

Fraunhofer Research Center for Assistive Information and Communication Solutions

## Presentation 2011

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# 1. Fraunhofer Portugal

## Institutional Background

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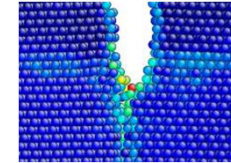
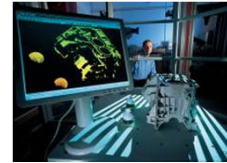
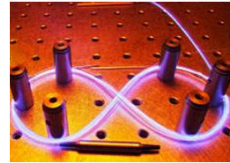
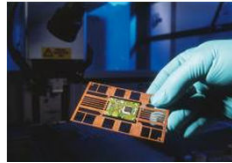
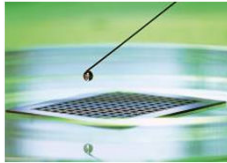


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# 1. Fraunhofer-Gesellschaft

## Institutional Background

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**60 Institutes**

**> 80 Research Units**

**> 17.000 employees**

**€1,7 billion R&D budget**

(>€1,4 billion from contract research)

**7 Groups**

- Information and Communication Technology
- Life Sciences
- Materials and Components
- Microelectronics
- Production
- Surface Technology and Photonics
- Defense and Security

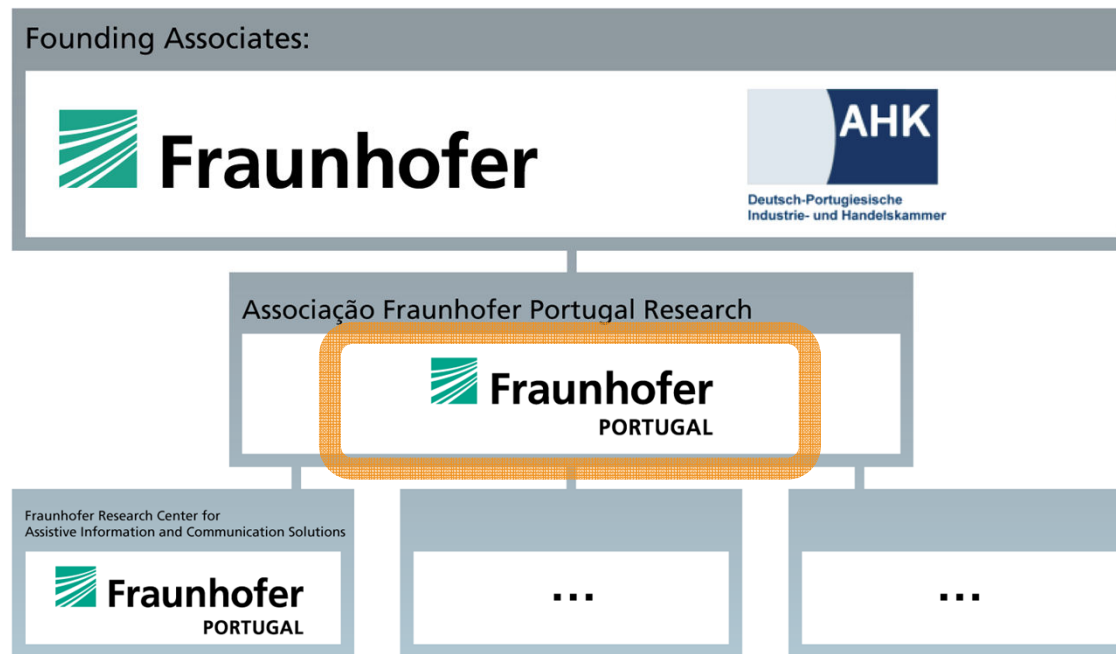
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## 2. Fraunhofer Portugal

### Institutional Background

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## 2. Fraunhofer Portugal Institutional Background

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### A New Ambition is Born for Portugal's R&D

