



# SMARTBEAR

## IOT PLATFORM FOR AGEING SOCIETY: THE SMART BEAR PROJECT

SMART BIG DATA PLATFORM TO OFFER EVIDENCE-BASED PERSONALISED  
SUPPORT FOR HEALTHY AND INDEPENDENT LIVING AT HOME

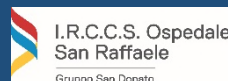
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- **STELA MUSTEATA**

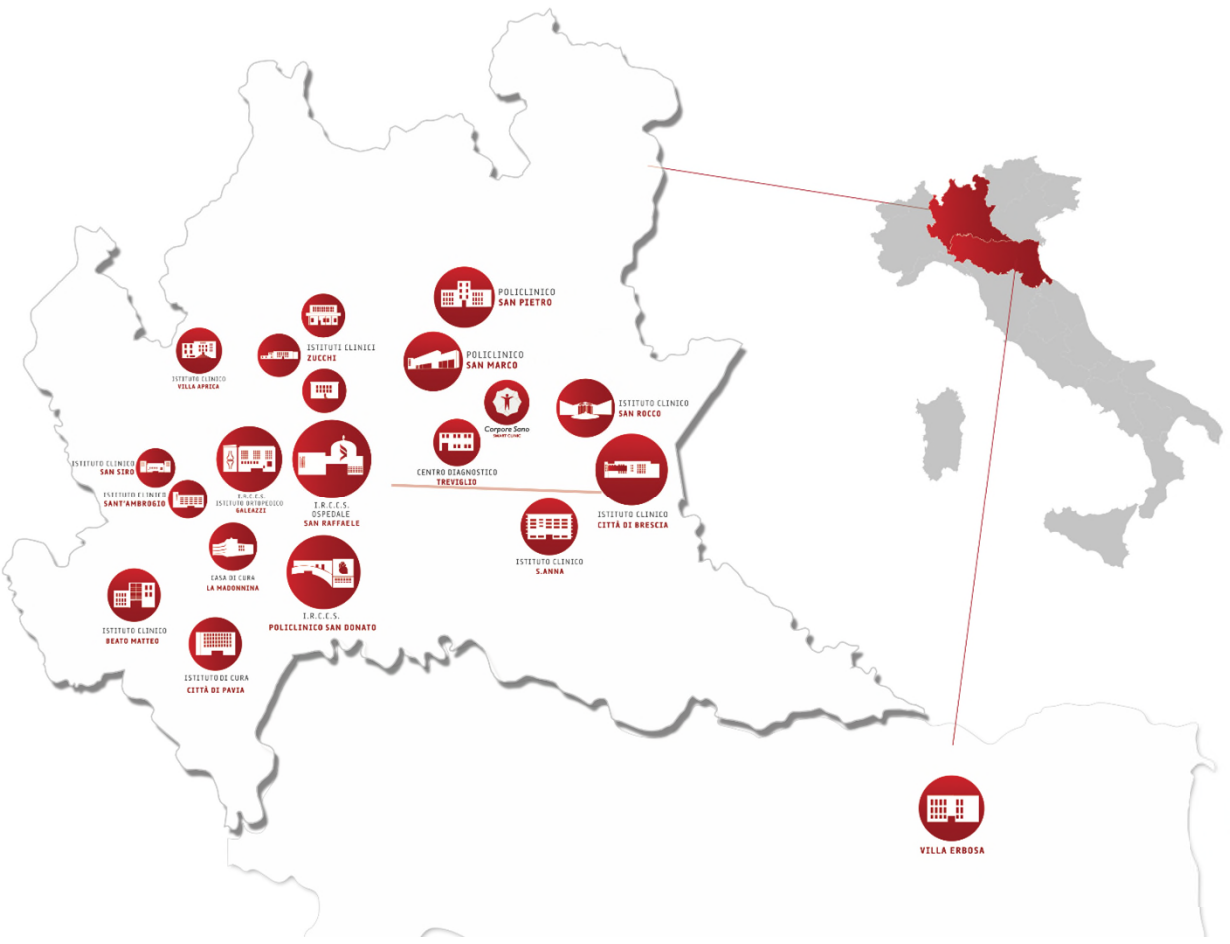


Graduated in Clinical psychology and specialized in Neuropsychology at Vita-Salute San Raffaele University, Stela Musteata is a scientist of the Center for Advanced Technology in Health & Well-being. In this department she works as a research neuropsychologist on international research projects for SMARTer and HEALTHier LIFE with expertise in cognitive intervention technologies and social robotics. Stela's previous research experience was at University of Victoria, in Canada, in the Division of Medical Sciences and in the Institute on Aging and Lifelong Health.



