FIDIS

Future of Identity in the Information Society

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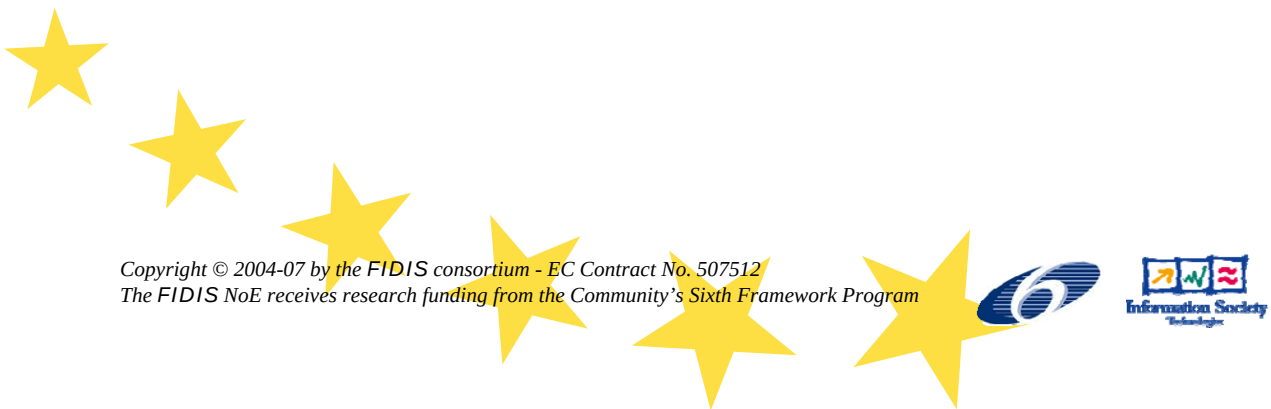
Summary

The FIDIS WP12 workshop on Emerging AmI Technologies was held at the University of Reading, UK on the 26-27 October 2006. This workshop was designed to be the kick-off event for two subsequent deliverables: D12.2 "Study on Emerging AmI Technologies" & D12.3 "Holistic Privacy Framework for RFID Applications". As such, the core content of these deliverables was developed through a range of participant presentations and subsequent discussion and co-ordination of the contributions of the partners was conducted. This document is a brief record of the event.



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Foreword

FIDIS partners from various disciplines have contributed as authors to this document. The following list names the main contributors for the chapters of this document:

Chapter	*Contributor(s)*
All	Workshop participants

Table of Contents

1 Executive Summary

The FIDIS WP12 workshop on Emerging AmI Technologies was held at the University of Reading, UK on the 26-27 October 2006. This workshop was designed to be the kick-off event for two subsequent deliverables: D12.2 “Study on Emerging AmI Technologies” & D12.3 “Holistic Privacy Framework for RFID Applications”, as well as a forum for discussion of D3.8 from Work Package 3.

The core aims of the workshop were achieved through a range of participant presentations and subsequent discussion and by co-ordination of the contributions of the partners by the deliverable editors. As is so often the case, the inter-disciplinary nature of the event helped foster extensive and interesting discussion beyond the scope of the deliverables themselves, for which more time would have been preferable. Additionally, suggestions for further deliverables under the auspices of WP12, which extend the current deliverables, were proposed and noted for further deliberation post-event.

This document is a brief record of the workshop.

2 Introduction

The domain of 'identity' is fast evolving, something that is in part driven by the evolution of technology. As such, the emphasis of this workpackage (WP) is on 'emerging technologies', i.e. those technologies or applications of technology which have not yet reached commercial critical-mass, but may in the future prove to have a significant impact in the identity field. This WP builds upon the solid foundation of WP3, 'High-tech ID', but, in order to firmly embrace the 'F' of FIDIS, looks with a degree of reasonable speculation beyond those areas previously explored by FIDIS deliverables.

The scope is not purely technological, indeed social and legal aspects are considered key to this WP and transversal topics such as analysis of good practice and standards will be included.

Specifically, this WP will include: (a) how new technologies will work; (b) what action, if any, needs to be taken at the European level (i.e. promoting them and/or (re)designing them for reasons of privacy and security); (c) propositions and descriptions of novel applications and services, possibly including an assessment of the viability of the market for these technologies (i.e. will they be state run, can industry make money from them or will the public adopt them – like with 'wiki' or 'blogs') and (d) legal implications.

The focus within this period is on emerging AmI (Ambient Intelligence) technologies and related issues.

