IoT technologies and platforms for enhanced living environments

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• Introduzione
• Scenario di riferimento
• Stato dell’arte
• Dai progetti ai prodotti
• L’opportunità
• Iniziative nazionali ed europee
• Conclusioni
A major concern in enhanced living environments (ELEs) is the efficient daily use of sensors in the collection, monitoring, and storing of data to improve users' quality of life” [1]

ELE complements the classic scenario with sensor network environments, aiming to build smart environment for providing noteworthy improvement to quality of life for the elderly or, people with special needs.

Globally, the ageing population is increasing at an unprecedented rate.

By 2060 one in three Europeans will be over 65.

This demographic shift presents a challenge as well as an exciting commercial opportunity as the Silver Economy emerges as a new market.

Innovative technological approaches are needed that cater to the needs and aspirations of older adults, empowering them to continue to lead independent lives and play an active role in society, whether that be at home, work, education, or in their community.

How can technology help older adults to live independent lives?
IoT technologies and platforms for enhanced living environments

Scenario di Riferimento - II

Dominii di riferimento per ELEs
IoT technologies and platforms for enhanced living environments

**Stato dell’Arte**

EU project (number 247950) 2010-2014

AAL Open Association - AALOA

http://aaloa.org/

AIOTI

ALLIANCE FOR INTERNET OF THINGS INNOVATION
Stato dell’Arte

Universal Open Architecture and Platform for Ambient Assisted Living (uAAL)

From «universAAL Architecture Handbook» available at:
AAL Open Association - AA LOA

AA LOA aims to develop an *open and shared software infrastructure* to be used as commodity by many stakeholders.

universAAL IoT

• UniversAAL IoT is the open source platform that enables seamless interoperability of devices, services and applications on an unprecedented scale, by integrating every available technology, in a true Internet of Things (IoT) approach.
• This collaborative vision is what founded universAAL, an operating system for IoT enabled smart environments.
• The platform provides the framework for communication, connectivity and compatibility between otherwise disparate products, services and devices.
• By empowering rapid development of IoT solutions, universAAL is the catalyst for a truly customised lifestyle experience.

Smart Living Environments

universAAL IoT is the platform through which wearables, home automation and any future Internet of Things enabled product or service can combine, and the solution to introducing interoperability to people’s lives.

https://github.com/universAAL/platform/wiki/Understanding-universAAL
AIOTI Alliance for Internet of Things Innovation

The Alliance for Internet of Things Innovation (AIOTI) was initiated by the European Commission in 2015, with the aim to strengthen the dialogue and interaction among Internet of Things (IoT) players in Europe, and to contribute to the creation of a dynamic European IoT ecosystem to speed up the take up of IoT.

AIOTI aims at **breaking silos between leading vertical**.

Objectives of the Alliance include: fostering experimentation, replication, and deployment of IoT and supporting convergence and interoperability of IoT standards; gathering evidence on market obstacles for IoT deployment; and mapping and bridging global, EU, and member states’ IoT innovation activities.

**WG5**: Smart Living Environment for Ageing Well

https://aioti.eu/
**AIOTI WG5: Smart Living Environment for Ageing Well**

**Scope**
- Supporting older people in staying active, independent and out of institutional care settings
- Reducing the costs of care systems
- Providing a better quality of life for vulnerable citizens

**Focus on**
- Elderly Care and Health
- Smart Home / Home Automation

**Large Scale Pilots (LSPs)**
- Goal: validation of most advanced IoT solutions in real-life scenarios and with the complete value chain and actual users
- Parameters to be evaluated: QoL, efficiency gains, financing models, organisational changes, socio-economic impact

https://aioti.eu/
Designing user interfaces (UIs) for elderly and/or disabled is a big challenge. They have various special needs that have to be considered in every aspect of a design process. Intelligent UIs that tailor interaction and presentation capabilities based on user needs, preferences and expectations can significantly increase the usability of information and communication technology (ICT) for Enhanced Living Environment (ELE) [2]. The improvement of the user interfaces and thus of devices and solutions for older people based on design for-all principles shall improve older people’s access to, acceptance of and use of ICT-based services.

L’opportunità

- L’invecchiamento della popolazione si traduce in un’opportunità di crescita per l’economia nazionale.
- Rivoluzione culturale e progettuale, volta a favorire lo sviluppo, nel Paese, della silver economy, cioè un insieme di attività economiche, anche industriali, finalizzate a dare una risposta ai nuovi bisogni, tanto di servizi quanto di prodotti, legati all’allungamento della vita.

