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INFLUENCE OF CULTURAL DIFFERENCE ON MOBILE USER EXPERIENCE

A Case Study of the Nokia Phone in Japanese Mobile Culture

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This thesis studies how the cultural difference influences the mobile user experience. The study takes the form of the case study of the Nokia phone in Japanese mobile culture. The theoretical part of the study familiarizes with the concept of culture, as well as cultural dimensions, and summarizes the cultural difference between Japan and Finland using cultural dimensions. The empirical part of the study conducts field study including interviews and field observations in order to collect the contextual data, and represents users in both cultures in the form of personas. Short and long usability tests with Japanese users as well as longitudinal individual observation are conducted using the Nokia phone, and issues found during this phase are culturally analyzed using the cultural difference data retrieved from the theoretical and empirical part of the study. As a result, it was found that not only the influence of the cultural differences represented in the cultural dimensions, but also the influence of the differences in the use context is significant.

Asiasanat – Keywords

Cross-culture, cultural difference, mobile, user experience, cultural dimensions, persona

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Tiivistelmä – Abstract

Tämä tutkimus selvittää miten kulttuurierot vaikuttavat mobiilikäyttökokemukseen. Tutkimus käyttää malliesimerkkinä Nokian matkapuhelinta Japanin mobiilikulttuurissa. Tutkimuksen teoreettinen osa perehdyttää sekä kulttuurin käsitteeseen että kulttuurin eri ilmenemismuotoihin, ja tiivistää kulttuurieroja Japanin ja Suomen välillä kulttuurin eri ilmenemismuodoissa. Empiirinen osa tutkimuksesta sisältää haastatteluista ja kenttähavainnoista koostuvan kenttätutkimuksen, kerätäkseen kontekstuaalista tietoa, ja esittää käyttäjät molempia kulttuureja edustavina persoonina. Pitkät ja lyhyet käytettävyystestit japanilaisten koehenkilöiden kanssa, sekä henkilökohtaiset pitkittäishavainnot on tehty Nokian puhelimella, ja tässä vaiheessa löydetyt ongelmat on analysoitu käyttäen teoreettisesta ja empiirisestä tutkimuksen osasta saatuja kulttuuristen eroavaisuuksien tietoja. Tuloksena, ei pelkästään kulttuurin ilmenemismuodoissa esintyvien kulttuuristen eroavaisuuksien vaikutus, vaan myös käyttökontekstin eroavaisuudet on havaittu merkityksellisiksi.

Asiasanat – Keywords
Monikulttuurinen, kulttuuriero, mobiili, käyttökokemus, kulttuurin ilmenemismuodot, persoona

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CONTENTS

1 INTRODUCTION

The goal of this study is to understand how the cultural difference influences mobile user experience. Focusing on the difference between Finnish and Japanese culture in a case study, user experience is examined considering the cultural dimension as well as the use context.

1.1 Background

The mobile phone is strongly connected to our everyday life. This small device is located close to us almost all the time, and if it is not found nearby, we start thinking about it. According to recent research, the mobile phone is one of the mobile essentials (MEs) which people take with when they leave home regardless of gender or culture. This would mean that from the moment we wake up and until when we go to sleep, or even while we are asleep, the mobile phone is with us and we have possibilities to interact with it (Chipchase, Persson, Piippo, Aarras, & Yamamoto, 2005). Although mobile phones are used in many aspects of everyday life across cultures, people in different cultures have different context of use, and this affects the user experience. In their book *Mobile User Experience*, Hiltunen, Laukka and Luomala (2002) indicate "…elements of use context have a substantial effect on how we explore, perceive and interpret our perceptions of the service" (p22). Also, considering the use context is even more important in user experience of the mobile phone than the one of PC software, because there is a wider variety in mobile use contexts than desktop context (Hiltunen et al., 2002 p. 21).

In FIGURE 1, Hiltunen et al. illustrates how the perspectives of use context (The user, the task, physical environment, technical aspects and social settings) can generate the

expectation for the service, which will then influence the way we explore the service and how we perceive it, then what kind of future expectation is created in our mental model.

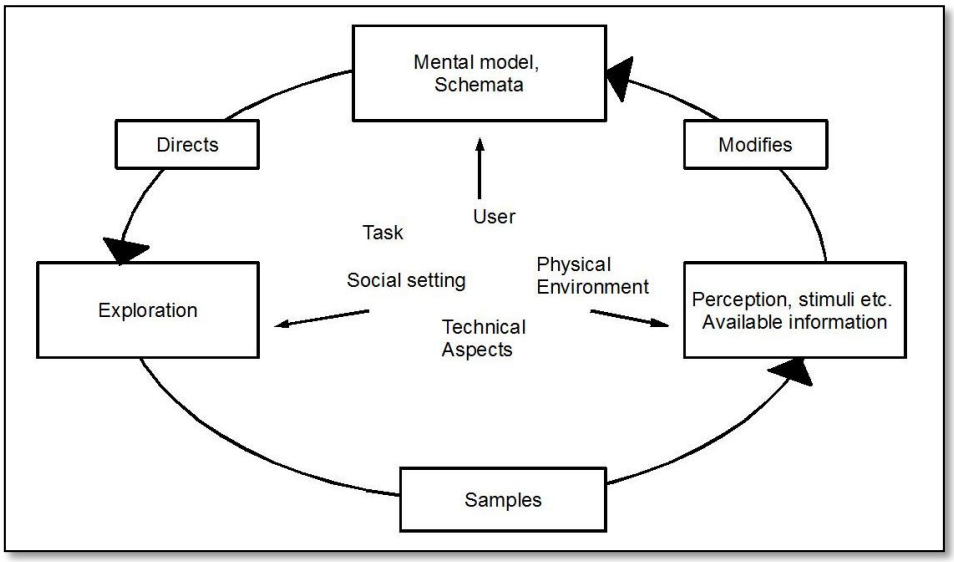

FIGURE 1. Use context and the formation of user experience (Hiltunen et al., 2002, 22)

Motivation for this study originally came from personal interest. My interest on this topic started in 2005 when I moved to Finland and began using my first Nokia phone. Although the texts in user interface were fully translated to Japanese, I had a strong impression towards the phone somehow making me feel alienated. Even though I had experience in switching the mobile phones several times across the manufacturers and considered myself quite equipped with the skill to figure out quickly how the new mobile phone works, Nokia was the exception and it took quite some time until I started feeling comfortable using it. Now I have been living in Finland for more than 4 years and I can manage the Nokia phone, but my strong impression toward the Nokia phone remains in my mind and I start to wonder what kind of user experience Nokia phone is providing to the Japanese users.

In November 2008, Nokia has decided to terminate the sales and marketing of their mobile devices in the Japanese market, except for the luxurious product line named Vertu, which is targeted exclusively for the special market segment. The reason for Nokia leaving the Japanese market, as Nokia executive vice president Timo Ihamuotila puts it, is "In the current global economic climate, we have concluded that the continuation of our investment in Japan-specific localized products is no longer sustainable" (Izumi, 2008). Along with the fact that foreign mobile manufacturers share only the 5% of the market share in Japanese market (Ibid), it clearly indicates that there is a big challenge for the non-Japanese mobile companies to survive in Japan, and this would justify the worth of investigating the topic of this study.

Technical background also motivates the topic of this study. 2G network system standards were different in Japan (PDC[1]) and Europe/ USA (GSM[2]). This means there was no interoperability between European/ American mobiles and Japanese networks. Although some non-Japanese mobile vendors were providing mobile phones to the Japanese users, even during the time when only 2G network was in use, non-Japanese mobile vendors actively started to enter the Japanese market after 3G network[3] was standardized after 2002. Considering that the mobile phones have been commonly used since the mid-1990s, non-Japanese mobile manufacturers who came after 3G network standardization could somehow be latecomers to the established market. It is possible that during the seclusion years when non-interoperable 2G network was in

[1] PDC: Personal Digital Cellular which was developed and used in Japan. It has no interoperability with GSM (Yamaguchi et al., 1995).
[2] GSM: Global System for Mobile Communications, which was originally introduced in Europe and has been in use in the USA since 1995 (GSM Association).
[3] 3G network: Third generation of telecommunication standard. It is a global standard established by International Telecommunication Union (International Telecommunication Union, 2003).

use, Japan might have established a unique mobile culture, which is different from the one in Europe or USA. When the non-Japanese mobile phone is used in such environment, unique usage culture might also influence the user-experience.

1.2 Previous Studies

Several studies have been done on the related topics considering web pages or desktop software. In their article, “Impact of Culture on User Interface”, Masao Ito and Kumiyo Nakakoji (1996) compared Japanese culture with North American culture and argue how the cultural differences such as social norms and language differences may influence both the listening mode and the speaking mode of user-computer interactions. In ”Cross-Cultural User-Experience Design” (2006), using the example of the web pages, Aaron Marcus suggests user experience design attributes consequently to Geert Hofstede’s cultural dimension, which is one of the most well known theory to distinguish the cultural differences also discussed in the section 3 of this study.

However, little research has been done on the relation of the cultural influence on mobile user experience, dealing with Japanese culture. In “Culturability in Mobile Data Services: A Qualitative Study of the Relationship Between Cultural Characteristics and User-Experience Attributes”, Choi, Lee and Kim (2006) have conducted interviews with participants from Korea, Japan and Finland about the mobile data services of these three countries. From the interviews, preferences and disfavors of mobile data service’s graphical user interface (GUI) characteristics, information architecture and content are analyzed according to the nationality of the participants. Results showed that there are correlations between the analysis outcome

and cultural traits defined in the cultural dimensions. Cui, Chipchase and Ichikawa (2007) have conducted extensive street interviews on phone carrying behavior and physical personalization in 11 cities for the article “A Cross Culture Study on Phone Carrying and Physical Personalization” and found that there is a tendency in choosing phone carrying option depending on the culture. Also, some cultures like to customize the phone while others do not like to customize their phones. They mention that Hofstede’s cultural dimension theory can be explaining the reason.

The above research has focused only on the limited aspect of the mobile phone. Also, little attention has been paid on the use context, although as already described in previously, different cultures have different use context, and the use context significantly influences the user experience, especially in the case of the mobile phone. This study will contemplate use context as cultural characteristics as well as the cultural traits in the theories of cultural dimensions.

1.3 Structure of the Research

This study consists of six parts. Section 2 and 3 are based on literature review on concepts, and later sections use these concepts as background theory. Section 2 deals with the concept of the usability and the user experience. Elements of the user experience, as well as the importance of studying the user experience in relation to the cultural difference are discussed here. In the end of this section, definition of the user experience in this study is determined. Section 3 investigates the theories of culture studied by the anthropologists. Definitions of culture, as well as cultural dimensions are reviewed. In section 4, the research method is explained. It explains what kinds of methods have been used in order to know the user’s goals, to measure

the establishment of the goals and in analyzing from the aspect of cultural difference. Section 5 provides the findings from the research. For each finding, analysis is followed in order to see how the cultural difference is influenced. Research ends with conclusion in section 6.

2 USABILITY AND USER EXPERIENCE

Originally, the title of study contained the term *usability*, not *user experience*. However, it was suggested by a researcher that the term usability may be changed to user experience. The reason is that the research topic is more than just about usability of the devices because it concerns also usage cultures, emotional interaction etc. At the same time, it was mentioned that good usability is one major part of positive user experience according to that researcher's opinion (T. Kujala, personal communication, April 29, 2008).

In order to understand why user experience is more appropriate than usability, it is necessary to understand the concept of usability. Section 2.1 discusses the concept of usability and section 2.2 will review the idea of user experience. Section 2.3 argues the importance of choosing the scope of user experience rather than usability. Also, the definition of the user experience in this study will be explained.

2.1 Usability

When we hear the term usability, one would probably think of the system's ease of use. The term *usability* comes from the verb *use* meaning "to put into service or action; employ for a given purpose" and the suffixes *-able* referring to "capable of, suitable for, or deserving of (being acted upon as indicated)" and *–ty* indicating "suffix forming nouns indicating state, condition, or quality" (MOT Collins English Dictionary, 2007). Considering the above definitions, literal meaning of the term usability would be *the quality of capability in employing for a given purpose*. It sounds quite simple and familiar to us but at the same time vague and may bring different interpretations. In the field of research, there have been several definitions

for usability. Among them, the best known definitions are probably Jacob Nielsen's and one of ISO 9241-11.

2.1.1 Nielsen – part of the usefulness, excluding the utility

Nielsen's book, *Usability Engineering* (1993) is a classic which may often be referenced in academic research. Although no descriptive definition is written, Nielsen defines usability as one of the attributes under *usefulness*, consisting of five attributes as follows (Ibid, 26-37).

- Learnability indicates how easy user can learn the system enough to operate when the system is used for the first time
- Efficiency refers to the level of productivity the user can obtain from the system once the operation of the system is learned
- Memorability is how much the user can remember about the system while he or she is not using it. The system with good memorability does not require the user to go through the learning process even after certain period of time of non use.
- Errors are defined as "any action that does not accomplish the desired goal". The system should have a low error rate. Error rate is measured by counting how many errors users make while completing the certain task.
- Satisfaction is the user's subjective attitude toward the system. This simply asked the users to rate their attitude about the system by a scale. The average is generated from the samples for objectivity

Figure 2 shows the overall picture of the system acceptability, in which usability exists as a part. Notice that another attribute under usefulness is *utility*. In Nielsen's definition of usability, utility is not part of usability. Nielsen says "where utility is the

question of whether the functionality of the system in principle can do what is needed, and usability is the question of how well users can use that functionality" (1993, 25). What he says is that even if the system has good functionality or content (utility), it does not make the use of system (usability) easier to the user, although the functionality or content would add the value (usefulness) to the system. Also, even if the system has bad usability, users might use it if the system has high utility. Likewise, even if the system has excellent usability, if it has low utility and the system does not provide any useful functionality or content, system has low usefulness.

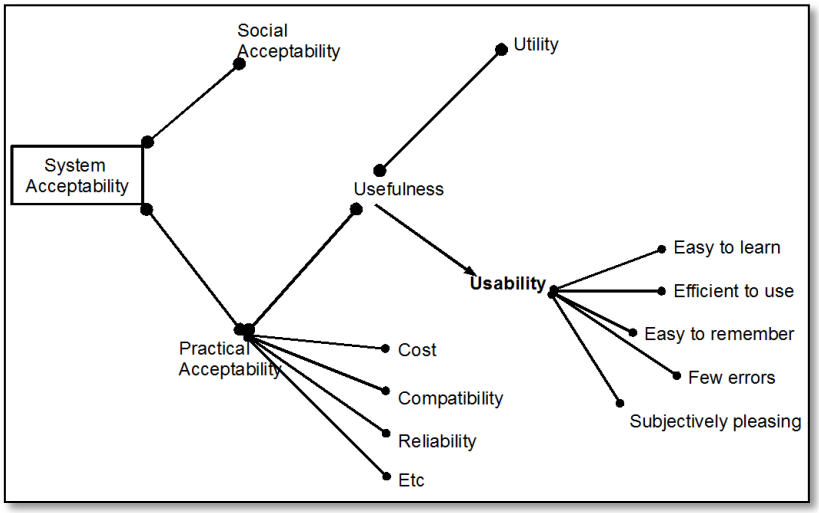

FIGURE 2. System acceptability model (Nielsen 1993, 25)

2.1.2 ISO 9241-11 – effectiveness, efficiency and satisfaction

In 1998, International Organization for Standard has published "Guidance on usability as part 11 of ISO 9241-11: Ergonomic requirements for office work" with visual display terminals (VDTs). According to this guidance, 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" (Jokela, Iivari, Matero, & Karukka, 2003, p. 54). As we can see, usability in this definition consists of three attributes: effectiveness, efficiency and satisfaction. ISO 9241-11 defines these attributes as follows:

- Effectiveness: the accuracy and completeness with which users achieve specified goals
- Efficiency: the resources expended in relation to the accuracy and completeness with which users achieve goals
- Satisfaction: freedom from discomfort, and positive attitude to the use of the product

  (Iivari, et al., 2003, p54)

As the descriptive definition says, ISO 9241-11 definition for usability centers the goal completion. As the measurement attributes are accuracy, completeness and the resources expanded in relation to them, the goal mentioned in this definition likely to be the pragmatic goals such as information searching, calculating the figures or getting document done. For example, effectiveness may be measured by testing how many errors user has made in searching the specified information. Efficiency may be measured with time in calculating the figures, or getting the specified document done. Satisfaction may be asked from the users in regards to their subjective opinion toward the tool in terms of achieving these goals. As Timo Jokela (2005) argues, concept of satisfaction is vague, since it can be taken as a function of effectiveness and efficiency or may be taken outside of these attributes. However, satisfaction is mostly measured based on the results of effectiveness and efficiency. If the effectiveness and efficiency level is high, users are assumed to be satisfied (Bevan, 2008). In other words, ISO 9241-11 usability is considered so that it does not include the factors beyond pragmatic goal completion. Things such as emotional aspect or sense of aesthetics, which may not directly affect the effectiveness or the efficiency in completing the pragmatic goals, are not considered as the usability attributes of this definition. This

would be because, as the title indicates, ISO 9241-11 is meant for office work with visual display terminals (VDTs).

2.2 User experience

User experience (UX) is a buzzword which definition has been discussed in several articles and studies. It is said that the term is coined by a cognitive scientist, Donald Norman in the 1990s. In an interview with Richard Anderson, Norman answered as follows when he was asked about the role of the term:

> I believe that what's really important to the people who use our products is much more than whether I can use something, whether I can actually click on the right icon, whether I can call up the right command... What's important is the entire experience, from when I first hear about the product to purchasing it, to opening the box, to getting it running, to getting service, to maintaining it, to upgrading it. Everything matters: industrial design, graphics design, instructional design, all the usability, the behavioral design... so, I coined the term "user experience" some time ago to try to capture all these aspects (Anderson, 2000, p. 44).

If you compare this definition to the Nielsen's definition, it seems user experience seems closer to system acceptability. But are they the same? Or is there something more in user experience? If so, what is it? In order to have better understanding on user experience, this section will first look at Norman's definition of user experience, and move on to the others.

2.2.1 Norman – all aspects of the end user’s interaction

According to the web site of Nielsen Norman Group, which Norman has co-founded with Nielsen, the definition of user experience is as follows:

> "User experience" encompasses all aspects of the end-user's interaction with the company, its services, and its products. The first requirement for an exemplary user experience is to meet the exact needs of the customer, without fuss or bother. Next comes simplicity and elegance that produce products that are a joy to own, a joy to use. True user experience goes far beyond giving customers what they say they want, or providing checklist features. In order to achieve high-quality user experience in a company's offerings there must be a seamless merging of the services of multiple disciplines, including engineering, marketing, graphical and industrial design, and interface design.
>
> (Nielsen Norman Group, n.d.)

Looking at this definition, one can notice that there are some attributes which were not included in the Nielsen’s or ISO 9241-11’s usability. The first notion which makes difference is “simplicity and elegance”: aesthetic attribute. In some usability tests, visual elements such as icons and graphics are also tested. However, the purpose is to measure the efficiency and effectiveness objectively (e.g. measure the time until the user can click on the right icon in search of certain functionality, or compare the number of mistakes in graphic based interface or text based interface in completing the same task), and not to understand whether they create positive emotion in user’s mind. “Joy to own” indicates that the concept of user experience covers also the moment when the user is not trying to accomplish the tasks. As Turkka Keinonen

(1998) argues, the main concept of usability regards the system as a tool. Therefore, good usability means free from defect while using it as a tool. Hence, concept of usability does not consider the aspect of owning the system. “Joy to use” is related to the system use but refers to an emotional aspect. Nielsen’s and ISO 9241-11’s usability definitions both include satisfaction as an attribute. However satisfaction in this case is not the same as emotion. Satisfaction in this case is measured or understood through other usability attributes such as efficiency and effectiveness. If the system has high level of efficiency and effectiveness, it is considered that the satisfaction level increases accordingly. Therefore satisfaction in this case is pragmatic. In contrast, emotion such as joy is beyond pragmatic, which adds extra value on top of the satisfaction. The last sentence of the definition of user experience implies that what happens outside of the system also matters. This part is also not covered with the definitions of usability, except that Nielsen (1993) mentions that approachability is one of the sub-factors under satisfaction. For example, some of the users may not want to start using the system if the manual is too thick (p. 34). However, the area covered with user experience regarding the facts outside the system use is in a way broader than the one covered with approachability.

2.2.2 Preece et al. – optimizer for the usability

Preece, Rogers and Sharp (2002) argues that, in order to develop the interactive products that are satisfying and enjoyable from the user’s perspective, a concept of *interaction design* is needed. They take the example of the work done by the architect, when designing a new building. For example when planning a new apartment building, the architect is concerned about how people are living, how they are interacting with other people, and what they are doing in the apartments. At the same time, civil

engineer is concerned about practical issues such as durability, fire regulations and construction methods. Preece et al. suggests that practical work done by the civil engineer is similar to the work done by software engineering. The aims of the architect are similar to what the concept of interaction design is aiming for (p. 6). Hence, the area concerned by interaction design is not limited inside of the system use, but also outside of the system use. This is the same as what Norman defined in user experience.

According to Preece et al., interaction design goals are separated into two categories: *usability goals* and *user experience goals.* They explain that usability goals are objective which are about how useful and productive system is. Whereas user experience goals are subjective and they are "concerned with creating systems that enhance the user experience in terms of making it enjoyable, fun, helpful, motivating, and pleasurable" (p. 30). They suggest that usability goals include: effective to use (effectiveness); efficient to use (efficiency); safe to use (safety); have good utility (utility); easy to learn (learnability) and easy to remember how to use (memorability) (p. 14). As for user experience goals, they suggest that the design of the system should concern: satisfaction, enjoyment, fun, entertainment, helpfulness, motivation, aesthetically pleasing, supportive of creativity, rewarding and emotionally fulfilling (p. 18). Figure 3 illustrate the interaction design goals. Usability goals center the whole design goals and user experience goals work as optimizer.

