SERVICE ROBOTS ASSISTING PERSONNEL IN RESIDENTIAL CARE FACILITIES

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Robotic Home Assistant Care-O-bot®

- Assistance for household chores
- Multimedia, social integration
- Fetch- and carry services
- Safety, Monitoring
- Home Management

Care-O-bot 3

product vision

Care-O-bot 2

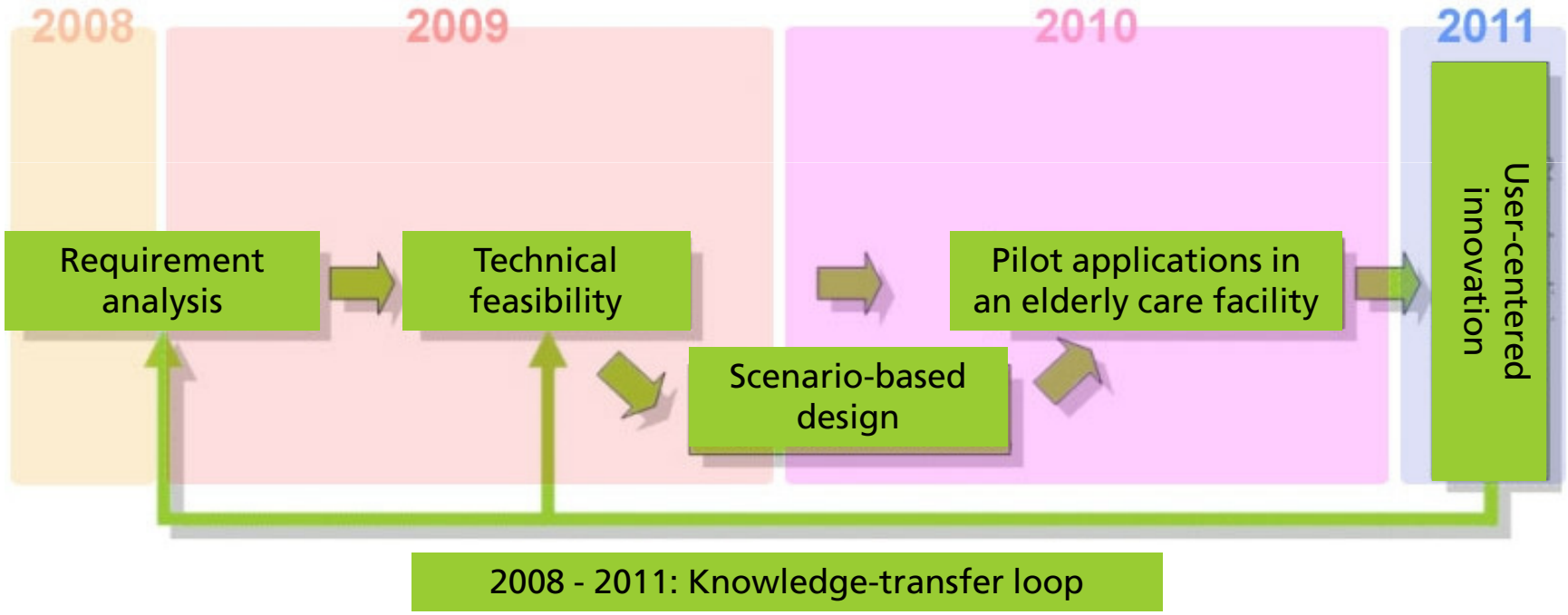
walking support, mobile manipulation

Care-O-bot I

Care-O-bot® 3 in Operation

The WiMi-Care-Project

- Target: Support the personnel of residential elderly care facilities
- Involve the relevant user groups throughout the whole development process in order to ensure the usefulness of the designed application scenarios and thus the acceptance of the users



Funded by BMBF (FKZ: 01FC08024-27), Project duration 11/2008 – 10/2011, www.wimi-care.de

WiMi-Care: Project Partners, Tasks and Demonstrators

University Duisburg-Essen:
Knowledge transfer

Fraunhofer IPA:
Care-O-bot®

MLR-System:
CASERO®

User Interface
Design: User
interfaces

Parkheim Berg:
Requirements
analysis and pilots

Requirement Analysis in an Eldercare Facility

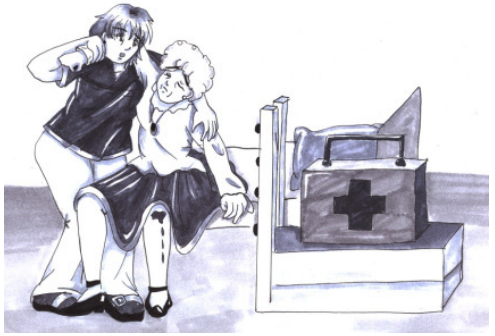
- Time-consuming routine logistics tasks
  - Pick-up and delivery service
  - Supporting the night duty
  - Carrying heavy load
- Almost no time for entertainment
- Adequate supply of the inhabitants with water
  - Offer drinks at a regular basis
  - Monitor consumption

