc.)

Om du jämför de nordiska och baltiska länderna. Vilka skillnader har du upplevt som är relevanta för ditt arbete?

På vilket sätt tror du att detta påverkar ditt arbete med lokalisering?

Cool-off

Hur länge har du jobbat med lokalisering?
Ålder?

Man/Kvinna

Avslutning

Godkänner du namnpublcering i uppsatsen?
Appendix 2 Questions about localization in the Nordic and Baltic countries

Date:
Time:

Introduction
The result of this interview will be used in my master thesis in localization, which I am currently performing at the Royal Institute of Technology (KTH) in Stockholm (the thesis is a public document). The purpose of the interview is to collect information about how localization in general and cultural localization in particular is performed in the Nordic and Baltic countries. The objective is also to identify the problems arising when localizing to those countries and how those problems are solved in practice.

Is it alright with you that I am recording this interview? (I am the only one with access to the tape). *Turning on the tape recorder.*

Warm-up
I will start with some background information.

What industry would you say you are working in?

What kinds of projects (commissions) does your firm normally work with?

What kind of products and services are the commissions normally about?

How many employees are you at the firm?

Main session

Work methodology

How would you define localization?
Please outline the localization process at your firm in general terms? (From commission to delivery).

In what way do you work with localization disregarded pure translation?

Factors influencing localization

Have you encountered any practical problems in your work with localization? If that is the case, what kind of problems and what is the cause?

Can you mention any changes you have made in a localization project in addition to translation?

What are the most important factors that one has to take into consideration when localizing, according to you?

Differences between countries

What differences between the Nordic countries have you experienced that influence your work?

Please compare all the Nordic and the Baltic countries. What differences have you experienced that is relevant to your work?

In what way do you think those differences influence your work with localization?

Cool-off

For how long have you been working with localization?

How old are you?

Male/female

That was all! Thank you for participating, it has been a great help. Do you wish to read my report when it’s finished?
Do you wish to be anonymous?
Appendix 3 Questionnaire 1 – questions about mobile, Internet and MSN use

1. Age ________ Female □ Male □

2. How do you pay for using your mobile?
   a subscription (pay per month) □ or a refill card □ Something else □ What? ____________

3. What kind of mobile phone do you have?
   Nokia □ Sony Ericsson □ Siemens □ Samsung □ Motorola □ Other ____________
   Model: ________ (example: 6230i)

4. How often are you *logged in* on MSN in the computer?

   Never □ less than 2 days/week □ 3-4 days/week □ 5-6 days/week □ All the time □

5. Do you use Internet every day?

   Yes □ No □ If No. How many days a week? ______

6. How often are you online? ____________________________

7. How often do you do the following one or several times during the day *with the mobile phone*?

   a. Take pictures with the mobile
   Never □ A few times a month □ > 2 days/week □ 3-5 days/week □ More often □

   b. Send pictures with the mobile
   Never □ A few times a month □ > 2 days/week □ 3-5 days/week □ More often □

   c. Listen to music or watch videos in the mobile
   Never □ A few times a month □ > 2 days/week □ 3-5 days/week □ More often □
d. Download music or videos with the mobile
Never □ A few times a month □ > 2 days/week □ 3-5 days/week □ More often □

e. Download ring tones with the mobile
Never □ A few times a month □ > 2 days/week □ 3-5 days/week □ More often □

f. Download mobile games
Never □ A few times a month □ > 2 days/week □ 3-5 days/week □ More often □

g. Play preinstalled mobile games
Never □ A few times a month □ > 2 days/week □ 3-5 days/week □ More often □

b. Surf with WAP (Look for news, sport, maps etc.)
Never □ A few times a month □ > 2 days/week □ 3-5 days/week □ More often □

8. Around how many SMS do you send every month? _________
Appendix 4 Questionnaire 2 – evaluation of Agile Messenger

1. How do you think it was to use Agile Messenger?

Very unsatisfying 1 □ 2 □ 3 □ 4 □ 5 □ Very satisfying

Very boring 1 □ 2 □ 3 □ 4 □ 5 □ Very fun/exciting

I disliked Agile Messenger very much 1 □ 2 □ 3 □ 4 □ 5 □ I liked Agile Messenger very much