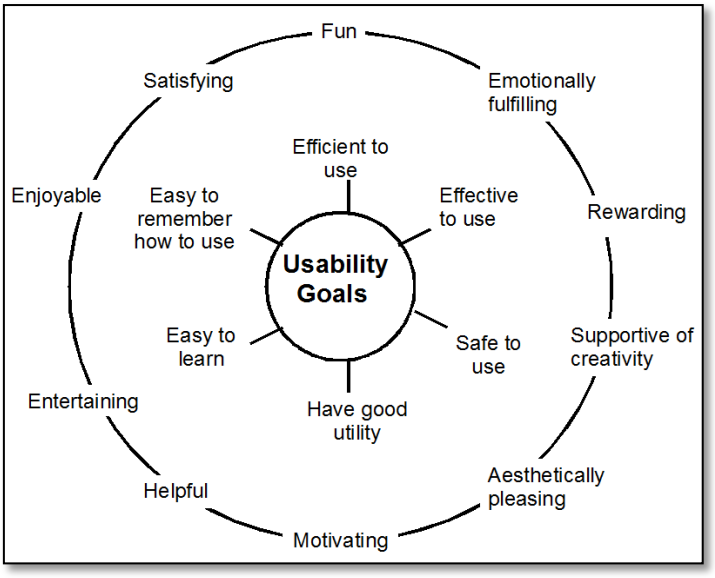

FIGURE 3. Usability and user experience goals (Preece et al., 2002, p. 19)

2.2.3 Hiltunen et al – everything the user experiences

In their book, *Mobile User Experience*, Hiltunen et al. (2002) describe user experience as below:

User experience (UX) = *Utility* x *Usability* x *Availability* x *Aesthetics* x *Offline issues*

They indicate that the relationship between these elements is "multiplication equation, since none of them can be fully compensated by the others" (p. 13). They separated utility from usability like Nielsen's definition referring to the value of the service which the user finds useful. For usability, ISO 9241-11 is referred to, and defined it in the same manner: "how easy and effectively the user can use the functionality of the system" (p. 16). Availability may be an element which is optimized in consideration of mobile service. This is because, even if the mobile service itself provides efficiency and effectiveness in their design, if the service itself is not available to the user, the user would not be able to see the value in it. This element concerns not only the structure of the mobile service which is being developed, but also other factors such

as server and network connections. In most cases, the mobile service provider is not in the position of being able to control the network availability. Hence, it is important that the design of the service takes into account the network un-availability. By aesthetics, not only the visual aspect, but also the auditory aspect such as voice quality as well as the somatic aspect are concerned in this definition. Aspects which can produce emotional feelings are included in this element. Off-line issues cover the aspects outside of the use of the service. Branding, back-end processes and trustworthiness are the examples. Branding of the company may come from the rumor, repetition or from the conversation with the trusted friend and it may affect the user's expectation and trust in the service. Back-end process refers to the part of the service that is done off-line. This may include the attitude of the customer service, which potentially also influences the user's expectation and trustworthiness to the service.

2.3 Summary

So far, definitions of usability and user experience are reviewed. This section will look at the differences between them, and justify the importance of user experience in this study.

In *Emotional Design*, Norman (2004) explains how the information processing differs in cognition and affect. Using cognition, a person interprets and makes sense what is going on around himself or herself. With affect, such as emotion and feelings, one makes quick decisions whether negative or positive. Cognition and affect influence each other. Usually one responds emotionally (with affect) to the circumstances before interpreting the situation logically (using cognition), although there are times when the cognition works first. Regarding the influence of affect to cognition, Norman (2002) explains that negative affect focuses the mind so that it is optimized

for problem solving. This is right considering the situation when one gets into a stressed situation where he or she needs to focus his/her mind to solve the problem or escape from the place. In contrast, positive affect broadens the mindset to optimize for creative thinking. Also, negative affect such as fear or unfamiliarity makes it more difficult to complete the same task while positive affect may make it easier to complete the same task. This would mean that if the system is meant to be used in the situations under negative affect such as stress, the design of it needs to be optimized for effective and easy problem solving and task completion. Table 1 summarizes the attributes of usability and user experience definitions that are discussed in the previous sections.

Usability			**User experience**		
Nielsen	**ISO 9241-11**	**Preece et al.**	**Norman**	**Preece et al.**	**Hiltunen et al.**
	Effectiveness	Effectiveness			Usability
Efficiency	Efficiency	Efficiency			
Satisfaction	Satisfaction			Satisfying	
Memorability		Memorability			
Learnability		Learnability			
Errors					
		Safety			
		Utility	Meet the exact needs of the customer	Helpful	Utility
			Simplicity and elegance	*Aesthetically pleasing*	*Aesthetics*
			Joy to own *Joy to use*	*Fun* *Entertaining* *Enjoyable* *Rewarding and emotionally fulfilling* *Motivating* Supportive of creativity	
			Seamless merging of the services of multiple disciplines		Offline issues
					Availability

TABLE 1. Lists of attributes from usability and user experience definitions.

Cognitive attributes are in the normal font, affective attributes in italics, contextual background attributes in underlined.

Notice that usability attributes are concerned with cognitive information processing, therefore the design which takes into account of these are optimized to be used under the negative affect, where one needs to quickly solve the problem. On the other hand, user experience definitions include attributes concerned with affect, on top of the cognitive attributes. These are for example, simplicity and elegance which brings joy to own and joy to use; fun; rewarding and emotionally fulfilling. If we think about the situation when we use the mobile phone, we can notice that we are not always using the phone to solve the problem. Although there are times when we need to complete the task quickly, for example sending text message in hurry or making urgent call, that is not all we are doing with the mobile phone. We are expecting more than just getting the problems solved or getting the task done. Besides, as Norman stated, affective aspect influences cognition. Therefore, it is important to take this aspect into account. Especially in this study, considering this aspect is important. The difference in the sense of aesthetics coming from the cultural difference might influence the affect, which might eventually affect cognition.

Other attributes which are different between user experience definition and usability definition, are services and off-line issues. This aspect is also an important issue to consider, because if the culture is different, things happening outside the screen of the system are also different. It is highly possible that these contextual background issues may affect the user’s expectation of the system, as well as perception of the information.

After the several definitions of usability and user experience are reviewed, and considering the objective of the research, this study will look into the following attributes in the user experience:

Utility x Usability (effectiveness, efficiency, learnability) x Aesthetics x Offline issues

This is based on the mobile user experience definition of the Hiltunen et al. (2002), except that this study's definition does not include the availability. The attribute availability is optimized for the mobile service such as online banking, which is accessed through the mobile network. However, since the target of this study is the device, which is locally available to the user, this attribute was excluded. Satisfaction is not included as one of the attributes under the usability. This is because satisfaction is too ambiguous to be defined by itself, and it is more appropriate to think that satisfaction is generated from all the attributes of the user experience, than to think that there is one independent attribute called satisfaction. Memorability had to be excluded because this attribute is optimized for the infrequently used system, and it refers to how much the users can remember about the system while they are not using it (J. Nielsen, 1993). Due to the time restriction, repetitive usability testing was not conducted for this study. Therefore, this attribute is not included. Attributes in the user experience will generate the questions accordingly as followings. These questions will be answered in the in the analysis phase of this study.

- Utility: Does the test device provide useful features which the user in the specific cultural settings can accomplish their goals? How is the usefulness influenced by the cultural difference?
- Effectiveness: Do the test device's features work in a valid way so that the user in

the cultural settings can accomplish goals? How does the cultural difference affect the effectiveness of the device's feature?

- Efficiency: Does the test device help to accomplish the user's goals efficiently? What sort of cultural difference is influencing the efficiency of the device?
- Learnability: Is the test device's interface (both software and hardware) easy for the user to learn in the cultural settings? How is the learnability affected by the cultural difference?
- Aesthetics: Is the aesthetics of the test device (both software and hardware) matching the user's preference? What sort of cultural difference is influencing the degree of matching the user's aesthetic preference?
- Offline issues: Are there any matters outside the mobile use in the cultural context, which may influence the user's expectation to the test device?

3 CULTURE AND CULTURAL DIFFERENCE

Although the word “culture” is frequently used in our daily life, we are rarely aware of the concise meaning of it. For example, when one is told that the researcher of this study is a student at the master’s program in digital culture, one often ask for a clarification on what exactly the study subject is about. Due to the ambiguity of this word, it is necessary to have a better understanding of the definitions which this study will be based on. Also, cultural difference needs to be explained. We often conclude that the reason of some conflict comes from the cultural difference. However, if the cultural difference is investigated in the research, variables regarding the cultural differences must be systematically organized. Therefore, this section will first aim to have a better understanding on the culture, and then continue to look into the cultural dimensions – systematically organized variables on cultural differences.

It is important to note that although this section discusses about the culture and the cultural differences, it will not cover the whole use contexts in the different cultural settings. As already discussed in the introduction section of this study, different culture has different use context, such as the user, the task, physical environment, technical aspects and social settings (Hiltunen et al., 2002), and especially in studying the mobile user experience, it is important to take the use context into consideration. The issues discussed in this section will help understand the user and his/ her social settings, specifically, how the user thinks and what kind of social norms the target culture has. However, other elements of the use contexts will be dealt in the later sections, as the information regarding them are retrieved from the field work.

3.1 Definitions of culture

As already mentioned, culture is a somewhat ambiguous word and it seems to have multiple meanings. The meaning of culture is different between “pop-culture” and “culture-shock”. In “pop-culture”, culture implies the production by the human being, which range is broad from so-called high-culture, such as art, to low-culture, such as games. In “culture-shock”, culture indicates the way of life. As mentioned in the very beginning, the goal of this study is to understand how the cultural difference influences mobile user experience. Culture, in this study is the same as the one in “culture-shock”, the way of life. Some aspects of mobile phones and their use can also be considered as culture, namely, digital culture. This section will review several definitions of the culture in order to gain the better understanding of it and define what it means in this study.

3.1.1 Williams – the way of life, and Hall & Hall – program for behavior

Raymond Williams (2006) points out the ambiguity in the meaning of the culture. He says that definitions of the culture can be divided into three general categories. The first is the culture as an ideal of the state or the process of the human perfection. The second is the culture as a documentary of the thought or the experience of the human being. The third is the culture as a description of the way of life, which values and the meanings are expressed in the form of institutions and the normal behavior. Apparently, the culture, which this study is dealing with, is the third definition. According to Williams, “The analysis of culture, from such a definition, is the clarification of the meanings and values implicit and explicit in a particular way of life, a particular culture” (ibid., p. 32).

Edward T. Hall and Mildred Reed Hall (1990) also links the culture to the behaviors.

They defined the culture as a *program for behavior*. “Members of a common culture not only share information, they share methods of coding, storing and retrieving that information. These methods vary from culture to culture” (Ibid, p. xiv) . According to Hall and Hall, each culture shares the “hidden code” for the behavior. This hidden code determines how the values and meanings are expressed in the behaviors. People in the same culture use this hidden code to recognize the meaning and values expressed in the behaviors.

3.1.2 Hofstede – software of the mind

Hofstede (2005) relates culture to the patterns of thinking, and calls these culturally affected mental programs as *software of the mind*. According to Hofstede, software of the mind is strongly related to one’s values, which is formed at the early stage of life with the influence of their parents. Also the parents’ values are acquired from their parents when they were children. Therefore, the values are culturally stable and change is slower in here, compared to other manifestations of culture such as symbols, heroes and rituals - visible part of culture, categorized as practices.

Figure 4 illustrates the Hofstede’s “Onion” model of culture, which shows that cultural manifestations exist in different levels of depth. As mentioned, symbols, heroes and rituals are the visible part of the culture and these are under the category of practices. Words and gestures which can be understood by the people sharing the same culture belong to symbols. Also, fashion and status symbols representing some meaning in the culture belong to this category. Heroes can be real or imaginary persons. They are represented as a highly praised behavioral model in the culture. Ways of greetings and religious ceremony belong to rituals. The acts of rituals themselves do not have meaning in terms of achieving practical goals. Instead, ritual

acts are done for the sake of the acts themselves, and they have meaning in the culture. Symbols, heroes and rituals exist at the surface part of the culture and therefore the change may be fast in these parts and new practices can be acquired through one's life. Values are the invisible element, which exist at the core of the manifestations of culture. As already mentioned before, since values are formed already in the early stage of one's life, they are culturally stable and changes are slow in this part.

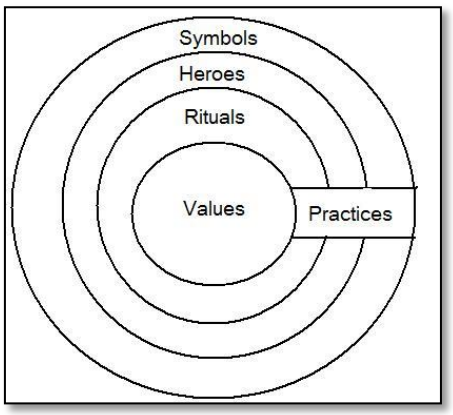

FIGURE 4. The "Onion": Manifestations of Culture at Different Levels of Depth (Hofstede & Hofstede, 2005)

3.1.3 Hampden-Turner and Trompenaars – the way of solving problems

Charles Hampden-Turner and Fons Trompenaars (1997) define the concept of culture as "the way in which a group of people solves problems and reconciles dilemmas" (p. 6). Like Hofstede, they also illustrate the layers of culture in the onion model (FIGURE 5). In their model, the surface layer is explicit and therefore similar to what Hofstede defined in the practices layers. This layer includes the visible artifacts and products such as language, housing, food and fashion. The middle layer consists of norms and values. Norms may be referred to as written laws and social controls. They show what is "right" or "wrong" according to the expectation inside of the group. Values are the sources to determine what is "good" or "bad". While norms

imply the behavior of the people in a way they should and are expected to behave, values determines the people's behavior based in a way they want to behave. The core part of the culture includes the basic assumptions. According to Trompenaars (1996), basic assumption is "the series of rules and methods which a society has evolved to deal with the regular problems that face it. This problem solving has become so basic that, like breathing, we no longer think about how we do it. We refer to these unconscious solutions as basic assumptions" (p. 52).

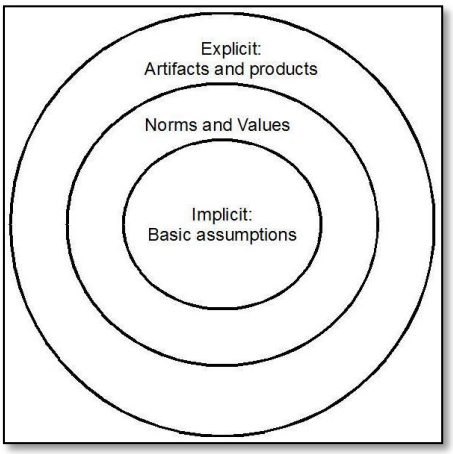

FIGURE 5. A model of culture (Trompenaars & Hampden-Turner, 1997, p. 22)

3.1.4 Summary

Although each definition mentioned above varies slightly in details, in summary, the way of thinking exists at the core of the culture. The way of thinking is at certain level mutual to the group of people belonging to the same culture, and it affects their behavior, such as how they perceive the information, how they react to the fact, how they relate to the people, how they communicate with others, or how they solve some problems. Eventually, this culturally mutual way of thinking appears on the surface explicitly, as aesthetic ideal, rituals, customs or lifestyle.

3.2 Cultural Dimensions

Several cultural anthropologists have summarized the cultural differences in the form of cultural dimensions. Cultural dimensions are often created based on the surveys which were conducted in multiple nations, and one can see the characteristics of the nation's culture, or compare the home nation's culture and host nation's culture. This section will review the cultural dimensions formed by three anthropologists mentioned in the previous section. As some criticisms disagree about the idea of dealing with the cultural difference at national level (Myers & Tan, 2003), it is true that individuals have their own culture, depending on the groups they belong to (e.g. generations, organizations, resident area etc). For example, not all the Japanese or Finnish are the typical Japanese or typical Finnish. At the same time, there are differences between the characteristics of each individual even within the same culture. Moreover, the accelerated tendency of the globalization makes people to move across the nations and therefore the number of the people who are at the borders of the national culture is increasing, which makes the culture to be mixed and be glocalized. Thus, conducting the analysis using the cultural dimensions data only may not be accurate if applying to the individual person. On the other hand, using these cultural dimensions together with other data such as the interview data and field observation data, it would be possible to get a closer look at more accurate cultural tendency. This study refers to the cultural dimensions established by three anthropologists. They were chosen among the several available cultural dimensions because of the relevancy of the data to this study: their cultural dimensions data are relevant to study the cultural difference between Japan and Finland.

3.2.1 Hofstede

Hofstede's cultural dimensions are probably the most influential definition (Myers & Tan, 2003). Hofstede formed these cultural dimension based on a survey, which was conducted on 116,000 IBM employees in their work sites in 72 countries between 1967 and 1973. The survey questions were about the employee values (G. Hofstede, 2001) and the four dimensions are defined initially. Later in the 1980's, after figuring out that the existing four dimensions are defined based on the western way of thinking, the fifth dimension was added based on the Chinese Value Survey. Although the initial survey data is old, several recent studies have also confirmed the replication of the dimensions (Hofstede & Hofstede, 2005). These five cultural dimensions are described in the following sections.

3.2.1.1 Large power distance vs. Small power distance

The power distance is the emotional gap between the subordinates and the superiors. The size of the power distance can be observed in various places such as in the family, at the school or at the work place. For example, while children are protected by the elders and expected not to take a risk to experiment in the family of large power distance cultures, the goal of the education inside the family of small power distance cultures is to let them become independent, and children are encouraged to experiment. According to Hofstede's survey, out of 74 countries, Japan is ranked at 49-50th (score 54) and Finland is ranked at 66th (score 33) for power distance index (PDI).

3.2.1.2 Collectivism vs. Individualism

This dimension is about how the individuals see themselves in the society. In

collectivist cultures, people see themselves as a member of the "we" group, and consider others as members of "them" group, while in the individualist cultures, people see themselves as independent individuals. This affects the behavior such as decision making. While opinions are determined by the group and not personally in collectivist cultures, people in the individualist cultures are expected to develop the personal opinion. The relied information source in collectivist cultures is social network, while individualist culture relies on the media as the information source. According to Hofstede's survey, Japan is ranked at 33-35th (score 46) and Finland is ranked at 21st (score 63) out of 74 countries for individualism index (IDV).

3.2.1.3 Masculinity vs. Femininity

This dimension can be regarded as "ego enhancement versus relationship enhancement" (Hofstede, 1998). At schools of masculine cultures, good students are praised for excellence, and the best students set the norm, while in the feminine cultures, norms are that the average students and teachers encourage the weaker students. Another difference between these cultures is the distinction between the emotional gender roles. In masculine cultures, the gender roles are distinct emotionally. Males are expected to act aggressively, tough, be confident, and seek for the materialistic success; females are expected to be gentle, unpretentious and seek for the quality of life. On the other hand, in feminine cultures, gender roles are indistinct, and both males and females are expected to be gentle and seek for the quality of life more than the materialistic success. Hofstede's survey ranked Japan as 2nd (score 95) and Finland as 68th (score 26) out of 74 countries for masculinity index (MAS) and shows that there is a large gap between these two countries.

3.2.1.4 High uncertainty avoidance vs. Low uncertainty avoidance

This dimension is about the anxiety level toward the unpredictable situations. Apparently in high uncertainty avoidance cultures, people feel stressed in unpredictable situations, and therefore they desire for the written or unwritten rules, regardless of the practicality of those rules. On the other hand, low uncertainty cultures are the opposite and people in this culture are curious about the unpredictable situations, and rules are rather flexible. This difference also appears in the education. At the schools of high uncertainty avoidance cultures, students focus on solving such problems which have only one concrete answer and they are acclaimed for the exactness, while in the low uncertainty avoidance cultures, students are encouraged to find the answer in abstract open ended questions. Consumer behavior is also influenced by this cultural difference. High uncertainty avoidance cultures value the cleanliness in products, while low uncertainty avoidance cultures value on the looks over cleanliness. From Hofstede's survey, it turned out that Japan has high uncertainty avoidance and Finland has low uncertainty avoidance. Out of 74 countries, Japan is ranked at 11-13th (score 92) and Finland at 48-49th (score 59) for uncertainty avoidance index (UAI).

3.2.1.5 Long term orientation vs. Short term orientation

Long term oriented cultures are pragmatic future oriented. People invest in the future even if it sacrifices the present or the near future. On the other hand, short term oriented cultures are past and present oriented. If investment is done, it is expected to get the result in the near future. It is not preferred in long term oriented cultures if the society has a huge gap between the people in terms of economical or social condition. Also in this culture, having good social network is valued and is considered to be a

key for success. On the contrary, it is considered normal in short term oriented cultures that there is a huge economical or social gap between the people with different abilities, because people are judged with ability and the ability is the key for success. Hofstede's study measured the long-term orientation index (LTO) for 39 countries. Japan is long-term oriented and ranked at 4-5th (score 80) and Finland is ranked at 16th (score 41).

3.2.2 Hall & Hall

Unlike other anthropologists introduced in this study, Hall & Hall has not defined the cultural dimensions as such. Rather, he defined the cultural variables, based on his observations. Hall & Hall (1990) defined the cultural variables according to context and time in the following sections.

3.2.2.1 High context vs. Low context

These variables are about how much the communication relies on the context in order to carry the meaning. In high context culture, communications are done implicitly. Thus, the message relies a lot on the context to carry the meaning and understanding the explicit message itself may not be enough to understand the real intention. On the other hand in low context culture, communications are done explicitly and since the message contains mass of information, the message carries the meanings which represent the intention as is. According to Hall, Japan has a high context culture, while northern Europe has low context culture.

3.2.2.2 Monochronic vs. polychromic

These variables are about how time is perceived. In monochronic cultures, time is perceived tangible resource as money, which can be saved, spent, lost or wasted. Hall

& Hall link this culture to low context culture. Since communication in the low context culture requires more information in order to represent the intention as is, low context culture can focus on and work on one thing at a time, and therefore it is monochronic. On the contrary, polychronic culture is linked to high context cultures, where the people already share the contextual background meaning, many things can be done simultaneously and things tend to happen concurrently. Monochromic culture is “a learned product of northern European culture (Hall & Hall, 1990)” and Japanese are polychronic people (Lynn, 1991).

3.2.2.3 Spatial differences

According to Hall & Hall, people unconsciously react to the spatial differences. Hall (1968) named the socially accepted use of distance and space is named as proxemics, and it may affect the way communications are done. In the field observation, it was noticed that there are some differences between the socially accepted use of the space in Japan and in Finland. For example, the distance between the individuals on the public transportation is different in these countries. Thus, this cultural variable may be taken into consideration when analyzing the influence of the cultural difference on the user experience.

3.2.3 Hampden-Turner and Trompenaars

Hampden-Turner and Trompenaars (2000; 1997) defined seven cultural dimensions based on the data gathered from 50 different countries. As already mentioned previously, they related the culture to how the people solve the problems. According to the way the problems are solved depending on the culture, following seven dimensions are defined. The first five dimensions are associated with how one deal

with the problem concerning the relationship with others. The sixth is about how one manages time, and the last dimension regards to the attitude towards nature.

3.2.3.1 Universalism vs. Particularism

This dimension is about the degree of the influence of the personal relationship on the rules. While universal rules have power over the personal relationship in universalism cultures, personal relationship has power over the universal rules in particularism cultures. This means that if the problem that people are trying to solve is related to the close friend, exceptional rules may be applied in the particularism cultures, while in the universalism cultures, rules are not likely to be bended based on the personal relationship. According to their survey results gathered via three different questions related to this dimension, Japan is in the middle between universalist and particularist, and Finland is definitely the universalistic culture (Trompenaars & Hampden-Turner, 1997).

3.2.3.2 Communitarianism vs. Individualism

This dimension is similar to what Hofstede has defined as collectivism vs. individualism. In communitarianist cultures, person perceives oneself as a member of the group, while in individualist cultures, person perceives oneself as individual. According to the three questions surveyed for this dimension, Japanese are communitarians, and Finnish are individualists.

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3.2.3.3 Specificity vs. Diffusion

This dimension is about how much the relationship in one area can influence to the other areas of life. For example, in specific cultures, the hierarchy at work has less

influence to the private life and people in this culture tend to consider work as what they are paid to perform, On the other hand, in diffuse cultures, where “every life space and every level of personality tends to permeate all others” (Trompenaars & Hampden-Turner, 1997), bigger commitment is required for work, as the hierarchy and the relationship at the workplace tends to influence the private life as well. According to the survey answers to four questions related to this dimension, Japan is diffusion culture, and based on the answer to three questions, Finland belongs to the specific culture.

