

Key Usability and Ethical Issues in the NAVI-programme (KEN)



Deliverable 4

Ethical Issues in Personal Navigation

A USER'S PERSPECTIVE

PART II VERSION 3.2

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Tiivistelmä

KEN-projektin (Käytettävyys ja Eettinen arviointi NAVI-ohjelmassa) yksi tehtävistä on ollut nostaa esiin henkilökohtaisen navigoinnin tuotteisiin ja palveluihin liittyviä eettisiä kysymyksiä. Tämän raportin *D4 Ethical Issues in Personal Navigation part II* tarkoituksena on käsitellä keskeisiä eettisiä kysymyksiä erityisesti käyttäjän näkökulmasta katsottuna. Tässä raportissa liitetään yhteen raportin *D4 Ethical Issues in Personal Navigation part I* johtopäätöksiä ja henkilökohtaisen navigoinnin tuotteiden ja palvelujen elinkaari.

Tässä raportin osassa kaksi eettiset periaatteet, joihin työ perustuu, ovat samat kuin raportin osassa yksi. Henkilökohtaisen navigoinnin tuotteiden ja palvelujen kannalta relevantit eettiset periaatteet ovat yleisen hyvän periaate, toisen vahingoittamisen välttämisen periaate, autonomian ja yksityisyyden kunnioittamisen periaate, oikeudenmukaisuuden periaate ja tehokkuuden periaate. Periaatteet muodostavat pluralistisen järjestelmän, missä yhden periaatteen noudattamisesta seuraavat velvollisuudet eivät ole absoluuttisia vaan niihin vaikuttavat muutkin periaatteet riippuen eettisen kysymyksen relevanteista seikoista ja kontekstista.

Tämä raportti on kirjoitettu noudattaen tuotteen tai palvelun elinkaaren vaiheita. Elinkaari on tässä työssä jaettu seuraaviin vaiheisiin: käyttäjävaatimusten määrittely, konseptin suunnittelu, implementointi, käyttö, markkinointi, ylläpito ja käytön lopetus. Nämä elinkaaren eri vaiheet on ensinnäkin liitetty eettisiin periaatteisiin ja toiseksi vaiheeseen liittyviä eettisiä kysymyksiä on esitetty konkreettisten kysymysten muodossa. Kysymykset on jaettu edelleen viiteen eri luokkaan: 1) käyttötilanteen arviointi, 2) lait, muut säädökset, standardit, normit ja hyvä käytäntö, 3) sosiaaliset vaikutukset ja sosiaalinen oikeudenmukaisuus, 4) päätöksenteko ja 5) turvallisuus.

Tämän raportin tarkoituksena ei ole luoda kaikenkattavaa moraaliteoriaa vaan yrittää luoda välineitä ymmärtämään ja tunnistamaan eettisten kysymysten roolia uusien teknologioiden tutkimuksessa ja kehittämisessä. Tavoitteena ensisijaisesti on herättää keskustelua teknologian kehittämisen eettisistä ulottuvuuksista ja kehittää välineitä, joilla voidaan edesauttaa eettisten kysymysten arviointia ja ongelmanratkaisua.

Tämä raportti perustuu kirjallisuuskatsaukseen ja kolmen eri ryhmän haastatteluun. Kaksi ryhmähaastatteluista liittyivät KEN-projektin käyttökulttuuritutkimukseen, kolmas ryhmähaastattelu oli asiantuntijahaastattelu.

Abstract

One of the tasks of the project Key Usability and Ethical Issues in the NAVI programme (KEN) is to address the ethical issues of the products and services for personal navigation. The purpose of this part two is to address the central ethical issues concerning navigation technology, services and products from the users' perspective. The approach connects the conclusions of the first part of this Ethical Issues in Personal Navigation report and the idea of a product life cycle.

In this part two of the report the ethical principles are the same as in Part One. The ethical principles relevant in the context of personal navigation are: the principle of common good, the principle of avoiding harm to others, the principle of autonomy or respect for privacy, the principle of justice, and the principle of efficiency. These principles form a *pluralistic system*. In a pluralistic system of ethics, duties that follow from the principles are not absolute but may have to yield to other principles in concrete situations, depending on the relevant facts or the context of the ethical problem.

This report is put together according the lifecycle of a product. The relationships between the phase of the life cycle and the ethical principles are described and furthermore, there are questions as an aid to considering the ethical issues involved in a concrete manner. Questions are divided into five separate categories: 1) assessment of tasks and environments and motives for use, 2) laws, other regulations, standards, norms and good taste, 3) social effects and social justice, 4) decision-making and 5) security.

As the purpose of this work is not to create a comprehensive moral theory but rather to attempt to provide tools for the understanding and recognition of the role of ethical issues in the research and development of new technologies, it seems well justified to choose an approach that opens up the possibilities for discovering ethical dimensions of research and development work in as theoretically unrestricting manner as possible. The goal is, after all, to raise awareness of the ethical dimensions of technology development and to create useful tools for problem assessment and solution.

This report is the part two of Deliverable 4 by the KEN project. The study is based on a literature review and interviews with three separate groups. Two of the interviews were made mainly in the context of the work of the user cultures in the KEN-Project and the third interview was done among professionals of navigation services.

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1 Introduction

1.1 Purpose

Ethics concerns not only deeds and consequences, duties and rights but also information or lack of it. The purpose of the ethical principles and questions presented here is to emphasize that ethical issue should not be presented in the form of directions but require contemplation of the every individual person and concern every one of us. They cannot be delegated to other people or to an organisation. Furthermore, ethical principles consist of laws and other regulations, standards, norms, good taste, justice, common good and respect for the privacy and autonomy of all people. They are also supposed to reduce harm to people and to avoid waste of resources.

The purpose of this part two is to address the central ethical issues concerning navigation technology, services and products from the users' perspective. The approach connects the conclusions of the first part of this Ethical Issues in Personal Navigation report and the idea of a product life cycle. In addition, ethics is connected here with laws, regulations, standards, good taste, social effects, social justice, decision-making and security.

During the NAVI-Programme and while writing this report more attention was drawn to the ethical issues concerning information technology in general. Issues like the digital divide or the data security of an individual human being are some current concerns in Finnish society. One starting point of this report was to somehow clarify the ethical issues particularly in three different kinds of situations. The first was the user in the work context, e.g. when an employer is locating an employee. The second context was the user as a family member, e.g. issues involving families locating other family members. The third situation is related to the so-called find-a-friend services, the user among friends context, e.g. how should we deal with such facts that not everybody is willing to give their location even to their friends?

In this part two there is first a brief introduction to questions involving ethical issues in the personal navigation from user's point of view. An introduction is presented as ethical principles at the beginning of each chapter. The rest of this report is put together according the lifecycle of a product. Each chapter describes the relationship between the phase of the life cycle and the ethical principles. Secondly, in each chapter there are questions as an aid to considering the ethical issues involved in a concrete manner. Questions are divided into five separate categories: 1) assessment of tasks and environments and motives for use, 2) laws, other regulations, standards, norms and good taste, 3) social effects and social justice, 4) decision-making and 5) security (cf. Topo et al. 2002). In this report some issues might be repeated several times but that is because firstly the same ethical principles are involved in several phases of the lifecycle of a product. Secondly this report is aim to be published by hypertext application and this report is the literary work for that application.

This is the fourth final version of the part two and it should be continuously evaluated and updated in the future. Like the first part of this report, the second part is based on the work of a small number of researchers and it could be seen as a starting point for a discussion on ethical issues in personal navigation.

1.2 Scope

This report is the fourth version of Deliverable 4 of the Ken Project. The first version was an introduction to the subject and presented some preliminary principles for evaluation. The study is based on a literature review and interviews in autumn 2001. The second version and the final version of Part One were published in January 2002. The purpose of that report was to cover some the central ethical issues applying to the professional and the organizational level. This fourth version includes the second part and it applies to all kinds of readers, but has been written particularly from the user's perspective. Anu Jäppinen, the first writer of this part two, deals the ethical issues from the social scientist's perspective, the other writer, Teija Vainio, more from the data processing perspective.

We would like to acknowledge the other researchers in the Ken-Project and Professor Tere Vaden, University of Tampere for their contributions to our work.

The study is based on a literature review and interviews with three separate groups. Two of the interviews were made mainly in the context of the work of the user cultures in the KEN-Project and therefore we would like to thank Veikko Ikonen for his support for our work. The third interview was done among professionals of navigation services.

1.3 Ethical issues in navigation services

Several authors have argued that increased attention should be paid to ethical questions in the development and use of new technologies in the near future (Pantzar 1996, 2000; Wagner 2000). Particularly confidentiality and privacy have been mentioned as key questions in gaining consumers' acceptance of products and services for personal navigation (Rainio 2000, Topo et al. 2002, 23). The Current Regulatory Framework Report in the KEN-Project also indicates the importance of sufficiently informing the users of location-based services (Simojoki 2001).

Ethical principles are a fairly commonly accepted way to approach the ethical dimension of professions. The principle-based approach consisting of several commonly accepted ethical principles has been developed especially by some medical ethicists (see, for example, Beauchamp & Childress 1994; Beauchamp & Walters 1994). Particular codes written for (or by) specific professional groups are sometimes defended by appeal to general norms, such as respect for privacy, autonomy, or doing no harm (Beauchamp & Childress 1994, 5.).

In this part two of the report the ethical principles are the same as in Part One. The ethical principles relevant in the context of personal navigation are:

- the principle of common good
- the principle of avoiding harm to others

- the principle of autonomy or respect for privacy
- the principle of justice
- the principle of efficiency

To cover the central ethical issues in research and development these principles should be applied both on the level of the individual professional and the organizational management. (Topo et al. 2002, 3)

The term *ethics* is a generic one "for various ways of understanding and examining the moral life" (Beauchamp & Childress 1994, 4). Ethics has to do with the values, principles, and convictions that people have and act on. Ethics is often referred to as the philosophical study of morality and it deals with the notions of right and wrong, good and bad. The ethical dimensions of life can be expressed in questions such as: What is a good life? What kind of society do we want to have? How should we treat others? What is the right thing to do? What rights, duties, and responsibilities do we have? (Topo et al. 2002, 6).

Finally, an approach that has been subjected to much criticism but that also has generated much discussion in the field of professional ethics is the *principle-based approach* to ethics. This approach allows for the incorporation of elements of the ethical theories described above. The authors of this collection of papers have decided to rely vaguely on this theoretical framework in the discussion of professional ethics and professional guidelines for personal navigation technology research and development activities. The reason behind this choice is that, unlike Kantianism or consequentialism, which attempt to address the complexities of the moral life through appealing to one single principle, the principle-based approach relies on many competing principles and also allows the taking into account of virtues. As the purpose of this work is not to create a comprehensive moral theory but rather to attempt to provide tools for the understanding and recognition of the role of ethical issues in the research and development of new technologies, it seems well justified to choose an approach that opens up the possibilities for discovering ethical dimensions of research and development work in as theoretically unrestricting manner as possible. The goal is, after all, to raise awareness of the ethical dimensions of technology development and to create useful tools for problem assessment and solution.

The critics of principlism claim that this system is not very helpful because several principles can be appealed to in problematic situations, thus not necessarily leading to one correct solution (see e.g. Sajama 1995). However, it can be argued that the principles are helpful in locating the sources of ethical conflicts and that they can thus be used as a tool for understanding the nature of ethical problems, thereby facilitating constructive discussion and problem solving. Furthermore, ethical problems are from the outset such that finding one simple solution that satisfies all parties involved may not be possible. Abstract principles must therefore be conceptually developed and shaped normatively to connect with concrete action-guides and practical judgments. (Beauchamp & Childress 1994)

More detailed norms such as rights and duties express the content of principles. In the case of navigation technology the rights of people using services and the obligations of those who are involved in the development of services and equipment are based on more general principles. The same also applies to various professional virtues that research and development personnel ideally pursue in their work.

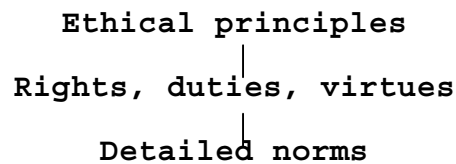


Figure 1 More detailed norms express the content of principles (Topo et al. 2002, 31)

This report concentrates primarily on the ethical principles that are relevant for those actors involved in the research and development of personal navigation technologies. This means that even the rights and obligations of users will be contemplated primarily from the point of view of the providers of equipment and services. The principles considered relevant in the drafting phase of this document overlap to a significant extent with the principles commonly found in other guidelines adopted by engineering professions. The principles of relevance are those of the framework of the ethical guidelines presented based on ethical principles and different actors' rights and duties based on those ethical principles, and finally on the idea of a lifecycle of a product or service. The ethical principles relevant here are:

- the principle of common good
- the principle of avoiding harm to others
- the principle of autonomy
- the principle of respect for privacy
- the principle of justice
- the principle of efficiency.

These principles form a *pluralistic system*. In a pluralistic system of ethics, duties that follow from the principles are not absolute but may have to yield to other principles in concrete situations, depending on the relevant facts or the context of the ethical problem. (Beauchamp & Childress 1994)

The purpose of rights is to protect individuals and interests that are crucial for life and well-being. From the right of one individual an obligation to act or to refrain from acting in a certain way follows - either on other individuals or society. For example, the notion of an individual's right to freedom or self-determination can be interpreted to claim that no one, no other individual or society, has the right to interfere with the self-regarding actions of an adult person, as long as the person is not causing harm to others. In some situations it may be problematic to determine what constitutes harm to others or what is genuinely self-regarding, but this is another question.

Rights can be roughly divided into moral and legal. Legal rights tend to be clearer in the sense that they are usually written down in law. Many legal rights can be traced back to moral ones. For example, the Finnish law on patient rights includes a section on the patient's right to self-determination. In many ways this particular law has the same content as the moral right to self-determination. Behind the legislation and moral right are the principles of autonomy and respect for persons.

As someone who has made a contract to obtain equipment or a service for personal navigation, the user has an obligation to pay for the expenses incurred from the use. In return, the user is entitled to receive clearly stated information on the cost of the service, instruction on the use of the equipment or service, and up-to-date and accurate information. The user also has the right to know where s/he will leave traces of use, for

how long this information will be retained, who has access to it and how the traces can be deleted.

2 Motives for use and identification of requirements

Ethical issues are interpretations of what is considered important or less important, valuable or less valuable and they are bound to societies and time. This is why the ethical principles vary in different societies and from time to time. Ethical issues should be reflected both by the users and by the general public and the professionals to increase users' ethical awareness, to generate public discussion and to form an ethical foundation for professional work. Ethical issues concern above all the interaction between individuals, and society: interpretations of motives, interests and actions and their consequences. Ethical issues should be considered throughout the whole lifecycle and both direct and indirect consequences of a device or service should be regarded.

2.1 Motives for use and identification of requirements and the ethical principles

The principle of justice could be taken into account in defining all tasks, different environments and motives for use when planning and design of navigation devices and services. All means of ensuring that as many people as possible could make use of them and get support for their tasks in different environments should be considered. Through thinking about the motives and situations of use it is possible to create devices and services that are useful, efficient, easy to use and that do not cause harm to people.

Ethical principles are the base of the common good and laws, standards, and other norms and notions of good taste etc. Laws and other norms are made on the other hand to protect the citizens from trouble, on the other, they are made to keep order, and to control, regulate and direct the actions of the people and organisations (e.g. companies) to prevent them from harming others. But in the end they are, basically (only) contracts between people. They can be changed if they seem to contradict the ethical principles, but they also change spontaneously as do ethical principles, though only slowly and usually through argumentation. They are not as unambiguous as they seem to be and this is why they for all practical purposes have to be interpreted. Good taste is even vaguer than the interpretations of laws and other regulations: It is delicately defined, dependent on the time, society etc. Plans and designs can be assessed in relation to good taste, too, with regard to different (sub-cultural, national, religious etc.) groups.

In order to avoid harm to people, to respect people's privacy and to promote justice, it could be considered if it is possible to create services that elicit as few changes as possible and merely give support to people in their tasks and situations of need. However, navigation devices and services, like many other devices and services, do have effects on people's social life and to protect people's rights and safety the effects should be discussed and monitored by all people and society as a whole. Thus problems might also be predicted and appropriate ways of use outlined. It should also be considered how the navigation devices and services could promote security in all respects but patronising or

surveillance. Then dependencies on the devices or services or loss of control without them might also be taken into account as possible social effects.

In the planning and design process of navigation devices and services equality could be promoted, for example by taking seriously the laws of equality defending people's rights to be treated equally regardless of race, sex, religion, age, disability or other irrelevant qualities. In practice this could mean e.g. considering the design for - all - principle as a standard in the planning and design process. All devices and services could be better suited to all people including people with disabilities, the elderly etc. Secondly, it could mean testing the usability of the concept and all the functions as well as the user interface with different kinds of users in all stages of planning, design, implementation and redevelopment. Failure in planning and design may result in making life more complicated and more difficult for people. It could also mean continuous learning in using a navigation device or service.

The assessment of social effects and social justice concerns values of equality, tolerance and respect for others. Furthermore, in a fair society, individuals are not treated differently due to race, sex, religion, age, disability or other irrelevant qualities (e.g. place of living, or service operator).

It could be said the more services have effects on people's lives the more potential ethical problems there are. This is particularly true when it comes to social life and navigation services that can easily increase suspicion in social relations. For example, there might be also alterations in family relationships, because positioning may undermine mutual confidence.

Usefulness is an integral part of usability, even more than ease of use (see e.g. Keinonen 2000). Usability generally refers to how well a device or a service, e.g. a navigation device or service, suits an intended purpose. Usability is connected with both the functions and the content of a device or a service, which define its theoretical utility. The utility of functions and the facility of use together constitute the usefulness of a device or a service. (Grudin 1992; Nielsen 1993, 25.) Usability is important not only in the economic perspective (Harrison et al. 1994) but for users it is also a justification of use and as a reason to acquire new devices (Keinonen 2000). Therefore usefulness should be included in the ethics of navigation devices and services and regarded as part of the common good sought through the whole lifecycle of a navigation device or service. Uselessness can also be considered as annoyance and harm as such.

Furthermore, the research and design of navigation devices and services – like many other devices and services – is often funded through public resources. Therefore it might be important to discuss in public how to do it well. In practice this means e.g. discussions about the principles applied in research and design, about including information on user cultures, use and usability and about applying user-centred design principles.

In order to avoid harm to people and to respect their autonomy and privacy informed consent is an essential question and it, too should be taken into account in planning and designing. However, there may be some situations, where no consent is needed and these have to be defined to protect people's rights. As the devices and services are planned there should be a public discussion about the ways to present the information needed and to support people's decision-making and about the guidelines for presenting the stored information and transferring it to other parties.

