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User-inclusive service design methods in the development of smart cities - The case of intelligent transportation solutions

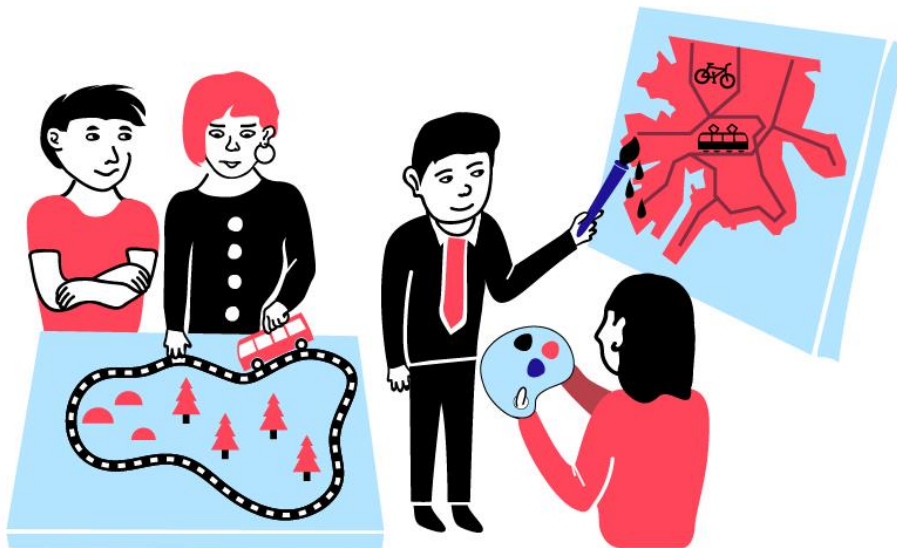International Design Business Management (IDBM)

Master's thesis

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USER-INCLUSIVE SERVICE DESIGN METHODS IN THE DEVELOPMENT OF SMART CITIES

THE CASE OF INTELLIGENT TRANSPORTATION SOLUTIONS

Drawn by Ellun Kanat

Master's Thesis

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Abstract

The general objective of this thesis is to expand knowledge regarding service design and user-inclusive design methods as well as new ways of working in general, especially in fields in which user-centred approaches have not been used in service development. I aim at encouraging organisations to reconsider their current habits and to try out new ways of working. Therefore, I investigated what representatives of Finnish organisations that are dealing with intelligent transportation (ITS) and mobility-as-a-service (MaaS) related challenges think about service design. In addition, I conducted a workshop in which some user-inclusive service design methods were tested.

Literature indicates that with the traditional innovation approaches, organisations run the risk of producing solutions that people are unwilling or unable to use, and the interviewed professionals share this concern. Furthermore, interviewees believe that user-inclusive service design methods could help in avoiding this risk and consequently lead to creating solutions that users would find meaningful and useful. Put otherwise, Finnish organisations are awakening to the fact that old solutions no longer work in tackling new problems, and they acknowledge the need for a more human-driven approach to innovation. Nevertheless, they seem to lack the knowledge and skills to employ more human-driven innovation practices.

This research has shown that organisations are cautious when it comes to trying out creative service design methods; they would like to have examples of others using these methods first before trying them out. To provide organisations with an exemplary case, a workshop testing some user-inclusive service design methods was conducted in the context of a student project that aimed at creating a new, innovative intelligent transportation solution for municipalities. As a result of the workshop it was discovered that user-inclusive service design methods can be very rewarding for service developers even at an early phase of a project and that user-inclusive service design methods would indeed be a step towards a more human-driven approach to innovation. That is to say, the methods could help organisations in developing meaningful solutions to the challenges they face.

This research has many important implications for the field of ITS, other traditionally non-human-driven fields, governmental agencies such as Tekes (the Finnish Funding Agency for Innovation), and the discipline of International Design Business Management (IDBM). The main implication is that user-inclusive as well as other creative ways of working are increasingly important and that the significance of multidisciplinary work increases in the future, which is why both current and future professionals should be educated more of them.

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1.   INTRODUCTION

1.1   Topic presentation

Many organisations are awakening to the fact that old solutions no longer work in unravelling new problems. Furthermore, users are becoming increasingly demanding towards the products and services they use as the world is getting more complex and connected. Therefore, providers must come up with novel solutions to answer customer demands and needs. As new problems occur, we must start to think differently. In Albert Einstein's much quoted words:

> *"We cannot solve our problems with the same thinking we used when we created them".*

Literature from the past years has suggested that creative industries have a lot to offer businesses (e.g. Mucha 2008). Moreover, it has been noted that "*our world is shifting beneath our feet and new thinking will be required to deal with the complexity and solve the more wicked problems that are now confronting us*" (Nissley 2010, p.9). In other words, the methods that have been used to solve problems and to create new solutions before are no longer enough. This view gets support also from Adler (2006) according to whom 20th century approaches do not work as well as they used to, if at all. In his paper, Nissley (2010) implies that a change of mindset is already happening, as many professionals have begun to understand that the rational-analytical ways of thinking are not sufficient in today's business world, and a change in attitude and course of action is needed to bring about innovations that contribute to better quality of products, services and life in general. This idea is also supported by Shrivastava et al. (2012) who note that different modes of thinking and understanding require different forms of knowledge. If new problems cannot be tackled by old ways of working, then unconventional and un-business-like approaches are needed.

In all simplicity, this means that a new mindset is required in many fields of business. While Nissley believes some organisations have already successfully started adapting their thinking to suit the contemporary challenges, Gummesson et al. (2010) state that "old truths" and resistance, or sluggishness to change are deeply rooted in the world of today in spite of the generally recognised fact that the pace of change is constantly accelerating. Together these notions imply that even though there has been some progress already, a comprehensive change of a mindset towards a new way of thinking is still waiting ahead. In

recent times, research has shown that a new mindset that could be beneficial to the business world would be service dominant logic (S-D logic) which refers to an approach that considers service the very core of doing business. Put otherwise, S-D logic emphasises that instead of selling units of products organisations should focus on serving people and thus creating value to users through service. Furthermore, the logic proposes that the competences of service users as well as other stakeholders should be applied in the service development process to reach the best possible level of service and consequently more value to users.

In addition to S-D logic, design thinking, which is a relatively new way of looking at problems and problem solving, is gaining popularity. In design thinking problems are approached via methods that are inspired by the thinking process of designers and artists, meaning that businesses are taking influences from the creative industries. The idea behind the design thinking mindset is that the same working methods can be applied to solving a business problem as to creating a design item. Design thinking thus offers one viable perspective to new kind of an approach to innovation as it has been said that businesses need transformation, and design thinking can promote that transformation (Lockwood, 2009).

While design thinking is getting increasing attention, there are still many application fields in which design has unexploited opportunities, especially in services. Consequently, service design is gaining foothold. Service design refers to an approach that utilises design methods in developing and improving services from the perspective of users, and by user-inclusive methods I refer to those methods that not only consider the user perspective but actually regard users as active participants in the design process.

A change in mindset as well as in the ways of working is needed also within public services, as there are many on-going challenges concerning organising these services in Finland [1]. The same situation applies also to transportation. New services are emerging in this context but there is still a lot of untapped potential, since users have not typically been taken into the process of designing these services. As a whole, the development of the transportation industry has been very strongly technology and infrastructure-led. Now, however, there is a lot of talk about intelligent transportation solutions (ITS) and Mobility-as-a-Service (MaaS), i.e. building better service concepts around transportation, which is why a change towards more human-driven thinking is in place. In addition, Tekes, the Finnish Funding Agency for Innovation, wants to discover how the technology push that has been dominating the

[1] Julkisten palveluiden innovaatiot 2014,
http://www.tem.fi/innovaatiot/palveluinnovaatiot/julkisten_palveluiden_innovaatiot

markets could be converted into a more human-driven approach to innovation. Therefore, in this case study I investigate if user-inclusive service design methods can contribute to creating services that individuals find valuable, meaningful and useful. Alongside examining existing literature, as characteristic to a case study, I
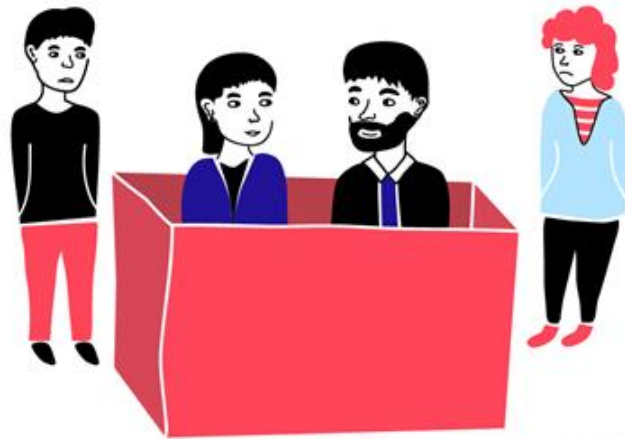
Drawn by Ellun Kanat

will use a combination of data collection methods (Eisenhardt 1989) by conducting interviews with Finnish professionals dealing with intelligent transportation solution (ITS) matters, as well as by organising a workshop within an ITS development project in which I test some user-inclusive service design methods.

The general objective of this thesis is to expand knowledge regarding service design and user-inclusive design methods as well as new ways of working in general. I aim at encouraging organisations to reconsider their working habits and try out new approaches, or at least to discuss if user-inclusive service design could be an alternative. Taking on new ways of doing is always a challenge, and there is a certain threshold over which one must step. However, I hope that this thesis sheds light on all the possibilities that user-inclusive service design offers.

1.2   Intelligent transportation services

What makes this topic especially relevant for today's world is that due to information and communications technology (ICT) penetrating almost every aspect of life there is a lot of talk about smart cities. As a whole, smart city covers a variety of themes and one of the biggest of these is intelligent transportation that is not only an important subject matter in the global perspective but also in Finland. One indication of this is the recently launched national innovative cities programme "INKA", which aims at developing strong loci for innovation and pioneering markets to Finland. The "smart city" is one of its core themes, and intelligent transportation an important part of that framework.

Besides getting attention through the INKA programme, intelligent transport has gained a lot publicity in recent times, as in late 2013 the Ministry of Transportation and Communication launched an experimental project on electronic transport services for 2014–2015. With this project, the ministry wants to endorse consumer markets in electronic transport services and consequently look into what type of impact these services can generate in the market. Furthermore, recently a working group appointed by the Ministry of Transportation and Communication handed in a report suggesting Finland to take up kilometre-based taxation for private car use. This caused a lot of discussion in Finland as many people experienced the suggestion as a threat to their well-being, and among the reasons for this was that people fear their expenditure on transportation will increase. Especially outside bigger urban centres people have to rely on private cars, as public transportation is not always an alternative due to e.g. poor bus headways or simply poor access to the services. Moreover, many people in areas with comprehensive public transportation network also prefer to use private cars [2]. Given that people weigh the suggestion of kilometre-based taxation against their current habits, their fear is understandable.

Due to these reasons, now more than ever there is great potential for intelligent transportation solutions that take also users' concerns into consideration. It has been predicted that in the future transportation companies move towards thinking in terms of mobility share instead of market share, meaning that success would be measured not by units sold, but e.g. how much of transportation circulation a certain company controls (Singh 2012). In other words, in the future instead of owning our own vehicles, we might purchase packages including different kinds of transportation services [3], much like mobile phone packages in today's telecommunications industry. If this happens, private car owning could decrease significantly.

However, as implied earlier, currently people are accustomed to their existing routines and consequently they are unable to foresee that their behaviour regarding transportation might change radically in a relatively short amount of time. Therefore, they now may see kilometre-based taxation type solutions a threat, but what they do not necessarily see is that those solutions may push us to reconsider our transportation habits and leads towards new ways of moving around. It has been stated that "*people are not likely to change their behaviour if it requires sacrifice*" (den Ouden 2012, p.67).

[2]   Laurikainen 2013,
http://yle.fi/uutiset/kilometriveron_tyrmaaminen_hammentaa_liikenneministeria/6993519

[3]   Frilander 2014, http://yle.fi/uutiset/alyliikenne_voi_romahduttaa_yksityisautojen_maaran/7160397

Therefore, it is now extremely interesting to investigate whether user-inclusive service design can produce solutions that encourage people to change their behaviour, whether it is the move from car owning to sharing – to using transportation services rather than private vehicles when moving from one place to another – or something else. Nevertheless, if service developers are able to create new solutions that people find meaningful and easy to use and which would not require sacrifice, Finns' attitude

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towards the whole transportation system can change radically. If this approach is successful, it is a huge leap towards a more sustainable society.
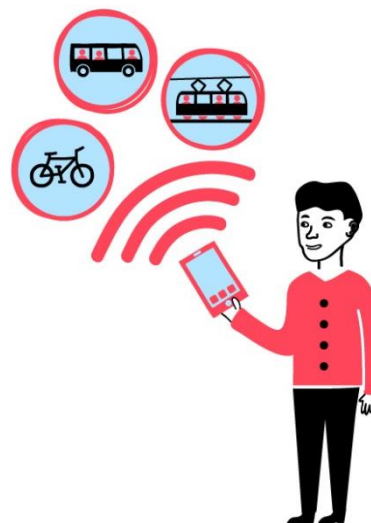
Moreover, the Ministry of Transportation and Communications has recognised the need for reorganising municipalities' transportation operations [4]. There is a risk that in the future the level of services decreases because the costs of these services are already high, and they are likely to increase significantly over the next decade if something is not done. In municipalities there are various vehicles operating more or less the same routes at the same times, but they are running their separate tasks, meaning that one is e.g. doing food transportation, one carrying an elderly person, one taking children to school, etc. In other words, there is a lot of potential in Finland for combining different sorts of municipal transportation services as well as coming up with completely new kind of transportation solutions, but how that can be done remains to be answered. Through interviewing Finnish professionals, I will discover whether they find user-inclusive service design a viable alternative for developing new, innovative intelligent transportation services.

1.2.1 From traffic management to traffic leadership

As noted above, municipalities are struggling with the cost of their transportation operations in Finland. Because of this, Tekes's Witty City programme has initiated a project together with the Tampere-based innovation hub Demola to come up with possible solutions to this problem. Demola is an organisation that coordinates real life cases given by organisations for multidisciplinary groups of students to solve. The project initiated by Tekes, called *"From*

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[4] Henkilöliikenteen uudistaminen käyntiin, 2014
http://www.lvm.fi/tiedote/4157396/henkiloliikenteen-uudistaminen-kayntiin

traffic management to traffic leadership", challenges students to create a solution with the help of which municipalities can cut their transportation costs in half. One goal of the project is to create a solution that is interesting on a national as well as international level. Essentially, the challenge is to create solutions that have the potential to change the way we understand municipal transportation. The idea is to be creative and break boundaries between sectors and promote open-minded cooperation (see full project brief, appendix 4).

This particular project is not tied to any specific problem or organisation. Instead, it focuses on creating solutions that respond to nationwide challenges. These challenges include organising school transportation, transportation for users with special needs, municipal logistic services, etc. The overall objective of the project is to create "*tangible demos on which further development of the idea and concept can be done*".

This project will provide the context in which to realise half of my empirical research. Within the project, I will test whether including users in the development process can provide the designer team (i.e. the student team) with new insights that assist them in designing new, meaningful solutions. Even though the task is to cut municipalities' costs, it is essential that the solution does not neglect user perspective, as for example has somewhat happened with the kilometre-based taxation, which is but one example of a case that has stirred negative emotions among users due to the top-down way it is imposed on individuals. Therefore, I will help the student team in gaining a better understanding of transportation users as well as help them in understanding what creatively enhanced methods they can use along the project. Together with the team, we will conduct a pilot workshop that gives the team a kick-start to the project.

1.3 Definitions

There are several terms relevant for the purposes of this thesis. Some focal concepts are elaborated on in the literature review of this work, but I want to distinguish between the following similar yet essentially differing terms to clarify the choices of wording:

Human-driven innovation – An approach to innovation that supports building more dynamic, tolerant, and plural a society. In addition, it utilises people's social relationships, as well as directs their flow (Ruckenstein et al. 2011). Human-driven innovations are

considered successful if they support individuals in their everyday endeavours (Ruckenstein et al. 2011).

User-centred design – A design approach that considers users but does not necessarily include them to design processes. Furthermore, it has been said that even though user-centred methods generally consider user-perspective they do not always highlight making solutions meaningful for users. (Ruckenstein et al. 2011)

User-inclusive design – An approach to design in which users are brought into the process and used as an active source for ideas and feedback. For clarification, I consider user-inclusive design to be a sub-category of user-centred design and an approach that enables gaining user insight and consequently increasing the likelihood of producing highly meaningful solutions for users.

1.4   Research problem

As already indicated, there are a lot of businesses as well as public actors that have not yet taken advantage of human-driven innovation. In this study, I look into what design thinking, and consequently user-inclusive service design methods have to offer when creating new, genuinely people-friendly services in contexts where human-driven innovation has been neglected. The case through which I explore the problem is that of intelligent transportation services, and thus the focus of this thesis is to discover whether user-inclusive service design methods can lead to human-driven innovations in intelligent transportation service development.

1.5   Research questions

My research questions are as follows:

Q1: What are user-inclusive service design methods and what is their role for ITS? Based on existing literature I will describe what user-inclusive design methods are and what their significance is for intelligent transportation services.

Q2: What benefits do user-inclusive service design methods offer? With the help of the literature review, I will describe why user-inclusive design methods should be

used in service development what benefits user-inclusive service design methods offer. By interviewing representatives of some Finnish organisations dealing with ITS issues, I will also explain professionals' views regarding the subject matter.

Q3: How can organisations be encouraged to benefit from user-inclusive service design methods? I will explore this by asking professionals what they feel would encourage their organisation to employ the methods. Furthermore, I will explore some user-inclusive design methods in practice in a current ITS development project to deepen the knowledge of the benefits and challenges that the methods impose. By doing this, organisations will gain important insight that can encourage them to utilise user-inclusive service design.

1.6   Structure of work

This research commences by an exploration of existing literature. As a whole, the literature review section aims at clarifying what kind of preconditions there are for human-driven innovation. Since they provide the context for the cases used in this thesis, the first topic covered in the section is emerging trends and changes in culture and lifestyle, which maps the needs and innovation conditions for intelligent transportation services.

The literature review continues by looking into design thinking. This is done to provide a foundation for the whole ideology behind using creative methods for business purposes. Subsequently, I look into user-inclusive service design to explain the rationale behind the design of services as well as including users as part of these design processes. Then I move on to determining what the situation is in Finland regarding the topics covered earlier in the literature review. The chapter will be summarised by forming a theoretical framework for the rest of the study.

After this the paper continues by presenting the chosen methodology, explaining how the data for the research is collected and analysed. Subsequently I proceed with findings of this study collected in the field research phase. After that an analysis of what was learned is given in the discussion and analysis section. This thesis ends with a chapter on conclusions, covering a summary of the research results as well as managerial implications.

2.   LITERATURE REVIEW

2.1   Emerging trends and changes in culture - the rise of "smart"

Technology has taken great leaps in recent times and people are continuously coming up with innovations. Some economies are booming and some are in crisis. While all countries are tackling their individual challenges, some global megatrends influence development actions regardless of the geographical location. One of these is the concept of "smart".

"Smart" refers to the phenomenon of Information and Communications Technology (ICT) penetrating various aspects of life. In his book, Singh (2012) states that this decade we will see a tendency towards intelligent products and services, and even smart cities. The focus will be on improving efficiency and saving costs, or in other words, on making life more convenient for people. There are plenty of fields to which the concept of smart can be and has been applied, such as smart homes, smart energy, intelligent buildings, smart phones, etc. (Singh 2012). In the following sections, I present two perspectives relevant to this research: firstly smart cities, which provide the greater frame for the case studies, and secondly the case context itself, i.e. intelligent transportation services. Furthermore, service-dominant logic, which links to these two themes as well as to a more general change in culture, is covered.

2.1.1   Smart cities

Currently there is an on-going global challenge among cities for the best sustainable urban development (Bakıcı et al. 2013) and it has been stated that even though cities keep on growing, they are not necessarily getting any better (Martínez-Ballesté et al. 2013). According to Martínez-Ballesté et al. (2013) the concept of a smart city came about as a result of addressing this issue and aiming at making cities better places for their citizens to live. While there is no absolute definition for a smart city in literature, it can still be stated that essentially smart cities are places that confront various problems regarding e.g. transportation and quality of life and respond to these problems by utilising the potential of ICT while aiming at sustainability (Martínez-Ballesté et al. 2013). Similarly, Mulligan and Olsson (2013) suggest that smart cities are places where digital infrastructure meets the physical city in a way that improves the local situation regarding the quality of life and environmental as well as economic issues. Likewise, according to Bakıcı et al. (2013) a

smart city can be spotted by the use of ICT in transforming the infrastructure of the city. In other words, a smart city is a place in which the delivery of services to end users is better and where environmental impact is smaller than in regular cities (Mulligan and Olsson 2013). As the smart city provides solutions to many problems occurring currently in the world, it is no wonder that he concept has turned into such a popular topic worldwide.

A lot of envisioning work relating to future cities have been made both in Finland as well as abroad (in Finland e.g. Suomisen perhe 2040 [5]). Hanlon reports that some people predict that as a phenomenon the emergence of smart cities can be compared to industrial revolution [6]. Durham appears to be one of the supporters of this view as he envisions that "*In 40 years' time cities will not just be smart, they will be so brainy it hurts*" [7]. In addition, it has been noted that cities are indeed getting smarter, but according to an article by the Guardian, this smartness can be reached in various ways as cities have varying needs and because one solution will not suit all[8]. Nevertheless, Kirby maintains that one viable way of reaching the desired smartness in a city is partnership between local authorities, utilities, universities and the private sector[9]. He continues that all these players have to work closely and creatively together to create solutions that meet the needs of growing urban areas. Similar results have also been discovered in Finland, as Jäppinen declares that in the future municipalities will organise their innovation activities through different sorts of cooperation agreements (Jäppinen 2011). Mondale (2000) also supports this idea, as he too writes that smart growth can be achieved through collaborations between public officials, businesses and citizens.

In his story for the Guardian, Burnham[10] notes that cities are confronting great challenges as existing resources are under pressure due to the fact that population grows and consequently congestion, emissions as well as economic competition increases. He reminds that those people who can innovate new solutions in that context will be highly appreciated, implying that when it comes to smart cities, all new sources of innovation are more than welcome.