3.2.3.4 Achieved status vs. Ascribed status

This dimension is about what the status is based on. In achieved status cultures, status is based on the achievement one has accomplished in his/ her life, while in ascribed status cultures, status is influenced by the family that the person is from, as well as age, gender, education and other factors that refers to being, rather than doing. According to the answers for two survey questions related to this dimension, Japan is in the middle between achieving and ascriptive, and Finland is achieving culture.

3.2.3.5 Affective vs. Neutral

This dimension regards to the expression of emotions. Compared to neutral cultures, where people are considered immature for showing feelings, it is more acceptable in affective cultures to express the emotions. When both Japanese and Finnish are asked whether they show emotions at work when they are upset, 74 percent of Japanese answered that they do not express emotions at work, while 41 percent of Finnish answered the same, meaning that Finnish are more affective compared to Japanese.

3.2.3.6 Inner direction vs. Outer direction

This dimension is about the attitude toward luck and fate. While people do not believe in luck or fate and they believe that success is purely depending on one's inner control in inner directed culture, in outer directed culture, nature, circumstances and fate are considered to have control over people and some success depends on whether being in the right place at the right time. Four related questions are surveyed to the Japanese. Result shows that Japan is relatively outer directed. For Finland, two related questions are surveyed, and according to the result Finland is in the middle between inner and outer directed culture.

3.2.3.7 Sequential time vs. synchronous time

This dimension is similar to what Hall defined in monochromic vs. polychromic time. Sequential time culture is similar to monochromic culture and synchronous time culture is similar to polychromic time culture. In sequential time cultures, present is separated from past and future, and people tend to do one thing at a time. While in synchronous time cultures, past, present and future are overlapping, people tend to do many things simultaneously. Hampden-Turner and Trompenaars do not provide survey result for this dimension. However, since this dimension is similar to what Hall defined in monochromic vs. polychromic time, his observation may be referred.

3.2.4 Summary

In this section, cultural dimensions defined by three anthropologists are reviewed. Although there are 15 different cultural dimensions, there seem to be some interrelation between some of them. **Power distance**, **collectivism vs. individualism** and **uncertainty avoidance** seem to be related if we look at the results of Japan and

Finland. Japan has fairly large power distance, slightly collectivism and high uncertainty avoidance culture, while Finland has small power distance, individualism and fairly low uncertainty avoidance culture. In the large power distance cultures, superiors have a big control power, while in the small power distance cultures, superiors have smaller control power over individuals. In the culture where the superior has a big control power, it is natural that people recognize themselves as members of the group under the superior and they are controlled with uniform rules. On the other hand, in the culture where the superior has less control power, people recognize themselves as individuals who have control power over themselves. Since uniform rules are not easy to be applied to the individuals as each of them vary, there tends to be fewer and flexible rules.

Achieved vs. ascribed status may be related to **collectivism vs. individualism** and **uncertainty avoidance**. Japan is in the middle of achieved and ascribed but more ascribed compared to Finland. Also, it has slightly collectivist and high uncertainty avoidance culture. On the other hand, Finland is achieved, individualist and low uncertainty avoidance culture. Collectivist culture recognizes oneself as a member of "us" group and others as members of "them" group, and high uncertainty avoidance culture feels anxiety about unpredictability. In the culture with such combination of the characteristics, it would be difficult for the new comer with no name value to get the status based purely on the achievement, because the new comer is considered as the member from the "them" group, and people often feel anxiety about some unknown aspect of the "them" group, even though the new comer has some achievements. It seems natural that in individualist and low uncertainty avoidance culture, people would be less anxious about the new comer even without the name value, and more open minded enough to pay attention to the achievement of the new

comer. **Achieved vs. ascribed status** seem to be related also to **universalism vs. particularism**. Finland is an achieved and a universalism culture. In achieved status culture, one values the achievement; what has been done, rather than who the person is. It seems natural that this culture is universalism, because universalism culture looks at what the problem is, rather than who the problem is related to.

As previously mentioned, the **high vs. low contextual** and **monochronic vs. polyphonic time** dimensions are related. Japan is a high context and polyphonic culture, while Finland is a low context and monochronic culture. Since low context cultures need more information to be carried in the messages, they tend to be monochronic. On the other hand in high context cultures, context information is already shared and needs less information to be carried in the messages. Hence, several processes may fit into the time slot and therefore tend to be polyphonic. **High vs. low contextual** may be related to **affective vs. neutral**. Japan is high context and neutral culture, while Finland is low context and less neutral than Japan. In neutral cultures, it is less acceptable to show the emotion openly. However, people in this culture can understand each other's feelings because they share the context information already and they can guess the feelings from the shared context.

If we observe how the high context cultures share the context information, it becomes clearer that there actually are relationships between **high vs. low contextual**, **power distance**, **collectivism vs. individualism** and **uncertainty avoidance**. As discussed, in large power distance cultures, superior's large control power makes people recognize themselves as a member of the group under the superior, and they are controlled by the uniform rules. As members who belong to the group, people in high power distance cultures share more information than the people in the small power

distance cultures, where people recognize themselves as individuals, and less uniform rules exist.

Specificity vs. diffusion may be also related to **power distance and collectivism vs. individualism**. Japan has the diffusion, slightly large power distance and fairly collectivist culture, while Finland has specificity, small power distance and individualist culture. Because the superior has a big control power, people in large power distance cultures tend to live as members of the work organization even outside of the work. On the other hand, people in the small power distance cultures have less consciousness as members of the work organization, they tend to draw a border between the professional and the private life.

There seems to be also a contradiction between some of the dimensions. For example, **uncertainty avoidance** may contradict with **long vs. short term orientation**. Japan is a high uncertainty avoidance and long term orientation culture, while Finland is a slightly low uncertainty avoidance and short term orientation culture. Long term orientation cultures invest in the future and sometimes sacrifice the near future. It means that compared to the short term orientation cultures, there tends to be longer time periods when people do not see the results from the investment, which makes them feel anxiety. It is true that in business, Japanese culture may have characteristics to put sustained efforts for the achievement in the long term. However in terms of mobile phone usage, it would be decent to think that between these two contradicted dimensions, high uncertainty avoidance would be stronger than long term orientation. Even if the Japanese is long term oriented, they would not put continuous efforts in order to get the results from the mobile phone. Because they have uncertainty avoidance, they would feel anxious if they didn’t see the results immediately.

Throughout the dimensions, the main difference between Japan and Finland would be in **masculinity vs. Femininity**, **uncertainty avoidance**, **power distance** and **high vs. low context**. Although masculinity vs. Femininity seems to be independent from other cultural dimensions and it is not clear how the difference in this dimension is affecting others, the difference between Japan and Finland in this dimension is significant (MAS value Japan:95 and Finland: 26. Difference: 69). There is also quite significant difference in uncertainty avoidance (UAI value Japan: 92 and Finland: 59. Difference: 33). As mentioned already, the difference in this dimension relates to other dimensions such as collectivism vs. individualism, achieved vs. ascribed and high vs. low context. The difference between Japan and Finland in power distance is less significant (PDI value Japan: 54 and Finland: 33. Difference: 21). However as previously mentioned, this dimension seems to be influencing other dimensions such as collectivism vs. individualism, uncertainty avoidance and specificity vs. diffusion. In that sense, the difference in power distance is important. Lastly, although difference in high vs. low context is not measured with numerical points, since it relates with other dimensions such as collectivism vs. individualism, uncertainty avoidance, monochronic vs. polyphonic and affective vs. neutral, it should also be considered as one of the important differences for this study.

Table 2 summarizes the main differences discussed above, along with the variables for Japan and Finland. In order to recognize the difference more clearly, score is also marked for Hofstede's dimensions.

Cultural dimension	Japan	Finland
Masculinity vs. Femininity	Masculine (MAS 95)	Feminine (MAS 26)
Uncertainty avoidance	High uncertainty avoidance (UAI 92)	Low uncertainty avoidance (UAI 59)
Power distance	Large power distance (PDI 54)	Small power distance (PDI 33)
High context vs. Low context	High context	Low context

TABLE 2. List of cultural dimensions with variables for Japan and Finland

4 METHOD

This section will describe the research method adapted for this study. First, research strategy explains the research from the higher level. After that, each phase of the method is described in detail followed by the conducted research activities.

This study takes a case study of the Nokia mobile phone in the Japanese culture. By observing the user experience of the Nokia phone in the Japanese culture, influence of the cultural difference between Japan and Finland on the user experience will be investigated. In a high level, this study will follow three steps. The first step is to study the user in both Japanese and Finnish culture, as well as Japanese and Finnish cultural context and identify their goals. Since this study deals with the user experience, goals here do not only refer to the pragmatic goals, but also include non-pragmatic goal such as aesthetics. The second step is to measure these goals in each user experience elements in order to gain understanding on the user experience of the test device in the Japanese culture. In the third step, analysis will be done by looking for the relationship between the cultural difference and the results from step two.

4.1 Knowing the culture and identify the goals through cultural personas

The previous section went through the definitions of the culture, as well as the cultural dimensions which help to identify the cultural difference in the way of thinking. However, as already mentioned in the introduction section, mobile user experience is significantly influenced by the use context. Use context - The user, the task, physical environment, technical aspects and social settings (Hiltunen et al., 2002, p. 21) also carries cultural variables, therefore there are cultural differences in the use context as

well. Thus, it is necessary to study the use context of each culture, and take it into consideration when analyzing the user experience. In the previous related studies, cultural dimension variables and user experience elements are listed, and relations between them are examined separately, such as, the relationship between the degree of uncertainty avoidance to the design of mobile service or web page (Choi et al., 2006; Marcus, 2006). However, in order to also consider also the use context, which itself is quite complex, a new approach is needed.

While investigating the user experience research methods, the concept of *persona* came to attention. The concept of persona is first introduced by Alan Cooper (2004) . It is an imaginative character with detailed profile information which represents the users, including their wishes and goals, as well as scenarios of their life which describes their interaction with the products. The benefit of adapting the concept of persona and its scenario is that, in the narrative form, it is possible to accommodate several cultural variables, such as user's motivation, use cases, as well as use contexts; environmental and social settings, and it helps to gain deep understanding of the users goals better. In other words, persona- which speaks for the user of a culture, together with the scenario- which embodies the contextual background, can represent the culture in details. The persona and the scenario will tell how the people in the culture live in the certain cultural context, and how they interact with mobile phones. Looking closely to their stories and scenarios, it would help to identify what they seek for from mobile phones and want to do with mobile phones in their life – their user experience goals.

In order to construct personas, field observation, interviews are conducted as main methods. Cooper, Reinmann and Cronin say "…a combination of observation and

one-on-one interviews is the most effective and efficient tool in a designer's arsenal for gathering qualitative data about users and their goals" (2007). However, the degree of understanding through the interviews and observation depends on the number of the interviews and the type of the interview subjects, as well as the time and the place of the field observation. Since the number of the interview subjects and the time period and the place for the field observation is limited for this study, literature review is added in order to have broad knowledge on the use cultures and make the persona and its scenario less biased. The main reference used for the Japanese mobile culture are: Personal, Portable, Pedestrian: Mobile Phones in Japanese Life (Itō, Okabe, & Matsuda, 2005) and K-tai White Paper (Mobile Contents Forum, 2007). As for Finnish mobile culture, article by Jukka-Pekka Puro (2002) and Virpi Oksman (2006), as well as the report by Nurmera, Heinonen, Ollia and Virtanen (2000) and Antero Kivi (2009) on the Finnish mobile usage and mobile handset population in Finland are used as references.

4.1.1 Field observation

4.1.1.1 Japan

The researcher of this study stayed in Japan for a period of three months between July – September 2008. During this time period, she had approximately one hour commute by train on weekdays from her residence in Yokohama to her office in Tokyo. The aim of the observation is not only to study the mobile phone usage and use context in Japanese culture but also to observe their lives and their cultural norms. Hence, the observation covered mobile phone usage and what people do. It also covered such things as advertisements, notes and posters displayed in the cultural settings as well as audio announcements. This is for studying the cultural norms in the way information

is represented. Observed items are written down in a notebook or when using pen and paper is difficult, comments are posted in the researcher's private blog through the mobile phone. Also, photos are taken when necessary.

4.1.1.2 Finland

A similar approach was taken to conduct the observation in Finland. After the observation period in Japan was finished, the researcher moved to Tampere, Finland and continued observation on the mobile phone usage, use context as well as people's lives and cultural norms. During the observation period, the researcher had approximately half an hour commute in the city of Tampere by bus during the weekdays. Observation was also done when the researcher was visiting Helsinki or Jyväskylä, which is about two hours by the express train.

4.1.2 Interviews

4.1.2.1 Japan

Interviews are conducted with 14 subjects plus one pilot subject. Subjects' ages are between 25 and 38 and they are chosen using snow ball method. Out of 14 subjects, 7 are male and 7 are female. Average age of the subjects is 34. Table 3 shows the demographic information of the Japanese subjects.

Due to the time limitation, interviews were conducted together with usability tests. Thus, in order to get a fair result, prior to the interview/ usability test, it was confirmed that the subjects have not used a Nokia phone and a Toshiba phone before. Since the interviews took the semi-structured form, the length of the interview was between one hour and two hours, depending on how much the subject had to say and

how many questions arosed from the responses. According to Cooper, Reinmann and Cronin (2007, p. 59), interviews for the length of one hour with six well-selected subjects are sufficient. This number was decided because these interviews were conducted along with usability tests which will be explained later in this section.

Subject	Gender	Age	Occupation	Phone model	Residence	Work plc.
J Pilot	Female	36	Dentist	NEC FOMA N703iμ	Yokohama	Yokohama
J1	Female	33	Japanese teacher	Sharp 812SH	Tokyo	Tokyo
J2	Female	25	Administrator	Sharp SH702iD	Chiba	Chiba
J3	Male	36	Dentist	Panasonic P506IC	Yokohama	Yokohama
J4	Male	41	Software engineer	Sharp 811SH	Tokyo	Tokyo
J5	Male	33	Purchasing agent in IT company	Sharp SH700iS	Tokyo	Tokyo
J6	Female	32	Accountant	NEC N706i	Tokyo	Tokyo
J7	Male	38	Illustrator	Panasonic P505iS	Tokyo	Tokyo
J8	Male	33	Business developer at internet portal	NEC FOMA 702 iD	Ibaraki	Tokyo
J9	Male	33	Accountant	Mitsubishi D903iTV	Tokyo	Tokyo
J10	Male	33	Business consultant	Sharp 922SH	Tokyo	Tokyo
J11	Female	33	Hospital administrator	Sharp 816SH	Chiba	Tokyo
J12	Female	35	Housewife	Sony Ericson SO902i	Chiba	
J13	Female	33	Psychologist	Kyosera WS009KE	Saitama	Tokyo
J14	Female	33	Unemployed	Sharp 705SH	Tokyo	

TABLE 3. Demographic information of the Japanese subjects

Interview questions focused on the subjects' everyday lives, particularly what they did from the moment they woke up in the morning until they went to sleep at night, and how they interacted with their mobile phones, what kind of mobile phones they used and how they decided to chose those particular models. Interviews with Japanese subjects were done in Japanese and the location of the interview was chosen based on the convenience of the test subjects so the interviews were usually taken at a place

near or at their work place, or at their residence. Interview data was recorded using the VCR, and later the data was transcribed by the researcher.

4.1.2.2 Finland

The approach of the interviews in Finland was similar to that in Japan. However, due to the test subjects being scattered in different geographical locations, interviews were conducted by email. Also, since the case study focused on the user experience of the Finnish mobile phone in Japanese culture, usability test with the Finnish subjects was not within the focus of this study. Table 4 shows the demographic information of Finnish test subjects.

Subject	Gender	Age	Occupation	Phone manufacturer	Residence	Work
F1	Female	25	Cashier/ Student	Nokia 3310	Helsinki	Helsinki
F2	Female	24	Educational assistant	Nokia 7373 (L'amour Collection Black)	Helsinki	Helsinki
F3	Female	33	Freelance teacher/ translator	Nokia N81	Tampere	Tampere
F4	Male	32	System engineer	Nokia 9300 (Communicator)	Tampere	Tampere
F5	Male	47	Enterprise architect	Nokia E90	Jyväskylä	Jyväskylä
F6	Male	36	Freelance illustrator	Samsung SGH-M300	Tampere	Tampere
F7	Male	32	Freelance animator	Nokia 7210 Supernova	Helsinki	Helsinki
F8	Male	36	Freelance illustrator	Nokia N95	Kangasala	Kangasala
F9	Male	40	User experience manager	Nokia N95	Tampere	Tampere/ Helsinki
F10	Male	36	Account manager	Nokia E71	Helsinki	Helsinki
F11	Female	26	Researcher/ Freelancer	Nokia E71	Jyväskylä	Jyväskylä
F12	Male	64	Retired/ company board member	Nokia 6680	Tuusula	

TABLE 4. Demographic information of the Finnish subjects

Using the snow ball method, email interviews were conducted with 12 test subjects.

Test subjects were between age 24 and 64 living in difference places of Finland. Out of 12 subjects, 4 were female and 8 were male. Average age was 35.9.

The interview was conducted in the form of email questionnaire with open questions. Since the aim was to have an understanding on the test subjects, their lives and their interaction with mobile phones, the questionnaire consisted of the questions that asked what they do and how they interact with their mobile phone in each time period of the day. In order to have better understanding on the use context, follow up questions were asked afterwards to most of the respondents in order to have better understanding of their mobile phone usage, context information and their lives.

4.1.3 Creating the persona

Based on the information gathered from the steps above, persona and its scenarios are created. This study referred to the procedures of Cooper, Reimann and Cronin (2007) as well as to the example written by Steve Mulder and Ziv Yaar (2006). The procedure of Cooper, Reimann, and Cronin is the most comprehensive especially in finding the behavioral patterns from the gathered data. Following their procedure, steps below are taken in order to create personas:

Step 1. Identify behavioral variables

The first step is to list the characteristics of the test subjects as *behavioral variables*. According to Cooper, Reimann and Cronin, behavioral variables include activities, attitudes, aptitudes, motivations and skills. The activities variable indicates what the test subject does with the mobile phone and how often. Attitudes variable is, for

example whether the subjects want to show the originality through the design of the mobile phone, or whether they choose the normal safe design. Aptitudes variable refers to the subjects' capability to learn. Motivations variable literally indicates why the subjects use the mobile phones. Skills variable refers to the subjects' skill for the mobile products' domain. Many variables are difficult to be categorized and fall into the grey zone between the categories. This study collected mainly the activities, attitudes and motivations variables. Aptitudes and skills variables were less important, considering that this study deals with the mobile phone for everyday use, not the special software, and also the fact that the test subjects for this study are in the age group which mobile phones should be learnable anyway.

Step 2. Map interview subjects to behavioral variables

In this step, test subjects were mapped against the behavioral variables listed in the previous step. For some variables, subjects were mapped to the discrete choices of yes or no. For example, subjects said either they always turn off the phone at night, or they never turn off their phone at night. For other variables, subjects were mapped in between the discrete choices. For example, depending on the frequency of the mobile camera use, subjects were mapped to the scale between the mobile camera frequent user and non frequent user. If the subject tells that she uses mobile camera often in everyday life, she is mapped to the closest scale from "use mobile camera often". If the subject tells that he hardly uses the mobile camera in his everyday life, he is mapped to the closest scale from "don't use mobile camera often". If the subject mentions the occasional use of the mobile camera in her daily life, depending on the frequency mentioned by the subject, she is mapped to the scale in between use mobile camera often and don't use mobile camera often. From the interview data only, it is not possible to measure the precise frequency of the use of some features. However,

since the purpose of mapping the subjects in this step is to identify the behavior patterns by observing the similarities in the tendency of the subjects' behavioral variables, preciseness is not critical. Subjects were mapped to the range according to what they answered in the interviews.

Below is the behavioral variable with the mapped interview subject. As in the written in the description of the step 1, behavioral variables are listed based on the interview results of both Japanese and Finnish subjects.

