RAMCIP

Robotic assistant for MCI patients at home

RAMCIP at a glance

- ***RAMCIP:***
  Robotic Assistant for MCI Patients at home
- Research and Innovation Action (RIA)
- Horizon 2020 – PHC-19-2014
  - Advancing active and healthy ageing with ICT: Service robotics within assisted living environments
  - Contract Nr: 643433
  - Start date: 1/1/2015
  - Duration: 3 years
- Consortium: 8 partners from 6 countries

The RAMCIP consortium

	Participant no.	Participant organisation name	Country
Research centre	1 (Coordinator)	Centre For Research and Technology Hellas (CERTH)	Greece
University	2	Technische Universitaet Muenchen (TUM)	Germany
University	3	Scuola Superiore Sant'Anna (SSSA)	Italy
Research centre	4	Foundation For Research and Technology Hellas (FORTH)	Greece
SME	5	ACCREA Engineering (ACCREA)	Poland
University	6	Medical University of Lublin (LUM)	Poland
Non-profit organisation	7	Barcelona Alzheimer Treatment and Research Center (ACE)	Spain
SME	8	Shadow Robot Company (SHADOW)	UK

RAMCIP
Rationale - motivation

Research and development of a novel home robotic assistant system for older adults with amnestic mild cognitive impairment (MCI) and at early stages of progressive dementia

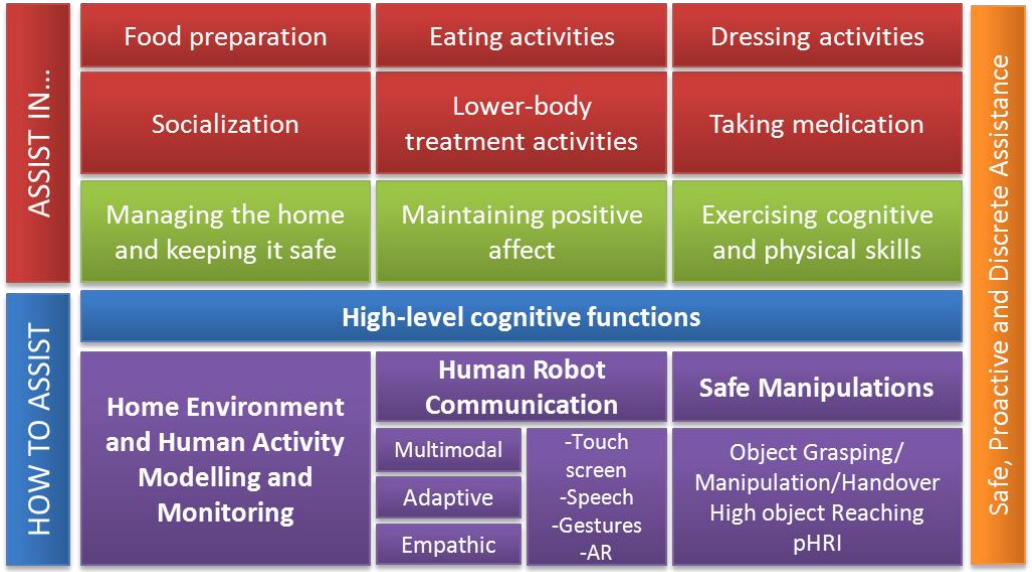
- Recently, significant steps have been made in the context of service robotics for assisted living environments to support older people's independence (e.g. HOBBIT, ACCOMPANY FP7 projects), through robots capable to
  - autonomously move
  - providing entertainment and telepresence functions
  - learning and bringing objects
  - detecting falls or facilitating safe locomotion by removing small objects and obstacles from the person's path

- Major challenges still need to be addressed towards **service robots of the future**
  - capable of assisting older persons in a **wide variety** of activities
    - **discreetly** and **transparently**, yet **proactively** and in **tight cooperation** with the human
  - acting as effective **promoters of the patient's mental health**,
  - **evolving** along with the user, capable to match her/his needs as they evolve over time