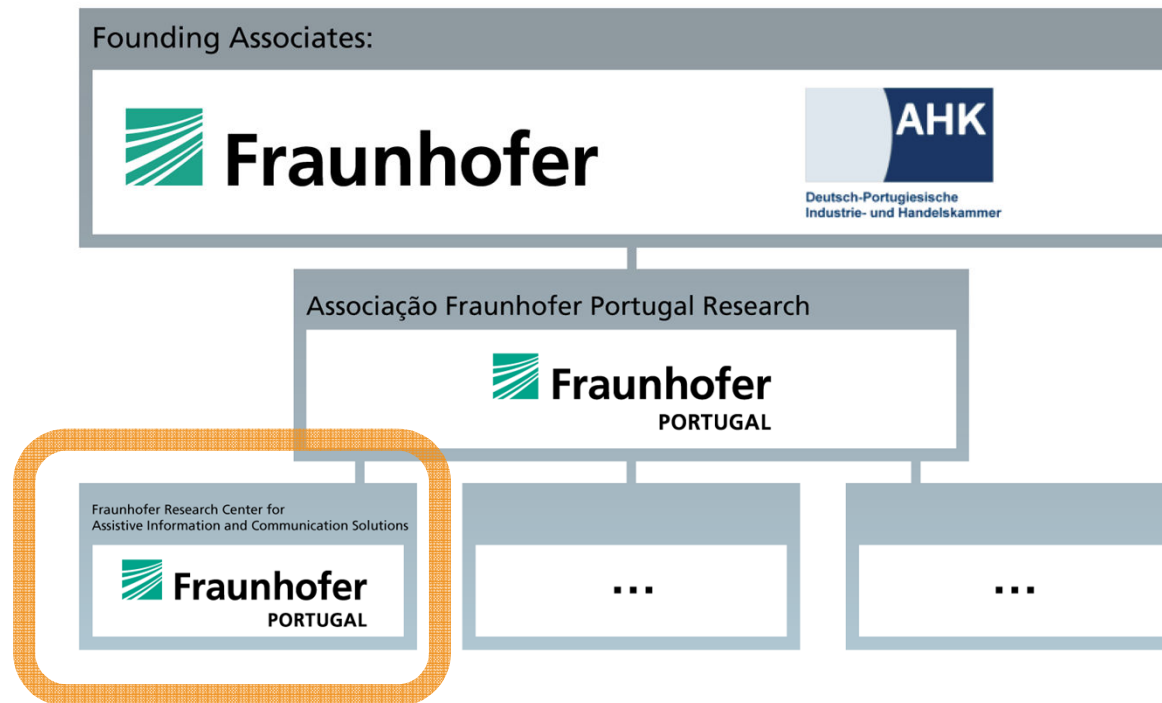
- **2007:** MoU and preliminary financing agreed vs. an initial activity plan
- **May 2008:** Fraunhofer Portugal AICOS kicks-off (incubated by UP)
- **Nov 2008:** Associação Fraunhofer Portugal Research is created
- **Jan 2009:** The "Associação" takes over AICOS from UP
- **Sep 2009:** AICOS public inauguration financing & collaboration agreements (UP) signed
- **Mar 2010:** the Portuguese Government formally declares Fraunhofer Portugal as an Institution of Public Common Interest (*Pessoa Colectiva de Utilidade Pública*).

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# 3. Fraunhofer AICOS

## Institutional Background

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# 3. Fraunhofer AICOS

## Operational Goals

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**Starting from scratch in May 2008 we have the following operational goals:**

- Above all: Be a reliable and leading edge R&D partner for the Industry!
- Transfer of Technology through projects and heads!
- Implement an operation with approximately 40 Full Time Equivalentents (FTE)
  - *Equals to a headcount of ~100 persons including administration and students*
- Implement the Fraunhofer funding model until the end of 2014:
  - *Decrease institutional funding to 1/3 according to the Fraunhofer Model*
  - *Achieve a mix of ~1/3 revenues from industry and ~1/3 national/international R&D programs*
  - *Achieve a planned budget of ~4M€ in 2014*