Activities											
Use mobile camera often	1,2,7,10,11, 12,14		4,9		3			5		6,8,13	Don't use mobile camera often
Use mobile phone's clock instead of real watch	2,4,6,8,9,10, 11,12									1,3,7, 13,14	Wear watch
Use mobile web frequently	3,8,9,10,14	6		4,5,12	2	11				1,7,13	Don't use mobile web at all
Check SNS on mobile	4,8,9,10									1,2,5,3,6, 7,11,12,1 3,14	Do not check SNS on mobile web
Check news on mobile	3,8,9,10									1,2,5,4,6, 7,11,12,1 3,14	Do not check news on mobile web
Use pictographs	1,2,6,7,8,10, 11,12,14				13				4,5	3,9	Don't use pictographs
Use mobile phone on the train	1,6,8,10,11, 12,13,14	3,4,7,9								2	Do not use mobile phone on the train
Send photo messages	1,2,7,11 12,14		4,10		5,6				3	8,9,13	Do not send photo messages
Use mobile alarm	3,4,5,6,9,10, 11,12,13,14				1					2,7,8	Don't use mobile alarm
Use mobile calendar	5,6,8,11				13					1,2,3,4,7, 9,10,12,1 4	Don't use mobile calendar
Use mobile digital TV	1,3,9,10		8							2,4,5,6,7, 11,12,13, 14	Do not use mobile digital TV
Use voice call often	2,6,12,13,14		4,5		1			3,11		7,8,9,10	Don't use voice call often
Attitude											
Want to show originality in mobile design (cute, sharp or cool)	2,7,8,10,11, 12,13,14		1, 3,6							4,5,9	Chose the mobile because of its safe and normal design

Manufacturer is important in choosing the phone	2,3,1,7,9,10, 11									4,5,6,8,12 ,13,14	Manufacturer is not important in choosing the phone
Confirmation note is important	2,1,4,5,6,7,8 ,9,10,11,13, 14				12			3			Confirmation note is irritating
Image quality of the mobile camera is important	2,7,12,14									1,3,4,5,6, 8,9,10,11, 13	Doesn't seek for quality in mobile camera
Want to have simple, smaller & lighter	1,2,8,11,12, 13,14	4	5		6,7					3,9,10	Can sacrifice the simplicity, size & weight for functionality
Worry if the screen is facing outside	1,2,4,5,7,8,1 0,11,13,14				6				3	9,12	Don't care if screen is facing outside
Prefer colorful interface	1,2,3,6,7,11, 12									4,5,8,9,10 ,13,14	Practicality is more important than the beauty of the UI
Always in silent mode, except when at home	1,2,4,5,6,7,8 ,9,10,11,13				12					3,14	Silent mode only in limited occasion
Silent without vibrator is used	2									1,3,4,5,6, 7,8,9,10,1 1,12,13,1 4	Vibrator is ON in silent mode
Turn off the mobile at night	2,5									1,3,4,6,7, 8,9,10,11, 12,13,14	Keep the mobile on at night
Feeling unsure about non-domestic mobile phone	2,5,6,7,8,11, 12									1,3,4,9,10 ,13,14	Not feeling unsure about non-domestic mobile phone
Appearance of the phone is important	1,6,7,8,10,1 1,12,13					2				3,4,5,9,14	Practicality is more important than appearance
Like the design which not many other people are using	3,10,11,12		8							1,2,4,5,6, 7,9,13,14	Don't care if other people are using or not
Use mobile phone at home	2,7,11,12,13 ,14		1,5, 6,10					4		3,8,9	Don't use mobile phone at home
Use private mobile at work	4,8,12,14				3			5,6, 7		1,2,9,10,1 1,13	Don't use private mobile at work
Read manuals when buy a new mobile		4			1,3, 6,7, 9,1 1			12		5,8,10,13, 14	Do not read manuals when buy a new mobile
Friends, family or sales person influence in choosing the phone	1,7,12,13									2,3,4,5,6, 8,9,10,11, 14	Choose mobile on own
Motivation											
Play with and have fun from mobile	1,2,3,7,8,9,1 0,11,12,13,1 4	6	4							5	Use mobile mainly for practical purpose

TABLE 5. Japanese behavioral variables with mapped subjects

Activities										
Call more than SMS	1,2,3,4,5,8,9,10,11,12								6,7	SMS more than call
Use other than call and SMS	1,2,3,4,5,6,8,9,10,11,12								7	Use only SMS and call
Use mobile calendar	3,4,5,11,12								1,2,6,7,8,9,10	Do not use mobile calendar
Use mobile alarm	1,2,3,5,10								4,6,7,8,9,11,12	Do not use mobile alarm
Use mobile camera	2,3,6,8,9,10,11,12								1,4,5,7	Do not use mobile camera
Use mobile web	9,10,11		8						1,2,3,4,5,6,7,12	Do not use mobile web
Use mobile GPS	10,11		8						1,2,3,4,5,6,7,9,12	Do not use mobile GPS
Use mobile email	9,10,11		8						1,2,3,4,5,6,7,12	Do not use mobile email
Use any other functions than listed above	4,8,11,12								1,2,3,5,6,7,9,10	Do not use any other functions than listed above
Send photo messages	2,11								1,3,4,5,6,7,8,9,10,12	Do not send photo messages
Use mobile in the morning before leave home (other than alarm)	11,12		9,10						1,2,3,4,5,6,7,8	Do not use mobile in the morning (or use only alarm in the morning)
Commute	1,2,4,5,9,10,11		3						6,7,8,12	Don't commute
Use mobile on the way to work	1,2,3,4,9,10,11								5,6,7,8,12	Do not use mobile on the way to work
Use mobile for private & work purposes	2,3,4,5,6,7,8,9,10,11,12								1	Do not use mobile for private & work purposes
Use mobile on the way back from work	1,2,9,10,11								3,4,5,6,7,8,12	Do not use mobile on the way back from work
Use mobile more in business hours than during the free time	5,6,8,9,10,11,12								1,2,3,4,7,12	Use mobile more during free time than during business hours
Attitude										
Bought mobile on own	1,2,4,5,6,8,10,11,12								3,7,9	Got mobile as a gift/ provided from work
Chose mobile because of functionality	1,4,5,6,8,10,11,12								2	Chose mobile because of the appearance
Turn mobile off at night	1,3,6,10								2,4,5,7,8,9,11,12	Do not turn off mobile at night
Motivation										
Use mobile to kill time (play and have fun with mobile)	9,10,11								1,2,3,4,5,6,7,8,12	Don't use mobile to kill time (use for practical reasons)

TABLE 6. Finnish behavioral variables with mapped subjects

Step 3. Identify significant behavior patterns

When the subjects are mapped to the behavioral variables, subjects with the similar behavior patterns were categorized into a *cluster*. In order to do this, first, numbers of

the behavioral variables, in which test subjects are in the same range, were counted. For example, if the subject 1 and 2 are both mapped as the frequent user of the mobile camera, and also mapped as not checking the SNS using the mobile phone, they have two similar behavioral variables in common. Between the Japanese subjects, the maximum number of the common behavioral variables was 20, and for Finnish subjects, the maximum was 16. Relationships with more than 16 common variables between Japanese subjects, and more than 13 common variables between Finnish subjects were collected, and relations between the subjects were drawn as a relational map. After that, groups of subjects who are inter-related to each other are recognized as clusters. Some clusters are omitted if most of their common behavioral variables are negative and not possible to identify their goals (e.g. combination of “do not use web”, “do not use GPS” and “do not send photo message”). The remaining clusters became the basis of personas. According to the similarity in the use cases, Japanese and Finnish clusters are numbered.

Figures below show the relational map of the subjects, with the clusters marked. Female subjects are marked in red and male subjects are marked in blue. Numbers of the common behavioral variables are shown on the lines connecting the subjects. As the figures show, number of the common behavioral variables in some of the relationships marked with the dotted lines are less than the minimum threshold mentioned above (Japanese =16 and Finnish =13). This means that there were small separate clusters originally. As the next steps will explain, after the characteristics of each small cluster were synthesized, redundancy between the clusters was examined and some of the clusters were merged together, if similarities between the small clusters are observed, and the difference between them was insignificant.

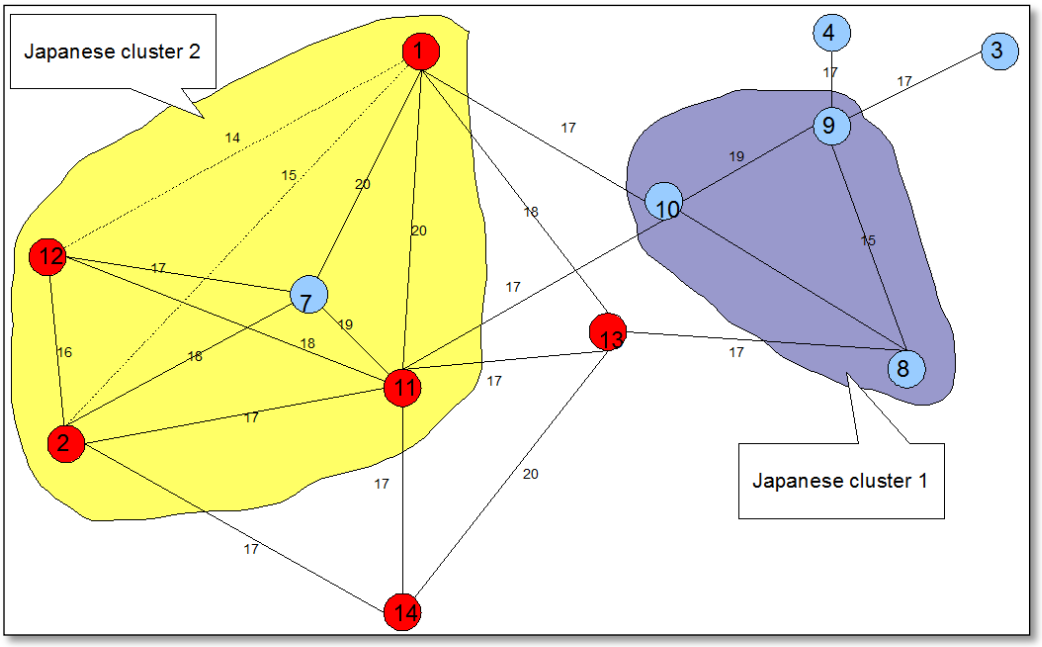


FIGURE 6. Relational maps of the behavioral variables of the Japanese subjects

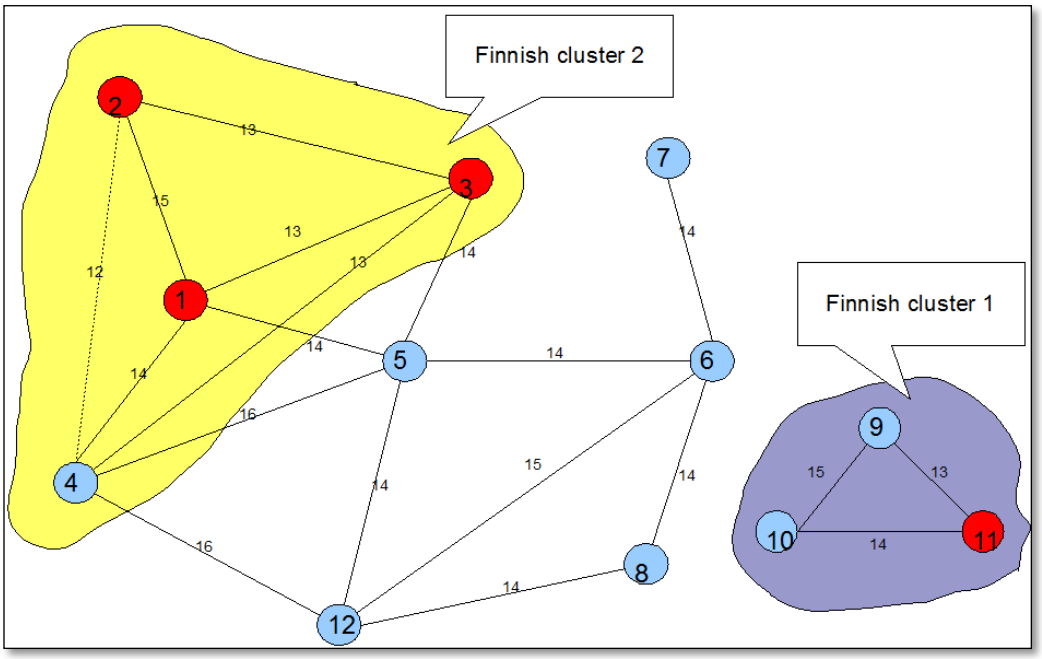


FIGURE 7. Relational maps of the behavioral variables of the Finnish subjects

Step 4. Synthesize characteristics and relevant goals.

When the clusters of the similar subjects were identified, characteristics of the each cluster were observed. Based on the characteristics and the more detailed interview data of the subjects who belong to the cluster, *goals* were associated with each cluster.

Goals include *end goals*, *life goals* and *experience goals*. End goals refer to what the subjects in the cluster wants to do with the mobile phone, such as stay connected with family, or organize the schedule. Life goals indicate who the subjects want to be. For example, be a good father or be successful. Experience goals refer to how subjects want to feel while using the mobile phone, such as feeling safe, in control, or cutting edge. These goals work as a basis of the persona's description. Table 5 summarizes the synthesized characteristics of each cluster, and goals based on them. Each cluster is given a descriptive name according to their characteristics.

<table>
<tr><td colspan="2">Japanese cluster 1: The efficient information surfer</td></tr>
<tr><td rowspan="4">Significant characteristics:
-Use mobile on the train
-Use mobile web
-Check SNS on mobile web
-Check news on mobile web
-Use mobile digital TV
-Use mobile's clock instead of real watch
-Don't use voice call often
-Don't seek for quality in mobile camera
-Practicality is more important than the beauty of the UI
-Mobile is always in silent mode, except when at home
-Choose mobile on own
-Manufacture is important in choosing the mobile</td><td>End goals:
-Want to get updated effectively by browsing the news or SNS with mobile web
-Want to fill in the empty time slots by doing something with mobile (e.g. check the baseball game score on the mobile web)
-Want to check the business schedule on web calendar</td></tr>
<tr><td>Life goals:
Live fulfilled life by getting as many things done as possible and having as much fun as possible.</td></tr>
<tr><td>Experience goals:
Practical, cutting edge, fast and trustworthy</td></tr>
<tr><td></td></tr>
<tr><td colspan="2">Japanese cluster 2: The experience sharer</td></tr>
<tr><td rowspan="4">Significant characteristics:
-Use mobile phone on the train
-Use mobile camera often
-Send photo message
-Use pictographs
-Prefer colorful UI
-Want to show originality in mobile design (cute, sharp, cool etc)
-Manufacturer is important in choosing the mobile
-Want to have simple, smaller and lighter
-Use mobile at home
-Do not check SNS on mobile web
-Do not check news on mobile web</td><td>End goals:
-Want to be connected with friends and family members by sending fun messages
-Want to share the experience with others by exchanging the photo messages
-Want to have the uplifting feeling from the mobile</td></tr>
<tr><td>Life goals:
Share small happiness from everyday life with friends and family</td></tr>
<tr><td>Experience goals:
Uplifting, safe and easy</td></tr>
<tr><td></td></tr>
<tr><td colspan="2">Finnish cluster 1: The versatile user</td></tr>
<tr><td>Significant characteristics:
-Use mobile for private and work purposes
-Use mobile on the way to work
-Use mobile on the way back from work
-Use mobile more in business hour than in free time
-Use mobile to kill time (play and have fun with mobile)
-Call more than SMS</td><td>End goals:
-Call clients and colleagues to inquire or to share the information
-Search for work related information when away from internet
-Call/SMS friends to inquire the meeting
-Take photos of the places and friends and share the</td></tr>
</table>

<table>
<tr><td rowspan="3">-Use mobile camera
-Use mobile web
-Use mobile email
-Use mobile GPS</td><td>photos on SNS
-Search for the information of the product or places
-Use GPS to navigate to the unknown place</td></tr>
<tr><td>Life goals:
Work smart, play hard</td></tr>
<tr><td>Experience goals:
Practical, quick, stylish, professional</td></tr>
<tr><td colspan="2">Finnish cluster 2: The information sharer</td></tr>
<tr><td rowspan="3">Significant characteristics:
-Use mobile on the way to work
-Use mobile more in the free time than in the business hour
-Do not use mobile to kill time (use only for practical purposes)
-Call more than SMS
-Use mobile alarm
-Do not send photo messages
-Do not use mobile web
-Do not use mobile GPS
-Do not use mobile email
-Do not use mobile in the morning before leaving home</td><td>End goals:
-Call to hear how the family is doing
-Want to be contacted if something happens to the family
-Call the partner when some family arrangement or information sharing is needed
-Use SMS to send reminders to her family
-Use SMS to contact friends to arrange the meeting occasionally</td></tr>
<tr><td>Life goals:
Be a good mother, good wife and good family member</td></tr>
<tr><td>Experience goals:
Simple, practical, not fancy and not too professional</td></tr>
</table>

TABLE 7. Synthesized characteristics and goals of the clusters

Step 5. Check for redundancy and completeness

This step is to check the clusters to check the overlaps between the characteristics and goals of clusters, and to see that each clusters are distinct. As mentioned previously, characteristics of each cluster are examined, and if the characteristics are similar, and no distinct differences are seen in between the clusters they are merged together and became a bigger cluster.

Step 6. Expand description of attributes and behaviors

This is the step, where the characteristics and goals of the test subjects in the cluster are transformed to the narrative descriptions of the personas, and the scenarios of mobile phone use in their everyday life. Step 4 already identified the significant characteristics of each cluster. These characteristics are based on the interview data. Also, end goals, life goals and experience goals are identified in the step 4. This

information became the structure of the personas and set the direction of the scenarios. In order to expand this structure into the narrative description, results from the interviews, field observation and the literature review are also combined.

In the interviews, subjects were asked about the aesthetical and functional preference for the mobile phones. Also, subjects were interviewed about their everyday life: how their typical day went, starting from the moment they woke up until the moment they went to sleep and how they interacted with their mobile phones, as well as the purpose of the interaction and also the reason for not interacting. In the field observation, the researcher observed the phone usage in the target cultures, and how the information was represented in these cultural contexts. Literature review provided the objective data on the mobile phone models and their usages. The narrative description of personas and their scenarios were created by adding the interview data of the subjects belonging to the persona's cluster, as well as the data from the field observation and the literature review on top of the structural data identified in the step 4. It is important to note that although the narrative is fiction by nature, information such as what the persona sees in his/her life, persona's mobile phone model, or the purposes of the text message are based on the information obtained from interviews, field observations and the literature review.

Step 7. Designate persona types

Two personas were constructed for each nationality, and they were prioritized based on the appropriateness for the test device this study is dealing with: Nokia N95. Since this mobile phone is a high-end model and most likely for tech savvy users who like to explore the new technologies, the cluster 1 was selected as a primary persona,

because it has the matching goal to the characteristics of this mobile phone, and cluster 2 was selected as a secondary persona. Primary persona is the main target, which the test device should be designed to fulfill their goals. Secondary persona is not the main target but since they have also possibility to use the test device, their goals should also be satisfied.

4.2 Measuring the goals to study the user experience in the Japanese culture

As discussed in the section two, user experience consists of utility, usability, aesthetics (joy to use), offline issue (joy to own). The aim is to gain understanding of these elements which are provided by the test device (Nokia N95) in the Japanese cultural context. Evaluations of the user experience goals are done by conducting short and long term usability tests together with interviews, as well as longitudinal individual observation using the test mobile phone in the cultural setting. The reason for conducting the long term usability tests in addition to the short usability tests was to identify the issues or findings when the Nokia phones are used in the real life setting of Japanese users, as well as to find out the user experience of the Nokia phone after the learning period is finished. This is because the researcher noticed that during the short usability tests, many of the test subjects had difficulties in learning the interface of Nokia phone, and the issues seemed to have been focused in the area of learnability. The difficulties in learnability should be considered seriously, since learnability is one of the essential elements in usability. However, issues and findings after the leaning period is finished should also be identified in order to study the user experience better.

4.2.1 Usability tests with interviews

4.2.1.1 Short usability tests with interviews

Test subjects

According to Jacob Nielsen and Thomas K. Landauer (1993), statistics show that usability test with five test subjects in the three phases of the product development period would be sufficient in finding the usability problems. In this study, 14 short usability test sessions (plus one pilot test) were carried out with Japanese test subjects. Since usability tests were conducted together with interviews, test subjects were the same as interview subjects, and they were chosen via snowball method. Upon recruiting the subjects, they were asked if they have used Nokia phones before, and also asked what manufacturer's mobile phones they have been using. None of the subjects who were recruited have used Nokia phones or Toshiba phones.

Devices

Usability tests are done with Nokia N95 phone as well as Toshiba 921T. At the time when the usability tests were conducted in the autumn 2008, these models were one of the latest ones in Japan. N95 is high-end model with more advanced features compared to other Nokia phone models available in the Japanese market. Thus, in terms of utility, it was a fair choice to be used in usability test with the Japanese, who are used to the mobile phones with advanced features. Toshiba 921T was used in order to compare with the usability test result of N95, because none of the test subjects have used the Toshiba mobile phones, and it has similar level of advanced functionalities as N95, although it is not possible to find the Japanese mobile phone with exactly the same spec as N95.

FIGURE 8. Nokia N95 (left) and Toshiba 921T (right) taken by the researcher

Tasks and questions

Usability tests were done together with interviews. First, test subjects were asked about their everyday life and how they interacted with their mobile phones in their everyday life; where do they keep their phones, what features and how they use their mobile phones. Based on their responses, subjects were asked to perform the same activities with N95 and 921T in the way they did it in their everyday life. This was different from the formal usability test, where the tasks were already determined prior to the test. This free form usability test was chosen because the aim of this test was to observe the user experience of the test device if they were used in the subjects' everyday life. Therefore, it was important that the tasks in the usability test was not biased. While subjects were performing the tasks, they were also asked open questions such as what they thought about the appearance of the device, the user interface and about using the non-domestic mobile phones. During the session, subjects were also asked about their own mobile phones, why they choose the model and the color, and what they like about it and what they do not like about it.

Place and length

The location of the usability test was chosen based on the convenience of the test subjects, because most of the test subjects were working in the companies and their life was quite hectic. However, in order to conduct the test in the natural setting, and study the use context at the same time, the researcher asked the test subjects to chose the location where they use their mobile phones. Although this was not always possible, some usability test sessions were conducted in the subject's office, at home or on the train. Together with the interview, each usability test session lasted for 1-2 hours. Usability test and interview data was recorded using the VCR, and later the data was transcribed by the researcher.

4.2.1.2 Long usability tests with interviews

As mentioned earlier, during the short usability test sessions, many of the subjects found it difficult to learn the interface of the Nokia phone, and the issues found during the short usability test tended to focus on the learnability aspect. Long usability test with interviews were conducted, in order to observe the user experience after the subjects have learned the interface of the Nokia phone.

Test subjects

Among the subjects who participated in the short usability test / interview sessions, two of them were chosen to participate in long usability tests. Each of them belonged to the different subject cluster, so that observation of the user experience from the different types of user's perspective was possible.

Device

Nokia N95 and Nokia 6124 were used for these tests. Due to the restriction in the resources, it was not possible to get two N95 devices. Although the Nokia 6124 has less functionality compared to the N95, and the hardware feature was quite different, software of both devices use the S60 user interface on symbian OS, so the software interface is very similar. The N95 was used by the subject who belonged to cluster 1, which characteristics included the use of advanced technologies. The Nokia 6124 was used by the subject, who belonged to cluster 2, who prefered the smaller and simple device rather than the one with the advanced features.

Tasks and questions

There was no specific task for long usability tests. Subjects were asked to use the test device as much as possible in the same manner as they use their own phone. Also, they were also asked to write down the issues and findings from the use of the test devices. Subjects were contacted daily by the researcher by text message or by photo message, so that during the limited period of time, the subjects had more chances to correspond by using the test device. Also, when subjects had questions or issues, the researcher contacted them and provided support to them.

Place and length

The long usability test lasted 1.5 or 2 weeks. The subjects constantly corresponded with the researcher via messaging. During the weekend, a phone interview was conducted to get the feedback. They were specifically asked what they have done during that week, and how they have used the test device, and what they thought after interacting with the device for a week. The interview was conducted also when the

subjects had completed the long usability test to get the overall impression and the detailed feedback, issues, and findings.

4.2.2 Longitudinal individual observation

From the beginning of July until the end of September of 2008, the researcher used the N95 and the 921T in her everyday life and conducted a longitudinal individual observation. The aim of this was to identify issues or findings when the N95 was used for the longer period of time in the cultural context as well as to compare the user experience of the N95 with the 921T. During this time period, the researcher had approximately one hour commute during the weekdays to the work place from Yokohama to Tokyo, partly by subway and partly by the train. Used functionalities include basic ones such as voice call and messaging, as well as web browsing, mobile blogging, route finding, photo taking and sending, music player and mobile wallet (in 921T only). Findings were written down by the researcher.

4.3 Analysis

When the measurement of the goals is completed and the user experience of the test device in Japanese culture becomes clear, it is analyzed by referring to the cultural difference. By comparing the Japanese persona and Finnish persona, as well as their scenarios, cultural and contextual difference becomes clear. The analysis phase will ask “why” for the user experience in Japanese culture, and look for the relationship to the cultural difference.

5 RESULTS

This section will show the results from the methods described in the previous section. Results from the field observation and the interviews are extracted into the form of persona with the scenario. The purpose of using the persona is to have a good understanding of the user, including the use context, use cases and user's goals. Issues and findings observed during the short and long usability tests with interviews as well as in the longitudinal individual observation are categorized accordingly to user experience elements and will be explained later in this section. For each issue, influence of the cultural difference is analyzed and why the issue is occurring, is discussed according to the cultural difference.

5.1 Cultural persona

Following the steps described in the method section, cultural personas are constructed based on the interview data and the literature review. There are 2 Japanese personas, Yosuke and Kaori, and 2 Finnish personas, Ville and Johanna. They are based on the clusters of the interview subjects. Yosuke, the Japanese primary persona is based on the Japanese cluster 1, and Kaori, the Japanese secondary persona is based on the Japanese cluster 2. Yosuke was designated as primary, because his attitude toward the advanced features was proactive, and it matched the concept of the N95, which is a "multimedia computer" (Nokia, 2007). Kaori was designated as a secondary persona, as her attitude toward the advanced feature was less proactive, and the features she uses was limited than the ones Yosuke used. Finnish personas were designated according to the similarity to the Japanese personas. Ville was designated as the primary, because his end goals included the use of several features including the advanced ones. Johanna was designated as the secondary, as her end goals focused on

the communication with others and information retrieval using the advanced features was not included.

