Systems Engineering Seminar
Final Presentation
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Improve QOL by using human machine

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1. Background

◆ **Rapidly Aging Population in Japan (Fig.1)**
The rate of aging in 2015 26.7%
The rate of aging in 2035 33.4% (Estimation)

◆ **Increase the cost of social security (Fig.2)**
→ Pension, health expenditure, and cost for care

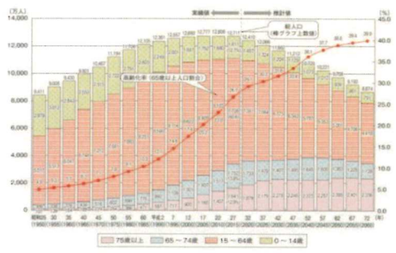


Fig.1 Changes of an aging society
内閣府「平成28年版高齢社会白書」

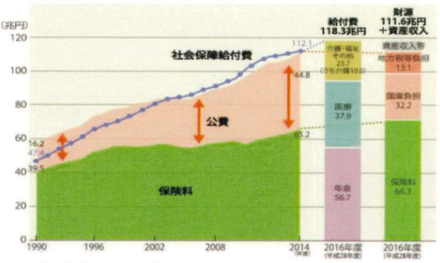


Fig.2 increase in social security expenditures
政府広報オンライン「社会保障と税の一体改革

Aging accelerates → increase in social security expenditures = Big amount of public expense

2. Requirement Analysis

◆**Requirement for elderly people**

高齢者のNeeds

Age 60 - 75
"want to enjoy" "live long with healthy"
"active engagement in society"

Age 75 - 85
"want to enjoy" "keep being healthy" "secure safety and security"

Age over 85
"want to enjoy" "want to live in their beloved home to the last

ニッセイ基礎研究所 「高齢社会におけるニーズと企業の対応動向

Common requirements → Enjoy, Be healthy, Create Community

Satisfy their requirements
Improve QOL → Extend healthy life expectancy

◆**Current State Analysis**

介護予防

Activity for improving QOL

(1) Hokuto city in Yamanashi
: The rate of aging 37% (2015)

- **Town development that is good for elderly people**
  A group to support dementia in a municipal hospital
- **Care prevention**
  A school for elderly people
- **Day care facility**
  Exercise

北杜市広報2017年6月号

(2) Saitama city in Saitama
: The rate of aging 23% (2015)

- **Lectures for care prevention**
  "Masu-masu Genki" school (ますます元気教室)
- **Interaction support**
  A place of recreation and relaxation
  Elderly citizen's welfare Center

さいたま市広報2017年7月号

3. Objective

Improve QOL by using human machine

Requirement for elderly people
Enjoy | Be healthy | Create Community
→ **Pepper imitates user**

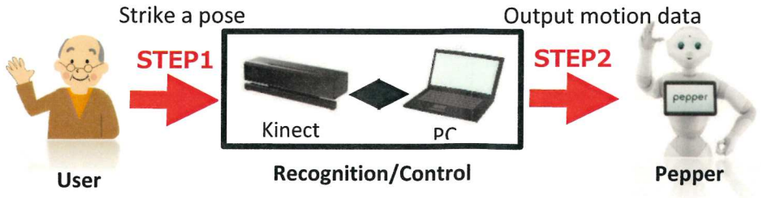
→ This system should meet these requirements

4. System

◆**Overview**

Pepper imitates user's motion

- Using **Kinect** and **PC**



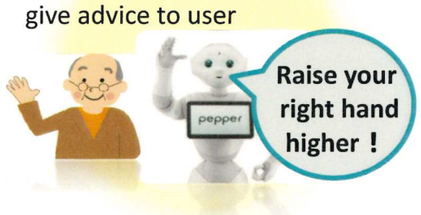
Connect the motion of human and pepper

■ **STEP1 Convert the motion into data**
- Recognize the motion of user by Kinect
- PC stores the motion data of Kinect

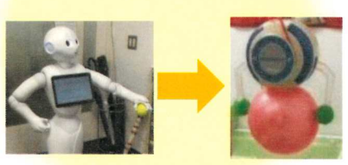
■ **STEP2 Pepper reproduce the user's motion**
- Convert the motion data of Kinect into pepper's motion

◆**Service Developing**

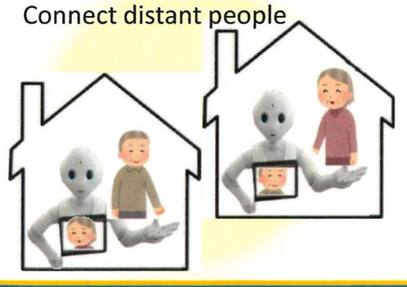
Ex.1 Exercise instractor
Exercise together and give advice to user



Ex.2 Robot operation
Crane game



Ex.3 Remote operation
Connect distant people



Requirement	
Ex.1 →	Be Healthy
Ex.2 →	Want to enjoy
Ex.3 →	Create community

5. Evaluation

◆**Questionnaire survey**

- Did you enjoy with Pepper?
- Do you want to use it again?
- Is explanation easy for you to understand?
- Is it easy for you to use it?

→ To adequately evaluate the appropriateness of this system