**IEC SEG AAL/CENELEC TC100X AAL Workshop:** Monday, March 10, 2014,

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Attendants: Paulo Alvito, Hamid Amir-Alikhani, Paul Coebergh van der Braak, Pat Cunniffe, Wim de Kesel, Kimberly Delort, Markus Dubielzig, Kate Grant, Ulrike Haltrich, Gerhard Henninger, Shuji Hirakawa, Jaekun Kwak, Janina Laurila-Dursch, Prof. Seongil Lee, Dejun Ma, Klaus Neuder, Stefano Pinardi, Pierre Sebellin, Thomas Sentko, Klaus-Peter Wegge, Hajime Yamada

## Opening Remarks by Thomas Sentko, chair of IEC SEG AAL

Workshop objective is to exchange information about work being done in field of AAL with an introduction to various groups working on AAL in Europe and internationally

## IEC Activities on Ambient Assisted Living: IEC SEG AAL (Mr. Thomas Sentko)

IEC now looking at systems view, master plan in IEC showed the need to address systems as well as products. System evaluation group studies the special market – AAL – and tries to evaluate role of fora and consortia in the market and ongoing standardization eg ISO, IEEE. Smart Grid tool on models used to map generic AAL use cases with input from German NC and EU projects. Aim to develop a systems committee in IEC. Some standards are needed to help customers in the field of AAL and need to understand from presenters what can help drive standardization from research project results. So ask for experiences and use cases that can be evaluated to decide whether standardization is appropriate.

## IEC Activities on Ambient Assisted Living: IEC TC 100 (Ms. Ulrike Haltrich)

Introduction on how IEC TC 100 has developed AAL projects in their area of work (audio, video and multimedia systems and equipment). TC 100 objectives and strategy are to enrich human life and contribute to society. TC 100 develops study sessions in AGS and this has led to the proposal for a new TA on Ambient Assisted Living, Accessibility and User Interfaces. AAL and Independent Living are both terms used for this area of work.

IEC TR 62678 was published in 2010 and considered the importance of including accessibility and usability in mainstream products. IEC TC100 published IEC 62731 in 2013 and universal framework for User Interaction in Multimedia AAL Spaces introduced as a IEC/PAS 62883. IEC TC100 identified 17 relevant AAL use cases in TR 62907. New work has been initiated on Digital television Accessibility – Functional Specification. IEC TC100 will have a workshop at the May meeting organized with CEA to explore aspects of AAL and independent living. TC100 has identified the potential role of Connected TVs not just as an entertainment device but also an “intelligent hub/home gateway”.

## IEC Activities on Ambient Assisted Living: CLC TC 100 X (Mr. Gerhard Henninger)

Role of the group is to monitor the adoption in CENELEC of work in IEC TC100; currently there are 2 WGs working on energy efficiency and also a focus group on AAL. Important to extend the involvement of AAL experts in the Focus Group, so far the group has led to the introduction of universAAL framework as a PAS in TC100 and the organization of the 2014 workshop.

## Objective of workshop:

Exchange of information between European AAL research projects and standardization activities and identify standardisation requirements in the field of AAL.

Many standards, some competing eg building automation and some standards which were developed without a recognition of AAL requirements and may need extension or adaptation.

Want to identify future needs concerning standards and certification, identify gaps where no suitable standards exist and encourage active involvement of research community.

**EU Project Presentations**

## Ms. Karina Marcus: EU AAL Joint Programme

ICT for Ageing Well, objectives are to deliver a better quality of life for elderly citizens, and strengthen the European Industrial Base. Develop products, services for ageing well at home, in the community and at work and create critical mass of R and innovation with projects close to the market.

AAL Joint programme has 50% public and 50% private funding. Each participant funded by their own country with a top up from EU. 19 EU member states and 3 associated non-EU countries (Norway, Israel, Switzerland).

**Each AAL JP call has a specific focus:**

1. Prevention and management of chronic conditions (e-health/telemonitoring)
2. Advancement of social interaction of elderly people (prevent loneliness and isolation)
3. Advancement of older persons’ independence and participation in the self serve society.
4. Advancement of older persons’ mobility (orientation and navigation and assistive technology inside and outside)
5. Home Care (enable older adults to live independently, and support informal carers)
6. Supporting occupation in life of older adults (active involvement paid or voluntary)

Consortia must have strong end-user involvement in any project; partners from 3 different states at least 1 business partner, 1SME and one end-user organization. High SME participation, also research and universities, large enterprises and endusers in the projects.

See [www.aal-europe.eu](http://www.aal-europe.eu)

**AAL JP Support Actions**

Action 1: AAL2Business to support bringing solutions to market in 2 to 3 years

Action 2: Collaboration with Regions with workshops to raise awareness of AAL JP projects

Action 3: User involvement in AAL JP projects, guidance etc

Action 4: Standards and interoperability in AAL to raise awareness of AAL solutions interoperability too facilitate market uptake.

