AALIANCE2

European Next Generation
Ambient Assisted Living
Innovation Alliance

Standardisation

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Introduction

- The vision of AAL: an intelligent environment that surrounds, monitors and „understands" the user, offers support when needed and remains invisible otherwise.

- Technically this requires a collaboration of many components and enabling technologies:
  - Components: sensors, actuators, networks, computers…
  - Services: mobility, meals on wheels, concierge…
  - Processes: social care, health care…

Interoperability

- The ability of all components to work together as one system is called „interoperability".
- This is of prime importance for AAL:
  - Large variance of user needs and preferences
  - „Future-proof", extensible systems
  - Integration with local infrastructure (e.g. home automation)
  - Integration with local service providers (e.g. taxi)
  - No full-range suppliers
- Most important building block for interoperability: standards.

Standards

- Standards play an important, but largely invisible role in our lives!
  - Product safety, interoperability, quality…
- Standards are public, vendor-neutral specifications, their use is voluntary
  - Bodies: CEN/CENELEC/ETSI, ISO/IEC/ITU
- Industry standards have slightly lower requirements with regard to neutrality and openness, but are also quite important.
  - Bodies: IEEE, IETF, OASIS, Continua Health Alliance, IHE…
  - Especially the IT sector is dominated by industry standards

Standards for AAL: Topics

- Interoperability
- Usability and ergonomics, „design for all"
  - User interface design for older adults
  - Users with special needs (vision, tactile etc.)
- Product safety and risk management
  - Electromagnetic compatibility & safety
  - Risk management in medical applications
- Privacy and data protection
- Processes and services
  - Quality criteria for AAL services
  - Guidelines for product development
- Certification

Risks and Problems

„A camel is a horse designed by committee.“
Alec Issigonis

- Complexity of standards
  - Standards often designed to cover many use cases, thus very complex and expensive to implement
- Competition
  - A product with standardized interfaces is easier to replace with a product from a competitor
- Interoperability issues
  - Standards often ambiguous, implementations faulty
- Obstruction of innovative solutions
  - The consensus and publication process is slow, standards are often years behind the state of the art.
- Access to standards
  - Access to official standards is expensive („pay-walled“)
  - Public info insufficient to decide which standards are needed

Why Standards are Not Enough

Source: Wikipedia

- Problems
  - Incompatible options (alternatives) in one standard, e.g. USB plugs
  - Faulty implementations
  - Interoperability must be addressed on multiple layers
  - Mapping of data between protocols (e.g. from ISO/IEEE 11073 to HL7) not defined

Approaches

- Conformance statement: detailed documentation of the options chosen during implementation of a standard
- Application profile: restriction of options for a certain use case (e.g. MPEG2 „Main Profile @ Main Level“)
- Integration profiles: Combination of multiple standards and application profiles for one use case
- Conformance testing: Use of test tools to validate correct implementation. Foundation for certification.
- Cross-vendor testing: systematic testing of products from different vendors

- All these approaches complement each other, there is not the „single solution“ solving all problems!

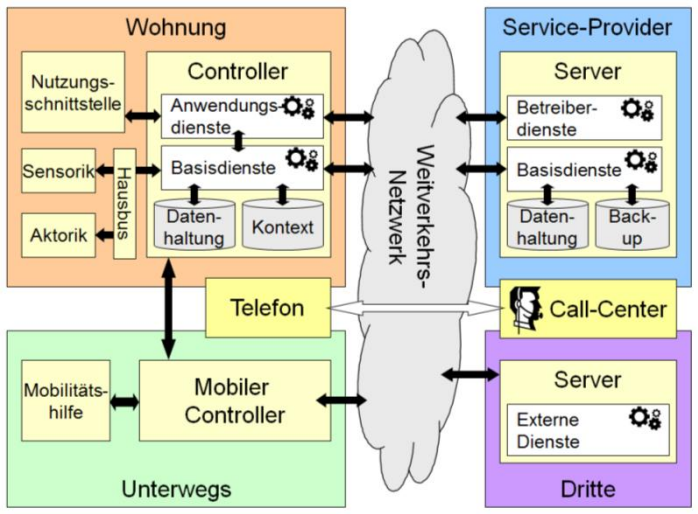
AALIANCE2 Recommendations: „Standardisation Watch Initiative“

- A multitude of standards of relevance for AAL exists, but nobody has an overview!
  - Result: we keep re-inventing the wheel
- AALIANCE2 has established an online repository (Wiki) of relevant standards
  - http://nero.offis.de/projects/aaliance2/ *
  - more than 400 entries
  - Requires continuous maintenance!
- Recommendation: Creation of a neutral and independent initiative that supervises the standards “scene” for the AAL community and offers independent information.
  - Could be integrated into the AALIANCE2 network or EIP-AHA

* Interested in the „Repository of Standards“? Send mail to<aaliance2@offis.de>

AALIANCE2 Recommendations: AAL Reference Model

- Discourse requires a common under-standing of terms and concepts
- A common, generally accepted AAL reference model as basis for discussion, standardization and development?
  - It is probably too early for that



- Recommendation: A European coordination project working towards a common AAL reference model:
  - Harmonization of terms and concepts in use
  - Collection of use cases and related requirements
  - Analysis of reference model from related domains (smart home, IoT) with regard to suitability for AAL
  - Coverage of technical level and service level.