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# 3. Fraunhofer AICOS

## Strategic Research Agenda

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AAL	ICT4D
Target Groups	<ul style="list-style-type: none"><li>▪ <b>Ageing &amp; Elderly</b> (including their relatives, caretakers and communities)</li><li>▪ <b>Rural &amp; Developing</b></li></ul>
Focus Areas	<ul style="list-style-type: none"><li>▪ <b>Human Computer Interaction &amp; UX</b></li><li>▪ <b>Information Processing</b></li><li>▪ <b>Autonomic Computing</b></li></ul>



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# 3. Fraunhofer AICOS

## Strategic Research Agenda – Activity Areas

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### AAL - Ambient Assisted Living

#### ■ What is AAL?

Leveraging ICT to help and to take care of older and aging persons while not being in the doctor's office nor in a hospital.

#### ■ Why AAL?

Inevitable lack of money and human resources to face the demographic shift

#### ■ What is wrong with AAL?

A reliable framework is missing in order to develop business cases, which are needed by the industry to start investing money in product and service development

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# 3. Fraunhofer AICOS

## Strategic Research Agenda – Activity Areas

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### ICT4D – Information and Communication Technologies for Development

#### ■ What is ICT4D?

The application of Information and Communication Technologies within the field of [Socioeconomic Development](#). ICT4D concerns itself with directly applying information technology approaches to poverty reduction.

#### ■ Why ICT4D?

The objective is to provide solutions for mobile device services and applications that meet the local users' demands. The primary target user group will be ICT users in rural and developing areas, namely in [African Portuguese speaking countries](#).

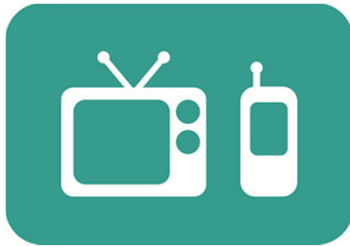
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# 3. Fraunhofer AICOS

## Strategic Research Agenda – Scientific Areas

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Human-Computer Interaction



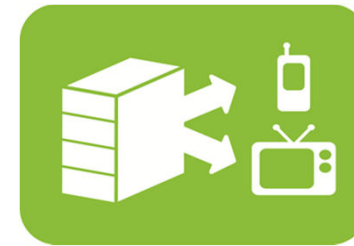
Adapting INTERACTION  
to SPECIFIC USER NEEDS

Information Processing



From RAW data ...  
to MEANINGFUL  
information

Autonomic Computing



SMARTER machines: less  
configuration &  
maintenance

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# 3. Fraunhofer AICOS

## Human-Computer Interaction

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- **User & Social Experience**

How an end-user feels about using a product?

- **Mobile & Future Devices**

Applications, Services, Mobile social networks, and studies on the use of non-PC Internet devices for special target groups

- **Evaluation & Usability**

A product should not get commercialized without being tested and iteratively redesigned first!

### Human-Computer Interaction



Adapting INTERACTION  
to SPECIFIC USER NEEDS

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# 3. Fraunhofer AICOS

## Information Processing

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- **Context Awareness**

Information specific to the current activity, situation or even mood of a person (e.g. working, feeling lonely)

- **Content Retrieval**

Search of data within multiple contexts (e.g. fall detection or prediction, health patterns)

- **Multimodal Information Fusion**

Acquisition of information by multiple sensors capturing the same reality (Fusion restores all inherent information of interest)

### Information Processing



From RAW data ...  
to MEANINGFUL  
information

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# 3. Fraunhofer AICOS

## Autonomic Computing

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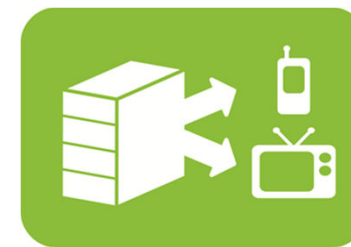
- **Architectures and Enabling Technologies**

Protocols, service platforms and software architectures that enable autonomic system deployment and management (e.g. TR-069, OSGI, ...)

- **Adaptive Systems & Algorithms**

Support systems that are able to adapt to time-changing and resolve unforeseen conditions (e.g. statistical modeling, adaptive control, ...)

