



HEALTH AND WELL-BEING IN SOCIO-TECHNOLOGICAL ECOSYSTEMS

Alberto Sanna

Director Research Center Advanced Technologies for Health and Well-Being



Advanced Technology
in Health and Wellbeing





Research Center Advanced Technologies in Health & Well-Being

Research Program and Business Development

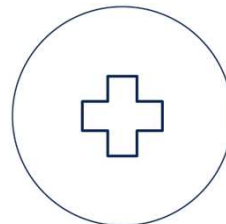
Smart *er* & Healthi*er* City



Smart *er* & Healthi*er* Life



Smart *er* & Saf*er* Hospital



European
Network of
Living Labs





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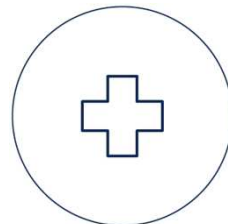
Smart *er* & Healthi*er* City



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San Raffaele Smart City: a Socio-Technological Ecosystems to... ... *address* social, technological, business, organizational, policy *complexity*

- Besides Raffaele the hospital (1300 beds) and university, 74.000 square meters are dedicated to labs, offices and meeting rooms, and a new smart building is on its way!
- 4.000 sqm retail area, Supermarket, Bookstore, Travel, Optician, Jewelry, Insurance, Restaurants, cafeterias, etc.
- Hotel (200+ rooms), Residence apartments
- Indoor and outdoor sports facilities and horse riding, high school, kindergarten, university, etc.
- 3000 + Underground & surface parking
- Shuttle monorail connection with public underground; direct connection to highway, close to Milan Linate airport, on-site private heliport.
- Energy-independent power plant on site (cogeneration)
- ...



312.000 sqm total San Raffaele Smarter City Area | **25,000+** people everyday on site: Patients, visitors, employees, students, etc.

Research Center Advanced Technologies in Health & Well-Being

Mission



ENGINEERING AWARENESS

in socio-technological ecosystems to sustain healthier,
greener and fairer Individual and collective behaviors