2.1 Deliverables of WP12

Planned for the third FIDIS work plan are two concrete deliverables within WP12:

2.1.1 D12.2: Study on Emerging AmI Technologies

This deliverable analyses supporting technologies for identity and identification which will play a central role for future implementations of profiling in AmI as discussed in WP7. It will attempt to address (a) how new AmI technologies will work; (b) what action, if any, needs to be taken at the European level (i.e. promoting them and/or (re)designing them for reasons of privacy and security); (c) propositions and descriptions of novel applications and services, possibly including an assessment of the viability of the market for these technologies (i.e. will they be state run, can industry make money from them or will the public adopt them – like with 'wiki' or 'blogs') and (d) legal implications.

2.1.2 D12.3: Holistic Privacy Framework for RFID Applications

RFID (Radio Frequency IDentification) is a strong contender as a ubiquitous identifier for use within AmIs. As such, based on the results of D12.1, this deliverable comprises a holistic Framework for a privacy-enhanced and secure use of RFID applications. It first discusses privacy problems from a legal and social viewpoint and sets up requirements of selected RFID applications with the help of scenarios. Besides it elaborates ethical rules and legal rules based on the European Legislative Framework (Directives 95/46/EC and 2002/58/EC) and discusses possible technical solutions for privacy-enhanced and secure RFID applications including privacy-enhanced Identity Management solutions. It also addresses social acceptability and usability aspects of those technical privacy-enhancing solutions.

These deliverables are related to the Joint Activities “High-Tech ID”, “Mobility and Identity” and “Profiling”, and it is expected that results will be fed into new deliverables of WP3, WP7 and WP11.

2.2 D12.1 Kick-off Workshop

The deliverables as described above depend on a focused workshop to determine the levels and areas of expertise of FIDIS partners and to co-ordinate the subsequent contributions. This workshop took place on the 26-27 October 2006 at the University of Reading, UK and covered a range of available and emerging technologies for Ambient Intelligence, including RFID as an AmI enabling technology, and the effects of these technologies on society and law.

In brief, the main topics of this workshop were:

- A holistic view on RFID including security and privacy
- Development of supporting technologies for AmI such as networking technologies, nanotechnologies, grid infrastructure related technologies and energy supplies
- Current and emerging core-technologies for AmI such as sensor technologies and ICT implants
- Legal and social aspects of AmI emerging technologies

The full event programme can be found in Annex 1, and the list of participants in Annex 2.

The scope of this workshop means that it was open to any FIDIS participant currently developing new technology, or who is in a position to be speculative regarding their own field of expertise.

A list and brief synopsis of presentations held follows in the next section. However, full copies of the presentation slides can be found on the internal portal at:

http://internal.fidis.net/workpackage-main/wp12/d121/

In order to be as efficient as possible, the event was timed such that it could also host discussion of D3.8 from WP3. This part of the event was held during the latter half of the second day. Formal discussion of this part is out of the scope of this deliverable document.

3 Presentations

Study on Emerging AmI Technologies - Mark Gasson

Brief synopsis: An introduction to the proposed scope of this deliverable, working time frame, deliverable outline and templates for contribution as well as initial division of tasks. Also an introduction to emerging human-machine interfaces for AmI such as Brain-Computer interfacing (BCIs) and implantable technologies was presented.

Nano-technologies and power supplies - Martin Meints

Brief synopsis: AmI concepts imply numerous sensors, actuators, computational devices and communicational infrastructure to link everything up. And all of these modules and components need electrical power … This presentation focused on describing the importance of energy supply, existing concepts, remaining problems and the need for further research and concluded with an introduction to nano-technology and its potential application in AmI environments.

Behaviour-based Authentication in the Built Environment - Athanasios Agiannidis

Brief synopsis: Discussion of a real implementation of an AmI environment which allows the strong dependency of authentication mechanisms on the use of credentials to be relaxed and security tightened by continuously authenticating users in an unobtrusive manner. This is possible because people exhibit certain behavioural patterns and concise behavioural signatures can be used to strengthen security.

Which Law on European Union and International Level can be relevant and *specifically problematic* with regard to EMT's in the field of *Privacy, Identity,* Security and Ambient Intelligence? Are there *new issues*? - Wim Schreurs

Brief synopsis: Presentation of a methodology to derive i) a list of relevant emerging technologies to discuss from a legal point of view and ii) a list of relevant European and International Law to discuss with regard to the emerging technologies.

