An Open Virtual Neighbourhood Network to connect Intelligent Buildings and Smart Objects

ETSI workshop on Internet of Things in the Smart Home
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Coverage of ICT-30 (IoT) call

ETSI workshop on Internet of Things in the Smart Home
Consortium

Big RIA Project:

1) TU Kaiserslautern, DE (Coordination)
2) ATOS Spain SA, ES
3) Centre for Research and Technology Hellas, GR
4) Aalborg University, DK
5) Gorenje Gospodinjski Aparati D.D., SL
6) OTE – Hellenic Telecommunications Organization S.A., GR
7) bAvenir s.r.o., SK
8) Climate Associates Ltd., GB
9) InterSoft A.S., SK
10) Universidad Politécnica de Madrid, ES
11) Gnomon Informatics S.A., GR
12) Tiny Mesh AS, NO
13) HAFENSTROM AS, NO
14) Enercoutim – Associacao Empresarial de Energia Solar de Alcoutim, PT
15) Municipality of Pylaia-Hortatis, GR

48 Months, 15 Partners, 9 EU/EFTA countries
Challenge and Vision

IoT arises from **interoperability of things on semantic layer**, creating **new services**

However,

- “Silos” or “Islands” characterize status
- Different
  - standards (W3C, oneM2M, FIWARE, ZigBee, ...),
  - Application areas (energy, mobility, health, building automation, ...),
  - brands (deliberate vendor locks, incompatibilities, ...)
  - ...
- Gap to users, social networks, market of services ...
Vision:

- To provide **Interoperability as a service**
- To create a platform for domain-crossing, **value-added services**

...by building and demonstrating:

- a **bottom-up ecosystem of decentralised interoperability** of IoT infrastructures called a **virtual neighbourhood**, 
- a social network for things, enabling **value added services**
  - users can **share** the access to their smart objects **without losing the control** over them
  - where **x-domain services and business models** can be established
Approach: VICINITY User Platform

Local VICINITY Gateways
- Technical interoperability (WLAN, ZigBee, ...)
- Data local under user’s control
- Execution of Apps

VICINITY IoT Cloud Services
- Semantic Interoperability as a Service
- Aggregation of data à la Facebook
- New services via 3rd party „Apps“
HW/SW Platforms

- HW nodes: SmartCoDe FP7, TinyMesh
- Android or OSGI VM
- Protocols: ZigBee, WLAN, Bluetooth Mesh, TinyMesh
- W3C Linked Data Platform (LDP), FIWare?

Semantic interoperability

- Interoperability middleware building on LinkSmart/Hydra, Ebbits
- Ontologies from Ready4SmartCities, SmartCoDe FP7, OneM2M ...
  (+ dynamic, user-driven, bottom-up extensibility, ... )

Evaluation of APIs and standards by model-based approach within development process

=> Feedback to standardization
Pilots: World Wide Vicinity

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Pilot 1: Smart Energy Microgrid enabled Municipal buildings

Municipal buildings in Algarve region, Portugal

- Community-scale energy microgrid

VICINITY value-added services:

- Data exposition to citizens so that they can understand the value of the investment
- Access to key performance indicators
Pilot 2: Assisted Living integrated in Smart Grid Energy Ecosystem

Demand Side Management (DSM) combined with Assisted Living.

VICINITY value-added services:

- **Real-time monitoring** of building facility and occupancy
- **User energy profiling**
- **Assistive services** for people with disabilities
- **Health** personnel services

[Image of a Smart Grid Energy Ecosystem]
Pilot 3: Intelligent (Transport) Parking

VICINITY value-added services:

- Virtualized and distributed Business Intelligence framework providing customized recommendations.
- Mobile apps presenting information on parking space options, allowing behavioral incentives.
- Intelligent distribution/allocation of parking space in case of conflict situations.
- Payment services with variable pricing system based on historical data analysis.
- Linked with authorization offered to residents or other prioritized visitors to healthcare apartments.
Electronic **medical care services** demonstrated in homes of the municipality of Pilea-Hortiatis in Northern Greece.

VICINITY value-added services:

- Intelligent processing of multi-sensorial signals received to raise events/alerts based on abnormal conditions (e.g. end-user hasn’t interacted with any device for a prolonged period)

- **Clustering of users** with similar profiles and health data streams constructing a **social network**
Smart Buildings Pilot
Home/Building

Manufacturing/Industry Automation

Intelligent Vehicular/Transportation
Transportation

eHealth Healthcare Pilot
at Home Pilot

Smart Energy Pilot

Cities Wearables

Farming/Agrifood

Horizontal/Telecommunication

Source: AIOTI WG3 (IoT Standardisation) – Release 2.0
Recommendations for Standards Involvement

VICINITY Architecture → Requirements for future standardisation → Relevant existing standards and standardization groups → Analyse gaps → Priority standardisation activities

VICINITY stakeholder requirements
Priorities for VICINITY Standards participation

- ETSI SmartM2M
- ETSI Intelligent Transport Systems (ITS)
- oneM2M Partnership Project
- W3C Web of Things
- ITU-T SG20 IoT and its applications including smart cities and communities
- CEN TC278 Transport Telematics and Traffic
- ISO TC 204 Intelligent Transport Systems
- AIOTI WG3
More Info: vicinityh2020.eu
www.swrmediathek.de/player.htm?show=2c253ce0-c076-11e5-a04b-0026b975e0ea