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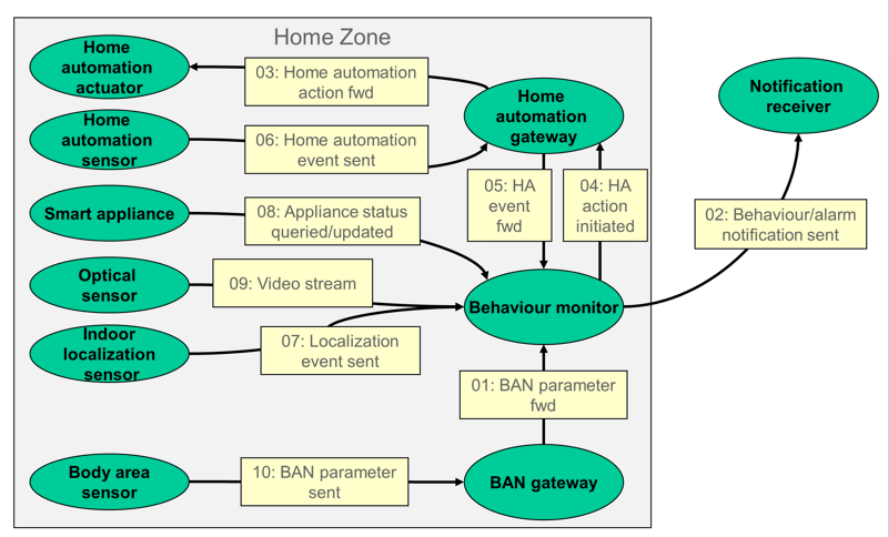
AALIANCE2 Recommendations: AAL Integration Profiles

- Integration profiles describe for one use case the system components, functions, and interfaces, and map these to standards.
  - Successfully used in eHealth



- This topic is addressed in several activities in AAL:
  - DKE AK „AAL Interoperability", IEC SG5, AAL-JP „Action on Standards"
  - Requires long-term work and suitable organization
- Recommendation: Creation of an international body for the development of integration profiles for AAL
  - Could be hosted e.g. by Continua or IEC.

AALIANCE2 Recommendations: Certification

- Certificates are independent confirmations assuring certain product properties.
  - Can grow market if they help the customer to choose and purchase the right products
  - However, certification processes are expensive
- Different certificates are possible in AAL:
  - Technical certificates: compatibility, interoperability
  - Data protection compliant product design
  - AAL building certificate documenting infrastructure
- Recommendation: Certification for AAL is sensible but should be harmonized European-wide.

AALIANCE2 Recommendations: AAL and Medical Device Law

- Products for diagnostic or therapeutic purposes are subject to the medical device directive (93/42/EEC) in the EU.
  - High requirements on quality assurance and risk management
  - Consequence: medical device products are expensive.
- Many vendors are afraid that AAL products would be subject to the MDD, thus too expensive for the market, and consequently do not even start to invest into this sector.
- Recommendation: Creation of an expert group with AAL and MDD experts that
  - 1. examines how the AAL service model can be mapped to the MDD and which modifications of the MDD may be needed
  - 2. provides recommendations to AAL system developers concerning medical device classification, and the handling of systems with medical and non-medical components

AALIANCE2 Recommendations: AAL and Data Protection

- Systems that monitor the user at home are recording very intimate and thus sensitive data.
  - Recommendation: Data protection must be considered from the start in AAL system design („Privacy by Design“)
  - Special attention is needed when data leaves the home environment (and thus control) of the user.
- Data protection law represents the mainframe age and is quite fragmented in Europe
  - The NSA/GCHQ scandals and the handling of personal data by international companies like Facebook show that the current data protection law is outdated
  - On the other hand there are certainly legitimate developments that are impeded by the current laws
  - Recommendation: Long-term “re-launch” of the European data protection law.

Conclusion

- The AAL sector seems to develop – albeit slowly – from research to large-scale pilots to commercial projects.
  - The topic of standards and interoperability has not yet received the attention it deserves
  - However, at this time there are many interesting developments
    - The Continua Health Alliance is interested in AAL
    - The IEC plans a "Systems Committee" on AAL
    - On national, EU/FP7 and AAL-JP level there are initial (albeit small) projects addressing these issues.
- It is difficult to keep the overview of what is happening where. One more reason to call for an „AAL Standardisation Watch Initiative"!

Thanks for your attention. Questions?

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- Further Information:
  - AALIANCE2 D4.5 Updated Report on Standards and Certification in AAL, http://www.aaliance.eu/
  - AALIANCE2 Repository of Standards: http://nero.offis.de/projects/aaliance2/