Comments: ____________________________________________________________

_________________________________________________________________

_________________________________________________________________

2. Do you want Agile Messenger in your mobile phone?

Yes □ No □ Don’t know □

3. Would you consider paying for downloading Agile Messenger?

Yes □ No □ Don’t know □

4. How would you prefer to pay for Agile Messenger? Choose one of the options and then write how much you would pay.

Fixed fee per month (unlimited amount of chat messages) □ _____ /month

Fixed fee per day (unlimited amount of chat messages) □ _____ /day

For the messages you have sent □ _____ /message

Other suggestion □ ________________________________ _____ /_____ 

5. Mention two things that were good with Agile Messenger.

1. ____________________________________________________________
6. Mention two things that were bad with Agile Messenger.
1. ________________________________________________________________
2. ________________________________________________________________

7. Was it anything you wanted to do that was not possible in Agile Messenger?
Yes □ Please describe:
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

No □           Don’t know □
Appendix 5 Introduction to usability tests

First I will present myself and the rules for the evaluation. The whole session here today will be in English. The reason for that is I am running similar tests in both Sweden and Estonia. Is that okay with you?

My name is Jenny Sundén and I am studying the last year at Media Technology at the royal institute of technology in Stockholm. Since November I have been doing my master thesis for the Finnish Swedish telecommunications company TeliaSonera and for Estonian EMT. This evaluation is part of that work.

You are chosen for this test because you are a user of MSN Messenger in the computer. The purpose with the evaluation is to find out how easy a certain Mobile Messenger service is to use. It is not me, nor anyone at TeliaSonera or EMT who made the service. What I want to find out is how it works and what you think about the service. There is no right or wrong answers, but I would like to know your honest opinion. You will be completely anonymous in the study. You can interrupt the evaluation at any time if you want. Some of the tasks can be tricky, since this phone is probably new to you and since the service is quite new. I would like you to try your best to fulfil the tasks, but if you get stuck I will help you out.

First I will ask you to download and install a service called Agile Messenger. It is very similar to MSN Messenger, but developed for the mobile phone. You will use this Nokia phone. After the installation you will be able to log in with your regular MSN username and password. You will get a piece of paper with some instructions. Do you have any questions so far?

After logging in you will have the opportunity to test the service freely for a while. You can chat with your friends or do anything you like with the service. After that I will ask you to perform a few simple tasks. Finally, I will give you two questionnaires to fill in.

You see that video camera there? I will video tape the mobile’s display during the whole session. Therefore you have to hold the mobile within the square on the table. Another important thing I would like you to help me with is to think aloud and tell me where you are in the interface. It might seem a bit odd to speak out loud what you think, but it would really help me a lot in my work. I will show you an example…
“I press the menu button. Hmm, here are a lot of symbols. I press Gallery. Hmm, Images, Video clips, Tracks… I chose Images. I am scrolling the list. I couldn’t find the image I was looking for. I press Back to go back. Then I press Exit. And Exit again to come back to the start”. I will also show you the most common buttons on the phone. Describes the menu button, the navigation button, the C button to delete text, the soft keys, the button for changing input mode (T9 or “normal mode”?), the space button and the button that makes signs like @ and question mark.

Okay now we are almost ready to start! Do you have any questions before we start?
I will sit in the background and take notes.

Just tell me when you are ready to start. Remember to think aloud all the time.
Appendix 6 Task list and descriptions of tasks

Table 9. Task components and description.