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[5]   Ahonen, Niemi, Nurmenniemi 2013 http://www.tekes.fi/ohjelmat-ja-palvelut/suomisenperhe2040/
[6]   Hanlon, n.d. http://www.theguardian.com/smarter-cities/changing-face-public-services
[7]   Durnham, n.d. http://www.theguardian.com/smarter-cities/forty-years-from-now
[8]   Anonymous, n.d. http://www.theguardian.com/smarter-cities/tailored-solutions
[9]   Kirby, n.d. http://www.theguardian.com/smarter-cities/getting-smart-cities-connected
[10]   Burnham 2013. http://www.theguardian.com/sustainable-business/reprogramming-city-urban-infrastructure-changes

According to Paskaleva (2011), cities have to learn to reconcile between long-term sustainable development and competitiveness. This requires that the cities not only consider the physical infrastructures that they have, but also and more importantly the social and the intellectual capital, i.e. knowledge and social capacity (Paskaleva 2011). However, getting access to the social capacity available will most likely require transparency in actions from all parties involved, as people are unlikely to share their ideas without any information on what the ideas are used for. In fact, a group of experts in Spain maintain that transparency in general will be one of the focal challenges regarding the development of smart cities alongside bureaucracy[11]. Interestingly, Kirby[12] reports that bureaucracy might not be the issue for long, as the current "*economic squeeze*" might provide new opportunities for smart cities as budget restraints force officials to think outside the box and even diminish the bureaucracy which normally prevents services from functioning efficiently.

2.1.2   ITS - Intelligent transportation systems and services

As part of smart city, Intelligent transportation systems and services (abbreviated ITS) is also gaining more and more attention. Salido et al. (2011) state that the current road transport is chaotic with all the congestion, unpredictability, pollution, and accidents. These problems are a concern all over the world and while positive development has occurred in some dimensions recently, the overall situation is continuously worsening (Salido et al 2011).

Intelligent transportation systems have been considered one viable alternative in achieving smart, sustainable growth (Bochner, 2000). Similarly, Mondale (2000) believes that transportation is a key element in the quality of life and the competitiveness of cities. He maintains that it can also be a key to saving costs regarding infrastructures as well as to building flourishing neighbourhoods and businesses. As an organisation called ITS-Finland puts it, *"Intelligent Transport Systems and Services (ITS) encompass a broad range of information and communications technologies that improve the safety, efficiency, and performance of the transportation system. When integrated into the nation's roadways, vehicles and public transportation network, ITS can help reduce congestion, improve mobility, save lives and optimize our existing infrastructure"* [13]. Providing such benefits at its best, it is only natural that smart transportation is increasingly interesting a topic.

[11]   Fernández 2010, http://elpais.com/diario/2010/12/12/negocio/1292162603_850215.html
[12]   Kirby n.d., http://www.theguardian.com/smarter-cities/transforming-tomorrow
[13]   Mitä on älykäs liikenne? n.d., http://www.its-finland.fi/index.php/en/mita-on-its/alykas-liikenne.html

Furthermore, in his book Singh (2012) predicts that in the future urbanisation and the new mega cities resulting from that will force radical changes on the way we move around. He implies that the tables will turn so that the technology-push perspective will turn into a user-pull as he believes that in the future cars will be designed around cities, not cities around cars, which he implies is currently the case. Consequently, new type of business models and services will emerge and car companies as well as other mobility service providers will change their mindset and success measurement to "mobility share" instead of market share (Singh 2012). Singh also believes that, in fact, transport-related infrastructure will be at the core of all infrastructure development and spending as urbanisation continues (Singh 2012). That is to say, as the evolution of cities and technologies and therefore smart environments continues, people's transportation routines will also change in one way or another. Therefore, there is demand for innovation in transportation solutions.

Regardless of the many benefits intelligent transportation services may present, not everyone welcomes all new smart solutions. In a piece of news regarding the intelligent transportation solution plans in Finland, a local expert states that the user perspective has been neglected and that the public administration as well as companies are ideating new solutions from a technology-push perspective[14]. It appears that if new solutions are brought about with a too strong top-down approach, meaning from officials to citizens, they are unlikely to be accepted. Therefore, a more bottom-up-type approach, i.e. from citizens to officials, could ease the process of bringing innovations into real-life use. If new transportation solutions were designed so that average individuals would have a say in them, users might not showcase resistance Then again, if the solutions were designed so that would be based only on user-opinions, they would not necessarily be genuinely new or challenge the existing transportation habits. Therefore, it should be considered whether a combination of bottom-up and top-down approaches that reconciles the interests of users and service providers would be the most appropriate one. Nevertheless, when designing intelligent transportation solutions users have not traditionally been included in the process, but now it seems evident that there is demand for user-inclusive development approaches.

2.1.3 Service dominant logic

At the beginning of this thesis, it was proposed that a new mindset is required from organisations to serve individuals better in the contemporary circumstances. Service

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[14] Kilometrivero jäävuoren huippu liikenteen digitalisoinnissa, 2013
http://www.mtv.fi/uutiset/kotimaa/artikkeli/kilometrivero-jaavuoren-huippu-liikenteen-digitalisoinnissa/2333972

dominant logic (S-D logic), as briefed in the introduction, represents an increasingly popular approach to doing business and it is closely tied to the notions made in section 2.1.1 regarding the need for more effective cooperation among different actors of society and the demand for more transparency. It has been widely recognised that the role of services is becoming more and more highlighted in business, as even those companies that have traditionally concentrated on selling units of products (i.e. practising goods-dominant logic) are expanding their offering towards a more service-focused direction[15]. S-D logic, however, does not look at service only as an added value to products, but rather as the very essence of doing business and developing organisations. It represents a greater change in mindset that is required if organisations really wish to adapt to the changes occurring in the world. In other words, instead of seeing services only as add-ons offered on the side of tangible products, S-D logic suggests that in fact, products are only add-ons to services, and competing through a service instead of a product is more appropriate an approach in current conditions (Lusch et al. 2007).

In S-D logic it is crucial that organisations work in conjunction with users and other important actors as according to Lusch et al. (2007) an organisation's service innovations are dependent on its collaborative competencies. In other words, an organisation can gain the required knowledge to gain competitive advantage if it has enough skills to learn from users, its networks as well as the environment. S-D logic thus highlights the role of human capital; the authors state that for example technology is more a means towards creating value (Lusch et al. 2007) rather than a source for value. This is justified by noting that e.g. IT has provided organisations with an opportunity to collaborate with stakeholders in new ways and consequently provided possibilities for learning, which has led to gaining competitive advantages (Lusch et al. 2007).

Interestingly, even though there has been increasing interest towards S-D logic, Gummesson et al. (2010) state that the theme has yet to reach the attention it deserves in research as well as in business education and management. That is to say, even though organisations have started to recognise the importance of services to some extent, the understanding regarding the magnitude of the role services can play has remained modest. Thus, it can be stated that professionals and organisations are still on the way to understanding how important services really are for business.

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[15]   Aaltonen 2010, http://www.theguardian.com/service-design/new-information-era

2.2   Design thinking

"Can we afford to ignore what the culture of the 'world of the arts' *offers to the* 'world of business'*?" (Mucha 2008: 42)*

This important question was presented by Mucha who notes that regardless of the fact that the two worlds, the "worlds of the arts and business", are different from one another, they also share a common feature: to succeed in both one needs to excel in creative processes (Mucha 2008).

Design thinking is a term that one sees in increasing amounts in newspapers as well as academic journals and that is strongly linked to the creative processes mentioned above. As such, the term is nothing new as design thinking has been around for as long as the practice of design (Cooper et al. 2009). However, the term has gained new meaning in recent years since it no longer refers to the ideation used in the design of objects only (Cooper et al. 2009). What has it started to mean and why is it so important, then? In a nutshell:

"Design thinking can be described in brief as a creative process and an underlying way of thinking that seeks new solutions in a forward-looking manner. Typically, it does not focus on improving existing solutions, but rather explores challenges and opportunities in order to find new solutions that have high value for users." (Kämäräinen 2012, p.13. Welcome to Finnish Design Thinking).

The same founding idea of producing value for users is also presented by Roger Martin, one of the most known promoters of design thinking:

"Design thinking includes helping people get a deeper understanding of customers using more qualitative approaches." (Martin and Euchner 2012, p.12)

Put otherwise, design thinking is all about user-centeredness and approaching problems with designer-like methods. Problem solving methods that are familiar from the creative industries are gaining popularity. This is because professionals have started to understand that products, services as well as user experiences can all be created by taking influences from the mindset and methods of designers (Fraser 2009) and that designers are masters in seeing what should be added to or changed about the human-made artefacts (Cross 2001). However, it must be noted that design thinking does not solely mean that business people should start thinking like designers, or designers like business people (Mootee 2013).

Design thinking goes beyond this definition, by being all about a *"search for the magical balance between business and art, structure and chaos, intuition and logic, concept and execution, playfulness and formality, and control and empowerment. […] Design thinking is not an experiment; it powers to experiment"* (Mootee 2013, p.32). In other words, design thinking opens up new opportunities, and allows for great growth and the development of new business models (Fraser 2009) through discovering the unmet needs of people and creative ways of doing (Cooper et al. 2009; Wattanasupachoke 2012).

Complementing this idea, Cooper et al. (2009) explain that design thinking encompasses a holistic thinking pattern. They equate design thinking as thinking of, thinking about and thinking trough. What this means in practice is that the concept includes imagining, visualising and dreaming up (thinking of), considering, reflecting and deliberating (thinking about), as well as understanding, grasping and figuring out (thinking through). In other words, their view considers design thinking a comprehensive process moving from vague ideas and visions (thinking of) towards careful consideration (thinking through), which allows the "thinker" to consider a subject matter in creative, empathetic but at the same time rational a manner.

Analytics meets intuition

Roger Martin defines design thinking as being a "*productive mix of analytical and intuitive thinking*" (Martin and Euchner 2012, p.10). According to him, both kind of thinking patterns are needed so that new creations would not be just new sort of interpretations of the past. In today's world, there is an incredible amount of data available, and the relevant data cannot be discovered with purely analytical methods; people need to trust intuition to choose which data to make use of (Mootee 2013) in order to find new meaningful sources of innovation. If analytical thinking alone is used, nothing genuinely new will ever be presented to this world and consequently there will be no real innovation. In other words, one must use also intuitive, creative thinking to get the full benefits out of the data of the past.

Design thinking is at its strongest at the "fuzzy front end" of idea generation, i.e. in the phase where initial ideation takes place and clear concepts are far from being fully developed (Cooper et al. 2009). It helps in tackling "wicked" problems that would be difficult to approach with purely analytical methods (Cooper et al. 2009). Additionally, it has been suggested that design thinking is an effective approach to learning about the problem at hand, as it can be used to raise good questions rather than finding a specific, one right solution (Wylant 2008).

Another feature associated with the concept is encouraging users to participate in an organisation's development processes to bring about new kind of products and services (Wattanasupachoke 2012).

It seems evident that professionals already master analytical thinking, as it has been the dominating thinking pattern in the business world as well as in business schools over the past years. What still lacks understanding and know-how is the intuitive, "design" side of the design thinking ideology, Since few big organisations have a culture that nurtures design thinking (Mootee 2013) or know how to develop one (Lockwood 2009). However, Lockwood argues that any organisation has the possibility to become design-minded. This can be done by collaborating with outside experts or growing internally. The process, according to Lockwood is not an easy process or a fast one, but with proper planning and patience the shift from "traditional" to design-minded is not necessarily as difficult as it may seem. For example, the shift towards more design-minded culture can stem from simple things such as considering how design and creativity can support an organisation's existing goals and values. In other words, "*It's not about putting design into corporate culture, it's about putting corporate culture into design*" (Lockwood 2009, p.89).

Creative working methods and design thinking

Tanner (1992) seems to agree that design minded organisations are needed since according to her creative thinking does not fully substitute for hard work, information, training or logic but it definitely promotes "getting the job done". Therefore, she maintains that people need to be provided with time to learn creative thinking capabilities and simultaneously organisations should invest in an environment that enhances creativity. To summarise, professionals in enterprises as well as in public organisations must learn to utilise creative methods better to find new, meaningful sources of innovation.

A good example of the use of creative working methods is that the corporate world has started to exploit the arts in increasing amounts e.g. for employee training as well as organisational development purposes (Seifter 2012). This is because people's skills to innovate are defective, and since innovation requires creativity and creativity is essential in the arts, working methods influenced by the arts can be exploited to raise employee competences (Seifter 2012). Furthermore, like design thinking in general, arts-influenced working methods enlighten about good opportunities regarding the problem at hand (Taylor

2008), meaning that creativity-requiring working methods can result very helpful in innovation processes.

In their paper Shrivastava et al. (2012) contribute to this idea by stating that by art one can find new perspectives, which allows for taking a new outlook on the world. This new outlook then leads to being able to reconsider old practices and to replace them with new innovative ones. The authors propose that art challenges the assumptions that we currently hold about our lifestyles by asking different questions. Mäkirintala (2009) provides a complimentary view by stating that applying the arts develops critical thinking and creative problem solving skills as well as allows for the search of meaning and experiences. In other words creative, design thinking methods in business can indeed rouse new viewpoints and important topics to ponder.

Even when looking at the past few years, it can be seen that the most successful companies have not relied purely on technology-push kind of attitude. The most popular products or services have not necessarily been those that have had the most advanced technological features. Rather, those that are user-friendly, intuitive and therefore easy and fun to use have succeeded. As Adler puts it, the next "big thing" requires innovation, which is essentially a design task, not a result of an analytical function (Adler 2006). A similar view is presented by Liedtka (2011) who points out that sometimes managers forget that the best data can be found in the real world instead of analytics on past events.

According to Adler, in the future great changes regarding the way we work and do business are facing us, whether we like it or not. For example, benchmarking competitors is getting less and less important as today's practices may be outdated already tomorrow (Adler 2006). In Adler's perspective, creative, artistic skills are much better tools for adapting to the pace of the world and creating innovations than the analytical, historical knowledge-based skills highlighted over the past few decades. Similarly, Mucha implies that organisations must adopt certain, more creative skills to be able to offer their clients the best rapid response in the rapidly changing market conditions (Mucha 2008).

To respond to this challenge, some companies have already shifted to rapid experimentations. In a world where the pace is incredible compared to decades ago, companies must test their quickly ideas to avoid wasting time on excessive planning. As Adler (2006) points out, experimentation is no longer costly and it is getting more and more affordable every day. Therefore, she says, organisations' most important resources are

those she calls the dreamers, i.e. the insightful, creative people who generate new ideas that then can be rapidly tested in practice.

Since advances have been made in the past decades technology-wise, in the future the biggest added value will come from someplace else than technology which at this point in time has become somewhat a given and whose development will become more incremental (Adler 2006). Envisioning the possibility – dreaming big – is therefore a necessity for seeing the reality and leaders must be able to "*inspire people to move from their current reality towards much more desirable outcomes*" (Adler 2006, p.496). Creative, design thinking can provide a channel for this kind of development. According to Seifter (2012) a good example of a creative way doing is that the leading organisations of the date are using arts in their advantage as they have understood that methods basing on the arts are entertaining and engaging tools for learning and thus not easy to match in effectiveness. Besides, it appears that creative methods inspire the transformation of people from mere workers to creators (Seifter, 2012).

Achieving diverse outcomes and goals
Taylor and Ladkin (2009) see that creative, arts-influenced working methods can serve for achieving diverse outcomes and goals. According to the authors, creative working methods can help in development processes as long as one knows what kind of outcome is expected and understands what kind of method can take to that direction. That is to say, these more creative methods cannot and should not be employed in a random fashion, but with care and sufficient understanding of a suitable application field. To help in reaching this understanding, the authors have recognised four processes which utilise the arts as the creative generator and which each contribute to reaching certain types of outcomes (Taylor and Ladkin 2009). These four processes (which are elaborated on below based on the authors' descriptions) are skills transfer, making, projective technique, and illustration of essence.

Skills transfer is essentially about using arts-influenced methods, such as theatre to let people feel the experiences of others and thus enhance learning, or introducing how it feels e.g. to learn a new skill and consequently encouraging a person to acquire the skill. In "making" a person is producing artistic output, and that experience helps the person in enhancing deeper personal presence and connection as well as in boosting creativity regarding the topic at hand. Both of these processes are more focused on the means rather

than the end, meaning that the end product of the processes is not important, but what matters is the process of getting to the end, as that is when the people involved in the process learn.

In projective technique a person uses creative methods in order to reveal their inner thoughts when conventional approaches fail to transmit the desired messages. This can be done for example by building mock-ups to concretely communicate a personal vision that is originally in a tacit format. In illustration of essence, on the other hand, arts-influenced methods are used to reveal the inner nature, the "essence", of a concept, i.e. what the concept is about. It is similar to projective technique but yet different in the sense that when projective technique focuses on depicting personal understanding, illustration of essence aims at revealing universally recognised aspects. These two processes are all about end results as it is the end results that produce the information about the topic under discussion. In other words, it does not matter how a person builds a mock-up, but what is indeed important is the final mock-up and the conclusions drawn from it.

Taylor and Ladkin (2009) remind that there are many methods that can combine some of the aforementioned processes and even create synergies. Therefore, when preparing certain methods for use, one needs to consider carefully what kind of outcome is desired and recognise if several processes are covered one method or if more than one method is needed.

Recapping design thinking
Based on the literature on design thinking, it can be concluded that many spokespeople of the concept understand it to include new types of thinking patterns from the business perspective. Still, there is some dispersion in the definitions of the term as well as in understanding it. In fact, Johansson-Skjöldber et al. (2013, p.121) maintain that there "*is no sustained development of the concept*". Regardless of lacking a unified definition, it can be said that design thinking has still raised awareness of the fact that design based methods can function as a great tool outside the field of pure product design or art, e.g. in social change (Cooper et al. 2009).

All things considered, design thinking inspired working methods are slowly integrated into business as companies can no longer rely on old ways of working and analytical functions when searching for innovation. Frankly, a person can easily satisfy their basic needs with the offering of today but people are still getting more and more demanding. This is because

most people want more convenience, more coherent experiences and more likable products and services. There are so many alternatives from which to choose these days that companies as well as public organisations must turn to new means for improving their current offering. Changing the mindset to a more service-minded outlook, i.e. service dominant logic can offer a way towards this improvement. With this approach companies can find new competitive advantages through collaborations with users and other stakeholders. Consequently, since creative working methods have been underused and undervalued by this date, they should be utilised more often in these collaborations if organisations wish to find new meaningful, human-driven innovations in the constantly evolving conditions of today.

2.3   User-inclusive service design

Another field that is gaining more and more attention by scholars is service design, as the service sector has expanded in recent times and services have become more and more central a piece of manufacturing companies' activities as well as contemporary life (Secomandi and Snelders 2011). Purely service companies are founded all the time while traditional product companies are turning into solution companies combining their traditional product offering with services (Katzan 2011). Since services are emerging, the need to carefully design what is offered to the customer is increasing accordingly. Service design is an approach which highlights the overall user experience while considering the specific needs of the service under design (Ojasalo 2009). The Service Design Network defines service design as follows:

> *"Service design is the activity of planning and organizing people, infrastructure, communication and material components of a service in order to improve its quality and the interaction between service provider and customers. The purpose of service design methodologies is to design according to the needs of customers or participants, so that the service is user-friendly, competitive and relevant to the customers" (2013)*

A service has been determined as an interaction between parties, which are often called the provider and the client, and normally the interaction goes so that the provider resolves a need that the client may have (Katzan, 2011). What this implies in practice is that services have traditionally been social by nature. Accoring to Katzan (2011) services exist within

systems which are adaptive social constructs belonging to a bigger whole. Therefore, he says, the efficacy of a service is dependent on the circumstances in which the service activity takes place. What needs to be remembered is that users are always present when a service is being actualised. Hence, they have an essential role in the value-creation process; users contribute to the service by their own actions. As a simplified example, a product can come into being without the input of a user but a service cannot; a service exists only when there is a person using it. As pointed out also in Research Technology Management (2011), while a product is designed so that one is the same as the other, a service is fundamentally unique as each customer experiences the service situation differently.

As there is a lot of subjectivity involved in a service experience, Katzan (2011) states that designing services can be quite challenging as it is actually quite problematic to determine what should be done and how. He sees that there are three things that have to be taken into consideration when determining this in the service design process. First, he sees the need to define the context for the service and determine what needs designing, for to be successful in the design process it is essential to solve the right problem. Second, when designing services, Katzan seems to assume that an organisation hires a design team to design a solution that the organisation puts into action when dealing with customers. Therefore, Katzan sees the need to decide how the design team works together with its client organisation to solve the service problem. Third, the designing party should explore which working methods they should apply when designing the service in question.

Users in service design processes
It has been argued that frequent, face-to-face, and bidirectional communication with users is a major aspect in achieving market success with a service innovation (Gustafsson et al. 2012). Moreover, it has been noted that companies still do not fully understand all the benefits that including users to design processes has to offer in the long term and therefore companies should learn to appreciate it more (Steen et al. 2011). These notions are similar to the notions of Gummesson et al. (2010) regarding service dominant logic in which active collaboration with users and stakeholders is recognised as crucial for success. Hence, there is demand for looking into what in this thesis are called user-inclusive design methods.

Gustafsson et al. (2012) state it is practically impossible to predict the demand for entirely new solutions. This is due to the fact that users determine whether they like a fundamentally new product or service only when they start using it. Therefore, it can be a good idea to

include users to the development process so that he organisation can get opinions on their service proposition already before the service is launched. However, the manner and the depth in which users can be taken into the design process vary, and according to Gustafsson et al. these depend on the nature of the service innovation in question. The authors suggest that when innovating incrementally, it is important to spend a lot of time with users in their context and it is vital to treat them as equal partners in the development process (Gustafsson et al. 2012). Likewise, it is important to create dialogues with them. On the other hand, as mentioned above, since customers can rarely envision fundamentally new solutions before they actually use them, in radical innovation the innovating companies need not be overly concerned about the content of their potential offering propositions, but rather focus on the user reactions that result from testing their proposed solution (Gustafsson et al. 2012). In other words, in radical innovation, the role of users may be more tester-like than creator-like, and it is essential for the service provider to communicate frequently with users to learn from them (Gustafsson et al. 2012). Regardless, organisations must remember that even the most radical of innovations must address latent customer demands and therefore they should collect user insight by including users into the development and innovation endeavours in one way or another.

