Intelligenza Artificiale e nuove tecnologie per la demenza

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Contenuti

- Intelligenza Artificiale
- Horizon 2020 e Progetti Europei
- ICT e Tecnologie Assistive
- E-Health and integreted care
- Presente e Futuro…

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“The question for all of us”, is, how can we use technology to make the quality of life better as people get older?”

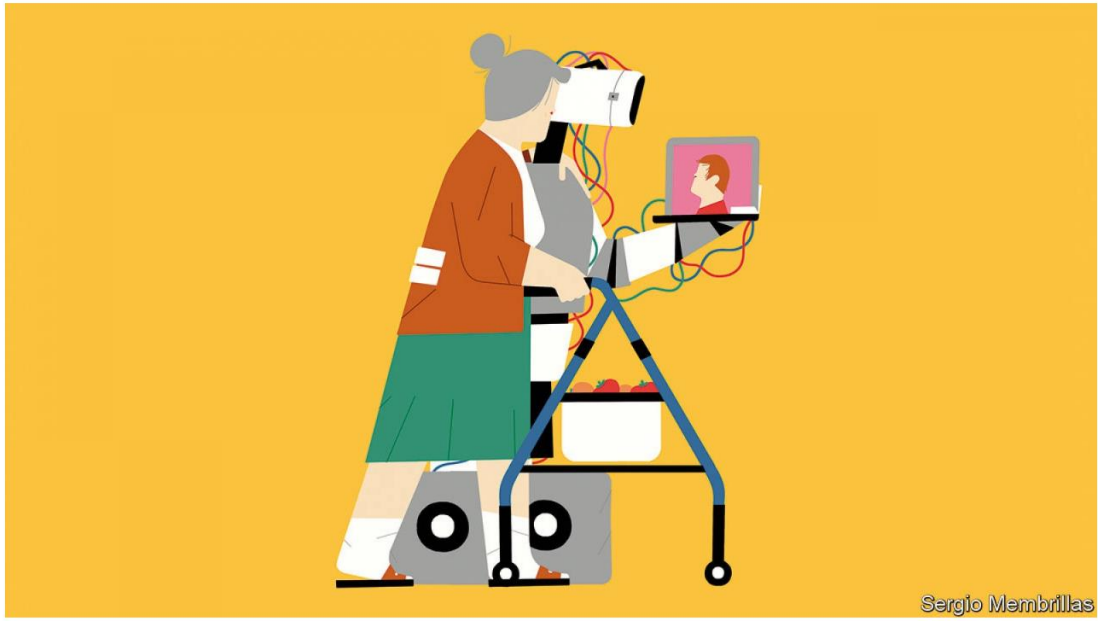
Gill Pratt

The Economist Topics Current edition More

Grandma’s little helper

An ageing world needs more resourceful robots

Rather than take people’s jobs, machines will help care for them in their old age



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Feb 16th 2019

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Could artificial intelligence make doctors obsolete?

BMJ 2018 ; 363 doi: https://doi.org/10.1136/bmj.k4563 (Published 07 November 2018)
Cite this as: *BMJ* 2018;363:k4563

Cookie policy

BMJ talk medicine
HAL will see you now
SOUNDCLOUD
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Linked patient commentary

Stop hyping artificial intelligence—patients will always need human doctors

AI (artificial intelligence) is the simulation of human intelligence processes by machines, especially computer systems. These processes include **learning** (the acquisition of information and rules for using the information), **reasoning** (using rules to reach approximate or definite conclusions) and **self-correction**.

Artificial Intelligence for Dementia Diagnosis – Genetic Analysis, Speech Analysis, and More

Last updated on February 10, 2019, published by Kumba Sennaar

Kumba covers emerging technology research breakthroughs and news at TechEmergence. She has performed research through the National Institutes of Health (NIH), is an honors graduate of Rensselaer Polytechnic Institute and a Master's candidate in Biotechnology at Johns Hopkins University.

Dementia AI Applications Overview

The majority of AI use-cases for predicting dementia appear to fall into four major categories:

- **Speech Monitoring:** Companies are using **machine learning** to analyze speech patterns to detect and monitor dementia progression.
- **Medical Image Analysis**: Companies are developing software using machine learning to analyze brain deterioration from scans to help predict the onset of dementia.
- **Visual Indicators**: Companies are training algorithms to assess eye movement patterns to track and correlate cognitive function and brain activity.
- **Genetic Analysis:** Companies are using machine learning to analyze genetic data to predict the onset of dementia.

HORIZON 2020

THE FRAMEWORK PROGRAMME FOR RESEARCH AND INNOVATION

The challenges

- Ageing population
- Increased disease burden
- Unsustainable and unequal health & care systems
- Health & care sector under pressure to reform

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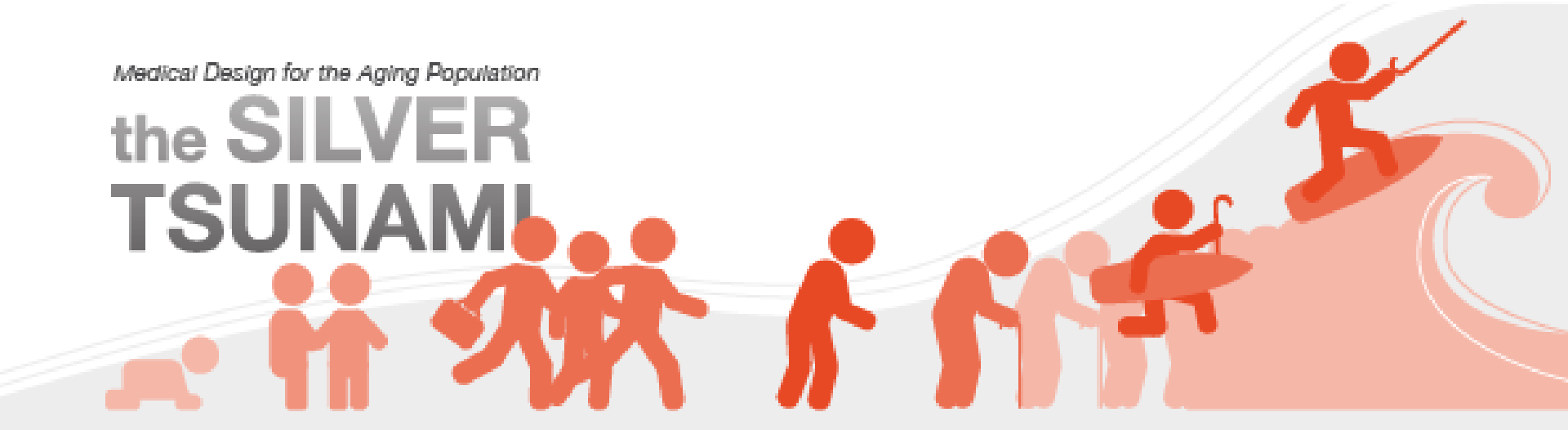
“Silver Tsunami” = an existential risk to society