### Autonomic Computing



SMARTER machines: less configuration & maintenance

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# 4. Project Examples

## Overview

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Some examples of our current Projects:

- **AAL4ALL**
- **Mover**
- **EMA**
- **Smart Companion**
- **eCAALYX**

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# 4. Project Examples

## AAL4ALL

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### Objectives:

- **'Interdisciplinary Task': Bring together all relevant stakeholders**

Public Institutions, Industry, User Organizations, R&D Institutions

- **'Most Important Task': Discuss, Agree & Specify**

The "Public Primary Health Care Standard for AAL-Solutions"

- **Business Model First**

Who are the key players? Who sells what to whom? (business driven interfaces)

- **Avoid reinventing wheels**

Analyze what standards and other international activities already exists and only focus on the missing pieces

- **Conformance tests lab and large field trial**

International proof of concept

### Facts:

- Planned Volume: 8,5 Million €
- Starting Date: March 2011
- Duration: 3 Years
- Partners: 34



# 4. Project Examples

## AAL4ALL

### Partners:



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# 4. Project Examples

## AAL4ALL

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### Expected Results:

- AAL ecosystem associated to a business model and validated through large scale trial
- Certification process for AAL products
- Reference designs will diminish investments risk and reduce the time-to-market
- “First mover “competitive advantage for mass market products
- Solution for Portugal demographic change
- Example for solutions in other European countries

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# 4. Project Examples

## Mover



### Problem:

- Lack of physical movement is one of present day concerns
- Population is more and more exhibiting health problems partially caused by the their lack of movement
- People do not always find the time and motivation to do exercise

# 4. Project Examples

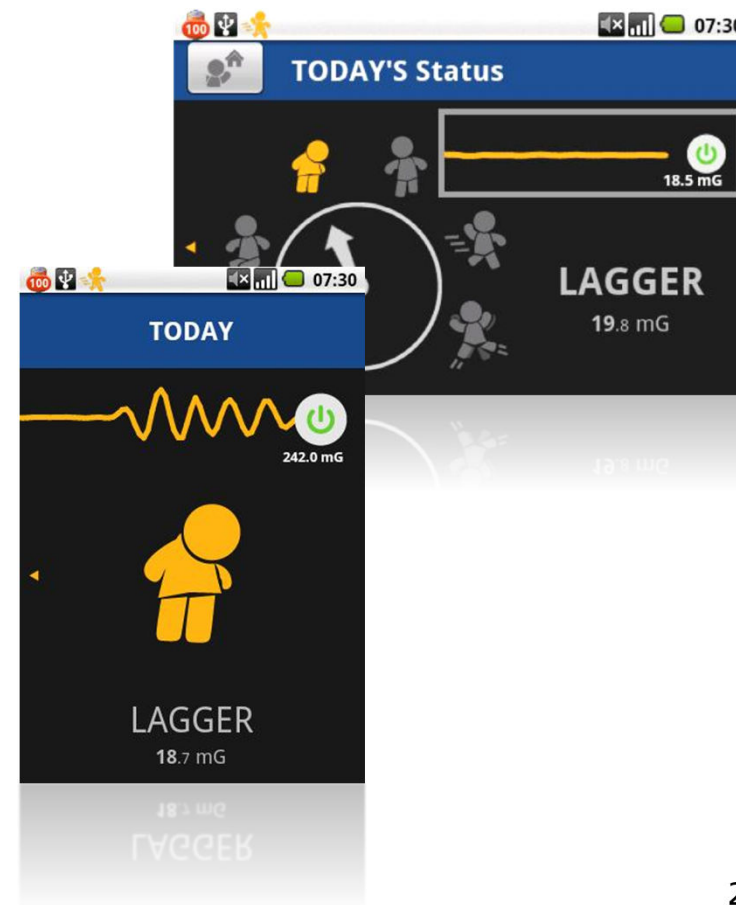
## Mover



### Solution:

- Tracks your activity level and helps you become more active
- Detects falls and warns via SMS and e-mail your contacts
- Compares your movement with others in the community