<table>
<thead>
<tr>
<th>Task component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Task 1</strong></td>
<td>Download and install Agile Messenger with WAP</td>
</tr>
<tr>
<td>State of mobile phone</td>
<td>Configured for GPRS. No IM service installed.</td>
</tr>
<tr>
<td>Successful completion criteria</td>
<td>The screen shows &quot;Installation complete&quot;.</td>
</tr>
<tr>
<td>Measure</td>
<td>Task accuracy (succeed/ not succeed) and task timing</td>
</tr>
<tr>
<td><strong>Task 2</strong></td>
<td>Open and log in to Agile Messenger</td>
</tr>
<tr>
<td>State of mobile phone</td>
<td>Configured for GPRS with correct access points in place. Agile Messenger installed.</td>
</tr>
<tr>
<td>Successful completion criteria</td>
<td>The participant’s contacts show in the display.</td>
</tr>
<tr>
<td>Measure</td>
<td>Task accuracy (succeed/ not succeed) and task timing</td>
</tr>
<tr>
<td><strong>About 5 minutes tryout period</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Task 3</strong></td>
<td>Add a new contact (test leader)</td>
</tr>
<tr>
<td>State of mobile phone</td>
<td>Configured for GPRS. Agile Messenger installed.</td>
</tr>
<tr>
<td>Successful completion criteria</td>
<td>When the participant’s contact list appear on the test leader’s computer screen.</td>
</tr>
<tr>
<td>Measure</td>
<td>Task accuracy and task efficiency (the ratio between the number of steps needed to the complete task compared to minimum number of steps).</td>
</tr>
<tr>
<td><strong>Task 4</strong></td>
<td>Send a message to test leader</td>
</tr>
<tr>
<td>State of mobile phone</td>
<td>Configured for GPRS. Agile Messenger installed.</td>
</tr>
<tr>
<td>Successful completion criteria</td>
<td>When the test leader receives the correct message.</td>
</tr>
<tr>
<td>Measure</td>
<td>Task accuracy and task efficiency (the ratio between the number of steps needed to the complete task compared to minimum number of steps).</td>
</tr>
<tr>
<td><strong>Task 5</strong></td>
<td>Send a message to person on contact list</td>
</tr>
<tr>
<td>State of mobile phone</td>
<td>Configured for GPRS. Agile Messenger installed.</td>
</tr>
<tr>
<td>Successful completion criteria</td>
<td>Correct message appears in the mobile’s display.</td>
</tr>
<tr>
<td>Measure</td>
<td>None</td>
</tr>
<tr>
<td><strong>Task 6</strong></td>
<td>Send a message to the test leader</td>
</tr>
<tr>
<td>State of mobile phone</td>
<td>Configured for GPRS. Agile Messenger installed.</td>
</tr>
<tr>
<td>Successful completion criteria</td>
<td>The test monitor receives the correct message.</td>
</tr>
<tr>
<td>criteria</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>-----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Measure</td>
<td>Task accuracy and task efficiency (the ratio between the number of steps needed to</td>
</tr>
<tr>
<td></td>
<td>the complete task compared to minimum number of steps).</td>
</tr>
</tbody>
</table>

Explanation of notions in table 9:

**Task**  
a set of actions to achieve a goal

**State of mobile phone**  
how the mobile was configured before every particular task

**Successful completion criteria**  
state of mobile when task completed

**Measure**  
what is measured for every task

**Test leader**  
the researcher (me)

**Succeed**  
the participant manages to fulfill task without any help from the test leader

**Number of steps**  
Number of different screens that shows in the display of the mobile before the task was completed
Appendix 7 Instructions for evaluation of Agile Messenger

Part 1. Get started with Agile Messenger

Download and installation

1. Press the menu button on the keyboard of the mobile in order to see the menu.
2. Download Agile Messenger at wap.agilemobile.com
3. Choose the link Nokia 6600, 7610, 6260, 6620
4. Install Agile Messenger.

Login

5. Open Agile Messenger.
6. Select Access Point “Telia SurfPort”
7. Log in with your regular MSN username and password (the same one that you use on the computer). OBS! Agile Messenger for this mobile is quite new, therefore it might take a while to connect (up to 5 minutes sometimes). Meanwhile you can fill in a questionnaire about your mobile phone use.

Get to know Agile Messenger

8. Now you have time to get to know Agile Messenger. Use the time to browse the menus and the options. You can send messages to your contacts or do whatever you like with the service.

Part 2. Common tasks

9. Close your ongoing chat/chats.
   Add a contact
10. Add me (Jenny) to your contact list. My email is testofmobilemsn@hotmail.com.

Change writing language

11. Press the menu button again. Go down with the arrow and choose Tools > Settings > Phone > General > Change Writing Language to English.

Go back to Agile Messenger

12. Press the menu button and hold it for about 1 second. Choose Agile Messenger from the list.
Send a message

13. Send a message to Jenny that says ”How are you back there?”.
14. Send a message to one of your own contacts (it does not matter who) that says ”Hi I am testing Agile Messenger”.

Switch to another chat

15. Send another message to Jenny that says “This is my last task”.

Now you are done with the testing part of the evaluation.
Excellent work!
Appendix 8 Performance scores from the usability tests

Task 1: Download and install Agile Messenger
Swedish user group

- 38% Successful completion of task
- 62% Unsuccessful completion of task

Estonian user group

- 10% Successful completion of task
- 90% Unsuccessful completion of task

Figure 12. Performance scores for task 1.

Task 2: Open and log in to Agile Messenger
Swedish user group

- 44% Successful completion of task
- 56% Unsuccessful completion of task

Estonian user group

- 56% Successful completion of task
- 44% Unsuccessful completion of task

Figure 13. Performance scores for task 2.

Task 3-5
Figure 14. Performance scores for task 3-5.