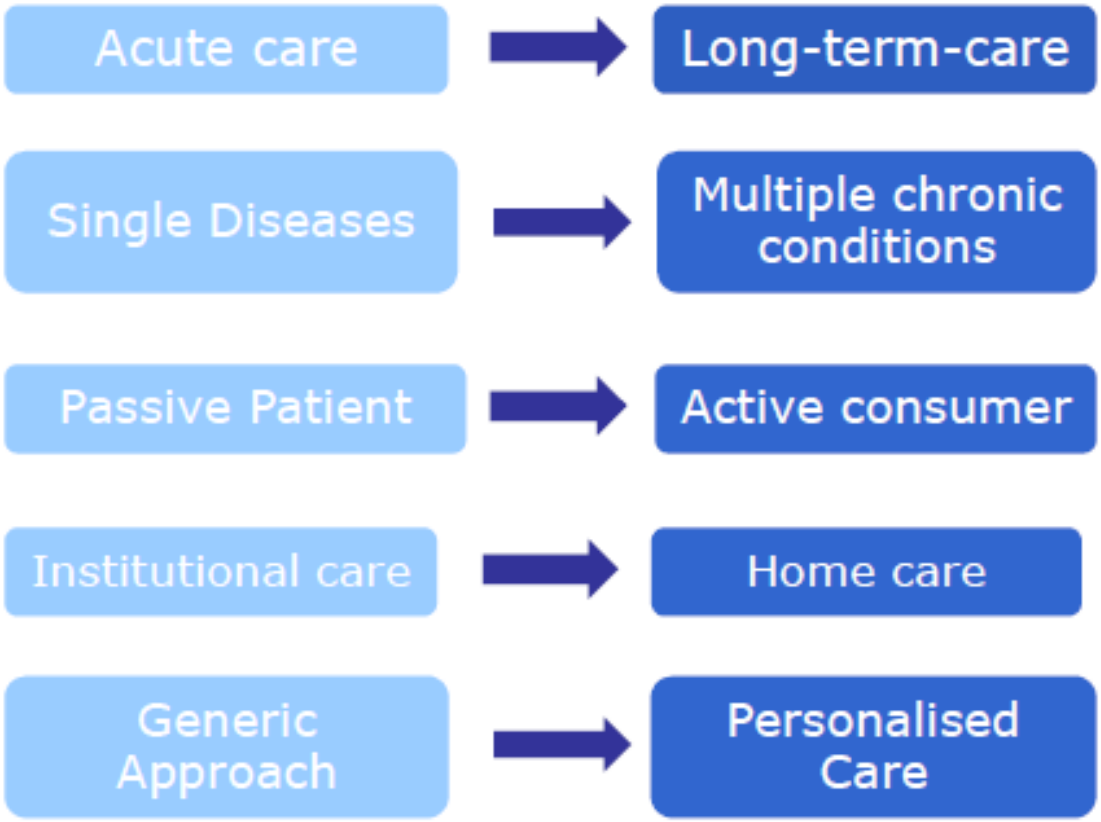
- **Older citizens depicted as:**
- A burden to caregivers, families, communities…
- Slower at pretty much everything
- Incapable of changing their ways
- Frail, forgetful, ill, foolish, incompetent, repulsive
- Can’t or don’t want to learn new things.



European Commission

Horizon 2020 - societal challenge 1

Transforming Health and Care



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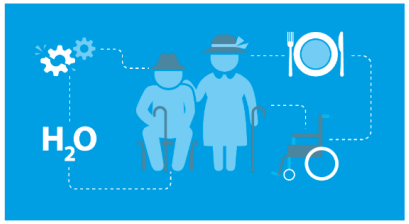
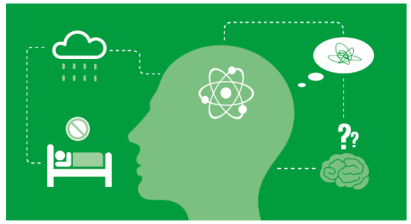
Project INTEGRATE

