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**TOWARDS AN ACCESSIBLE SCIENCE: FACILITATING
ACCESS TO SCIENTIFIC
DIGITAL RESOURCES FOR VISUALLY IMPAIRED
STUDENTS**

Progress Report # 2

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eContentplus

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¹ OJ L 79, 24.3.2005, p. 1.

1 Table of Contents

- 1 TABLE OF CONTENTS 2**
- 2 SUMMARY..... 3**
- 3 STATUS 4**
 - 3.1 RESOURCES EMPLOYED 4
 - 3.2 WORK PACKAGE OVERVIEW 4
 - 3.3 DELIVERABLES STATUS 11
 - 3.4 PERFORMANCE INDICATORS 13
- 4 AWARENESS AND DISSEMINATION 14**
 - 4.1 OVERVIEW OF AWARENESS AND DISSEMINATION ACTIVITIES..... 14
 - 4.2 EVENTS AND MEETINGS 14
- 5 CONCLUSIONS..... 15**

2 Summary

According to the Description of Work, the general objective of @Science project is "to allow wider access to scientific resources thanks to a wider digital diffusion, exploiting accessibility features able to extend their enjoyment to all citizens".

The first objective pursued by @Science consortium within the period from month 7 to month 12, was the investigation of the state-of-the-art about how university services for students with disability all over Europe support blind and visually impaired students in scientific university courses. To this purpose, four actions were undertaken: scientific and technical literature analysis (in particular proceedings of ICCHP and CVHI conferences) to find documented success experiences, web crawling to collect information about ongoing or recently ended projects (e.g. KPT project), participation to conferences and exhibitions (e.g. 6th

International conference on higher education and disability, Innsbruck) and preparation and distribution of a questionnaire to collect information about the national situation.

The second objective concerned planning of activities for the second period (from month 13 to month 24). In particular: events organized by the @Science network were re-arranged as a consequence of new contacts with the IGUMA (International Group on Universal Mathematics Accessibility) working group. That was done by organizing technical meetings between UPMC and JKU universities. In order to prepare guidelines according to the description of work (deliverables 4.2: guidelines to prepare scientific textbooks usable by visually impaired, 4.4: guidelines to prepare scientific educational resources to hold scientific lessons, to prepare examinations achievable by visually impaired), experimentation and evaluation activities were undertaken or examined when results were available. They mainly concerned tools to work with mathematical notation (e.g. the LAMBDA editor, the MaWen system, Scientific workplace, MathType, LaTeX related tools, MathPlayer, computation tools such as Maple, Mathematica, Matlab, Scilab, Octave, etc.) and tools to work with graphical representations in alternative formats (e.g. audio-tactile representations through IVEO system, haptic representations through tools such as the Phantom device, etc.). Moreover, in order to collect information and experiences for work package 4 (especially for deliverable D4.3 tools to enable communication among university libraries and distributed digital library), two events were attended: ELAG conference, 31st Library Systems Seminar (Barcelona, Spain, 9-11 may 2007), EIPub 2007, International Conference on Electronic Publishing (Vienna, Austria, 13-15 June 2007), and ECDL conference, European Conference on Digital Libraries (Budapest, Hungary, 16-19 September 2007). Also preliminary contacts with running experiences have been taken (e.g. with Biblioteca Italiana per Ciechi, Braillet, EDL project). Then, the dissemination and awareness activities started from month 1, have been carried on. Most of efforts have been addressed to spread science accessibility principles and techniques all over Europe and also overseas, thanks to the participation to the main meetings and congresses of the specific sector.

Furthermore, paper abstracts, communications, full papers, workshop proposals and posters were prepared and submitted to the following conferences (see the dissemination plan, D6.1), in order to actively participate in the coming stages of the project: AAATE 2007, ASSETS 2007, CSUN 2008, ICCHP 2008.