Ranked 5th in 2nd Android Developers Challenge Lifestyle Category



# 4. Project Examples

## EMA

- A complete energy monitoring solution
- Low cost
- Easy to deploy regardless of home footprint
- User-friendly interface
- Modular design
- Use of existing infrastructure for communication
- Visualization on any Internet connected device

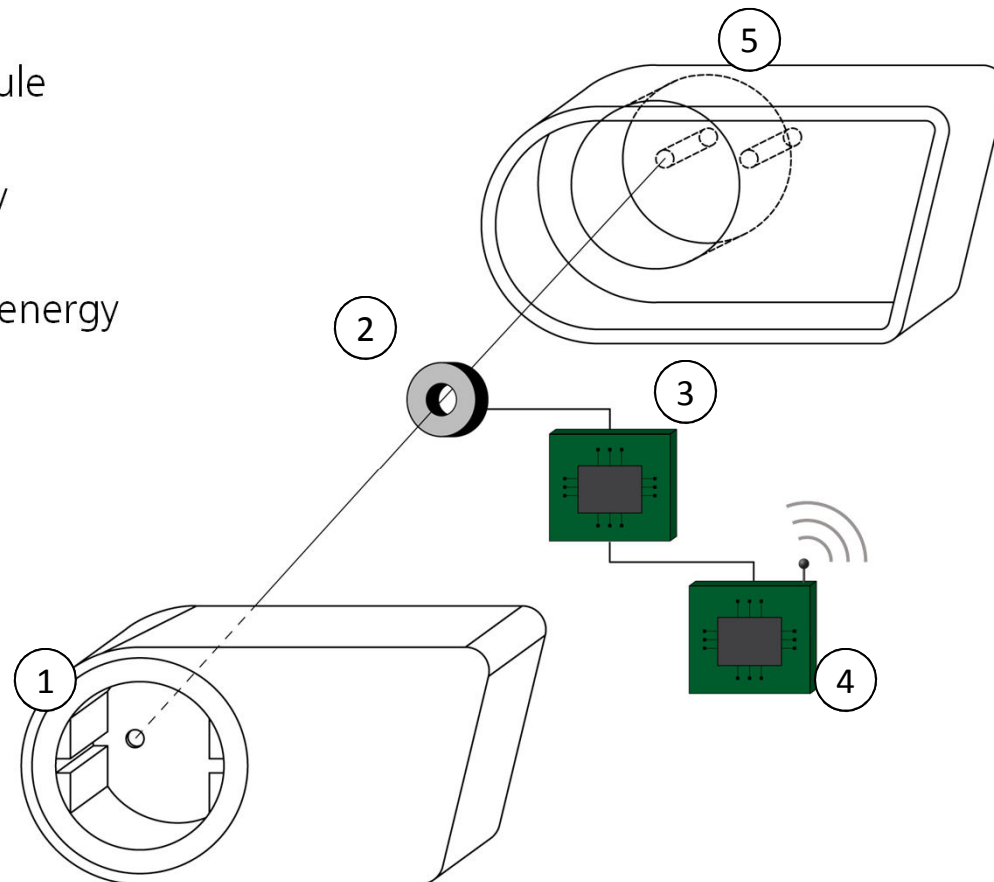


# 4. Project Examples

## EMA

- Low cost electricity metering module
- Uses Z-Wave® wireless technology
- Can be adapted to other types of energy

- ① Connects to device plug
- ② Current transformer
- ③ Power metering IC
- ④ Z-Wave® transceiver
- ⑤ Connects to wall socket