Privacy is a power relationship dependent on knowledge and control, since it is very difficult to have privacy if people have of knowledge on what they can do to protect their privacy or power to set the limits for their privacy. Thus the decisions about positioning and about consent to it are very important. Therefore when and for what reasons it is acceptable to gather information about people and how or for what it can be used should be carefully considered.

2.2 Assessment of motives for use and identification of requirements

Motives for use and requirements are usually defined at the beginning of the planning and design of navigation devices and services. However, definitions and redefinitions are made also, for example, when the implementations are realised or marketing is planned. Here motives for use and identifications refer to preliminary definitions made at the beginning. Thus there are no specific designs or plans of navigation devices or services but only certain technical possibilities for positioning and assumptions or general ideas about the motives and environments where they could be of help. On the other hand, the identification of requirements refers to people's information needs concerning the navigation devices and services planned.

2.2.1 Assessment of tasks and environments and motives of use

1. In what kind of situations or tasks could navigation devices and services be useful or fun for different kinds of people or groups?
2. What could be the surplus value of navigation devices and services compared with the (more) traditional means or equipment?
3. What kind of requirements might the environments of use impose on navigation devices or services?
4. What could be the motives for use for the navigation devices or services? Where will they not be needed? When or where might they cause problems or danger, or where might a device loss or breakdown, network failure or empty battery cause severe problems or serious danger?
5. Will people lose some abilities or become unable to cope with some situations if they use navigation devices or services?
6. Are there more ethical issues to be raised to the public awareness?

Explanations and comments on the questions

People usually want some arguments for using new devices and services: they should be somehow better than older ones so as to make a task or action easier or more efficient or they should be able to provide support in new tasks, situations or environments. This utilitarian point of view can also be justified by the fact that in most cases the development of new devices and services is funded through public funds. Public funds should always be used efficiently and for useful purposes only.

I'm wondering, what's the use for me to carry it with me all the time? Is it of any use?

A disabled woman, Western Finland

What I think is important and needs to be considered here, is the relevance and the necessity. There are now all kinds of imaginary alternatives of which the necessity is close to zero and so one should reflect what is really necessary and important.

An elderly man, Western Finland

However, usefulness can appear in the form of entertainment, too. If they are useful in relation to the task people are expecting to do or for entertainment, they can be regarded as useful.

Usability is connected to both the functions and the contents of a device or a service, which define its theoretical utility. Utility of functions and facility of use, i.e. usability, together constitute the usefulness of a device or a service. (Grudin 1992; Nielsen 1993, 25.) In other words if there are no tasks or motives for use, people easily consider them useful but lacking usability as well (cf. Keinonen, 2000). In addition useless devices and services are considered an annoyance and as such therefore potential causes of harm, therefore it should be considered where or in which tasks or environments they are not needed or where they may cause problems or even danger. Dependence on devices and services should also be considered: They may have an effect on people's lives in making them become too dependent on services and unable cope without them, but possibly get lost with a map or feel very insecure guiding themselves without a device. For these reasons, the motives for use as well as the tasks and environments should be considered in terms of ethical assessment, too, especially when the motives of use and the requirements for navigation devices or services ought to be defined.

[Why are these questions important from the ethical point of view? See Chapter 9.1](#)

2.2.2 Assessment of laws and other regulations, standards, norms and good taste in regard to navigation services

1. What could be proper ways of using navigation devices or services?
2. What could be inappropriate or unacceptable ways to use navigation devices or services?
3. What problems could they cause for people who use the navigation devices or services, or for society?
4. When or where would people not like to be positioned or tracked?
5. In what kind of situations could people be tracked without their own consent? Who could make the decision for them?
6. Are there other ethical issues to be raised to the public awareness?

Explanations and comments on the questions

People are often unaware or ignorant of the laws and regulations concerning devices and services. They seem to assume that the authorities are supervising their interests and forbidding illegal or unacceptable devices and services. However, new products or services especially coming onto the market are not necessarily legitimated in all respects since there are no permits or licences to be applied for beforehand in all cases. Yet, even when ignorant of the existing laws and regulations, people usually have some kind of conceptions or beliefs about what is or at least or what should be forbidden, illegal or wrong. Good taste or informal norms are vaguer and under continuous redefinition and

negotiation, but if a device or service impinges on good taste or conflicts with a norm, people usually notice it very easily.

When the legitimacy and good taste of devices and services are assessed, the questions above may be helpful. It is usually easier for people to think about proper or improper ways to use devices or services where they would not like to be tracked or what problems they could cause, if they are asked personally, or if the questions are in some way related to their lives. This can be done e.g. with use cases. Thus user-centred design should be regarded as a means to assess the legitimacy and acceptability as well as the tasks and motives for use too. Consideration should also be given to possible exceptions to the rules, e.g. in what kind of situations people can be tracked without their permission and who can make the decision for them.

[Why are these questions important from the ethical point of view? See Chapter 9.2](#)

2.2.3 Assessment of social effects and social justice in regard to navigation services

1. What kind of effects may navigation devices or services have on relationships between people? Do they induce isolation?
2. What resources, skills and motivation can be expected of people to use the devices or the services?
3. Could some people's lives become too complicated or too dependent on navigation devices services?
4. Will people lose abilities in taking up new services or will they become unable to cope with some situations without navigation devices or services?
5. Are there other ethical issues to be raised to the public awareness?

Explanations and comments on the questions

It is probable that the more affects devices or services have on people's lives the more potential ethical problems these are. This is particularly true when it comes to social life and navigation devices or services. They can easily increase suspicions in social relations, if they are considered as patronising means or as a means of surveillance or even spying. Social pressures, for example, could potentially develop so that everybody must have a navigation device or service turned on always and everywhere. If they turned turn it off even for a moment, other people would worry or entertain suspicions. Therefore it would be less stressful to let other people locate you all the time.

There might be also alterations in family relationships causing e.g. jealousy and other problems, because positioning may undermine mutual confidence.

Thirdly, navigation devices or services may also induce isolation in groups, if only some members of the groups use them: for example information about gatherings may not reach the people who do not use them. On the other hand, they can reinforce relationships between people if they are considered as a means of security and confidence.

In contrast I'm wondering if people really cocoon themselves and the devices maintain their relationships or if it will be like with mobile phones and people will become more sociable and get in contact more

easily since it is more effortless.
Northern Finland

Teenager,

Therefore it might be good if navigation devices and services would primarily support the tasks people want to perform and cause as few changes in people's lives as possible. Assessment should also be made about what the devices and services should be like in order to induce use that is reinforcing not isolating or patronising.

People are usually prejudiced about taking up new services. They may be afraid that they will be expected to have skills they do not have or to learn a lot of new things or buy new devices they cannot handle.

It makes quite a big difference what kind of devices you need to have to use the services, what kind of input system and display abilities they need to have. I have a very old mobile phone, which cannot display anything like this. But it's all I need at the moment. And even in this one there are a lot of functions I never use. If they [navigation services] can be used only through devices full of different functions, you will probably have to struggle to get the maps on screen. Thus the device is quite significant.

Mother of two, Western Finland

These prejudices should be carefully examined and taken into account, because they affect the motives for use and the conceptions of usefulness. This is one more reason why design for all should be considered as a principle, also from the ethical point of view. In practice this means considering in the planning and development of devices and services all kinds of people and their (intellectual) resources for acquiring and using navigation devices or services, their abilities to learn how to use them and their different motives for use.

Therefore careful consideration should begin to what kind of skills people have for using the older devices and services and what new skills they might be able to acquire through reasonable effort. Design for all can also produce solutions that are useful to all. The adjustment of the volume of speech in mobile phones, for example, was originally designed for people who are hard of hearing but it helps everybody using their mobiles in noisy places.

Devices and services may have effects on people's lives making them too dependent on services and cannot cope without them, but for example get lost with a map or feel very insecure.

I'm wondering if people will lose their social skills altogether if there were services like this available all the time. And in principle you wouldn't have to have anything to do with other people since you could have all the information through your devices.

Teenager, Northern Finland

These fears and prejudices should be recognised and taken seriously in public discussion whenever decisions about navigation services are made.

[Why are these questions important from the ethical point of view? See Chapter 9.3 Assessment of social effects and social justice with regard to navigation services?](#)

2.2.4 Assessment of ethics of navigation devices and services in viewpoint of decision-making

1. What kind of data or information really needs to be gathered on a device or service for it to function well for navigation, where is the data stored and for how long?
2. How could the data gathered on people in a device or service be presented to them? What should be the conditions for surrendering it to third parties and how could people prevent the delivery in practice?
3. How could an informed consent to positioning be given in practice? How about withdrawal of consent?
4. When should navigation devices or services inform about ongoing positioning? How about in the course of a longer period of tracking, how should navigation devices and services inform people about positioning? Would reminders of ongoing tracking be needed?
5. In what kind of situations could people be tracked without their own consent? Who could make the decision for them?
6. Are there other ethical issues to be raised to the public awareness?

Explanations and comments on the questions

People cannot make informed decisions about whether or how to use a navigation device or service if they do not know what information has been stored on them and their behaviour in a device or service and what the conditions for storage. This is also the reason for assessing, how people will get the information in practice and how it should be presented to them as well as the conditions of delivery to third parties, e.g. to other people or other companies like subsidiary companies.

Well, the person him/herself should have the right to specify the people who would get information about his/her whereabouts, thus it wouldn't be available to everyone. A disabled man, Western Finland

Yes, there has to be really good data protection in that thing so that no information is given to other parties. A disabled man, Western Finland

Yes, yes, and then the data security has to be so good, so that the (data) connection is cut off for sure, so no information is delivered to anybody, that is absolutely necessary. A disabled man, Western Finland

Case should be taken to ensure that people know about their rights to prevent the delivery of location data to third parties. For these information needs service descriptions and a user guide or other instructions should be considered. In the KEN-Project one task was to elaborate a common classification of the products and services for personal navigation, and the trade description model was created to clarify the products and services from the user's point of view (see more in Kaasinen et al., Products and Services for Personal Navigation –Classification from the User's Point of View).

Secondly, people should be involved in assessing the limits of consent: Is it enough to ask for consent once or are confirmations needed? Do they need regular reminders of ongoing

tracking? Assessment should be made of when or if people should ever be tracked without their own permission and who in that case can give consent for it.

Why are these questions important from the ethical point of view? See Chapter 9.4

2.2.5 Assessment of the security of navigation services

1. How could consent to positioning be given (on paper, in person, electronically, other)? How could people giving consent be identified in practice (password, ID-card, social security number, other)?
2. What kind of information should people have about the navigation devices and services before acquiring it or starting in time to use them?
3. What kind of data or information really needs to be gathered for navigation devices or services in order to get them to function well for navigation? Where and for how long must the information be saved, how can it be deleted and how will it be presented to people?
4. Where will people use navigation devices and services and what kind of tasks will people want to perform with them? Are devices, services, networks and navigation systems reliable and competent enough for all the tasks and environments they are expected to help in?
5. Have all risks to users, their health and personal safety or to data security in case of device loss or breakdown or network failure been considered carefully enough?
6. Should there be a built-in context sensitive help or a customer care service to help people in their problems?
7. What should be done to help people who become too dependent on navigation devices or services?
8. Are there other ethical issues to be raised to the public awareness?

Explanations and comments on the questions

With regard to navigation devices and services, informed consent is the foundation of security: people ought to be able to make an informed decision whether to start using a navigation device or service. This implies a carefully assessment of a) what people should give their consent to, b) what is the easiest and safest way for users to obtain informed consent and c) how the persons giving their consent should be identified?

In the Personal Data Act (Finnish government 1999) it is stated that no unneeded information (other than that needed to for the good functioning of navigation devices and services) should be gathered. In the same act it is stated that people should have opportunities to review the information gathered on them and delete it if they want to. This is why it the information needs should be considered and also the practical procedures for reviewing and deletion. Since the navigation devices and services are quite new and fairly complicated products the decisions concerning them should be based on descriptions of them. Security consists mostly of impressions and therefore the fears and suspicions concerning navigation devices and services should be explored and taken into account in their planning and design.

I have negative attitude towards all sorts of control, I mean altogether, I would like to be absolutely sure that no one or nothing has control, with all these things in the world...
A disabled woman, Western Finland

Most people regard navigation information as very private and thus security matters are very important to them. The risks concerning the level of privacy were often conceptualised in terms of surveillance. In the interviews separate services were frequently connected to broader social structures and the idea of a highly organized and totalitarian society.

It's quite a big risk to allow someone to locate you. I wouldn't like to be tracked in any circumstances.

A sailor, Western Finland

Therefore we should consider whether the devices and services and positioning means are reliable and sufficiently developed to offer security. In practice this implies a consideration of whether they might only support the tasks people want to perform and help in different kinds of situations and environments. Secondly, people are usually prejudiced about taking up new services. They are afraid, for example, that they ought to have skills they lack, or learn a lot of new things or buy new devices they cannot handle.

For these reasons we should consider what kind of service support should be planned in order to help people with their problems and to give them information in times of need: Should there be a context-sensitive help in a device that could be available at all times at low costs or a customer service care provided by operators or (other) service providers?

Yes, there are so often too many functions to use, especially if you use it only rarely. It should be very simple and besides there should be instructions inside that device.

A huntsman, Northern Finland

If you had this thing in your pocket, well it should be so easy to use you should know how to use it without a user guide.

A huntsman, Northern Finland

It might also be wise to inform people openly about the potential risks and about means of minimising them.

[*Why are these questions important from the ethical point of view? See Chapter 9.5*](#)

3 Concept generation of navigation devices and services

3.1 Concept generation of navigation devices and services and the ethical principles

Usefulness is an integral part of usability, even more than ease of use (cf. Keinonen 2000). Usability generally refers to the suitability of a device or a service, e.g. a navigation device or service for an intended purpose. Usability is connected with both the functions and the contents of a device or service, and they define its theoretical utility. The utility of functions and the facility of use, i.e. usability, together form the usefulness of a device or a service. (Grudin 1992; Nielsen 1993, 25.)

Usability is not important only in the economic perspective (Harrison et al. 1994) but for users it is also a justification for use and a reason for acquiring new devices (Keinonen 2000). Therefore usefulness should be included in the ethics of navigation devices and

services and regarded as part of the common good sought through the whole lifecycle of a navigation device or service. However, to respect the autonomy of people, it might be enough if the navigation devices and services would provide support to people in their tasks or situations of need only and enhance their abilities to cope with situations but without making them dependent on the devices or services. Furthermore, the research and design of navigation devices and services – like many other devices and services – is often funded from public resources. Therefore it is important to discuss in public how to do this well. In practice this means e.g. discussions about the principles applied in research and design, about including information on user cultures, use and usability and about applying user-centred design principles.

The principle of justice should be taken into account in defining all tasks, different environments and motives for use when planning and designing navigation devices and services. All means of ensuring that as many people as possible could make use of them and get support for their tasks in different environments should be pursued. Through thinking about the motives and situations of use it is possible to create devices and services that are useful, efficient, easy to use and which do not cause any harm to people.

Ethical principles are the base of the common good and laws, standards, and other norms and notions of good taste etc. Laws and other norms on the one hand are made to protect the citizens from trouble, on the other, they are made to keep order, control, regulate and direct the actions of the people and organisations (e.g. companies) to prevent them from harming others. But in the end they are, basically (only) contracts between people. They can be changed if they seem to contradict the ethical principles, but they also change spontaneously like ethical principles though only slowly and usually through argumentation.

However, they are not as unambiguous as they seem to be and this is why they have to be interpreted for all practical purposes. Good taste is even vaguer than the interpretations of laws and other regulations: It is delicately defined, dependent of the time, society etc. The plans and designs can be assessed in relation to good taste, too, with regard to different (sub-cultural, national, religious etc.) groups.

When new devices and services are planned and designed, one should assess whether the existing laws, standards, norms are adequate to protect the citizens, or whether new laws, acts, regulations are needed. This means there is a need for public discussion and feedback from everyone, especially the future users, about the navigation devices and services, their proper or incorrect planning, design and use, too.

The assessment of social effects and social justice concerns requires values of equality, tolerance and respect for others to be taken into account. Furthermore, in a fair society, individuals are not treated differently based on race, sex, religion, age, disability or other irrelevant qualities e.g. place of living, or service provider or operator.

It could be said that the more services affect on people's lives, the more potential ethical problems there are. This is particularly true when it comes to the social life and navigation services that can easily increase suspicion in social relations. There may be also alterations in family relationships, because the positioning may undermine mutual confidence.

In order to avoid harm to people, to respect people's privacy and to promote justice, the possibility of creating services that elicit as few changes as possible and merely give support to people in their tasks and situations of need could be explored. However, navigation devices and services, like many other devices and services, do have effects on people's social life and to protect people's rights and safety the effects should be discussed and monitored by all people and the whole of society. Thus problems may also be anticipated and appropriate ways of use outlined. Dependence on the devices or services or loss of control without them should be also considered as possible social effects.

In planning, designing and developing navigation technology it should be seriously considered that technology can also contribute to increased inequality in society. The devices and services can be seen as parts of a society's social system and as a potential cause of inequality. Above all, in order to benefit people and to serve the common good the navigation devices and services should be easy to use without necessitating extensive training for most people.

To promote social justice among people, it could be useful to evaluate what skills and motivation people already have to use other devices services (apart from navigation devices or the services) and what kind of resources they have to use the new ones and what skills they can be expected to acquire. Secondly, equal rights regardless of race, sex, religion, age, disability, economic circumstances or other personal facts, and the norms of the different nationalities and religions, should be regarded in the light of social justice. All devices and services could be assessed as to whether they are easy to use and suitable for all people including people with disabilities, the elderly etc. The usability of the concept and all the functions as well as the user interface might also be tested with different kinds of users all stages of planning, design, implementation and redevelopment. Failings in planning and design may result in making life more complicated and more difficult for people and in demanding continuous learning in using navigation device or service. They can be also ways of contravening the principle of justice.

Problems of equality and social justice may emerge in the actual resources and opportunities to acquire navigation devices or to use the navigation services. Those who cannot afford to use them or do not have the skills or motivation to use them may be left without some information. However, the information may be important for their well-being, or lack of it may even cause harm or trouble to them.

Furthermore, the navigation devices and services may also have effects on consumer culture. If most people use the devices and services, it is likely that over-the-counter services will be removed and life may become too complicated for those, who have no resources (financial or intellectual) for using the devices or services. This is why it might be good to consider if there could be public support or public services for such people. To promote the common good and the equality of people in this respect, there should be discussion about the availability of devices and services as public utilities and about the availability of services without electronic navigation devices or services providers.

Making decisions is an essential part of autonomy for people and privacy is the most important thing they can make decisions on concerning the navigation devices or services. At the moment many people consider location data very private. For decision-making people need information. Above all, to be able to decide whether to use the navigation devices or services, people need information about them in their own language, including

information about their functions, and the tasks they are meant to support, the environments of use and the limitations concerning use. (See also Simojoki 2001).