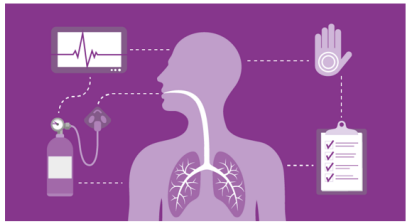
CASE STUDIES



Geriatric Care



Mental Health



COPD

Diabetes

CROSS-CUTTING THEMES

Financial Models for Care Integration

Care Process Design

IT Management

Patient Involvement

Financial Flows

European Innovation Partnership on Active and Healthy Ageing

www.ec.europa.eu/eip/ageing

Scirocco
Scaling Integrated Care in Context

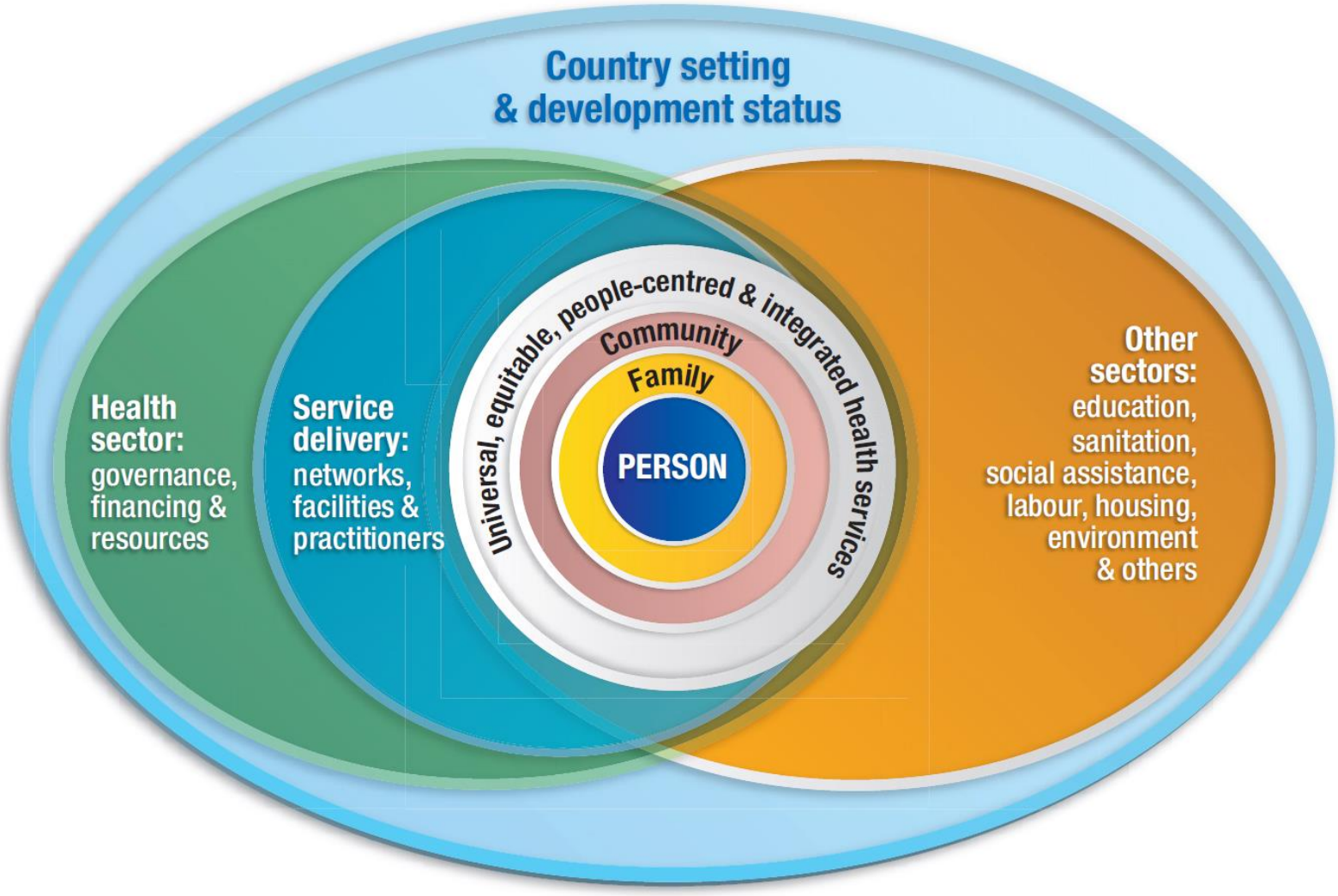
World Health Organization

WHO global strategy on integrated people-centred health services 2016-2026

Executive Summary

Placing people and communities at the centre of health services

Figure. Conceptual framework for integrated people-centred health services



WHO global strategy on integrated people-centred health services 2016-2026

Assistive Technology Definition

Any item, piece of equipment,
or product system
whether acquired commercially off the shelf,
modified or customized,
that is used to increase, maintain, or improve
functional capabilities of individuals with disabilities

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Business Model Evolution in Healthcare Emphasizes Actionable Information

Value for Customer

Medical Platforms

Wearables/ Biosensors

mHealth

Big Data & Health Analytics

IoMT

Medical Solutions

Artificial Intelligence

Augmented Reality

Robotics

Predictive & Preventive Care

- **Insight-as-a-Service**
- **Automation-as-a-Service**
- **Robotics-as-a-Service**

Real-time Outcome based Care

- **Product-as-a-Service**
- **Data-as-a-Service**
- **Platform-as-a-Service**
- **Managed Services**

Historic/Evidence Based Care

- **Sell Parts/Hardware**
- **Consumables/Upgrades**
- **Repair/ Maintenance Support**
- **Leasing and Buying Support**

Differentiation via intelligent solutions for evidence/ outcome based health benefits to demonstrate value to end-users

Intelligence + **Services** + **Medical Products**

Differentiation by providing services to key stakeholders such as Physicians, Patients and Payers