Action 5: AAL information Portal to get better information about existing solutions about “ICT and ageing well”. (Portal must be sustainable not just during a project)

Action 6: Market Observatory of AAL: preliminary study in AAL field to provide information to supply and demand actors

**AAL Forum holds an annual conference:**

Vienna 2009

Odense 2010

Lecco 2011

Eindhoven 2012

Norrkoping 2013

2014 meeting in Bucharest 9-12 September 2014

**Finalising AAL 2 for 2014-2020 Active and Assisted Living** programme (in Societal Challenges SC1) and work with Active and Healthy Ageing Partnership.

Next Call is “Care for the Future” – an ageing society faces an increasing need for care, and need to consider how can ICT contribute to sustainable solutions. Information day will be held in Brussels on 16th April 2014, consortium building 17 April 2014. Want user involvement from the beginning in projects.

**Discussion:**

Have use cases and requirements been distilled from all the projects?

Who is on the advisory board (GA and have content working group for each call for approval by the GA, public consultations, stakeholder meetings, and review roadmaps eg Continua).

## Mr. Lars Rölker-Denker: Integration Profiles and AAL Use Cases

Challenges for future-proof AAL Systems

Systems must fit into existing houses and technology must interact with local infrastructure (eg building automation, and local service providers)

Identified more than 500 standards, how can they be used?, AALLIANCE2 project developed repository, and have gaps eg in remote maintenance, building plans for internal localization,

There are some approaches to complement standards eg conformance statement, application profiles, conformance testing, cross-vendor testing, integration profiles.

AAL JP Action on Interoperability: brief overview; collected 300 Use cases and distilled in to 7 representative use cases. Looked at FP6 and 7 projects etc, cluster most popular AAL system components and selection of most important use cases for integration profiles (analyse given use case, identify systems and system components and describe interactions as transaction and select standards for each transaction)

1. Behaviour monitoring
2. Calendar service
3. Social interaction with Smart TV
4. Shopping and nutrition planner
5. Mobility assistant
6. Personal trainer
7. Environmental health monitoring and alarm

4 of the integration profiles were developed further including identification of standards.

Behaviour monitoring

* Used for dementia/cognitive impairment support and address monitoring of users location and activities and identify potential dangers
* System with home automation sensors, power sensors re device use, optical sources, sensors on body (eg accelerometers to detect falling) etc. (see slide 20 figure)
* May have home automation gateway and body area sensor gateway (more limited coverage).
* Classify transactions as required or optional. Provide high level processing and data flow schematic and transaction definitions (slide 29) and each transaction is then described in greater detail. Referenced standards for each transaction identified.
* Other integration profiles eg Social interaction with Smart TV can reuse most of the originally identified transactions.

**Discussion:** Reliant on the infrastructure, what happens when it fails?

(IHE: integrating healthcare enterprise; interoperability in hospitals etc)

## Mr. Markus Dubielzig: AAL-JP CaMeLi, NavMem, ARGUS

Siemens department is “Accessibility Competence”

Working on 3 projects and considering on whether all devices are usable by endusers eg smart phone

## NavMem: Navigation Support for Older Travellers with Memory Decline

Project started in 1-10-12 and runs for 36 months, 7 partners working on a mobile companion to provide orientation and navigation support, easy to use. One mode can provide visual cues to next waypoint (chosen by user). Navigation mode enriched with photos etc, third mode is safety feedback to allow user to get help from informal carer. It can be difficult to make it really simple for the user, with standard technology/devices but need to adapt them to make simpler to use and understand. Important to know IEC ????? on how to make accessible information.

## CaMeLi, Care me for Life

2010 project to demonstrate that avatars are generally accepted even if limited to a interaction with standard remote control (yes/no). This new project will have avatar on tablet with avatar that can express emotion and is communication channel to friends/neighbours etc. Interaction with other people is important, makes people living alone more active, and developing an innovative virtual assistant -- an AVATAR.

Emotion and speech detection involve optical and acoustic aspects. Express emotion with gesture and voice. FaceReader is installed at many train stations, have fusion with voice analysis. ORBIS NL and ViVa CH are user partners, apartments for independent living and care home environment. Japanese study demonstrated that the more avatar looks like a human the less acceptable it is, need to find one agreeable for all users (may have to give users choice).

ORBIS want to install and maintain system so have major trial with large organization and project solution will continue to be available to enduser after the end of the project, currently early in project working on lab tests, installation end of 2014 in end user homes.

**Discussion:** User Studies have been mixed male and female and have not distinguished gender difference in acceptance of avatar.

Usability implications, but what standards are needed? too early (6 month into project) to be clear, gesture interaction mainly de facto standardized and some gestures are IP protected. But user interface has to be simple.