Privacy is a power relationship dependent on knowledge and control, since it is very difficult to have privacy if people have no knowledge of what they can do to protect their privacy or power to set the limits for their privacy. Thus the decisions about positioning and about consent to it are very important. Careful consideration is needed on when and for what reasons it is all right to gather information about people and how or for what it can be used.

When the consent is necessary should be considered carefully, how often it should be confirmed, how is it done in practice and how consent can be withdrawn. Questions about the limits of consent and situations in which the consent is not needed should also be addressed. In order to protect a person's privacy, whether people need to know when the positioning starts and – if it is continuous – when it ends should be considered. If tracking is set for a longer period of time people might also need reminders to be able to stop the tracking if they want to.

People's autonomy in relation to the use of navigation devices or services is put to the test in decisions about information gathered on them. To make the decisions, people might need some information on data stored in the databases of navigation services, about the time-span of storage and about the conditions of surrendering it to third parties, subsidiary companies etc. To be able to exercise their autonomous power in decision-making, people might also need some kind of information about their rights to see the information stored on them, to correct or to erase it and to forbid the surrender of information to third parties.

Devices or services are expected to work well and efficiently and to be accurate and easy to use in tasks and situations for which they are intended. In other cases, they may be considered as causes for accidents and damage, for waste of money or causing harm in other ways. Uselessness can also be considered as annoyance. The navigation devices and services should promote security in all respects to avoid harm to people, but still avoid breeding or encouraging to patronising or to surveillance. In order to avoid problems and harm to people, there may be a need for the risks to users (e.g. to their health and personal safety, data security etc.) to be assessed, minimized and disclosed to them.

3.2 Concept generation of navigation devices and services

Concept generation is a long process and design and redesign may last for years and continue even when devices and services marketized. Here the concept design refers to activities related to planning and designing of navigation devices and services in situations where there are no products on the market but only motives and environments of use, tasks to be supported by them and requirements defined based on them. On the other hand, concept generation concerns here all descriptions, instructions and guidance given to people in order to inform them about navigation devices and services and their potentiality and limits. The assessment of ethical issues concerning the concept design should be a continual process throughout the lifecycle of devices and services. Changes derived from them should also be taken seriously and not be put aside to wait for the next generation of navigation devices and services.

3.2.1 Assessment of tasks and environments and motives of use

1. In what kind of situations and tasks could navigation devices and services be useful or fun? What could be the motives for using them?
2. What could be the surplus value of the services compared with the (more) traditional means or equipment?
3. What kind of requirements might the environments of use set for navigation devices and services?
4. Where will navigation devices or services not be needed? When or where they could be useless or when or where might they cause problems or danger?
5. Could navigation devices or services offer safety or they can be considered as surveillance or patronising?
6. Will people lose abilities in taking up new services or become unable to cope in some situations without the service?
7. Are there more ethical issues to be raised to the public discussion?

Explanations and comments on the questions

People usually want some arguments for using new services. They should be somehow better than older ones or they should make a task or action (entertainment among others) easier or more efficient. This utilitarian point of view can be also justified through the fact that, in most cases, the development of new services is funded from public funds that should be used efficiently and for useful purposes only. Usefulness as part to usability (cf. Keinonen, 2000) is more subjective than objective; if people are motivated to use devices and services, for example for entertainment, they are useful in relation to the tasks people have expected to do or support.

I'm wondering, what's the use for me to carry it with me all the time? Is it of any use?
A disabled woman, Western Finland.

What I think is important and needs to be regarded here, is the relevance and the necessity. There are now all kinds of imaginary alternatives whose necessity is close to zero and so it should be reflected what is really necessary and important.
Elderly man, Western Finland

Useless services are considered an annoyance and as potential causes of harm, therefore one should consider, where or in which tasks or environments navigation devices or services are not needed or where they can cause problems or even danger. Services based on information hi-tech and connected to information networks are also assumed to be accurate, reliable and to give up-to-date information.

I was wondering too, how those services (in use scenarios) are maintained. I think it demands work, like someone to type it (the information) and it seems there is no point in them if they are like the web pages these days, updated in March 2000. In principle it would be great, but I seriously doubt if it is possible to find enough people to put in the information every day to keep it (the information) up-to-date. The opening hours for example, no matter how fancy the service is, if it gives wrong information about opening hours you probably get really pissed off.
A sailor, Western Finland

These impressions should also be taken into account in the generation of navigation devices and services. In practice this could mean comparing navigation services with the existing means of navigation. Secondly it could mean assessing whether they really

support people in their tasks and make the tasks easier or whether people have more problems in navigating with them than without them. Thirdly, it may be helpful to think about the possible problems and resistance to navigation devices and services since they describe fears; prejudices and suspicions people tend to have towards new devices and services.

I have a negative attitude towards all sorts of control, I mean altogether, I would like to be absolutely sure that no one or nothing has control, with all these things in the world.
A disabled woman, Western Finland

They really have to be reliable if they are meant to be used for navigation. It's the basic feature in present devices that they don't work.

A sailor, Western Finland

For example, navigation devices and services may have an effect on people's lives in that they become too dependent on services and cannot cope without them but for example get lost with a map or feel very insecure.

[Why are these questions important from the ethical point of view? See Chapter 9.1](#)

3.2.2 Assessment of laws and other regulations, standards, norms and good taste in regard to navigation services

1. What could be proper ways to use navigation devices or services?
2. What could be inappropriate or unacceptable ways to use navigation devices or services?
3. What problems or danger could they generate?
4. When or where would people not like to be positioned?
5. Are there more ethical issues to be raised to the public discussion?

Explanations and comments on the questions

In addition to usefulness (see 2.1 above) one should consider during concept generation whether people regard navigation devices and services as appropriate and acceptable or not. On the other hand, questions about the limits concerning positioning can detect the boundaries between appropriate and inappropriate, legal and illegal use, especially in cases where there is no legislation or other official regulations for navigation devices and services or for the use of positioning information. People usually do not have much information about standards or laws concerning the services they use. But still, they usually have some conceptions about the limits of good taste and legitimacy. This is why it might be good to involve future users in assessing the concepts even if they are just paper mock-ups and not functional prototypes.

[Why are these questions important from the ethical point of view? See Chapter 9.2](#)

3.2.3 Assessment of social effects and social justice in regard to navigation services

1. What kind of effects may navigation devices and services have on people's relationships? What problems could emerge in families when using navigation devices or services? Why would people not use them? Could they cause isolation?

2. Will the navigation devices and services be easy to use? Could people have actual resources, skills and motivation to use them? What kind of resources or skills have they acquired using devices and services other than for navigation?
3. Will navigation devices and service make some people's lives too complicated or too dependent on them?
4. Will all people have equal rights or opportunities to use navigation devices and services regardless of their race, sex, religion, age, skills, disability or other personal facts or economic situation?
5. What effects could navigation devices and services could have on consumer culture? Are there several services outlets included equally in the navigation services? Are services available to all people?
6. Have the regulations and norms of the different nationalities and religions been taken into account?
7. Are there more ethical issues to be raised to the public discussion?

Explanations and comments on the questions

It could be said that the more services influences on people's lives, the more there may be potential ethical problems. In practice this means that navigation devices and services should primarily support the tasks people want to perform and occasions as few changes as possible. This is particularly true when it comes to social life and navigation devices and services. They can easily increase suspicion in social relations if they are considered to be patronising means or a means of surveillance or even spying. Social pressures, for example, could potentially develop in a way that everybody should have a device or service turned on always and everywhere. If they turned it off even for a moment, other people might start to worry or to have suspicions. Therefore it would be less stressful to let other people track you all the time. There might be also alterations in family relationships e.g. jealousy and other problems, because the positioning may undermine mutual confidence.

Even if I try, I don't think I would want anybody to track me. And if you think about for instance a married couple, which have terrible fights, you could imagine they wouldn't like it (one being tracked by the other) under any circumstances.

Elderly woman, Western Finland

On the other hand, they can reinforce people's relationships if they are considered a means of security and confidence.

In contrast I'm wondering if people really cocoon themselves and the devices maintain their relationships or if it is like with mobile phones and people become more sociable and get in contact more easily since it is more effortless.

Teenager, Northern Finland

Thirdly, navigation devices and services may also cause isolation among groups, if only some members use them.

I'm wondering if people will lose their social skills altogether, if there were services like this available all the time and in principle you wouldn't have to have anything to do with other people since you could have all the information through the devices.

Teenager, Northern Finland

For example, information about gatherings may not reach the people who do not use them. All impressions of possible effects are very valuable in concept generation and help to understand the challenges and possibilities of navigation services.

On top of motives for use, also actual resources should also be considered for promoting social justice, i.e. can people afford to acquire new devices for navigation services or can they afford to pay the service fees?

What do you think about these services in terms of equality? Do you think everybody can have them in the future? The Interviewer

It's going to be question of prices, too. If they cost a thousand or two, normal people won't get them. It's often the boundary question. A huntsman, Northern Finland

I think normal people need those [navigation devices] so rarely that I wouldn't get one. They are sort of disposable and they need to be changed to new ones every year or two and thrown away if broken. They could be used much longer if they were treated carefully and used only in real need.

A huntsman, Northern Finland

Therefore people must consider, how their social life will change among those, who do not use them – if they will be excluded from their normal social circles or have difficulties in coping in some situations due to lack of devices or services. In contrast some people may become too dependent on navigation devices and services. Thus ways of coping with social effects of this kind should be considered.

There will always be some people who need special devices and services or who have to be taught to use navigation devices and services. But on the other hand, when it comes to social justice, design for all could be a good foundation for every design process.

If a person who has never even held a mobile phone in his hand gets one like this (a navigation device presented in a use scenario) cannot use it if there are more than three buttons to press. Elderly man, Western Finland.

Thus one should consider carefully what kind of skills people have to use the older devices and services and what new skills they might be able to acquire through reasonable effort.

It makes quite a big difference what kind of devices you need to have to use the services, what kind of input system and display abilities they need to have, because I have a very old mobile phone, which cannot display anything like this. But it's all I need at the moment. But even in this one there are a lot of functions I never use. If they (navigation services) can be used only by devices full of different functions you would probably have to struggle to get the maps on screen. Thus the device is quite significant. Mother of two, Western Finland

On the other hand it should be borne in mind that applying the design for all principle usually leads to solutions that are more sophisticated thereby they can reduce the possibilities of problems in use and that way promoting the common good (see more on the subject: <http://www.stakes.fi/include>). For example, the adjustment of volume of speech in mobile phones, originally designed for people with hearing difficulties helps all people using their mobiles in noisy places.

From the users' point of view it is also important to consider for the development of the consumer culture: if where most of the people use the devices and services, it is possible that over-the-counter services will be removed. As a result, life may become too

complicated for some people, who have no resources (financial or intellectual) for using navigation devices or services. In this case one should consider if there should be public support or public services organised for those people.

[Why are these questions important from the ethical point of view? See Chapter 9.3](#)

3.2.4 Assessment of the ethics of navigation devices and services from the perspective of decision-making

1. What kind of information would people need on navigation devices and services before they start using them and how should the information be given to them in practice? What matters should be confirmed with future users, before taking up navigation devices or services?
2. What kind of data or information needs to be gathered by the service in order to keep it functioning well? How long it will be saved for and how it can be deleted? Who could have access to databases or to the information? On what conditions could it be given to third parties like subsidiary companies etc.?
3. How could informed consent be obtained for positioning? How about withdrawal of consent?
4. In what kind of situations could people be tracked without their consent? Who could make the decision for them?
5. How should navigation devices and services tell when tracking starts and when it ends? How about in the course of a longer period of tracking, should people be reminded of it regularly?
6. Are there more ethical issues to be raised to the public discussion?

Explanations and comments on the questions

In order to be able to make informed decisions about using (or not using) a navigation service or how about to use it people also need to know, what information has to be stored on them and their behaviour in navigation services or devices. In Finland people also have the right to do so under the Personal Data Act (Finnish government 1999). Therefore plans are needed on how people could find out in practice what information has been stored on them. In the case of navigation services it is probable that there will be quite large amount of information. Thus one should also consider carefully how the information should be presented to people, so that they can understand it and possibly delete it or make decisions about the use of services.

The most important decision about navigation devices and services is giving informed consent to positioning. One should assess carefully what kind of information people might need about the possibilities and limits of devices, services, networks and about the management on data collected of them and the withdrawal of consent for positioning. Furthermore, the conditions for surrendering the information gathered to other people or companies should be considered, too.

Well, the person him/herself should have the right to specify the people who would get information about his/her whereabouts, thus it wouldn't be available to everyone. A disabled man, Western Finland

Yes, there has to be really good data protection in that thing so that no information is given to other parties. A disabled man, Western Finland

Yes, yes, and then the data security has to be so good, that the (data) connection is cut off for sure so no information is handed over to anybody. That is absolutely necessary. A disabled man, western Finland

The limits of consent for positioning should be considered too: when no consent is needed and who can give consent for others. Furthermore, we must think if people should know exactly when they are being positioned in order to be able to stop it at any time and how they be notified. Reminders of the ongoing tracking should also be considered.

[Why are these questions important from the ethical point of view? See Chapter 9.4](#)

3.2.5 Assessment of the security of navigation services

1. When and how should informed consent be obtained in practice? How about the withdrawal of consent? How should the person giving consent be identified?
2. How should people be informed of tracking that lasts for a longer period of time? At the moment, is the location information updated or regularly? How often?
3. What kind of data or information really needs to be gathered for the navigation services to work well? Where and for how long will the information be saved, how can it be deleted and how will it be presented?
4. Where will people use the services and what kind of tasks will people want to perform with them?
5. Are the services and navigation systems reliable and competent enough for all the tasks or environments they are expected to help in?
6. Will people lose abilities in taking up new services or become unable to cope in some situations without the service?
7. Is it worthwhile to make a built-in (context sensitive) help or organise a customer care service to help people in their problems?
8. Where or how will people get support in problem situations? How are the liabilities distributed? What could be done for people who become too dependent on navigation devices or services?
9. Is there something about positioning services that makes people suspicious or afraid?
10. Are there more ethical issues to be raised to the public discussion?

Explanations and comments on the questions

In terms of navigation devices and services informed consent is the foundation of the security. People ought to be able to make an informed decision whether to start using a navigation service. This is why one should assess carefully what the best way is to obtain informed consent and what the content of that consent is. Secondly, one should consider – especially in cases where the tracking is continued for a longer period of time – whether people should be informed about it just at the beginning or regularly during the tracking. The consent should be based on correct knowledge of the services and their possibilities and limits.

Is there also a need for careful consideration as to what kind of information people need before they can make decisions and how they will get it? People ought to have an opportunity to regularly review the information gathered on them and delete it if they

want to. Therefore one should assess what kind of information really needs to be gathered for navigation devices and services in order for them to function well, how it will be presented to people in practice, how they can delete it and if it should be included in the descriptions of navigation devices and services.

What do you think in general, is it acceptable to gather information about people?
Interviewer

Well, if it is not excessive.
Teenager, Northern Finland

But at least for profiling certain agreements should be made. You shouldn't have to declare specifically if you do not want it but instead you would have to sign up if you want it. Teenager, Northern Finland

Most people regard navigation information as very private and thus security matters are very important to them. The risks concerning the level of privacy were often conceptualised in terms of surveillance. Frequently separate services were connected to broader social structures and the idea of a highly organized and totalitarian society.

It's quite a big risk to allow someone to locate you. I wouldn't like to be tracked in any circumstances.
A sailor, Western Finland

The navigation devices and services should be developed well enough since services based on information hi-tech and connected to information networks are also assumed to be accurate, reliable and to give-to-date information.

I was wondering too, how those services (in use scenarios) are maintained. I think it demands work, like someone to type it (the information) and it seems there is no point in them if they are like the web pages these days, updated in March 2000. In principle it would be great, but I seriously doubt if it is possible to find enough people to put in the information every day to keep it (the information) up-to-date. The opening hours for example, no matter how fancy the service is, if it gives wrong information about opening hours you probably get really pissed off.
A sailor, Western Finland

They really have to be reliable if they are meant to be used for navigation. It's a basic feature in present devices that they don't work. A sailor, Western Finland

In practice they should be able to support the tasks people want to perform and to help in different kinds of situations and environments.

Navigation devices and services may also have effects in people's lives in that they become too dependent on services and cannot cope without them, but get lost with a map or feel very insecure.

I'm wondering if people will lose their social skills altogether, if there were services like this available all the time and in principle you wouldn't have to have anything to do with other people since you could have all the information through the devices.
Teenager, Northern Finland

It might also be wise to inform people openly about the potential risks and about means of minimising them. A built-in help function or a customer care service should be considered, too, in order to prevent problems and to help users to recover from error situations.

Yes, there are so often too many functions for use, especially if you use it only rarely. It should be very simple and besides there should be instructions inside that device. A huntsman, Northern Finland

To promote justice the division of responsibilities between the operator, users and authorities should be clear and the distributed in case of problems. This way people would know where they could get help and possible compensation to users given in cases of serious breakdowns, failures or in situations of danger.

Well, you have to be careful always. Disabled woman A, Western Finland

You have to use your own brains, too. Disabled woman B, Western Finland

No, no, no. This is just an instrument. Disabled woman A, Western Finland

There may also be some people who become too dependent on navigation devices or services; therefore one should consider how they could be helped and dependency prevented.

[Why are these questions important from the ethical point of view? See Chapter 9.5](#)

4 Implementation of concepts designed for navigation devices and services

4.1 Implementation of concepts designed for navigation devices and services and the ethical principles

In order to respect the autonomy of people, the navigation devices and services should provide support to people in their tasks or situations of need only and enhance their abilities to cope with situations but not make them dependent on the devices or services. Usability generally refers to how well a device or a service suits an intended purpose. Usability is connected with both the functions and the contents of a device or a service, which define its theoretical utility. The utility of functions and the facility of use, i.e. usability, together constitute the usefulness of a device or a service. (Grudin 1992; Nielsen 1993, 25.)

Usability is not important only from the economic perspective (Harrison et al. 1994) but for users it is also a justification for use and a reason for acquiring new devices (Keinonen 2000). Therefore usefulness should be included in the ethics of navigation devices and services and regarded as part of the common good sought through the whole lifecycle of a navigation device or service. However, to respect the autonomy of people, the navigation devices and services could merely provide support to people in their tasks or situations of need only and enhance their abilities to cope with situations instead of making them dependent on the devices or services.

Devices or services are expected to work well and efficiently and to be accurate and easy to use in the tasks and situations for which they are made for. In other cases, they may be considered to be causes of accidents and damage, for loss of money causing harm in other ways. Uselessness can also be considered to be an annoyance and harm as such. To avoid harm to people the navigation devices and services should promote security in all respects but avoid engendering to patronising or surveillance.