Innovation strategies and service design

Verganti states that while user-centred design is important, it is only one approach to innovation (Verganti 2008). Within product manufacturing, in his opinion an approach that may function better in producing radical innovations is called design-driven innovation, which does not take user-requirement or observation into account (Verganti 2008). Design-driven innovation starts from an organisation's *"vision about possible breakthrough meanings and product languages that could emerge in the future"* (Verganti 2008, p.438). In other words, it is about changing what a products means to a customer (Verganti 2008). This approach requires designers' creativity in addition to sophisticated technology. According to Verganti, an example of a design-driven company would be e.g. the Italian Alessi, whose experimental products hardly stem from user requirements. Rather, Alessi makes its own interpretations of everyday products and turns them into desired design items.

The Figure 1 presented below portrays Verganti's view of the benefits reached by different innovation strategies (Verganti 2008). He maintains that technology-push can drive radical improvements in product functionality and can adapt to existing sociocultural meanings or generate a whole new understanding of what the designed product actually stands for.

Design-driven approach, on the other hand, always generates new meanings, but the level of technological development required for it may vary from incremental to radical. User-centred approach, according to Verganti, can generate only incremental technological improvements within the existing sociocultural meanings. Verganti also states that naturally, all approaches are aware of each other, but the starting point for the innovation is what draws the line between the aforementioned approaches.

Verganti maintains that in product development companies tend to explore user needs simply by asking them what they want or by observing them (Verganti 2011). In other words, it appears that he considers user-centeredness as responding to user requirements rather literally. He regards user-centred methods as a good approach for improving existing solutions but argues that these rarely lead to genuinely new ones. When applying the design-driven innovation approach, Verganti suggests that a gifted team of young researchers can be very productive in creating radical innovations (Verganti 2011), when compared to experienced experts who are often so at ease with the dominating industry assumptions that they are less likely to come up with fresh perspectives. Even though product and service development may be quite different from one another, it could be

Figure 1
Adapted from Verganti (2008): Innovation Strategies
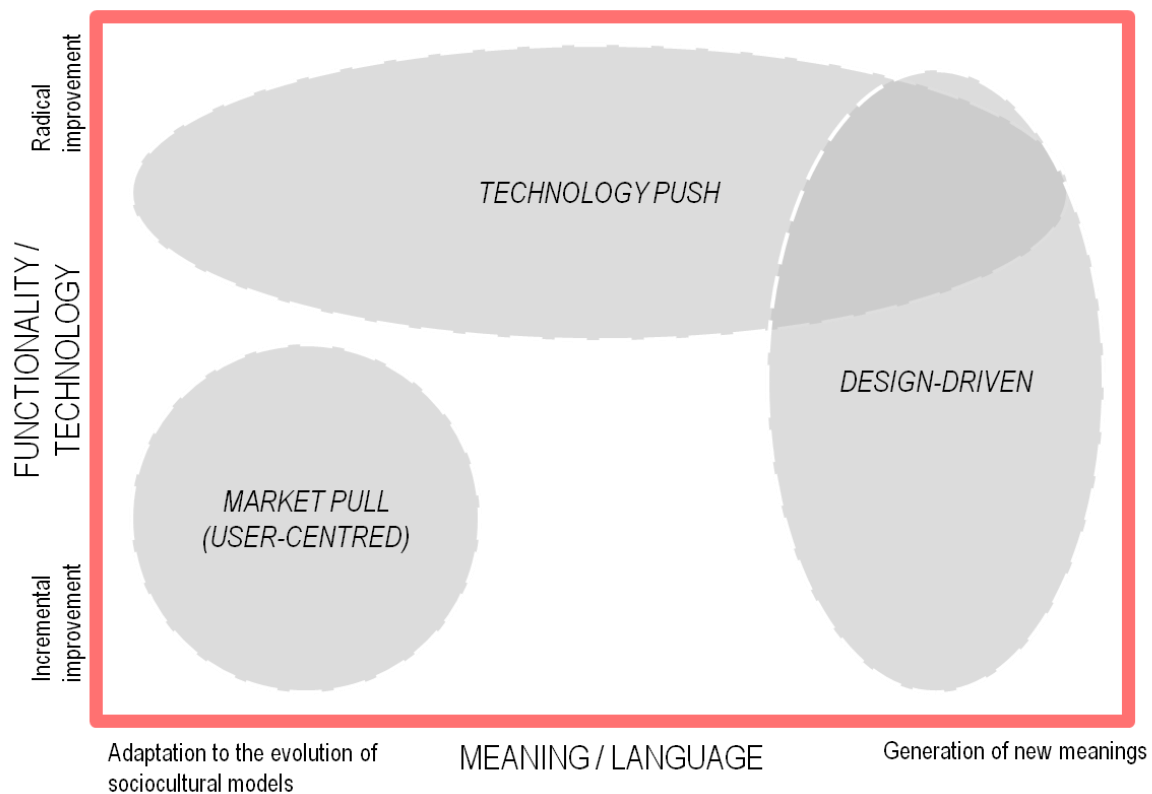
interesting to evaluate Verganti's points regarding the different innovation strategies also when doing service design.

Emotions in services

It has become evident that people no longer make purchase decisions based on what the product or service bought is by its functions, but rather based on the significance and contributions it has on their lives (Auletta and Dakduk, 2013). For organisations this means that the preferences and the loyalties of customers must not be overlooked and therefore user understanding is in much bigger a role than ever. Beltagui et al. (2012) propose that there is functional and emotional interaction between customers and service providers. These two forms of interaction together comprise a service experience. In their paper, Beltagui et al. argue that in service design it is therefore essential to consider both emotional as well as functional aspects of the service. They state that emotional design is something that is traditionally associated with products, but their stand is that, actually, there are more touch points between a service provider and a customer in services, which is why considering emotional aspects offers great opportunities also for service development (Beltagui et al. 2012). The authors explain that services can be compared to a theatrical performance; the success of a service depends on whether the service is appropriate for its users, just like the success of a play depends on whether its audience enjoys the performance or not.

As indicated with the theatre example, the success of a service depends highly on the subjective perceptions of individuals. Beltagui et al. (2012) remind that customers cannot be controlled as their minds are ultimately the places where the service experience happens. Therefore, service providers should use their design skills to stage the settings for the experience, because the experience itself is out of their reach. The authors highlight that managing the elements of the service encounter and the service environment is therefore crucial. Expanding understanding regarding users is vital so that service providers can create the sort of preconditions in which the desired customer experience is more likely to happen.

Importance of the right methods

Steen (2012) declares that in recent times, technology-push has been the dominating starting point for innovation and therefore organisations are running the risk of producing solutions that people are unwilling or unable to use. Consequently, it can be argued that there indeed is a need for new, user-inclusive types of service development processes and

methods. This view is supported by Kujala, who discovered in her research that by including users to development processes the developers get more precise information on user requirements, and that user involvement increases the probability of system success as well as user satisfaction (Kujala 2003). In addition, the sooner customers can be integrated into the service design process the better, for they provide important insights for innovation (Ojasalo 2009). However, Steen et al. (2011) remind that to be effective, it is important that companies choose the appropriate methods and the right people when incorporating user-inclusive methods. Likewise, Kujala (2003) acknowledges that being user-inclusive is not exactly easy, as the methods with which users are taken into the process as well as their role in it need to be chosen with care. Furthermore, the methods must be used appropriately, as the choice of methods affects the project outcomes (Kujala 2003). Simply put, before starting to employ user-inclusive methods, service developers must understand what can be achieved with different methods, and therefore the methods as well as the people of a project must be considered thoroughly if one wishes to succeed with the service design endeavour.

What all literature seems to agree on is that for a service to be successful a deep understanding of users is needed and that user-inclusive service design offers valuable assistance in gaining that understanding. Therefore, it can be argued that as a result of the increasing demands of users as well as the researched benefits of including users to design processes, user-inclusive methods are a viable approach to service innovation.

2.4   Design thinking and user-inclusiveness in Finland

Internationally speaking, it has been stated that creative methods have started to gain popularity:

> *"World leaders increasingly turn to the arts because the old ways no longer work as they used to, and business leaders have been among the first to realise this"* (Adler 2006, p.490).

Elsewhere leaders may be increasingly interested of the potential of the creative industries, but this trend is not very strongly visible in Finland, at least not in the public sector or the transportation field. According to Jäppinen (2011) innovation overall, let alone creative or user-inclusive service design methods as the source of innovation, has not traditionally been

explored in the context of Finnish public organisations as service providers. In her research Jäppinen (2011) discovered that Finnish municipalities are at the same time user-driven, as inhabitants require new services and have started to participate more actively to public conversation, and authority-driven as the municipalities are strongly tied to the law and the obligations that come with it. She also sees that the user-driven side has been on the rise since the 2000s, and municipalities have started to use new, user-inclusive methods to get inhabitants to participate in development activities. However, individuals i.e. service users are still generally more open to user-inclusive design than the officials and politicians in charge of services. Therefore, a change in mindset on the organisational level is needed if we wish to see Finnish public organisations employ user-inclusive methods more often in the future (Jäppinen 2011).

Jäppinen continues that the required change of mindset is mainly a question of culture. Boyle and Ottesmayer (2005) as well as Karp (2004) remind that the successful change of culture is dependent on the support and commitment of people, employees of all levels, and thus can never be forced from the top down. In other words, employees must understand and share the desire for change and consequently understand the relevance of user-inclusive initiatives before anything can happen effectively.

A good example of this kind of desire for change and understanding of user-inclusive developing in Finland is the city of Jyväskylä[16]. There the area of Kangas has been developed with the help of user-inclusive service design methods. Jyväskylä invited individual inhabitants as well as larger communities to contribute to developing a new district, to allow people to share their visions of a likeable neighbourhood in which they would gladly live and work. In this process Jyväskylä used a vast array of methods; they organised events in which individuals could participate in designing the area as well as provided an opportunity for people to contribute from home via an online forum.

Fortunately, there are signs that Jyväskylä may not remain the only stand-out example of the desired level of understanding and a more vast change in mindset. One indicator of this is that the Ministry of Employment and the Economy has recently published a national design programme, Design Finland[17]. Through it the Ministry acknowledges the fact there is great pressure for change in the Finnish economy and society and that design can be a viable tool in achieving that change.

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[16] Jyväskylän Kankaasta houkutteleva testipenkki yrityksille 2014,
      http://www.tekes.fi/Julkaisut/Fiksu_kaupunki_2014.pdf

Echoing Adler's words, in the publication it is also stated that many countries have already turned to design when seeking new solutions and growth, and furthermore, it is implied that as a country known for its design Finland has a golden opportunity to follow in these footprints. However, Finland still has not used design to its full potential. By this programme, Finland intends to increase its design capabilities in order to improve its competitiveness through both economical as well as general well-being aspects. Functional public services, and therefore also the exemplary cases of this thesis, i.e. intelligent transportation services, are on the agenda of the national design programme.

2.5   Forming theoretical framework

Literature has revealed that as our living environments are evolving and turning smart, new services will also emerge. Within mobility service providers the mindset is also likely to change, perhaps so that instead of thinking about focusing on numbers of vehicles sold, providers start to consider their success based on the share of people circulating in their vehicles (Singh, 2012). In other words, what we now consider transportation "standards" may change, and these changes cannot be achieved sustainably without developing infrastructures and using the intellectual capital that can be found from the cities, i.e. the capabilities of the citizens.

There are already some pilots regarding intelligent transportation services. However, not all have been welcomed; there have been comments of authorities neglecting the user perspective, and therefore there is clearly a demand towards utilising user-inclusive development activities to avoid top-down solutions. Put otherwise, new ways of working are needed to create more human-driven innovations. However, currently the case seems to be that users are more open to participating into development activities than officials and politicians are to including them into the processes.

The meaning of the literature review was to provide important information on the topics of my research. I aimed at explaining the general conditions for innovation, the shift of mindset that is in progress as well as why design thinking is needed. Consequently, I explained how design thinking is connected to service design and user-inclusive methods, as well as how creative working methods contribute to the topic.

[17)   Muotoile Suomi 2013, http://www.tem.fi/files/36278/Muotoile_Suomi_spreads.pdf

As indicated earlier, literature shows that there is an understanding that the way we have solved problems in the past will no longer work in tackling new challenges. Therefore, design thinking, which refers to holistic, more creative a problem solving approach combining intuitive and analytical thinking, is considered a viable way to generating more human-driven innovations. Based on literature it appears there is a lack of both understanding and skills regarding creative thinking, both of which are essentials for design thinking. Likewise, the importance of the emotional aspects of services has also been underestimated, and user-inclusiveness, which refers to taking users as active service developers alongside the service provider, could help in developing emotionally appealing services.

Currently analytical thinking is highlighted in schools as well as in businesses, which is why the intuitive side of design thinking that requires creativity and emotional sensitiveness needs practicing. As also discovered in the literature review, "smart" cities and consequently intelligent transportation services are emerging. Within this sector, as well as in services in general, there seems to be a lack of understanding regarding the benefits of a user-inclusive approach to development, and there are already signs of demand towards more user-driven transportation solutions. Additionally, literature revealed that sustainable growth and development of meaningful solutions require cooperation between all levels of society from users to businesses.

All in all, the literature review implies that:

1 There has been a lack of understanding regarding the importance of versatile partnerships between actors when designing new services

2 There has been a lack of understanding regarding the importance of the input of users in the development of functional services

3 There has been a lack of understanding regarding the importance of the emotional aspects of services.

4 There has been a lack of both understanding and skills when it comes to design thinking and consequently creative working methods

Based on literature it seems that all of these four "understandings" need to be present for human-driven innovations to occur via user-inclusive service design in the current smart city environments. In other words, together these four literature propositions indicate that in order to employ user-inclusive service design methods and consequently come up with new, meaningful service innovations Finnish service providers dealing with ITS related issues should be encouraged towards more versatile partnerships. Likewise, they need to be taught about the benefits of user-inclusive approaches. And finally, they need to be educated about the benefits of creative thinking and emotional aspects of service design. Only when the significance of all four dimensions is understood, there is a strong enough foundation that enables using new, unconventional working methods sustainably for initiating human-driven innovations (figure 2).

Figure 2
Dimensions of the theoretical framework: Foundation for sustainable user-inclsuive service design practices

USER INPUT

CREATIVITY

PARTNERSHIPS

EMOTIONS
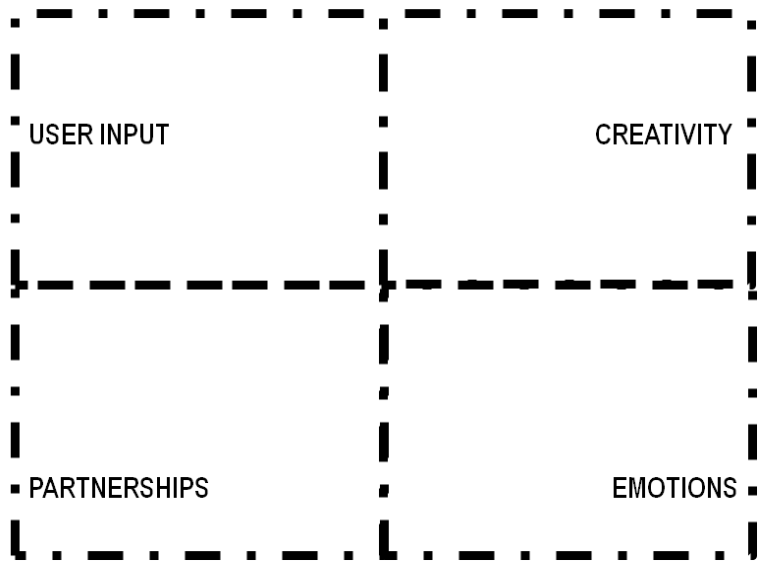
The next phases of this research go as follows. Firstly, interviews are conducted with municipalities and other selected organisations to mirror the four literature propositions against reality by mapping the real level of knowledge and opinions regarding service design and user-inclusiveness as well as creative working methods. Through the interviews I also get Finnish professionals' opinions regarding Q2, the benefits of user-inclusive service design. Interviews are followed by a workshop in which some user-inclusive service design methods are tested in practice to deepen the understanding of the aforementioned methods' benefits as well as to provide an exemplary case which hopefully encourages organisation to try this approach in their own development activities. As a result of the field research I also get the answer to the final research question, Q3 determining how organisations could be encouraged to start benefitting from user-inclusive service design.

3.   METHODOLOGY

In this thesis, I investigate user-inclusive service design in sectors that have neglected user perspective in service development. More specifically, I focus on intelligent transportation services. This thesis is qualitative and conceptual, as it is conducted in a form of a case study with both empirical and exploratory qualities. A case study research covers investigating a phenomenon in real life circumstances (Yin 2003) and "*focuses on understanding the dynamics present within single settings*" (Eisenhardt 1989, p. 524). This particular case study is exploratory, as little previous data exists of the researched phenomenon (Collins and Hussey 2003), which in this case is the use of service design within ITS. Both primary and secondary data were used for the purposes of this research.

According to Flyvbjerg (2006) a case study has been conventionally described as a thorough examination of a single case which can be used at the beginning of an investigation to generate hypothesis and whose results cannot be generalised to provide information about a wider population. However, such interpretations of case studies have been also rejected as it has been stated that case studies can be useful for building theories of new research areas as well as areas that cannot be evaluated based on existing work (Eisenhardt 1989). Furthermore, case studies are sometimes considered subjective, but in fact, researching cases and building theory based on them can be objective as researchers stay very close to the data and thus remain "honest" to it (Eisenhardt and Graebner 2007). In Finland little research has been conducted on user-inclusive service design in intelligent transportation service development and thus the case study approach is appropriate for building theory on the phenomenon; the novelty of the topic enables more unbiased and unlimited an investigation of the research findings thus allowing ideal conditions for theory-building (Eisenhardt, 1989).

Case studies that aim at theory building rely on theoretical sampling, meaning that "*cases are selected because they are particularly suitable for illuminating relationships and logic among constructs*" (Eisenhardt and Graebner 2007, p.27). Theoretical sampling is used in this case, and the reasoning behind the sampling process will be elaborated on in the sections presenting data collection methods.

It has been stated that "*the case study produces the type of context dependent knowledge that research on learning shows to be necessary to allow people to develop from rule-based*

beginners to virtuoso experts" (Flyvbjerg 2006, p.221). Hence, it can be argued that this case study is needed to generate information about whether user-inclusive service design is an appropriate strategy for initiating more human-driven innovations for intelligent transportation, and consequently to provide professionals with the information they need to take the necessary steps for implementing new practices.

Finally it should be stated, that this work bases on abductive reasoning. Dew (2007) states that abductive reasoning has three key features: presumption, plausibility, and defeasibility. In practice this means that there is a possibility that despite the foundation leading to conclusions in abductive reasoning is true, the conclusions can turn out to be inaccurate (Kolko, 2010). In other words, abductively drawn conclusions can be described as "*what might be*"; they offer the best explanation to the situation. Additionally, abduction "*is concerned with the practical need to take action, which motivates us to provisionally accept a hypothesis upon which we can base our next steps*" (Dew 2007, p.40).

3.1   Data collection methods

A case study is characterised by a combination of data collection methods such as interviews and observations (Eisenhardt 1989), and a combination was also used in this thesis. Primary data for this research was collected by interviews and a workshop. Interviews were conducted to produce information on the level of understanding and the perceptions of the benefits that representatives of different organisations dealing with intelligent transportation issues hold on service design and its different methods. Furthermore, possible experiences of using service design methods were mapped alongside with the expectations and challenges that are associated with their use. Workshops, on the other hand, were conducted to produce first-hand knowledge of the benefits and challenges of employing user-inclusive service design methods. This step contributed to discovering the answer to the research question by revealing if human-driven services can be designed better with the help of user-inclusive design methods.

Literature review and other complementary material presented later on in this work provided the secondary data of the research.

3.1.1 Interviews

Literature review implied that service design and consequently user-inclusive methods have not yet reached their full potential in organisations' activities mainly due to lack of understanding and skills regarding the subject matter. The interviews conducted for this research aim at clarifying whether this holds true in Finland or if professionals have other opinions. All the interviews were semi-structured to allow a free and open flow of conversation while ensuring that the predetermined topics were covered.

Eisenhardt and Graebner (2007: 28) state that limiting the bias of interview data can be reached through "*using numerous and highly knowledgeable informants who view the focal phenomena from diverse perspectives*". Therefore, altogether 16 individuals from 12 organisations were interviewed. Interviewees were first and foremost picked based on the organisation in which they work. The chosen organisations all have on-going intelligent transportation service projects or are significant stakeholders in them, which meant that also the individual interviewees had a strong touch point to ITS. In addition to this, interviewee selection was based on the individuals' personal characteristics. Interviewees were known to be important members of the organisation they represent, and alongside that they were known to be open-minded professionals who have the potential to drive a change towards a new mindset in their organisations.

While all interviewees represented certain organisations, it must be noted that they are still individuals forming their own, subjective opinions. Therefore, their responses are observed as personal opinions. Nevertheless, individuals were also interviewed about the situation of service design on a more general level, meaning that the results retrieved from the interviews can provide important insights also in larger perspective.

Interviews were divided into two rounds. The first round interviewees were selected from those organisations that are dealing with current ITS challenges or are at least important stakeholders in them. Interviewees included representatives from the Ministry of Transport and Communication, Finnish Transport Agency (Liikennevirasto), Trafi (Finnish Transport Safety Agency), ITS Finland, Eera, and the cities of Helsinki, Tampere, Mikkeli and Salo, and the interviews were conducted in December 2013.

Regardless of the open nature of the interviews, the four literature propositions of the theoretical frame and some supporting questions regarding each literature proposition were covered in all first round interviews to investigate whether literature suggestions are accurate

in the case of Finland. All in all, the interview topics covered intelligent transportation projects the organisation is involved in, service development, service design and its methods, as well as communication. Furthermore, the interviews aimed at deepening the framework analysis by presenting also the subsequent questions (see appendix 2 for full interview framework):

What results do organisations expect from user-inclusive methods?

What is the most effective way to communicate the benefits and results of using user-inclusive methods?

What would encourage organisations to apply user-inclusive methods in their own development processes?

In the second, complementary round representatives of companies providing design services in the ITS field were interviewed. Interviewees for this round were also insightful professionals selected based on recommendations from first round interviewees or knowledge of them spreading the message of design in the field of ITS. Interviewees for this round represented Nórr Design, WSP Finland and Ramboll Finland. These interviews were conducted in January and February 2014. In this round the first round interview results as well as user-inclusive service design in general were discussed with interviewees.

Respecting the wishes of some of the interviewees, the identities of the participating individuals are kept confidential and the commentaries presented in later sections of this work are identified only by the chronological order of the interview in question.