Similar research in Japan, but avatar moves with user; it does not remain in the house.

Issues of privacy have to be addressed, particularly if not limited to the home, but with one tablet need not be networked.

Is MPEG-V appropriate? And CEN has social chain alarm standard under development (CEN TC 431).

## Klaus Wegge:

Short introduction to status of Guide 71 revision, guide for addressing accessibility in standards. Not clear if this is a direct replacement for existing Guide 71 (KW thinks not).

New standardization mandate 473 “Design for All” in relevant standardisation initiatives” in Europe.

Mandate 376 closed end of February with the publication of EN 301549 (accessibility ICT for public procurement)

In EU new public procurement directive published, has to be implemented in 2 years. Standard procurement must be for accessibility support.

## Mr. Stefano Pinardi: Easy Reach Project, Interfaces for Elderly

SpinNet Lab works on sensors and applications such as healthcare for the elderly.

Industrial area of Milan has a lot of elderly,

Ambient sensors (temperature, humidity, light, distance, presence)

Wearable sensors (accelerometers, gyroscopes, compass, heart rate, oxygen saturation)

3 case studies, intelligent monitoring and AAL JP projects.

Independent Living for the Elderly: by 2030 in Italy more elderly than young

Need to help caregivers to monitor and manage emergency situation and intervene as necessary. Need pervasive sensors, vertical integration of data, horizontal integration of technology and intelligent analysis of data for caregivers. For example use case to prevent falls.

Project to investigate the use of mobiles by the elderly, with an appropriate interface design which is both simple to use and simple to understand; by using touch screen with photos to send message, audio or video messages rather than use the keyboard. The other service will be geo-location of people and service, again relies on interaction with a touchscreen. Additionally there is a requirement to connect the young and the elderly, the young use social networks while the elderly do more one-to-one communication.

Case 3 is social application for home-based people using the Smart TV, use android embedded sensors, airpointer for gesture recognition. Elderly people may have less accurate gestures because of impairments. In phase 3 create pilot home TV interface driven by gesture interface and integrate with mobile interface.

Undertake software usability measurement inventory to collect user feedback.

More pervasive use of sensors, more opportunity for user communication and in the medium term the challenge is integrated services and applications with intelligent homes and local services. In long term smart society should deliver solutions. Easy to use solution for the elderly will be easy to use technology for everyone.

Mr. Paulo Alvito: Robot Platform Development and System Integration for the projects

ID Mind develops Entertainment, remote inspection and services application robots

Low cost platform to put laptop on, and control robot with Skype. Also transfer to Goggle because Skype now MS and developer support stopped

Remote operated vehicle with sensors and clients develop software

Service robotics 2010 bank installation assisting location finder and need to work without human intervention, swarm of 5 manage which charging, and flow of information. If not receive update from motor then do reset.

Note: IEC are now studying robot service applications,

Critical issues are meeting user needs, robustness (dependability), autonomy of operation, and safety, and a reasonable price.

SocialRobot

Develop integrated mobile care platform, to navigate indoors with unstructured environment, with reminder services, and also social community network.

2 wheel differential robot platform, use serial communication protocol (I2C) for low level boards. And robots also have USB and low level sensors on platform eg temperature, humidity (user content) and device sensors (battery, motor and driver temperature. Additionally higher level sensors eg odometry, laser ranger, infra-red markers, Kinect type camera, camera and microphone, touch screen, speakers, LEDs for robot to show basic status.

Aim to deliver for less than 8000euro; designing shell to go over base electronics

Software integration using ROS robot operating system, no longer supported product but almost all robot community work with this OS and it is an open source activity (MIT model).

## MOnarCH - Multi-Robot Cognitive Systems Operating in Hospitals

Feb 2013-Jan 2016, to provide swarm of robots in hospital environment to do activities with children who are long stay, eg in oncology centre in Portugal and core target is 6-7 years with robot to be smaller than typical child of this age. First stage the 4 wheel omni-directional platform is complete and now designing shell.

Low level communication architecture and each micro-control loop is monitored for diagnosis and safety by sending information to high level computer systems. Navigation computer runs in Linux, and interaction computer (tablet) runs windows for user interaction.

Safety is very important, use soft materials and have bump detection with detection switches. Can control velocity and acceleration, in places can go faster, but if need to stop must have smooth movement. Use sonar obstacle detection. All boards must be in normal operation state for the motor drivers to be enabled.

## FROG - Fun Robotic Outdoor Guide guide robot to engage tourists with fun exploration of outdoor attractions,

System with sensors, robot, vision model, navigation model and augmented reality model and can display this over real images on the screen eg in zoo. Or in tourist attraction can see images of site in earlier times. Final design was a 4 wheel platform base and soft foam bumper with 12 sensors that immediately cut motors on contact, had to reduce weight by battery choice, additional cooling because of use environment, some additional emergency stop override. Engaging shell designed, people should not touch sensors so have green shells, and weigths circa 100kg.