3 Status

3.1 Resources employed

Resources employed for the reporting period (person-months)							
Beneficiary short name	WP 01	WP 02	WP 03	WP 04	WP 05	WP 06	TOTAL
USM	2	1	1	1		2	7
JKU-IS	0.1	0.2	0.5	0.5		0.5	1.8
K.U.Leuven	0.1	0.2	0.5	0.5		0.5	1.8
FMFI UK	0.1	0.1	0.5	0.5		0.5	1.7
UICVR	0.1	0.25				0.5	0.85
UPMC	0.1	0.25				0.5	0.85
TOTAL	2.5	2	2.5	2.5		4.5	14

3.2 Work Package Overview

Work package description

Work package number :	1	Start date:	1	End date:	24
Work package title:	Project management				

Objectives for the period

The objectives of the second period (month 7 to month 12) of the project were:

- monitoring of key performance indicators for quality assurance;
- planning of future activities;
- co-ordination of planned activities.

Description of work carried out and achievements

Key performance indicators were monitored both by tools to collect statistics (log files analysis, access analysis, subscription to the website, etc.) and by filling in a table statistics concerning dissemination events. Planning of upcoming activities was achieved by discussing network members specific knowledge and already existing collaborations. That allowed to schedule participation to several events all over Europe and to contribute to events overseas. Furthermore, thanks to the collaboration of some @Science network members to the IGUMA working group (an international group on universal mathematics accessibility involving worldwide participants) and to the organization of ICCHP conference by Johannes Kepler Linz university, new opportunities for @Science events re-arrangement opened up. That needed co-ordination activities to change the events planned in the description of work. That change was approved by the EC on July 25th 2007.

Deviation from work plan & remedial action

Two deviations from the work plan occurred: change of events organized by the @Science thematic network in order to achieve better results, late financial statement. Changing of events was due to the opportunity to have better dissemination and collaboration results as well as to the overlapping of many already existing international events in September-October 2007. The remedial action undertaken for the change in the events planning was the organization of internal technical meetings to schedule again the events and organize them. At the same time, EC was informed and an agreement was achieved about the new events planning.

Late financial statement submission was due to administrative procedures longer than expected.

Work package number :	2	Start date:	1	End date:	8
Work package title:	State of the art				

Objectives for the period

From month 7 to month 12 the objectives concerned the investigation of the state-of-the-art about how university services for students with special needs support blind and visually impaired in scientific courses and about the existence of special education and training on science accessibility for university staff (especially professors and tutors).

Description of work carried out and achievements

To achieve the work package objectives, four actions were undertaken: scientific and technical literature analysis (in particular proceedings of ICCHP and CVHI conferences) to find documented success experiences, web crawling to collect information about ongoing or recently ended projects (e.g. KPT project), participation to conferences and exhibitions (e.g. 6th International conference on higher education and disability, Innsbruck) and preparation and distribution of a questionnaire to collect information about the national situation. The questionnaire was distributed both to universities in countries participating to the @Science network and also to many countries not already involved in the @Science network (e.g. Czech Republic, Germany, Hungary, Ireland, Norway, Scotland, Spain, Sweden, Portugal, UK).

Deviation from work plan & remedial action

The due date for deliverable 2.3 and 2.4 was not met. Deliverables 2.3 and 2.4 were ready at month 13. That was due to the late collection of questionnaires distributed. Many countries not covered by @Science network sent back late the questionnaires (after August). Moreover, some conferences suitable for the deliverables (in particular International Conference on Higher Education and Disability, Conference on Visual and Hearing Impairment, International computer Camp and Education for all) were planned in July, August and September. The remedial action undertaken was to send back more questionnaires than expected so as to receive back a sufficient number of answers and to collect in advance literature and web-based resources.

Work package number :	3	Start date:	2	End date:	24
Work package title:	University support services				

Objectives for the period

In this period tasks 3.1, namely the identification of best practices was taken on and task 3.3, namely communication of best practices, started.

Description of work carried out and achievements

To achieve some of the objectives for task 3.1 and 3.3, two actions were undertaken: use of communication tools and participation to specific conferences and some meetings were organized. The following events were chosen to this purpose: 6th international conference on higher education and disability (Innsbruck, Austria), International Computer Camp (Helsinki, Finland), Conference on Visual and Hearing Impairment (Granada, Spain), Education for All (Warsaw, Poland). In addition, a meeting with support services in Woluwe was organized by Leuven university, a preliminary meeting with a representative of the support service of Karlsruhe university was held in Baden-Baden at GES conference, a meeting with support service in Karlsruhe (Germany) was planned for November 2007 and a meeting with Teiresias support service in Brno (Czech Republic) university was planned for December 2007.