3.1.2 Workshops

After the two rounds of interviews, a workshop which tested user-inclusive service design methods in an intelligent transportation service project was organised. The workshop context was evaluated thoroughly, as the aim was to contribute to a real-life, on-going municipal project. In the lack of a suitable project by municipalities for the schedule of this work, the student project at Demola, which was presented in the introduction, was elected. Furthermore, due to being a current topic in Finland, the student project had raised interest among some municipalities already before its inception, and thus through it there was a possibility to influence the municipal mindset.

Workshop environment

In this section I explain the theory that led to organising the workshop which was organised at the premises of the Tampere-based innovation hub Demola within the "From traffic management to traffic leadership" project presented in section 1.2.1. Our workshop was conducted at the Demola premises during Demola Jam, a day-long event during which all students working on real-life Demola challenges get together to discuss and develop their projects. There were dozens of people present at the event. The day included partially directed and partially free work for the projects.

The meaning of our workshop was to get the student team started with their assignment, i.e. the "From Traffic Management to Traffic Leadership" project. Before the workshop the team had not yet considered what kind of integrated solutions they wanted to head towards. Since it was mentioned in the literature that the sooner users can be integrated into the development process the better, for they provide important insight for innovation (Ojasalo, 2009), we saw it important to work user-inclusively already at a very early stage of the project. Moreover, we decided to conduct a workshop in an environment where we could get feedback from several transportation service users at the same time, and Demola Jam gave us the ideal circumstances for that.

The purpose of the workshop for me was to produce first-hand information on the benefits as well as the challenges of conducting this kind of creative, user-inclusive workshops. I wanted to provide organisations with a practical example of what needs to be considered when working user-inclusively. Furthermore, the workshop would shed light on whether the benefits that literature and interviews implied were accurate. I also wanted to learn whether user-inclusive service design can be conducted by anyone, and if the threshold to use it be consequently lowered. The actual outcomes, on the other hand, were beneficial to the team for the next steps of their work. All in all, the workshop aimed at generating hands-on knowledge about organising user-inclusive activities as well as increasing the professional capabilities of the author and the project team.

Choosing workshop methods

As presented in the literature review, when doing service design, it essential for the organisation to take notion of three aspects (Katzan, 2011). In this section we go through these points step by step in the context of this research case. Firstly, one must clarify objectives regarding the problem at hand: *What are the problem and the context to which an organisation wishes to contribute with service design?* The problem to be solved with the

challenge is that in Finland professionals are currently looking into how to combine different municipal transportation services to boost the efficiency of municipalities. As presented in the literature review, at the same and with the current innovation approaches time organisations are running the risk of producing solutions that users are unwilling to use. Cutting costs can be easy, but doing so in a way that does not affect users negatively may be problematic. To provide a good foundation for the project, it was therefore important to understand users better. Overall the design process contributed to integrating different municipal transportation services in a way that is meaningful for users. Therefore:

> *The objective regarding the problem at hand is to understand what users think about current or possible transportation systems so that we can understand better the foundation on which the solution will be built.*

Then Katzan sees that it needs to be determined how designers should work with their customer organisation on the determined task problem: *How deep is the cooperation between the design team and the customer organisation?* The designer team in this case is the student team put together by Demola, and the client organisation is Tekes. In this workshop the design team should communicate actively with Tekes to ensure that the goals of the workshop are met.

> *Cooperation between Tekes and the design team is strong to achieve the best possible benefits with the workshop for the purposes of this thesis and the case project.*

Since the project aims at creating completely novel solutions for municipalities, the focus of the design task should not be on relying on existing municipal transportation standards but on thinking outside the box. The findings of the literature review suggested that it is often difficult for users to imagine fundamentally new solutions before they start using them. Similarly, Verganti suggested that a group of young professionals might be more productive in producing ground-breaking solutions. Based on these theories, it can be argued that municipalities can also find it difficult to imagine fundamentally new solutions when it comes to transportation. In the interviews it was discovered that municipalities are so tied to certain laws and regulations that they might struggle with seeing past them and consequently thinking outside the box. Therefore, it is better to have "outsiders" such as the student team propose solutions to the problem that this project addresses.

As Gustafsson et al. (2012) propose, in radical service innovation it is important for the designers to communicate actively with users to learn from them. Likewise, in the literature review it was noted that user-inclusiveness is a viable road to meaningful innovations, and it has not been utilised enough in service development. Therefore, it is important that the designers work in a user-inclusive way. When the designers create together with users using artfully inspired methods, the solution is more likely to be meaningful for users and consequently users might be more ready to accept it. With this particular project we aim at reconsidering the way municipal transportation is understood and trying to initiate a change in the way we move around, and therefore it is absolutely crucial to get people involved from the word go. Thus an interactive process in which users have the possibility to influence is essential. Literature also indicated that creative thinking and working methods are great tools for raising good questions regarding the problem at hand. Thus both along the entire working process as well as in the case workshop:

> *User-inclusive service design methods that base on creative doing should be applied in this ITS project to boost creativity about the problem that the challenge presented and to get user insight.*

Based on Katzan's theory, it became evident that user-inclusive, creative service design methods were appropriate to use in the workshop. Consequently, I reviewed a set of methods that could be used in the process. Roberta Tassi has gathered an extensive list of different service design tools as a result of her graduation thesis work in 2008. (Service Design Tools, 2009. In the website "Service Design Tools" [18]) Tassi presents these methods and suggests purposes for which they serve. Out of these methods I chose two methods which base on using creativity but which are also easy to do, so that people would not find them too intimidating. These methods are mood board and mock-up. These were the best alternatives due to them being easy to realise but still based on influences from the creative industries. Tassi describes the tools in the following way:

> *"A mood board is a visual composition of pictures and materials that propose an atmosphere by giving the generic perception of it. The mood board helps in the elicitation of some values the service has that are difficult to be described by words. The use of a visual representation fixes univocally the perception of the service inside the team."* [19]

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[18] Tassi 2009, http://www.servicedesigntools.org/
[19] Moodboard, http://www.servicedesigntools.org/tools/17

"The mock up is a model, an illustration or a collage describing an idea. At the beginning of the design process, the mock up is mainly made through the use of photomontages, created with photos of existing situations, products or services combined with other elements. During the next phases the mock up get more and more realistic, till they become real prototypes representing the main features of the project." [20]

3.2 Limitations of the study and suggestions for further research

Given the exploratory nature of this study, there are several limitations one must consider when consulting this work. Firstly, the number of interviewees is limited. Therefore, it would be interesting to conduct a similar research with a wider base of professionals. Additionally, it would be interesting to conduct a research in another field that has been developed in a technology-push manner in order to see if the results of this research hold true also outside ITS.

Secondly, the theme of this work is rather new. Service design and design related matters in general have reached wider fame only in recent years, and the topic is still unfamiliar to many. Now that the subject matter is becoming more and more known due to e.g. the national Design Finland programme, the level of awareness might change drastically even in the short term, which is why the topic could be revisited in a year or two to see whether there has been development.

Thirdly, the workshop is a small-scale pilot. Even though realised within the framework of a development project, the test environment was favourable to such methods as will be explained later. More workshops should be conducted in other projects to test whether the benefits and challenges are similar also in other contexts. For example, it would be interesting so test some user-inclusive service design methods when a project is in more mature a phase more specific concepts would be available for testing.

[20] Mock up, http://www.servicedesigntools.org/tools/18

4. FINDINGS

4.1 Interviews, round 1

This section presents the findings collected in the round one interviews. First, interviewees' knowledge, experiences and skills of service design are explored, after which the benefits, expectations and challenges that interviewees associate with user-inclusive service design are investigated. These parts are followed by feedback and communication related aspects of service development. Finally, findings on how interviewees feel organisations could be encouraged to employ user-inclusive service design methods are presented.

All the interviews were conducted face-to-face at the offices of the participating organisations. The main points of the first interview were written down on a computer during the talk, and the rest of the interviews were recorded. The main points of the conversations as well as important comments were later typed out for further analysis.

4.1.1 Knowledge, experiences and skills

One of the main themes of the interviews was the interviewees' familiarity with service design. In three of the nine organisations interviewed the representatives had little idea of what service design meant. The representatives of four organisations understood some aspects of service design, but simultaneously acknowledged the limitedness of their understanding. The representatives of two organisations were familiar with service design and had a good understanding of the versatility of the concept. Among the versatile pool of comments, for example the following remarks were made when asked if the interviewees were familiar with service design:

> "[The term] sounds strange to me" (interview 8)

> "This is the first time I hear about service design" (interview 1)

> "To me it [=service design] means customer-centred, interactive service development" (interview 6)

> "I understand it as taking usability one step further, i.e. considering the whole user-experience" (interview 2)

"[…] especially user-centeredness relates to service design. […] To me it [=service design] is familiar, but I also recognise the immense challenges related to it, especially in the public sector. […] But it is an important topic and I believe in it" (interview 9)

In the three interviews in which the individuals were unfamiliar with service design it was assessed that the generally low familiarity with the topic may be due to the fact that the sector in which the interviewees work, i.e. transportation in this case, is very engineer-led. There is little multidisciplinary collaboration and therefore the mindset stays rather unified year after year. However, after introducing the idea of service design, all the interviewees, irrespective of their previous level of knowledge, were intrigued by the topic and regarded it as important.

Those interviewees to whom service design was somewhat familiar or very familiar a topic (this was in six interviews out of nine) all understood it as a user-centred approach. Interestingly, the responses implied that they essentially think of service design specifically as *user-centred* indicating that users are mainly considered the starting point for service development, but not necessarily regarded as co-developers or an active source of innovation. This argument is made based on the fact that none of the interviewees mentioned *user-inclusiveness* (i.e. including users into the design force) on their own initiative, indicating that it is an aspect of service design that is less known and utilised in practice. Otherwise the depth of knowledge regarding and experiences of service design methods varied, but the representatives of all these six organisations stated to know of projects in which some features of service design had been utilised. From an outside perspective, most of these features seemed rather humble given the potential service design has, and the methods employed (e.g. surveys) appeared rather conventional and one-sided. In other words, it seems that in general the first-hand experiences regarding service design are limited when compared to the whole array of service design methods.

As the first-hand service design experiences are somewhat modest, it appears that professionals lack the skills of employing the methods. A couple of the organisations interviewed had hired or were planning on hiring service designers and some had used service design "more or less professionally" in earlier projects. Nevertheless, if looking at the interviewee group holistically, overall organisations' understanding and skills regarding the subject matter come across as limited. Therefore, it is no wonder that design influenced

working methods have not been used much in ITS. Then again, it should be kept in mind that the situation is not necessarily much different if observing other fields than ITS. As stated in the literature review, service design (as well as the use of design in general) is still raising its profile as the service sector has expanded drastically only in recent years. Given the novelty of the topic and the generally low level of knowledge regarding it, it can be argued that it is actually encouraging that in Finland there are also organisations that have taken the topic so seriously that they have even recruited designers.

4.1.2 Benefits and expectations

When discussing earlier service development processes in transportation related services and public services in general, interviewees were unanimous of the fact that development tends to be led from the process perspective.

> "Development has been greatly process-led, possibly due to the fact that we all are pretty much engineers…" (interview 1)

> "[Intelligent transportation services have been developed] in an engineer-led manner… that is how it has always been." (interview 2)

Simultaneously, all the interviewees agreed that there is a need for change towards more multidisciplinary and human-driven an approach, and that the principles of service design would be a step to the right direction. Those interviewees that were familiar with the topic were able to connect the idea of service design with better understanding of users and improving everyday life in general. Furthermore, after introducing the idea of service design, also the interviewees who were not familiar with it before were able to spot the potential of service design for the aforementioned benefits.

> "If somehow [=referring to service design methods] we can make them [=services in general] such that they are easier to use or even more memorable, it [=service design] is exactly what we should do" (interview 8)

> "I think that companies would want to use it [=service design] more often. But I think it is essentially a question of [not having the] skills. The world has changed and people have not yet realised what it means and what opportunities it brings" (interview 3)

Consequently, the idea of user-inclusive service design methods that highlight creative, even artful doing was introduced. All interviewees welcomed the idea agreeing that new ways of innovating should be tried out. Especially in transportation the up-coming transformation of the industry will be so great that it seems all fresh perspectives in its development are needed. In other words, there is a need for the transportation field as well as public sector in general to "reinvent" itself, and fresh working methods in addition to user input could aid that process:

> *"It [=user-inclusive service design] sounds exactly what should be done… And challenging! The environment is quite demanding. But personally I think that all kinds of crazy methods should be tried out. Or not even crazy but different kind of methods"* *(interview 5)*

> *"[The idea of user-inclusive service design] sounds good in the sense that we are 'so engineers'. User-experience is very important and we engineers do not really know what to do about it" (interview 8)*

Earlier in this thesis it has been noted that old working methods no longer work in finding solutions to new problems. Organisations should use their own creative, visionary skills as well as dare to use outside help to generate new ideas. Therefore, users' input can have incredibly important a role for innovation. New, fresh viewpoints and true epiphanies are what also the interviewees expect of service design methods:

> *"It is super important that we can create something new that gives wow-factors to every new service. At the same time we must be extra careful with what has already been invented so that we do not put stakes into re-inventing the wheel. And that is where the potential of service design essentially lies. Too often we aim at making a good version of something that already exists. That is not enough" (interview 3)*

> *"I do not have any clear expectations [of what outcomes service design could generate to ITS], which makes it [=service design] so interesting. We are so set in our ways of thinking that seeing outside the box becomes much easier when someone from the outside comes to the process with fresh perspectives. […] In fact; the stupidest ideas are often the best ones [...] So what I would hope from service design methods is that they would bring something completely new, previously un-*

thought-of points to the table, much like those stupid ideas. [...] Otherwise we are just fine-tuning existing solutions gaining limited benefits" (interview 2)

In the literature review it was implied that sometimes the more creative design methods work better as generators of more questions and new points of view rather than generators of fully developed solutions. This idea was implied also in the interviews:

"The thing that you aim at creating does not always come true, but as a spin-off of that process you create something else. Development endeavours realised by service design and user-inclusive methods often produce exactly this phenomenon due to the fact that you look at things from many different angles" (interview 3)

Interviewees also saw that user-inclusive service design methods can speed up development processes in the sense that the methods can lead to getting valuable specifications earlier than in the traditional development processes. Interviewees believe that user-inclusive service design is a useful tool for testing ideas at early stages and consequently seeing whether an idea can work in practice. In other words, agility and rapid experimentations are features that interviewees associate with user-inclusive service design methods.

"The biggest opportunity that service design provides is to test how something works, what kind of impact that something has and consequently how it feels in practice. It is much easier for decision-makers to make their judgements based on that than on a piece of theoretical paper" (interview 3)

"Fast specifications are what can be achieved with this [user-inclusive service design]. You can get to rather good specifications based on which you can seriously start developing your service. […] The wilder the method could lead to concreteness more rapidly" (interview 7)

In addition to all the viewpoints mentioned above that came up in several interviews, one interviewee also saw potential to increase users' understanding of the service provider via user-inclusive service design methods.

"I expect service design to help different people understand the whole service process which is characterised by many laws, and through that understanding we could then get realisable ideas" (interview 5)

4.1.3 Challenges

Another theme covered in the interviews was the challenges that organisations might face when taking on service design endeavours and user-inclusive design methods. Regarding this point there was unanimity but also some dispersion in opinions.

Interviewees recognised various challenges relating to using service design methods. The challenges that were mentioned most often were bureaucracy and laws. It appears that currently there are many parties creating pressure towards transportation service providers and many interviewees feel there is a limited amount of options available regarding what can be done in terms of municipal transportation services. Also mindset related issues were mentioned as a challenge to overcome. It came up that using the more unconventional service design methods might stir confusion not only among professionals, but also among tax-payers. The more creative service design methods are not necessarily familiar to citizens, and individuals might consider them a waste of their tax money, since the methods might seem just irrelevant entertainment to outsiders.

> *"It is not a straightforward barrier but […] there is a certain bureaucracy and pertinence associated with a bureaucrat's work. […] If you go and use 'silly' methods tax payers may think their money is going into irrelevant entertainment, even if that were not the case. Therefore especially in the public sector, one needs to be extra careful regarding what one does" (interview 6)*

As it was indicated in the literature review, also some interviewees mentioned that policy makers and officials might impose a barrier to taking on user-inclusive methods in public organisations. It was implied that the aforementioned groups might even feel threatened by allowing users to participate in development activities. Therefore, it can be argued that there is a clear problem regarding knowledge and consequently mindset and attitude when it comes to more creative working methods and user-inclusiveness, both among professionals as well as users. Alongside with mindset, old habits were discussed. It appears that in industries with little multidisciplinary, it is difficult to embark on new ways of doing without outside help or reference cases.

Interestingly, it was also discovered that some interviewees did not find any real challenges to employing user-inclusive service design methods, but rather saw the sparse use of the methods only as a result of not knowing about it:

"I do not know if there is really anything challenging to it [=using user-inclusive service design]. It is just something we have not thought of enough" (interview 8)

This comment is encouraging and implies that some organisations already possess at least some level of readiness to change in terms of mindset. Additionally, interviews revealed that there are also other signs of a shift in mindset that supports the potential employment of the more unconventional working methods and perhaps even user-inclusive methods. Learning by doing, which can also be considered an important aspect of both service design and user-inclusiveness, is according to some gaining popularity:

"The trend is to learn by doing and to take things forward by doing rather than sitting at a table pondering. The challenge is stepping over the threshold" (interview 4)

Unfortunately, it was also discovered that the idea of service design and its user-centeredness has also stirred negative connotations in some organisations' internal discussions. This is mainly due to misunderstandings and people not understanding what service design is fundamentally about. Therefore, in the future it is essential to popularise the term and make it easily approachable so that people would start seeing its true benefits and potential more vastly, and not be frightened by the jargon-echo that the term may have:

"The term 'service design' is currently a bit hyped, so one has to be careful with it, even though there are definitely good reasons for it [being so hyped]" (interview 3)

"People experience it [=service design and the related user-centeredness] as responding to every little need people may have. Besides, production and organisation-based thinking are so deeply rooted that it is difficult to get people to consider anything from the perspective of individuals. Furthermore, it is practically impossible for some people to understand that user-centred thinking could improve and organisation's own processes too, and in addition people think it [=service design] is something that totally destroys 'the palette' in terms of expenses" (interview 9)

"Within the huge ensemble of services provided by the public sector, designing individual services is regarded as frustrating, as in the entire complexity of issues it appears such an incremental improvement" (interview 9)

Interviewees also recognised inspiring people as one great challenge: it may not be easy to get people to participate to service design activities. At least now in the beginning it will be difficult to get users along as well as to get organisations' own employees on board. Moreover, several interviewees pointed out that employing user-inclusive methods is not just a question of getting any people to participate but of getting the right ones. People who belong to the so called late adopters of new products and services, or who are generally resistant to change might not offer the best possible insight.

> "People tend to criticise easily the work of others, but when the moment for them to participate comes, they disappear" (interview 9)

> "You need to get the right kind of testers; if the late adopters are planning on new solutions we are sailing in dangerous waters" (interview 3)

Additionally, some interviews also provided important insights regarding more specific user groups, "the right kind of testers" that should be included and encouraged to participate in the design processes. For example, young people were mentioned as one important source of innovation, due to limitlessness of their minds:

> "Young people are great. They have a great feature of not yet knowing the limits of the real world and therefore they can think things in completely new ways… until they are pushed into a certain mould" (interview 3)

Together with getting people excited about new working methods, the restricted amount of resources available was also one of the major points that the interviewees saw problematic. Resources always seem to be scarce, and if user-inclusive methods are more time and money-consuming than the conventional ways of working, even trying out the methods becomes more unlikely:

> "It is a question of time and it requires courage and energy from the experimenters to try something new, so the challenge is to get people excited and use their time for this" (interview 4)

> "We support taking on new challenges, but it [=i.e. the use of unfamiliar methods] is more dependent on the use of time. Does it take more time or money? This is what we consider. But I think doing things in a new way is overriding the old way, as people expect something new to come about. […] There are preconditions for it, especially

the management level would be happy to look into it [=new ways of working]" *(interview 4)*

Echoing what was discovered in the literature review, some interviewees understood that user-inclusive methods may not be a straightforward solution to designing better services, as one needs to know what to do and how to use the results retrieved through them:

"I think the biggest challenge is how to get to concreteness and what to do with it [=the material retrieved through the use of the methods] so that it [=the result] will not be dull. […] So how to do that, because you need someone's creative mind for that" *(interview 3)*

Complementing this idea, one interviewee had experienced a similar challenge first hand. The organisation that this person works for had adopted a user-inclusive approach in a project and this resulted in a problem with user expectations. This individual discovered that if users get to give their input to something and are not able to see their contribution in the end result, it might be a big disappointment and stir negative emotions, in the worst case scenario even regarding participating in future projects. Therefore, it is very important to consider carefully those projects to which users should be included, and consequently how to exploit the user input as well as what to let the users expect from their contributions:

"We once had a project in which we included users along the process. [We learned that] one challenge of service design is that you create great expectations to people and then the preconditions [that we have to follow can] turn the project into a torso. We received a lot of critical feedback regarding the final outcomes of our project. It definitely makes you careful on how you manage expectations" *(interview 9)*

4.1.4 Feedback

Feedback relates to user-inclusive service design so that through user-inclusive service design methods organisations can get immediate feedback and insights on the service under development, as mentioned earlier in this findings section. Therefore, the current loop of feedback was also discussed in the interviews. Feedback tends to be something that is received in a more or less random manner because different services appeal to emotions on different levels and consequently stir feedback respectively. A common view in the interviews was that feedback is rarely collected during service development. However,

interviewees see that it should be collected more often. As previously mentioned, interviewees expect that user-inclusive service design methods can speed up development processes in the sense that the methods can lead to getting valuable specifications earlier than in the usual process. Therefore, they can function as a valuable tool for collecting feedback already early in the development process.

