



MINAMI

Micro-Nano integrated platform for
transverse Ambient Intelligence
applications

FP6 Contract: IST-034690



Ethical Guidelines for Mobile-Centric Ambient Intelligence

Version 1.1, June 9th, 2008

Veikko Ikonen, Eija Kaasinen, Marketta Niemelä and Jaana Leikas

VTT Technical Research Centre of Finland

{firstname.lastname}@vtt.fi



Introduction

This document presents the summary of ethical guidelines for mobile-phone based ambient intelligence solutions, defined by the MINAmI project. The aim of the guidelines is to motivate and influence all who are involved in the design and utilisation of mobile-centric Ambient intelligence technologies, applications and services. A more thorough description of the guidelines and the grounding for them can be found in MINAmI deliverable D1.4, Ethical guidelines for mobile-centric ambient intelligence.

The guidelines bring up ethical issues mainly from individual perspective and our analysis covers mainly application and platform design. In actual service design, further ethical issues will be raising and those should be studied case by case. Utilising mobile-centric ambient intelligence also raises societal issues for instance related to the role of technology in the society. Those questions cannot be solved in a single project but this document aims at least to identify those issues and raise them to discussion.

Our aim has been to conclude concrete and clear ethical guidelines that could be used as check lists in platform design, application design and partially also in service design. This aim is quite ambitious as ethical principles tend to be easily acceptable but not so easy to concretise. It is clear that this document can only introduce tentative guidelines, and a lot of further work is needed to produce concrete and extensive guidelines. The guidelines cannot cover all aspects of individual applications and services. That is why ethical issues need to be studied in the design both by user interviews and evaluations and by assessments carried out by experts of ethical issues. We will continue refining the guidelines and that is we now present the guidelines publicly to get feedback both about the contents of the guidelines and their applicability.

Ethical guidelines are built on six ethical principles that are selected based on the ethical assessment of MINAmI scenarios by our Ethical Advisory Board:

Privacy: an individual shall be able to control access to hi(s)her personal information and to protect hi(s)her own space

Autonomy: an individual has the right to decide how and to what purposes (s)he is using technology.

Integrity and dignity: individuals shall be respected and technical solutions shall not violate their dignity as a human beings

Reliability: Technical solutions shall be sufficiently reliable for the purposes that they are being used for. Technology shall not threat user's physical or mental health.

E-inclusion: Services should be accessible to all user groups despite of their physical or mental deficiencies.

Role of technology in the society: The society shall make use of the technology so that it increases the quality of life and does not cause harm to anyone

Ethical guidelines for mobile-centric ambient intelligence

1. Privacy

An individual shall be able to control access to hi(s)her personal information and to protect hi(s)her own space



Application design:

- Apply local privacy legislation (see chapter 4.2):
 - Only relevant information is collected and stored
 - Access to personal data is limited to authorized people
 - The user gets feedback what data is collected, where it is stored, and for what purposes it is used
 - The user gives permission to the collection of data, storing and redirecting it
- Check the application for privacy threats:
 - Tracking opportunities of people and objects
 - Unauthorised access to personal data
 - Function creep of systems
 - Profiling people

Platform design

- Data storage is secured on the phone and on the mass memory tags.
- Disposable sensors with mass memory do not reveal personal data
- Data transfer is secured between tags and sensors and the mobile phone
- Data transfer is secured between the phone and external servers
- Natural user interaction tools should not make personal information visible to outsiders

2. Autonomy

An individual has the right to decide how and to what purposes (s)he is using technology.



Application design

- The control of using the system stays with the user, even if the system is invisible or continuously on
- The user has tools to start, stop and configure applications
- The user gets clear feedback on applications and functions that are on
- The user gets sufficient feedback on what is happening in the application

Platform design

- Tag and sensor reading with the phone can be equipped with user confirmation

To be discussed:

- How much does the user need to know about what is happening in the application?
- Does the user need reminding of applications that are continuously on?
- Does the user need feedback on each individual data transmission?

3. Integrity and dignity

Individuals shall be respected and technical solutions shall not violate their dignity as human beings



Application design

- Evaluate that the application is acceptable from user point of view as well as from the point of view of other people involved

Service design

- Users are actors, not objects in the system
- Actual users should be involved in the design process, and their opinions should be listened

To be discussed:

- The person whose dignity can be insulted may be an outsider, not the actual user. E.g. the burglar in the home security case

4. Reliability

Technical solutions shall be sufficiently reliable for the purposes that they are being used for. Technology shall not threat user's physical or mental health.



Appication design

- The measurement accuracy is sufficient for the purpose that it is used
- The algorithms with which measurements are combined and analysed are sufficient

Platform design

- The platform is promoted as an application platform only for applications where the reliability requirements can be fulfilled, regarding both measurement accuracy and measurement frequency
- Possible technical problems such as losing radio connection, memory getting full or need to recharge batteries are anticipated and indicated in time
- Users should have ways to ensure the trustworthiness of tags for viruses and other hostile elements

Service design

- User conception of the reliability is in line with the actual reliability

5. E-inclusion

Services should be accessible to all user groups despite of their physical or mental deficiencies.



Application design

- No user group is ignored without strong reasoning
- Consider if the application has potential in providing specific value to disabled users

Platform design

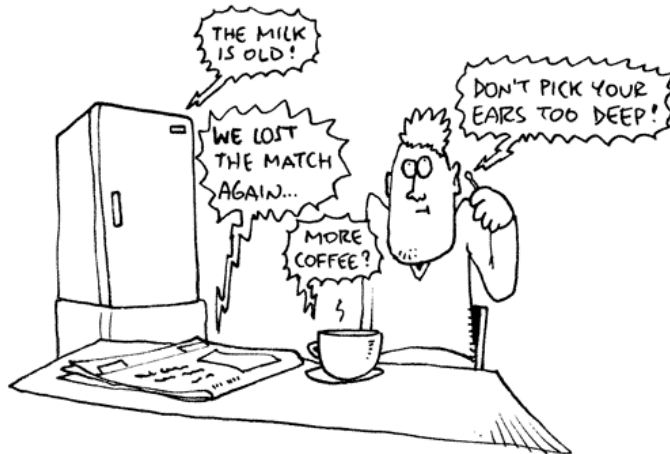
- Alternative modalities are supported in user interaction

To be discussed

- Can all citizens be provided with equal possibilities to anticipate health hazards?
- Can assistive technologies provide people with above normal abilities. To what extent is that acceptable?
- Does Aml technology used for independent living actually isolate elderly and disabled people in the society?
- Aml may provide new possibilities to disabled users, should these be studied instead of just ensuring accessibility?
- In a market economy, commercial entities are quite free to choose their target groups. How can e-Inclusion be ensured in other than public services?

6. Role of technology in the society

The society shall make use of the technology so that it increases the quality of life and does not cause harm to anyone



Platform design:

- The kinds of purposes that the technology can be utilised for are analysed thoroughly
- Dark scenarios are included in the analysis: misuse, harmful applications, and hazards.
- Ethical assessment is carried out to study whether those purposes are ethically acceptable
- The usage possibilities to be promoted in marketing are assessed for ethical acceptability

To be discussed:

- Should embedding of tags and sensors in the environment be regulated?
- How informed people should be about Aml systems in their environment? How should they get that information?
- Do increasing possibilities to monitor health parameters increase the quality of life?
- In general users should be able to find their own ways to utilise technology. To what extent should the designer anticipate possible (mis)usages?