Assistive Technology and Robotic Technology for Dementia Care

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Statement

• **Assistive technologies** are important and useful for autonomy and independence of persons with MCI and mild dementia.

• **Information and robotic technologies** have potential for improvement of activities and participations.
Assistive technologies for persons with dementia

- Electric Calendar
- Scheduler
- Medication reminder
- Locator
- Picture phone
- Simple remote control
- Wheelchair with automatic brake
Assistive technologies for persons with dementia

- Some researches showed the evidences of some assistive technologies; e.g. Medication reminders improved medication adherence (Kamimura, et.al.)

- Adaptation of the devices to each user is important for practical use; e.g. assessment, instruction, customization and training.

- Assistive technologies must be a part of dementia care.

Communication robots available in Japan

- PARO (Daiwa House Industry)
- Kabochan (Pip)
- PaPeRo (NEC)
- PALRO (FUJISOFT)
- Pepper (SoftBank)
- NAO (Aldebaran Robotics)
Some of the robots showed effectiveness for persons with dementia.

However, there are many questions.

Why do we use these robots for persons with dementia?

What kinds of services do persons with dementia want?

How do we use these robots?
Development of an information support robot for the elderly with cognitive disabilities

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How to develop useful technologies for the elderly?

Information support robot for persons with dementia??
Decision process of the system concept based on field-based innovation

① Matching technology to users at the living environment

- Possibility of information support using the robot
- Suitable method according to the cognitive function of the elderly
- Information acquisition >90%
- Suitable environment
- Suitable synthesized speech
- Speech recognition 78.9%

Participant observation
Mock-up evaluation
User experiment

② Making system concept in the community (Izu city)

Group interview
(124 older people)
(40 professionals)
Interview (9 families)
Workshop (2 families and related professionals)

③ Business model

Target users:
> Home-bound elderly with forgetfulness; incl. MCI and Mild dementia

Services:
> Medication adherence
> Schedule indication

Provision form:
> Rental provision

Related professionals:
> Home cares
> Area comprehensive support center

172 needs from the elderly
36 support scenarios
System concept

- Input of the information
- Share of the information
- Information share system: Users and their families input the information and share them with professionals
- Service Model (Human support)
- Conversational information support protocol:
  - Technology for transmitting information with certainty
  - Technology for recognizing meaning of the users’ answer
  - Flexible interface for function of each user
- Schedule • Medication
- Memory
  - Important information for daily living; date, time, schedule and so on
- Activity
  - Timely information about necessary activities
- Target users:
  - Elderly with forgetfulness
  - MCI
  - Mild dementia
Evaluation of the robot system

- Persons with MCI and mild dementia understood information told by the robot.
- Once they acquired the information, they decided and took actions by themselves.
- Experiments of one month use with two older people revealed usefulness of the robot system for activities and participations.
- Information and robotic technologies have potential for improvement of autonomy and independence.
Effective uses of the technologies in community improve activities and participation.