"Usually the feedback collecting goes so that you test out the latest version of a product, e.g. an app, before it is launched. I think that you should go collect the feedback earlier in the process, thinking more comprehensively what kind of users you want and so on" (interview 2)

This point is closely connected to another important point made in the interviews: user feedback on the service under development is important, but so is the vision that the designing organisation has of it. It was mentioned that:

"You need to be sure that people test it [=the object under design] in the real environment. I think Steve Jobs once said that you can't make market research about something that does not exist. […] You should not succumb to user feedback only, but instead you need to have a vision of your own to refine [based on the feedback]" (interview 3)

As pointed out earlier, one interviewee had experience of including users in a service development project. In that case, users were given the opportunity to influence a service under design by asking them to test out the prototypes of the possible solution. At the same time, the user-inclusiveness of the project was a success and a failure. Users were active and excited to be included, but in the end they got disappointed when the real outcome was modest when compared to the prototypes they tried out. The lessons learned from that case are very valuable for this research too, indicating that the expectations regarding a user-inclusive project need to be managed carefully so that the process does not generate negative feelings. Therefore, communicating with users during a design process is also crucial for collecting feedback:

"Inhabitants were challenged to join the project and they got to try the prototypes in real life […] It was a great success. But in the end they were disappointed when the end result was nothing like the prototypes tested out. From this we got a lot of critique on why include users if they will only be disappointed" (interview 9)

What these aforementioned points together indicate is that when employing a user-inclusive approach, it is important to ensure that the participating individuals are aware of the depth of their contribution. If user input is used only for support and for gaining understanding rather than for creating a fully-developed solution it must be clearly communicated. If user expectations are set too high, or if the individuals are not sufficiently informed about the nature of their input, there is a risk of jeopardising the whole idea of user-inclusiveness in that particular process. User-inclusiveness is a good way to boost user acceptance of an innovation presented by the service provider, but it does not serve its purpose if users feel negatively about the service to which they give their contribution. In other words, the way in which user-inclusiveness is employed also affects the feedback received from it.

4.1.5 Communications

Nowadays people are exposed to so many different messages all around that it can be difficult to succeed in conveying the desired messages. It is not unheard of that in communications efforts the true point of a work can be lost if users' attention is caught by irrelevancies that appeal to emotions more than the essential point of the work. According to the interviewees, neither is it unheard of that communications have failed because in spite of a functioning service concept that addresses people's needs, the service communications has not reached its potential users. Then again, if an organisation succeeds in its communications efforts, the service is more likely to succeed. Because of these notions, the potential of service design methods and user-inclusiveness for communications were also discussed with interviewees.

It was discovered that it is not uncommon that misunderstandings happen due to ineffective messages. If communication were formulated in more user-driven a manner, it would be much easier for organisations to successfully deliver the desired messages:

> *"Usually we write press releases based on what we want to communicate to the recipients, not what recipients want to hear from us. […] This is something that we should also keep in mind." (interview 3)*

As the above notion implies, the success of communication depends on the way it is received. Therefore, the ways in which interviewees prefer to absorb new information were also discussed. In many cases it became clear that real-life stories told by peers in e.g.

seminars are a good way for learning new things. In addition to storytelling, all interviewees saw great potential in visual messages. In fact, some individuals said their organisation had already used visualisations in their communication and found it useful. All in all, it became evident that the conventional press-release type of communication is not necessarily the best way to transmit information.

"Storytelling-types of things are such that should be promoted. If you consider e.g. PowerPoint presentations, texts slides are something that are starting to belong to the past… [In communications] there is a lot of potential for conveying a clear idea of what is going on as easily and to as many people as possible. So we should invest in it [= more creative communications], definitely" (interview 4)

"This way of thinking that helps making things more tempting, interesting, and easy-to-approach for users sounds interesting. A set of picture tells more than a boring press release. And I bet it would not even be that difficult to do, if we only understood to consider that kind of perspective [to communications]. […] We need to keep in mind for whom we actually do these things. We could think of other ways of communicating than just writing a press release. […] I agree we should use more imagination. These are important things but we just do not think about them enough" (interview 8)

4.1.6 Encouraging and adoption

Interviewees were also asked what they thought could get their organisation as well as organisations in general to try out the more unconventional, user-inclusive service design methods discussed in the interviews. It appears that interviewees find service design very interesting, but since they lack understanding and skills regarding the subject matter, they cannot or do not dare initiate service design projects without support from their peers. In other words, it appears organisations want to hear and learn of exemplary cases by other organisations which they could then use as reference for their own work.

"We would need examples that others have used it [=service design] too. There are always people within an organisation who are ready to try out even 'funny' things. But to make the attitude expand more we need outside advocates so that we can say that

in someplace else they have done it… and so that we do not have to be the first ones trying it out" (interview 5)

"This kind of development endeavours are specifically powered by examples" (interview 7)

What deserves attention is that during this first round of interviews user-inclusive service design methods were characterised as e.g. funny, silly and crazy. It is possible that interviewees might have meant these only as a synonym to express "different" or "unconventional" ways of working but one cannot help but wonder if the underlying attitude is that creative service design methods are considered something that is fun to try out, but not a serious approach to service development in the long term. Therefore, the role of examples becomes even more critical, as it seems that proof is needed in order for people to see service design methods as worthy tools for gaining important insights and ideas for innovation instead of just something fun to do in between serious work.

It was also mentioned, that in some cases even examples from the interviewees' own department could be enough to spread the message of service design to other departments of the same organisation.

"We would need a couple of success stories of our own to be able to spread it [=service design] across the entire organisation" (interview 6)

Furthermore, it appears that sometimes it may be better to express matters in different ways. It came across that sometimes people can get lost in jargon. Sometimes even sensible concepts are nebulous and difficult to approach if they have a forbidding name. Therefore, as stated earlier, when promoting user-inclusive service design or service design principles in general, it may be better to speak in layman's terms to convey the message in the desired way:

"[It would be important to] spread understanding of what this [=service design] is all about. Even I cannot verbalise it well enough… Service design and user-centeredness are a bit jargon. We must popularise the terms and think which aspects of them to highlight" (interview 9)

Consequently, the principles should be applied to everyday doing in a down-to-earth manner. There is no need to impose radical changes to organisations at once, but rather

"drive in the idea" of service design little by little so that it spreads, and promote it alongside other important themes.

> *"It [=encouraging the use of service design methods] happens through everyday activities. You should not be like 'I will change this entire organisation', but rather start gnawing bits and pieces here and there. […] Besides, digitalisation will change our actions so drastically anyway, that it functions as a good driver for other kinds of changes, too" (interview 9)*

It was also said that wider communication about the rapidly achievable benefits of user-inclusive service design, such as the fast specifications mentioned earlier, may influence positively the way organisations respond to the subject matter.

4.1.7 First round summary

The first round interviews provided interesting information regarding service design in general as well as user-inclusiveness and ITS. For the second round interviews, I summarised the material collected into six main findings which were used as the frame for the second round interviews. The six findings are as follows:

> *There is dispersion about the knowledge of service design among the first round interviewees. Some have never heard of it, some understand the basic idea of it, and some know rather well what can be reached with it.*

> *Few have actually used service design in their own work, but see the need to develop new solutions in a more human-driven manner.*

> *Until now intelligent transportation related services have been developed in a process-led manner, but interviewees see the need for this to change.*

> *Organisations receive feedback regarding their services rather randomly – some services are commented on a lot while some not at all. But mainly feedback is collected and received very late in the development process or after it.*

> *Many organisations have used visualisations in their communication and see it an important aspect which should be developed further and utilised even more.*

All consider service design an interesting topic and would like to see it being used more in service development.

4.2   Interviews, round 2

After the first round of interviews a shorter, complementary round of interviews was conducted with companies offering design services in order to understand how they see the situation regarding service design in Finland. In this round the findings of the first round interviews were briefly presented to the interviewees after which they were asked to comment the findings. This was done to gain an understanding whether the designers and other organisations see the benefits and challenges of user-inclusive service design similarly and whether they have mutual interests regarding the topic. This information helped in understanding better the circumstances and potential for future cooperation among the different parties. The companies whose representatives were interviewed at this stage were Nórr Design, WSP Finland, and Ramboll Finland.

Like in the first round, also these interviews were conducted face-to-face at the offices of the participating organisations. The main points of the interviews were written down on a computer during the talk or recorded and later typed out. At this stage, the number of organisations participating was 3 with altogether 5 individuals present.

As a starting point for the conversation, the findings presented in section 4.1.7 were shown to interviewees. Given this loose framework, I asked the second round interviewees to give comments whether there was something that draw attention, or that they wanted to add, or what they saw differently. It was interesting to notice that interviewees' perceptions and opinions echoed the first round results. As one interviewee put it:

> *"I find nothing surprising about these results. I have noticed that the whole idea of service design is unknown in the world of engineers. […] Even though solutions are designed for users and engineers understand that solutions need to be usable it is still not normal to actually turn to users. Sometimes surveys are done but reciprocity has remained generally low. […] Maybe there is a thought in the background that this [=service design] should be done but still nothing is actually done" (interview 11)*

Despite that the results were not surprising to the second round interviewees they had also complementing ideas and additional comments regarding the results. It came up that it is

not easy to gain foothold for design and service design approaches in engineering projects. Technology has been so strong an influence and inspiration until now:

"Up until now things have proceeded in a process-led manner and also in a 'technology fever'. Now things are starting to change when people are getting used to internet etc., so it could be that the time for that fever is over. People are starting to understand that technology alone is not enough, and that nice applications of it along with considering user needs and perspectives are needed" (interview 12)

Continuing with this idea, it was also stated that user-inclusive service design can be extremely important an approach in making the shift from technology-push to more human-driven solutions. User-inclusiveness can help decision makers to really understand users' side of matters. Now in transportation there are many service providers who are naturally concerned with their own individual businesses without realising that users look at transportation from a very different angle. It was pointed out that for users there are just different forms of travel which take them from one place to another. They do not care whether they travel by bus or train as long as their experience is coherent and seamless. If service providers want to develop this experience of seamlessness, user-inclusive service design can be extremely functional for that.

However, as it was mentioned, the level of knowledge regarding service design as well as design in general and its possibilities is still low, and therefore decision-makers might not even know to consider service design as a relevant approach. It came about that some interviewees believe that one reason for the low level of knowledge might be that projects using service design tend not to have publicity. It was stated that a factor affecting this is that in Finland there is no centralised organisation devoted to spreading the message of design. A good reference point of promoting design-related matters is Design Council of the UK, which actively focuses on spreading the word of design in Great Britain. Thus if an organisation uses service design in Finland others will not necessarily hear about it, unless the organisation that has actually used design actively promotes it. In other words, it would be important to share information about successful service design projects. It was mentioned that the World Design Capital year was a good starting point and for some it was also a good reason to start doing design, but more work still needs to be done.

"Sharing successful cases would be essential in spreading the message. Regarding service design it seems there is no culture for that in Finland […]" (interview 10)

It was also noted that Finnish organisations might not use international benchmarking enough. It was pointed out that there are surely good reference points abroad which Finnish organisations could use as an example when it comes to using design. Not all innovations or ways of working have to originate from Finland to be functional. Again, everything comes back to the lack of understanding and skills about service design. Simply put, organisations need more information about the topic, either from the domestic setting or abroad.

> *"We rarely hear of benchmarking. Not all innovation comes about in Finland. For sure there are good exemplary cases elsewhere which could be valuable points of reference for Finnish organisations too" (interview 10)*

In addition to not knowing enough about the topic, another significant challenge that one second round interviewee saw in adopting user-inclusive service design approaches was the bidding competition which is a common practice in Finland, and in addition to that also other money-related aspects. It was stated that even if an organisation saw the need for design and decided to acquire design services, they do not always know how to formulate the bid so that they would get the best candidate for the job. This is due to the deficient understanding of design that they have. If organisations could be taught about design in general so that they would understand better what design in business actually is about, their capabilities of acquiring appropriate supporting services regarding design would also increase.

> *"The key to promoting the understanding of service design is in training organisations […] we need to promote design thinking in general because organisations do not really know what can be reached through design. […] At some point in time it would be useful to draw clear distinctions between design and advertising, people cannot always tell the difference. […] It is true that design methods can be used for planning advertising, but it should be kept in mind that there is no equality sign between the two. Design is much more" (interview 10)*

When it comes to encouraging organisations to do things differently, besides teaching them about the benefits of service design and user-inclusiveness, it was also mentioned that the right kind of leadership is required from a higher hierarchical level, either from individuals or organisations that have the power to influence others:

"I find that people are ready for change but it always takes someone to bring about the change. In the process there are always people who start thinking about costs. But I would not even talk about a change in attitude but rather that people do not understand what it [=service design] is. You need to get just the one person in the project with enough authority to say that 'now do things differently'. The signal [to employ user-inclusive service design methods] should come from above, e.g. from governmental agencies' directions" (interview 11)

Like in the first round interviews, especially visual communication was considered an important theme and second round interviewees see that there is potential for service design methods also in this context. Visualisations can be an easy path to communicating even complex things and therefore should be used more.

Interestingly, the second round interviewees also mentioned that the terminology should be carefully considered when speaking of service design. Some interviewees said that perhaps we should not always talk about service design or other jargon terms, as not everyone understands what it is about. Simultaneously, it was mentioned that the term service design is still the best term that is available and it depicts rather well the essence of the concept, i.e. that design can be utilised in service development too. But at the moment some still find the term ambiguous and some are even annoyed by it.

"Service design is a little bit like intelligent transportation, everybody understands it differently and nobody knows how to explain explicitly what it actually is" (interview 11)

"For some service design can be a swear word – they do not want to hear about it. We need to be aware of this and avoid wearing ideas out" (interview 12)

To continue with the bad connotation that service design may have one interviewee pointed out that the word "design" can be the reason why some people find service design so distant an idea and are therefore not able to find value in the concept. The word design is so closely associated with designers, creative industries and other work distant to e.g. engineers that they might struggle in seeing the value of design for their own work. In other words, depending on the audience, also verbal communication should be considered carefully when promoting service design. And interestingly, it was presented that perhaps the reason some

people find using service design such forbidding an idea is that currently it is regarded as something that people cannot really do without support from design professionals.

> *"The alarming signals of service design being annoying to some maybe connected to the word design, because now you need the help of a designer to do service design"* *(interview 12)*

Another point that came up in both rounds of interviews was the use of young people as a source for ideas. Their creative potential should not be overlooked and it should be kept in mind that after all, they are the ones using services in the future.

> *"It is important to use young people; they are the future users of the services after all"* *(interview 10)*

> *"Of course, it is always easier to sell new ideas for young people"* *(interview 11)*

When discussing specifically user-inclusive methods, the interviewees stated that while both user-centred and user-inclusive approaches to service design are valid options, there are still some differences between the two. Interviewees see that user-inclusiveness is definitely more time consuming and demanding, but at the same time can be more rewarding, as with user-inclusive methods a designer can gain much deeper an understanding the subject matter under design.

> *"There are also service design methods in which the designer uses only observation or empathy skills, etc. and these are used if the resources are not such that allow for the use of user-inclusive methods. However, if there are enough resources, you can get much deeper with the help of user-inclusive methods"* *(interview 10)*

Additionally, it came about that user-inclusive service design is not always a valid approach, as there are situations in which service design methods cannot and should not be used. However, these cases are exceptions, and in most cases user-inclusiveness is indeed valid for developing services.

> *"When designing services or systems in which people feel their privacy is threatened service design cannot be used. […] If considering ITS, for example, automatic surveillance is done for users' security; in the end it is society's job to take care of its citizens. But in general service design can be used for most of the time"* *(interview 11)*

"Price is something that you cannot really design" (interview 12)

Regardless of the fact that the level of knowledge and skills regarding service design is rather low and that there are challenges to overcome, the second round interviewees still believe that the development is heading to the right direction, and that it is encouraging to see that many people see potential in service design. Furthermore, as one interviewee put it:

"It would be interesting to investigate if it was be possible to create tools with the help of which engineers could do service design independently, without designers. In other words, the interesting question now is 'can we make service design such that anyone can do it?'" (interview 12)

If service design can be popularised so that anyone can do it, perhaps in a few years service design practices and user-inclusive approaches will have become so routine that no separate name for them is no longer needed. After all, services are designed for people and their content with the solutions ultimately determines the service success. All in all, the interview results can be condensed into one comment by a second round interviewee:

"When designing solutions for users, users should be the ones determining what sort of benefits they want out of the service; be they economic, aesthetics, security or usability related." (interview 11)

4.3   Final remarks on interviews

Both rounds of interviews provided important information for the next steps of this research. Until now, the potential of creative working and thinking as well as the role of emotions in services have been neglected. Likewise, the input of users in service development and cooperation between actors seems to have been underused. Interview results also show that there is a great need for examples regarding the use of user-inclusive methods. Moreover, it became evident that also communication regarding the work done must be carefully designed so that the lessons learned could be forwarded effectively. All in all, based on the interviews it seems that there is both interest and need for user-inclusive service design. Likewise, it appears there is a readiness for a change of mindset towards a new kind of working culture and thus also towards service dominant logic, as interviewees showcased excitement towards the methods. At the same time, there is a certain type of shyness

hindering the change in the ways of working and examples of incorporating fresh practises. For that reason the pilot workshop planned as part of this work becomes extremely important. If the workshop can be delivered successfully, at best this thesis can provide organisations with an exemplary case that gives practical information about user-inclusive service design and consequently encourages organisations to try user-inclusive methods in their own development processes.

4.4 Workshop

The theory that directed organising the workshop was presented in section 3.1.2. Here I will focus on the practical side. In other words, in this section I will present what was done before and during the workshop, as well as the lessons that were learned from it.

4.4.1 Preparations preceding workshop

The way to the one-hour workshop turned out somewhat demanding. It required a lot of planning as well as consideration about what we wanted to learn during the day. The days preceding the workshop I did several hours of planning alone reviewing suitable methods and questions to address during the day. Once I had done the preliminary work, I and the team got together the day before the actual workshop to discuss the details of the session. That meeting also took some three hours of discussion and agreeing on details of the following day. It was indeed quite difficult to decide what to do in the end and how to do it; the project was at such an early as well as chaotic phase that it was difficult to get a grip of it. Finally we came to the conclusion that in order to understand better the features that people value in transportation, we need to understand what their worst fears regarding transportation are, or what they think are the most significant faults in the current transportation services. Furthermore, since the project aimed at creating integrated transportation solutions, we decided it would be of value to understand how people feel about travelling with special user groups. These aspects would give the team important information and preliminary specifications around which to start building their solution proposition.

The main challenge with the preparations was that it was impossible to predict what exactly would come out of the workshop. This required a lot of uncertainty tolerance; beforehand it

was impossible to foresee what kind of ideas users would give us. Additionally, even though we knew there would be dozens of people present, we did not know how many people we would be able to recruit to the workshop. These aspects along with the fact that none of us had ever conducted this kind of creatively enhanced workshop increased the uncertainty that characterised organising the session.

4.4.2 Workshop in action

As mentioned, there were several dozen people present in the premises where the workshops were held, as over 50 people had pre-registered for the event. All the participants were adults, with the great majority being young adults, and there were both students and professionals present. During the Demola Jam day there were some organised activities, but there was an hour-long section reserved for free interaction between teams. During this time slot we conducted our workshop inviting passers-by to give their input. Altogether 19 people participated actively in our workshop, and approximately ten more were observing the people who participated. People found our workshop intriguing and different, but some were too shy to participate even when encouraged. (See appendix 5 and 6 for workshop material and outputs)

First we asked people to share their opinions about the biggest faults of current public transportation, or share what would be their worst nightmare in public transportation. Considering Taylor and Ladkin's (2009) four processes we wanted people to use a combination of projective technique and making to reveal their deep-rooted thoughts. We gave participants tinfoil, markers and post-it notes which they could use to mould their perceptions into a physical form, draw their ideas on a table, or do a combination of both. As the participants created their outputs they enhanced creativity regarding the topic through making, and the end result itself was the projection of their deep-rooted emotions. All outputs were documented by taking pictures of them (see appendix 6). Interestingly, most people chose to draw their idea, but some used post-it notes and tinfoil as "accessories" to highlight certain points of their work. There were also people who refused to participate, simply pleading on their lack of skills. "I cannot do that" was a response that we heard several times – but we also knew to expect that as literature implied that creativity-requiring tasks are something that people can feel uncomfortable with.

In the end thirteen users gave their input to this task, three of which were us, i.e. I and the two of the project team members. We participated to give people a clear example of what we expected them to do.

For the second step of the workshop we used mood boards to see how participants would feel about travelling with certain special user groups. We had made three collages out of different kinds of user groups and asked people what they would feel in case they would have to travel a 30 minute ride home with a bus full of people from these groups. We showed participants mood boards of children as well as elderly and handicapped people. We intentionally chose somewhat provocative sets of images for the mood boards to stir up emotions. Projective technique was used also in this phase, as the participants were provided with a set of smiley faces from which they could choose the emotion that best represents their feelings. One team member collected the responses from the participants on one sheet. Six people participated in this phase before we ran out of time and had to put an end to the workshop.

4.4.3 Lessons learned

The main lesson learned through the workshop was that getting user input is demanding and time consuming – but rewarding. First, as theory indicated, it was difficult to decide what exactly would be done in the workshop and what creatively enhanced methods would be employed. Even though the general project task to which the team had to contribute was clear, the point from which the working should commence was more difficult to determine. All kind of information was needed but all could not be collected in one workshop. Since the beginning of the project was rather chaotic due to the vastness of the assignment, it was useful to find some sort of way, such as the workshop, to get started and talk to people to get ideas. So what this means in practice is that when learning to do user-inclusive service design the important thing is to just start experimenting.

Second, even though this particular workshop was conducted in an environment in which people are generally active (all event participants had actively sought their way into the Demola projects and community) not all people were willing to participate, even if they were idle at the moment. The creatively enhanced methods were clearly not pleasing for all, and therefore some valuable opinions were left uncollected. In other words, it can result challenging to gather participants from outsiders who are not prepared to use their creativity

and this needs to be taken into consideration. The methods can require patience and pertinence from organisers, as well as social skills to encourage and inspire users to participate.

Third, and as earlier implied, using the methods was more time consuming in practice than anticipated. Planning the activities, encouraging people to participate, and actually executing the task turned out to be quite demanding and some people required more support from us than others. On the other hand, it needs to be considered that we were first-timers doing this kind of activity, so naturally that also affected our time management skills. Additionally, if considering the mock-up phase, some people put a lot more effort into their outputs than what we thought. They seemed to enjoy depicting their ideas; the activity was clearly very engaging. Therefore, the fact that using the methods is time-consuming is not necessarily a bad thing, but in fact, it allows for deeper a connection with the topic and the participating users.

When it comes to presenting different scenarios with the mood boards, participants also reviewed the images somewhat longer than we expected, and finding the appropriate emotional response to the mood boards also took longer than what we thought. This appeared due to the loose background story that we had given to the mod boards. It turned out that users wanted more specific scenarios, more detailed stories around the mood board to assist in their decision making. Our loose "going home from work" was not effective enough. Some participants started asking about what their day had been like, etc. and discussing the scenario with other participants. Naturally, specifying the task took time, and on top of that also the conversation that arose about the travelling alternatives was surprisingly lengthy.