Services + **Medical Products**

Differentiation solely through product innovation

Medical Products

Last Decade | **Current Decade** | **Next Decade**

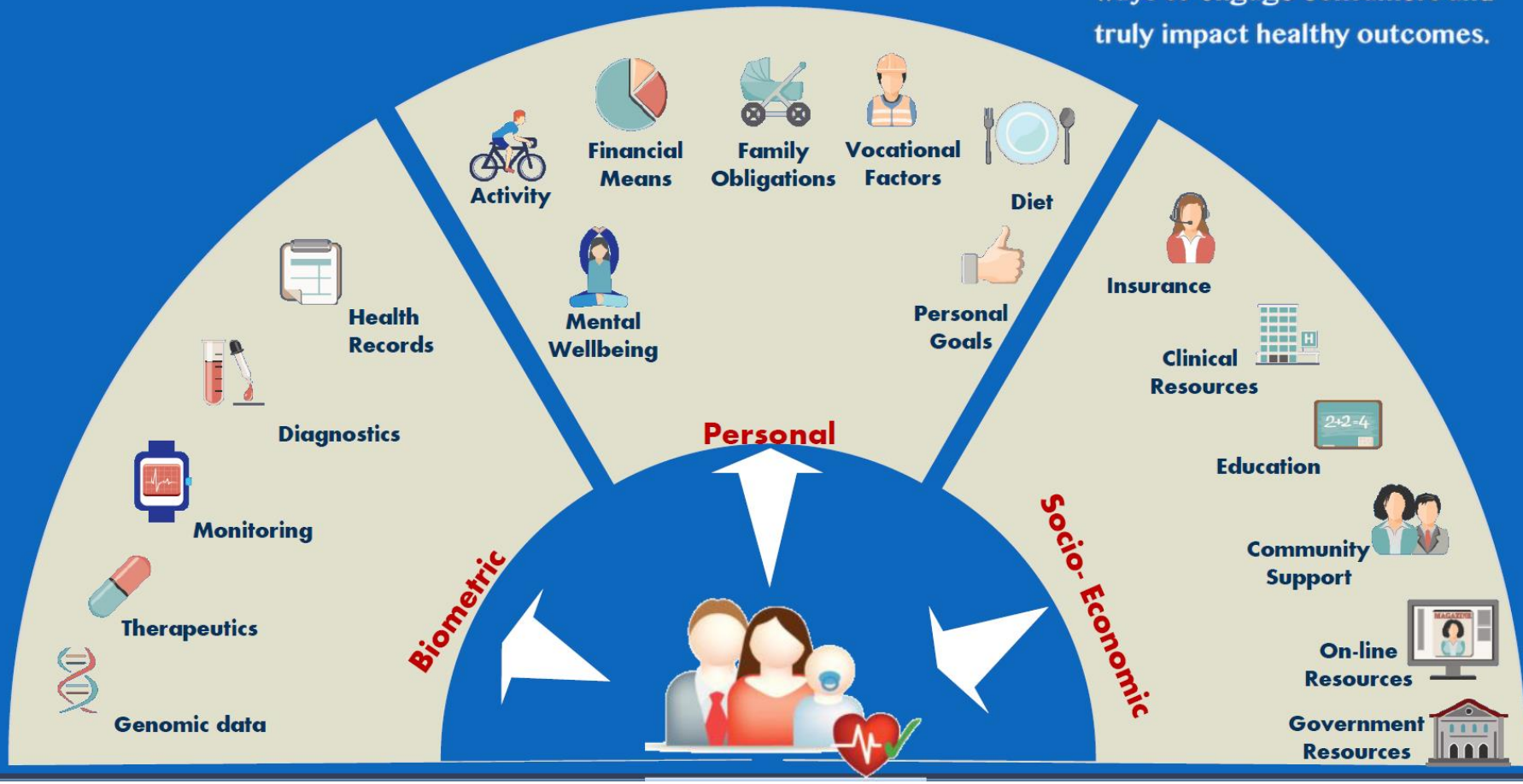
Source: Frost & Sullivan

Personalizing Healthcare Through Big Data & A.I.

Today in healthcare, individuals are often segmented into broad demographic categorizations.

This one size fits all approach leads to initiatives that have low compliance, and often fail to achieve desired milestones.

By creating a more comprehensive view of the individual, healthcare stakeholders are discovering new ways to engage consumers and truly impact healthy outcomes.