Gruppo  
San Donato

# San Raffaele Smarter and Healthier City in Milan *A Living Lab for Open Innovation in Health & Well-Being*





# Research Center Advanced Technologies in Health & Well-Being *Research Program*

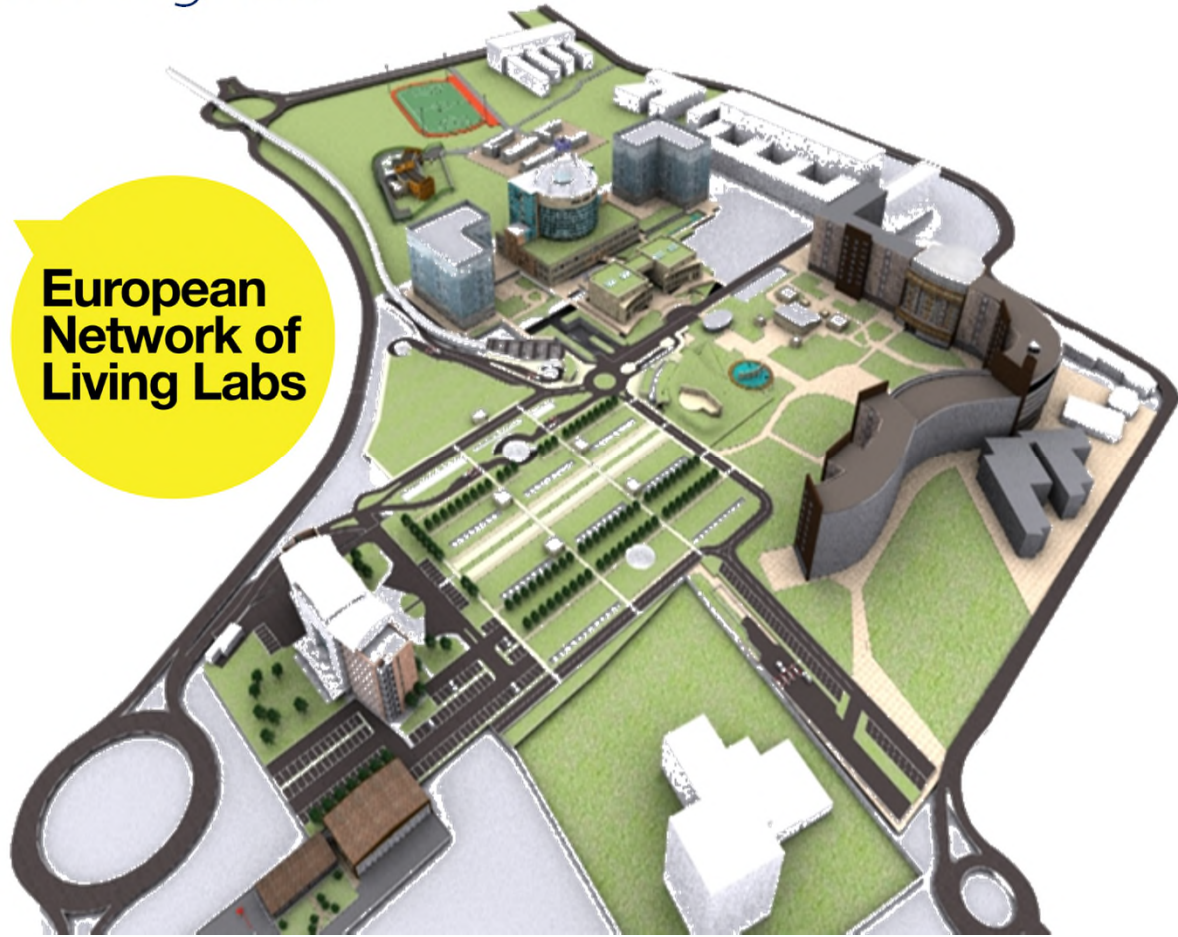
Smart *er* & Healthier City



Smart *er* & Healthier Life



Smart *er* & Safer Hospital

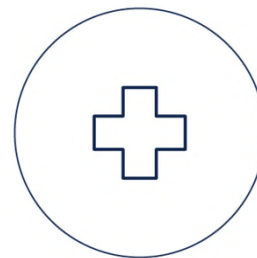




Smart *er* & Healthier City

Smart *er* & Healthier Life

Smart *er* & Healthier Hospital



### Healthcare 4.0

Social, Service and Process *Robotics & IoT*

- ✓ Healthcare Process Re-engineering
- ✓ Social & Cognitive
- ✓ Surgical
- ✓ Rehabilitative
- ✓ Exoschelectric
- ✓ Dro(ne)botics
- ✓ Nanobotics
- ✓ Assistive
- ✓ Architectural

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# SMART BEAR PROJECT OVERVIEW

Smart<sup>er</sup> & Healthier<sup>er</sup> Life



The aim is to promote Individual's awareness and motivation for behavioural change. Using Communication and Information Technologies to help citizen to make healthier, greener and fairer choices according to user's needs and preferences. SMART BEAR project is focused on disease prevention and well-being promotion.



Funded by the European  
commission



Call: *"Trusted digital solutions and  
Cybersecurity in Health and Care"*



To implement and test **state  
of the art technology** in the  
senior's everyday life in  
order to enhance their  
**wellbeing**