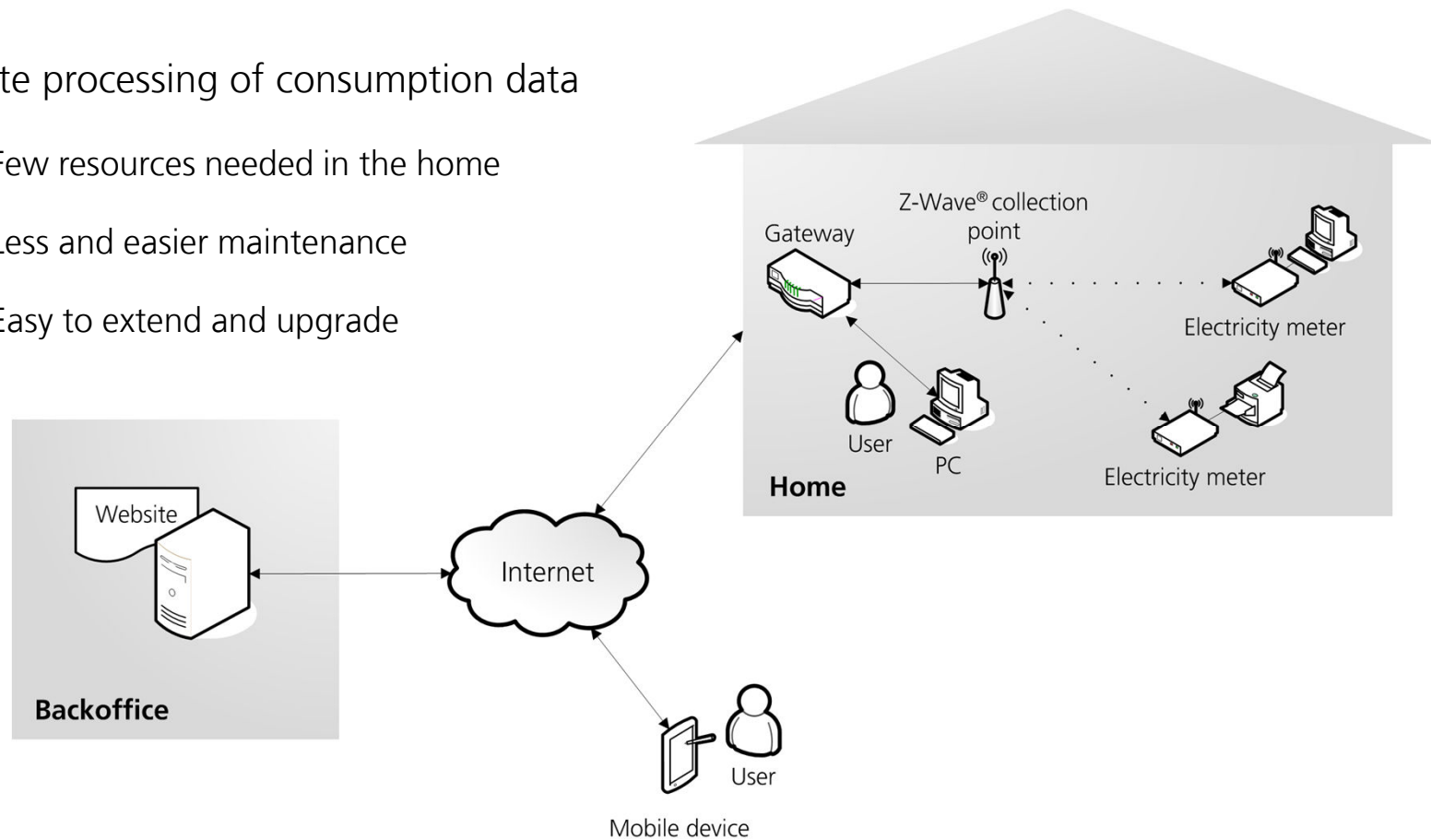
# 4. Project Examples

## EMA



### ■ Remote processing of consumption data

- Few resources needed in the home
- Less and easier maintenance
- Easy to extend and upgrade