Additionally, as the interviews suggested, communication during the process turned out challenging. With many people participating at once it was sometimes difficult to communicate to participants why we were doing what we were doing. This can be compared to what was mentioned in the interviews regarding managing expectations. Some people simply got confused. This was mostly due to the time constraints. Had we had more time, it would have been easier to focus on communicating with one person at a time and consequently explain more clearly for what their input was used. Then again, the fact that there were multiple people participating in the workshop simultaneously encouraged discussion regarding the topic, which resulted in valuable material for the project group.

Nevertheless, it became clear that when planning user-inclusive workshops it is extremely important to reserve extra time also for careful communication with people. Even though in theory we had the information to prepare for this, practice still turned out tricky.

While the workshop did not focus on planning or testing how to communicate the end result forward, working with the creative methods also provided important implications regarding that aspect of service design. In the mock up phase it became very clear that combining images with stories is quite engaging. People often depicted their opinions by sharing some everyday stories and got carried away when sharing that story. Those stories clearly appealed also to other people around, as discussions arose. Surprisingly, the mood boards were a bit more difficult for people to grasp, since the participants were not able to connect them directly to any emotions. This implies that appealing to emotions is very complicated, and it cannot always be done with images only. Participants called for specific contexts and stories around those pictures to understand better how they could feel in the situation depicted through the mood board. In other words, a combination of visualisations and stories seems like something that could lead to effective communications.

What was especially rewarding about the workshop was that both steps of the process generated a lot of conversation. At the first stage for example, some people started drawing and they got more and more excited as they went along, revealing very important thoughts and gave the team new viewpoints. There were discussions between users and team members, as well as users and other users, and listening to those conversations was very valuable to the project team.

Organiser opinions

After the workshop session I interviewed the two team members that conducted the workshop with me. They agreed that using the methods turned out to be gratifying and fun, even though they had doubts about the methods' usefulness beforehand. Had we only talked with people the process would have been most likely faster and we could have collected more opinions. Then again, creative methods were more interesting an alternative, as people actually started talking with each other in the process as well as asking more about why we are collecting their ideas and feedback in such an unusual way. Furthermore, as a result we have the feedback in a visual form which helps the team in interpreting the results also later on as well as in communicating the results to the project's stakeholders.

The two project team members who took part in organising and conducting the workshop stated the following.

"Interesting, different... I have not used those kinds of methods before. […] It was more than what I expected. We learned interesting methods to collect feedback and opinions. […] and now we actually know what people think, or at least we know their basic ideas about public transportation. (Team member 1)

"It was not difficult… But it was time consuming and it was also challenging to encourage people to do things. But it was still rewarding and stirred up conversation" *(Team member 2)*

One very important finding resulting from the workshop was the notion relating to difficulty of user-inclusive design: it is actually not that difficult. Once the methods were picked and we had decided what to do with them, it was fun and engaging working together with users. As mentioned earlier, the process was demanding in the sense that it required a lot of thought, work, and time beforehand in addition to a certain level of tolerance for uncertainty, but still, it was not too difficult.

When it comes to the outcomes of the workshop for the team, the team got important information about the preferences that people have in transportation. As the team's task was to design an integrated, intelligent transportation service (see appendix 4 for project brief), they wanted first-hand information about what users dislike about current public transportation and how they experience travelling with certain user groups. Dislikes were examined to recognise what to avoid in order to design a solution that is more meaningful and valuable to people. The feelings about travelling with other user groups, on the other hand, were tested to understand if some municipal transportation services should or should not be included in the integrated solution under design.

In the mock-up phase in which people were given the opportunity to mould or draw their perceptions of the biggest faults or worst fears in public transportation, the carrying theme was inconvenience in terms of information and timetables. It became evident that currently the information is scattered or inaccurate so that in the end, it is impossible to rely on it, and missing a ride due to this kind of information is experienced annoying. Only two out of the thirteen people that gave input mentioned only non-schedule related fears. Therefore, the

group got their number one specification for the integrated solution; time is the number one determinant for a successful transportation solution.

Also through the mood board exercise the student group gained important information. Based on the preliminary result it seems that transportation users are indifferent about people with whom they travel. This is argued due to the fact that users struggled in formulating an opinion about their preferences of travelling company. They asked for more details about their day, the situation in which they would travel, etc., and in addition, the participants stated that they do not care with whom they share a ride, as long as the ride takes them to their destination as planned. Thus the team learned that regular transportation users do not mind travelling with special groups, indicating that the integrated solution under design could expand to cover also the transportation for special user groups. However, given that such a small number of users participated at to this project, the student group intended to revisit the topic at a later date.

4.4.4   Final remarks on workshop

As a result of the workshop it was learned that even at an early stage of a project it is possible to get important feedback and specifications though user-inclusive service design. The design thinking based, creatively enhanced methods which were tested were a great tool for learning about users as well as about the project topic. However, it was learned that using the methods can require a lot of input from the people working with them and therefore can require also monetary resources from organisations. However, the methods themselves are not necessarily costly. For example the physical materials needed in our case workshop were pen, paper and tinfoil, none of which are pricey.

All in all, the workshop was very educational. As mentioned, the time consuming nature and the challenges regarding planning were good to experience first-hand, because "practice makes perfect", and thus the next time of employing user-inclusive service design will be much easier. No theory can prepare for what something is like in real life. Literature as well as the interviews provided me with a lot of valid information yet still the same issues surprised us in practice. Nevertheless, there were also many positive outcomes such as producing great material, stirring up conversation, learning about users and simply having fun while working on an important topic, which is why I believe user-inclusive service design should not be left unnoticed by anyone. This particular workshop was only a small-scale

pilot conducted at a very early stage of a project but still the outcomes were very useful. If user-inclusiveness was helpful already at such an abstract phase of service development, it can turn out even more useful when testing a more developed concept or solution.

5.   DISCUSSION AND ANALYSIS

As presented in the introduction, this research aims at clarifying whether user-inclusive service design methods can promote human-driven innovations in intelligent transportation development. The objective of my research is to find a definition for user-inclusive service design methods, discover what their benefits are and how organisations could be encouraged to benefit from them.

The findings of this research are an indication that user-inclusive service design promotes human-driven innovation in intelligent transportation service development. Interviews showed that Finnish professionals have started to understand the importance of human-driven aspects of intelligent transportation services as they acknowledge that new ways of working are needed to create better services for people. Therefore, it can be argued that a shift towards service dominant logic is in process in Finland. Service dominant logic recognises the importance of collaborations among different actors, and most importantly, *serving users* as the core of doing business. However, as few changes in the way of working have been made thus far, it appears that the shift in logic is still a work in progress. I argue that the reason for this is one significant factor whose importance for service development has is yet to be fully understood in Finland. Later in this section I will explain what it is and why I believe it is so significant, but first the answers to research questions Q1 and Q2 need to be explored.
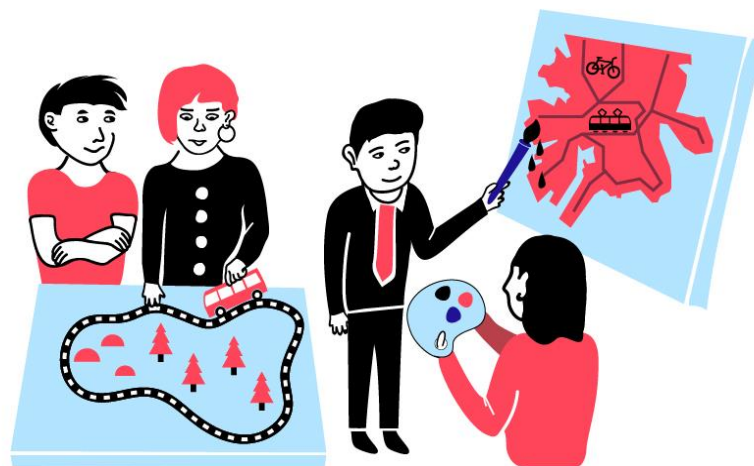
5.1   Defining user inclusive service design

Before analysing the field research findings more thoroughly, the answer to the first research question Q1 *"What are user-inclusive service design methods and what is their role for ITS?"* should be determined to give a solid foundation for further analysis. The answer to this was discovered already at the beginning of the work through the literature review. It became evident that in various sectors user perspective has often been neglected when designing new services, and this appeared to be the case also in the field of intelligent transportation. Furthermore, it was noted that the role of services is getting more significant all the time and the focus of doing business will shift to more service-dominant logic, i.e. serving people more holistically and creating value through service instead of selling units of products. For this kind of an approach to business to flourish, organisations need to start working in new ways,

and cooperate with users as well as other stakeholders to learn about the aspects that create value for them. Therefore, it is no wonder that the concept of service design has also gained popularity in recent times. Service design looks at service development from the perspective of users; it aims at making services user-friendly, competitive and relevant to individuals. To make these three aforementioned points reality, a service provider must carefully determine what aspects of the service need designing, how the design process should proceed, and which design methods should be used.

There are several different service design methods, which vary in terms of the user input as well as the creative effort they require. The methods with which users are taken into the process are the focus of in this thesis, and I call them user-inclusive methods. In a world where the significance of service is increasing all the time, it is essential for service providers to put more emphasis on creating value to users through service. By collaborating with users instead of just empathising with them it is possible to create solutions that take user perspective genuinely into consideration.

Thus we have reached an answer for Q1:

> *User-inclusive service design methods refer to those service design methods with which a service provider takes users alongside organisation members and designers for active service developers. In other words, users are not only considered during a user-inclusive service design process, but they are regarded as an integral part of the design force. These methods would help also ITS organisations develop services that take users' needs and wants better into consideration.*

Drawn by Ellun Kanat

5.2 Benefits and challenges of user inclusive service design

Now that user-inclusive service design methods have been defined, the benefits that the approach presents and their significance to intelligent transportation services should be determined. These benefits were identified with the help of the literature review as well as the field research that consisted of interviews and the pilot workshop. Already in the literature review it was mentioned that users should be included in service development processes as such an approach provides organisations with opportunities to gain user insight (Gustafsson et al. 2012). This notion came up also in the field research, as interviewees believed this is one of the most important benefits that user-inclusive service design offers. Another hoped-for benefit of user-inclusive service design was getting fresh ideas and perspectives. Likewise, literature suggests that with unconventional working methods organisations can find completely new aspects to their activities as well as promote proceeding with projects (Taylor, 2008 and Tanner 1992). Interviewees admitted that workers tend to have their professional biases, meaning that their professionalism sometimes prevents them from seeing all the solutions available. Normal users do not understand all the complexities prevailing regarding the service in question, and thus they can question many aspects of the service, giving food for thought for the professionals too.

The workshop organised as part of the field research confirmed that these interviewee expectations for the benefits of user-inclusive service design are accurate. In the workshop it was learned that even at early stages of a project user-inclusive service design methods can generate discussion and offer new viewpoints which are useful for subsequent phases of a development project. With the help of user-inclusive service design methods the project team learned what users really value and through that got some clear first-stage specifications on what the final solution should be crafted. In other words, the results of this research suggest that organisations know to expect the right things from user-inclusive service design and consequently they should definitely take more advantage of it in case they really wish to look for new sources of innovation as well as create more meaningful services to people.

Through the literature review it was discovered that users' input in the design process is likely to increase users' positive attitude towards the service under creation (Kujala 2003). Likewise, interviewees believe that user-inclusive service design can influence the success of a service, as making services more fun or memorable were mentioned as hoped-for

results indicating, like Gustafsson et al. (2012) implied, that user-inclusive service design methods can be used also for testing service ideas.

External communications related benefits were also discussed in the interviews since they are strongly linked to service success. Interviewees saw that user-inclusive methods could be of benefit in developing communication means, as currently organisations tend to think about their communications from the perspective of what they want to share with the users, when instead it should be considered what the users want to hear from the organisation. It appears that there are already examples of services that have functional concepts that serve people's needs well, but due to ineffective communications the messages of these services have not reached users. To avoid this from happening with in the future, user-inclusive methods could be used e.g. for developing effective and likeable messages and communication means or testing different communications styles. "Normal" users know best what kind of communication works for them, which is why user input should be used also in this context. Communications can have a big influence on whether a service succeeds or fails, and therefore getting user input also to this stage of a service development process can be a valuable step towards conveying the message of meaningfulness to people.

As explained above, interviewees saw many benefits that can result from user-inclusive service design. However, they also saw challenges. In addition to discovering whether user-inclusive service design methods offer the benefits that literature suggests and interviewees thought they would, the reason for organising the workshop was to provide organisations with a practical example showing whether these challenges are a relevant concern. Interviewees seemed especially concerned about the time and money that user-inclusive activities may take when compared to more traditional forms of working. Through the workshop it was discovered that interviewee concerns are somewhat accurate; planning and conducting user-inclusive activities can be demanding (as Steen et al. 2011 and Kujala 2003 suggested) and time consuming. Frankly, it takes time to choose what needs to be explored with the methods as well as which methods to use. Additionally, during the workshop we noticed that sometimes it can be challenging to encourage people to participate and use their creative skills, and some people can require more time to perform the given tasks than expected. Thus it became clear that people can clearly struggle with using their creative side. This means that as literature suggested, in user-inclusive activities the choice of appropriate methods as well as the people taking part in the activities is extremely important (Steen et al. 2011). The wrong methods can intimidate people and discourage them from

participating whereas the right methods encourage participation and lead to results. Therefore, when beginning to employ user-inclusive service design methods, it can be a good idea to start experimenting with "easier" methods (such as the ones we used in our workshop instead of e.g. theatre influenced ones) so that people are not intimidated and refuse to give their input.

Naturally, in the future when using design-influenced working becomes more common, people also get accustomed with creative working and thus including users in creative activities becomes easier. As noted in the interviews, stepping over the threshold for the very first time is the biggest challenge to overcome. Besides, even if user-inclusive service design appears challenging, it should be kept in mind that the benefits can override the challenges. For example the more "traditional" planning which tends to be characteristic in many situations in the business world often includes hours and hours of meetings and organisations' internal discussions before any real action or decisions are reached. In other words, also current working methods require a lot of resources from organisations and developing services can be time consuming anyway. At least as a result of user-inclusive service design an organisation can get real feedback, opinions and specifications from users quickly and thus get important material and practical information early in the design process.

### *Innovation strategies and user-inclusive service design*

Many individual professionals' opinions have been presented in this work, but still, there are clear trends based on which some theoretical conclusions can be made. These conclusion then aid in determining the answer to the second research question. I believe that regardless of the fact that he originally discusses product development related issues, the findings of this research can be used in an adaptation of Verganti's innovation strategy model (Verganti 2008) to depict the current potential of user-inclusive service design for service innovations in ITS. Some of Verganti's ideas resemble those of Gustafsson at al. (2012) regarding innovation in services, since like Verganti with design-driven innovation, Gustafsson et al. also see that in radical innovation the designer's vision about the solution is extremely important, whereas in incremental innovation the role of user requirements increases.

Perhaps due to the differences between the nature of services and products, according to Gustafsson et al. it is still crucial to apply a user-inclusive approach to service design processes also when seeking radical innovation. Based on the findings of this work, it

appears that this suggestion is true in when developing intelligent transportation services in Finland. If considering Verganti's suggestions of innovation strategies presented in the literature review, it seems that the organisations dealing with ITS-related issues in Finland, do not necessarily possess such design capabilities that they could incorporate design-driven innovation on their own and gain the desired solutions by acting independently. If they could, for example the "From Traffic Management to Traffic Leadership" project presented in chapter 1.2.1 would have been unnecessary as organisations could simply have designed new meaningful solutions for users on their own. Therefore, I argue that within ITS, design-driven innovation strategy is not the best approach with which to solve current problems. But neither is listening to user requirements only. As literature suggested, people can rarely envision fundamentally new solutions on their own; people think and act according to the existing sociocultural models they have, so in order for users to think "out-of-the-box" they need stimuli from someone else. Pushing forward services only to make use of new technologies is also unwise, as the solutions can be such that people are unwilling or unable to use.

However, if at best design-driven innovation produces something genuinely new and user-centred strategy satisfies user needs, a strategy that brings out the benefits of both can be productive. And this is exactly what user-inclusive service design seems to do (see figure 3), since based on the interviews and the examined literature within intelligent transportation solutions it appears that both professionals and users need each other to see "outside the borders of their own boxes". The starting point for user-inclusive service design is thus creating a balance between addressing user needs (be they in latent or apparent form) and creating something that questions existing solutions and consequently generates new meanings.

Figure 3
User-inclusive service design and innovation strategies
Adapted from Verganti (2008): Innovation Strategies
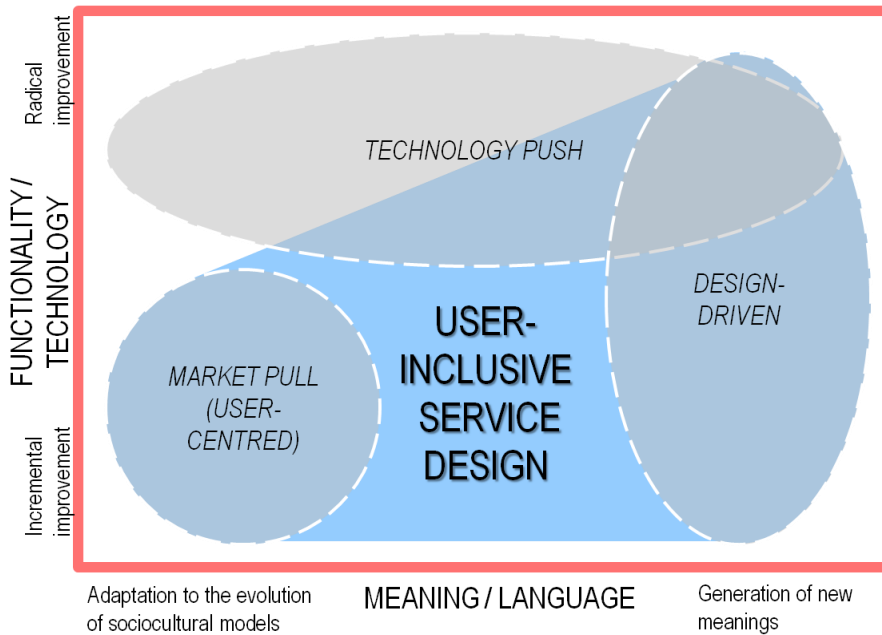
I also believe that depending on the nature of the problem under design and the success of the design process, the results reached can vary from incremental to radical in terms of generating new meanings. As the review of literature as well as the interviews indicated, in user-inclusive service design it is crucial for the service provider collect a good team and to choose the appropriate methods with which to start innovating. If the service provider succeeds and gets input from the "right" insightful people, the design-driven mentality of a service design process materialises in the sense that fresh ideas can initiate totally new solutions that enable a transformation in the way people understand certain phenomena. In case of failure, i.e. if no fresh ideas occur, the process can resemble more Verganti's theory about market-pull initiated innovation meaning that the benefits reached through such an approach can also remain incremental.

As user-inclusive service design provides opportunities first and foremost for human-driven innovation, technology functions only as an enabler in this context. Besides, for a great deal of intelligent transportation solutions the necessary technology already exists, meaning that the main thing for the ITS field at the moment is not necessary to create new technological solutions, but to highlight the humane aspects of new service development. However, it is possible that radical improvement occurs in terms of a technology's functionality as a result of a user-inclusive service design process, which is why the benefits of the approach can extend also along the right-hand-side of Verganti's frame (again, see figure 3), covering the same area as design-driven innovation.

Moreover, as it was mentioned in the interviews, user-inclusive service design is not the appropriate approach to all service development. There are services relating to e.g. safety

and other delicate matters over which users should not have a say. In these situations design-driven strategy may be more appropriate an approach to new service development. There are appropriate times and places for all the innovations strategies presented above, but in current conditions it seems that the user-inclusive strategy is the most appropriate one for developing solutions that the transformation to smarter cities requires.

To summarise the thought presented above, the key to creating radical human-driven innovations via user-inclusive service design methods is in generating unique perspectives to consider and un-thought-of epiphanies by including users alongside professionals to development processes. After getting new perspectives, complementary ideas, or feedback from the users, it is the professionals' job to interpret users' input in ways that users find valuable and meaningful. In other words, it must be noted that user-inclusiveness is not a value as such, but an organisation must first understand for what and why user input is used. It seems that user-inclusive service design methods contribute to gaining important insight and fresh ideas and at their best they can lead to radical, yet meaningful human-driven innovations, but they are not the straightforward answer.

Value for all through user-inclusive service design

As mentioned several times throughout this work, transportation is at a crossroads. As mentioned in the beginning of this work, a change of behaviour is required from transportation users who at least in Finland tend to be very attached to their private cars in order to make use of the new services that intelligent transportation enables. Den Ouden (2012) has stated that to achieve a desirable change in people's behaviour they should not be asked to make sacrifices. Instead of telling people what should be done, they should be allowed to determine their own goals, as people are more committed to achieving the goals they have determined for themselves.

Den Ouden's value framework (figure 4) presents the idea that innovations that create value to users can have positive influences also in a wider perspective, creating value simultaneously for

Figure 4
Value framework
From: Den Ouden (2011)

users, organisations, ecosystems, and the society if it seems that the interests of these four levels have conflicts. According to den Ouden (2012, p. 5): *"to change the behaviour of people on a larger scale, we need to provide solutions that they love to use. […] The ultimate solution is therefore the one that provides a pleasurable experience for end-users, with the ability for the organisations involved to do well, sustainably. Only this way will there be a big enough positive impact at societal level and will real transformation take place"*.

I argue that use-inclusive service design has great significance for this matter. As explained earlier, user-inclusive service design aims at bridging the gap between the user-pull and design-driven strategies thus reconciling the conflicting interests that users and organisations may have. When users and service providers develop new solutions together, it is possible to commit users to change their behaviour as it is ensured that users get the kind of services that they love to use and that they need while service providers can develop services for which there is demand and committed users. This enables the service providers to continue their activities. When these aspects are in order, ecosystems can evolve around the service and thus the stakeholders of that ecosystem (i.e. stakeholders that contribute to the service in one way or another) gain value. Once there is a functioning ecosystem, the environment becomes more functional and the result is a thriving society in which the quality of life is improved. In other words, user-inclusive service design can initiate transformational innovations that are meaningful not only to users, but to society as a whole.