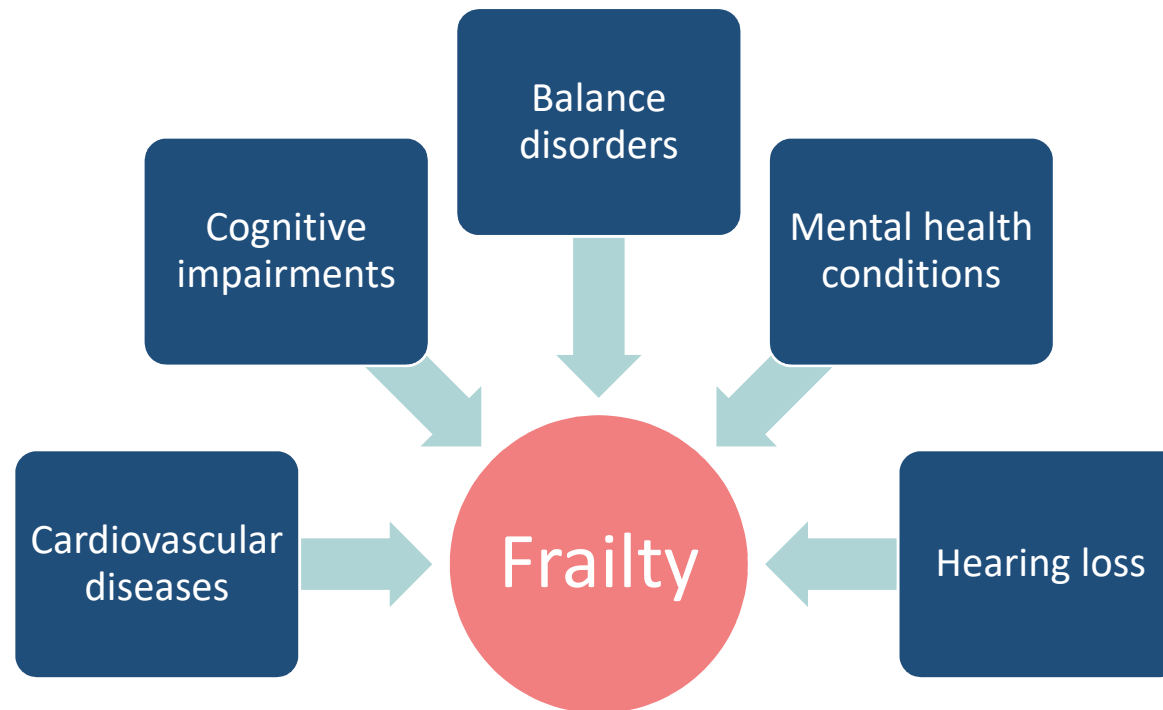




# INTRODUCTION

WHO (2014): “Ageing well” must be a priority

“Unless health systems find effective strategies to address the problems faced by an ageing world population, the growing burden of chronic disease will greatly affect the **quality of life of older people**”





# INTRODUCTION

SMART BEAR targets **people over 65** to implement:

Management of chronic  
medical conditions

- Enhance **self-awareness** on the users' **health status**
- Support the **self-management** of the users' **health conditions**
- Enable evidence-based support for **clinicians' decision making**

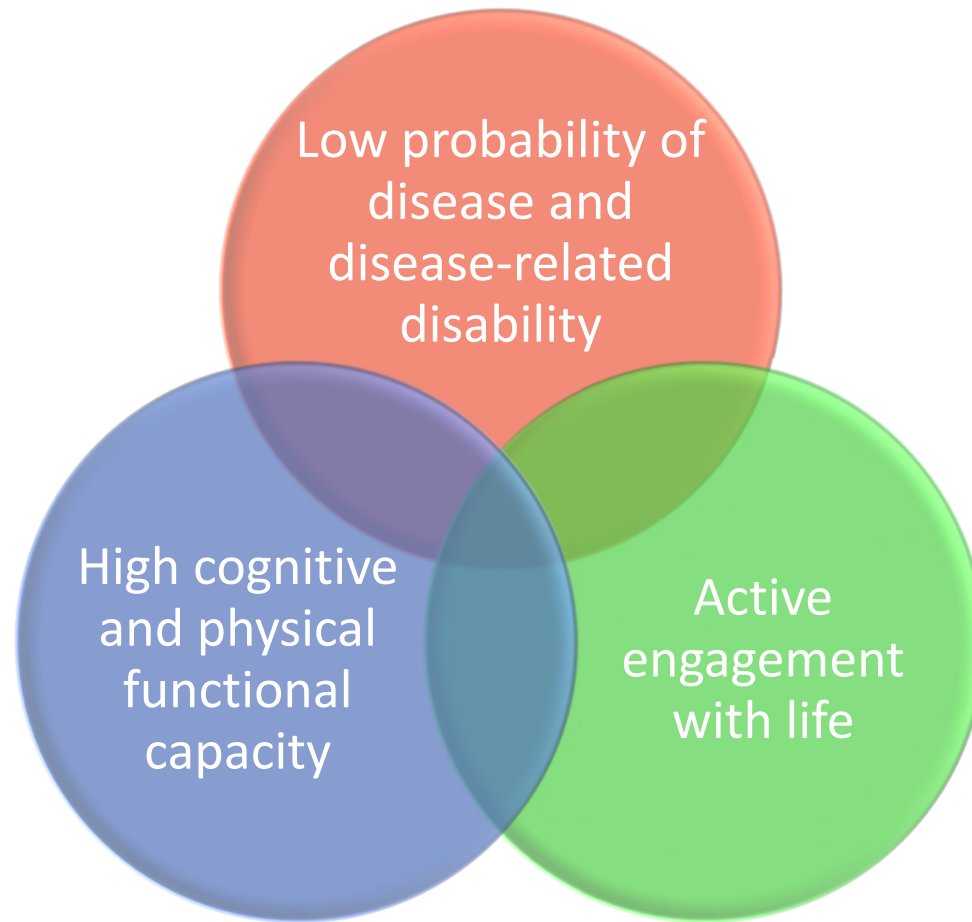
Healthy ageing

- Promote **active living** (physically and cognitively)
- Encourage **healthy habits** (socialization and nutrition)
- Provide conditions that facilitate **safe, independent living**