Research Center Advanced Technologies in Health & Well-Being

Personalized and Trustworthy Services for Healthier & Greener Lifestyles

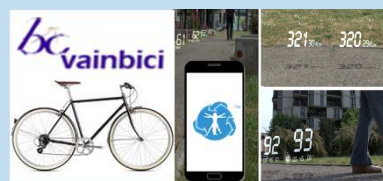
PHARMA INDUSTRY



HOSPITAL



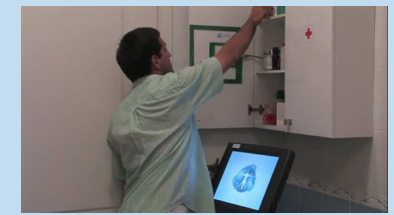
PHYSICAL ACTIVITY



SUPERMARKET



HOME



FOOD INDUSTRY



MEDIA INDUSTRY



PHARMACY



MEDICAL DOCTOR



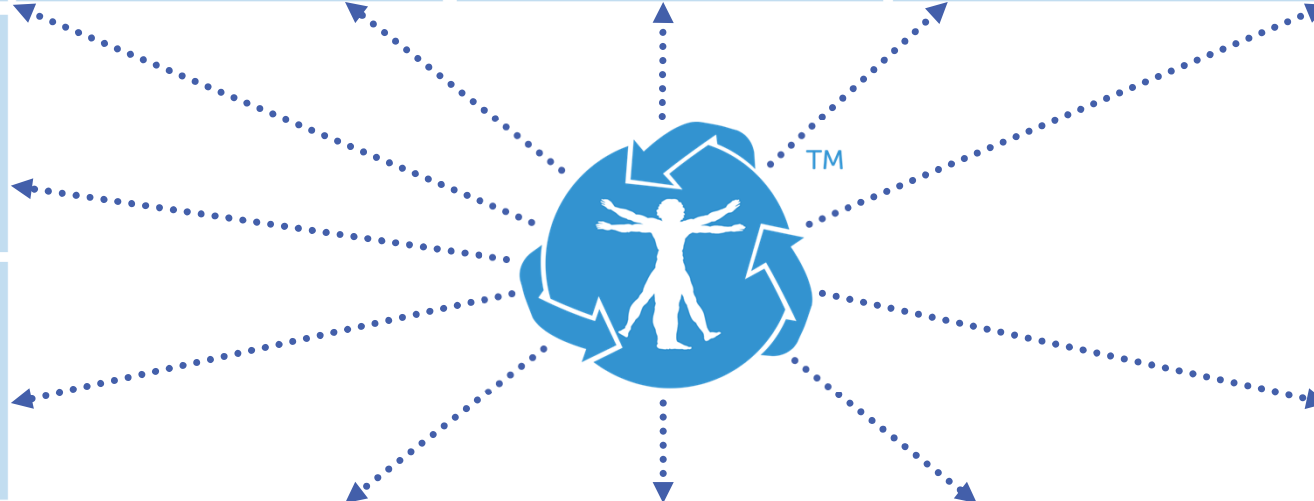
WORKPLACE



MOBILITY



SCHOOL



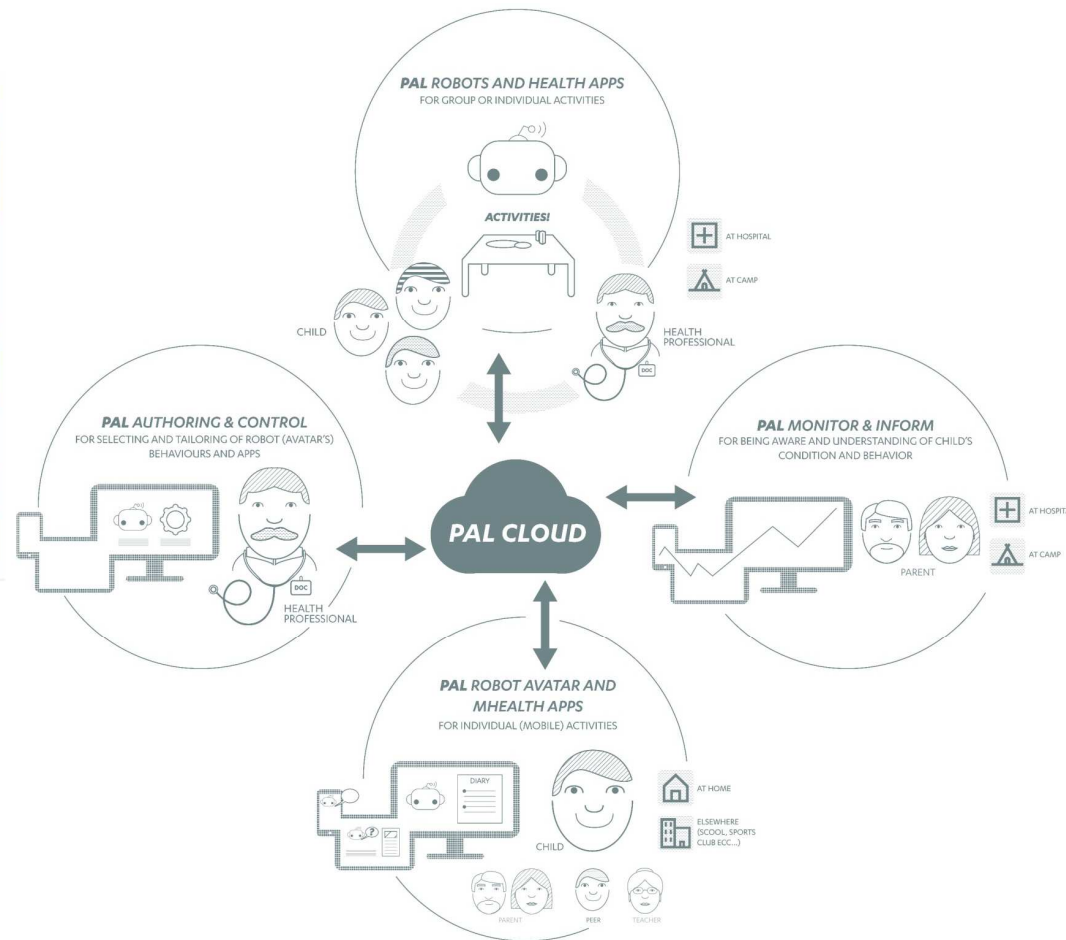
e-Services for Life and Health to Deliver Personalized Medicine