AmI and the Grid - Vassiliki Andronikou

Brief synopsis: An introduction to the 'Grid' technology, and its potential application in AmI environments as an enabling technology. The mobile Grid was presented and issues of context-awareness and a discussion on how 'Grid' technology can cater to the main system requirements of AmI, i.e. working AmI needs a lot of resources in terms of Computing Power and Storage available as well as Data especially at places which are normally not high computing centres (like Bars, the Smart Home etc.) The Goal of Grid Computing perfectly matches these requirements, although security problems within Grid Computing still remain open.

Holistic Privacy Framework for RFID Applications - Simone Fischer-Hübner

Brief synopsis: An introduction to the proposed scope of this deliverable, working time frame, deliverable outline and templates for contribution as well as an initial division of tasks. Discussion of the motivation and objectives of the deliverable, i.e. raise awareness of project participants, policy makers, providers/deverlopers of RFID applications/technology and contribute to the debate on RFID policies by providing an integrated interdisciplanary perspective on privacy problems and approaches to privacy-enhanced solutions

Privacy and data protection issues of RFID applications - Eleni Kosta

Brief synopsis: In RFID applications, when do **data protection** issues arise? And do provisions of the sector-specific legislation on privacy and electronic communications apply? A description of a potential contribution to and legal evaluation of the proposed holistic solutions was developed.

Ambient Law applied to RFID - Wim Schreurs

Brief synopsis: AmI requires that the law is ambient & intelligent as well, thus present in an invisible and automated way, in the advantage of the user and adaptive (adaptation of the world to the user and not of the user to the world). Ambient Law is about the integration of legal and technological tools for the effective protection of privacy & security, autonomy and user control (e.g. P3P, the integration of law in technology, privacy by design, privacy by default). Thus we require Ambient Law & RFID via M2M communication that enables: Enforcement of mandatory rules of Data Protection Directive 95/46 & Privacy & Electronic Communications Directive 2002/58 (Data Protection Principles).

From AmI to MAmI - a possible paradigm shift - Stefan Köpsell

Brief synopsis: Current AmI architectures & related Privacy Problems, i.e. user centralised identity management in combination with mobile devices. Proposal for architectural changes: Mobile AmI (MAmI) where sensors are carried by the user rather than built into the environment. If the environment asks the user controlled sensors for the needed data then the user is in control of the collected data with benefits for privacy and other problems are solvable as well: processing power, power consumption etc.

Engineering sensors for AmI to be mobile instead of being fixed makes AmI much easier to tailor and adapt (no size fits all) or even personalise, deploy (cars are easier to innovate than railways) and secure (multilateral: conflicts of interests are the norm, not the exception in pluralistic democracies – and some would say in each and every society). How sensors are networked and controlled (both favourably exclusively by means of “repeaters” humans take with them) is an essential means to reconcile ease (AmI) and security and privacy (user control).

Lower network layers’ implications - Oskar Senft

Brief synopsis: A discussion about how lower network layers contain linkable data which allow the possibility to identify a user (person), track mobility, track device usage, etc.

An anthropological approach of technology and society - Daniela Cerqui

Brief synopsis: Social and cultural anthropologists are involved in the study of differences between human cultures, and in the study of what human beings may have in common despite these differences. One common thing is the use of technology, as there is absolutely no human culture without it. Therefore, the study of the relationship between technology on the one hand, and society – and more fundamentally humankind – on the other hand, is a relevant topic. This was discussed at length, especially with reference to technological neutralism and determinism.

FIDIS, AmI and emerging technologies: Where are we going? - Kevin Warwick

Brief synopsis: Discussion: Whilst FIDIS has to consider how today's technology is used, and the consequences it entails, we have to cast a critical eye to the future – technology is developing at an unprecedented rate, so where will we be in ten, twenty, thirty years time? Indications are that technology will move towards a human/machine symbiosis, where the two entities are physically and intimately linked together. How will society deal with this progression, and what questions does this raise from a security, privacy and identity perspective?

4 Conclusions

This workshop had three core objectives:

1. To exchange interdisciplinary knowledge regarding emerging technologies related to AmI environments including RFID as an AmI enabling technology
2. To provide a base for discussion of WP3's D3.8
3. To organise the content of D12.2 "Study on Emerging Technologies" and D12.3 "Holistic Privacy Framework for RFID Applications" by discussion of the tables of contents and co-ordination of the contributions of the partners

These objectives were achieved to the degree that can be expected from a short workshop, with follow-up discussions planned to be held on the dedicated WP12 mailing list. The inter-disciplinary nature of the NoE always ensures that such events are broad in their scope, and this led to a great deal of discussion. As is nearly always the case, time for discussion was short and, ideally if time allowed, subsequent events will somehow cater for extended discussion sessions where possible.