# RATIONALE

## HEALTHY AGEING



[Rowe JW, Kahn RL. Successful aging. *Gerontologist*. 1997;37(4):433–440]



# PILOT SITES

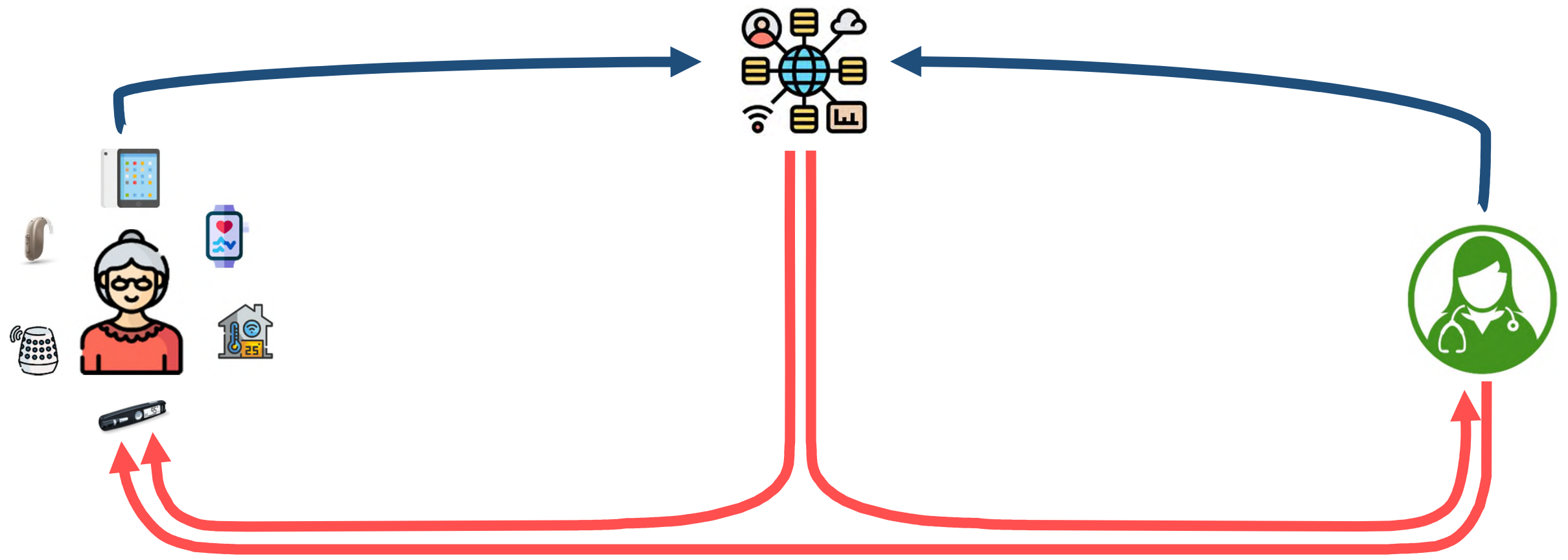


5 Pilots with 5100 participants over 65

Pilot Sites	Sample Population	Sample Size	Geographic Area
Greece	Independent older adults living at home/ Older adults living in collective structures	1000	Region of Peloponnese, Municipality of Palaio faliro
Italy-Portugal	Independent older adults living at home/ Older adults living in collective structures	1100	Milan metropolitan city, District of Crema, Madeira Island
France	Independent older adults living at home/ Older adults living in collective structures	1000	Ile-de-France (Paris Region), Nouvelle Aquitaine and Bretagne
Spain	Independent older adults living at home/ Older adults living in collective structures	1000	Barcelona, Madrid, Sevilla areas, Pais Vasco, Galicia and Balearic Island
Romania	Independent older adults living at home/ Older adults living in collective structures	1000	Bucharest, Cluj Napoca and Constanta metropolitan areas