Ethical principles are the basis of the common good and laws, standards, and other norms and notions of good taste etc. Laws and other norms are made on the one hand to protect citizens from trouble, on the other, they are made to keep order, control, regulate and direct the actions of people and organisations (e.g. companies) to prevent them from harming others. But in the end they are, basically (only) contracts between people. They can be changed if they seem to contradict the ethical principles, but they also change spontaneously like ethical principles though only slowly and usually through argumentation. They are not as unambiguous as they seem to be and this is why they have to be interpreted for all practical purposes. Good taste is even vaguer than the interpretations of laws and other regulations: It is delicately defined, dependent on the time, society and other factors. The plans and designs can be assessed in relation to good taste, too, with regard to different (age, sub-cultural, national, religious) groups.

In order to ensure safety, privacy and justice for people, the need for new laws, regulations and standards should be continually assessed throughout the lifecycle of the devices and services, especially those protecting the privacy of people and the information gathered of them on registers.

The assessment of social effects and social justice concerns requires recognising the values of equality, tolerance and respect for others. Furthermore, in a fair society, individuals should not be treated differently due to race, sex, religion, age, disability, economic situation or other irrelevant qualities (e.g. place of living or service operator). First of all, in order to benefit people and to serve the common good should consider how to make navigation devices and services that are for most people are easy to use without extensive training.

In the planning and design process of navigation devices and services equality can be promoted, for example, by taking seriously the laws on equality, defending people's rights to be treated equally (see the qualities above). In practice this means that design for all should be considered as a standard in the planning and design process. Nevertheless, this does not mean similar devices or services for all. Variety of products can be seen as promoting autonomy, i.e. giving people options to decide the best choice for them. However, all devices and services should be easy to use and suitable for everybody, including people with disabilities, the elderly etc. Secondly, the usability of the product concept and all the functions as well as the user-interface should be tested with different kinds of users at all stages of planning, design, implementation and redevelopment. Faults in planning and design may result in making life more complicated and more difficult for people and demanding continuous learning in using a navigation device or service, thereby flaunting the principle of justice.

Problems of equality and social justice may emerge in the actual resources and opportunities to acquire navigation devices or to use the navigation services those who cannot afford to use them or do not have the skills or motivation to do so may be deprived of information that is important for their well-being. Lack of information may even cause

harm or trouble to them. Furthermore, the navigation devices and services may also have effects on consumer culture: in cases where most of the people use the devices and services, it is likely that normal (non-electronic) services will be removed. In that case life may become too complicated for some people who lack resources (financial or intellectual) to use the devices or services.

Making decisions is an essential part of autonomy for people and privacy is the most important thing about the navigation devices and services they can make decisions on. At the moment many people consider location data very private. For decision-making people need information. First of all, to be able to decide whether to use the navigation devices or services, people need information about them in their own language: about their functions, and the tasks they are meant to support, the environments of use and the limitations concerning the use (e.g. updating the service). In addition, to be able to decide which operator or service provider to choose, people need information to assess and compare the different services, the prices and the price setting.

People's autonomy in using navigation devices or services culminates in decisions about information gathered on them. To make the decisions, people have to get some information on data stored on the databases of navigation services, and about the storing conditions: the time-span of storage and about the conditions of surrendering it to third parties, subsidiary companies etc. In order to exercise their autonomous power in decision-making, people also need information about their rights to see the information stored about them, to correct or to erase it and to deny the deliveries to third parties. They may also want information about the minimum requirements for the service providing companies concerning the security and the qualifications of the personnel stipulated by laws and other regulations. There should be a public discussion about ways presenting the information and supporting people's decision-making. Secondly, discussion is also needed about the guidelines for presenting the stored information and transferring it to other parties.

The foundation of security for most people is relevant information – in their own language. Information is needed about the potential and restrictions on the devices and services, and also about their proper use and how consent can be given when taking them up. Especially in the case of new devices and services like those for navigation, it is very important to plan their descriptions carefully, likewise their potential and restrictions, because people usually have some fears, suspicions or prejudices regarding new things.

Thirdly, people need information about the location data saved about them in the services and about their rights and means of seeing, correcting and erasing the data and about the right to withdraw the consent for positioning at any time. These rights are legislated by the Personal Data Act (Finnish Government 1999). Furthermore, people usually want – for safety reasons – information about the management of the location data gathered on them. This information includes what kind of professionals do the data management, where and for how long the data is saved and on what conditions it can be surrendered to third parties. All this information mentioned above is essential for people to safeguard their rights, to feel autonomous and to avoid harm.

In order to protect their privacy, people might need information about positioning, when it starts and when it ends. One should consider whether reminders of ongoing tracking would be needed, too. For other risks of services, problems in use, system failures or breakdowns there could be some kind of help available to avoid more harm to people. To

promote justice the divisions of responsibilities between the operator, users and authorities should be clear and the liabilities shared in case of problems. This way people would know where they could get help and possible compensation. People who have become addicted to devices or services should be taken care of, too.

In order to avoid problems in use, the risks to users (e.g. to their health and personal safety, data security etc.) should be assessed, minimized and disclosed to users. The safety, accuracy and reliability of the devices and services should be promoted in all respects – both using the navigation devices and services and without them (in case of failures, breakdowns, flat battery etc.). In the name of justice, help should be provided in problem situations and possible refunds made to the users. Furthermore, for the principle of efficiency possible problems should be predicted and precautions taken to avoid them.

4.2 Implementation of concepts designed for navigation devices and services

Implementation is usually carried out when concepts of devices or services are ready to an extent but implementation and concept design often go partly hand in hand, too. One should consider how concepts could be implemented in one-way or another as prototypes (which may be anything from paper mock-ups to functional prototypes) and tested. Here the implementation concerns all activities done to illustrate the concepts created. On the other hand implementation concerns all descriptions, instructions and guidance given to people to inform them about navigation devices and services, their potential and limits.

4.2.1 Assessment of tasks and environments and motives for use. Users should be involved in assessing:

1. What is the surplus value of navigation devices and services compared with the (more) traditional means or equipment? Are the networks and devices accurate and reliable enough for the tasks people expect them to perform? Is the information in navigation services up-dated often enough in relation to the tasks allocated to them?
2. Is there something people would like to do with navigation devices or services that is not possible with those designed?
3. Where or for what reasons are navigation devices or services not needed?
4. Are the navigation devices and services designed to be easy to adopt and easy to use?
5. Have the environments of use been taken into account well enough?
6. Is there something about these positioning devices and services that make people suspicious or afraid?
7. Are there more ethical issues to be raised to the public discussion?

Explanations and comments on the questions

People usually want some arguments for using new devices and services: they should be somehow better than older ones or they should make a task or action easier or more efficient. This utilitarian point of view can also be justified through the fact that in most cases the development of new devices and services is funded from public funds that

should be used efficiently and for useful purposes only. However, the usefulness may, of course, appear in form of entertainment, too. Usefulness as part to usability (cf. Keinonen, 2000) is more subjective than objective: if people are motivated to use the devices and services, for example for entertainment, they are useful in relation to the task people have expected to do or support.

I'm wondering, what's the use for me to carry it with me all the time? Is it of any use?
A disabled woman, Western Finland

Devices and services based on information hi-tech and connected to information networks are also assumed to be accurate, reliable and to give up-to-date information.

I was wondering too, how those services (in use scenarios) are maintained. I think it demands work, like someone to type it (the information) in and it seems there is no point in them if they are like the web pages these days, updated in March 2000. In principle it would be great, but I seriously doubt if it is possible to find enough people to put in the information every day to keep it (the information) up-to-date. The opening hours for example, no matter how fancy the service is, if it gives wrong information about opening hours you probably get really pissed off.
A sailor, Western Finland

They really have to be reliable if they are meant to be used for navigation. It's the basic feature in present devices that they don't work.

A sailor, Western Finland

Useless devices and services are considered an annoyance and therefore potential causes of harm. Therefore one should consider where or when navigation devices and services are not needed or where they can cause trouble or even danger.

Careful consideration should also be given to what kind of skills people have to use the older devices and services and what new skills they might be able to acquire through reasonable effort.

When a person who has never even held a mobile phone gets one like this (a navigation device presented in a use scenario) he or she cannot use it if there are more than three buttons to press.
Elderly man, Western Finland.

Thus users of different kinds should be involved in testing and assessing the adequacy of design and redesign and suitability of the devices and services for the tasks and environments of use they regard as important. In practice this means comparing navigation devices and services with the existing means of navigation and assessing whether the devices and services really support people in their tasks and make them easier or whether they have more problems in navigating with them. Secondly, it may be helpful to think about the possible problems and resistance to the navigation devices and services: they probably introduce impressions of potential causes of harm in terms of navigation devices and services.

[Why are these questions important from the ethical point of view? See Chapter 9.1](#)

4.2.2 Assessment of laws and other regulations, standards, norms, good taste etc. in regard to navigation devices and services

1. Do you think all the relevant laws and other regulations, standards and good taste have been taken into consideration in the planning and designing of the navigation devices and services?
2. What are proper ways of using navigation devices and services?
3. What are inappropriate or unacceptable ways to use navigation devices and services?
What problems could they cause?
4. When or where would people not like to be tracked?
5. Are the services and (present) devices compatible or is there a need for further standardisation?
6. Are there more ethical issues to be raised to the public discussion?

Explanations and comments on the questions

During the implementation tests and assessments by future users are essential for several reasons. One of these is assessing whether people regard the navigation devices and services as appropriate and acceptable or not. On the other hand, questions about the limits concerning positioning can determine the boundaries between appropriate and inappropriate, legal and illegal. This is very important in cases where there is no legislation or other official regulations for the navigation devices and services or for the use of position information. Secondly, navigation devices and services should also be assessed in terms of standards: are the (existing) devices and services compatible or are new standards needed?

People usually do not have much information about standards or laws concerning the devices and services they use. But still, they usually have some conceptions about where the limits of good taste and legitimacy can be drawn. These conceptions and beliefs should be taken into account especially in the case of new devices and services, as there may not be official regulations or laws to control implementation.

The distribution of responsibility is very important, too. It should be done in a concrete manner even before the devices and services enter the market in order to avoid possible inconsistencies and a threat to the rights of users and to their well-being and in order to inform people about the help resources and options for compensation in problem situations.

[*Why are these questions important from the ethical point of view? See Chapter 9.2*](#)

4.2.3 Assessment of social effects and social justice with regard to navigation devices and services

1. What kind of effects can navigation devices and services have on people's relationships?

2. What problems could emerge in families when using navigation devices and services? Why would they not use navigation devices or services? Could they cause isolation?
3. Are navigation devices and services easy to use? Do people have enough resources, skills and motivation to use the navigation devices and services, or do they require continuous learning?
4. Do the navigation devices or services make some people's lives more complicated or too dependent on them?
5. Will people lose abilities in taking up new devices or services or become unable to cope in some situations without devices or services?
6. What effects could navigation devices and services have on consumer culture? Are several services outlets included equally in the navigation services? Are services available to all people?
7. Are there more ethical issues to be raised to the public discussion?

Explanations and comments on the questions

In order to benefit people and to serve the common good most people should be able to use devices and services easily and without extensive training. To promote social justice among people, one should consider where the design for all principle and those of user-centred design can and should be applied. There will always be some people who need special devices and services or who have to be taught to use navigation devices and services, but when it comes to social justice, design for all should be the foundation in implementation, too.

Design for all can produce solutions that are useful to everyone. The adjustment of volume of speech in mobile phones for example, originally designed for people with difficulties in hearing, helps all people using their mobiles in noisy places. In practice, users of different kinds should be involved in testing and assessing the adequacy of design and redesign and suitability of the devices and services for the tasks and environments of use allocated to them. The tests and assessments also help in considering whether the devices and services are too demanding for some people and what new skills they might be able to acquire through reasonable effort. This is important in promoting social justice and preventing trouble due to people's lack of skills or difficulties in use.

In addition to skills and motives for use, actual resources should also be considered promoting social justice.

What do you think about these services in terms of equality? Do you think everybody can have them in the future?

The Interviewer

It's going to be a question of prices, too. If they cost a thousand or two, normal people won't get them. It's often a boundary question.

A huntsman, Northern Finland

I think normal people need those [navigation devices] so rarely that I wouldn't get one. They are sort of disposable and they need to be changed to new ones every year or two and thrown away if broken. They could be used much longer if they were treated carefully and used only in real need.

A huntsman, Northern Finland

In practice this means one should consider, whether most people can afford to use the navigation services or not. It is probable that not everybody can. Therefore one should consider how social life will change for those, who do not use the devices and services – will they be excluded from their normal social circles or have difficulties in coping in some situations due to lack of devices and services. In contrast the navigation services and devices may have effects on people's lives in that they become too dependent on services and cannot cope without them but get lost with a map or feel very insecure.

I'm wondering if people will lose their social skills altogether, if there were services like this available all the time and in principle you wouldn't have to have anything to do with other people since you could have all the information through the devices.
Teenager, Northern Finland

These potential consequences may elicit fears and prejudices should be taken seriously in implementation, planning and design.

It may be that the more devices and services affect people's lives the more potential ethical problems there are. In practice this means that navigation devices and services should primarily support the tasks people want to perform and cause as few changes as possible. Navigation devices and services can easily increase suspicion in social relations if they are considered patronising or means of surveillance or even spying.

And it wouldn't be real kind of watching. It would be like a feeling you are being watched over. Even if I would know he (the daughter) is there, I wouldn't know what she's doing. And it's in your own imagination if you think like "she's there, so she can do this and that". It might cause a lot of conflicts in your relationships.
Mother of two, Western Finland

I have a negative attitude towards all sorts of control, I mean altogether, I would like to be absolutely sure that no one or nothing has control, with all these things in the world...
A disabled woman, Western Finland

Social pressures for example, could potentially develop so that you should have a navigation device or service turned on always and everywhere. If you turned it off even for a moment, other people would worry or start to have suspicions. Therefore it would be less stressful to let other people locate you all the time.

It could be like you would slip in your decisions and keep it switched on all the time and that way...

There might also be alterations in family relationships, because the positioning may undermine mutual confidence.

I don't know. Maybe I don't think of it like that it could reduce the responsibility for children. It would be just an instrument. Teaching responsibility is something else.
A man, Northern Finland

Navigation devices and services may also cause isolation among groups, if only some members use navigation devices and services, e.g. information about gatherings may not reach the people who do not use them.

On the other hand, they can reinforce the relationships between people if they are considered as a means of security and confidence.

In contrast I'm wondering if people really cocoon themselves and the devices maintain their relationships or if it is like with mobile phones and people become more sociable and get in contact more easily since it is more effortless.

Teenager, Northern Finland

All the impressions of the effects are very valuable in concept generation and help to understand the challenges and potential of navigation devices and services.

From the users' point of view the development of consumer culture is important, too: in cases where most people use the devices and services, it is likely that over-the-counter services will be removed. As a result life may become too complicated for some people who have no resources (financial or intellectual) for using navigation devices or services. In this case one should consider, if society should support those people or endorse public services etc. Secondly, navigation devices or services can also offer only partial information (e.g. only about over-the-counter services whose owners have paid a fee to an operator) For that reason people may be unaware of some service outlets available and the consumers may use only those offered by navigation services. That, without doubt, would change the consumer culture.

[Why are these questions important from the ethical point of view? See Chapter 9.3](#)

4.2.4 Assessment of the ethics of navigation devices and services from the perspective of decision-making

1. Is the informed consent obtained in an easy and clear way? How about the withdrawal of consent?
2. Are people given enough information about all the data collected on them and about how long the data gathered will be saved, and the possibilities to delete it?
3. Will there be either a context sensitive help or a customer care service to help people with their problems or difficulties in use?
4. How is the data gathered on people saved and managed? On what conditions it can be delivered to third parties?
5. Should navigation devices or services tell easily and clearly when the positioning starts or in case of a longer period of tracking, when it ends? Would reminders of ongoing tracking be needed?
6. How is data security assured and what kind of information should people be given in problem situations or security hazards and how fast?
7. How should the prices of navigation devices or services be set?
8. Are there enough opportunities and resources for giving feedback about the positioning services?
9. Are there more ethical issues to be raised to the public discussion?

Explanations and comments on the questions

The most important decision about navigation devices and services is giving informed consent to positioning. Careful assessment is needed as to whether all the information people need (e.g. about the devices and services, about the management of data collected on them and the withdrawal of consent to positioning) is explicit, in the users' language and easy to understand. Furthermore, how and what people should be told about identification procedures demands consideration. Or, what they should be told about the

conditions of surrendering information on users and their locations to third parties like other people or other companies.

Well, the person him/herself should have the right to specify the people who would get information about his/her whereabouts, thus it wouldn't be available to everyone. A disabled man A, Western Finland

Yes, there has to be really good data protection in that thing so that no information is given to other parties A disabled man B, Western Finland

Yes, yes, and then the data security has to be so good, that the (data) connection is cut off for sure so no information is surrendered to anybody, that is absolutely necessary. A disabled man A, Western Finland

There may also be other security matters in terms of using the navigation services. The need for notification about the start and the end of tracking and reminders of ongoing tracking should be considered, too. To be sure all solutions are for the common good and devices and services are not causing problems, it might be a good idea to ascertain it with future users.

To be able to make informed decisions about using (or not using) navigation devices or services or about how to use them, people also want to know what information can be saved on them and their locations in navigation services or devices. Therefore one should consider how and what information should be presented and how to do it easily and clearly. Furthermore, it should be easy to compare different devices and services and their prices and price setting.

Finally, feedback opportunities are also an important part of navigation devices and services. If people can give feedback about the products, they may feel more involved in planning and design, and perhaps more autonomous and better regarded as users, too. Lack of feedback opportunities may on the other hand be regarded as neglect of the common good and disrespectful to the needs of future users.

[Why are these questions important from the ethical point of view? See Chapter 9.4](#)

4.2.5 Assessment of the security of navigation services

1. Is the informed consent obtained easily and clearly way? Is it easy to withdraw consent?
2. Have all risks to users, their health and personal safety (radiation, allergies, hazards in traffic) or to data security in case of a device loss or breakdown, empty battery or network failure been predicted and considered? How are the responsibilities distributed in case of problems? Where or how will people get support in problem situations? Should there be a built-in context sensitive help or customer care service to help people with their problems?
3. Are people given enough information about navigation devices or services and about the start of the tracking or – in case of a longer period of tracking – the end of it? Are reminders of the ongoing tracking needed?
4. What kind of data really needs to be stored in navigation devices and services in order for them to function well? How about where and for how long the information will be saved, how will it be presented and how can it be deleted?

5. What will be the environment of use of navigation devices and services and what kind of tasks do people want to perform with them? Are they and the networks reliable and accurate enough for the tasks and environments they are expected to support?
6. Is there something about navigation devices and services that make people suspicious or afraid?
7. Are there more ethical issues to be raised to the public discussion?