Deviation from work plan & remedial action

Work package number :	4	Start date:	4	End date:	24
Work package title:	Scientific resources usable by visually impaired: text books, lessons, examinations				

Objectives for the period

The work from month 7 to month 12 focused on: analysis of copyright laws in task 4.1, evaluation of tools suitable for task 4.2 and 4.3 and 4.4 (see D2.1, D2.2 and contribution to conferences) and investigation of state-of-the-art about digital libraries.

Description of work carried out and achievements

In order to analyze the copyright laws and special conditions for blind and visually impaired, a collection of EC directives and regulations was carried on. Moreover, preliminary contacts were established with some associations involved in publishing (e.g. Associazione Italiana Editori, Federation of European Publishers and the EUAIN network). That was achieved at ACP 07 conference in Bruxelles on September 19th. As for evaluation of tools, the following actions were undertaken. At first, the analysis of tools related to mathematical notation manipulation (e.g. the LAMBDA editor, MaWEn system, MathPlayer, MathGenie, MathTalk, Scientific Workplace, Mathtype and computation programs such as Mathematica, Matlab, Scilab, Octave, and also InftyReader for OCR of mathematical expressions, etc.). Then graphical representations in alternative formats were addressed: through IVEO system, by approaching the potentialities of haptic devices, such as the Phantom device and by contacting some of the developers of emerging tools (e.g. Politecnico di Milano which presented AudioTact at CVHI conference). Also, a meeting in Montreal about a new device for graphic rendering was organized by UPMC university and McGill university in May. Furthermore, a rather innovative device (Graphic Window Professional) was studied and experimented at SightCity conference. Moreover, in order to deeply know worldwide evolution and support technical discussion to go towards transnational guidelines, the international @Science technical workshop with IGUMA group was planned and organized.

Four events were chosen to address digital libraries and digital publishing issues: European Library Automation Group, (Barcelona Spain, 9-11 May 2007), international conference on Electronic Publishing (Vienna, 13-15 June, 2007), European Conference on Digital Libraries (Budapest, Hungary, 16-19 Sep, 2007).

Deviation from work plan & remedial action

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Work package number :	5	Start date:	1	End date:	24
Work package title:	Shared information network and devoted knowledge bases				

Objectives for the period

Objective of this period was the maintenance of the communication network and reading resources uploaded in the repository.

Description of work carried out and achievements

The website and the repository were updated periodically mainly with three kind of contributions: articles taken from the web, article abstracts with references to published digital resources (e.g. Springer proceedings of ICCHP, ACM proceedings of ASSETS, etc.) concerning relevant issues in science accessibility and reports about conference attended. Moreover, a page with proposals of upcoming events was maintained.

Deviation from work plan & remedial action

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Work package number :	6	Start date:	1	End date:	24
Work package title:	Awareness and dissemination				

Objectives for the period

Within this period dissemination activities will be carried on mainly through the participation at congresses and meetings to inform about the latest and effective tools and methods for enabling blind and visually impaired students to easily go through scientific studies.

Description of work carried out and achievements

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Dissemination activities went on according to the dissemination plan. Thanks to the possibility to collaborate with the IGUMA group and to work with Johannes Kepler Linz university in organizing ICCHP, the @Science events were re-arranged as follows:

- @Science worldwide expert workshop with IGUMA working group, 27th February 2008, Paris, France. This conference aims at having a high level technical discussion on main issues and future development in science accessibility;
- @Science conference at ICCHP, 7th-11th July 2008, Linz, Austria. This conference was divided into two parts: a pre-conference workshop and a special thematic session on science accessibility during the conference;
- @Science transfer conference, September 2008, Milan, Italy. This conference is addressed mainly to students, university support services and operators for disability.

In order to spread information about these events, a midterm brochure was prepared and printed both in Braille and in large print, according to the description of work (see Description of work, chapter 9).

A list of conferences and meetings where @Science members participated or contributed follows.

ICTA

The first International conference on ICT & Accessibility is organized by the Research Unit of Technologies of Information and Communication (UTIC), Higher School of Sciences and Techniques of the University of Tunis. @Science contributed with the paper “@Science: towards an accessible science”.