Determining benefits of user-inclusive service design: Q2
As argued above, user-inclusive service design methods can generate many benefits and value to several stakeholders at once. However, employing the methods is not necessarily an easy task, for organisations must gather the right team of professionals, find the right users to include in the process as well as find the right methods for working with them. Fortunately, there are many kinds of methods that suit different purposes and they can vary from more creative to less creative. However, the literature review as well as the field research revealed that the creative methods that take influences from the world of arts are great in rousing people's imagination and in helping to question existing practices which is why it is good to use them when developing new services that aim at changing behaviour. Depending on the nature and the status of the service design process, creativity-requiring

working methods can be used for example for coming up with new ideas, testing concepts or designing communications.

Therefore, in terms of Q2,*" What benefits do user-inclusive service design methods offer"*, this research suggests the following:

Traditionally organisations have been developing services in a technology-push manner and thus they have been running the risk of displeasing users by designing solutions that users are unwilling or unable to use. Fortunately, this is changing and organisations have started to see that see that this approach is no longer productive. Therefore, organisations should assure their offering addresses user wants or needs - be they latent or apparent - by working together with users. Furthermore, the likelihood of solving "wicked problems" increases if users and professionals together develop services with creative methods that boost their imagination and enable looking at problems from new perspectives. The way we move around is likely to change radically, and if users get to give their input to service development, their willingness to use and content with new intelligent transportation services may increase. Besides, this kind of approach that provides users with services they love to use can generate meaningful, human-driven innovations that not only benefit users and organisations, but also the services' ecosystems and ultimately the society as a whole.

Drawn by Ellun Kanat

5.3 Towards user-inclusive service design practices

Theoretical framework vs. findings

Singh (2012) believes that the focus of this decade will be on making life more convenient to people and the findings of this research imply that this is true also in Finland. This can be stated due to the fact that interviewees regard aspects such as making services easier to use and more memorable as important. Furthermore, literature review indicated that this kind of convenience, which can be reached via cooperation between public and private actors as well as citizens, is extremely important in the development of smart cities (e.g. Kirby) as the conditions for innovations are becoming more and more challenging and anyone who can innovate in those circumstances will be highly appreciated (Burnham). The theoretical framework formulated as a result of the literature review implied that in Finland *there has been a lack of understanding regarding the importance of versatile partnerships between actors when designing new services.* Interviews verified this to be true as it was pointed out that within the field of ITS services have been developed in a mono-disciplinary manner. However, interviewees did admit that more versatile partnerships between actors are needed to design new, functional services.

Furthermore, interview findings support what Steen (2012) suggested about technology-push having dominated the international market scene and organisations running the risk of creating solutions that users are unwilling or unable to use. Interviewees mentioned several times that an engineer-led field such as ITS needs touches from other disciplines to change its mindset as well as working patterns. All the interviewees admitted that up until now, services have been developed in a process-led, technology push mindset as literature suggested, implying that the focus has been on how processes can be improved from the organisation's perspective, often without questioning the process as such or genuinely considering the user experience. This is also tied to the mono-disciplinary nature of the ITS field; when like-minded people have worked together, it has been unlikely for fresh, out-of-the-box ideas to occur. Currently, the situation seems to be as Mootee (2013, p.198) states: *"Organisational silos are everywhere and many companies are on autopilot more. They have separated people from each other's knowledge, created vocabularies that restrict real communication, put a damper on collaboration, cast creativity as crazy and have opened the door for management consultants to pour in and propagate the status quo with their data, spreadsheets and PowerPoint slides".* Therefore, it can be argued that in the future organisations should ensure that their employees are diverse in terms of professional

backgrounds so that the working environment allows for ideation from many different angles. However, according to den Ouden (2012) it is not enough that a group of experts from different disciplines is gathered together as such an approach runs a risk of generating simply a pool of specialised opinions. Having people from different backgrounds working together can produce great results if the participating individuals have the skills to look over their own silo to see problems more holistically. Scientific knowledge thus must be complemented with other types of knowledge (e.g. instrumental, ethical and aesthetic knowledge). In other words, for multidisciplinary working to produce results, the innovation team must possess a certain level of open-mindedness and readiness for understanding other points of view.

Luckily, as this thesis has shown, Finnish professionals possess these aforementioned qualities. Even though there has been a lack of understanding regarding partnerships to this date as the first dimension of the theoretical framework suggested, the findings of this study indicate that matters are moving to a better direction. The fact that interviewees recognise the need for new perspectives and out-of-the-box ideas implies that organisations are opening up to the idea of new types of more versatile collaborations.

Literature review revealed that many scholars believe that users are essential for service development as user involvement increases the probability of service success, regardless of the level of innovation (e.g. Gustafsson et al 2012). However, literature also implied that *there has been a lack of understanding regarding the importance of the input of users is the development of functional services,* which is why it was interesting to discover that none of the interviewees questioned the central role of users when creating new services. Everyone seemed to agree, that these days it is very important to understand users and even ask for their feedback. Furthermore, all interviewees saw the idea of developing together with users only as a positive matter. New perspectives are needed and as it came about in the interviews, alongside new types of partnerships, users can also provide them. Besides, it was noted that users should have a role in determining what kind of benefits they gain from the services directed to them.

Based on the interviews it appears that user input has still not been used to its full potential in service development. It was discovered that it is not necessarily unusual for organisations to collect user opinions via online inquiries etc., but these kinds of inquiry tactics contain little reciprocity, meaning that the collaboration between organisations and users has remained

somewhat shallow, and thus getting the full potential out of user input has not been reached. Therefore, it can be stated that until now *there has been a lack of understanding regarding the importance of user input.* Nevertheless, since interviewees saw user opinions so important and they acknowledge that users should be included more thoroughly in service development processes, it can be argued that this understanding is increasing all the time.

In the theoretical framework it was also noted that *there has been a lack of understanding regarding the importance of the emotional aspects of services.* However, the notion by Belatgui et al. (2012: 113) of services being a mix of both functional and emotional benefits appears to be at least somewhat recognised by interviewees already, as they mentioned that making services fun and memorable is very important these days and more effort should be directed to developing these aspects of services. Nevertheless, I argue that the theoretical framework statement is somewhat true; the role that emotions can play in services has not been fully understood yet since the actions taken to develop services that are emotionally appealing still seem humble. Luckily, the fact that interviewees mentioned words such as fun, memorable, and wow-factor in the context of services implies that awareness of the importance of emotions in services is increasing. Therefore, there is reason to believe that the emotional aspects are starting to get the attention they need in order for organisations to develop more lucrative services that support people's everyday endeavours.

As argued above, based on the interviews it seems that there *has been a lack of understanding* regarding the importance of versatile partnerships, user input and the role of emotions for services but the situation is clearly changing in terms of all these as professionals have realised that these aspects need to be taken into consideration better. Even though the prospects regarding the three aforementioned dimensions seem promising there is still one dimension that suffers from a more severe lack of understanding. That is creativity.

In the interviews it came up that professionals think it is important to practice out-of-the-box thinking and find genuinely new perspectives to service development. Therefore, all interviewees believe that alongside being more user-inclusive and having collaborations that are more versatile, creative ways of working and consequently service design methods could be an interesting approach for developing better services. However, few had actually tried creative working methods and it seems that the reason such methods have not been

used thus far seems to be, as literature indicated, that *there has been a lack of both understanding and skills when it comes to design thinking and consequently creative working methods*. The generally deficient knowledge that interviewees had of service design further supports this statement. Even though many of the interviewees knew of service design, there were also interviewees that had never heard of the term. Additionally, as noted in the findings section, it was admitted that creative ways of working are not thought of as an option, simply because there is deficient awareness and knowledge of them.

Even though all interviewees regarded the creative approach to service development as extremely interesting, the fact that that they admitted they would need more examples and information about the use of the more creative, user-inclusive service design methods to promote them in their organisation proves that they do not have the required understanding or skills to work in unconventional ways. Therefore, it can be argued that the lack of understanding regarding this dimension of the theoretical frame is the most significant out of the four dimensions (figure 5). Nevertheless, it is encouraging that as a result of this study it has become evident that there are professionals in Finland who are open-minded and who understand that something needs to be changed in order to develop solutions that serve people better in the current smart city environments. Put otherwise, professionals already

possess the motivation for changing their working habits, and thus they appear to have the motivation to shift towards genuinely user-inclusive service design approaches and service-dominant logic. However for them to do this sustainably, professionals need to develop their creative skills. In other words, what is still missing is the ability to actually change or adapt working practices, and therefore efforts that aim at increasing these abilities are needed.

Figure 5
Dimensions of the theoretical framework: Foundation for sustainable user-inclsuive service design practices

- 81 -
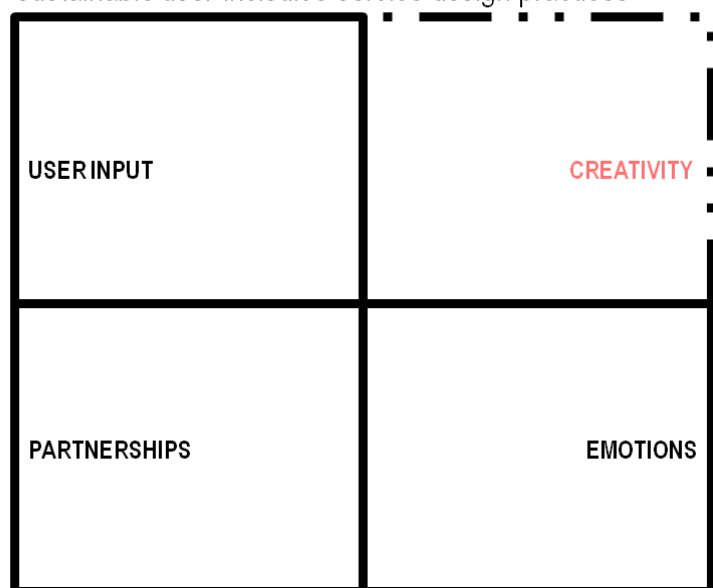
Changing service development behaviour within ITS

Fogg (2009) has created a model for explaining human behaviour, and I believe this model helps explain also how organisations could be encouraged to utilise user-inclusive service design methods when striving for human-driven innovations. According to Fogg, in order to get people to act in the desired way three factors that must occur simultaneously. These are motivation to change, ability to perform the desired behaviour, and triggers that initiate the change. If one of these is missing, there will be no change. Fogg explains his theory with the figure 6 below. However, Fogg complements this theory by stating that motivation and ability can trade off as depicted in the figure; with high motivation a change can occur even if the abilities are low but there is a trigger facilitating the change (e.g. step-by-step instructions). On the other hand, if there is low motivation to change but high ability to do so, a change can occur if there is a trigger that somehow sparks to take action (e.g. a prize for executing certain procedures). Nevertheless, an appropriate trigger must be in place in both cases, and the trigger can lead to an increase in motivation or abilities, depending on which of the two aforementioned situations is in question. If looking at the figure, the desired behaviour can occur if there are triggers on the right-hand-side of the activation threshold.

Figure 6
Adapted from: The Fogg Behaviuor Model 2009
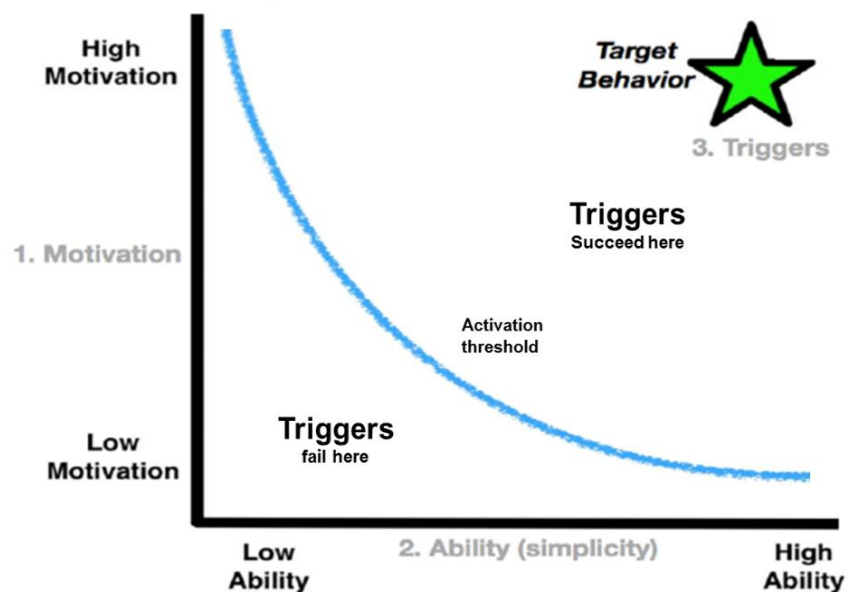
If adapting the findings of this study regarding the Finnish ITS field against Fogg's model, it appears that there is an increasingly high motivation to change. A shift in mindset is in progress towards more service dominant logic meaning that organisations are becoming more and more aware of the need for change and thus are also motivated to change. However, in terms of Fogg's model, what is still missing is ability and triggers (see figure 7).

Figure 7
ITS and behaviour change
Adapted from: The Fogg Behaviuor Model 2009
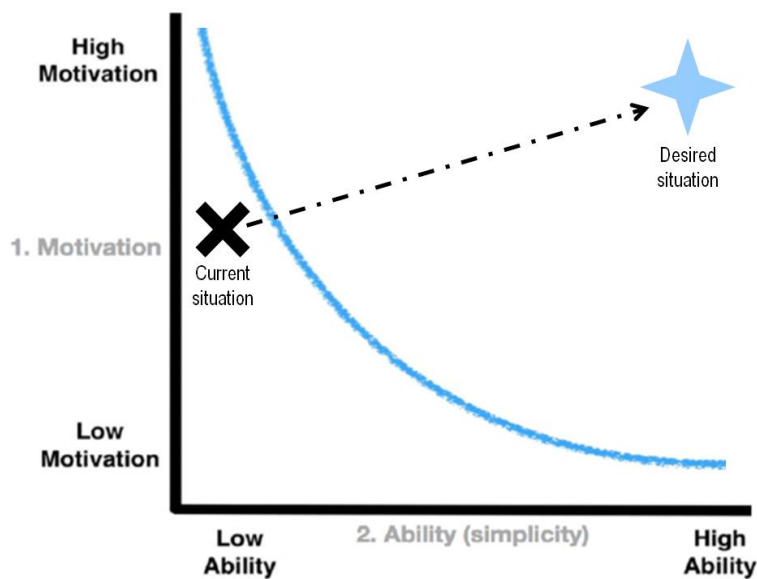
In this work I have maintained that user-inclusive service design can lead to human driven innovations in ITS. Therefore, organisations' abilities with regard to those methods should be increased so that human-driven innovations could occur. If looking at the figure, the aim is to get organisations change their behaviour so that their abilities to act user-inclusively would increase, and their motivation to work in such ways would also get even higher.

In the current situation, the ability of organisations to change appears low; professionals' deficient creative skills hinder the shift from conventional, process-led ways of working to more human-driven approach to innovation. In order for ITS organisations to start using user-inclusive service design in service development, they need triggers that facilitate the incorporation of these new working approaches. Trying the new approaches leads to learning and consequently increased abilities to work in different ways. In other words, now that ITS organisations clearly have quite a good motivation to change their service development approaches, most efforts should be placed on developing triggers that encourage organisations to start experimenting with use user-inclusive service design. These triggers can be e.g. information of successful user-inclusive service design cases or appropriate incentives that lead to more cases of using user-inclusive service design methods. Whichever the approach is, once organisations start experimenting with user-inclusive approaches, more information is generated, which leads to an increase in organisations' abilities to act in the desired way, i.e. user-inclusively. Simultaneously,

motivation increases in the process as it is learned that the new practices produce good results.

Now let us consider the dimensions of the theoretical framework. I argued that in order to employ user-inclusive service design methods *sustainably* when innovating in a human-driven manner, there needs to be sufficient understanding about all the four dimensions, which are 1) versatile partnerships, 2) user input, 3) the role of emotional aspects in services as and 4) design thinking and creativity. If looking at the theoretical framework together with Fogg's model, the current situation looks like in figure 8. On the background of the figure, we have the dimensions of the theoretical framework. On the top of that the activation threshold not only depicts the line across which activation can happen; it also depicts "the line of understanding" regarding the dimensions of the theoretical frame. The parts of the dimensions that are on the left-hand-side of the line depict the level on understanding there is regarding each dimension.

We can see that currently, the understanding regarding the three first aspects of the theoretical frame is quite well covered. This means that even with the current ways of working, the topics of the first three dimensions can be at least partly addressed (e.g. now users are considered thanks to online inquiries etc. but such consideration can remain shallow). What we also see is that creativity is completely left out. If this is combined with the previously suggested idea of getting organisations to develop their user-inclusive service design skills, it can be argued that triggers are needed on the right-hand-side of the line of understanding along the path that leads to target behaviour, more precisely in the area in

Figure 8
Reaching sustainable basis for user-inclusive service development practices
Adapted from: Fogg 2009
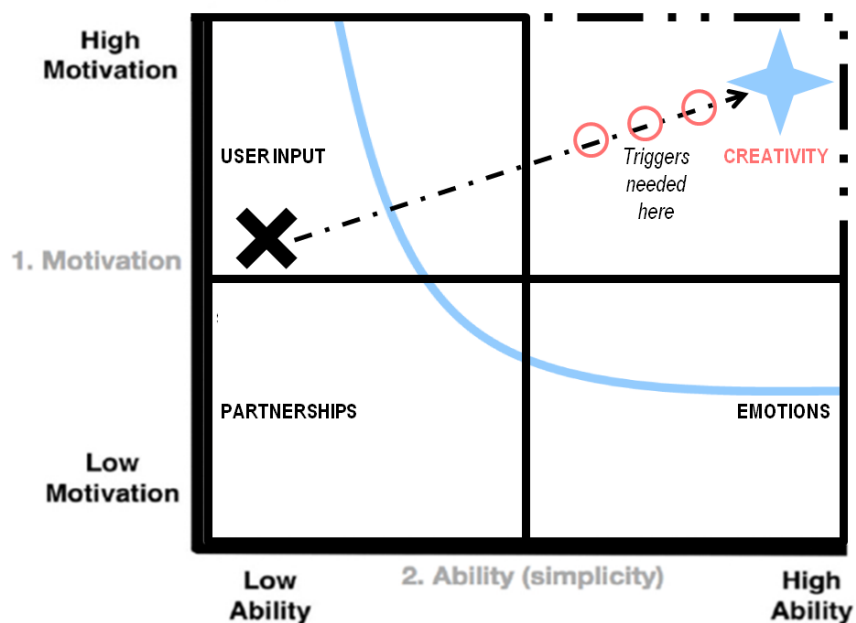
which professionals have deficient understanding, which in this case is creativity.

As it was pointed out in literature, creative, artistic skills are much better tools for adapting to the pace of the world and creating innovations than the analytical, historical knowledge-based skills highlighted over the past few decades (Adler 2006). This means that organisations must adopt certain, more creative skills to be able to offer their clients the best rapid response in the rapidly changing market conditions (Mucha 2008). I consider these "rapidly changing market conditions" to be equivalent to development of smarter cities and meaningful solutions with in that frame. Moreover, as implied in literature, the development of smart city solutions is dependent on user input and consideration of users' feelings as well as versatile partnerships. Therefore, I argue that if triggers that promote creative abilities are developed, also the abilities and understanding regarding the other three dimensions of the theoretical framework are complemented. When these triggers are followed, the behaviour climbs "uphill" towards the desired behaviour, and consequently the line of understanding also moves to the right as skills are gathered throughout the four dimensions of the theoretical framework.

As a result of having triggers that boost the use of user-inclusive service design, organisations will reach an understanding regarding all four dimensions (figure 9). That is to say, organisations will reach a holistic set of skills that enable doing user-inclusive service in a *sustainable* manner when seeking human-driven innovations in a world where serving users is the focus of organisations' activities. When the desired situation has been reached, the trigger that promotes user-inclusive service design can be the more comprehensive understanding of the benefits that can be reached via the methods.

Figure 9
Reaching sustainable basis for user-inclusive service development practices: Future scenario
Adapted from: Fogg 2009
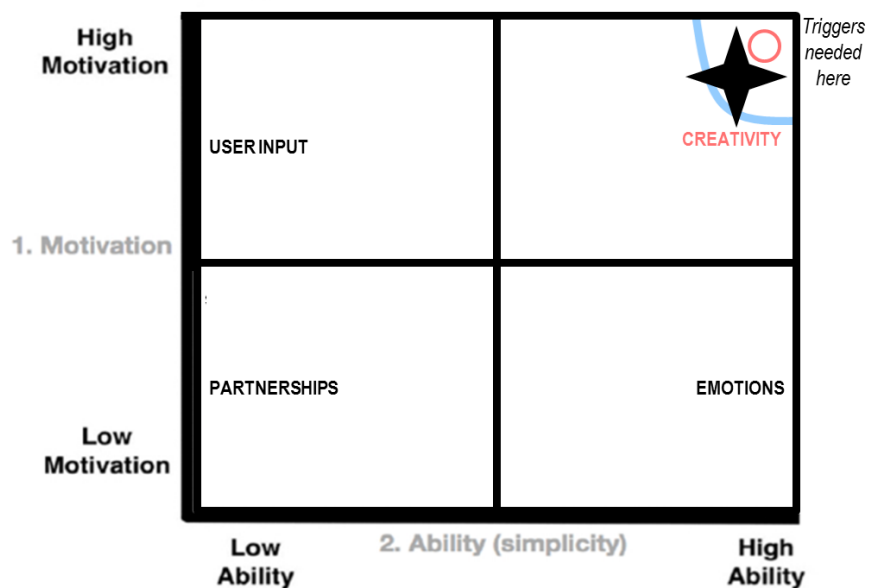
Triggers

As implied above, triggers are in a key role in promoting sustainable use of user-inclusive service design practices in the development of intelligent transportation services. Here I will elaborate briefly, what these triggers could mean in this context in practice. This listing is by no means exhaustive, but gives an indication what the triggers could mean.

Information

In literature, it was stated that creativity offers many benefits for the business world, as it e.g. promotes proceeding with projects (Tanner 1992) and develops professionals' critical thinking abilities (Mäkirintala 2009). Based on earlier research as well as the findings of this work, these aspects have not yet been widely discovered by Finnish professionals, yet they would be essential for the use of service design methods. Therefore, more information is needed to trigger an increase in professionals' knowhow of creativity, and education is in a key role in spreading that information.