Health Education for Kids in Social Hubs, Schools, Museums, etc.



e-Services for Life and **Health** to Deliver Personalized Medicine

Personal Assistant for Health Education and Adherence for Kids with DMT1



e-Services for Life and **Health** to Deliver Personalized Medicine

Personal Assistant for Health Education and Adherence for Kids with DMT1



VIDEO PAL

https://youtu.be/v_7RqBq6tv0

VIDEO ALIZE

<https://youtu.be/K7pDGKKIxVU>



Personalized e-Services for Well-being in automotive and Mobility

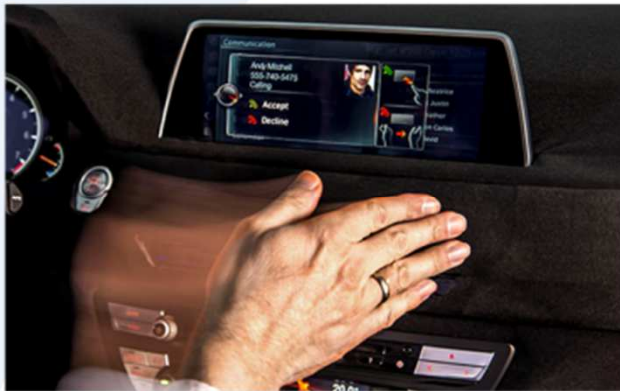
Biomechanical and Cognitive Car Interfaces & Door-to-Door Mobility



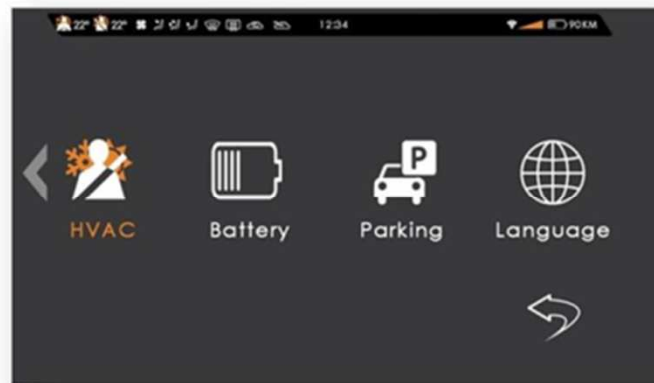


Well-Being in Automotive and Mobility

The Personalized Car



Innovative **HMI based on gesture recognition** simplifying the operation of the auxiliary systems