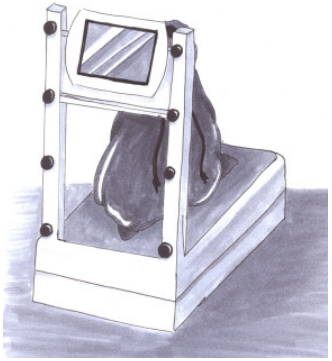
➔ Transport and supervision tasks can be solved with a less complex platform such as CASERO

➔ Water supply scenario requires complex manipulation capabilities, will be solved with Care-O-bot

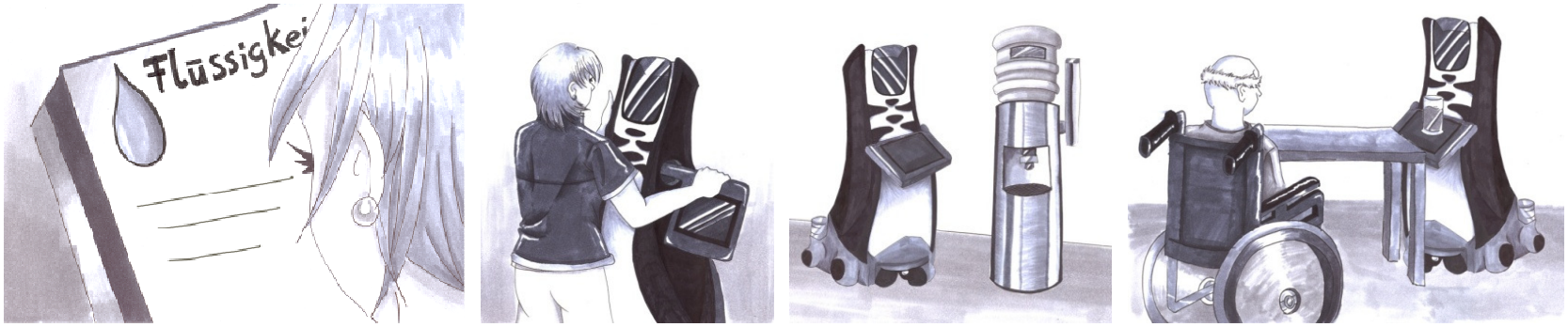
Scenario Overview

- Transport tasks, e.g. laundry, mail, meals, …
- Night monitoring: check for inhabitants in corridors, provide emergency equipment, interface to asses personal data, call a doctor, …
- Potation supply: check how much each person has drunk, offer drinks, register drinks given out to inhabitants
- Entertainment / activation of inhabitants: Robot to be used as a jukebox, to play mind and board games etc.





First User Tests in May 2010



- Targets for 5-day testing period
  - Evaluate technical feasibility of water delivery scenario
  - Get some initial feedback on the acceptance of the robot
- Simplified version of water delivery scenario
  - Draw water from a water cooler at predefined position
  - Navigate on a long corridor between kitchen and recreation area
  - Offer and hand over water to an inhabitant using the tray

First User Tests in May 2010

Experiences During First User Tests

- Technical Feasibility
  - Save navigation in corridors even with people working along
  - Sometimes people got confused by robot driving sideways, but showed no fear of possible collisions
  - Sometimes predefined target positions at table were blocked, thus robot had to abort
  - Grasping from kitchen sink and water dispenser worked reliably
- User Acceptance
  - Overall reaction very positive from both, inhabitants and care personnel
  - Users normally took a drink from the tray of the robot, however, only a few actually drank the water
  - Some users talked back to the robot after it addressed them using recorded speech

Current Work in WiMi-Care

- Extend water delivery scenario and integrate entertainment scenario
- Integrate face detection for explicitly addressing specific persons
- Improve user interaction to make sure they actually drink the water
- Integrate data base functionality to monitor drinks given out to inhabitants
- Increase robustness, e.g. sensor based detection of water dispenser buttons, detect mugs on table and tray
- Implement user interface for care personnel allowing to set the robot to work according to a given schedule

➔ Second test phase scheduled for June 2011

Additional information

http://www.care-o-bot.de/english
http://www.wimi-care.de/eng/