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## 4. Project Examples

### Smart Companion

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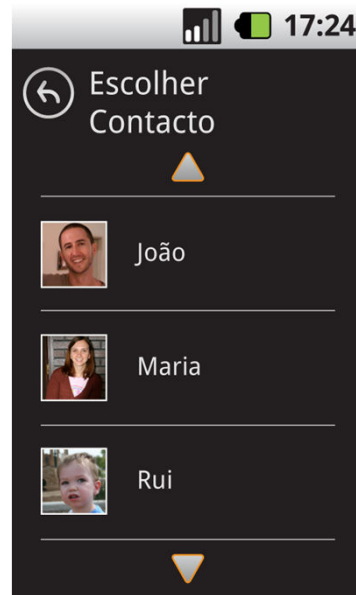
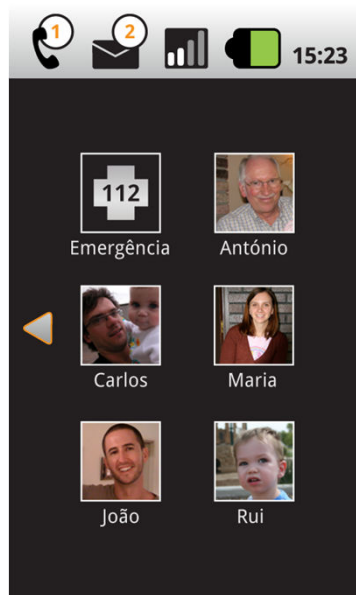


- The Smart Companion is an Android customization specially designed to meet older adults' needs
- It aims at being a companion which is permanently available to help and support users in their daily actions



# 4. Project Examples

## Smart Companion



It enables the user to easily:

- Call the emergency line
- Call friends
- Send voice and text messages
- Receive medication reminders
- ... and much more

# 4. Project Examples

## eCAALYX



3 main subsystems:

### ■ Caretaker Site

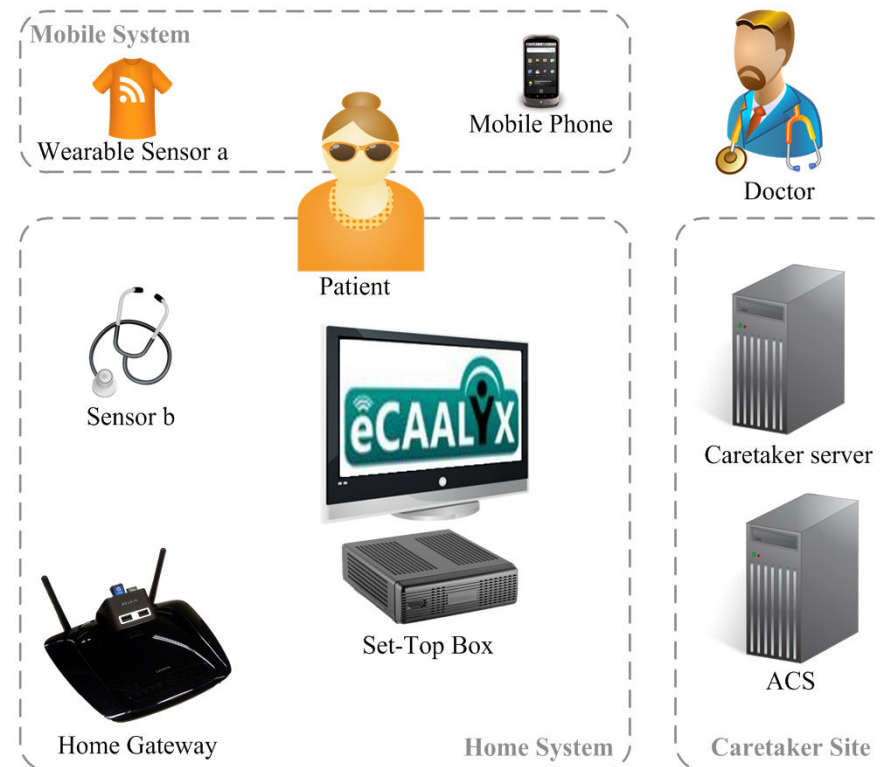
- Server and ACS - Telefónica I&D

### ■ Home System

- HG and STB - Fraunhofer AICOS
- Sensors - Corscience

### ■ Mobile System

- Mobile Apps - INESC Porto
- Garment – Cetemmsa

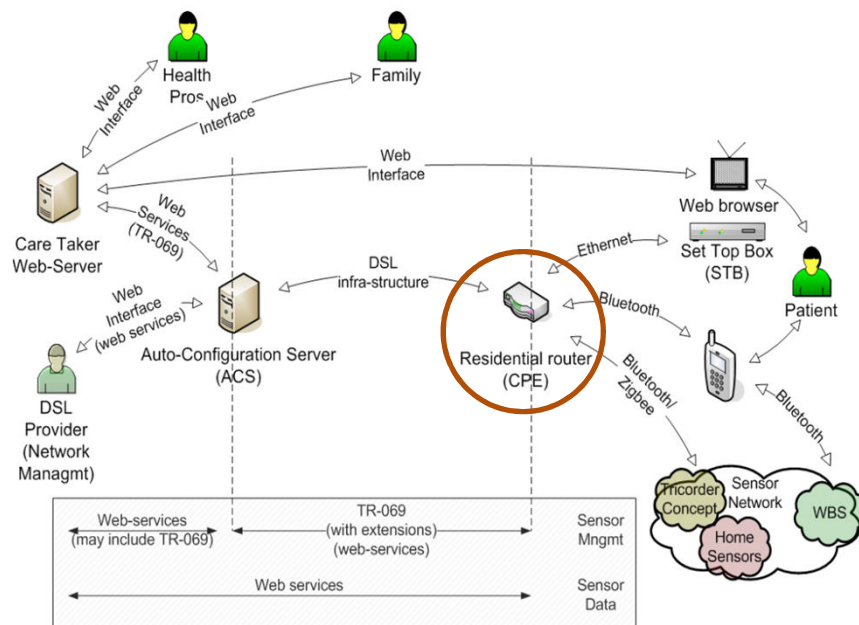


# 4. Project Examples

## eCAALYX



### Home Gateway:



- **Gathers data from medical sensors**  
Independent of communication technology and protocol
- **Obtains scheduling + pre-processing rules from the Caretaker**  
Scheduling rules define vital signs monitoring procedures; Rules are used to raise alarms on the Caretaker side
- **Remotely managed**  
A set of extensions to the IGD TR-098 data model were defined to manage the configuration of the sensors at home

# 4. Project Examples

## eCAALYX

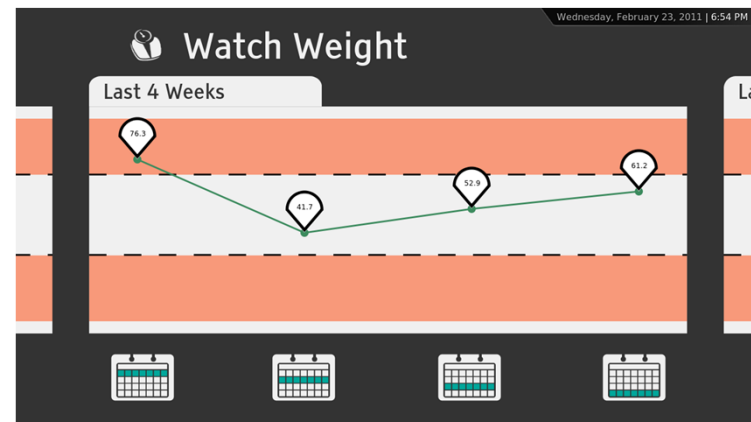


### Set-Top-Box / Personal Health Channel:

- User Interface connected to the TV
- Connects to the Caretaker Server to retrieve patient data (health status, agenda, reminders, etc.)
- Video Conferencing between patient and doctor and emergency calls
- Being implemented in Google TV and XBMC



Set-Top Box



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# 5. Fraunhofer AICOS Services

## What can we do for you?

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### ■ R&D Consulting

- Propose new solutions and ideas for evolving your products and services

### ■ Proof of Concepts

- Initial implementation for proving that new ideas really work

### ■ Prototype Implementation

- Architectural specification
- System implementation
- System testing and validation

### ■ Easy access to German Fraunhofer Institutes in other Areas of Competence

### ■ Member of Scientific National System (thus eligible to participate in public incentive R&D programs) 29