GES 2007

The "German e-Science Conference 2007" (GES2007) - organised by Helmholtz-Gemeinschaft, Max-Planck-Gesellschaft and German Rectors' Conference (HRK) - is the first event to demonstrate the results from four e-Science areas: Grid computing, knowledge networking, e-Learning and open access. The conference will be the forum for the partners of the German e-Science community to present their results by talks, by posters and by demos, for the international e-Science community to get an overview of the progress of e-Science in Germany and for potential new users of the German e-Science infrastructure to meet the experts in the field of e-Science. The conference will cover four areas of e-Science:

- Grid computing
- Knowledge networking
- e-Learning
- open access

@Science contributed with a poster about the thematic network and a paper: “@Science: a network about science accessibility”.

W4A

The possible benefits of the Web 2.0 are great but it seems that without timely and prompt action disabled users will be barred from these benefits. Indeed, using sites which such as: Flickr, YouTube, MySpace, Google Maps, and Google Portal will rapidly become 'off-limits' to disabled users. Semantic Web technologies have already shown themselves to be useful in addressing some issues of Web Accessibility. However, this new technology has not yet started to make its way into mainstream applications. Without change, will the benefits of the Semantic Web be lost? Will the promising enhanced interactivity of Web 2.0 technologies become increasingly inaccessible to disabled users? We pose the question: Web 2.0 and the Semantic Web: Hindrance or Opportunity?

@Science contributed with a paper: “Mathematics on the Web: emerging opportunities for visually impaired people”.

SightCity 2007 Frankfurt

The SightCity in Frankfurt is the biggest exhibition for aids for the blind and the visually Impaired in Germany.

The SightCity exhibition at the Sheraton Airport Hotel in Frankfurt took place for the first time in 2003, organized by the following companies:

- AUDIODATA
- BAUM
- Brailletec
- Handy Tech GmbH
- Metec AG
- Tieman
- Reinecker
- Reha-Technik
- F. H. Papenmeier.

@Science carried on the dissemination activities by distributing brochures and entering in touch with exhibitors (companies, universities, and associations). In particular, we tried out some tools such as the Handy Tech Graphic Window Professional device, the Dolphin DAISY book softwares, and the Piaf tactile printer, and we spoke with Karlsruhe University teachers and students.

EIPub 2007 – 11th International Conference on Electronic Publishing

Elpub 2007 is devoted to examining the full spectrum of "openness" in digital publishing, from open source applications for content creation to open distribution of content, and open standards to facilitate sharing and open access. ELPUB 2007 offers a variety of activities, such as workshops, tutorials, panel debates, etc.

@Science contributed with a paper on the Open Document Format and its impact on accessibility for persons with a reading impairment.

IEEE ICALT 2007

Theme: distributed social and personal computing for learning and instruction.

Topics of Interest:

- New Generations of educational technologies
- Educational technologies for new generations
- Technologies for real-time assessment of learning and performance
- Linking dynamic concept mapping and problem solving in complex domains
- Personalized mobile computing for learning and instruction
- Social computing
- Personalized systems
- Interdisciplinary programs to prepare educational technologists
- CSCL technologies
- Content authoring technologies
- e-Pedagogy and Instructional Design
- Knowledge Management Technologies in Education
- Organizational Management of e-Learning in Universities
- e- testing and new test theories
- Data mining, text mining, and web mining in education

Sponsored by: IEEE Technical Committee on Learning Technology, IEEE Computer Society.

Hosted by: University of Electro-Communications, Japan. Proceedings Publisher: IEEE Computer Society Press.

@Science presented the paper "Mathematical working environments for the blind: what is

needed now?”

HCI International 2007

International forum for the dissemination and exchange of up-to-date scientific information on theoretical, generic and applied areas of HCI. The programme will feature:

- 20 pre-conference half-day and full-day tutorials
- an opening session with a keynote address
- more than 250 parallel sessions
- poster presentations
- an exhibition including demonstrations by industrial companies

A panel session involving important stakeholders from China and Asia, and representatives major international Information and Communication Technology (ICT) industries.

@Science participated with a poster on the @Science thematic network, and distributing brochures.

6th International Conference on Higher Education and Disability

Milestone 2007: Sharing International Resources on the Road to Inclusion. University of New Orleans Training, Resource and Assistive Technology Center and the University of Innsbruck tri-annual conference in Austria.