FIGURE 9. URBANO

5.1.1 Yosuke (Male, 33) Business consultant, Married. No child.

Using mobile: URBANO (FIGURE 9[4])

Role: The efficient information surfer

Life goal: Live fulfilled life by getting as much things done as possible and having as much fun as possible.

Most likely to say: "This phone can load 3 web pages while the train is staying at the subway station for 2 minutes."

End goals:

-Wants to keep himself updated effectively by browsing the news or SNS with mobile web

-Wants to check the business schedule on the web calendar

-Wants to fill in the empty time slots by doing something with the mobile

-Wants to check the baseball game score on the mobile web

Yusuke lives in own home with his wife outside of Tokyo. They recently bought a house because they wanted to have their own peace. On Friday morning at 7.55, alarm in the Yusuke's mobile phone rings but he still stays in bed. At 8, the 2nd alarm rings and he wakes up. His mobile phone is always in the silent mode but he configured so that the alarm sound is audible even in the silent mode. He turns the TV on but he does not have time to watch so he just listens to the sound while getting dressed for work. After getting prepared, he sips the coffee quick then puts the mobile phone and the financial newspaper in his bag and leaves his home at 8.25.

Commute takes 1 hour and a half. The first 45 minutes is on the express train to a terminal station in Tokyo. After that, he changes to the subway, then he changes to another line. There are usually empty seats in the express train so he reads the financial newspaper thoroughly. At the terminal station, he changes to the subway. The subway is very crowded and there is no place to read the newspaper. He takes his mobile from his bag and starts browsing the SNS. He quickly loads the pages while the train is staying at the station, because that is the only moment when the phone is in the network reach. This SNS is handy because it has also a news section which has lots of text on one page. He can read the news efficiently without loading pages many times. At the same time, he can know what his friends are up to. Mobile web browsing is handy for him to fill in the several small empty time slots while waiting for or traveling on the trains. These time slots feel too long not to do anything but they are too short to focus on reading something serious.

He arrives at work at 9.55 and starts working from 10. His work day is full of meetings. Usually he has 5-6 meetings a day so he moves from one meeting room to another. His mobile phone is in his pocket while he is at work, so that he can check the meeting schedule from his mobile phone. When he receives meeting invitations, he enters it to the web-based calendar from his PC, so that he can check the schedule from the mobile web.

Between the meetings, he comes back to his desk and checks emails. He notices that there is an invitation email in his inbox for the farewell party for his teammate tonight. Email has a link to the web page of the restaurant so he clicks the link and the browser opens with a map, direction and the contact information.

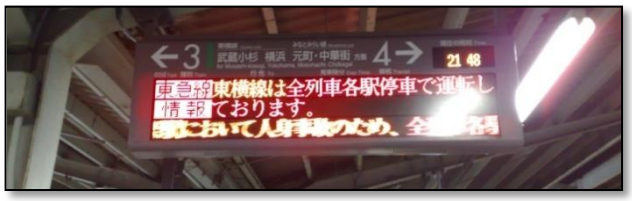
[4] Note: Copyright (C) 2009 KDDI CORPORATION

Using mobile camera, he takes a photo of the PC screen showing the map. At the same time, he adds the party to his web-based calendar.

His day at work continues until 8.30pm, and since all other teammates already left for the farewell party, he goes there alone. The place is two stations away from his office. He leaves the office and head to the subway station. While waiting for the subway, he checks the score and the current pitcher of the baseball match using the mobile web. The subway comes and as he gets on, he remembers that he should send a message to his wife. He quickly writes a message but as he sends, the subway starts to move to the tunnel. The phone returns a note "The message was not sent". When the train arrives at the next station, he resends the message, and confirms the note "The message has been sent".

The train arrives at the following station, and he gets off. As he goes up the stairs from the subway platform, he opens the image of the restaurant information which he took with his mobile camera. The direction tells that the restaurant is near the B4 exit. There are several exits in the station so he first needs to find out which exit he should go to. He checks the station map and finds the right exit. Using the map that he took with his mobile camera, he could find the restaurant.

The party finished at 11pm, and he goes to the station. At the station, he hears continuous announcement about the train accident. The information board in the station also shows that there is some delay in the train schedule. Even if the train is delayed for a couple of minutes, it is normal that some voice announcement and/or the information board notifies about the delay. However this time, it seems the trains are delayed for more than 15 minutes.



He takes his mobile and access to the route finder web page and starts searching for other travel options. He checks the fastest route and goes to the platform of that line. As he waits for the train, he notices that there is an advertisement of the real estate agency that he bought a house from. Most of the agencies have web sites but it is too much work to remember and type in the whole URL into the browser. The advertisement had a search word, which he can type in the mobile portal website which his phone automatically accesses when he opens the mobile web, so it was easy to get to the web page of that agency.

Yusuke has to wait for the train for 8 minutes, which feels quite long if he is not doing anything. He takes his mobile phone again and opens the digital TV for a news program. On the other side of the platform, there are several people like him, all looking at the mobile phone's screen.

The train finally comes. Because of the accident on another line, it is

quite crowded but he can still continue watching the mobile digital TV. He uses the subtitles so that he understands without the sound. After the news program is finished, he checks the stock exchange using the mobile web, then check the SNS to browse the news and friends' diary.

He arrives home at 1am. When he comes back home, his wife says "You were busy today". He replies "Well, I don't feel that I am so busy". His schedule is full of plans and he is always doing something. He rather thinks his life is content and does not think that he is busy. Rather, if there is some moment when he is not doing anything, it makes him feel worried.

For Yusuke, the mobile phone is an information device. Using the small empty time slots, he can get himself updated with the latest news which helps in his work. Also, he can stay connected efficiently with his friends through the SNS, although not directly.

In Japan, mobile phones are purchased via the operators. Depending on the operator, the available models are different. There was some attractive model available from other operator, but Yosuke did not bother to change the operator, because then his mobile email address would have to be changed and it is quite a big deal to change the mobile email address. Yosuke communicates mostly by emails rather than SMS or voice call. SMS is not commonly used in Japan, as it is not possible to send SMS from the mobile of one operator to another operator, so if one says "mail" in mobile context, it usually means email.

For this reason, he chose his current mobile from the available models of his operator. He chose this model because of the functionality and the uniqueness of the design and feature. The big clock on the cover screen looks practical and original, because he does not have to open the phone when he wants to quickly check the time while in the meetings. However he changed the clock from analog to digital, because many times, he needs to know the exact minute. It was also important for him that the manufacturer can be trusted. He has been using the mobile phone for over 14 years now and has been switching the mobile every 2-3 years when the model with attractive features comes out. Every time he switches his mobile, he does some research using internet and product brochures. Also he reads through the technology section of the news paper daily. From what he gathered, this manufacturer could be trusted, and safe.

Overall, he is satisfied with his mobile, he can get things done quickly in a satisfactory level and he could learn how to use it without reading the manuals at all. He also likes the fact that the design is a bit unique and not many other people are using it. It is also important that the hardware is thin and light so it does not feel uncomfortable when he keeps it in his pocket. He customized the shortcut applications, so that he can easily access to the most frequently used features quickly. The most frequently used features are clock, the web, camera, digital TV and messaging. He uses the mobile camera mostly as a memo. He hardly uses voice call. He talks about 3 times a month. At home, he does not use his mobile so much, except the alarm and when occasionally receives some message from his friends. Some of his friends bought iPhone as a second phone. He thinks iPhone is an interesting toy but not for practical use, because it does not have digital TV, and he cannot use it with one hand and the touch screen seems difficult to use for writing the text.

FIGURE 10. Nokia N95

5.1.2 Ville (Male, 30) Project manager, Single

Using mobile: Nokia N95 (FIGURE 10)
Role: The versatile user
Life goal: Work smart, play hard with interesting people
Most likely to say: "I like enjoying the relaxing moment that comes after the long day of challenge at work or adventure with my friends. A mobile is a tool to help me getting through the long day."

End goals:

-Calls clients and colleagues to inquire or to share the information
-Searches for work related information when away from internet
-Calls/SMS friends to inquire about meeting each other
-Takes photos of the places and friends and shares the photos on SNS
-Searches for the information of the product or places
-Uses GPS to navigate to the unknown place as well as track exercise results

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Ville lives alone in the apartment which is quite close to the center of Helsinki. He chose that area because he can enjoy the nature while it is quite close to work and places to meet his friends.

Ville's day starts at 7am, when his mobile alarm rings. After he wakes up, he turns on his PC and gets dressed. While drinking coffee, he quickly checks his private email. After reading some mails, he puts his mobile phone in his pocket and leaves home around 7.30am. When the weather is nice, he sometimes walks to the office. Otherwise, he takes a bus. The commute is short and he spends about 5 minutes on the bus and walks for 10 minutes. Since the commute time is so short, he usually does not do much on the bus, except when there is some urgent message from a client, he tries to read from the mobile phone before he gets to work. He starts working at 8am. During the work day, he communicates quite a lot with colleagues and clients using his mobile. Usually he communicates using via voice call but sometimes when the matter is simple, or the other person does not answer the phone, he sends the SMS.

Several times a week, he travels to the clients' site. When he visits the client, he takes his laptop, but his PC cannot always be online. In such cases, he uses the web browser in the mobile to search and find the information he needs. Also, he checks the company emails on the mobile phone. When he is having a meeting with the client, he turns his mobile phone to the silent mode. He is in charge of several projects, so his work day is quite intensive, but he enjoys meeting different people and having new challenges. After visiting the client, he usually goes back to the office. On the way to the office, he checks his email with his mobile to read the messages from colleagues or other clients. Sometimes he sends SMS to his friends and asks if they want to go eating in the evening. When he comes back to the office, he discusses with his colleagues about the client he just visited, and he also responds to emails he received while he was away.

Around 5pm, he leaves the office and goes swimming at the local pool. He often goes swimming or walking in the forest to calm down after the intensive day. After swimming, he noticed there is a SMS message from

his friend, who can join for dinner tonight. He calls his friend and agrees to meet at the restaurant nearby. While having a dinner, they discuss about the plan to camp in the national park which they plan to do two weeks later. They talk about what they would need to bring. Ville checks the products using the mobile web browser. After the dinner, Ville comes back home around 9.30pm.

Sometimes after work, he goes walking or running to the forest nearby. He takes his mobile with him so that he can track the exercise results using the Nokia sports tracker application, which he downloaded and installed himself. After walking or running, usually he comes back home around 7pm. He cooks and listens to music. Later, he turns on the PC to check email and SNS. He created the camp event with SNS and invited his friends so that people can discuss about the camp event online, and also they can invite others. Ville found out that some new people will join the camp and is happy about it. Later he takes a shower and turns his mobile to the silent mode. After the intensive day, he does not want his mobile phone to disturb his relaxing moment at night. He places it on the table near the bed and goes to sleep around 12am.

Two weeks later, Ville goes camping with his friends. They rent a car together and load with food as well as equipments then they head to the national park. They have camped in other places before but they have not been to that national park before. Ville uses the GPS in the mobile phone to navigate the route to the destination. Because he visits unfamiliar places quite often, this feature is handy. After they get to the national park, they go for a long hike until the late evening. In the evening, they cook, drink and talk while enjoying the late sunset. Ville takes some photos with his mobile camera.

The next day, they go walking outside on the trail paths. Ville can orientate himself with the GPS in his mobile phone. He thinks his mobile phone is convenient, because pretty much everything he needs is there. After he comes back from camping, he expands the network in SNS and uploads the photos he took with his mobile and shares with friends.

For Ville, the mobile is an essential tool to get his work done with new challenges. At the same time, he can use it to have fun with his friends, visit new places and experience new things. He chose the N95 because it has all the features he needs and it can be used like a handy computer. The browser is important to search the information he needs in his professional and private life. The camera is handy because he often visits new places with friends and meets new people. The GPS is convenient when he visits some places in the nature. It has the features that he needs but it is still small enough to fit into his pocket, and the design is sophisticated enough to be used in front of his clients, but still not too professional to be used in the private life.

Because his work is in the IT field, he has chances to try out the new mobile technologies. Also, since most people around him are using Nokia phones, he can share the information about the interesting add-on applications. He is not keen to try every new technology, but is not afraid to spend some effort and money to try the advanced features if he thinks that it would help to achieve his professional goals and make his private life more enjoyable. For that reason, he has been changing his mobile phones every 2-3 years, even if the one he is using at that moment does not get broken.

FIGURE 11. 812SH

5.1.3 Kaori (Female, 31) Marketing sales assistant, Single

Using mobile: 812SH (FIGURE 11[5])
Role: The experience sharer
Life goal: Share small happiness from everyday life with friends and family
Most likely to say: "Look what I've found on the street."

End goals:
-Wants to be connected with friends and family members by sending fun messages
-Wants to share the experience with others by exchanging the photo messages
-Wants to have the uplifting feeling from what she uses every day

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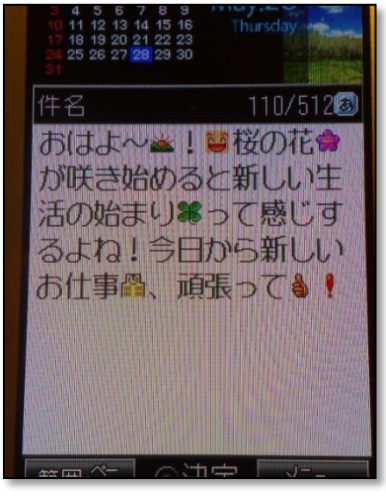
Kaori lives alone in the small but nicely decorated apartment in the suburb of Tokyo. She works as a marketing sales assistant in a mid-sized electronic manufacturer, where 150 employees are working.

Monday morning, at 7am, Kaori's alarm clock rings. Slowly she wakes up, gets out of bed, turns on the TV and gets dressed while hearing the news. According to the weather news, the cherry blossom flowers will likely be in bloom this weekend.

While getting dressed, she removes her pale pink mobile phone from the charger and quickly checks whether any message have arrived. No new message. She turns the phone to the silent mode then put it to the side pocket of her handbag. She makes a cup of tea in her favorite mug, which she got from her sister as a birthday present. The color of the mug is the same color as her mobile phone. Because it is her favorite color, it keeps her feeling uplifted. While having a tea, she starts thinking about her friend, Sachi, whom she went for lunch with yesterday. Sachi starts working at her new job from today and is a bit nervous.

At 8am, she leaves from home. The nearest station is about 10 minutes walk from her apartment. On the way to the station, she finds some cherry blossom flowers which are beginning to bloom and takes a photo using the camera in her mobile phone. After arriving at the station, she waits for the train in the right queue. Since there are several kinds of trains arriving to the same platform, lines are drawn on the floor to mark the right queue.



The train arrives shortly and she gets on the train. The train is not so crowded but all the seats are occupied as usual. As she is riding the train, she starts typing a message to Sachi. "Good morning ☺! Cherry blossom reminds me of the beginning of the new life. Good luck on

[5] Copyright SOFTBANK MOBILE Corp., 2009.

your first day of your new job." She inserts various pictographs to add feeling and attaches the photo of the cherry blossom and then sends it to Sachi. After she checks for the confirmation note "the message has been sent", she starts browsing the messages that she has received.

She uses her commute time to respond to the non-urgent messages. There are some available priority seats but she rather stands, because in the priority seat, she has to turn off the mobile phone. In 45 minutes, Kaori arrives at her work place. Her regular work hours are from 9am to 5.30pm. Sometimes she has to work overtime but usually she can leave by 6.30pm. During the work hours, her mobile phone is in her bag. Sometimes when someone is calling, the phone vibrates in her bag but she doesn't answer. At lunch time, she checks her mobile phone for any calls or messages. If there are any urgent calls, she returns the calls, but otherwise she does not respond until the work day ends. Sometimes she takes her mobile to the toilet when she is expecting an important message.

At 6pm, Kaori is finished with work and leaves work. On the way back home, she drops by at a store to look for a gift for her cousin who has recently become a mother. She already had a gift picked at but it is not in the same place anymore. She wants to ask where it went, but there is no one around so she goes to the cashier. Although she just wants to ask a question, she has to wait in the queue. Fortunately, the queue is not long and she can find what she is looking for.

After leaving the store, she takes a train back home. In the train, she takes her mobile phone from her bag and notices that there are two messages. Since her mobile phone is basically in the silent mode all time while she is out, often she does not notice when the message is received. In that case, she checks the time stamp of the received message and if she notices that the message was left unnoticed for long time, she apologizes for the delay when responding to the message. The messages were from her mother and from Sachi. Her mother lives in her hometown, which is in the western part of Japan. Although they do not see each other often, they exchange messages almost daily and the photos attached to the messages make them feel closer.

When she comes back home around 7.30pm, she turns on the PC and starts cooking. Her mobile phone is on the table near the PC. While eating, she checks her emails and browses the SNS to read her friends' diary . She leaves some comments on her friends' diary. After she is finished eating, she receives a message from Yuki, who lives in her neighborhood. They go walking together three times a week. In the message she says "Hi! How was your day? When do you want to leave for walking?" Kaori responds to the message "My day went OK. Shall we leave in 30 minutes?"

Thirty minutes later, Kaori leaves from her home with her mobile phone. It's better to keep the mobile with her in case something happens. Kaori meets Yuki in front of the station and they walk for an hour. They talk about their work, and some other small things in their lives.

Kaori comes back from walking around 10pm. She takes a shower and after that, she starts watching the

English conversation lesson program on TV, which her boyfriend, Hiro is also watching. She sends a message to Hiro, reminding that the program has started. Hiro replies a message to Kaori, telling that he is also watching the same program. That message makes her feel that they share the same moment although they are in different places.

After the program is finished, she keeps the TV on, but corresponds with Hiro with some messages about the TV program they just watched. The same communication may be done with the phone conversation, but they use mobile messaging, because they can correspond in more relaxed way without disturbing each other too much. Around 12am, she sends a message to Hiro, telling good night, then puts her mobile phone to the charger and then sets the alarm clock and goes to sleep. It is important to charge it every day. Otherwise, she might not be able to answer if something happens.

For her, the mobile phone is an essential tool to connect her with other people. It is very useful because using the messaging, she can share experiences with others without disturbing them. She chose her mobile because of the color, size and weight. This pale pink color is cute and reminds her of the cherry blossom flower and keeps her feeling uplifted. She likes the fact that the fingerprint does not stay on the matt surface of the phone. Also, it is useful that she can see the time on the cover screen without unfolding the phone. She doesn't wear a watch so when she needs to know the time, she checks her mobile phone.

When she bought her mobile, she chose the one without the advanced features such as digital TV, as it makes the mobile bigger, heavier and more expensive. Also, her friend is using the same model and recommended that it's easy to use. Kaori does not like reading the manuals so she asks her friend when she does not know how to use the mobile phone. She has been using the mobile phone for over 10 years and has been using the mobiles from the same manufacturer most of the time, so that she does not have to learn the new interface.

The most frequently used functionalities are the messaging, the camera and the clock. She hardly talks on the phone except when she meets her friends. She usually calls when she gets to the place of meeting, because usually the meeting places are crowded and without phone calls, it is difficult to find each other. She configured the setting so that the screen shows many colors (FIGURE 12[6]).

FIGURE 12. 812SH menu screen

[6] Copyright SHARP Corp., 2009.

FIGURE 13. Nokia N81

5.1.4 Johanna (Female, 32) Resource coordinator, Married, one child

Using mobile: Nokia N81 (FIGURE 13[7])
Role: The information sharer
Life goal: Be a good mother, good wife and good family member
Most likely to say: "Let's call sometime again"

End goals:

-Calls to hear how her family is doing
-Wants to be contacted if something happens to her son
-Calls her husband when some family arrangement or information sharing is needed
-Uses SMS to send reminders to her family
-Uses SMS to contact her friends to arrange an occasional meeting

Johanna lives in her own home in the suburb of Tampere with her husband, Teemu and son, Joonas. They bought the house two years ago and have been doing the renovation little by little.

At 6.00am, Johanna wakes up with the mobile alarm. Teemu wakes up at the same time. Johanna gets dressed and goes down to the kitchen with her mobile phone, and makes some coffee after putting her mobile on the table. Then she wakes Joonas up and helps him to get dressed. In the kitchen, Teemu is having breakfast and reading the paper. He leaves for work earlier than Johanna. Johanna prepares the breakfast for Joonas and herself and they eat together. After they eat the breakfast, Johanna puts her mobile in her handbag then leaves from home with Joonas at around 7.30am.

First, Johanna takes Joonas to the day care center which is in walking distance from their home. After taking Joonas to the day care center, Johanna takes a bus to go to work. Commute takes about 30 minutes altogether and Johanna spends 20 minutes on the bus. The bus runs every 15 minutes in the mornings. Usually she takes the same bus every day but in case there is some changes, she has a bus time table in her bag.

The bus is sometimes delayed for about 10 minutes but Johanna thinks it's normal. While waiting for the bus at the bus stop, Johanna looks at the direction from where the bus comes. When the bus approaches to the bus stop, Johanna makes a sign to the driver so that the driver knows that she wants to use the bus. Otherwise, the bus would not stop. The bus is usually not so crowded and there are usually some empty seats. On the bus, she checks the mobile's idle screen to review her work and private schedules and her to-do lists. She remembers that today is Joonas's candy day so Johanna sends SMS to Teemu to remind to buy some candies for Joonas when he picks Joonas up from the day care center in the evening. The idle screen of Johanna's mobile phone shows one to-do item: "call healthcare center". She makes a call to the local healthcare center in order to make an appointment for a regular dental check for Joonas, and updates the calendar with the appointment. Johanna does not actively make long phone calls while on the bus, however if she needs to take care of something, she makes calls. Also, if someone calls, she answers. It is not prohibited to talk on the

[7] Copyright Nokia, 2009.

mobile in the public transportations in Finland.

Johanna arrives at work around 8.30am. At work, she uses the mobile calendar to organize the schedules, and checks the tasks. She does not use her mobile phone for work related calls, because work related communications are done face-to-face, by emails or by messenger. She has several meetings, including long formal ones and short informal ones. She adds the meeting schedules in her mobile phone's calendar so when the meeting time comes, she is alerted even when she is away from her PC. Also, she adds the important to-dos to the calendar with deadline information. When she is at her desk, her mobile is on her desk. When she goes to the meeting, she usually takes her mobile with her, so that she can check and update the schedules and to-dos while in the meeting. A good thing about using mobile calendar is that she can manage both her private schedules and work schedule on the same device and can check anywhere anytime. Because she has a small child, sometimes private schedules can affect the work schedule, so it is necessary that she can manage both private and work schedule on one device. During the long formal meetings, she turns the mobile to the silent mode. Otherwise, it is usually in the normal mode.

One of her co-worker came to her telling that they are planning a Mayday gathering, and asks if Johanna's family wants to join. Johanna calls Teemu, but he does not answer. He is probably in a meeting. Johanna sends a SMS to Teemu. During the office hour, she does not make long phone calls, but sometimes she makes quick phone calls, or sends some SMS for private reason when needed. After a while, she receives a reply from Teemu, saying he wants to join the gathering. Johanna updates her mobile calendar about the time and the place of the gathering.