The RAMCIP vision

The RAMCIP vision is of future service robots capable of:

•Providing **safe, proactive and discreet assistance** in a series of significant aspects of the user's daily life



  - From food preparation, eating and dressing activities to managing the home and keeping it safe
  - the robot should also assist the user to maintain positive affect and also exercise cognitive and physical skills
    - capacity **embedded in their daily behaviour**; i.e. providing such exercise subtly, by modifying the way they assist

RAMCIP Innovation

The RAMCIP project aims to research and develop a novel service robot, capable to **proactively assist** older persons in a wide range of daily activities, being at the same time an **active promoter of the user's physical and mental health**

The RAMCIP robot will comprise three major innovative aspects:

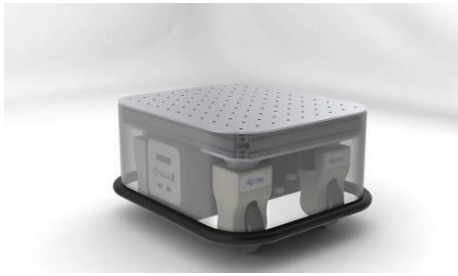
- (a) **cognitive functions** based on **advanced user and home environment modelling** and monitoring, allowing the robot to decide **when** and **how** to assist the user,
- (b) novel adaptive **multimodal human robot communication interfaces**
  - with emphasis on **empathic communication and augmented reality displays**, all dynamically fused and tailored to the user and the environment needs,
- (c) **advanced**, **dextrous** and **safe** robotic manipulation capabilities
  - applied in service robots for assisted living environments
  - enabling **grasping and manipulation** of a wide variety of home objects, as well as safe physical HRI
  - introducing assistance activities that involve **physical contact**

RAMCIP Objectives

- ***Objective 1.*** *To develop a service robot that will be capable of robustly understanding* ***actions****,* ***complex activities*** *and* ***behaviour*** *of* ***multiple*** *persons in the user's home*
- ***Objective 2.*** *To develop a service robot that will provide* ***proactive****,* ***discreet*** *and* ***optimal*** *assistance to the user*
- ***Objective 3.*** *Establishment of advanced* ***communication channels*** *between the* ***user and the robot***
- ***Objective 4.*** *Establishment of advanced* ***physical interaction*** *between the* ***robot and the home environment***
- ***Objective 5.*** *Establishment of assistance activities involving* ***physical interaction*** *between the* ***robot and the user***
- ***Objective 6.*** *To validate RAMCIP project results in real scenarios*

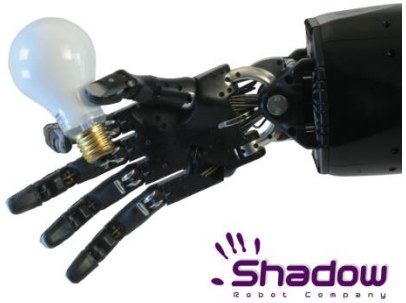
RAMCIP Implementation Approach
Basic H/W components

- ***Mobile base***
  - Mobile platform with torque interface to the drives that will make compliant mobile manipulation possible. The mobile platform will be selected from the designs available at **ACCREA**.