This conference is geared toward post-secondary educators, administrators, disability service providers, members of international exchange programs and their participants. Twenty-nine countries and 114 universities and organizations were represented at the 2004 conference. MIUSA /NCDE will be presenting a session entitled: 'Snapshots of a Changing World: Working with Overseas Partners to Include People with Disabilities in International Exchange Programs.'

@Science participated with a presentation of the @Science network works and by distributing brochures.

ICC 2007 – International Camp on Communication and Computers

ICC 2007 is an international camp which focuses on communication and assistive technology. It is addressed to visually impaired students from 15 to 20 years old. It offers to visually impaired students an experience to learn about modern information technology, accessibility and special equipment for visually impaired people, to learn about studying possibilities throughout Europe and to live international and intercultural exchange. Students who attend ICC are from about 30 countries and mainly interested in computer science and technology.

@Science held workshops on accessibility to mathematics, on LAMBDA system, and supported the knowledge exchange among conference participants on the topics of scientific content accessibility.

CVHI 2007

This is the fifth event in the CVHI international conference series on Assistive Technologies and Rehabilitation Engineering supported by the European Commission. The focus of this conference will be in assistive technology for visual impairments and high quality scientific presentations will be held.

@Science took part to the conference by holding a hands-on workshop on the LAMBDA system, and giving a presentation entitled “Speech and Braille tools to improve access to university scientific courses”.

Education for All

The Conference was organized within the activities of Development Partnership as the final step of the transnational cooperation. The discussed topics concerned the access to higher education as well as transition to labour market for persons with disabilities.

The presentation topics were:

- Services and assistive technologies in access to higher education
- Integration of young persons with disabilities into labour market
- Challenges in making higher education accessible.

@Science distributed the brochures, and entered in touch with potential collaborators.

ECDL 2007

This unique and well-established series brings together researchers, developers and practitioners working in various disciplines and related areas of digital libraries all over the world. The conference will consist of a three days technical program, preceded by a tutorial day and followed by workshops. The technical program will include refereed paper presentations, plenary sessions, panels and poster sessions. The tutorials will provide in-depth looks at areas of current interest.

ECDL 2007 will be devoted to discussions about hot issues and applications and will primarily provide a forum to reinforce the collaboration of researchers towards the Ubiquitous Digital Libraries.

@Science presented the poster “Speech and tactile tools for scientific digital resources”.

ACP 2007 – Accessible Content Processing

The Accessible Content Processing 2007 is a conference organized by the EUAIN project. The main topics presented concern web accessibility, digital content accessibility, involvement of publishers to deal with accessibility problems.

The @Science Network was presented, and we spoke with potential and interested collaborators.

Meetings

BCBS Studiedag

A meeting between Leuven university and Woluwe university about support services for university scientific studies.

Meeting with Karlsruhe University representative

Preliminary meeting with a representative of Karlsruhe university support service in Baden-Baden. Aim of the meeting was to establish preliminary collaboration with Karlsruhe university for further involvement in the @Science network.

Presentation of the laboratory on tactile graphics at McGill University

A meeting to learn about a new device for representing graphics in alternative formats.

8th OpenMath Meeting

Presentation of the @Science network and science accessibility problems at the meeting of OpenMath consortium and eContentPlus JEM thematic network (Joining Educational Mathematics).

Deviation from work plan & remedial action

3.3 Deliverables Status

Deliverables List

Deliverable No¹	Deliverable title	Delivery due date²	Actual date of delivery³
D1.2	1 st periodic report	7	10
D2.3	Support services for visually impaired in scientific university courses	8	14
D2.4	Specific education for university teachers and tutors	8	14
D6.5	Brochure presenting @Science project midterm results	12	14
D6.6	Midterm assessment and evaluation report	12	14

¹ Deliverable numbers in order of delivery dates: D1 – Dn. Deliverable numbers must indicate which workpackage they relate to, e.g. D2.1 for the first deliverable from workpackage 2).

² Month in which the deliverables will be available. Month 0 marking the start of the project, and all delivery dates being relative to this start date.