Discussion:

ISO 13482 2014 safety requirements for social care robots (TC184 SC2)

IEC have AHG with China and Germany to explore robot applications

Also IEC TC59 doing work on mobile robot platform etc. [**IEC 62849 Ed. 1.0**](http://www.iec.ch/dyn/www/f?p=103:38:0::::FSP_LANG_ID,FSP_APEX_PAGE,FSP_ORG_ID,FSP_PROJECT:25,20,1275,IEC%2062849%20Ed.%201.0)

Performance evaluation method of intelligent mobile robot platform for household and similar applications

Specific group looking at safety issues with robots in public places. Have standards for industrial robots

## Mohammad-Reza (Saied) Tazari: UniversAAL and ReAAL

UniversAAL “Ecosystems around common open platforms to achieve de facto interoperability standards.”

AAL is a multi-vendor market, therefore interoperability is a major challenge. Individuals need to be able to pick applications and services to match their needs. System must be able to evolve and add new functionality as required.

Lecce declaration signed by more than 200 organisations from more than 44 AAL projects with 9 measures identified to help achieve a common open platform. Had been parallel projects working on AAL platforms eg Amigo, GENESIS, MPOWER, OASIS, PERSONA SOPRANO.

Need to put technology enablers under real life stress test in the project REAAL.

UniversAAL tried to establish common understanding of AAL, in reference model, and common approach to software development in the reference architecture and a specific software solution in a concrete architecture for AAL. UniversAAL based on market support through uStore, development support through AAL studio (developer depot), operational support through AAL Space. However market envisages AAL service provider rather than user individually choosing a specific product. Or would have to install run time environment and then add desired service (may not be something a typical AAL user can manage). Context Bus, Service Bus and UI (User Interaction) bus akin to 3 buses of UPnP systems.

Have 352 active UniversAAL accounts, 4 living labs, at OneM2M meeting in Berlin (April) UniversAAL will present specification for semantic interoperability.

AALOA Manifesto see [www.aaloa.org/manifesto](http://www.aaloa.org/manifesto)

## ReAAL

Promote standards, guidelines and open platforms for interoperable solutions ion the domain of AAL and active and independent living.

Will evaluate the role of a common open platform

Measure related socio-economic impact eg vendor lock in, missing AAL ecosystem, lack of best practices and lessons learned and lack of information on return on investment.

Technical barriers include that scope of AAL is too open and diverse, no clear technology trends, lack of interoperability guidelines based on open solutions, lack of commonly adopted platform, maturity, usability and reliability of candidate platforms not proven.

Analyse effectiveness of pilot’s value chain and derive replication guidelines.

Deploy several applications in several pilot sites 7000 people and 7 countries)

Shape a business model and ensure sustainability of different UniversAAL entities.

Need to find evidence, costs for adoption, evidence that costs pay off for different stakeholders etc.

Advisory board has DKE, AAL JP, ETSI, DALLAS etc.

Example pilot site, each has a number of users and specific applications. Eacxh pilot has a technical partner providing services to pilots.

* 60 users in 22 apartments in intelligent home environment, day centre etc in Germany; fall detection by CapFloor.
* 300 users in Norway, mobile safety, safety at home, electronic locks, tracking for dementia patients

See <http://cip-reaal.eu>

**Discussion:** No control group, no attempt to analyse the effectiveness of other approaches. Perhaps this survey could motivate the market with a focus on a unifying platform, each pilot chooses applications freely.

Personal information handling might be a barrier that changes with countries. Potentially a common platform can provide shared security solutions, not for each application but a service for all. Some have cloud services, some use gateway, interoperable in each pilot site because each has multiple applications to give data sharing interoperability.

In reality would need relatives to configure system, not clear how would interoperate with other systems put in by other vendors,

## Open Discussion and Closing Remarks

Robots work in communities, there is a specific group working on robot companions in AAL/ageing well applications.

Smart homes and smart environments could be a logical basis to add applications for specific requirements related to AAL.

Need to consider JTC 1 work in reference architectures eg SNRA the sensor network reference architecture and the work on RA for internet of things.

In the smart home have aspects of entertainment, energy, surveillance, and AAL. Is AAL another entity in the smart home? Or is it different because also applies to care homes, apartment blocks etc

Target communities that are energy poor, do not want solutions that are energy hungry, do not want to replace care givers with systems because they can be energy consumers.

With renewable energy then storage in the house will be important, if need continual service have to take precautions eg potential requirement for solar panels when anyone on life support in NZ.

New IEC TC on storage of energy and must be some solutions to address issues, eg Germany has to shut down power plants because too much energy from renewable sources. Also must consider disaster recovery.