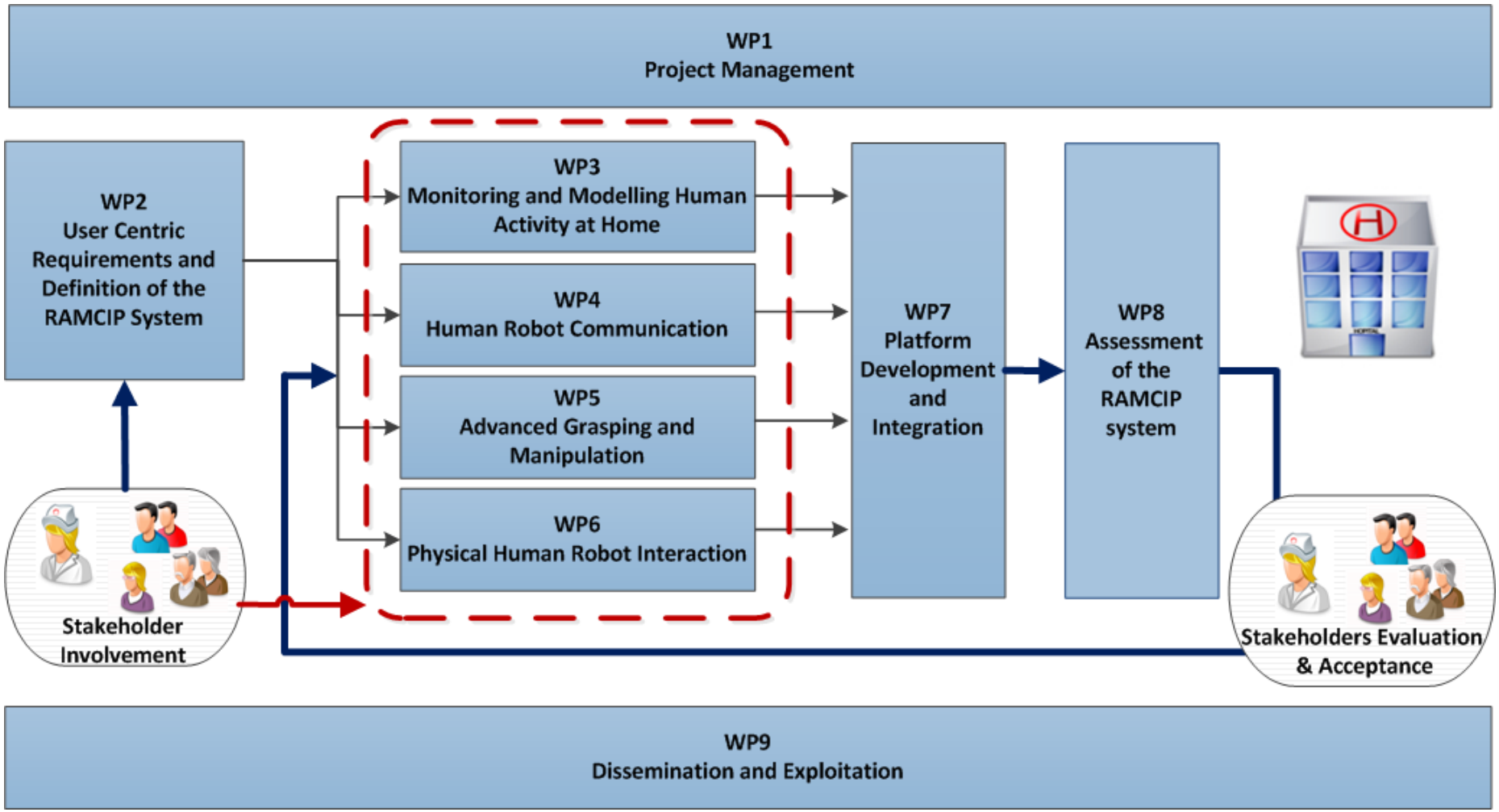


- ***Robotic Arm***
  - **ACCREA** will build a robotic arm suitable for application in the household and pHRI for the planned tasks

- ***Robotic Hand***
  - **SHADOW** will research and develop an improved SHADOW hand that will be optimized for the application scenarios, developed with a roadmap to low cost for production, and will be integrated with the arm of the final RAMCIP robot



RAMCIP Workpackages
Pert Diagram



For more information on RAMCIP…

- RAMCIP Website:

  www.ramcip-project.eu

- Follow us on twitter:

  @ramcip (https://twitter.com/ramcip)

Thank you

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