Explanations and comments on the questions

With regard to navigation devices and services, informed consent is the foundation of security for most people. This is why careful assessment is needed on the best way to obtain informed consent and the content of the consent. Secondly, in cases where the tracking is continued for a longer period of time, one should consider, whether people should be informed about it only at the beginning or regularly during the tracking and at the end of it. Consent should be based on correct knowledge of the devices and services, their potential and restrictions and their risks and the distribution of responsibility problem situations. The risks in terms of users' personal safety health (e.g. radiation, allergies, hazards in traffic), regarding data security and people's safety without navigation devices and services in case of device loss or breakdown, empty battery or network failures should be assessed and minimized, too. In order to address the problems in a relevant manner and to save people from more harmful consequences, one should consider if help functions or customer care services should be arranged.

Yes, there are so often too many functions for use, especially if you use it only rarely. It should be very simple and besides there should be instructions inside that device. A huntsman, Northern Finland

If you had this thing in your pocket, well it should be so easy to use you know how to use it without a user guide. A huntsman, Northern Finland

Most people think the security problems usually concern the information gathered on them in the navigation devices and services. Therefore assessment is needed of, what kind of information is really indispensable for the proper function of navigation devices or services and how it could be presented to people.

What do you think in general, is it acceptable to gather information about people? Interviewer

Well, if it is not excessive. Teenager, Northern Finland

But at least for the profiling there should be certain agreements made. You shouldn't have to declare specifically if you do not want it, but instead you would have sign up if you wan it. Teenager, Northern Finland

The ways of reviewing the information gathered and ways of deleting it should also be assessed. Thirdly, conditions for surrendering the information to other people or other companies should be considered, too. These issues could be addressed e.g. by doing tests with prototypes and eliciting the opinions of future users about their opinions of the results of implementation.

Most people regard location as information very private and thus security matters are very important to them. The risks concerning the level of privacy were often conceptualised in

terms of surveillance. In the interviews separate services were frequently connected to broader social structures and the idea of a highly organized and totalitarian society.

It's quite a big risk to allow someone to locate you. I wouldn't like to be tracked in any circumstances.
A sailor, Western Finland

Consequently, the reliability and accuracy of the positioning systems should be assessed in relation to the tasks allocated to them and to the environments of use. In practice this means they should be able to support the tasks people want to perform and to help in different kinds of situations and environments. However, security consists mostly of impressions. Therefore in terms of navigation devices and services fears and suspicions should be researched and taken into consideration in implementation.

[Why are these questions important from the ethical point of view? See Chapter 9.5](#)

5 Marketing of navigation devices and services

Marketing refers here to all activities related to making products out of devices and services, planning the marketing, giving people information about navigation devices and services (both through advertising and retailers) etc. Ethical issues concerning the marketing of navigation devices and services and the adequacy and the quality of information given about them should be considered right from the start of planning and designing and continued right to the end of their lifecycle since marketing has its roots in designs and motives for use.

5.1 Marketing of navigation devices and services and ethical principles

Users should have the right to have all the relevant, impartial and correct information on the tasks the navigation devices and services can support and about the environments in which they work well. In order to avoid harm and to promote the principle of efficiency in problem situations the social effects among others should be considered and measures taken to prevent harm in the future. People should also be warned carefully enough about the limitations of navigation devices or services with regard to the accuracy and reliability of the navigation devices and services in different tasks and in different kinds of environments.

Ethical principles are the base of the common good and laws, standards, likewise other norms and notions of good taste etc. Laws and other norms are made on the one hand to protect the citizens from troubles, on the other, they are made to maintaining order, control, regulate and direct the actions of people and organisations (e.g. companies) to prevent them from harming others. But in the end they are, basically (only) contracts between people. They can be changed if they seem to contradict the ethical principles, but they also change spontaneously like ethical principles though only slowly and usually through argumentation. They are not as unambiguous as they seem to be and this is why they have to be interpreted for all practical purposes. Good taste is even vaguer than the interpretations of laws and other regulations: It is delicately defined, dependent on the time, society etc. Plans and designs can be assessed in relation to good taste, too, with regard to different (sub-cultural, national, religious etc.) groups.

In order to ensure safety, privacy and justice for people, the need for new legislation, regulations and standards should be continually assessed throughout the lifecycle of the devices and services, especially those protecting the privacy of people and the information gathered on them in registers. All the laws and other regulations, standards, norms and good taste should be extended from the actual devices or services (and their use) to all the information given about them as well as to their development and maintenance.

The assessment of social effects and social justice means values of equality; tolerance and respect for others must be taken into account. Furthermore, in a fair society, individuals should not be treated differently based on age, disability economic situation or other irrelevant qualities (e.g. place of living, or service operator).

In the planning and design process of navigation devices and services equality can be promoted for example by taking seriously the laws of equality safeguarding people's rights to be treated equally regardless of age, economic situation, disability or other irrelevant qualities. In practice this means that design for all should be considered as a guiding principle in the planning and design process. Nevertheless, this does not mean similar devices or services for all. A variety of products can be seen as promoting autonomy, i.e. giving people options to decide on the best choice for them.

In order to respect users' autonomy and privacy informed consent is essential and should be taken into account in discussions too. However, there may be some situations in which consent is not needed and these must be defined to protect people's rights. Furthermore, for the efficiency of the navigation devices or services possible problems should be predicted and precautions considered for avoiding them. The problems occurring should be considered as well as possible means of preventing them in the future.

Making decisions is an essential part of autonomy for people and privacy is the most important thing concerning the navigation devices or services they can make decisions on. At the moment many people consider location data very private. For decision-making people need information. To be able to decide whether to use the navigation devices or services, people need information on them in their own language. They need information about the functions of the devices and services and the tasks they are meant to support, the environments of use and the limitations to use (e.g. the frequency of updates of the information in services). In addition, to decide which operator or service provider to choose, people should be able to assess and compare the different services, the prices and the price setting.

In order to exercise their autonomous power in decision-making, people may also need information about their rights to see the information stored on them, to correct or to erase it and to forbid its surrender to third parties. They usually want information about the minimum requirements for the service providing companies concerning security and also the qualifications of the personnel required by laws and other regulations.

People also need information about the location data saved on them in the service and about their rights and the procedures to see, correct and erase the data stored on them in the service and about the right to withdraw consent at any time. This information is provided through by the Personal Data Act (Finnish Government 1999). Furthermore, they may want information about the management of the location data gathered on them: what kind of professionals do the management, where and for how long the data is saved

and on what conditions it can be surrendered to third parties. All these considerations mentioned above are essential for people to look safeguard rights, to feel autonomous and to avoid harm.

For other risks of services (e.g. to peoples health and personal safety, data security etc.), problems in use, system failures or breakdowns it might be good an idea to consider whether there should be some kind of help available to avoid more harm to people. To promote justice the responsibilities between the operator, users and authorities should be clear and distributed in case of problems. This way people would know where they could get help and possible compensation given in cases of serious breakdowns, failures or in situations of danger.

For justice and to promote people's autonomy opportunities for feedback are a requisite. In case of problems complaints from users should be reviewed immediately and answered appropriately.

5.1.1 Assessment of tasks and environments and motives for use

1. In what kind of situations or tasks could navigation devices and services be useful or fun? What could be the motives for using them? What is the surplus value of the navigation device and services compared to (more) traditional means or equipment?
2. What kind of requirements will the environments of use impose on navigation devices and services?
3. When or where might the navigation devices and services cause problems or even danger?
4. What information should be given to people about navigation devices and services?
5. What problems could emerge in marketing navigation devices and services?
6. Are there enough opportunities and resources for giving feedback about navigation devices and services?
7. Are there other ethical issues to be raised to the public discussion?

Explanations and comments on the questions

From the users' point of view the most important question about marketing is the adequacy of information given about navigation devices and services at the moment of starting to use them and in problem situations. Thus one should consider carefully what kind of descriptions people need of navigation devices and services, how detailed they should be and in what form they should be given to people. People should be also informed about the scope of the content of navigation services and the possible impartiality of information.

This is an example of how usefulness is regarded as an important part of usability (cf. Keinonen 2000). In practice this means considering the grounds for marketing the navigation devices and services in order to make them regarded as useful in general.

I'm wondering, what's the use for me to carry it with me all the time? Is it of any use?
A disabled woman, Western Finland

As navigation devices and services are based on information hi-tech and connected to information networks, they are also assumed to be accurate, reliable and give up-to-date information.

I was wondering too, how those services (in use scenarios) are maintained. I think it demands work, like someone to type it (the information) in and it seems there is no point in them if they are like the web pages these days, updated in March 2000. In principle it would be great, but I seriously doubt if it is possible to find enough people to put in the information every day to keep it (the information) up-to-date. Opening hours for example, no matter how fancy the service is, if it gives wrong information about opening hours you probably get really pissed off.

A sailor A, Western Finland

They really have to be reliable if they are meant to be used for navigation. It's the basic feature in present devices that they don't work.

A sailor B, Western Finland

These impressions should be taken into account in the marketing of navigation devices and services, because navigation devices and services are assumed to be of better quality or to give better support in tasks or situations than more traditional means or equipment.

What I think is important and needs to be regarded here, is the relevance and the level of necessity. There are now all kinds of imaginary alternatives whose the level of necessity is close to zero and so one should reflect what is really necessary and important.

Elderly man, Western Finland

Therefore one should consider, what kind of information should be available on the qualities and possibilities and the limits of the navigation devices and services. It may also be helpful to think about the possible flaws in marketing as well: what could go wrong when making descriptions of the devices and services.

Organising resources for feedback is an important part of marketing, too. If people can give feedback about the products, they may feel more involved in the planning and design of the navigation devices and services and perhaps more autonomous, too. Lack of feedback opportunities may on the other hand be regarded as lack of respect for development and quality matters. This is why the opportunities for feedback should be taken into account in marketing.

[Why are these questions important from the ethical point of view? See Chapter 9.1](#)

5.1.2 Assessment of legislation and other regulations, standards, norms and good taste in regard to navigation devices and services

1. What are proper ways of marketing navigation devices or services?
2. What are inappropriate or unacceptable ways to promote navigation devices and services?

3. What should be the minimum information given to users at the start of use about navigation devices and services, their potential and limitations and about the risks involved?
4. Have all the relevant laws and other regulations, standards and good taste been taken into consideration in the marketing of the navigation devices and services?
5. Are the general ethical guidelines for marketing also followed in the advertising of navigation devices and services?
6. What kind of laws or norms should there be controlling the use of location data for marketing or the surrender of the information to other people or other companies? What conditions should there be?
7. Are there other ethical issues to be raised to the public discussion?

Explanations and comments on the questions

People are often unaware or ignorant of the laws and regulations concerning devices and services and their marketing. They seem to assume the authorities safeguard their interests and forbid illegal or unacceptable practises. However, people are usually sensitive to marketing issues and easily get annoyed by incorrect marketing. In the worst case incorrect marketing does not give all the relevant information to people or leads to false expectations of navigation devices and services. It may also fail to reveal the real potential and limitations of navigation devices and services. Therefore marketing information needs to be considered carefully. This is especially the case when it comes to navigation devices and services with totally novel features.

As in all marketing business, in the marketing of navigation devices or services, too, the laws and other regulations should be taken into account as well as the general ethical guidelines and good taste. Good taste and norms are continually defined and revised in societies and in modern multinational countries there may be many different ethical codes regardless of the laws that apply to everyone and equality of all in front of the law. These ethical codes should be taken into account in marketing, too.

There are also laws about the management of personal information (other than that specified in the Finnish Personal Data Act (1999) and saving it in registers, but the conditions of handing over the information to other people and other companies are left to people themselves.

Well, the person him/herself should have the right to specify the people who would get information about his/her whereabouts, thus it wouldn't be available to everyone. A disabled man, Western Finland

Yes, there has to be really good data protection in so that thing that no information is given to other parties A disabled man, Western Finland

Yes, yes, and then the data security has to be so good, so that the (data) connection is cut off for sure so no information is surrendered to anybody, that is absolutely necessary. A disabled man, Western Finland

People have legal rights to forbid the distribution of their personal information. However, in order to do so people have to be aware of the right. Therefore one should consider if and when it is necessary to inform people about their rights and how this should be done. Secondly, the conditions of distribution should be described as part of the descriptions of the devices and services given to people when they start to use them.

[Why are these questions important from the ethical point of view? See Chapter 9.2](#)

5.1.3 Assessment of social effects and social justice with regard to navigation devices and services

1. Should the service be marketed as a built-in function in the devices or as an add-on service sold by the operator?
2. What kind of regulations and norms do the different nationalities and religions have that might concern navigation devices and services?
3. Will navigation devices and services reinforce social relations or increasing suspicions? Could they cause isolation?
4. Are all service outlets included equally in the navigation services? Are services available to all people?
5. Will navigation devices and services change consumer culture? In what ways?
6. Are there other ethical issues to be raised to the public discussion?

Explanations and comments on the questions

The social effects of marketing are numerous but the issues particularly concerning navigation services are mostly related to social equality and justice and changes they may cause in consumer culture. To promote social justice one should consider what from users' point of view is the most advantageous way of providing navigational assistance. One should consider whether it should be a built-in function (e.g. like SMS in mobile phones) of devices or an add-on service (e.g. like new games in some mobile phones) or a service supplied upon specific request (e.g. like a weather report to mobile phones). These choices may have remarkable effects on people's potential to use navigation devices and services as for users they have quite different economic consequences. For example, some people may be able to afford to use a service occasionally but cannot afford to buy new devices with built-in navigation features.

People are often prejudiced about using up new services. They are afraid that they will be expected to have skills they do not have, to learn a lot of new things or buy new devices they cannot handle. There will always be some people, who need special devices and services or who have to be taught to use navigation devices and services, but it when comes to social justice, design for all should be the foundation of every design process.

When a person who has never even held a mobile phone gets one like this (a navigation device presented in a use scenario) s/he cannot use it if there are more than three buttons to press. Elderly man, Western Finland.

Thus one should consider carefully what kind of skills people need to use the older devices and services and what new skills they might be able to acquire through reasonable effort.

Social justice and equality of navigation devices and services should be taken into account in marketing, also in terms of the multiplicity of ethical codes in modern multinational and multi-religious societies. For example, there may be some different norms or regulations concerning the positioning of people and about giving information about service sites in other ethical codes compared with a mainstream.

The navigation devices and services may easily increase suspicions in social relations if they are considered patronising means or means of surveillance or even spying.

I have a negative attitude towards all sorts of control, I mean altogether, I would like to be absolutely sure that no one or nothing has control, with all these things in the world...
A disabled woman, Western Finland

There might also be alterations in family relationships causing e.g. jealousy and other problems, because the positioning may undermine confidence.

Even if I try, I don't think I would want anybody to track me. And if you think for instance about a married couple, which have terrible fights, you could imagine they wouldn't like it (being tracked by the other) under any circumstances.
Mother, Western Finland

I don't know. Maybe I don't think of it in a way that it could reduce the responsibility of children. It would be just an instrument. Teaching responsibility is something else.
A man, Northern Finland

On the other hand, the devices reinforce the relationships between people if they are considered a means of security and confidence.

In contrast I'm wondering if people really cocoon themselves and the devices maintain their relationships or if it is like with mobile phones and people become more sociable and get in contact more easily since it is more effortless.
Teenager, Northern Finland

These possible impacts should be taken into account in terms of marketing too.

From the users' point of view the development of consumer culture is also important. In cases where most people use the devices and services, it is likely that over-the-counter services would be removed. As a result life may become too complicated for some people who have no resources (financial or intellectual) to use navigation devices or services. In that case one should consider, if society should support those people or endorse public services etc.

What do you think about these services in terms of equality? Do you think everybody can have them in the future?
The Interviewer

It's going to be a question of prices, too. If they cost a thousand or two, normal people won't get them. It's often a boundary question.

A huntsman, Northern Finland

I think normal people need those [navigation devices] so rarely that I wouldn't get one. They are sort of disposable and they need to be changed to new ones every year or two and thrown away if broken. They could be used much longer if they were treated carefully and used only in real need.

A huntsman, Northern Finland

Secondly, navigation devices or services can also offer only partial information (e.g. only about over-the-counter services whose owners have paid a fee to an operator). For that reason people may be unaware of some service outlets available and the consumers may use only those offered by navigation services. That, without doubt, would change consumer culture. Therefore people should be informed somehow about the scope of the content of navigation services and the possible impartiality of information in navigation devices and services. The navigation services should also include public services and the

like and they should not be based solely on paid ads or the activity of private service providers.

Why are these questions important from the ethical point of view? See Chapter 9.3

5.1.4 Assessment of the ethics of navigation devices and services in viewpoint of decision-making

1. Are people given enough information about navigation devices and services in order to give an informed consent to positioning? How about the withdrawal of consent?
2. Are people given enough information about the location data needed in order for navigation devices and services to function well? How about people's right to review the information saved in a navigation device or service or to delete the information any time?
3. Are the prices of navigation devices and services and the price setting explicit and transparent enough? How is it presented to people?
4. Do people get all the relevant information about the navigation devices and services in their own language?
5. Are there other ethical issues to be raised to the public discussion?

Explanations and comments on the questions

The most important decisions about navigation devices and services are the decision to start using the devices and services and giving informed consent to positioning. To be able to make informed decisions about these issues, people need information. This should include what information will be stored on them and what it will be used for, how the data collected will be managed, what the conditions of surrendering it to third parties e.g. to other people and other companies are.

Well, the person him/herself should have the right to specify the people who would get information about his/her whereabouts, thus it wouldn't be available to everyone. A disabled man A, Western Finland

Yes, there has to be really good data protection in that thing so that no information is given to other parties. A disabled man B, Western Finland

Yes, yes, and then the data security has to be so good, that the (data) connection is cut off for sure so no information is handed over to anybody, that is absolutely necessary. A disabled man A, Western Finland

This means all the relevant information about taking up the service and discarding it and about the actual potential of a device or a service and its limitations. In practice it is information about the scope of the content of navigation services and the possible impartiality of information in navigation devices and services. Finally, to be able to make informed decisions concerning navigation devices and services, the prices and price setting should be explicit and easy to understand.

[Why are these questions important from the ethical point of view? See Chapter 9.4](#)

5.1.5 Assessment of the security of navigation services

1. Are the expectations created by the marketing met by the actual features and competencies of navigation devices and services or does the marketing raise false hopes?
2. What risks should people be informed or warned about? What information do people need about device loss or breakdown, empty battery or network failure situations or other problem situations? Should there be a built-in context sensitive help or a customer care service to help people with their problems?
3. How should users be informed about of responsibility distribution?
4. Is there something about the marketing of navigation devices and services that makes people suspicious or afraid?
5. Are there other ethical issues to be raised to the public discussion?

Explanations and comments on the questions

Most people consider location information very private and they are worried it might get into the wrong hands or be exploited. When interviewing people, they often conceptualised risks concerning the level of privacy in terms of surveillance. Frequently separate services were connected to broader social structures and the idea of a highly organized and totalitarian society.