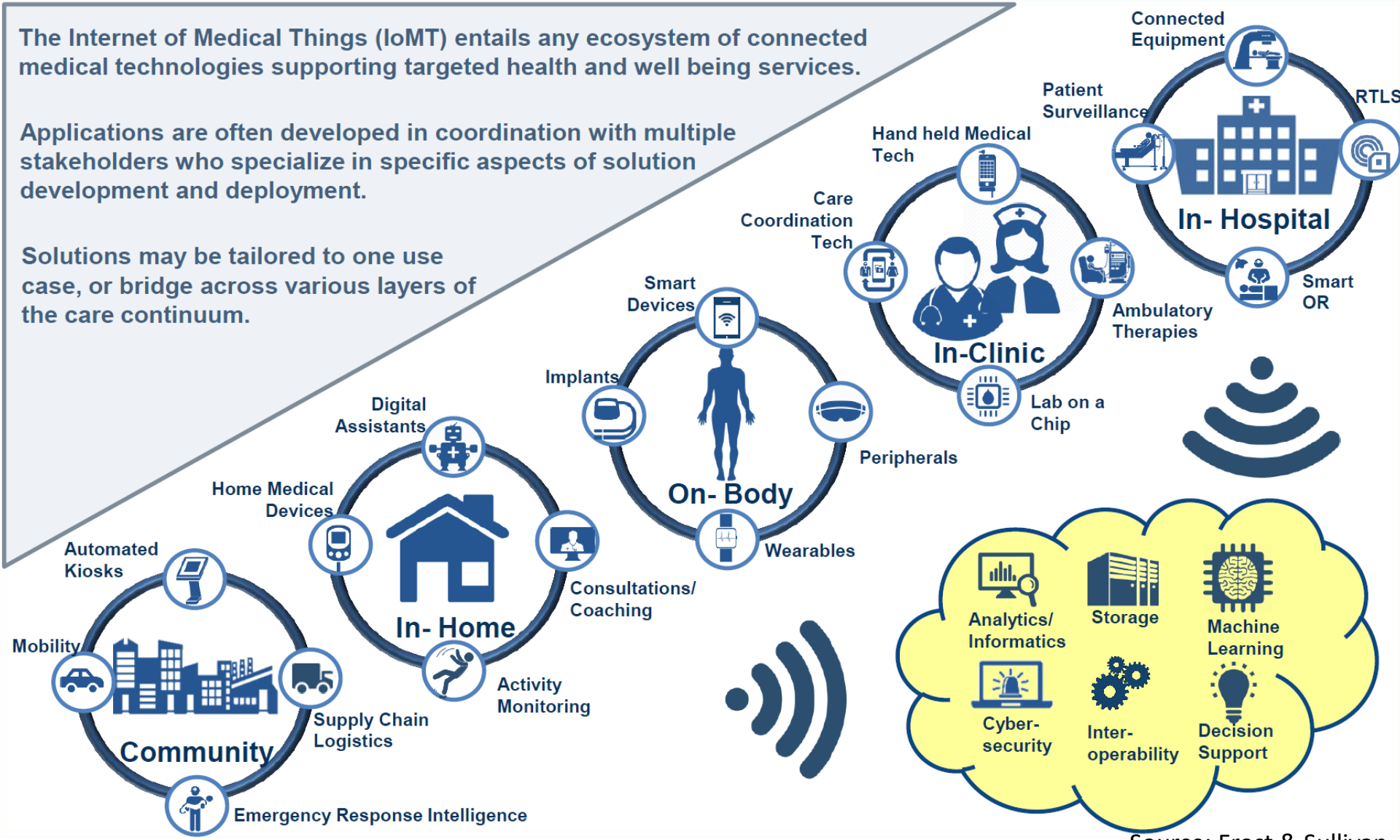


AI Systems Critical to Deployment of Internet of Medical Things

The Internet of Medical Things (IoMT) entails any ecosystem of connected medical technologies supporting targeted health and well being services.

Applications are often developed in coordination with multiple stakeholders who specialize in specific aspects of solution development and deployment.

Solutions may be tailored to one use case, or bridge across various layers of the care continuum.



Source: Frost & Sullivan

University of Salford MANCHESTER

Technologies to support community-dwelling persons with dementia : a position paper on issues regarding development, usability, effectiveness and cost-effectiveness, deployment, and ethics

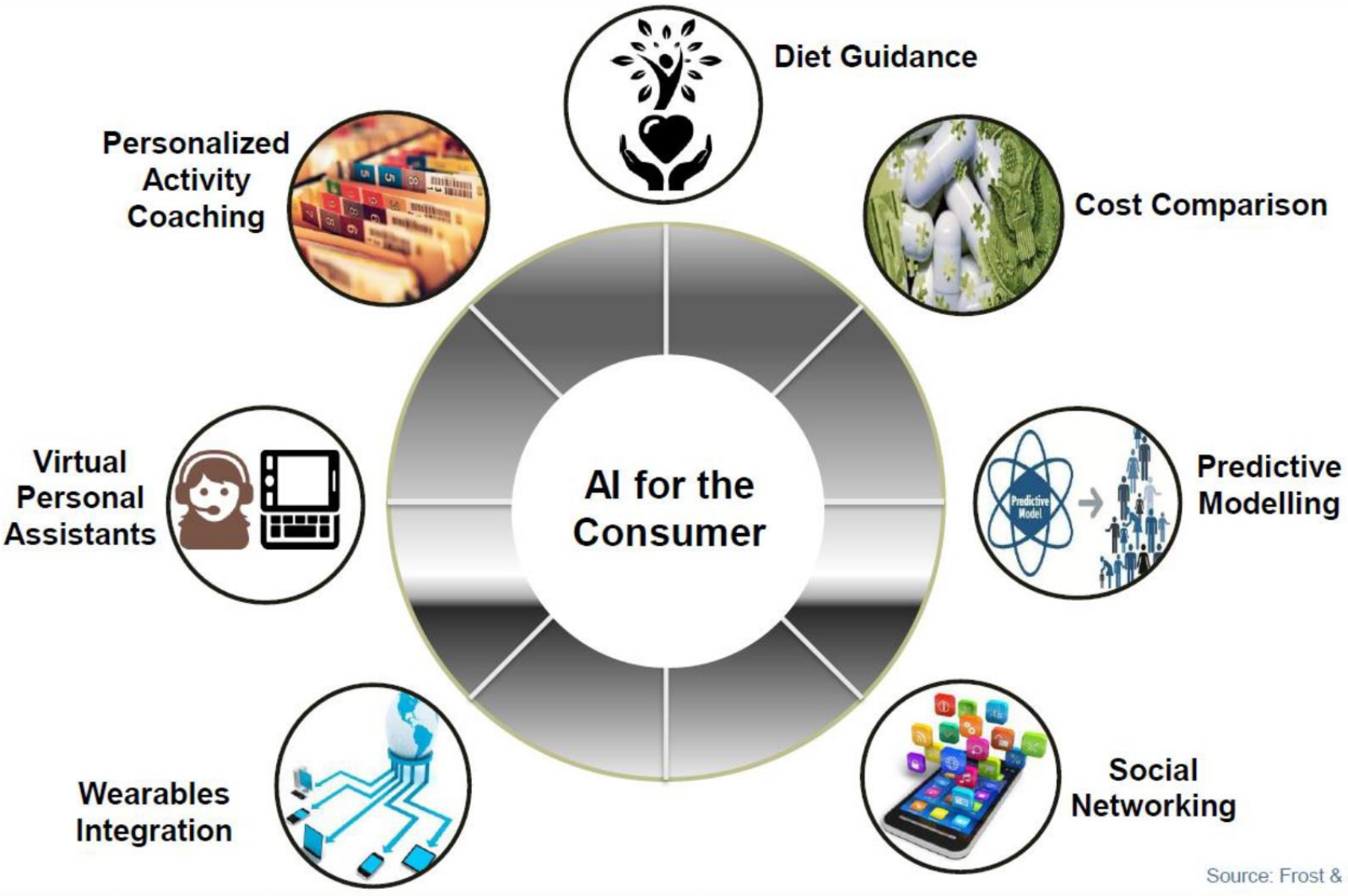
Meiland, F, Innes, A, Mountain, G, Robinson, L, van der Roest, H, García-Casal, JA, Gove, D, Thyrian, JR, Evans, S, Dröes, R, Kelly, F, Kurz, A, Casey, D, Szcześniak, D, Dening, T, Craven, MP, Span, M, Felzmann, H, Tsolaki, M and Franco-Martin, M

http://dx.doi.org/10.2196/rehab.6376

Summary:

- avoiding replication of technology development that is unhelpful or ineffective
- focusing on how technologies succeed in addressing individual needs of persons with dementia.
- It is suggested to include these recommendations in national and international calls for funding and assistive technology research programs.
- practitioners, policy makers, care insurers, and care providers should work together with technology enterprises and researchers to prepare strategies for the implementation of assistive technologies in different care settings.

AI for the Consumer



Source: Frost & Sullivan

Calendula

CITIUS

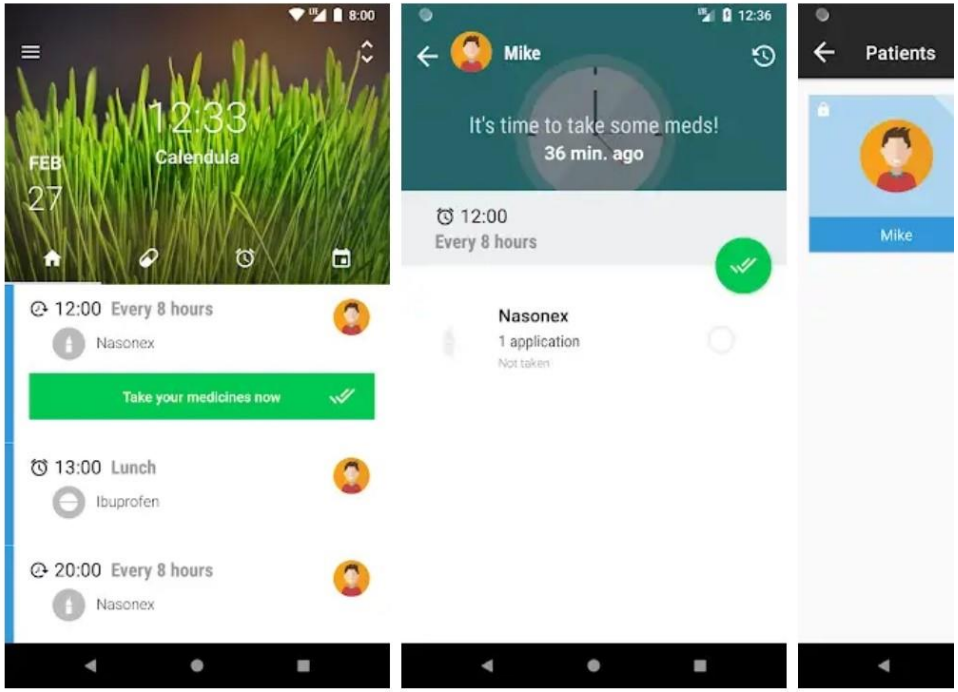
Salute e fitness

INSTALLA

4,3 ★
52 recensioni

1000+
Download

3
PEGI 3



Calendula

Gestisci in modo semplice le tue medicine

Calendula è un assistente per la gestione personale delle medicine che ti aiuterà a seguire le tue prescrizioni mediche
senza impostare migliaia di promemoria sul tuo telefono od avere paura di dimenticare di assumere farmaci.
Imposta dose e trattamento, associali alla tua routine giornaliera e lascia che Calendula lavori per te.

Calendula fornisce:
○ Un'interfaccia semplice ed intuitiva
○ Promemoria per l'assunzione di medicine, con allarmi completamente configurabili
○ Trattamenti flessibili, con opzioni specifiche per pillole contraccettive ed altri medicinali con periodo di sospensione