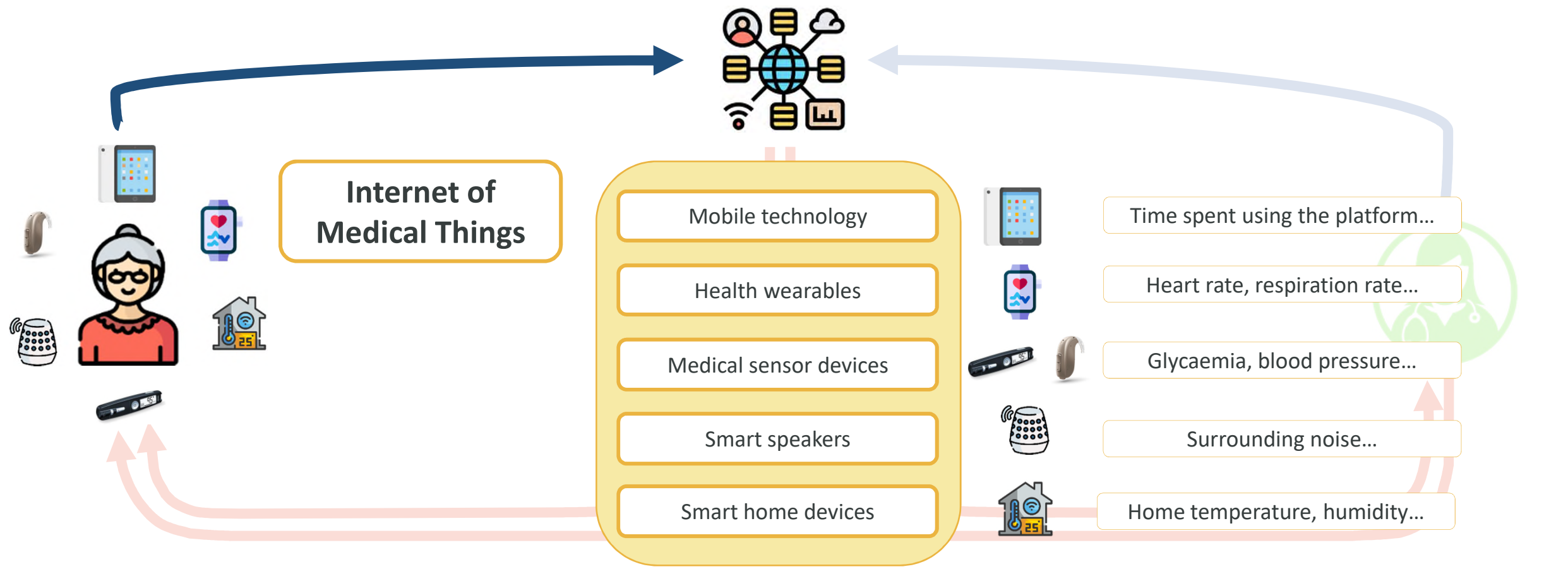
# SMART BEAR DEVICES AND CLOUD SYSTEM

"Smart Big Data Platform to Offer Evidence-based Personalised Support for Healthy and Independent Living at Home"



# SMART BEAR DEVICES AND CLOUD SYSTEM

"Smart Big Data Platform to Offer Evidence-based Personalised Support for Healthy and Independent Living at Home"



# SMART BEAR PERSONAL DEVICES



Smartphone  
(Samsung Galaxy S10)



Smart Hearing Aids  
(Phonak Marvel 50)



Smart Blood Pressure  
(BPM core)



Smart Thermometer  
(Thermo)



Smart-watch  
(Garmin VivoSport)



Smart Scale  
(Body +)



Smart Oximeter  
(iHealth air)

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Device	Parameters
Phonak Marvel-50	Duration of active use [hours or minutes]
	Average duration of active use per day [hours or minutes]
	Duration of exposure at environmental noise levels per day and per week [minutes]
	Percentage of active use in soft/medium/high intensity sounds [percentage]
Body+	Body weight [kilogram or pound]
	Body muscle mass [kilogram or pound]
	Body bone mass [kilogram or pound]
	Body fat mass [kilogram or pound]
	Body fat free mass[kilogram or pound]
	Body fat ratio [percentage]
BPM Core	Diastolic Blood Pressure [mmHg]
	Systolic Blood Pressure [mmHg]
	Heart Rate [beats per minute]
Thermo	ECG signal [ $\mu$ V, time series]
	Body Temperature [Celsius or Fahrenheit]
iHealth Air	Skin Temperature [Celsius or Fahrenheit]
	Blood oxygen saturation [percentage]
Garmin VivoSport	Pulse rate [beats per minute]
	Number of steps [dimensionless number]
	Distance traveled [meters]
	Calories burned through activity [kCal]
	Calories burned by Basal Metabolic Rate [kCal]
	Intensity Minutes [minutes]
	Duration of vigorous/moderate/low activity [seconds]
	Floors climbed [dimensionless number]
	Average heart rate on last 7 days [beats per minute]
	Average heart rate at rest [beats per minute]
	Sleep quality [label]
	Sleep duration [seconds]
Time spent in deep/light/REM sleep [seconds]	

# SMART BEAR PERSONAL HOME DEVICES



Smartphone  
(Samsung Galaxy S10)



Motion Sensor  
(Philips)



Smart Bulbs  
(Philips)



Aqara Temperature Device  
(Xiaomi)