On-board display design based on **advanced cognitive science studies**

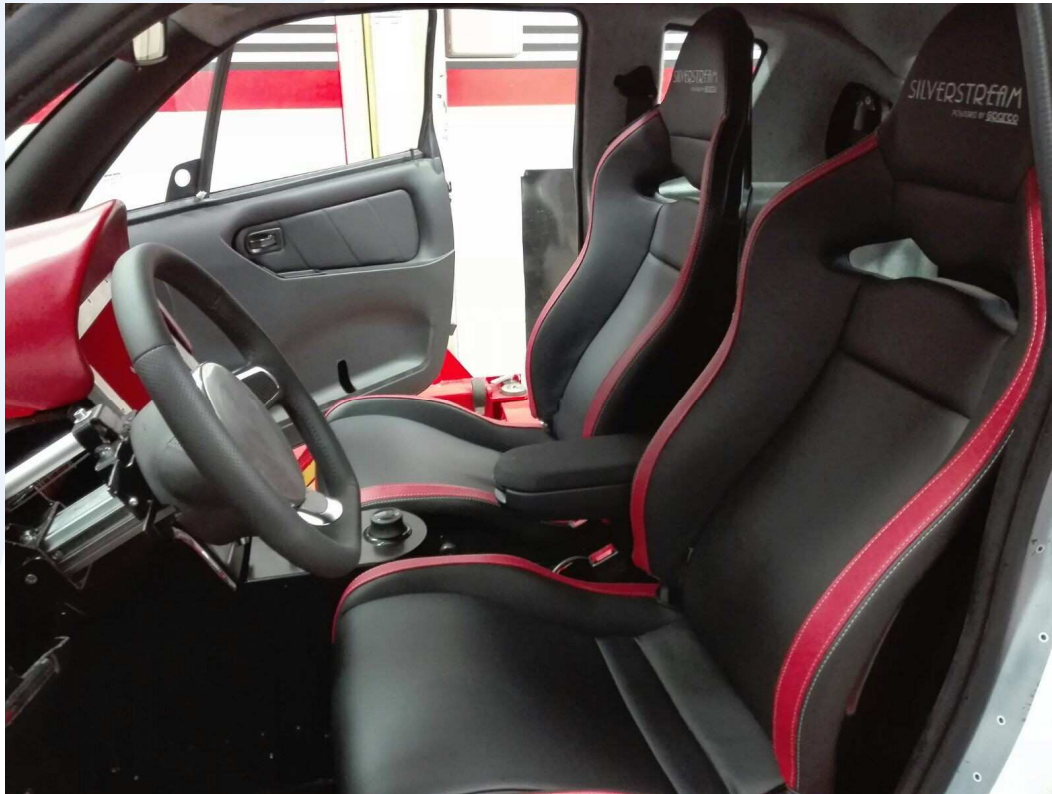


optimal posture including lumbar and neck support for comfortable and low-fatigue driving



Well-Being in Automotive and Mobility

The Personalized *Car*





Well-Being in Automotive and Mobility

*The Personalized **Car***



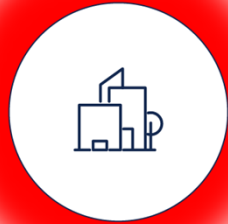
VIDEO SILVERSTREAM

<https://youtu.be/j4DufScv8cl>



Smarter and Healthier City and Beyond... Smarter and Healthier Life Everywhere

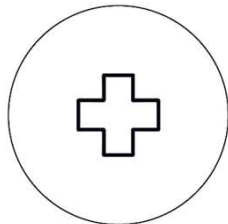
Smart *er* & Healthi*er* City



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The Real Estate Reloaded (in progress)

Embedding Health & Well-Being Services in New Smart District Design

MILAN PLANS FOR A MULTIGENERATIONAL FUTURE

Milano4YOU, an area of 300,000 sqm in the Segrate – municipality in the metropolitan area of Milan, represents a digital-native neighborhood offering a new lifestyle concept in line with the emerging needs of multigenerational communities.

The Milano4YOU disruptive multidisciplinary design and operation model is based on an IoT framework integrated into sustainable and modular buildings. Pervasiveness of digital technology generates real time Big Data collection fully compliant with security and privacy. Machine-learning algorithms provide cognitive abilities to systems and services, thus enabling a "learn and adapt" approach to the individual and collective needs of a lively and dynamic community.

Milano4YOU design is an ongoing project in collaboration with the Research Centre for Advanced Technology in Health and Well-Being of the nearby Hospital San Raffaele. San Raffaele Living Lab co-creation methodology is shaping services and experiences in the Milano4YOU social ecosystem with the aim of promoting health and wellbeing, as well as triggering cross-generational experiences in a socially-oriented environment. Since Milano4YOU model is a living model, it aims to adapt to the wide range



Image credit to come

requirements of dwellers characterized by different needs (millennials, working adults, children and families, older adults). In fact, dwellers will have an active role and be part of a community by setting up collaborations, cooperation and best practice exchanges in response to common problems or needs. Residents will not be considered consumers

any more, they will become prosumers: consuming and producing at the same time services, content, partnership, buying groups as well as interacting with public administration, healthcare and security organizations,

startups and other innovation-oriented stakeholders. The zoning by use represents a right mix of different living needs and an interesting context where a multigenerational community can flourish.

The integration between energy system, digital infrastructure, construction characteristics and the ecosystem of human-centred services enabling a wellbeing context aims at achieving economic Sustainability,

environmental Sustainability and human Sustainability:

- Economic Sustainability**
The project offers affordable homes and minimises expenses by means of a shared economy operation model.
- People Sustainability**
Services are designed to promote physical, emotional and social wellbeing, in residential, assisted living, commercial, business, culture and leisure contexts. The park and the cultural centre play a key social role.
- Environmental Sustainability**
Neighbourhood energy model, is in line with the concept of Nearly Zero-Energy Buildings – nZEB. The digital infrastructure, minimises energy consumptions by reusing energy waste.