3.4 Performance Indicators

Indicators	Expected vs Actual					
	Year 1 (exp.)	Year 1 (act.)	Year 2 (exp.)	Year 2 (act.)	Year 3 (exp.)	Year 3 (act.)
Number of accesses to @Science website	100	1304				
Number of subscriptions at @Science mailing list	20	18				
Number of subscriptions at @Science forums	20	18				
Number of downloaded documents	15	25				
Number of available titles	50	22				
Number of involved universities/ high schools	10	11				
Number of involved students' associations	5	2				
Number of participants contributing to workshops, conferences, meetings	10	8				
Number of organisations participating at workshops, conferences, meetings	5	8				
Number of countries covered in any workshops/conferences/meetings organised by the network	10	16				
Number of relevant workshops/conferences/meetings where a representative of the network has participated	4	14				
Number of workshops/conferences/meetings where results of the network have been presented	3	12				
Number of stakeholders who have been informed about the network and its results	10	60				
Number of scientific textbooks prepared by stakeholders according to textbooks guidelines	-	-				
Number of courses/examinations prepared according to guidelines for educational resources	-	-				
Take-up of any Guidelines developed by the network	-	-				

4 Awareness and Dissemination

4.1 Overview of awareness and dissemination activities

Dissemination and awareness actions focused on participating to international and national conferences, on preparing and submitting contributions for future events, on organizing some devoted meetings and on planning @Science international events which involve a worldwide public.

Events were chosen according to their relevance for a specific target group (in particular, publishers, libraries, assistive technology developers, university services for students with disability, students, associations, etc.).

Involvement of students, stakeholders, publishers and assistive technology producers started by collecting contact information at the events attended and by establishing preliminary informal collaboration so as to define a role in the @science thematic network as needed by the network membership agreement. A detailed list of events attended is reported in section 3.2 and 4.2. Actual concertation actions (see D6.1 about dissemination) and official invitations to join @Science network will be undertaken in the early months of the second year.

4.2 Events and meetings

List of Events & Meetings

Name	Location	Date
BCBS Studiedag	Woluwe, Belgium	02 March 2007
ICTA - International conference on ICT & Accessibility	Hammamet, Tunisia	12-14 April 2007
GES 2007– German e-Science Conference	Baden-Baden, Germany	02-04 May 2007
W4A – Web For All	Banff, Canada	07-08 May 2007
Presentation of the laboratory on tactile graphics at McGill University	Montréal, Canada	07-08 May 2007
SightCity 2007 Frankfurt	Frankfurt, Germany	08-11 May 2007
Technical Meeting	Paris, France	03-06 June 2007
ElPub - 11th International Conference on Electronic Publishing	Vienna, Austria	13-15 June 2007
8 th OpenMath Meeting	Schloss Hagenberg, Austria	25-26 June 2007
IEEE ICALT 2007	Niigata, Japan	28-30 July 2007
HCI International 2007	Beijing, China	22-27 July 2007
6 th International Conference on Higher Education and Disability	Innsbruck, Austria	24-27 July 2007
ICC 2007	Helsinki, Finland	23 July – 08 August 2007
CVHI 2007	Granada, Spain	28-31 August 2007
Planning and organisational meeting for the @Science Meeting in February 2008 in Paris	Paris, France	07 September 2007

Education for All	Warsaw, Poland	10-12 September 2007
ECDL 2007	Budapest, Hungary	16-21 September 2007
ACP 2007	Bruxelles, Belgium	19-20 September 2007

5 Conclusions

The activities carried on from month 7 to month 12 were essential to acquire full knowledge of state-of-the-art both about assistive tools, scientific digital publishing accessibility, university support services in scientific studies. The examination of state-of-the-art was longer than expected, but it addressed many countries not yet covered by the @Science network and overcome European borders. Dissemination activity aimed to reach many different target groups. Some results can be remarked. In particular: involvement and collaboration with the IGUMA group (International Group on Universal Mathematics Accessibility) which will lead to the expert workshop in February 2008, involvement of universities to contribute to ICCHP special thematic session on science accessibility being organized by the @Science network in July 2008, preliminary collaboration with universities and assistive technology manufacturers which should lead to the network expansion. The use of the communication network is expected to increase in the coming months thanks to the growing number of subscriptions to the website. Furthermore, the undertaken evaluation and experimentation activities are crucial to produce reliable guidelines.