Already in the literature review, it was stated that currently rational-analytical thinking is highlighted in business schools, which is why it is no wonder that professionals have deficient understanding of how creative working methods can be of benefit for business. In the future it is thus extremely important that alongside the traditional rational-analytical problem solving skills also creative skills would be brought onto the educational institutions' agenda. There are already some multidisciplinary programmes (such as International Design Business Management at Aalto University) through which professionals learn design thinking skills. Programmes such as these are an important first step, but a few individual programmes on the level of universities only are unlikely to solve this problem in the long-term. Therefore, creative subjects should be highlighted in a wider perspective, even at earlier levels of education. Besides, creative subjects seem to have positive effects on young students' performance even in other subjects[21] meaning that if a more extensive understanding of creativity is reached, the benefits of creativity can extend also outside the business world.

Alongside educational institutions, responsibility in spreading information must be taken also by organisations. Those who have had successful service design projects should share the information they have in order to raise the general level of knowledge regarding the topic,

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[21]   Taideaineet parantavat PISA-tuloksia 2008,
        http://www.norden.org/fi/ajankohtaista/uutiset/taideaineet-parantavat-pisa-tuloksia

regardless of whether the project has taken place in ITS or some other sector. For this kind of information exchange to happen organisations need platforms that facilitate and discussion. In this regard, also governmental agencies, associations, etc. that gather actors together can play a role. For example, Tekes has a major influence here; through its programmes, different actors can meet each other, share information and discuss new ideas and concerns as well as initiate collaborations. Furthermore, in the daily work with customers Tekes' experts can "spar" organisations to consider taking on new working methods.

Additionally, all kinds of events, seminars, and other forms of interaction between organisations in which information is exchanges as well as research and other publications have the possibility to advance the incorporation of new, more creative working methods. For example, the *Design Finland* programme brought up in the literature review will definitely have a role as one driver of the change, but in addition to that other measures and encouragement can become relevant.

Incentives

Naturally, for information to come about somebody has to generate it through concrete cases of using creative, user-inclusive service design methods. Therefore, there is also a need for lucrative enough incentives that trigger even those with lower levels of abilities to experiment new approaches. Based on this work it seems that professionals and organisations have interests for service design to spread, but simultaneously organisations are reluctant to be the first ones integrating it to their activities with the current level of information that they have. If there are not enough exemplary cases and if the information exchange process does not start proceeding naturally it is possible that, as one interviewee put it, promoting the use of service design might require a little push from higher levels. Then again, literature proposes that the desire to change behaviour should occur in a bottom-up manner (e.g. Boyle and Ottesmayer 2005, and Karp 2004) meaning that forcing is rarely the answer to a sustainable change. However, as stated in earlier parts of this discussion, Finnish professionals already possess a certain level of readiness for a greater change in the ways of working, but there is a lack of knowledge and skills as well as courage to experiment to take the necessary steps. Therefore, if authorities set incentives or directions that would facilitate or spark the incorporation of new ways of working, it could be that these measures were not even considered top-down. A little push from above could simply be the trigger that puts the greater change into action.

Additionally, in the literature review it was pointed out that e.g. municipalities have a lot of laws and regulations which they have to follow when planning intelligent transportation services and services in general. The same point was mentioned in the interviews, as organisations regard these guidelines as one major challenge in the incorporation of user-inclusive service design. Therefore, it can be argued that it is time for authorities to start changing or at least adapting these laws and regulations if they hinder sensible and innovative service development. As Kirby writes, the economic squeeze, which is a current topic also in Finland, should be seen as an opportunity for diminishing bureaucracy and thinking in new ways to generate more opportunities for new meaningful smart city solutions. If Finland really wants to be a leader in developing new, intelligent transportation solutions it must make use of these opportunities and dare step out of the box and allow companies, public organisations as well as other actors of the society to innovate in a freer manner. Consequently rapid experimentations regarding and consequently meaningful ITS innovations could be more likely to occur. In other words, deregulation could be the incentive that organisations need for matters to start moving forward without further intervention. Fortunately, there has been discussion of pilot cases regarding deregulation [22]. Now it is interesting to wait and see how the pilot proceeds and what impact this kind of incentives have for the evolution of service development.

It seems that a fear of jumping into the unknown is the biggest reason for not using user-inclusive service design in Finland; new abilities for adapting to change are not acquired as organisations do not want to take risks. This is why organisations also need examples and more information about new practices such as service design before even trying them out. Could this fear be a matter of culture? Hofstede's famous cultural dimension analysis [23] suggests that in the Finnish culture people tend to avoid uncertainty and respect traditions, and this could be a reason why Finnish professional life is somewhat lagging behind in the mindset change and using service design. User-inclusiveness, service design, design thinking, and service dominant logic are all relatively new phenomena for business. Therefore, if the cultural characteristics in Finland encourage sticking to more conventional, analytical ways of working, perhaps it is natural that Finnish organisations want examples and proof that the new, more creative approaches really work before trying them out, even if professionals knew what kind of benefits could be expected.

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[22] Hermans 2014 http://www.linkedin.com/groups/Suomesta-tulee-maailman-ensimm%C3%A4inen-mobilityasaservicetestialusta-4069395.S.5855291405647228929?trk=groups_most_popular-0-b-ttl&goback=.gmp_406939

[23] What about Finland? http://geert-hofstede.com/finland.html

Thus besides organisations educating each other about successful service design projects, for user-inclusive service design to become an integral part of intelligent transportation service development in the short-term triggers are needed and Finnish authorities must take responsibility in this regard. They should bring teaching creative skills more strongly to educational institutions' agenda and set incentives so that organisations would start experimenting new ways of working. That is if Finland wishes really to make use of design when searching for human-driven innovations.

Encouraging organisations to benefit from user-inclusive service design

Finally, after analysing the theoretical framework in relation to the findings of this research and evaluating how behaviour can be changed, we have reached an answer to Q3: "*How can organisations be encouraged to benefit from user-inclusive service design methods?*"

> *It seems that the most relevant aspect for encouraging organisations to benefit from user-inclusive service design is developing appropriate triggers that lead to learning about and using this new, more creative approach to service innovations. These triggers are information and incentives, and both organisations and authorities share the responsibility of initiating these triggers.*

> *Firstly, organisations need more information about successful examples of user-inclusive service design to act upon the topic. Therefore, those organisations that have had successful service design projects should share their good experiences to encourage others to benefit from service design methods. Additionally, information about creative working is needed, which is why more emphasis needs to be placed on creative subjects in education so that abilities to use creative working methods, such as user-inclusive service design, would increase also on a general level.*

> *Furthermore, incentives to take on new practices are needed. For example, governmental agencies can promote the shift towards a more service-dominant logic and consequently the employment of user-inclusive service design by providing incentives or directions that encourage organisations to experiment with creative ways of working. These experiments allow for spreading new information as well as learning new skills, and these together increase the level of abilities to work in new ways in organisations.*

6. CONCLUSIONS

6.1 Summary of research

Since there is a growing understanding in the business world that new practices are needed to solve the increasingly wicked problems that are occurring in the contemporary world, this thesis set out to discover whether user-inclusive service design would be a viable approach for reaching human-driven innovations in intelligent transportation solutions. User-inclusive service design methods refer to service design methods with which users are not just considered during the service design process, but with which they are included in the design force so that organisations can develop services that answer to user needs even better than before.

Traditionally organisations have developed solutions in a technology-push manner and thus they have run the risk of displeasing users by designing solutions that people are unwilling or unable to use. Therefore, in future organisations should assure their offering addresses user wants or needs by working together with users. The way we move around is likely to change radically because the current smart city and intelligent transportation solutions allow for organising transportation in new ways. Nevertheless, users are so accustomed to their current habits that they are not necessarily able to imagine this change, which is why they can even resist radically new transportation solutions. However, if users get to give their input to service development within this area, their willingness to use and content with new intelligent transportation services may increase. This implies that user-inclusive service design can indeed promote human-driven innovations in ITS. For that reason, it can be stated that user-inclusive service design is a matter which organisations should no longer overlook – on the contrary; organisations should start incorporating new, user-inclusive ways of working, because who would know better how to make services and life convenient for users than users themselves?

Overall, the results of this work are very encouraging; Finnish professionals have started to acknowledge the need for change from technology and process-led innovation approaches to new ways of working. In other words, professionals are shifting towards more service-dominant logic, i.e. understanding that creating emotionally appealing services by collaborating with users and versatile partners is becoming the key to a flourishing business as well as a functional society. This means that there is great potential for creating

meaningful service innovations through user-inclusive service design in the Finnish intelligent transportation field.

I have argued that organisations can start utilising user-inclusive service design if they receive more information about the benefits of creative working and design methods and are provided with appropriate incentives that facilitate experimenting with these practices. As a result of practical experiences, organisations will start understanding that alongside rational-analytical thinking, which currently dominates the professional world, more creative working approaches are needed on a regular basis to create meaningful service innovations. Once this understanding is reached, organisations can start utilising user-inclusive service design sustainably to their advantage and start developing services that not only create value to individual users but also to society as a whole.

I hope that this thesis has provided ITS professionals with new viewpoints and expanded knowledge regarding service design and user-inclusive design methods as well as new ways of working in general. As noted already in the introduction, taking on new ways of doing is always a challenge, but I hope that as a result of reading this paper, professionals start seeing the value in acquiring design thinking skills in order to develop more meaningful, human-driven solutions for the new, smart city environments.

Drawn by Ellun Kanat

"*Now is the time to begin bridging the gaps between education and employment, between design and business, and between any of the remaining 'us' and 'them' that keep us all from working together to unleash our imagination of a better future*"

(Mootee 2013, p. 199)

6.2 Policy implications

ITS

This study provides important insights for organisations in the ITS sector all over the world, and even for organisations representing other sectors that have been led in a technology or process-led manner. This work has suggested that user-inclusive service design methods can contribute to creating more user-friendly, meaningful services. It has become evident that the professionals interviewed for this work find the methods interesting as well as useful, and that it is vital to include users and consider their views in one way or another during service development processes to increase the probability of service success. At the very beginning of this paper, it was stated that "*new problems cannot be solved by the same thinking we used when we created them*", and it seems that user-inclusive service design is definitely an approach which presents a new way of thinking in ITS.

Besides incorporating more user-inclusive working methods, organisations should highlight multidisciplinary work in the future. In this research it was specifically mentioned that the ITS sector is currently such one-dimensional a field in terms of worker backgrounds that fresh ideas are even unlikely to occur. This one-sidedness naturally influences the quality of the solutions created, meaning that there is a risk that the solutions do not appeal to users. Therefore, besides using the intellectual capacity of users, it is also good to work across sectors to find more meaningful ideas and perspectives to service development. In other words, the benefits of multidisciplinary work can be similar to the benefits of employing users in development processes, as professionals from different fields can also provide ITS professionals with valuable new perspectives.

Tekes – the Funding Agency for Innovation

This thesis has also shed light on aspects that are significant for Tekes, the Finnish Funding Agency for Innovation. Since it became evident in the interviews that design related aspects are not as familiar to organisations as they could be, it is important that Tekes promotes what design has to offer through its programmes and in its daily work with customers. Since businesses and business schools tend to highlight the role of analytical thinking, an influential organisation such as Tekes has the opportunity to inspire organisations to make use of design in Finland. Programmes such as Feelings (Fiiliksesta Fyrkkaa in Finnish) that help organisations understand the role of emotions and the "non-rational", intangible

dimensions of products and services have a lot to offer in this regard. Likewise, in this thesis it was presented that the expertise regarding seeking bids is also deficient in Finland. When it comes to acquiring design-influenced work, organisations do not necessarily know how to formulate the bid appropriately, which can result in acquiring something that was not intended. Therefore, educating Finnish professionals about bidding becomes important, and consequently it means that Tekes's Smart Procurement programme (Huippuostajat in Finnish) offers organisations valuable learning opportunities.

Furthermore, in the case of Tekes there are also many opportunities for cross-programme activities. Considering the topic of this thesis, it would be interesting to consider joint activities for The EVE programme[24] and Feelings. There are certainly organisations in EVE that would benefit from learning about the intangible aspects of business that are highlighted in the Feelings programme.

International Design Business Management

This thesis has also shown that there is clearly demand for professionals who understand the value of design outside the creative industries and who understand how to user it in order to make future products and services more meaningful to people. Therefore, the implications for the field of International Design Business Management are also significant. In the future the role of multidisciplinary study programmes, such as International Design Business Management at Aalto University, become even more important since professional fields which have been mono-disciplinary (e.g. ITS) are starting to notice that they need professionals from other areas of expertise to succeed. Therefore, now that multidisciplinary work is still somewhat in its infancy, it is extremely important to educate new experts that understand the representatives of other disciplines and have the capabilities to reconcile between various perspectives or ways of working and promote design thinking in professional contexts.

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[24] Electric Vehicle Systems programme aimed at companies and research institutes that work with electric vehicles and machinery and the components and systems used in them

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APPENDICES

Appendix 1: list of interviews in alphabetical order

Eera

ITS Finland

Liikennevirasto

Cities of

      Helsinki

      Mikkeli

      Salo

      Tampere

Ministry of Transportation and Communication

Nórr Design

Ramboll Finland

Trafi

WSP Finland

Appendix 2: Interview template for round 1

Developing services

How has transportation service development been until now?

How are the development ideas usually born?

Are users usually involved in the development processes?

When developing new services, do you usually get a lot of feedback?

How have you collected feedback regarding services?

    Do citizens give feedback without asking? Do you ask feedback from them? Does the

    feedback come indirectly, e.g. from the media?

Do you usually react to user feedback?

    If so, how?

    If not, why not?

User-inclusive methods

Is service design as a concept familiar to you?

Does service design stir up some sort of ideas?

Have you heard of cases in which service design was used?

What do you think about user-inclusive methods that take influences e.g. from the arts?

Have you ever tried service design methods?

    What did you think of them?

Communications

How do you normally communicate e.g. results of important projects?

Is there anything you wish to improve regarding communications?

How would you feel about using creative means of communications?

Appendix 3: Interview template for round 2

In the first round, I interviewed representatives of some municipalities, government agencies and expert organisations regarding service design related aspects. I discovered the following:

> *There is dispersion about the knowledge of service design among the first round interviewees. Some have never heard of it, some understand the basic idea of it, and some know rather well what can be reached with it.*

> *Few have actually used service design in their own work, but see the need to develop new solutions in a more human-driven manner.*

> *Until now intelligent transportation related services have been developed in a process-led manner, but interviewees see the need for this to change.*

> *Organisations receive feedback regarding their services rather randomly – some services are commented on a lot while some not at all. But mainly feedback is collected and received very late in the development process or after it.*

> *Many organisations have used visualisations in their communication and see it an important aspect which should be developed further and utilised even more.*

> *All consider service design an interesting topic and would like to see it being used more in service development.*

What do you think about these findings? Are they accurate or surprising? Is there something to add? Is there something on which you disagree?

Do you see some special benefits in the use of service design, or is there anything particular challenging regarding it?

In your view, what is the level of understanding regarding service design in intelligent transportation circles?

Are there situations in which one should not user inclusive service design or ask user opinions?

Appendix 4: From Traffic Management to Traffic Leadership project brief

The brief

Due to big societal changes public services will face big challenges - the costs have to be cut, productivity has to be much better and new innovations are needed. Cost of municipality transport is also in big change. In order to do this we need to find innovative solutions to change the mind-set from real-time traffic management to predictive and integrated traffic. ICT based services is one approach to make the change.

The problem

"Cutting the municipality transport costs to half" challenges developers to introduce solutions and concepts to manage municipal traffic services through new integrated approaches and services. New level of productivity and cross-functional services can also lead into new solutions. The concept can be related to for example one or several of the following municipal traffic services:

- School transport
- Health care
- Transport services according to the Disability service act
- Transport services according to the Public transport act
- Other municipal transport services
- Other municipal logistic services, e.g. food

Results are expected to be tangible demos on which further development of the idea and concept can be done.

Things to consider

- Solution is related to a practical case, and/or it has a potential and committed customer.
- Idea is truly executable
- Solution is supported by committed suppliers
- The desired state is challenging and unique in Finland
- Flexiblity of the concept to adopt new elements
- Ambitiousness and internationality of the actors involved , how truly international business can be created

One goal of the challenge is to introduce a national while also internationally interesting reference of "From traffic management to traffic leadership" in Finland.

The background

The aim of the Witty City programme is to provide people with better living and working environments and companies with opportunities to bring new products and services on the market. The development work will take place in real-life environments and will be a joint effort between users, companies and the public sector. The focus will be on embedding ICT-

based services in everyday situations, such as mobility and energy use and on ensuring that the services are easy to use.

Tekes is the most important publicly funded expert organisation for financing research, development and innovation in Finland. We boost wide-ranging innovation activities in research communities, industry and service sectors.

In conjunction of ITS Europe, Tekes's Witty City programme organises an innovation challenge **"Cutting the municipality transport costs to half: From traffic management to traffic leadership"**

Appendix 5: Workshop instructions

Part 1:

Part 1

CHALLENGE:
- Create your worst nightmare in public transportation

Or
- Depict what you hate the most about the current public transportation

Or
- Both!

Tekes

Part 2:

Part 2

You are leaving work for home. You have only one transportation alternative to choose from, and it is reasonably priced, comfortable and fast. You are getting on the ride, and then you see the people you are about to travel with for the next 30 minutes of so.

Check out your company!
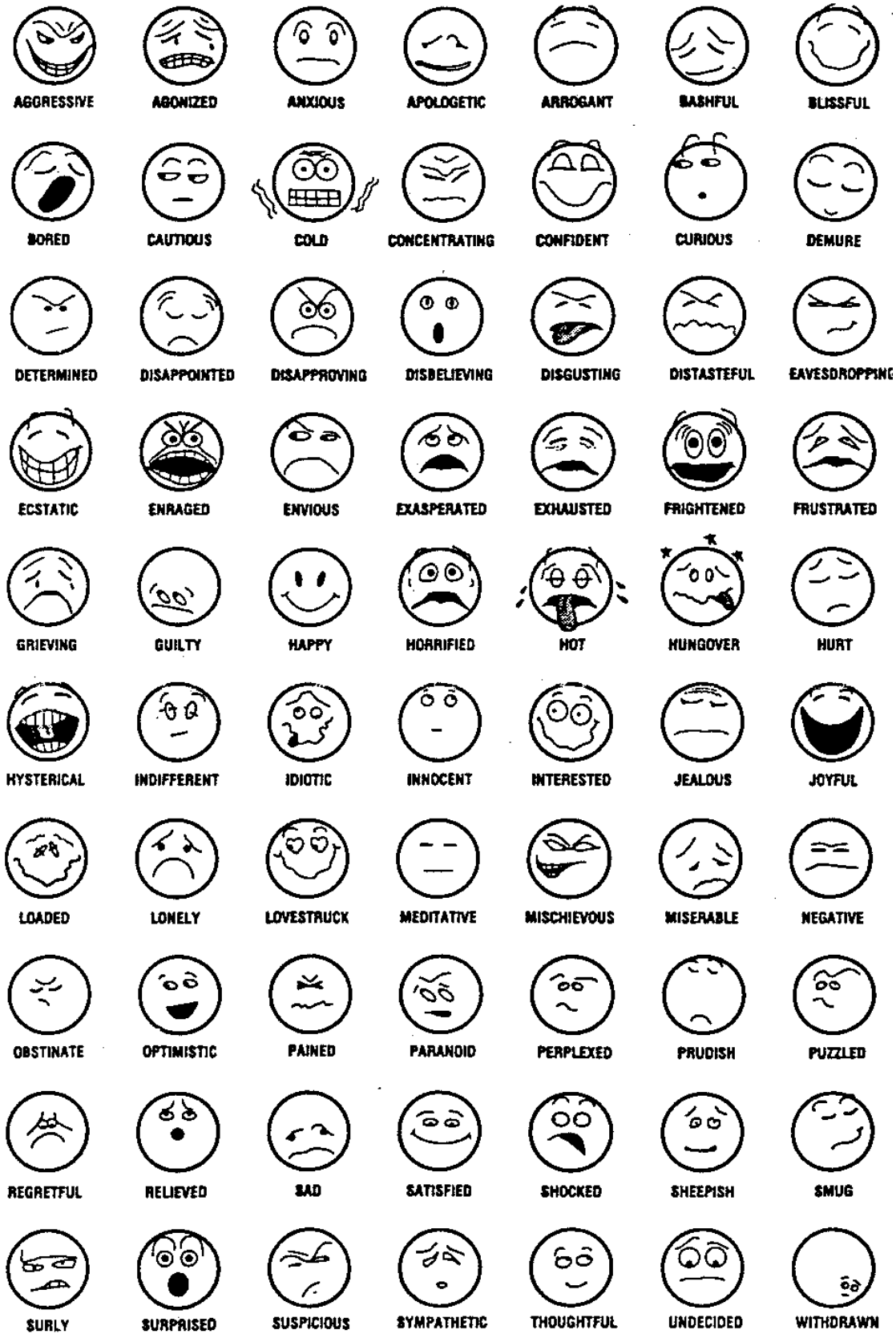You feel…?

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Moodboards used in part 2

Mood board 1

Mood board 2

Mood board 3

Response alternatives for part 2

AGGRESSIVE	AGONIZED	ANXIOUS	APOLOGETIC	ARROGANT	BASHFUL	BLISSFUL
BORED	CAUTIOUS	COLD	CONCENTRATING	CONFIDENT	CURIOUS	DEMURE
DETERMINED	DISAPPOINTED	DISAPPROVING	DISBELIEVING	DISGUSTING	DISTASTEFUL	EAVESDROPPING
ECSTATIC	ENRAGED	ENVIOUS	EXASPERATED	EXHAUSTED	FRIGHTENED	FRUSTRATED
GRIEVING	GUILTY	HAPPY	HORRIFIED	HOT	HUNGOVER	HURT
HYSTERICAL	INDIFFERENT	IDIOTIC	INNOCENT	INTERESTED	JEALOUS	JOYFUL
LOADED	LONELY	LOVESTRUCK	MEDITATIVE	MISCHIEVOUS	MISERABLE	NEGATIVE
OBSTINATE	OPTIMISTIC	PAINED	PARANOID	PERPLEXED	PRUDISH	PUZZLED
REGRETFUL	RELIEVED	SAD	SATISFIED	SHOCKED	SHEEPISH	SMUG
SURLY	SURPRISED	SUSPICIOUS	SYMPATHETIC	THOUGHTFUL	UNDECIDED	WITHDRAWN

Pictures retrieved from: http://healing-solutionstherapy.com/wp-content/uploads/2012/07/FeelingFaces.gif

Appendix 6: Workshop output

Your worst fear in public transport or the worst fault in current transportation services