AI in Clinical Applications

Analysis of Patient's Electronic Health Records

Oncology Diagnostic Assistance

Population Health Management

Medical Image Processing

Predictive Care Guidance

Physician and Hospital Error Reduction

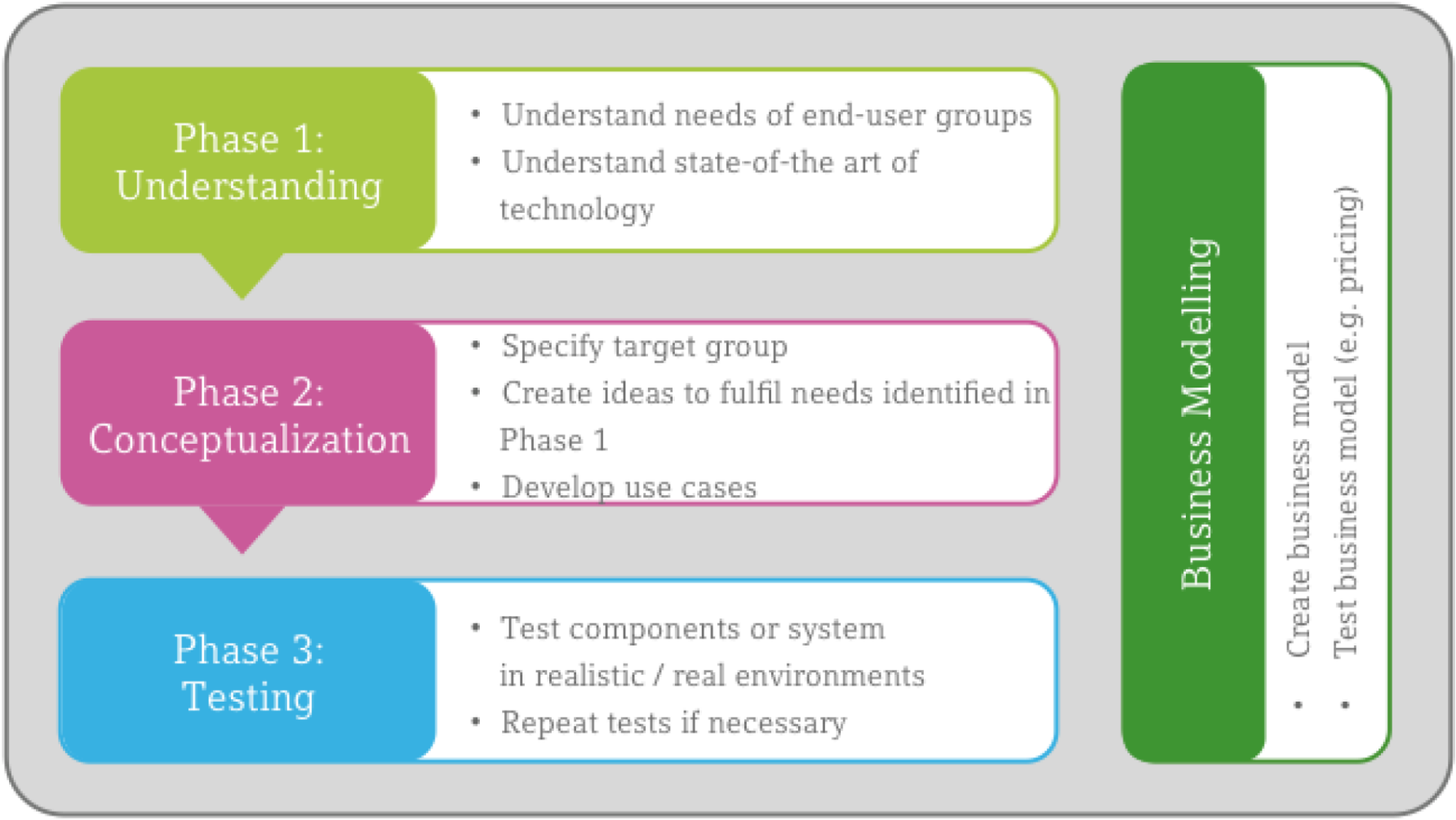
Effectiveness of Care Metrics

Source: Frost & Sullivan

alzheimer's association®

AAIC 18

From user integration To co-creation



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The ***Connected Health Summer School*** is an annual multi-disciplinary training programme designed for researchers interested in the development of new eHealth services and apps.

The aim is to create an international and intersectoral network of researchers and professionals that fosters mutual knowledge exchange in the field of smart environments technologies for persons with dementia.

REMIND

How can assistive technology help?

Assistive technology can:

- help you to live more independently;
- provide support and reassurance; and
- reduce the risk of accidents.

Assistive technology can help you to do things like:

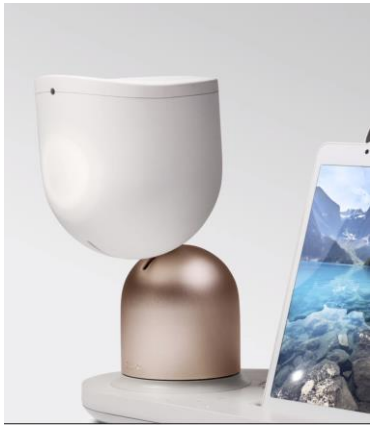
Remember days, dates and time.
Find things.
Take your medication on time.
Keep in touch with family and friends.
Continue to do things that you have always done.
Let you know if the gas is left on.
Let you know if a tap is left running.
Raise an alarm.
Let people know where you are if you become lost or disorientated.

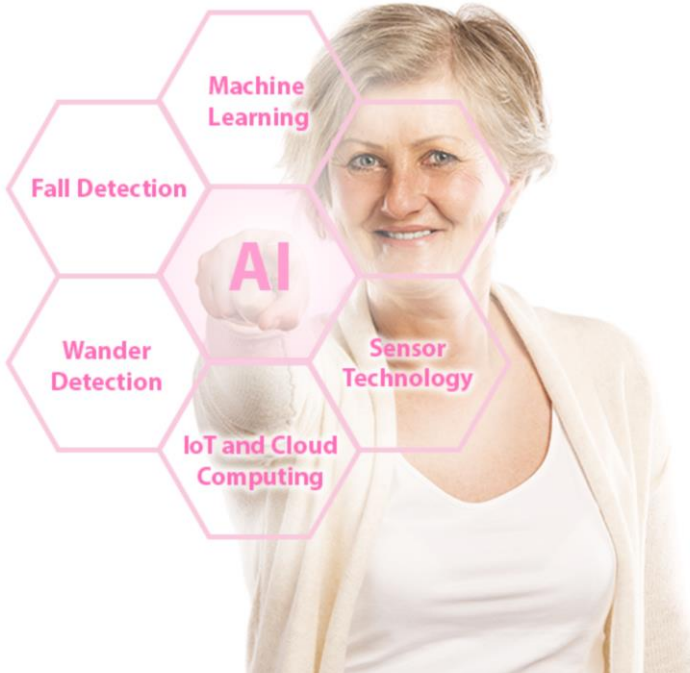
REMIND

COME L'IA RIVOLUZIONA L'ELDERLY CARE

Forbes

1. At home health monitoring
2. Smart device assisted daily living
3. Smart device assisted fall detection
4. Virtual companions
5. Anti-aging research