Her work day finishes usually at 5pm, and takes a bus back home. She checks the bus schedule before leaving the office. The bus runs about every 20 minutes. There are usually empty seats in the bus. She sits in a window seat, while looking out the window, she receives a call from Teemu. Johanna answers. Teemu asks Johanna to buy some milk from the store on the way back home. After hanging up the phone, she looks out of the window again and wonders what to cook tonight. If the model of the bus is new, there is a screen at the front of the bus telling the name of the following bus stop. In many cases, there is no voice announcement, so she needs to be aware of where the bus is. When the bus approaches to her stop, she presses the stop button. She gets off at the bus stop and drops by the grocery store and buys some milk in a blue carton. Regardless of the manufacturer, milk carton in Finland is color coded; full fat milk in red, low fat in blue, 1% fat is light blue, so she can find the right milk without checking the text on the carton.

When Johanna arrives back home before 6pm, she puts her handbag near the kitchen table, where Teemu is giving candies to Joonas. They talk about the day for a while, and then Teemu takes Joonas out to the yard. While they are playing, Johanna prepares for the dinner and they eat around 6.30pm. After dinner, while Teemu and Joonas are watching TV, Johanna calls her sister. There is no particular reason but they often call each other and keep each other updated about their life. After the call is finished, she places her mobile on the table in the living room.

Joonas goes to sleep around 9pm. After that, Johanna turns on the PC and checks her emails and SNS to view her friends' status. She sometimes browses the internet to get some ideas for the renovation, and discusses them with Teemu. Although her mobile has a capability for web browsing, she does not use it, because the

screen is too small and she does not feel the necessity for using the mobile browsing while she is out. When she is at work or at home, she has access to Internet. After using the internet for sometime, Johanna takes a shower and then takes her mobile from the living room to the bedside table, and goes to sleep around 11pm.

On Saturday, Johanna's family goes to the department store to check out the sale. They go to the food section and discusses if they should buy the food in the show case, because it may contain nuts which Joonas is allergic to. There is a small queue machine on the opposite side of the glass showcase, where people take a small piece of paper with a number on it, and waits until the screen shows their number. The machine is quite small, and there is no sign that says "Take the number". Also, there is no sound when the number changes. However, this system is usual in the large stores in Finland, so Johanna unconsciously checks whether there is such system. This time, however, Johanna is not sure whether she wants to buy the food before she checks the ingredients. Because of the sale, many people are waiting for their numbers. Johanna quickly asks the question to one of the sales person without taking the number, and finds out that the food contains nuts. After shopping, they come back home, and they have coffee in the yard. Johanna makes a phone call to her sister and asks her family to come over to help with the renovation work on Sunday.

On Sunday afternoon, Johanna's sister's family comes over. While the children are playing in the yard, the adults do the renovation work. Johanna takes some photos of the children using the mobile camera. She keeps the photos in the phone and sometimes shows them to friends when she meets them. Later, she calls her parents and keeps them updated about how they are doing.

For Johanna, the mobile phone is a tool to organize schedules on the calendar, inquires about matters and shares the information by calling or by sending a SMS. She communicates mostly with her family by voice call, except when she cannot reach by calling or wants to remind something, she sends SMS. When she contacts her friends, she often use SMS, unless it's urgent or there is some complicated matter.

Johanna got her N81 as a birthday gift from Teemu about a year ago. She is satisfied with it, because she can get things done effectively. It is useful that the idle screen shows the recent schedules and the to-dos. The size and the weight is also right for carrying around or using it. Mobile camera is not so necessary for her but it is nice to have, when her camera is not around. The simple and practical design is also appropriate for work. She does not want to use fancy designed mobile, or a professional looking mobile either.
She configured the quick dialing so that when the key [2] is held, it makes a call to Teemu. When [3] is held, it calls her sister. Otherwise, she has not customized her phone.

She has been using the mobile phones for over 10 years. Since the practicality is important aspect for her mobile use and she does not seek the newest technologies, she does not switch her mobile phone often. Only when it breaks, or is received as a gift, she changes her mobile.

5.2 User experience results and analysis

Issues and findings observed during the short and long usability tests with interviews as well as in the longitudinal individual observation are explained in this section. For each issue, a discussion follows to analyze what kind of cultural difference is causing the issue. Analysis is done by considering the cultural difference defined in the cultural dimensions, as well as differences in use contexts, such as tasks, physical environment, technical aspects and social settings which are studied from the interviews, field observations, reports, and white papers.

5.2.1 Utility

This section will provide the answer to the following questions:

- Does the N95 provide useful features which the users in the cultural settings can accomplish their goals?
- How is the usefulness influenced by the cultural difference?

As previously mentioned, the Nokia N95 is a high end model with advanced features. On top of the standard features of the mobile phone, it also has a music player, WLAN, as well as a GPS. According to the Japanese interview subjects, the features they use include messaging, voice call, an alarm, a phonebook, a calendar, a camera, the web, a digital-TV and a mobile wallet. The use of the digital-TV is mentioned by 3 out of 15 Japanese test subjects and the mobile wallet use is mentioned by one test subject. According to the white paper, the mobile wallet feature is used by approximately 18% and the digital-TV is used by 36% of the Japanese mobile users in the year 2008 (Mobile Contents Forum, 2008). On the other hand, none of the Japanese interview subjects said that they use or they need the mobile GPS feature,

while three Finnish interview subjects mentioned that they use this feature.

The use cases and the lifestyle of the Finnish subjects who mentioned the use of the GPS feature are represented in Ville's scenario. They have mentioned using it during their free time either when they visit some unfamiliar places or together with sports tracking. What they have in common is that all of them mentioned that the nature and sports as their interests. Although one Japanese subject answered that he goes to the sports gym on Sundays, the combination of the nature and the sports is not mentioned as interests by any of the Japanese interview subjects. Unlike the Japanese subjects, it seems natural for the Finnish subjects to do activities in the nature during their free time and being in the nature is part of their life. This is probably because compared to the subjects living in the urban area of Japan, access to the nature is easier for Finnish people even if they are living in an urban area. Visiting an unknown place in the nature and visiting an unknown place in the city requires different tools. In the nature for example in the forest or in the national park, there is less directional signs. So naturally, the GPS would be a useful tool to find out the current location. In the city, on the other hand, directional signs can be found often and it is easy to know the current location. Not only on the street, as in Yosuke's scenario, but also in the station, it is quite common to find the direction maps of the exits. Thus, having maps or GPS on the mobile is not necessary. Rather, one would need a tool to find out how to use the transportation. Such tools as train journey planner would be a useful tool in this kind of situations.

The N95 does not provide the mobile wallet feature probably because of the difference between the infrastructure in Japan and in Finland. Mobile payment has been in practice also in Finland. However, payment is done by sending a SMS to the

particular number, so no extra feature is required in the mobile phone. On the other hand, mobile payment in Japan requires a dedicated feature in the mobile phone's hardware and software, because it is done through the "mobile wallet", to which the user loads some amount of money or register the credit card in advance and payment is done by contacting the mobile phone to the casher's contact port.

The same could be said about the lack of the mobile TV feature in the N95. Although it is not commonly used and none of the Finish interview subjects have mentioned about its use, the mobile TV has been available commercially since the end of the year of 2006 in Finland (Digita Oy, 2009). Some high end models from Nokia have the capability of receiving the TV signal without additional equipment. However, while the standard which is taken into the practice in Europe is DVB-H[8], Japan is using its own standard called DMB[9] (Kaasinen et al., 2008) . Thus, it would require extra effort in order to make them compatible with the standard in Japanese mobile TV and that is probably be the reason that the N95 is not providing the mobile TV feature for the Japanese market.

In a summary, the technical difference, specifically, the infrastructure between Finland and Japan seems to be the factor for the N95 not providing the mobile wallet and mobile TV features. Considering the percentage of the users who use the mobile wallet feature or mobile TV feature, it looks like it would not be critical even if the N95 does not provide these features. However, since most of the other Japanese high-end mobile phones provide the mobile wallet and mobile TV feature, the people's expectation for the high-end model would be created based on this fact.

[8] Digital Video Broadcasting for Handhelds
[9] Digital Multimedia Broadcast

Hence, the lack of these features would not influence the usefulness of all the Japanese users However, for the people who use the Japanese high-end models, as the persona Yosuke, missing these features, especially mobile TV may be an issue. Since the purpose of the mobie TV use is mainly for having fun rather than for the pragmatic purposes, it might be inaccurate to say that missing this feature affects the usefulness. However, as one Japanese subject said below, missing this feature would affect the fun part of the mobile phone use in Japanese culture. Although having fun is not a pragmatic goal, it is one of the important goals in the mobile use for the users like Yosuke.

> I don't seek for the exciting feeling inside of the device. However, being able to access to the information that I need quickly, for instance quickly checking the baseball score, or watching the mobile TV makes me feel excited. (J10, male)

5.2.2 Usability

As discussed in section 2, usability in this study includes effectiveness, efficiency and learnability. Issues found during the usability tests are classified into these categories, and each issue is followed by the analysis considering the cultural difference.

5.2.2.1 Effectiveness

This section will provide the answer to the following questions:

- Do the N95's features work in a valid way so that the users in the cultural settings can accomplish their goals?

- How does the cultural difference affect the effectiveness of the N95's feature?

From the usability tests, four main issues are found relating to the effectiveness: a mini-map browser, a message time stamp, an attitude toward the sound and the status note. Each issue will be described with the possible reasons based on the cultural difference.

Mini-map browser

One of the outstanding issues found during the short and long usability tests was regarding the web feature in the N95. The N95 has a mini-map web browser, which has a higher capability than the standard mobile web browser, as it can display the web page similar to the original layout, instead of squeezing the page to fit to the width of the mobile screen (FIGURE 14, left) . Users can scroll around to see the original web page, and the benefit of this browser is that compared to the standard mobile web browser, which can show only the web pages created for mobile phones, the mini-map browser allows users to access to the normal web pages which are viewed from the PC's browser. On the other hand, the mini-map browser is not compatible with the Japanese standard mobile portal web page provided from the operator (Yahoo! Keitai) (FIGURE 14, right). Thus, N95 has a bookmark to the PC portal web page (Yahoo! Japan).

FIGURE 14. Left: Yahoo! Japan on N95 mini-map browser, taken by the researcher, Right: Untitled image of Yahoo! Keitai top page on standard mobile browser. Note: Copyright Yahoo Japan Corporation, 2009.

This was pointed out as an issue because of the time it takes for the browser to load the standard web page, difficulty to navigate around, as well as the cost of the data transmission. This was referred by the long usability test subject as “unbearable stress” (J10, male). This issue was categorized under the effectiveness, because the browser does not function in a valid manner that the user wants. However, this can also be an efficiency issue, as a number of the test subjects mentioned that compared to loading the standard mobile portal web page (Yahoo” Keitai), it takes too much time to load the standard PC portal web page (Yahoo! Japan) with the mobile connection, and they have to wait unnecessarily until they can start browsing or searching for the information. The reasons why this mini-map browser is considered to be an issue in Japan are probably because of the difference in the standards coming from the historical background of the mobile cultures, as well as the difference in the use context.

Mobile web service was first launched in Japan as i-mode service in 1999 from one of the Japanese mobile operators, and the service was quickly accepted by the

majority of mobile users. Already in year of 2000, the number of subscribers exceeded 12 million (Barry, 2002). At that time, fast 3G connection was still not available, so the web pages which users accessed from the mobile phones needed to be such pages optimized for the mobile phones, which had less data size and the pages were designed to fit the screen of the mobile phones. The popularity of the i-mode service has made contents providers to provide such mobile optimized web pages. By the time the fast 3G connection was standardized after the year 2002, the Japanese mobile culture established such use case model, that when users access to the web from the mobile, they accessed to the mobile specific web pages. This can be proven by the fact that even though nowadays it has become technically possible to access the PC web pages using the high end browser (full browser) on many of the Japanese mobile phones, only 15.6% of the users have used that feature, and 39.7% of them used it less than once a month (Mobile Contents Forum, 2008).

On the other hand in Finland, the report on the mobile network use of 2008 says that although some mobile web sites are frequently accessed, accessing to the PC web sites is the majority of the mobile networks use from the mobile device, and the access rate to the mobile web pages is low (Riikonen & Kivi, 2009). This is probably because compared to the i-mode in Japan, Wireless Application Protocol (WAP) service was not successful in Finland and therefore the number of the mobile optimized web pages is low. In this use context, the mini-map browser would be very useful because it allows users to navigate around the PC web pages in a mobile screen smoothly and they can have the similar experience as browsing the web on the PC. However, since the expectation of the Japanese users' mobile browsing is constructed based on the i-mode service, where they browse the mobile optimized web pages and it is normal to browse from the mobile portal web page, the mini-map

browser which does not allow them to access to the mobile portal web page may have been considered less effective.

Another difference is in the use context. The long usability test subject mentioned, “With my own mobile phone, I can load a couple of web pages while the subway is staying at the station (and therefore the mobile is within the network reach). But with this N95, not even one page could be loaded” (J10, male). As in Yosuke’s scenario, the mobile web feature is often used during the commute time in Japan, and taking the subway is one of the most common commute methods. In the longitudinal individual observation, it was noticed that during the short moment while waiting for the subway or when the subway is stopping at the station is the only time one can load the web page. This duration depends on the situation but usually is a few minutes. If the web page cannot be loaded during this time, it frustrates the user, because it is not possible to see outside the window on subways, and since the commute may last over an hour, it becomes very boring. Compared to Finland, the commute time tends to be longer in Japan. Also, since the commute often requires changes of the trains, there tends to be several empty short time slots. The mobile web is frequently used in such short time slots. In such a case, one can see the influence of what Hall & Hall (1990) said about the perception of the time. Japan has a polychronic culture, and according to Hall & Hall, in the polychronic cultures, multiple things happen simultaneously. The mobile is such a handy device for the polychronic culture, because it allows them to do something else while they are not fully engaged in other activities. If the mobile web is used in such short time slots while the user is doing something else at the same time, one would value the efficiency, such as providing the most relevant information quickly rather than providing the detailed information. This would be the reason why the test subject has

valued the mobile web browser than the mini-map browser. When using the mobile web browser, access is restricted to the mobile optimized web pages, which provides limited information but retrieving such information is fast. On the other hand, mini-map browser allows access to the PC web pages with rich information but retrieving of such information takes a longer time.

On the contrary, as Ville's scenario tells, the mobile web is used when searching for the information at work and when the PC is not online or when one is not in front of the PC but needs to check some information (e.g. in a business or private meeting). Otherwise, one subject answered that she may use mobile web when checking the information of the products on the way to the store. Another subject mentioned using it while killing time during a long commute or when staying overnight away from home. In the first two cases when they are searching for the information, the users would rather use detailed information, in fact, in these situations, they are actually using the mobile web as a substitute for the PC web. In the latter use contexts, efficiency is not a critical factor. Considering these use contexts, the mini-map browser would be more effective than the mobile browser for the Finnish users.

Message time stamp

Another issue pointed out was the timestamp of the message. If the user receives messages in the N95, the inbox shows the list of the messages with the sender and the message title (FIGURE 15, left). Several test subjects pointed out that the inbox message list should show the date and time when the message was received. In the N95, once the message is opened and the [Message details] option is selected, it is possible to see the time stamp there. However, since the timestamp information is

frequently used, Japanese subjects say it is too much work that they have to go through all those steps every time they want to see the time and the date. One of the Japanese test subject said “It's a bit difficult to know what time the message has arrived. Because I cannot check my phone so often, I need to check when the message has arrived” (J13, female).

FIGURE 15. Left: Inbox of N95 not showing timestamp. Right: Inbox of 921T showing the timestamp at the bottom of the screen. Taken by the researcher

As in Kaori’s scenario, mobile use is forbidden in many of the work places in Japan. Even though there are no written rules, the social context does not allow the workers to do something private during the business hours. Among the Finnish test subjects, only one subject has answered that the phone use is forbidden at work, as she is a cashier. The other Finnish co-worker who used to work at the DIY store as a sales person mentioned that even though there was a rule to prohibit the use of the mobile phones at the store, workers were using mobile phone when there were no customers, “because when there are no customers, it would not cause a problem anyway” (F8, male). As Hampden-Turner and Trompenaars (1997) wrote in specificity vs. diffusion dimension, mental commitment to the work is bigger in the diffusion culture than in the specific culture.

Needless to say, one is supposed to turn the mobile phone to the silent mode at work in Japan, and this applies also to the public transportation, where one hears the continuous audio announcement to turn the mobile phone to the “manner mode” and the voice call should be refrained. There is no governmental law to prohibit the use of the ring tone or voice call on the public transportation. Rather, the regulation is the social norm, so that one would not bother other passengers with the sound of the mobile phones. As in Johanna’s scenario, although it is not encouraged to talk on the mobile phone in the public transportations in Finland, some Finnish interview subjects answered that they talk on the mobile phone while on the commute when they need to take care of some matter. Only one Finnish subject mentioned the annoyance of the mobile phone use in the public transportation. This difference may come from what Hall & Hall (1990) mentioned as the spatial differences. According to them, space is perceived not only by vision, but also by other senses including auditory sense. In the dense place such as the urban area of Japan, personal space perceived by vision is smaller compare to the one in Finland. If the sound comes from the mobile phone in such space, it would make the perceived personal space even smaller, and would make people feel more disturbed than hearing the same sound in the sparse place. For these reasons, the mobile phone is either in the silent mode or its use is refrained for longer time in Japanese culture. In such situations, incoming messages often remain unnoticed, and the importance of the message timestamp is increased.

Attitudes toward the sound

During the usability test, many of the Japanese test subjects were surprised when

they heard the default ring tone of the N95, because it is loud. “The default sound volume is too high. I would immediately turn down the volume” (J6, female). The default ringtone volume is the same as if one purchases the N95 in Finland. As mentioned in the previous issue regarding the message time stamp, due to the spatial difference, the degree of disturbance caused by the sound is bigger in the spaces in the urban areas of Japan than in Finland. If one happens to forget to switch the mobile phone to the silent mode in the crowded public transportation and the ringtone starts to sound, one feels ashamed for violating the other passengers’ auditory personal space. If the sound is loud, the embarrassment amplifies. On the other hand, if the space is less crowded and the distance between the personal spaces are bigger, the degree of violation is smaller and the sound causes less embarrassment. Another Japanese test subject suggested that it would be better if there is a “manner key” on the side of the phone, so that it will be possible to switch the phone to the silent mode quickly without taking it out of the pocket or the bag. This suggestion is also from the desire to avoid feeling ashamed of violating other people’s personal space in the areas with high density.

Status note

When the test subjects were sending the messages using the N95 in the usability test, they often asked whether the message has been sent or not. This did not happen when the subject was doing the same task with the 921T. The difference in the behavior is, when the message is written and the send option is selected, the N95 goes back to the previous screen without showing the note, and if the message is sent successfully, no note is shown. If the message sending fails, a status note is shown. On the other hand, The 921T shows two status notes by default even if the message

is sent successfully. The first note appears when the message is stored in the outbox, saying “Message is stored in the outbox to be sent”. The second status note appears when the message has been sent out from the outbox, it says “The message has been sent”. Test subjects said that the first note is not necessary, but the second status note about the successful sending is needed.

The N95 seems to be more efficient, because the 921T requires the user’s action to read those notes and click on the [OK] on the notes every time the message is sent. Even if the N95 shows an error message when the message sending fails, the users expressed the favor for the status note which informs even if the message sending is successful. One usability test subject said “When sending the message with an attachment, it would be nice if the phone shows the progress bar, where you can see the status on how much the message is being sent” (J4, male). Another subject stated, "I think I am used to such confirmation messages. Unconsciously I was a bit unsure whether the message has been sent" (J6, female). As in Hosftede’s cultural dimension, Japan has higher uncertainty avoidance culture than Finland (2005). This means that Japanese users have higher anxiety about unknown situations than the Finnish users. This can be observed in the everyday life situations, such as in the way of handling the delay of the trains or busses. As in Yosuke and Johanna’s scenario, the way to handle the delay of the public transportation is different between Japan and Finland. Passengers in Japan are notified about the delay if there is two minutes delay in the train schedule to decrease the anxiety. On the other hand, passengers in Finland are notified about the delay only when the delay is increased to a critical level. This is probably because, as Hofstede noted, Finland has lower uncertainty avoidance culture and compared to the high uncertainty avoidance culture, people do not feel so much anxiety even in the unpredictable situations. The

desire for the status message, and the way the 921T actually shows the status in detail and the N95 is showing only the error message is just like how two cultures handle the train delays. In order to avoid the anxiety as much as possible, the Japanese users prefer the detailed status messages and the preference is reflected in the 921T. On the other hand, Finnish culture would not bear so much anxiety about unpredictable situations and the notification is not necessary unless the situation becomes problematic. This preference is reflected in the behavior of the N95.

5.2.2.2 Efficiency

This section will provide the answers to the following questions:

- Does the N95 help to accomplish the user's goals efficiently?
- What sort of cultural difference is influencing the efficiency of the N95?

As already mentioned, the mini-map browser, which is discussed in the effectiveness section also relates to the efficiency. Besides that issue, efficiency related issue mentioned by the Japanese test subjects is regarding the email address. In both Japan and in Finland, messaging is a popular method of correspondence. However, while Finnish users mostly use SMS as a messaging method, the Japanese users mostly use emails. This is because SMS can be sent only to the users of the same operators, and it is not easy to remember the recipient's operator. On top of that, in order to avoid spam mail, many of the users' mobile email addresses tend to be long and contain the combination of alphabets and the numbers. Still, in order to make voice calls, one would need a phone number. This would mean, usually, the contact information in the phonebook includes both phone number and the long and complicated email address.

Domain insert functionality

When the Finnish user meets new people and they want to exchange their contact information, probably the most common way is to first ask one's phone number and then gives a missed call to the other. This works because the most commonly used methods of correspondence in Finland are voice call and SMS (Smura, 2008), where only the phone number is required. However, in the context where users need long and complicated email address, as well as phone number, exchange of the contact information tends to be a bit more work. In order to make this hassle a bit easier, some Japanese test subjects mentioned that they send the contact information altogether via infra-red, or send as email from the PC. At any rate, "…because nowadays, people have quite long email addresses to avoid spam mails, and it's too much work to type that address manually with mobile phone's keys …I avoid to input manually as much as possible " (J8, male). However, there are some occasions when the user needs to enter the contact information manually. During the usability test, when one of the test subjects was asked to add a contact in the test device, she said, "I don't want to enter the whole mail address, so I like such function which I can insert the domain, such as @docomo.ne.jp" (J11, female) . This function is available in the 921T but not in the N95, possibly because having such long and complicated mobile email address is specific to the Japanese mobile culture. Although missing this function is not critical, it would affect the efficiency in some situations.

5.2.2.3 Learnability

This section will provide the answer to the following questions:

- Is the N95's interface (both software and hardware) easy to learn for the user in the cultural settings?
- How is the learnability affected by the cultural difference?