A first proposal for structuring both deliverables was presented by the respective deliverable editors and was discussed and amended during the workshop by all partners involved. In addition, time planning for contribution delivery was discussed, and the tentative time plans drawn up. These are both given in Annex 3.

A further result from the discussion sessions was the proposal of a further deliverable (a study on ICT implants), which extends the work being undertaken here, for WP12 in the next (4^{th}) FIDIS workplan. Such developments are very important for the continued excellent work of the NoE, and are a true reflection of the value of providing a face-to-face forum where issues can be openly discussed and debated in an inter-disciplinary context.

Overall, feedback on the event from the participants was excellent and progress on the subsequent deliverables is now moving forward.

5 Annex 1: Event Programme

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Meeting room: 'The Sullivan Room', Room 141 Cyb/Comp-Sci Building

Lunch / Coffee: 'The Seminar Room', Room 167 Cyb/Comp-Sci Building

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26th October 2006

8:45 am - 9:15 am: Meeting introduction

- Registration
- Welcome
- Short introduction of the participants
- Objectives of this workshop
- General schedule, internal reviewing process

9:15 am - 10:45 am: Session 1:

Presentation and discussion of work on Del. D12.3:

Holistic Privacy Framework for RFID Applications

Ending: April 2007

- Introduction and moderation by Simone Fischer-Hübner
- Contributions by participants

10.45 am - 11:00 am: Coffee break

11:00 am - 1:00 am: Session 2:

Presentation and discussion of work on Del. 12.3 continues

1:00 pm - 1:30 pm: Lunch

1:30 pm - 3:30 pm: Session 3:

Presentation and discussion of work on Del. 12.2:

Study on Emerging AmI Technologies

Ending: June 2007

- Introduction and moderation by Mark Gasson
- Contributions by participants

3:30 pm - 3:45 pm: Coffee break

3:45 pm - 5:45 pm: Session 4:

Presentation and discussion of work on Del. 12.2 continues

5:45 pm: CAVE system demo

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27th October 2006

8:45 am - 9:15 am: Day 2 introduction

- WP12 Motivational Lecture (Kevin Warwick)
- WP12 and WP7: D7.10

9:15 am - 10:45 am: Session 5:

D12.2 & D12.3: Final Thoughts? / Start of Session 6

10.45 am - 11:00 am: Coffee break

11:00 am - 1:00 am: Session 6:

Presentation and discussion of work on Del. D3.8:
Study on protocols with respect to identity and identification
Ending: Sep 2007

- Introduction and moderation by Martin Meints
- Contributions by participants

1:00 pm - 1:30 pm: Lunch

1:30 pm - 3:30 pm: Session 7:

Presentation and discussion of work on Del. 3.8 continues

3:30 pm - 3:45 pm: Coffee

3:45 - 4:00 pm: Session 8:

Meeting conclusion

6 Annex 2: Event Participants

Participant	**Organisation**
Stefan Köpsell	TU Dresden
Vassiliki Andronikou	ICCS/NTUA
Colette Cuijpers	Tilburg University (KUB)
Martin Meints	ICPP
Wim Schreurs	VUB
Oskar Senft	SIRRIX
Eleni Kosta	KU Leuven
Simone Fischer-Hübner	Karlstad University
Hans Hedbom	Karlstad University
Mark Gasson	University of Reading
Kevin Warwick	University of Reading
Daniela Cerqui	University of Reading
Athanasios Agiannidis	University of Reading

7 Annex 3: Deliverable time planning

The proposed schedules for the two deliverables were agreed upon as follows:

D12.2 – Study on Emerging Technologies

- ☐ 15/01/07 Initial Social Statement Due
- ☐ 15/02/07 Initial Tech contributions Due
- ☐ 15/03/07 Initial Legal & Social Reply Due
- ☐ 31/03/07 End Integrative editing
- ☐ 30/04/07 2nd Draft of all Chapters Due
- ☐ 15/05/07 End 2nd Integrative editing
- ☐ 16/05/07 Start internal review
- ☐ 31/05/07 Reviewers' comments
- ☐ 15/06/07 Final Amendments Due
- ☐ 30/06/07 Final Submission

D12.3 - Holistic Privacy Framework for RFID Applications

- ☐ 10 January 2007 Input to Problem Domain
- ☐ 30 January 2007 Scenarios
- ☐ 15 February 2007 Draft Problem domain chapter incl. scenario illustrations
- ☐ 28 February 2007 Input to the approach chapter by contributors
- ☐ 15 March 2007 Draft Solution chapter incl. Scenarios
- ☐ 31 March 2007 Review Version
- ☐ 30 April 2007 Final Deliverable