Secondo Assoprevidenza, il giro di affari della fascia di popolazione oltre i 60 anni di età può arrivare a muovere sino a 122,5 miliardi di euro. Oggi un italiano su quattro ha oltre 65 anni e che si stima che nel 2050 si possa arrivare a uno su tre. Guardando invece agli “over 60”, si contavano circa 17 milioni di consumatori potenziali alla fine del 2016, che, sempre secondo stime, potrebbero superare i 23 milioni entro la fine del 2040.
The European Silver Economy concerns Europe’s older citizens. It includes all the economic activities relevant to the needs of older adults, in many sectors: health and nutrition, leisure and wellbeing, finance and transport, housing, education and employment.

The Silver Economy is closely linked to current trends in Europe’s demographics, and the effects on older adults’ quality of life and on the wider European economy.

Silver Economy members also have particular needs, which will evolve with the current rapid rate of technological and demographic change.
Various DGs of the European Commission (EC) already pursue Silver Economy policy initiatives, e.g. on eHealth, active and healthy ageing, senior tourism and age-friendly housing.

Current EC measures include the Active and Assisted Living Joint Programme, the eHealth Action Plan, the European Innovation Partnership on Active and Healthy Ageing as well as dedicated parts of Horizon 2020 Societal Challenge 1 on Health, Wellbeing and Active Ageing.

The European Commission also supports the Joint Programming Initiative ‘More Years, Better Lives – The Potential and Challenges of Demographic Change’, an EU member state-driven initiative seeking to enhance coordination and collaboration between European and national research programmes related to demographic change.
Iniziative Nazionali ed Europee

Cluster Nazionale Tecnologie per gli Ambienti di Vita

Cluster = Orchestratore di ecosistemi dell’imprenditorialità innovativa high-tech

- Progetto SHELL: Ecosistemi domestici condivisi ed interoperabili per ambienti di vita sostenibili, confortevoli e sicuri
- Progetto Active Ageing at Home
- Progetto Desing For All: Integrazione di SW e di Interfacerce Uomo-Macchina nel design per Ambienti di Vita Assistita

DD n. 1735 del 13/07/2017: AVVISO PER LA PRESENTAZIONE DI PROGETTI DI RICERCA INDUSTRIALE E SVILUPPO SPERIMENTALE NELLE 12 AREE DI SPECIALIZZAZIONE INDIVIDUATE DAL PNR 2015-2020

Le 12 aree di specializzazione su cui si focalizza il bando sono: Aerospazio; Agrifood; Blue Growth; Chimica Verde; Cultural Heritage; Design, creatività e Made in Italy; Energia; Fabbrica Intelligente; Mobilità sostenibile; Salute, Smart, Secure and Inclusive Communities; Tecnologie per gli ambienti di vita.
The Activ84Health Explorer is a platform that allows users to freely explore known and new areas while being physically active, from within the safety and comfort of an indoor setting.

The platform uses Google Streetview images and opens a window to the world for the users that can no longer go outside independently. The platform stimulates reminiscence, challenges the user to remain physically active and train their memory, and promotes exploration. The Activ84Health platform relies on cloud-based software, and requires a tablet for navigation (through the touch-screen functionality). Each user has an individual profile, which allows the platform to take into account personal physical and cognitive abilities. Additionally, this allows the collection of individual data on physical activity, dedicated indicators such as duration of a work-out, cadence speed and route choice.

ACTIVE AND ASSISTED LIVING PROGRAMME
ICT for ageing well

More than 40% of the entities funded are SMEs
We aim at funding development and innovation projects that show a clear promise to bring new products, solutions or services concepts to the market within 2-3 years after the end of the funding period.

The second AAL Challenge Prize just launched
Conclusioni

• Nello sviluppo di architetture e piattaforme IoT per ELEs si stanno affermando alcune soluzioni di riferimento nate da progetti di ricerca poi evoluti in soluzioni per il mercato
• Rimane comunque una elevata frammentazione di proposte, tipica dello scenario IoT e comune a diversi settori
• Nel caso specifico delle soluzioni ELEs, un aspetto critico e spesso sottovalutato riguarda il ruolo dell’utente, e quindi la sua centralità in termini di requisiti di design – fondamentale applicare approcci di tipo «design for all»
• I trend demografici in atto in Europa e nei paesi maggiormente sviluppati, legati all’aumento delle aspettative di vita, stanno creando nuove sfide ma anche nuove opportunità economiche, come quelle associate alla Silver Economy
• L’Europa, in particolare, ma anche altre nazioni come Canada, Giappone, USA, stanno sostenendo da anni l’emergere della Silver Economy con iniziative di supporto alla ricerca orientata al mercato
Grazie per l’attenzione!
Domande?

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