Many of the issues found during the usability tests were related to the learnability. While most subjects could perform the tasks using the 921T quite easily, the N95 seemed challenging. The main reason for this would be while the interface of the 921T is similar to the mobile phones from other Japanese manufacturers, the interface of the N95 is quite original. Also, while the interface of the 921T is obvious, the interface of the N95 tends to require active attention. In addition, it was noticed that some test subjects were afraid of performing the usability tasks with the N95 even before they touched it. This will be discussed in detail in the offline issues section. It is important to note that there is also some factors outside the device which prevents the users from actively trying and learning the interface.

Besides the issues discussed below, it was noticed that Japanese test subjects had difficulties in finding the right application path in the N95 such as when finding alarms or notes. Although these are found more easily in the 921T, as the application path is similar to other Japanese mobile phones, the application path is rather product dependent and not culture dependent. Therefore, this issue is excluded from the scope of this study.

Keys

When the Japanese test subjects were asked about the appearance of the N95 and the 921T, she answered “With the Japanese phone, it is easy to imagine what would happen if I press some keys, but with this, it looks like I have to learn little by little” (J6, female). The most significant issues related to the learnability are regarding the keys. Four main issues related to the key learnability are found, and issues are listed as below. Besides the issues below, seven subjects could not find a way to enter the pictographs. This issue has been excluded from the scope because the pictograph is a Japanese specific feature.

1. Do not find the call creation and/ or call end key
2. Do not know where the clear key is
3. Do not know how to access to the application menu
4. Do not know how to go back to the previous screen

As for the 921T, one subject said that it was difficult to find the way to access the menu screen. Otherwise, key learnability issues were not found during the usability testing. Figure below shows the keys of the N95 and the 921T. The number of the keys are almost the same (N95= 25 and 921T=24). The differences between the keys on the N95 and the 921T are, while keys on the 921T have more text and icons, the keys on the N95 have more colors (FIGURE 16).

FIGURE 16. Left: N95's keys. Right: 921T's keys, taken by the researcher

Overall, the N95's key looks simple and well designed. However, understanding the simple design sometimes requires the common shared knowledge or otherwise the user needs to tryout actively. Using green and red for call handling keys is somehow standard for the Nokia phones. Just like Johanna chooses milk according to the color of the package, this is another example of the socially established color code knowledge in Finland, where the 90% of the market share is covered by Nokia (Kivi, 2009). If one has knowledge on such color code, he should be able to figure out the call creation or the termination key of the N95 even if they are not identified with the icons. On the other hand, since Nokia's mobile phones are not commonly used, such color code is not common between the Japanese mobile users. Call handling keys are usually identified with the icons, not with the colors in Japanese mobile phones. Thus the N95's color coded keys are not easy to be recognized their meanings for the Japanese test subjects.

The clear key of the N95 was not noticeable to some Japanese subjects, because of the information which the key is providing, as well as the location of the key. The font of the key top label "C" is rather small and it is only one character. Also,

considering the fact that most of the subjects' Japanese phone has the clear key above the number "2" key, the location of the N95's clear key is different from their expectation. Even if the key itself is noticed, some subjects said that they did not think that "C" stands for "Clear", as the clear key of the subjects' phone says "Clear (in alphabet or in Japanese characters)", as in the 921T. Since the usability test with Finnish subjects was not conducted in this study, it is not possible to say how much of the Finnish users would have difficulties in finding the clear key in the N95. However, the clear key with only "C" on it has been in use in Nokia's navi-key style design phones since 1997 (Lindholm, Keinonen, & Kiljander, 2003) so there is more possibilities that this "C" would remind the Finnish users than the Japanese users that "C" stands for clear.

The same reason can be said for the menu key also. The key is not providing the information familiar to the Japanese subjects, and the location of the key is different from what they are used to. In the N95, the menu screen can be accessed by pressing the  menu key. This icon was used in many of the Nokia series 60 phones until recently. However, the icon is an abstract and one would not be able to guess the function of the key from the icon itself. In the 921T, pressing the center key opens the application menu. Since the center key does not have any icon, one of the subjects said that it is not easy to figure out how to access to the application menu. On the other hand, most of the subjects could access to the application menu on the 921T smoothly, probably because accessing the application menu screen using the center key is common in the Japanese phones. However, since usability testing has not been done with the Finnish subjects, it is not possible to say whether the learnability of the N95's menu key is any better for the Finnish users.

Once subjects opened some applications in the N95 and want to go back to the previous screen, six Japanese subjects told that it was difficult to figure out how to do it. This again is because the N95 works in a different way than the subjects' mobile phones. In all of the subjects' phones and also in the 921T, pressing the clear key backsteps which is a common interface logic in the Japanese mobile phones. On the other hand in the N95, the clear key does not backstep, instead, the screen indicates the back function in the right soft key when applicable (FIGURE 17). Since Japanese subjects are used to backstepping by pressing the clear key, eventhough N95 shows the text [Back] on the screen, the subjects still pressed the clear key and expected the phone to backstep. However, using the clear key for backstepping is not the specific logic only for the Japanese mobile phones but also used in some of the Nokia phones as well (Lindholm et al., 2003). For the Finnish users who have been using the phones with such logic, the N95's soft key backstepping might require sometime until they are used to it.

FIGURE 17. [Back] as right soft key, taken by the researcher

Frequently used operation on the screen

During the usability tests, subjects were asked to add a contact in the phone book application, as it was one of the common activities users have performed in their life. Some subjects said that it was not easy to add a new contact in the N95. Although they eventually figured it out, it took longer than when they performed the same task in the 921T. According to a subject, "It looks like the available functionalities are hidden" (J3, male). The opinion of another subject was quite similar.

> …However, when the <Phone book> application is opened, I looked for the [New] on the screen. And thought it cannot be [Options], as [Options] sounds

like it contains some other functionality. But since there was no other choice, I pressed the [Options]. It was not easy to figure out that I have to go under the [Options]. … "Option" sounds like optional functionalities. Adding the new contact is the basic functionality. So I would think it is better to make such basic functionality stand out. (J5, male)

FIGURE 18. Left: Main screen of the phone book in N95. Right: 921T, taken by the researcher

The figure above is the main screen of the phone book application of the N95 and the 921T. While the Procedure for adding a new contact in the phone book in the N95 is to select [New contact] from [Options], in the 921T, pressing the left soft key [Create] on the main screen will do the same. As mentioned in the key learnability section, in the N95, right soft key is dedicated to backstepping such as [Done], [Exit] or [Close], and the left soft key is used for [Options] which provides all the possible functions in the current screen. On the other hand, in the 921T, backstepping is done using the clear key. Right soft key is available for [Menu], where the user can access all the possible functions (same as N95's [Options]), and the left soft key is

dedicated to the function which is considered to be most frequently used in that screen.

Power distance may explain the reason why finding a way to add a new contact in the N95 was challenging for Japanese. Compared to Finland, Japan has larger power distance culture. In the large power distance culture, one is expected to follow the rules which the superiors have made, and not to take risks to experiment, while in the small power distance culture, one is encouraged to be independent and to experiment. Influence of the power distance can be observed in everyday life in Japan and in Finland also, as in the scenarios of Kaori and Johanna. In Japan, it is strictly guided to queue for the cashier in many of the stores, and such rules are clearly indicated in a way that one could not fail to miss. On the other hand in Finland, although there is a rule, one is not strictly guided to follow it, and in many cases, rules are not clearly indicated, so finding the rules requires active exploration. In the same way, the 921T guides the user through the rules which are considered to be the most relevant for the typical use cases. As long as one is taking the most relevant actions, he or she can get things done by just pressing the function shown on the screen without actively looking for the available functionalities. On the other hand, the N95 is more open for various types of the use cases and treats all functionalities in the same level. The users can actively look for the available options based on their own needs, without being tied to the uniformed rules of the manufacturer. In the N95, all the actions are treated equally and none of the functionalities are an exception. For the people in large power distance cultures who are accustomed to be guided through the uniform procedures, the 921T would be intuitive, but the N95 might require some extra effort because they have to look for the available functions. For the small power distance cultures, the N95 would work

fine, because people in this culture are used to exploring actively and choosing the action based on their needs.

The above mentioned learnability issues may be neglected as minor difference between the manufacturers which the users can be get use to. However, during the interviews, many of the interview subjects have mentioned that they have been using the mobile phones from the same manufacturer so that they do not have to learn the new interface logic. Also, one can tell that the interface of the Japanese mobile phones are made similar to each other, from the fact that much less learnability issue was found in 921T even though none of the test subjects have used Toshiba mobile phones before. As mentioned earlier, Japan has an uncertainty avoidance culture, which means that they feel anxiety about unpredictable situations. Trying the mobile phones with some unfamiliar interface logic would put them in an unpredictable situation, as it is difficult to know what would happen from the operation of the phone. This may be observed in two of the Japanese subjects' feedback toward the N95, "I get the reaction which I do not expect. I am getting the same reaction without knowing what is going on" (J6, female). "When I use this Nokia phone, I always have some kind of doubt that if I follow my instinct, procedure will fail" (J11, female).

It is true that the learnability issues discussed in this section are something that users can get used to after using the device for a while. However, since Japan has uncertainty avoidance culture, people may not even try to use such device with unfamiliar interface, as they feel anxious about what "might" happen from the use of such unfamiliar mobile phones. Thus, learnability issues may not be neglected especially in the high uncertainty avoidance cultures.

5.2.3 Aesthetics

This section will provide the answer to the following questions:

- Is the aesthetics of the N95 (both software and hardware) matching the user's preference?
- What sort of cultural difference is influencing the degree of matching the user's aesthetic preference?

During the usability test interviews, both positive and negative feedback were provided from the Japanese subjects toward the N95's aesthetics. Since positive issues come from the difference compared to the Japanese mobile phones, they will also be discussed here. Along with positive feedbacks, negative issues regarding both software and hardware aesthetics are also discussed in the following, and each issues are followed by cultural analysis.

Colorful icons

In terms of the aesthetics of the icons, some Japanese subjects responded with positive feedback toward the N95. Compared to the 921T, icons on the menu screen of the N95 are more colorful. According to those subjects, the color of the icons makes it easier to identify what each icon means. One Japanese subject said, "Nokia phone shows beautiful images and it's easy to see. Compare to the Toshiba phone, Nokia phone's Menu icons have colors and it is easier. For example, this globe icon looks really like Internet" (J2, female). The preference for the colorful user interface is probably linked to the fact that Japan has a high context culture. As Hall & Hall

(1990) discussed, communication in the high context culture is done implicitly and the message relies on the context to carry the meaning. From what the subject said, one can tell that she relies also on the color of the icon to identify the meaning of it.

Border line between the message title and the message body

When reading a received message on the N95, three Japanese subjects told that they would like to have a line between the message title and the message body. As shown in FIGURE 19 below, the N95 has a margin between the message title and the message body, instead of the line.

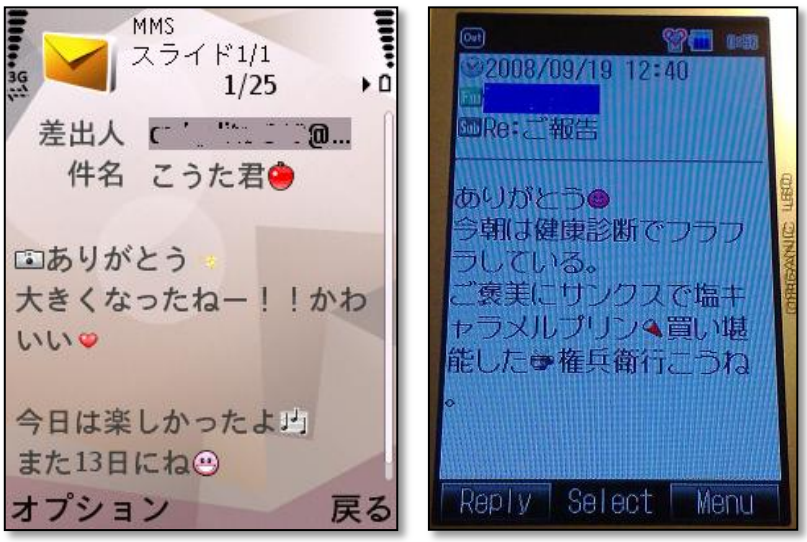


FIGURE 19. Message viewer. N95 (left) has a margin between the title and the body of the message, while 921T (right) has a line in between

The line itself does not convey the meaning, and if one reads the text, it would be possible to distinguish the title from the message body. However, it is true that if the line exists, the border between the message title and the message body becomes clearer. This issue might not have become apparent in Finland because the main messaging method is SMS, which does not allow the message title. In that case, if one opens the message, it shows the sender's name or the phone number, and the

message content. In this case, it is easier to recognize where the sender information ends and the message content starts. However in Japan, the main messaging method is email, which allows the message title. In this case, since the message title often contains such information which might also be included in the message body, without the visual separation such as the border line, it becomes more difficult to distinguish the where the message title ends, and where the message content starts. On top of that, the fact that Japanese culture being a high uncertainty avoidance has probably made the Japanese subjects to point it out as an issue. If there is no line between the title and the body of the message, the border becomes less clear, which unconsciously makes the users feel anxious, even if there is no actual problem caused by it. FIGURE 19 shows the message viewer of both test devices. In the 921T, not only the border inside of the message, but also the border between the message viewer and the soft keys are clearer.

Being original, different from others

The main reason for the positive feedback regarding the N95's hardware design was that it looks different from what other people are using. Specifically, the N95 used for this study was a borrowed device and the color of the device was plum brown, which is not available in the Japanese market. Test subjects were told about this fact when they were asked for their aesthetic preference. What subjects said about the hardware design of the N95 includes the following:

> Toshiba's phone's appearance is usual and it looks like everyone else has it. It is better to have more original looking phone than the same as everyone else's (J3, male).

> I like this (N95) design a lot. Its color is rare in Japan…It does not look cheap. I do not like something eccentric but I like to use products with high quality design because it is something I use every day. I would want this. Nokia phone is more fun to use compare to Toshiba phone" (J11, Female).

> I like this brown color which is not available from the Japanese market. This color is rare. I rather like to use the one which not many people are using (J12, Female).

> I like this color (of the N95). It's rare and not many people would be using mobile phone with this color (J8, male).

The plum brown color of the test device is gender neutral. It is neither feminine nor masculine, at least in the researcher's subjective opinion. Choosing such color seemed to be natural for the feminine culture such as Finland, where the gender roles are indistinct, as Hofstede noted (2005). However, it was somehow unexpected that this kind of neutral color is accepted positively by both male and female Japanese subjects. As Hofstede found out, Japanese culture is strongly masculine, meaning that in this culture, gender roles are distinct and females are expected to be feminine and males are supposed to me masculine. In fact, 4 out of 7 Japanese female subjects have pink mobile phones as their own, and 5 out of 7 Japanese male subjects have blue or black mobile phones as their own.

On the other hand, the real reason for preferring this color is because it is rare, and not many other people are using it, especially the test device is not available in the

Japanese market. Thus, using this color mobile phone is somehow special, and one can show his or her status through the color. This is linked to one of the characteristics of the masculine culture, where one values ego over the relationship, also, the status purchases are more frequent (Hofstede & Hofstede, 2005, p. 140). At the same time, what the Japanese subjects answered above seem to be linked to Hofstede's other cultural dimension, collectivism vs. individualism, in which Japan is located in the middle with score of 46 and rank 33-35 out of 74 countries (Ibid, p. 78). If the culture is totally individualistic, one would not care what other people are using, or not using. On the other hand, if the culture is collectivistic, one would rather want to use the same model as what other people are using. Since Japan is in the middle between collectivist and individualist, while they still care about what other people are using, they do not want to use the same design as many other people are using.

Afraid of breaking or making the screen dirty

Aside the key learnability issue mentioned before, the negative opinion regarding the N95's hardware design mainly came mainly from its sliding style. Unlike the common Japanese folding style mobile phones, the N95 is a sliding style, meaning that the screen and some of the keys are facing out on the surface all the time, and this makes the Japanese subjects worried. The main concerns which the subjects mentioned are: the screen might get broken, and the finger print remains on the screen.

> It is interesting looking. However one thing I am worried about is that I drop my phone often. If I drop this phone on the screen side down, and if there happens to be a pebble on the street, the screen might get broken. My phone is

> a folding style. When I drop this phone, usually it is folded so the screen is protected. When I take out the phone from the pocket, I usually take it out quick (so there is a chance that I drop). (J5, male)

> I don't like that the fingerprints remain on the screen. I have never used the phone with the screen on the outside, because I don't want the finger print to stay on the screen, or that the screen is scratched. There is a phone which Cameron Diaz is advertising but I did not buy it because the surface is metallic and finger print would stand out on the surface of the phone. (J14, female)

The concerns above seem to represent the characteristics of the uncertainty avoidance culture. Although they are concerned that the screen might get broken, if they are asked whether they have actually experienced such cases, many subjects answered that they haven't experienced it, except that one subject's digital camera's screen once got cracked and another subject's mobile phone's screen is scratched. Also, since many of the subjects told that they have been using the folding type phone because they were afraid of breaking the screen, they did not actually know how easily the screen may get broken. Thus, they were worried about the fact that they could not be sure that the screen would not get broken. This anxiety about the unpredictable situation is the characteristic of high uncertainty avoidance culture (Hofstede & Hofstede, 2005).

Another concern about the fingerprint on the screen is also a characteristic of the uncertainty avoidance culture. According to Hofstede, people in weak uncertainty avoidance culture seek for convenience in shopping, while people in the strong uncertainty avoidance culture search for purity and cleanliness (2005, p. 181).

Practically, it is more convenient if the screen and the keys are facing outside, as one can answer the phone without opening the phone, and slide opening is easier and quicker than the unfolding. This convenience is valued over the cleanliness of the screen in Finland, probably because the culture is a weak uncertainty avoidance culture, while in Japan, the cleanliness is valued over the convenience, as the culture is a strong uncertainty avoidance.

5.2.4 Offline issues

This section will provide the answer to the following questions:

- Are there any matters outside the mobile use in the cultural context, which may influence the user's expectation to the test device?

The mobile user experience already starts before he or she starts using the device. During the usability testing, it came to my attention that some of the subjects were hesitant of doing the task in the N95 even before touching the device. The offline issues, such as the brand image and the product image would influence the expectation for the product. For example, when the researcher was walking in downtown Tokyo on a rainy evening as she was rushing back home after the interview, live music was heard from one store. The researcher took away the umbrella and looked up and wondered where this fun atmosphere came from. It was the Apple store, and the researcher just had to go in. There was no direct connection between the use of Apple products and the live music, so it is an offline issue. However, live music surrounding their products creates such image that with their products, life would be fun. If one purchases the product with such an image in his mind, not only using of the product, but also having such product would be a fun experience. This section will discuss about Nokia's brand image in Japan, and the

product image of the N95.

Brand image

Unlike Finland, where the 90% of the mobile market is dominated by Nokia (Kivi, 2009), Nokia's market share in Japan is low. According to one article, their market share in 2007 was 0.3% (Izumi, 2008). Most of the Japanese subjects said that they have heard about the name of Nokia, and they know that globally it is a top mobile phone brand. Still, it does not seem to be familiar to the subjects. Unlike other manufacturers such as Sharp, Panasonic and NEC, available products from Nokia in Japan are only the mobile phone. This may be one of the reasons why the subjects do not feel familiar to the brand. At the same time, compared to other Japanese manufacturers who release several models for each major operators four times a year, the number of the models which Nokia has been releasing to the Japanese market is lower, so the chance that the Japanese subjects hear about the brand may be limited, which may explain why one subject said in the following when asked about his image toward Nokia:

> Nokia has a big market share worldwide, but in Japan the market share is extremely low. I would like to try it but I don't have a chance to see it, and because I have not tried it yet, it is difficult to say. (J3, male)

Japanese consumers are quite strict about the quality. It is normal that things work perfectly, and it is a disaster if something fails. This is probably linked to the fact that Japan has strongly masculine culture, in which, according to Hofstede (2005), the norm is set according to the best. At the same time, the Japanese culture is a high

uncertainty avoidance culture which makes choosing of electronic products very careful. One example about the LCD TV might explain it. In terms of the quality of the LCD TV, Japanese consumers were concerned about the dead pixels, where one or more pixels on the screen are shown as black dots. In order to avoid this, when some consumers chose the LCD TV, they specified not only the brand, but also the factory which the TV was manufactured, so that they could be sure about the quality of the product they were purchasing. Since mobile phones are less expensive compared to the LCD TV, consumers would not specify the factory, but they still cared about the brand image. In terms of the brand image, five subjects answered that they felt less comfortable choosing the non-Japanese brand. The reasons for it come from the uncertainty avoidance. They are concerned about the situation when something happens to the mobile phone, for example when it gets broken, or when they do not know how to use it. Below are the examples of what the subjects said regarding the non-Japanese brands.

> I have a bit of an uncomfortable feeling towards non-domestic brands. Because it's not designed by Japanese, so I wonder if the functionality suits, for instance the messaging. I cannot say particularly, but somehow, I feel that way. Also, for instance when it gets broken, I wonder if they could supply the parts, or they would provide good support. (J7, male)

> I want to choose the one that not many other people are using, but at the same time, I feel a bit uncertain because not many other people are using it. That is why I have not bought any non-domestic phones yet. I really like the design, but because not many other people are using it, I cannot ask from other people about

> how it works. I would totally go for Nokia in terms of the design. I chose this Sony Ericson because it is a bit like Nokia's design but I still hesitated to buy the non-Japanese mobile phone. Also I have heard from one friend who used the Nokia phone saying that Japanese phones are better. I think having some friends or family that I can ask question about how it works makes me feel secured a lot. (J12, female)

Other subjects told that they did not feel uncomfortable about using the non-Japanese brand. However, the consideration of the brand image seems to be quite serious and many factors are related to constructing the brand image in one's mind. For instance, from what one subject tells as below, one can know that he is considering not only the brand's current models, but also the historical background in connection to the operator. Also the country of the brand is also affecting the image.

> I consider brand image seriously when buying the mobile phone. I have been using Sharp, because I know that Sharp has been putting their latest technology into my operator's models. So I can trust Sharp in connection to my operator. Panasonic sounds well just as a brand also but not in connection to my operator. When I was buying a phone, I thought also about Samsung, because they had very thin model. But I hesitated to buy because I do not have so good image toward the brand. I have a good image toward the Nokia's brand. It's European. The brand image is good enough to have their mobile phone. However, I concern about the usability. If I compare to Sharp's phone, I would chose Sharp's phone. (J10, male)

Nokia being a Finnish company would create a positive brand image. Because of the results from the PISA test, numbers of books are published regarding the Finnish educational system, and Japanese have good image toward such country with good education, because good education will make the country competitive. Still, the fact that it is a non-domestic brand which does not have historical background to show its strength, and the fact that there are not many Nokia users around create their brand image fragile.

N95 as a smart phone, not a k-tai

As mentioned previously, mobile phones are bought through the operators in Japan so the operator's website is often used as an information source when one is searching for information on the mobile phone. The N95 is available from one of the major operators called SoftBank, the only operator who sells the iPhone in the Japanese market. SoftBank website top page shows three categories: iPhone, mobile phones and smart phones. The N95 is categorized under the smart phones, which is not a mobile phone. If one clicks on the [Product information] on their web page, the page goes to the mobile phone category, where the N95 is not listed. In order to see the information of the N95, one needs to click on [Smart phones] under the [Other products and services].