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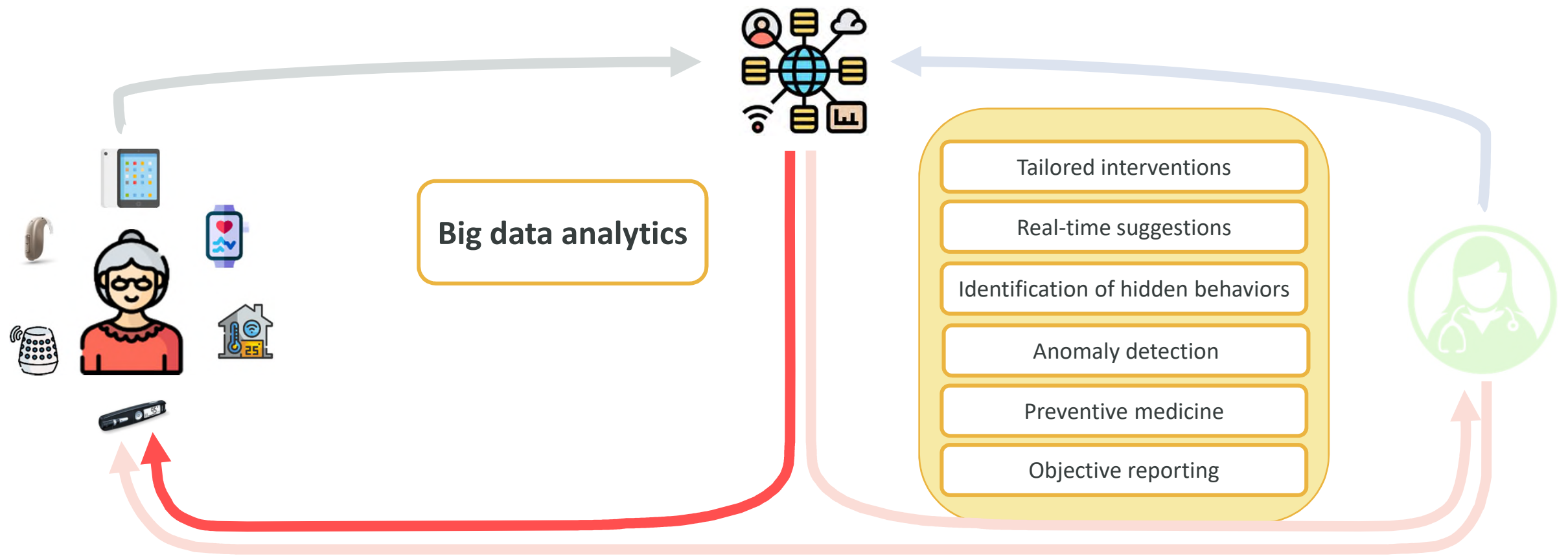
Aqara Temperature Device  
(Xiaomi)

Devices	Measurements
Motion Sensors + Smart Bulbs + Aqara Temperature Device	Room Light Intensity [illuminance]
	UV Index [integer]
	Outdoor/Room Temperature [Celsius or Fahrenheit]
	Outdoor/Room Relative Humidity [percentage]
	Outdoor/ Room Atmospheric pressure [hectoPascal]
	Weather conditions (i.e. wind speed, wind direction, rain volume, snow volume and visibility)



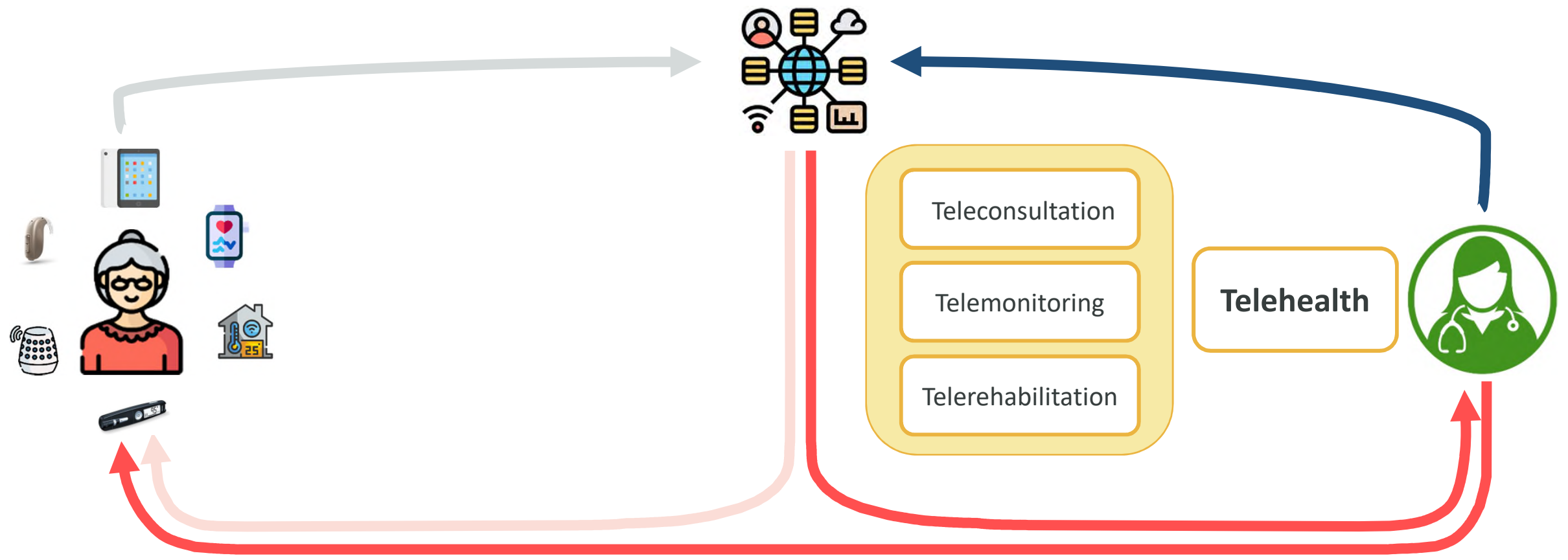
# SMART BEAR INTERVENTIONS

"Smart Big Data Platform to Offer Evidence-based Personalised Support for Healthy and Independent Living at Home"