It's quite a big risk to allow someone to locate you. I wouldn't like to be tracked in any circumstances. A sailor, Western Finland

This is why one should be assess, if people get enough information concerning the safety of data on a device or a service, people's rights to review the information saved them, on conditions of storage, e.g. conditions of surrendering it to third parties like other people or other companies etc. In addition to data safety and user's rights, one should assess what facts about the risks and problem situations should be included in marketing information as well as about applicable help functions or customer services.

Yes, there are so often too many functions for use, especially if you use it only rarely. It should be very simple and besides there should be instructions inside that device. A huntsman, Northern Finland

If you had this thing in your pocket, well it should be so easy to use that you know how to use it without a user guide. A huntsman, Northern Finland

People should also be aware of the division of responsibility distribution in order to decide when and where to seek help and possible compensation. Finally, since security consists above all of impressions, the fears and suspicions concerning the navigation devices and services should also be addressed and taken into account in marketing.

[Why are these questions important from the ethical point of view? See Chapter 9.5](#)

6 Use of navigation devices and services

Use refers here to use of devices and services that are made for navigation, i.e. positioning people and services and giving users information about the environments and support in tasks they want to perform. In terms of ethics, use is regarded here both as use of devices and services and as a medium affecting people's lives in many ways. Assessing ethical issues concerning the use of navigation devices and services also refers to assessing the adequacy and the quality of all descriptions, instructions and guidance given to people to inform them about navigation devices and services, their potential and limits.

6.1 Use of navigation devices and services and ethical principles

Users have a right to have all the relevant, impartial and correct information on the tasks the navigation devices and services can support and about the environments in which they actually work. Information on the times of restrictions of performance or lack of it in certain environments should be disclosed. All means of ensuring that as many people as possible can make use of the devices and get support for their tasks in different environments should be employed. However, to respect the autonomy of people, the navigation devices and services should provide support for people in their tasks or situations of need only and enhance their abilities to cope with situations but not make them dependent on the devices or services. By thinking about the motives and situations of use it is possible to create devices and services that are useful, efficient, easy to use and which do not cause harm to people.

Usefulness is an integral part of usability, even more than easiness of use (cf. Keinonen 2000). Usability generally refers to how well a device or a service, e.g. a navigation device or service, suits an intended purpose. Usability is connected with both the functions and the content of a device or a service, which define its theoretical utility. The utility of functions and the facility of use, i.e. usability, together constitute the usefulness of a device or a service. (Grudin 1992; Nielsen 1993, 25.)

In order to ensure safety, privacy and justice for people, the need for new legislation, regulations and standards should be continually assessed throughout the lifecycle of the devices and services, especially those protecting the privacy of people and the information gathered on them in registers. The general guidelines and minimum requirements for the use and the maintenance for navigation devices and services should also be defined and repeatedly revised.

The assessment of social effects and social justice requires the values of equality, tolerance and respect for others to be taken into account. Furthermore, in a fair society, individuals are not treated differently based on race, sex, religion, age, disability or other irrelevant qualities (e.g. place of living, or service operator). The devices and services should be seen as parts of social system and people should be aware of the potential inequality they can lead to. Above all, in order to benefit people and to serve the common good the navigation devices and services should be easy to use, generally without extensive training for most people.

In order to avoid harm to people, to respect people's privacy and to promote the justice, it would be advisable for the services to occasion as few changes as possible and merely

give support to people in their tasks and need situations. It might also be good to regard dependency on the devices or services or loss of control without them as possible social effects. However, navigation devices and services, like many other devices and services, do have effects on people's social lives. Therefore, to protect people's rights and safety the effects should be discussed and monitored by all people and society as a whole. Thus problems may also be predicted and appropriate use outlined.

The foundation of security is relevant information given to people – in their own language – about the potential and limitations of the devices, their proper use and how consent can be given when taking up a navigation device or service. Secondly, problem situations should be considered very carefully. To promote justice the divisions of responsibilities between the operator, users and authorities should be clear and the responsibilities shared in case of problems. This way people would know where they could get help and possible compensation to users given in cases of serious breakdowns, failures or in situations of danger.

Making decisions is an essential part of autonomy for people and privacy is the most important thing concerning the navigation devices or services they can make decisions on. At the moment many people consider location data very private. For decision-making people need information. First of all, to be able to decide whether to use the navigation devices or services, people need information about them, in their own language. Above all they need information about the functions of navigation devices and services, the tasks they are meant to support, the environments of use and the limitations concerning use (e.g. updating the service).

People's autonomy in using navigation devices or services culminates in decisions about information gathered on people (often only during continuous positioning). In order to make decisions, people need some information on data stored in the databases of navigation services, about the time-span of storage and about the conditions of storage e.g. about the surrender of data to third parties, subsidiary companies etc. To be able to exercise their autonomous power in decision-making, people may also need some information about their rights to see the information stored on them, to correct or to erase it and to forbid its surrender to third parties. In practice this refers to information 1) about the location data saved on them in the service, 2) about their rights and procedures to see, correct and erase the data stored on them in the service and 3) about the right to withdraw consent at any time.

6.1.1 Assessment of tasks and environments and motives for use Users should be involved in assessing:

1. In what kind of situations or tasks are navigation devices and services useful or used for fun?
2. Is there any surplus value of navigation devices and services compared with (more) traditional means and equipment? Have they made people's lives or task performance easier and better or have they made them more complicated or the people dependent on them?
3. Is the scope of information offered through navigation devices and services large enough? Are there enough services outlets included in the navigation services to serve all people equally? What happens in case of a network failure, a device loss

- or breakdown, can people survive anywhere without navigation devices or services?
4. Are there enough opportunities and resources for giving feedback about navigation devices and services?
 5. What problems have emerged in the use of navigation devices and services? Why or where people do not use them? When or where do people not like to be tracked? Have all kinds of environments of use been taken reasonably into account?
 6. Do navigation devices and services offer safety or do people feel they are under surveillance or being too guarded?
 7. Are there more ethical issues to be raised to the public awareness?

Explanations and comments on the questions

In terms of ethical issues, usefulness is important for several reasons. It forms the grounds for buying new devices for navigation or taking up navigation services thus people do not waste money but get support for the tasks (including entertainment) they are expecting to have support for.

I'm wondering, what's the use for me to carry it with me all the time? Is it of any use?

A disabled woman, Western Finland

I think normal people need those [navigation devices] so rarely that I wouldn't get one. They are sort of disposable and they need to be changed to new ones every year or two and thrown away if broken. They could be used much longer if they were treated carefully and used only in real need.

A huntsman, Northern Finland

This way usefulness is part of usability, too (cf. Keinonen, 2000). Secondly, usefulness can be connected to navigation devices and services due to efficiency or easiness of tasks in comparison with more traditional means or equipment for navigation. Uselessness on the other hand is usually considered an annoyance and therefore a potential cause of harm. Thirdly, navigation devices and services are assumed to help people in situations where they need to find something and to work in different environments. Moreover, since they are electronic devices and services connected to information networks, they are also assumed to be accurate, reliable and to give up-to-date information. In cases where these requirements cannot be met, one should consider how people should be notified and how quickly.

It is very common for problems to occur only after a longer period of use. That is why resources and opportunities for feedback should be assessed here, too. It is also due to the norms and rules of use formed in families, or other groups and societies those new devices and services get their meanings over an everyday life in longer period of time. In some cases, conventions or norms may run contrary to the laws or other norms concerning e.g. social life. For this reason assessments should be made from time to time as to what problems navigation devices and services cause and how they could be reduced. For example, the positioning function may be used to monitor people in a way they consider to be surveillance or patronising instead of security. It may, however, take some time to notice thus, especially if people have not been monitored before. The apparent problems, e.g. attempts at misuse, should be taken seriously and the general public should be informed of them. They should be taken seriously and considered carefully.

Navigation devices and services may also be too demanding for some people or cause them overwhelming problems in use. Secondly, they may also have effects in people's lives making them too dependent on services and unable to cope without them, but get lost with a map or feel very insecure. There may also be some minor but annoying problems or times of malfunctions or breakdowns, where people need support in the use of their navigation devices and services. This is why the adequacy of help functions and customer services and their general availability should be periodically assessed.

Yes, there are so often too many functions for use, especially if you use it only rarely. It should be very simple and besides there should be instructions inside that device. A huntsman, Northern Finland

If you had this thing in your pocket, well it should be so easy to use that you know how to use it without a user guide. A huntsman, Northern Finland

[Why are these questions important from the ethical point of view? See Chapter 9.1](#)

6.1.2 Assessment of legislation and other regulations, standards, norms and good taste with regard to navigation devices and services

1. Are navigation devices and services in accordance with laws and other regulations, standards and good taste?
2. In what kind of situations can people be tracked without their own consent? Who can make the decision for them?
3. Will all people have equal rights or opportunities to use navigation devices and service regardless of their race, sex, religion, age, disability or other personal facts or economic situation? Have the regulations and norms of different nationalities and religions been taken into consideration?
4. Are the existing laws, standards and other regulations, norms etc. sufficient or is there a need for new legislation? Is there a need for further standardization with regard to navigation devices and services?
5. Are there more ethical issues to be raised to the public awareness?

Explanations and comments on the questions

New products or services – like navigation devices and services at the moment – coming onto the market are not necessarily legitimated in all respects, since there is no need for permits beforehand or licences in all cases. For example, the need for consent to positioning is not quite unambiguous but there may be situations where it is not needed. These should be defined, likewise the conditions for surrendering location data in those situations. In addition, despite the efforts in design for all, it may be difficult to be sure the devices and services are in accordance with all different codes of ethics.

Problems, opportunities for illicit use or other misuse – by the users themselves or by other people – may emerge only in longer periods of use. Consequently one should constantly assess what kind of new laws or other regulations are needed. Navigation devices and services should also be assessed in terms of standards: are the (existing) devices and services compatible or are new standards needed? The legislation process, however, is a very slow and heavy means of taking care of problems. Therefore one should consider what other actions might be taken, e.g. by the service providers, operators or manufacturers, to prevent problems and to compensate for possible damage or harm done to the users in cases of misuse.

Why are these questions important from the ethical point of view? See Chapter 9.2

6.1.3 Assessment of social effects and social justice with regard to navigation devices and services

1. Are navigation devices and services easy to use? Do people have enough resources, skills and motivation to use them or do people have to learn new things all the time to be able to use them and all their functions?
2. Do navigation devices or services make life easier or more complicated or do they make people too dependent on them?
3. Have navigation devices and services promoted or helped in maintaining relationships or have they made people feel isolated?
4. Do people still want to use navigation devices and services despite possible defects or limitations?
5. Do all people have equal rights or opportunities to use navigation devices and services regardless of their race, sex, religion, age, disability or other personal facts or economic situation?
6. What kind of regulations and norms do different nationalities and religions have that might concern navigation devices and services?
7. Have navigation devices and services changed consumer culture? Are the traditional means or instruments and services still available? Is the scope of information offered through the navigation devices and services wide enough? What happens in the case of a network failure or device loss or breakdown? Can people manage anywhere without navigation devices or services?
8. Are there more ethical issues to be raised to the public awareness?

Explanations and comments on the questions

Ease of use in usage and in acquiring knowledge about the navigation devices and services promotes social justice. Constant assessment is needed as to, whether the navigation devices and services are too difficult to use in relation to the skills people have or too different in comparison with other devices and services people have used thus far.

Yes, there are so often too many functions for use, especially if you use it only rarely. It should be very simple and besides there should be instructions inside that device.
A huntsman, Northern Finland

There may be a need for a revision of the descriptions and user instructions or extra tutoring material (in addition to a standard user guide) or even for tutoring. If most people have continual difficulties in using the devices and services or in learning to use them, more extensive research and development and redesign should be considered.

Since navigation devices and services can easily increase suspicions in social relations, one should assess what effects they really have in families, circles of friends or other social groups. They can be regarded e.g. as patronising, or as a means of surveillance or even spying.

I have a negative attitude towards all sorts of control, I mean altogether, I would like to be absolutely sure that no one or nothing has control, with all these things in the world...

A disabled woman, Western Finland

Social pressures for example could potentially develop so that you should have a device or service turned on always and everywhere.

It could be like you would slip in your decisions and keep it switched on all the time and that way...

On the other hand, they may reinforce relationships between people if they are considered as a means of security and confidence.

In contrast I'm wondering if people really cocoon themselves and the devices maintain their relationships or if it is like with mobile phones and people become more sociable and get in contact more easily since it is more effortless.

Teenager, Northern Finland

I don't know. Maybe I don't think of it as reduction of the responsibility of children. It would be just an instrument. Teaching responsibility is something else.

Young man, Northern Finland

Thirdly, navigation devices and services may also induce isolation among groups, if only some members of groups use navigation devices and services. These effects, defects and limitations should be studied or at least recognized and taken into account in the redevelopment of navigation devices and services. Measures to be taken to reduce the problems caused by the devices and services and to help people in trouble should be considered.

To promote social justice among different groups – regardless of their ethnic background, religion, age, sex, race, place of living or other personal facts – there should be constant assessment as to whether all people have equal access to navigation devices and services and whether navigation devices and services cause people problems. Furthermore, the information given about the scope of the content of navigation devices and services and its possible impartiality should be considered. On the part of people who are not using navigation devices and services to promote social justice there should be assessment as to whether there are enough service points and whether other means of navigation are still available.

From users' point of view the development of consumer culture is also important. If most people use the devices and services, it is likely that over-the-counter services will be removed. As a result life may become too complicated for some people who have no resources (financial or intellectual) for using navigation devices or services. In this case one should consider, if society should support those people or endorse public services etc.

What do you think about these services in terms of equality? Do you think everybody can have them in the future?

The Interviewer

It's going to be a question of prices, too. If they cost a thousand or two, normal people won't get them. It's often the boundary question.

A huntsman, Northern Finland

I think normal people need those [navigation devices] so rarely that I wouldn't get one. They are sort of disposable and they need to be changed to new ones every year or two and thrown away if broken. They could be used much longer if they were treated carefully and used only in real need.

A huntsman, Northern Finland

Secondly, navigation devices or services can also offer only partial information (e.g. only about over-the-counter services, whose owners have paid a fee to an operator), people may be unaware of some of the service outlets available and the consumers may use only those offered by navigation services. That, without doubt, would change, consumer culture.

Social justice and equality can also be assessed as a question of resources: Do people have resources to acquire navigation devices, can they afford to use navigation services or are there devices to be borrowed or public services available at fair prices? These questions are particularly important if most people are using devices and services and there are chances non-users may get into trouble or be isolated without them.

[Why are these questions important from the ethical point of view? See Chapter 9.3](#)

6.1.4 Assessment of the ethics of navigation devices and services from the perspective of decision-making

1. Is informed consent for positioning obtained easily and clearly? How about the withdrawal of the consent? Is all the relevant information given about this in people's own language(s)?
2. Do navigation devices and services tell in an easy and clear way, how long the data gathered on people will be saved for and how they can delete it?
3. Do navigation devices and services tell easily and clearly, when the tracking starts and when it ends? How about over of a longer period for tracking? Are reminders of ongoing tracking needed?
4. Is there any need for they're a built-in context sensitive help or a customer care service to help people with their problems?
5. Is it easy to assess and compare different navigation devices and services? Is the scope of information offered through navigation devices and services wide enough to give people the support for tasks and environments they are supposed to give?
6. Are the prices of services and the price setting explicit and transparent enough?
7. Are there enough opportunities to give feedback to device manufacturers or service providers?
8. Are there more ethical issues to be raised to the public awareness?

Explanations and comments on the questions

The most important part of making decisions about navigation devices and services is giving informed consent to positioning. Whether all the information people need (e.g. about the devices and services, about the management of data collected of them and the withdrawal of the consent for positioning) is explicit, in users' language and easy to should be assessed. To be able to make informed decisions about using (or not using) navigation devices and services or how to use then people need information, on what data can be stored on them in services and devices. Therefore assessment is needed of how the

information saved on people is presented, information about the length of storing and the possibilities for deleting it.

Only during the use of navigation devices and services is it easy to detect deficiencies in the information given by devices and services about the start and the end of tracking. Therefore all people should continually assess the device and alterations should be considered if necessary. The need for reminders about ongoing tracking should also be considered, if people seem to expect them.

If there are several options for navigation devices and services, people have to make choices about which one(s) is the best for their purposes. For this reason assessment is needed of, what kind of descriptions are needed of 1) devices and services, 2) of their competence in different kinds of situations and environments and 3) of their limitations. Prices and price setting is another important factor when choices are made. Therefore it is necessary to assess if these are explicit enough for comparing and transparent enough for predictions and evaluations. The scope of the information given through the navigation devices and services should be considered in terms of the tasks and environments that people allocate to them.

[Why are these questions important from the ethical point of view? See Chapter 9.4](#)

6.1.5 Assessment of the security of navigation devices and services

1. Do people have enough information about what kind of data or information is gathered in the service, about where and how long it will be saved for and about how it can be deleted? How about the right to forbid the surrender of information?
2. What kind of information people would need about positioning devices and services before they start using them and how should the information be given to them? What matters should be confirmed with potential users, before taking up positioning devices and services? Are there certain conditions of about making the data available to third parties?
3. How could navigation devices and services tell when positioning starts and when it ends? How about over a longer period of tracking? Are reminders of it needed?
4. Are navigation devices and services accurate and reliable enough in relation to the tasks people want them to support? Is the scope of information wide enough regarding the tasks for which people want support?
5. What problems have occurred in use or what risks to uses are these in navigation devices and services? Is the security and reliability of the products and services promoted to minimise failures in use?
6. Do navigation services or devices make people's lives or tasks easier or more difficult? Do people have resources, skills and motivation to use navigation devices and services, or do they require continuous learning? Have people lost abilities in taking up new services or become unable to cope in some situations without the service?
7. Will people get support in problem situations or in cases of a device loss or breakdown, empty battery or network failure? What information or support will people get in case of device breakdown or network failure situations or other problem situations? Is a built-in context sensitive help or a customer care service needed to help people with their problems?

8. Is there something about these positioning devices and services that makes people suspicious or afraid?
9. Are there more ethical issues to be raised to the public awareness?

Explanations and comments on the questions

In order to make decisions about the use of navigation devices and services or about when or how to use them people need to feel safe. In order to feel safe people want information about the devices and services and their potential and limitations. Secondly, they want information on what the devices and services are meant to do, what kind of information has to be stored on them, how the information is managed and on what conditions it can be surrendered to other people or companies.