It is quite common also in the Finnish electronic store's websites, that mobile phones are categorized into 'matkapuhelin' (mobile phone) and 'älypuhelin' (smart phone). Usually in the 'älypuhelin' category, phones with specific hardware characteristics such as touch screen or sliding QWERTY keyboard are listed. Since the N95 does

not have such hardware features, although it is a high end model with advanced features, it is categorized under the ‘matkapuhelin’ category. The definition of the smart phone in Japan seems to be different from the one in Finland. According to the SoftBank website, is “the device with the global standard OS such as Windows Mobile or Symbian OS/S60. By using the device together with the PC or by adding the applications, one can enjoy the original features which are distinct from the k-tai (mobile phones)” (SOFTBANK MOBILE Corp., 2009a). In other words, the N95 is listed under the smart phones not under the mobile phones because its platform is Symbian S60. Unlike the Japanese phones which platform information is normally not disclosed and thus a third party cannot develop the ad-on applications, several add-on applications for the N95 can be found by searching on the Internet. However, the white paper shows that 24.2% of the Japanese survey participants have answered that they do not need a smart phone because they are satisfied with the normal mobile phone’s features (Mobile Contents Forum, 2008, p. 164). As in Johanna’s scenario, it is quite common in Finland to renovate their home on their own, or some even build the house from the scratch. On the other hand, such thing is not common in Japan, as one cannot be sure what kind of problems might happen if not done by the specialist. This is according to Hofstede, is the characteristics of uncertainty avoidance (2005, p. 180). The same would be applied to the mobile phone’s features. While Finnish users are not hesitant about searching for the add-on applications and figure out themselves how it works, and take responsibility themselves about installing the add-ons, Japanese users would feel safer if the features they need are already prepared by the manufacturer (specialist) so that the users can be sure that those features are well tested by the manufacturers and the users can ask for support when something happens.

Another thing to be noted in the definition of the smart phone by the SoftBank is that it says that it is distinct from “k-tai”. The word “k-tai” is an abbreviated form of the word “keitai denwa (mobile phone)”. However, strictly speaking, the discourse of the word “k-tai” is slightly different from “keitai denwa” (Itō et al., 2005, p. 20). Since it does not include the word meaning the phone, literally it means mobile, specifically, the portable object, or the object that you take with you. Therefore, the word “k-tai” gives more intimate impression than the word “keitai-denwa”. The N95 is not a “k-tai”, but it is a “smart phone”. Unlike the Finnish language has a word ‘älypuhelin’, there is no Japanese translation relevant to the “smart phone”, hence, the English word is written in the Japanese character. However, according to the report, 50.9% of the Japanese people do not know what “smart phone” is (Mobile Contents Forum, 2008).

Information about the N95 can also be obtained also outside from the website. However, from the website, since it is not found under the [Product information] but listed under the [Other products and services] as one of the “smart phones”, which does not sound familiar. Compared to the phone listed under the [Product information] as a “k-tai”, it would probably give such impression that the N95 may not be for the majority of the users and rather meant for the very tech savvy people.

5.3 Summary

In this section, issues from the usability tests and interviews were reviewed, and each issue was analyzed considering the cultural and contextual difference between Japan and Finland. Overall, influence of all the main differences in cultural dimensions summarized in the section three was observed: Masculinity was

observed in the preference for the design which is original and different from others. Influence of high uncertainty avoidance was the most significant of all, and was seen in issues such as feeling uncomfortable about the lack of the message timestamp, status notes or the border line in the message. Being afraid of breaking or dirtying the screen is also another issue coming from the high uncertainty avoidance. Influence of this cultural dimension was observed not only in these specific issues, but also in the test subjects' attitudes toward the Nokia phone during the usability tests. Influence of the large power distance was apparent in the behavior of the user interface of the Toshiba mobile phone, which the Japanese test subjects found it easier to find the functionalities. While the user interface of the Toshiba phone guides the users through by showing the most frequently used functionality in soft keys, Nokia phone requires users to actively find the needed functionality from the option menu. Lastly, high context was reflected to the favor for the colorful icons in the Nokia's user interface. Figure below summarizes the issue discussed in this section together with the influence factor.

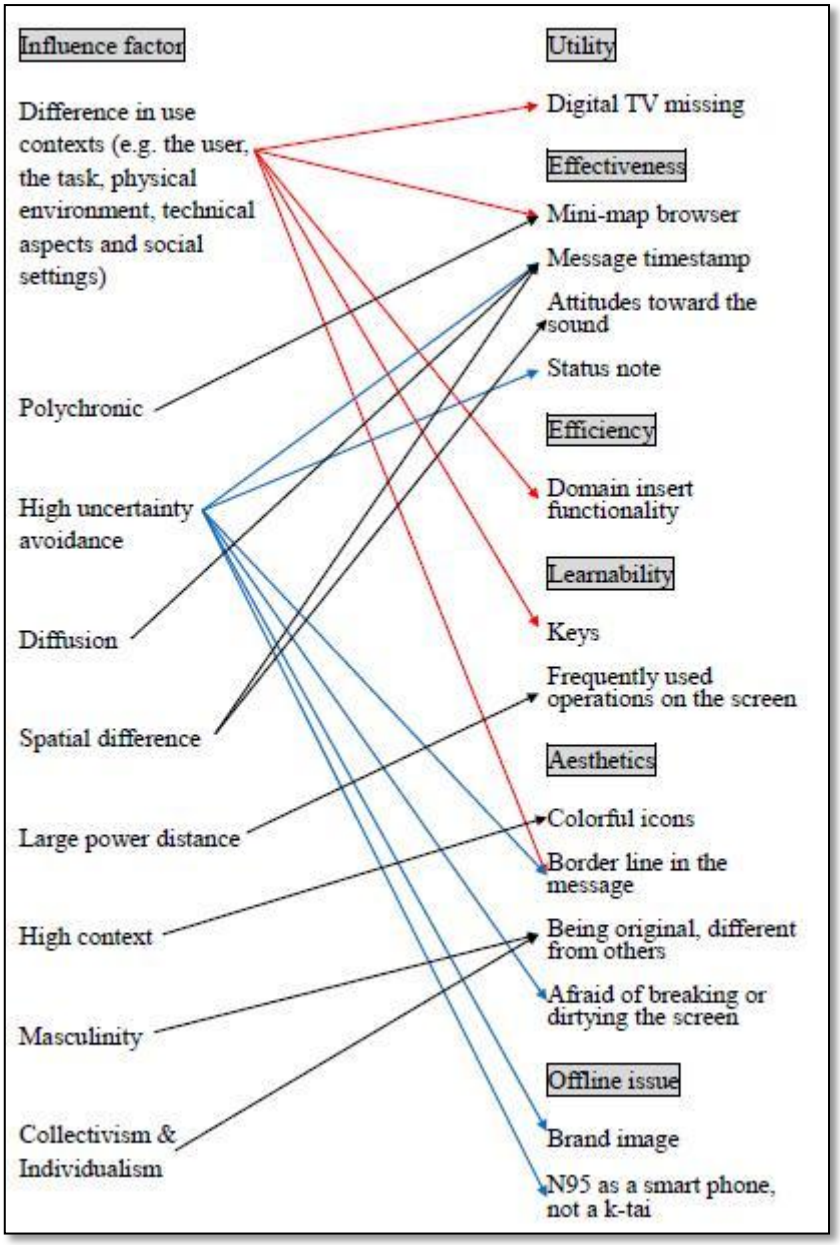


FIGURE 20. Found issues and cultural influence factors. Influences of the high uncertainty avoidance are marked in blue. Influences of the use context are marked in red.

As the figure tells, influence of the high uncertainty avoidance was observed most significantly (marked in blue). High uncertainty avoidance culture bears anxiety for unpredictable situations. Japanese subjects' unfamiliarity toward the N95 may make them bear anxiety, and negative feelings towards it. As previously mentioned, since one usually responds to the circumstances emotionally (with affect) before

interpreting the situation logically (Norman, 2004), negative affect from the high uncertainty avoidance may have declined the positive issues and amplified the negative issues found in the device.

The second most significant influence was from the differences in the use contexts (marked in red). They include technical or infrastructural difference, and differences in the tasks coming from different lifestyles of the users, such as using the web functionality in order to make most of the long commute hours. They also include the difference in the shared knowledge due to the market difference, such as commonly known color codes. These are part of the culture which is not summarized as cultural dimensions. Compared to the cultural dimensions which is about the core part of the way of thinking and thus stable and is valid for long period of time, elements in use contexts are subject to be changed from time to time. Thus, valid information regarding the use contexts requires the up to date data from interviews, fieldworks, and the marketing research.

What these results tell is that in order to develop the mobile phone which is suitable for different cultures, researchers need to conduct the researches not only in the office, but also in the field in order to get the information which is outside of the literature and written research results. The mobile phone will not be used by the icon named user, but will be used by real people whose surroundings may change rapidly.

6 CONCLUSION

This chapter will discuss the main points and findings of this study. The goal of this study was to understand how cultural difference influences the mobile user experience. In order to reach this goal, the study started with the theoretical research, where the two critical issues: cultural difference and user experience were studied from the literature. Since the term, user experience, is a buzz word and there seems to be infinite numbers of definitions, clarification was needed. Some of the most relevant definitions were reviewed and also compared with the definitions of the usability. Based on the review, the importance of studying the user experience was confirmed, and the definition of the user experience for this study was determined. The next step was to organize the cultural difference between Japan and Finland systematically. First, the definitions of the culture were reviewed, and cultural dimensions of the three anthropologists were reviewed. Based on the review cultural differences between Japan and Finland were summarized.

The study continued with the empirical part, where the field study was conducted in order to gather the contextual data. This is because, although the cultural difference between Japan and Finland were summarized in the form of cultural dimensions, in studying the mobile user experience, difference of the use context should also be considered, as it is another fact which would influence the user experience. From the field study, information about the user, how, what and where do they use their mobile phones, technology, as well as social settings were gathered both in Japan and in Finland. The findings were represented in the form of personas, which represent the users of both cultures. Their scenario in the narrative form included the information about the use context gathered from the field study. The cultural analysis of the

findings was done in combination of the differences in the cultural dimensions as well as use contexts. As a result, influence of the cultural difference both in cultural dimensions and in use context was observed.

By representing the culture in the form of persona, this study could observe the user in the cultural setting from several different aspects, such as typical use cases, physical and social use contexts, and commonly used technology. As in the example of the key learnability issue, having observed the culture in the form of persona helped to see the links between the cultural context and the issues found during the usability tests. Persona also helped to understand that the user is not some simple object with the patterns of characteristics or attributes. Rather, they have real life and many things relating to the user fall outside of the systematical patterns, as the actual users and their contexts are more complicated. Besides, they have life surrounded with the changing situations.

When the product goes from the market of one culture to the other, localization of the product is done. According to Localization Industry Standard Association, “localization is the process of modifying products or services to account for differences in distinct markets” (2008). The process addresses linguistic issues, physical issues, business and cultural issues, and technical issues. The way the cultural issue is addressed depends on the case. The process of the localization usually includes the translation of the text, changing the format of the variables such as date, numbering and currency, making it possible to show and input the local language, modifying colors and icons if needed, and to add some extra features if necessary. This process may be enough if the product segment is not well established in the target market, or if the use of the product does not include much social

interaction. However, in the case of localizing the mobile phone to the Japanese culture, extra efforts seem to be needed, because the original mobile culture is well established in Japan, and the use of the mobile includes much of social interaction, which differs from culture to culture. Because the use of mobile includes much of social interaction, mobile products need to be compatible with the way the users think and the way social settings are surrounding them. The fact that the Japanese culture is high in uncertainty avoidance, and therefore they tend not to venture themselves using something different and unpredictable, also requires extra effort. In such situation, products from other culture need to take one step forward to be approachable from the users.

This study has also provided the reason behind the researcher's personal culture shock between these two countries. When the researcher came to Finland, it felt difficult to find out how things work. It seemed like rules were somehow hidden, although they were there. In situations like when queuing at the store or in some office, when getting off from the bus, or when trying to lock the toilet door, rules seemed to be less obvious compared to Japan. Therefore there needs to be more active observation of the rules. Or some toilet door system which locks by turning up the handle would require a commonly shared knowledge in order to find out how it works. The only way to overcome culture shock is to accept the cultural difference and to adjust oneself to the new culture, which means one has to change in some level how one thinks. This may be something which is needed for the localization of the mobile phone.

In summary, this study has contributed in understanding the users and their contexts in both the Japanese and the Finnish cultures in order to realize how the cultural

differences may influence the user experience. However, further study is required in order to have a better understanding of this issue. For instance, if the field study is done in the opposite way: test the Japanese mobile phone with Finnish users, the influence of the cultural difference would become even clearer. Also, the subject of this study were acquired by the snowball method, therefore, most Japanese subjects were working or living in or near an urban area. However, not all the Finnish subjects were in the same situation as the Japanese subjects. If the demography of the subjects in both cultures were consistent, the correctness of the results would be improved.

7 REFERENCES

Anderson, R. (2000). Organizational limits to HCI: Conversations with don norman and janice rohn. *Interactions, 7*(3), 36-60.

Barry, M. (2002). The uses and meaning of I-mode in japan. *REVISTA DE ESTUDIOS, 57*, 151. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.97.8389&rep=rep1&type=pdf#page=149

Bevan, N. (2008). UX, usability and ISO standards. Paper presented at the *CHI 2008,* Florence, Italy. 1. Retrieved from http://www.cs.tut.fi/ihte/CHI08_workshop/papers/Bevan_UXEM_CHI08_06April08.pdf

Chipchase, J., Persson, P., Piippo, P., Aarras, M., & Yamamoto, T. (2005). Mobile essentials: Field study and concepting. Paper presented at the *Proceedings of the 2005 Conference on Designing for User Experience,* San Francisco, California. , *135* Retrieved from http://portal.acm.org/citation.cfm?id=1138235.1138301

Choi, B., Lee, I., & Kim, J. (2006). Culturability in mobile data services: A qualitative study of the relationship between cultural characteristics and

user-experience attributes. *International Journal of Human-Computer Interaction, 20*(3), 171-203. doi:10.1207/s15327590ijhc2003_2

Cooper, A. (2004). *The inmates are running the asylum*. Indianapolis IN : Sams,.

Cooper, A., Reimann, R., & Cronin, D. (2007). *About face 3 : The essentials of interaction design*. Indianapolis, IN : Wiley,.

Cui, Y., Chipchase, J., & Ichikawa, F. (2007). A cross culture study on phone carrying and physical personalization. *Lecture Notes in Computer Science, 4559*, 483. doi:10.1007/978-3-540-73287-7_57

Digita Oy. (2009). *Mobiilitv - näkyvyysalueet.* Retrieved May 18, 2009, from http://www.mobiilitv.fi/Nakyvyysalueet

GSM Association. *Brief history of GSM & the GSMA.* Retrieved May 2, 2009, from http://www.gsmworld.com/about-us/history.htm

Hall, E. T. (1968). Proxemics. *Current Anthropology, 9*(2/3), 83. doi:10.1086/200975

Hall, E. T., & Hall, M. R. (1990). *Understanding cultural differences*. Boston MA: The Intercultural Press.

Hampden-Turner, C., & Trompenaars, F. (2000). *Building cross-cultural competence: How to create wealth from conflicting values*. New Haven, USA: Yale University Press.

Hiltunen, M., Laukka, M., & Luomala, J. (2002). *Mobile user experience*. Helsinki : Edita, IT Press,.

Hofstede, G. (1998). *Masculinity and femininity: The taboo dimension of national cultures*. California: Sage.

Hofstede, G. (2001). *Culture's consequences : Comparing values, behaviors, institutions and organisations across nations* (2nd ed.). California, USA: Sage.

Hofstede, G., & Hofstede, G. J. (2005). *Cultures and organizations : Software of the mind* (Rev. and expand 2nd ed.). New York: McGraw-Hill.

International Telecommunication Union. (2003). *All about the technology*. Retrieved May 29, 2009, from http://www.itu.int/osg/spu/ni/3G/technology/index.html

Ito, M., & Nakakoji, K. (1996). Impact of culture on user interface design. In E. M. Del Galdo, & J. Nielsen (Eds.), *International users interface* (pp. 105-126). New York, NY, USA: John Wiley & Sons, Inc.

Itō, M., Okabe, D., & Matsuda, M. (2005). *Personal, portable, pedestrian*. Cambridge, Mass: MIT Press.

Izumi, S. (2008, November 27). Nokia to cease sales in japan. *Reuters,* Retrieved from http://www.reuters.com/article/technologyNews/idUSTRE4AQ1K620081127?pageNumber=2&virtualBrandChannel=0&sp=true

Jokela, T. (2005). Case studies on a quality model based on the ISO 9241-11 definition of usability. Paper presented at the *International Cost294 Workshop on User Interface Quality Models,* Rome, Italy. 62. Retrieved from http://141.115.28.2/cost294/upload/395.pdf#page=68

Jokela, T., Iivari, N., Matero, J., & Karukka, M. (2003). The standard of user-centered design and the standard definition of usability: Analyzing ISO 13407 against ISO 9241-11. Paper presented at the *Proceedings of the Latin American Conference on Human-Computer Interaction,* Rio de Janeiro. , *46* 53-60. Retrieved from http://portal.acm.org/citation.cfm?id=944519.944525

Kaasinen, E., Kivinen, T., Kulju, M., Lindroos, L., Oksman, V., Kronlund, J., et al. (2008). *FinPilot2 final report – user acceptance of mobile TV services* No. 2).

Helsinki, Finland: Forum Virium Helsinki. Retrieved from http://www.finnishmobiletv.com/press/FinPilot2_Final_Report_20080529.pdf

KDDI CORPORATION. (2009). *Untitled photograph of URBANO. retrieved may 31, 2009* KDDI CORPORATION. Retrieved from http://k-tai.auone.jp/model/urbano/special/

Keinonen, T. (1998). One-dimensional usability: Influence of usability on consumers' product preference. (Doctoral dissertation, University of Art and Design Helsinki, 1998).

Kivi, A. (2009). *Mobile handset population in finland 2005 - 2008*. Helsinki, Finland: TKK HELSINKI UNIVERSITY OF TECHNOLOGY. Retrieved from www.netlab.tkk.fi/~jakivi/publications/Kivi_Mobile_Handset_Population_2005-2008.pdf

Lindholm, C., Keinonen, T., & Kiljander, H. (2003). *Mobile usability: How nokia changed the face of the mobile phone*. New York: McGraw-Hill Professional.

Lynn, L. H. (1991). Cultural differences and the management of engineering in US-japanese joint ventures. *Technology Management: The New International Language, ,* 474-475. doi:10.1109/PICMET.1991.183695

Marcus, A. (2006). Cross-cultural user-experience design. *Lecture Notes in Computer Science, 4045*, 16. doi:10.1007/11783183_4

Mobile Contents Forum. (2007). *K-tai white paper 2008* (1st ed.). Tokyo: An Impress Group Company.

Mobile Contents Forum. (2008). *K-tai white paper 2009* (1st ed.). Tokyo: An Impress Group Company.

Mulder, S., & Yaar, Z. (2006). *The user is always right: A practical guide to creating and using personas for the web*. California: New Riders Publishing.

Myers, M. D., & Tan, F. B. (2003). Beyond models of national culture in information systems research. *Advanced Topics in Global Information Management, ,* 14.

Nielsen Norman Group. *User experience - our definition.* Retrieved November 25, 2008, from http://www.nngroup.com/about/userexperience.html

Nielsen, J., & Landauer, T. K. (1993). A mathematical model of the finding of usability problems. *Proceedings of the INTERACT'93 and CHI'93 Conference on Human Factors in Computing Systems,* Amsterdam, The Netherlands. 206-213.

Nielsen, J. (1993). *Usability engineering*. Boston MA: Academic Press.

Nokia. (2007). *Press releases - nokia N95 multimedia computer starts shipping.* Retrieved May 13, 2009, from http://www.nokia.com/A4136001?newsid=1113533

Nokia. (2009). *Untitled photograph of N81. retrieved may 8, 2009* Retrieved from http://www.nokia.fi/link?cid=PLAIN_TEXT_357784

Norman, D. (2002). Emotion & design: Attractive things work better. *Interactions, 9*(4), 36-42. doi:10.1145/543434.543435

Norman, D. (2004). *Emotional design : Why we love (or hate) everyday things*. New York: Basic Books.

Nurmela, J., & Tilastokeskus. (2000). *Mobile phones and computer as parts of everyday life in finland*. Helsinki: Statistics Finland.

Oksman, V. (2006). Young people and seniors in finnish mobile information society. *Journal of Interactive Media in Education, 2*, 02. Retrieved from http://jime.open.ac.uk/2006/02/oksman-2006-02-paper.html

Preece, J., Rogers, Y., & Sharp, H. (2002). *Interaction design : Beyond human-computer interaction*. New York: J. Wiley & Sons.

Puro, J. P. (2002). Finland: A mobile culture. In J. E. Katz, & M. Aakhus (Eds.), *Perpetual contact* (pp. 19–29). New York: Cambridge University Press.

Riikonen, A., & Kivi, A. (2009). *IP traffic measurements 2008 - mobile internet usage patterns*. Helsinki, Finland: TKK Helsinki University of Technology. Retrieved from http://www.netlab.hut.fi/tutkimus/momi/publications/Riikonen_IP_Traffic_Measurements_2008.pdf

Smura, T. (2008). Access alternatives to mobile services and content : Analysis of handset-based smartphone usage data. Paper presented at the *ITS 17th Biennial Conference*, Montreal, Canada, June 24-27, 2008. Retrieved from http://www.canavents.com/its2008/abstracts/140.pdf

SOFTBANK MOBILE Corp. (2009a). *SoftBank.* Retrieved May 27, 2009, from http://mb.softbank.jp/mb/

SOFTBANK MOBILE Corp. (2009b). *Untitled photograph of 812SH. retrieved may 31, 2009* SOFTBANK MOBILE Corp. Retrieved from http://mb.softbank.jp/mb/product/3G/812sh/index.html

The Localization Industry Standards Association. (2008). *LISA: Localization.* Retrieved May 30, 2009, from http://www.lisa.org/Localization.61.0.html

Trompenaars, F. (1996). Resolving international conflict: Culture and business strategy. *Business Strategy Review, 7*(3), 51-68.

Trompenaars, F., & Hampden-Turner, C. (1997). *Riding the waves of culture : Understanding cultural diversity in business* (2nd ed.). London: Nicholas Brealey.

Use., -., -ty. (2007). *MOT collins english dictionary 2.0.* Retrieved November 24, 2008, from http://mot.kielikone.fi/mot/jyu/netmot.exe?UI=figr&height=153

Williams, R. (2006). The analysis of culture. *Cultural theory and popular culture : A reader* (pp. 32). New Jersey: Pearson Prentice Hall.

Yahoo Japan Corporation. (2009). *Untitled photographs of yahoo! keitai top page. retrieved may 16, 2009* Yahoo Japan Corporation. Retrieved from http://mobile.yahoo.co.jp/sp/ykeitai/sbminfo/man01.html

Yamaguchi, A., Nodera, Y., Ohashi, M., Sakai, S., Suzuki, T., Watanabe, F., et al. (1995). Interoperability of PDC with GSM. *Universal Personal Communications. 1995. Record., 1995 Fourth IEEE International Conference on*, Tokyo, Japan. 452-456.