# SMART BEAR INTERVENTIONS

"Smart Big Data Platform to Offer Evidence-based Personalised Support for Healthy and Independent Living at Home"






# SMART BEAR SCENARIOS



- Identify the profiles of different categories of users and characterize them (personas)
- **Design the platform to meet each profile's needs**


**Carlo**



**Problems**

- Sedentary lifestyle
- Bad diet habits
- High blood pressure

**Lidia**



**Problems**

- Low mood
- Memory and concentration difficulty
- Hearing loss
- Unhealthy environment

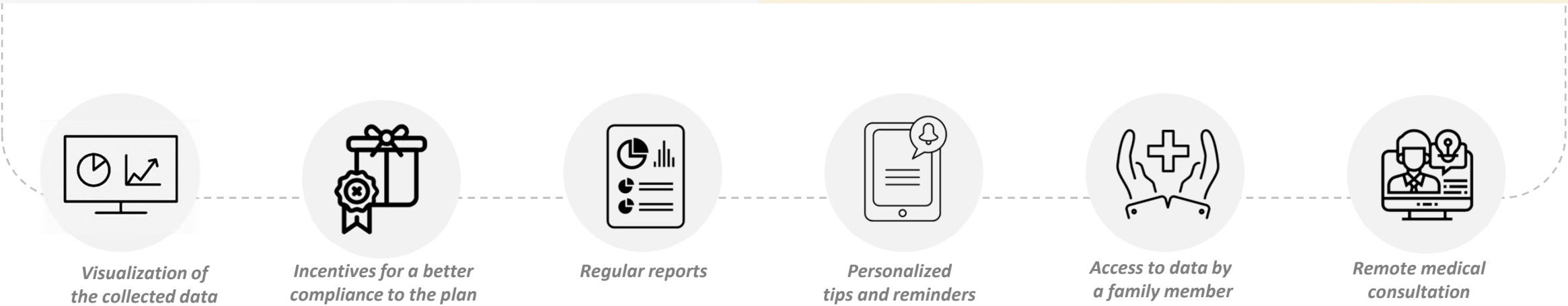
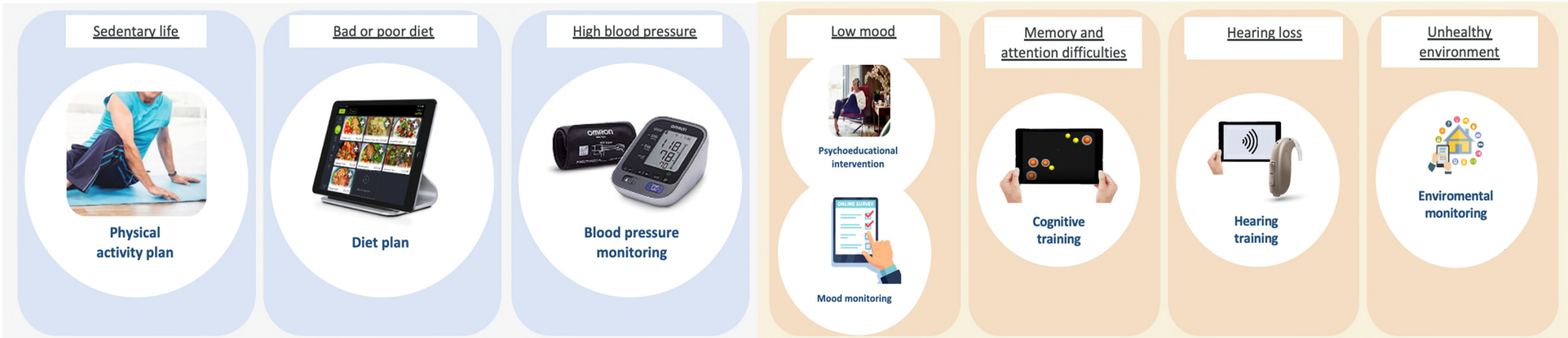


# SMART BEAR SCENARIOS & INTERVENTIONS

		Carlo (S1)	Lidia (S2)
Interventions	I1. Physical training	X	
	I2. Diet plan	X	
	I3. Monitoring of physiological parameters	X	
	I4. Psychoeducational intervention		X
	I5. Monitoring of the mood		X
	I6. Cognitive training		X
	I7. Hearing training		X
	I8. Environment Monitoring and adjustment		X
Transversal functions	TF1. Data visualization	X	X
	TF2. Gamification	X	X
	TF3. Regular report	X	X
	TF4. Regular report to clinician	X	X
	TF5. Suggestion	X	X
	TF6. Reminder	X	X
	TF7. Data access to caregiver	X	X
	TF8. Tele-consulting	X	X