Well, the person him/herself should have the right to specify the people who would get information about his/her whereabouts, thus it wouldn't be available to everyone. A disabled man A, Western Finland

Yes, there has to be really good data protection in that thing so that no information is given to other parties. A disabled man B, Western Finland

Yes, yes, and then the data security has to be so good, that the (data) connection is cut off for sure so no information is handed over to anybody, that is absolutely necessary. A disabled man A, Western Finland

People should be aware about their rights to review the information to delete it and to forbid its surrender to other companies or to other people. These facts are also important in giving consent to positioning and in its withdrawal and it should be confirmed that all users understand them. This information is also granted to people by the Personal Data Act (Finnish Government 1999). For these reasons the descriptions of navigation devices and services should be continually assessed and revised throughout their whole lifecycle. Thirdly, people want to know when the tracking starts and – in the case of a longer period of tracking – when it ends. The need for reminders of the ongoing tracking should also be considered.

Most people should be able to learn to use devices and maintain the skills without too much effort or extensive training. In addition navigation devices and services may have effects on people's lives making them too dependent on services and unable to cope without them but, for example, get lost with a map or feel very insecure.

I'm wondering if people will lose their social skills altogether, if there were services like this available all the time and in principle you wouldn't have to have anything to do with other people since you could have all the information through the devices. Teenager, Northern Finland

Failures in use, misuse and other problems should be analysed and the support given to users assessed.

Yes, there are so often too many functions for use, especially if you use it only rarely. It should be very simple and besides there should be instructions inside that device. A huntsman, Northern Finland

If you had this thing in your pocket, well it should be so easy to use you know how to use it without a user guide. A huntsman, Northern Finland

Navigation devices and services that are connected to electronic systems or to information networks of some kind are expected to be reliable and accurate and to give up-to-date information.

I was wondering too, how those services [in use scenarios] are maintained. I think it demands work, like someone to type it [the information] and it seems there is no point in them if they are like the web pages these days, updated in March 2000. In principle it would be great, but I seriously doubt if it is possible to find enough people to put in the information every day to keep it (the information) up-to-date. The opening hours for example, no matter how fancy the service is, if it gives wrong information about opening hours you probably get really pissed off.

A sailor, Western Finland

They really have to be reliable if they are meant to be used for navigation. It's the basic feature in present devices that they don't work.

A sailor, Western Finland

Therefore one should assess if these requirements are met and, if not, what measures should be taken to ensure that they are. Compensation for damages should also be assessed. For the further development, possibly the fears and prejudices of people should be studied, reviews of user instructions made, and all the problem situations and failures analysed to prevent their in the future.

[Why are these questions important from the ethical point of view? See Chapter 9.5](#)

7 Maintenance of navigation devices or services

Maintenance refers to all activities aiming at the maintenance and security of networks, positioning systems and the up-to-datedness of the information in databases. Secondly, maintenance may refer to updating of (service) applications or to redesign of devices. On the other hand assessing maintenance also concerns the adequacy and the quality of descriptions, instructions and guidance given to people to inform them about navigation devices and services and their potentiality and limits. Thus maintenance issues should be considered throughout the whole lifecycle of devices and services.

7.1 Maintenance of navigation devices or services and ethical principles

Users have a right to have all the relevant, impartial and correct information on the tasks the navigation devices and services can support and about the environments they work well. Information on the limitations on performance or in certain environments should be disclosed to users. There should also be quality control of navigation devices and services and encouragement to both continuous development and competition among the manufacturers or service providing companies. Quality control does not refer only to standards and laws concerning development and implementation but also to the control of accuracy and the reliability of the devices and services.

Ethical principles are the basis of the common good and laws, standards, and other norms and notions of good taste etc. Laws and other norms are made on the other hand to protect the citizens from trouble, on the other, they are made to keep order, control, regulate and direct the actions of the people and organisations (e.g. companies) to prevent them from harming others. But in the end they are, basically (only) contracts between people. They can be changed if they seem to contradict the ethical principles, but they also change spontaneously like ethical principles though only slowly and usually through argumentation. They are not as unambiguous as they seem to be and this is why they have to be interpreted for all practical purposes. Good taste is even vaguer than the interpretations of laws and other regulations: It is discreetly defined, dependent on the time, society etc. The plans and designs can be assessed in relation to good taste, too, with regard to different (sub-cultural, national, religious etc.) groups.

In order to ensure safety, privacy and justice for people, the need for new laws, regulations and standards should be continually assessed throughout the lifecycle of the devices and services, especially those protecting the privacy of people and the information gathered on them in registers. All the laws and other regulations, standards, norms and good taste (and interpretations of them) should be extended from the actual devices or services (and their use) to all the information given about them as well as to their development and maintenance.

The social effects among others should be considered and measures taken to avoid harm and to promote the principle of efficiency. For the same reason people should also be warned carefully enough about the limitations of navigation devices or services with regard to the accuracy and reliability of the navigation devices and services in different tasks and in different kinds of environments. To promote justice the responsibilities between the operator, users and authorities should be clear and the responsibilities distributed in case of problems. This way people would know where they could get help and possible compensation to users given in cases of serious breakdowns, failures or in situations of danger.

Privacy is a power-relationship dependent on knowledge and control, since it is very difficult to have privacy if people have no knowledge of what they can do to protect their privacy or power to set the limits for their privacy. Thus the decisions about positioning and about consent for to are very important. One should consider carefully when consent is necessary, how often it should be confirmed, how is it done in practice and how it can be withdrawn. Questions about the limits to consent and situations in which consent is not needed should be addressed. In order to protect their privacy, people usually want to know when the positioning starts and – if it is continuous – when it ends. If tracking is set to continue for a longer period of time, people may also need reminders so that they can stop the tracking if they want to. People should be able to discard the navigation device or service at any time – maybe temporarily too – and without any costs or without much effort.

Making decisions is an essential part of autonomy for people and privacy is the most important thing concerning the navigation devices or services they can make decisions on. According to the interviewees, many people currently consider location data very private. For decision-making people need information. Above all, to be able to decide whether to use the navigation devices or services, people need information about the navigation devices and services in their own language. That information should include information not only about their functions, and the tasks they are meant to support also the

environments of use and the limitations to use (e.g. updating the service). In addition, to decide which operator or service provider to choose, people should be able to assess and compare the different services, the prices and the price setting.

People's autonomy in using navigation devices or services culminates in decisions about information gathered on them (often only during continuous positioning). To make the decisions, people have to get some information on data stored in the databases of navigation services, about the time-span of storage and about the conditions of storage, e.g. about the conditions of surrendering information to third parties, subsidiary companies etc. Secondly, people need information about the location data saved on them in the service and about their rights and procedures to see, correct and erase the data stored on them in a service and about the right to withdraw consent at any time. (See also Simojoki 2001) .

The foundation of the security is the relevant information given to people in their own language about the potential and restrictions of the devices, about their proper use and about how to give consent when taking up a navigation device or service. Especially when it comes to fairly new devices and services like navigation devices and services, it is very important to plan the ways of describing the devices and services and their potential and restrictions carefully, because people usually have some fears, suspicions or prejudices regarding new things.

The safety, accuracy and reliability of the devices and services should also be promoted in all respects – both using the navigation devices and services and without them (in case of failures, breakdowns, flat battery etc.). To promote justice the responsibilities between the operator, users and authorities should be clear and the responsibilities distributed in case of problems. This way people would know where they could get help and possible compensation to users given in cases of serious breakdowns, failures or in situations of danger.

7.1.1 Assessment of tasks and environments and motives for use

1. Do navigation devices and services support people in all the tasks and in all the environments they ought to? What is the surplus value of the navigation devices and services compared to more traditional means of navigation?
2. Are there often problems or network failures in getting navigation devices and services to work?
3. Is the scope of information offered through navigation devices and services wide enough? Are there enough services outlets in the navigation services in order to offer impartial information and to serve all people equally?
4. Do the navigation devices and services make people's lives easier or more complicated? Have people become unable to cope in some situations as a result of the use of navigation devices and services?
5. Are navigation devices and services easy to use? What happens in case of a network failure or a device loss or breakdown? Should there be help functions or more services available to support people in using difficulties? Is the information updated often enough with regard to tasks and environments of use of navigation devices and services?
6. Are there other ethical issues to be raised to the public awareness?

Explanations and comments on the questions

With regard to maintenance the reliability and accuracy of navigation devices and services should be considered in relation to the tasks and environments they are expected to support. If there are continuous problems with either accuracy or reliability or if people expect more from the navigation devices and services, changes in maintenance and information given to users should be (re) considered. People should also be aware of the scope of the content (and its impartiality) of navigation services and possible changes in it (or possibly in the updating of the information). If people do not have enough information, revision of descriptions and user instructions should be considered.

Thus, one should consider carefully what kind of skills people have to use older devices and services and what new skills they might be able to acquire through reasonable effort. If the navigation devices and services prove to difficult to use or make the performing of tasks more complicated, revision of descriptions and user instructions should be considered and tutoring planned to promote social justice and the common good.

When a person who has never even held a mobile phone gets one like this (a navigation device presented in a use scenario) s/he cannot use it if there are more than three buttons to press. Elderly man, Western Finland.

To promote justice the responsibilities between the operator, users and authorities should be clear and the responsibilities distributed in case of problems. This way people would know where they could get help and possible compensation to users given in cases of serious breakdowns, failures or in situations of danger. There may also be some people, who have become too dependent on navigation devices or services. Therefore the possibilities for providing them with help should be assessed.

[Why are these questions important from the ethical point of view? See Chapter 9.1](#)

7.1.2 Assessment of laws and other regulations, standards, norms and good taste with regard to navigation devices and services

1. How is the maintenance of navigation devices and services arranged in relation to laws and other regulations, to standards and to good taste?
2. Are navigation devices and services available to all citizens equally regardless of their place of living or other personal facts? Do people have (enough) resources and skills to use the devices or the services? Will life become too complicated or too dependent on the devices and services in some groups?
3. Are there other ethical issues to be raised to the public awareness?

Explanations and comments on the questions

As with use, in maintenance there are ample of possibilities to assess the adequacy of legal and other official regulations as well as more informal norms and good taste with regard to the use and maintenance of navigation devices and services. The adequacy should be assessed with regard to both the functionality of devices and services and data security: Are new laws or official regulations needed to control the availability and proper functioning of the devices and services and is the data gathered on people in services safe enough (cf. giving consent to positioning and identification). The assessment should also be continuous and concern all service providers and operators responsible for maintenance.

In terms of laws, norms and the like the principle of justice is one of the most important. With regard to navigation devices and services it refers to 1) the availability of navigation services and 2) their usability. Availability means both that they can be used everywhere and by everybody – regardless of their race, sex, religion, age, place of living, skills, disability or other personal facts. Secondly, it means assessing whether people have resources, intellectual and economic, to start to use and to learn how to use them without much effort or extensive training.

What do you think about these services in terms of equality? Do you think everybody can have them in the future?

The Interviewer

It's going to be a question of prices, too. If they cost a thousand or two, normal people won't get them. It's often the boundary question.

A huntsman, Northern Finland

I think normal people need those (navigation devices) so rarely that I wouldn't get one. They are sort of disposable and they need to be changed to new ones every year or two and thrown away if broken. They could be used much longer if they were treated carefully and used only in real need.

A huntsman, Northern Finland

[*Why are these questions important from the ethical point of view? See Chapter 9.2*](#)

7.1.3 Assessment of social effects and social justice with regard to navigation devices and services

1. Do navigation services or devices make people's lives or tasks easier or more difficult? Do people have resources, skills and motivation to use navigation devices and services, or do they require too much effort?
2. What kind of effects will the navigation devices and services have on people's relationships?
3. How are the prices of navigation devices or services set? Are the prices and the price setting clear and transparent enough?
4. Have all the risks to the users' personal safety been considered and minimized?
5. Are there other ethical issues to be raised to the public awareness?

Explanations and comments on the questions

Navigation devices and services should give people support in different kinds of environments and in tasks they want to perform. Most people should be able to learn to use and to maintain their skills without too much effort or extensive training. Navigation devices and services may have effects on people's lives so that they become too dependent on services and cannot cope without them, but, for example, get lost with a map or feel very insecure.

I'm wondering if people will lose their social skills altogether, if there were services like this available all the time and in principle you wouldn't have to do anything to do with other people since you could have all the information through the devices.

Teenager, Northern Finland

With regard to social justice the actual costs of use should also be considered. What do the prices consist of? Are there monthly charges or are all the costs charged at once and is it easy to understand how the charges add up? These details may affect people's abilities to use and maintain navigation devices and services, especially those with meagre resources.

[Why are these questions important from the ethical point of view? See Chapter 9.3](#)

7.1.4 Assessment of the ethics of navigation devices and services from the perspective of decision-making

1. Are people given all the relevant information about the navigation devices and services in their own language?
2. Are the prices of services and the price setting clear and transparent enough?
3. Is it easy to assess and compare different navigation devices and services?
4. Is the information given in navigation devices and services up-to-date enough in relation to the tasks people want them to support? How is the up-to-datedness of the information confirmed? What problems could people have in cases where the information update has failed (e.g. in network failure situations)? Is the scope of information given by navigation devices and services large enough?
5. Are there other ethical issues to be raised to the public awareness?

Explanations and comments on the questions

As a foundation for decision-making people need information on all the relevant details of the functions of navigation devices and services. One should consider what information is relevant, especially maintenance. However, the most important information naturally concerns, consent to positioning, the information saved in devices or services and its use and the conditions of storage, e.g. conditions of surrendering information it to third parties such as other people or other companies, etc.

Well, the person him/herself should have the right to specify the people who would get information about his/her whereabouts, thus it wouldn't be available to everyone. A disabled man A, Western Finland

Yes, there has to be really good data protection in that thing that no information is given to other parties. A disabled man B, Western Finland

Yes, yes, and then the data security has to be so good so that the (data) connection is cut off for sure so no information is handed over to anybody, that is absolutely necessary. A disabled man A, Western Finland

On top of this one should consider if people should be informed well and often enough about the start of tracking and – if the tracking period is long – about the end of it.

There may also be situations or places where positioning is impossible or places where it is not allowed to use the navigation devices and services may not be used or changes in accuracy of positioning or problems in networks or in devices. Therefore one should consider carefully what information needs to be given to people and when. The way of presenting the information should also be considered carefully. .

Devices and services based on information hi-tech and connected to information networks are assumed to be accurate, reliable and to provide up-to-date information. Adequate up-to-datedness is relative and depends on the tasks the navigation devices and services are expected to support.

I was wondering too, how those services [presented him as use scenarios] are maintained. I think it demands work, like someone to type it (the information) and it seems there is no point in them if they are like the web pages these days, updated in March 2000. In principle it would be great, but I seriously doubt if it is possible to find enough people to put in the information every day to keep it (the information) up-to-date. For example the opening hours, no matter how fancy the service is, if it gives wrong information about opening hours you probably get really pissed off.

A sailor, Western Finland

They really have to be reliable if they are meant to be used for navigation. It's the basic feature in present devices that they don't work.

A sailor, Western Finland

For the proper use of the navigation devices and services careful consideration should be given to what people should be told about the confirmation of updating the information and possible limitations to this.

[Why are these questions important from the ethical point of view? See Chapter 9.4](#)

7.1.5 Assessment of the security of navigation services

1. Are navigation devices and services accurate and reliable enough in relation to the tasks people want them to support?
2. Is the information given in navigation devices and services up-to-date enough in relation to the tasks people want them to support? How is the up-to-datedness of the information confirmed? What problems could people have in cases where the information update has failed (e.g. in network failure situations)?
3. Have navigation devices and service made some people's lives too complicated or too dependent on them?
4. Have all risks to users, their health and personal safety (radiation, allergies, hazards in traffic) or to data security in case of device loss or breakdown or network failure been predicted and minimized? How are the responsibilities distributed in case of problems?
5. Are the companies providing services reliable enough? Are the conditions of surrendering the location information to third parties adequate?
6. What measures have been taken to promote the safety of the data gathered of people in navigation devices or services?
7. Is there something about navigation devices and services that makes people suspicious or afraid?
8. Are there other ethical issues to be raised to the public awareness?

Explanations and comments on the questions

Devices and services based on information hi-tech and connected to information networks are assumed to be accurate, reliable and to give up-to-date information. Adequate up-to-datedness is relative and depends on the tasks the navigation devices and services are expected to support. For the proper use of the navigation devices and services careful

consideration should be given to what people should be told about the confirmation of updating the information and possible limitations to this. The same concerns the information about data security and risk management. The problem may be that there is so much complicated information it is very difficult to present it to people simply and clearly. It should also be kept confidential to ensure the security and prevent misuse. However, storing and management of large quantities of very sensitive data can be quite a challenge to some service providing companies or operators.

For all these reasons there should be means to assess the companies and their credibility and their data security level and measures taken to guarantee it. All this information is very important to people who make decisions about using (or not using) the navigation devices and services, since security for users is an impression that needs backing.

Navigation devices and services may also affect people's lives so that they become too dependent on services and cannot cope without them, but get lost with a map or feel very insecure. It might also be wise to inform people openly about the potential risks and about means of minimising them. Whether people get enough information in problem situations like network failures or device loss or breakdowns should be assessed. The distribution of responsibility should be reviewed: are responsibilities fairly distributed, are there good procedures to prevent more problems and are people given compensation in cases of serious breakdowns, failures or in situations of danger.

[Why are these questions important from the ethical point of view? See Chapter 9.5](#)

8 Discarding the navigation devices and services

The discarding of devices and services is usually done if the devices or services a) do not fulfil the expectations or requirements of users, or b) if there are no longer motives to use them or c) if there are problems with them. All these reasons may include ethical problems and therefore they should be assessed throughout the lifecycle of navigation devices and services. However, they may be more acute and obvious and necessitate measures when people discard navigation devices and services and thus regarded especially at the end of lifecycle.

Making decisions is an essential part of autonomy for people and privacy is the most important thing concerning the navigation devices or services on which they can make decisions. At the moment many people consider location data very private. For decision-making people need information. (See also Simojoki 2001). First of all, to be able to decide whether to use the navigation devices or services, people need information about them in their own language: about their functions, and the tasks they are meant to support, the environments of use and the limitations to use (e.g. frequency of the updating of services). In addition, in order to make decisions people need to be able to assess and compare the different services, the prices and the price setting.

8.1 Discarding the navigation devices and services and ethical principles

People's autonomy in using navigation devices or services culminates in decisions about information gathered on them. To make the decisions people need some information on data stored in databases, about the time-span of storage and about the conditions of storage, e.g. conditions of surrendering data to third parties, etc. To be able to exercise their autonomous power in decision-making, people also need information about their rights to see the information stored on them, to correct or to erase it and to forbid its surrender to third parties. People also need information about the right to withdraw consent at any time. How people could discard the navigation device or service without too much effort or cost when it is no longer needed should be considered.

In order to ensure safety, privacy and justice people, the need for new legislation, regulations and standards should be continually assessed throughout the lifecycle of the devices and services, especially those protecting people's privacy and the information gathered on them in registers. It might be good to extend all the laws and other regulations, standards, norms and good taste from the actual devices or services (and their use) to all the provided. People should also be warned carefully enough about the limitations of navigation devices or services in regard to accuracy and reliability in different tasks and in different kinds of environments.