Come procedure…

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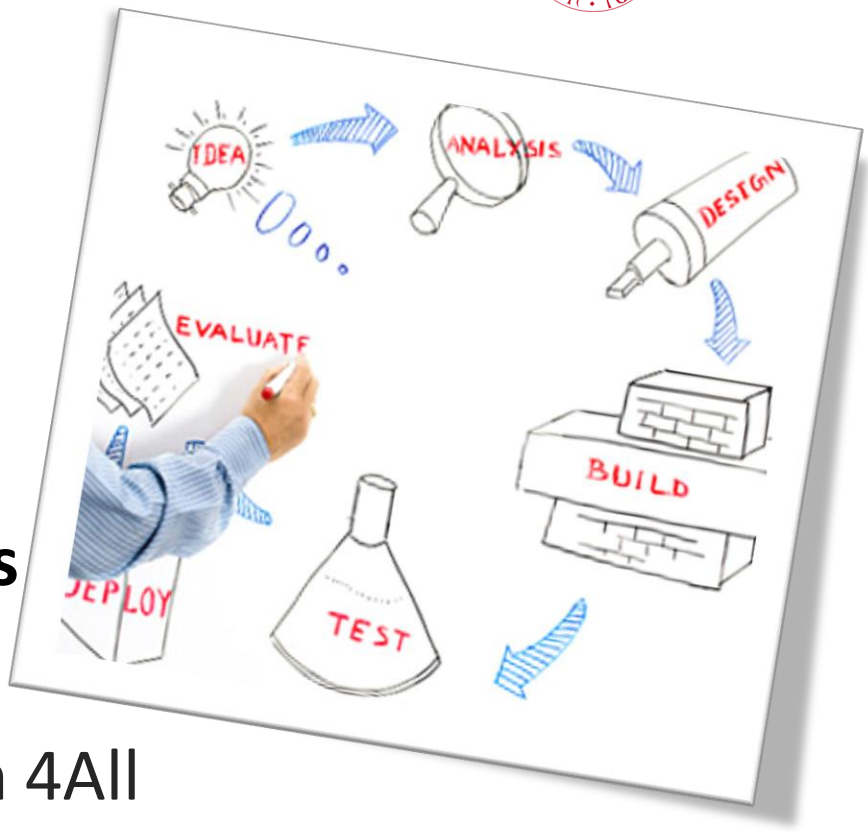
Tech Working Group



- **Co-Design and Co-creation**
- **Interdisciplinary group**
- **Real experts (PWD) – New roles**
- **Bottom-up solutions**
- **Calm technology:** no innovation 4All
- **Integreted care and interoperability**
- **Ethical issues**

NoviLunio

European Commission

European Group on Ethics in Science and New Technologies

Statement on

Artificial Intelligence, Robotics and 'Autonomous' Systems

Research and Innovation

European Group on Ethics in Science and New Technologies

Brussels, 9 March 2018

Università degli Studi di Padova

GRAZIE!

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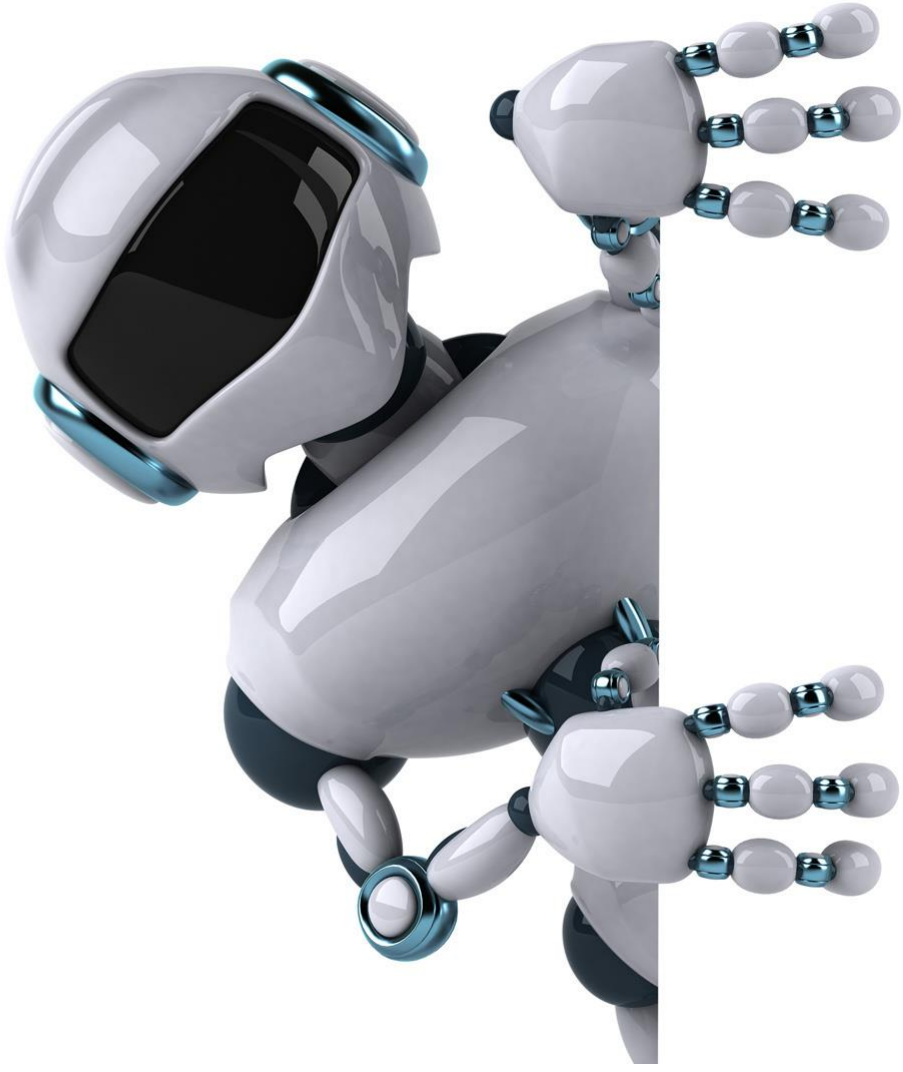
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