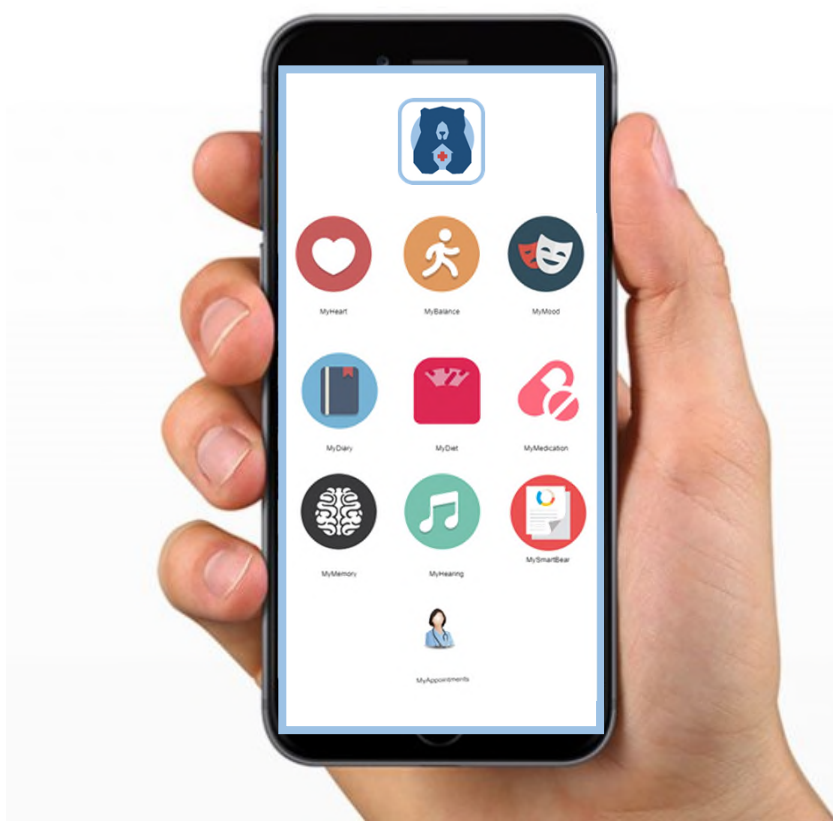


# SMART BEAR SCENARIOS & INTERVENTIONS: Carlo & Lidia





# SMART BEAR PLATFORM



1. MyHeart
2. MyBalance
3. MyMood
4. MyDiary
5. MyDiet
6. MyHearing
7. MyMemory
8. MyMedication
9. MySmartbear
10. MyAppointments



# NEXT: ENROLLMENT

**SMARTBEAR**  
Expérimentons ensemble des objets connectés pour le bien-être et la santé des seniors à domicile !

Catel, pilote en France du projet

Accueil Senior Professionnel Le projet Blog

## ET SI VOUS PARTICIPIEZ ?

Bénéficiez chez vous gratuitement d'outils connectés pour votre bien-être et votre santé !

Je participe !

Nombre de places restantes **0 9 8 2**

**SMARTBEAR**  
Smart Big Data Platform to Offer Evidence-based Personalized Support for Healthy and Independent Living at Home

**SMARTBEAR**

Il progetto di ricerca SMART BEAR è condotto da 27 partner, (tra cui università, istituti di ricerca e imprese europee), che lavorano allo sviluppo di una piattaforma informatica capace di monitorare le condizioni di salute di migliaia di persone in tutta Europa e di fornire ad ogni paziente raccomandazioni personalizzate. Saranno coinvolte in questo progetto 5100 persone in cinque progetti pilota (Grecia, Italia-Portogallo, Francia, Spagna, Romania).

**ICAR** **ARIA** **Catel** **PHILIPS** **Bird&Bird** **CITY**

**ANNA STARSLAN** **UNIVERSITÀ DELLA VILVA DI MILANO** **INNOVATOR**

**Atos** **STREAMVISION** **UPV - EHU** **LA STATALE** **ATC** **quironsalud** **FONDAZIONE Gruppo San Raffaele**

**Med Lab** **IT SUPPORT** **UNINOVA** **MELLENB BERGSK** **National and Research University of Athens**

**FORTH** **IBM** **Università Nazionale del Sud** **gynx technology solutions** **Comunità Sociale Cremona**

**DOVE SEGUIRCI**

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**CHI PUÒ CANDIDARSI?**  
Uomini o donne di età compresa tra 65 e 80 anni, con DUE O PIÙ tra le seguenti condizioni\* :

- Malattie cardiovascolari
- Deficit dell'udito
- Disturbi dell'equilibrio
- Deficit cognitivo
- Disturbi dell'umore (depressione, ansia, ecc.)
- Sindrome di fragilità
- Obesità

**CERCHIAMO 1000 VOLONTARI**

**UOMINI O DONNE DI ETÀ COMPRESA TRA I 65 E 80 ANNI**  
\*non in forma grave

**SEI INTERESSATO?**  
Per partecipare scrivici tramite e-mail a [smartbear@eservices4life.org](mailto:smartbear@eservices4life.org) o chiama il numero telefonico 02/2643 5505

**CONTATTACI ORA PER RICEVERE ULTERIORI INFORMAZIONI**

This project has received funding from the European Union's Horizon 2020 research and innovation programme, under QRand Agreement 857172

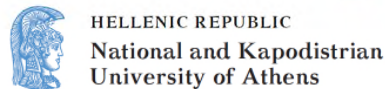
## VISIT US AT [www.smart-bear.eu](http://www.smart-bear.eu)



# SMARTBEAR

# THANK YOU

[smartbear@eservices4life.org](mailto:smartbear@eservices4life.org)



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