A Data Driven Neighbourhood

Milano4YOU is designed to be a replicable and reconfigurable model in different scales and places, and its first deployment in Segrate aims to:

- Embody the principles and contents of the United Nations Sustainable Development Goals.
- Demonstrate that technological innovation can be non-invasive and concretely translate into a lower cost of living and a better quality of life.
- Create a "data driven" neighbourhood where data becomes the dynamic element that gives value and life to increasingly innovative services.

The merging of the digital infrastructure, platform of services, energy management and social experience into the modular green building is

crucial in defining an efficient and sustainable model able to meet contemporary demand, mainly coming from both youth and older adults, that improve quality of life in terms of services rather than pure the asset ownership.

Milano4YOU is expected to release the first building units in 2023. The project team welcomes the AAA ISO initiative and looks forward to collaborating in a spirit of open innovation to inform development of a new ISO standard for smart multigenerational neighbourhoods and improve quality of life and wellbeing for all.

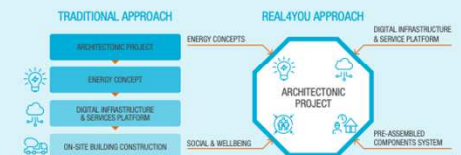
Alberto Sanna
Director, Life & Health Scientific Institute San Raffaele Milan Italy

MILANO4YOU MASTER PLAN WITH ITS MULTIPLE AREAS



- 1 Parco 60,000 mq
- 2 Senior housing 7,300 mq
- 3 Villa 4,500 mq
- 4 Residenza Libera 55,808 mq
- 5 Centro culturale 1,700 mq
- 6 Social housing 7,500 mq
- 7 Centro sportivo 3,500 mq
- 8 Centro commerciale 5,500 mq

MILANO4YOU INNOVATIVE APPROACH





The Urban Park Reloaded (in progress)

5G-enabled Engaging Outdoor Experiences for Social Well-Being

- 01 Healthy-me
- 02 In motu vita
- 03 Mi Sky&Skyline
- 04 Il Bosco Tangenziale
- 05 Light Water
- 06 Rolling Water
- 07 BooX Factor



- 08 No-Video, Gioco

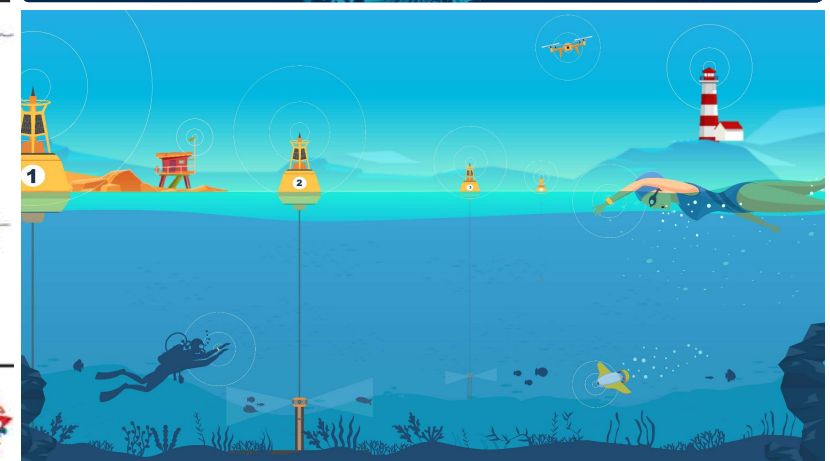
- 09 Lambro's Cup

- 10 Walk-in Cinema
- 11 Dog Sharing
- 12 Vivaio : The social Gardening
- 13 Fiera della Tangenziale Est
- 14 Riciclo
- 15 ParX Factor
- 16 Rolling Wall



The Sea Experience & Protection Reloaded

Open Water Swim Lanes, 5G-enabled Buoys and **WaterIoT**





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