To avoid harm and to promote the principle of efficiency in problem situations the social effects, among others, should be considered. Furthermore, the navigation devices and services may also have effects on consumer culture: in the cases where most people use the devices and services, it is likely that over-the-counter-services will be removed and life may become too complicated for some people who have no resources (financial or intellectual) to use the devices or services. In this case support from society for those people e.g. by endorsing public services should be considered. To promote the common good and the equality of people in this respect, there should be discussion about the availability of devices and services as public utilities and about the availability of services without electronic navigation devices or services providers.

To promote justice the responsibilities between the operator, users and authorities should be clear and distributed in case of problems. This way people would know where they could get help and possible compensation given in cases of serious breakdowns, failures or in situations of danger.

In the name of justice if there should be help functions or help desk services to help people in problem situations should be considered. Furthermore, for the efficiency of the navigation devices or services possible problems should be predicted and precautions taken to avoid them. For further development and quality control purposes opportunities for giving feedback about the devices and services, and the quality of their information should also be reviewed.

8.1.1 Assessment of tasks and environments and motives for use

1. Is it easy for the user to withdraw consent to positioning? Will people get support in problem situations? Where or how?

2. What reasons are there for discarding the navigation devices and services? Is it done due to problems in using the navigation devices and services?
3. Has the positioning been accurate and reliable enough in relation to the tasks?
4. Has the information given in navigation devices and services been up-to-date and accurate enough in relation to the tasks people have wanted to perform with them?
5. Have navigation devices and services made people's lives or task performance easier and better or have they made it more complicated? Have people lost abilities through using navigation devices or services or become unable to cope without the service in some situations?
6. Are there more ethical issues to be raised to the public awareness?

Explanations and comments on the questions

The most important ethical question about discarding navigation devices and services is naturally the withdrawal of consent to positioning. One should assess whether it is easy enough and whether people have enough information about the relevant procedures and their rights to delete all information gathered in the devices or services. In problem situations one should also be consider how or where people could get support.

When people discard a device or a service there is often a reason that may be linked to ethical problems and so these should be studied and taken into account in redevelopment, redesign of devices and services and their use descriptions and in revision of user guides or other instructions given by retailers or operators. Discarding may be due to lack of motives for use, insufficiencies in task performance or dependence on environment. It may also be done because there are problems related to ethical problems, likewise lack of information, problems in use or problems in technical performance, accuracy and reliability of navigation devices and services.

I was wondering too, how those services (in use scenarios) are maintained. I think it demands work, like someone to type it (the information) and it seems there is no point in them if they are like the web pages these days, updated in March 2000. In principle it would be great, but I seriously doubt if it is possible to find enough people to put in the information every day to keep it (the information) up-to-date. The opening hours for example, no matter how fancy the service is, if it gives wrong information about opening hours you probably get really pissed off.

A sailor, Western Finland

They really have to be reliable if they are meant to be used for navigation. It's the basic feature in present devices that they don't work.

A sailor, Western Finland

Navigation devices and services may also have made the tasks simply more complicated or it may have taken too much effort to learn to use them. For further development and redesign of devices and services it is important that these issues be considered. The services may have affected people's lives so that they become too dependent on services and cannot cope without them, but for example get lost with a map or feel very insecure.

I'm wondering if people will lose their social skills altogether, if there were services like this available all the time and in principle you wouldn't have to have anything to do with other people since you could have all the information through the devices.

Teenager, Northern Finland

On the other hand, there may have been functions or options that people have been unaware of when starting to use navigation devices and services. Therefore all accounts, prejudices, fears and other feelings and impressions should be taken seriously and taken into account in redevelopment and in revisions of use instructions for use.

I have a negative attitude towards all sorts of control, I mean altogether, I would like to be absolutely sure that no one or nothing has control, with all these things in the world...
A disabled woman, Western Finland

Discarding may also be a result of deficiencies in descriptions of navigation devices and services, or of illicit use or data security. On the other hand there may be a need for public discussion about the use culture and maybe about a need for new laws too.

[Why are these questions important from the ethical point of view? See Chapter 9.1](#)

8.1.2 Assessment of laws and other regulations, standards, norms and good taste with regard to navigation devices and services

1. What are the devices and services like in relation to laws and other regulations, standards, norms and good taste?
2. What laws and other regulations are there to control the discarding of the navigation devices and services and the withdrawal of consent to positioning?
3. Are the existing laws, standards and other regulations and norms sufficient or is there a need for new laws?
4. Are there more ethical issues to be raised to the public awareness?

Explanations and comments on the questions

There are laws concerning the users' rights to discard devices and services and to delete the information gathered on them at any time. However, the laws do not define the procedures for doing this. Therefore the relevant procedures and instructions for deleting the information should be considered and given to users at the beginning of use. Secondly, withdrawal of consent to positioning should be assessed in terms of ethics, too: Is it easy enough for users and can they do it at any time? If it can be done e.g. only in the Internet, it may be difficult for those people, who do not have an Internet connection. Nevertheless the user should be made fully aware of the procedures by personal letter or other means. Furthermore, navigation devices and services should also be assessed in terms of standards: are the (existing) devices and services compatible or are new standards needed?

From the ethical point of view it might also be interesting to know why people discard navigation devices or services, as this may reveal shortcomings in laws or in standardisation, too. There may also be some ethical issues to be raised to the public awareness of which service providers are not aware. This is also the reason why users should have opportunities give feedback about the devices and services. For redevelopment purposes it might be useful to study them and to raise them in public discussion.

[Why are these questions important from the ethical point of view? See Chapter 9.2](#)

8.1.3 Assessment of social effects and social justice in regard to navigation devices and services

1. Have people's lives become too dependent on navigation devices or services or can they manage well without them after discarding them? Are the traditional means or instruments and services still available?
2. What effects has the use of navigation devices and services had on people's social lives? Have they reinforced people's relationships or increased suspicions or have they caused isolation?
3. Have people lost abilities in using navigation devices or services or become unable to cope in some situations without the service?
4. What effects have navigation devices and services had on consumer culture?
5. Are there more ethical issues to be raised in public awareness?

Explanations and comments on the questions

The social effects and social justice in discarding the navigation devices and services particularly concern the management of tasks and social life without the navigation devices and services. Therefore one should assess how navigation devices and services may affect people's lives. They may have become too dependent on services or unable to cope without them, but get lost with a map or feel very insecure or are too dependent on them.

The consequences to the social lives of those who do not use the devices and services should also be assessed: Will they be excluded from their normal social circles or have difficulties in coping in some situations due to lack of devices and services.

In contrast I'm wondering if people really cocoon themselves and the devices maintain their relationships or if it is like with mobile phones and people become more sociable and get in contact more easily since it is more effortless.

Teenager, Northern Finland

All these effects should be addressed and the possible harm detected for redevelopment purposes or for public discussion.

From the users' point of view the development of consumer culture is important, too. If most people use the devices and services, it is likely that over-the-counter services will be removed and as a result life may become too complicated for some people, who have no resources (financial or intellectual) for using navigation devices or services.

What do you think about these services in terms of equality? Do you think everybody can have them in the future? The Interviewer

It's going to be a question of prices, too. If they cost a thousand or two, normal people won't get them. It's often the boundary question.

A huntsman, Northern Finland

I think normal people need those [navigation devices] so rarely that I wouldn't get one. They are sort of disposable and they need to be changed to new ones every year or two and thrown away if broken. They could be used much longer if they were treated carefully and used only in real need.

A huntsman, Northern Finland

In this case one should consider, if society should support those people e.g. by endorsing public services. Secondly, navigation devices or services can also offer only partial information (e.g. only about those over-the-counter services that have been paid for to an operator) Therefore people may be unaware of some service outlets available and the consumers may use only those offered by navigation services.

[Why are these questions important from the ethical point of view? See Chapter 9.3](#)

8.1.4 Assessment of the ethics of navigation devices and services from the decision-making perspective

1. Have people got all the relevant information about discarding navigation devices and services? How about deleting the information gathered on them?
2. Have there been enough opportunities for feedback about navigation devices and services?
3. Are there more ethical issues to be raised to the public awareness?

Explanations and comments on the questions

To make decisions users need information about the procedures, places and times and about their rights to delete all the information gathered on them in navigation devices or services. One should consider what information they need for this and how it should be given to them when they start using navigation devices and services. Confirmation of discarding should also be considered: Should it be done by letter or in some other way? Finally, feedback opportunities are also an important part of navigation devices and services. If people can give feedback about the products, they may feel better regarded as users and perhaps also more autonomous. Lack of feedback opportunities may on the other hand regarded as the neglect of the common good and disrespectful to the needs of users.

[Why are these questions important from the ethical point of view? See Chapter 9.4](#)

8.1.5 Assessment of the security of navigation services

1. Is it easy for users to discard navigation devices and services and to withdraw consent to tracking? Can people do it any time?
2. Do people have enough information about deleting the information gathered on them?
3. Are navigation devices and services discarded because of ethical problems or problems in use?
4. Are there more ethical issues to be raised to the public awareness?

Explanations and comments on the questions

Discarding the navigation devices and services should be easy for users but proper identification should be done as a standard procedure. One should also consider how people could be informed on their right to delete the information gathered of them in the navigation devices and services. In cases where the navigation devices and services have

caused harm to people, their health or their personal safety, compensation should be considered as well as warnings to other users.

[Why are these questions important from the ethical point of view? See Chapter 9.5](#)

9 Underlying ethical issues

9.1 Assessment of tasks and environments and motives of use

Usefulness is an integral part of usability, even more than ease of use (cf. Keinonen 2000). Usability generally refers to how well a device or a service, e.g. a navigation device or service, suits an intended purpose. Usability is connected with both the functions and the contents of a device or service; these define its theoretical utility. The utility of functions and the facility of use, i.e. usability, together constitute the usefulness of a device or a service. (Grudin 1992; Nielsen 1993, 25.)

Usability is important not only from an economic perspective (Harrison et al. 1994) but for users it is also a justification for use and a reason for acquiring new devices (Keinonen 2000). Therefore usefulness should be included in the ethics of navigation devices and services and regarded as part of the common good sought through the whole lifecycle of a navigation device or service. However, to respect the autonomy of people, the navigation devices and services should provide support to people in their tasks or situations of need only and enhance their abilities to cope with situations but not make them dependent on the devices or services.

Devices or services may be expected to work well and efficiently and to be accurate and easy to use in the tasks and situations for which they were made. In other cases, they may be considered causes of accidents and damage, for waste of money or harm in other ways. Uselessness can also be considered an annoyance and harm as such. The navigation devices and services should promote security in all respects but avoid engendering or to tend or to surveillance.

In the planning, design and implementation of navigation devices and services the principle of justice should be taken into account in all tasks, environments and motives for use. All means of ensuring that as many people as possible could make use of them and get support for their tasks in different environments should be ensured. Through thinking about the motives and situations of use it is possible to create devices and services that are useful, efficient, easy to use and that do not cause harm to people. In case of problems complaints from users should be reviewed immediately and answered in a relevant way.

Users also have the right to all the relevant, objective and correct information on the tasks the navigation devices and services can support, and about the environments in which they work well. Information on the limitations of performance in certain environments should also be disclosed. For further development and quality control purposes opportunities for giving feedback about the devices and service, the quality of their information should be reviewed, too.

9.2 Assessment of legislation, regulations, standards, good taste and other norms with regard of navigation services

Ethical principles are the base of the common good and laws, standards, and other norms and notions of good taste etc. Laws and other norms are made on the one hand to protect citizens from trouble, on the other, they are made to keep order, control, regulate and direct the actions of people and organisations (e.g. companies) to prevent them from harming others. But in the end they are, basically (only) contracts between people. They can be changed if they seem to conflict with the ethical principles, but they also change spontaneously like ethical principles though only slowly and usually through argumentation. They are not as unambiguous as they seem to be and this is why they have to be interpreted for all practical purposes. When new devices and services are planned and designed new interpretations of the existing laws and other regulations are needed and these should be regularly re-evaluated. This means there is a need for public discussion and feedback from everyone, especially the future users, about the proper or improper planning and design and use of navigation devices and services. The general guidelines and minimum requirements for the use and maintenance of navigation devices and services should also be defined and recurrently revised.

In order to ensure safety, privacy and justice for people, the need for new legislation, regulations and standards should be continually assessed throughout the lifecycle of the devices and services, especially those protecting the privacy of people and the information gathered on them in registers. All the laws and other regulations, standards, norms and good taste (and interpretations of them) should be extended from the actual devices or services (and their use) to all the information given about them as well as to their development and maintenance.

In order to avoid harming people and to respect their autonomy and privacy informed consent is an essential prerequisite and should be taken into account in discussions, too. However, there may be some situations, in which consent is not needed and these should be defined to protect people's rights. Secondly, the problem situations should be considered very carefully. In the name of justice help should be provided in problem situations and possible refunds made to users. Finally, equal rights regardless of race, sex, religion, age, disability, economic circumstances or other personal facts, and the norms of the different nationalities and religions, should be regarded too in order to promote justice and to respect the laws on the equality of all citizens.

9.3 Assessment of social effects and social justice in regard to navigation services

It could be said the more services people's lives, the more there are potential ethical problems. This is particularly true when it comes to the social life and navigation services that can easily increase suspicions in social relations. For example, if they are considered as a means of surveillance or even spying or as patronising or reducing the face-to-face or immediate communication resulting in isolation for those who do not use the devices or services. For these reasons and to avoid harming people, to respect people's privacy and to promote justice, one should consider how the services change people's lives and

whether the devices and services merely give support to people in their tasks and need situations or occasion many changes. This concerns avoiding dependency on a navigation device or service or loss of control in its absence. However, navigation devices and services, like many other devices and services, do affect on people's social lives and to protect people's rights and safety the effects should be discussed and monitored by all people and society as a whole. Thus problems may also be predicted and appropriate ways of use outlined.

In order to benefit people and to serve the common good the navigation devices and services should be easy to use without extensive training for most people. To promote social justice among people, it could be useful to evaluate what skills and motivation people already have to use other devices (apart from navigation devices or the services). Secondly, evaluations could also concern what kind of resources they have to use the new devices and what skills they can be expected to acquire. Also, equal rights regardless of race, sex, religion, age, disability, economic circumstances or other personal facts, and the norms of the different nationalities and religions, should be considered in the interests of social justice. For these reasons careful consideration should be given to, where design for all -principle and those of user-centred design could be applied. For the same reasons it might be good to test the usability of the concept and all the functions as well as the user-interface with different kinds of users at all stages of planning, design, implementation and development. Faults in planning and design may result in making life more complicated and more difficult for people and demanding continuous learning in using a navigation device or service, thereby contravening the principle of justice.

Furthermore, problems of equality and social justice may emerge in the actual resources and opportunities to acquire navigation devices or to use the navigation services. To promote the common good and the equality of people there should be discussion about the availability of devices and services as public utilities and about the availability of services without electronic navigation devices or services providers.

To avoid harm and to promote the principle of efficiency in problem situations the social effects among others should be considered and measures taken to prevent them in the future. People should also be warned carefully enough about the limitations of navigation devices or services with regard to the accuracy and reliability of the navigation devices and services in different tasks and in different kinds of environments.

9.4 Ethical principles in the background of decision-making in navigation devices and services

Making decisions is an essential part of autonomy for people and privacy is the most important thing concerning the navigation devices or services they can make decisions on. At the moment, many people consider location data very private. For decision-making people need information; above all to be able to decide whether to use the navigation devices or services people need information about them in their own language. They also need information about their functions, and the tasks they are meant to support, likewise the environments of use and the limitations to use (e.g. updating the service). In addition, to be able to decide what kind of device or service to choose people need to be able to assess and compare the different services, the prices and the price setting.

Privacy is a power-relationship dependent on knowledge and control, since it is very difficult to have privacy if people have no knowledge of what they can do to protect their privacy or power to set the limits to their privacy. Thus the decisions about the positioning and about consent to it are very important. Thus one should consider carefully when informed consent is necessary, how often it should be confirmed, how it is done in practice, how the person could be reliably identified and how consent can be withdrawn. Questions about the limits of consent and situations in which consent is not needed should be addressed. In order to protect their privacy, people may need information on when the positioning starts and when it ends. If tracking is set for a longer period of time, people may also need reminders to be able to stop the tracking if they want to. One should also consider how people could discard the navigation device or service – possibly also temporarily –without much effort and at as little cost as possible. .

People's autonomy in using navigation devices or services culminates in decisions about information gathered on them. To make the decisions, people need some information on data stored in navigation services, about the time-span of storage and about the conditions for storage, e.g. conditions of surrendering information to third parties, etc. To be able to exercise their autonomous power in decision-making, people also need information about their rights to see the information stored on them, about their right to correct or to erase it and to forbid its surrender to third parties. They might also want information about the minimum requirements for the service providing companies concerning the security and the qualifications of the personnel set by law and other regulations. When the devices and services are planned, designed and used, there should be public discussions about the ways to present the information and about how to support people's decision-making and about the guidelines for presenting the stored information and transferring it to other parties.

In planning and designing the navigation devices and services equality should also be taken into account. It would be good if the decision about using devices and services were based on clear and simple information about the consent for positioning and about the potential and restrictions of the devices and services. One should also consider what information people need at the beginning and the end of tracking and failures or problems in networks and how it could be presented clearly and simply. Thus all kinds of people might be able to use the services without too much trouble or without complicating their lives unnecessarily. To promote justice the responsibilities between the operator, users and authorities should be clear and distributed in case of problems. This way people would know where they could get help and possible compensation to users given in cases of serious breakdowns, failures or in situations of danger. For justice and to maintain people's autonomy, opportunities for feedback would be a requisite.

9.5 Security

The foundation of security is relevant information given to people – in their own language – about the potential of navigation devices or services, their limitations and, their proper use. They also need information about how consent can be given when taking up a navigation device or service. Thirdly, people also need information about the location data saved on them in the service and about their rights and procedures to withdraw consent at any time. People are not always aware of their right to see, correct and erase

data stored on them in a service, either. Finally, they may also want information about the management of the location data gathered on them: what kind of professionals do the management, where and for how long the data is stored and the conditions of storage, e.g. on what conditions it can be surrendered to third parties. These are essential prerequisites for people to be able to safeguard their rights, to be autonomous and to avoid harm.

For the risks of services, problems in use, system failures or breakdowns there should be some kind of help available to avoid more harm to people. To promote justice the responsibilities between the operator, users and authorities should be clear and distributed in case of problems. This way people would know where they could get help and possible compensation given in cases of serious breakdowns, failures or in situations of danger. To avoid problems the risks to users (e.g. to their health and personal safety, data security etc.) should be assessed, and disclosed to them. The safety, accuracy and reliability of the devices and services should also be promoted in all respects. People should probably also be aware of the tasks and environments the navigation devices and services are meant to support, so that they would not have false hopes about their potential.

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