

Ontology for Caring Dementia Patient

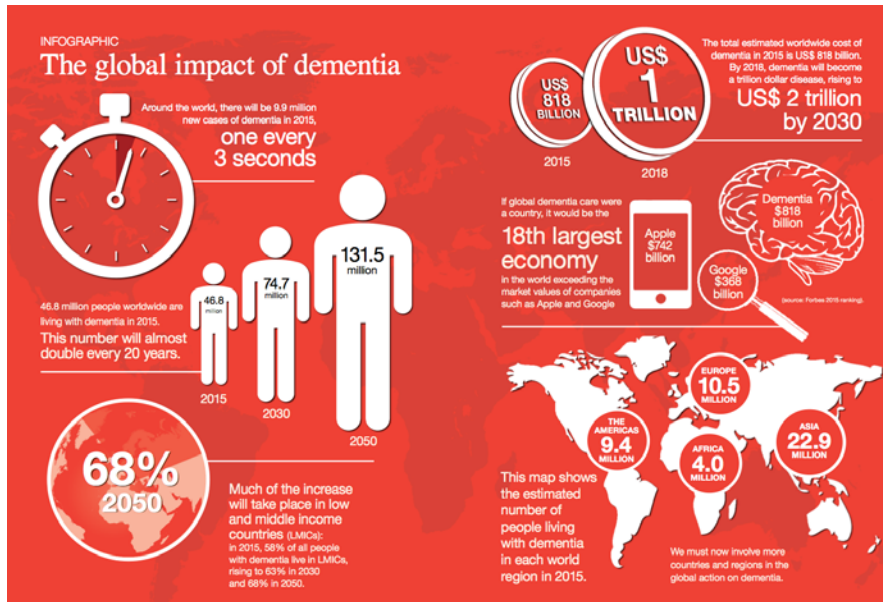
H.W. Jeon

Korea **Institute** of Science
and **Technology**

한국과학기술연구원

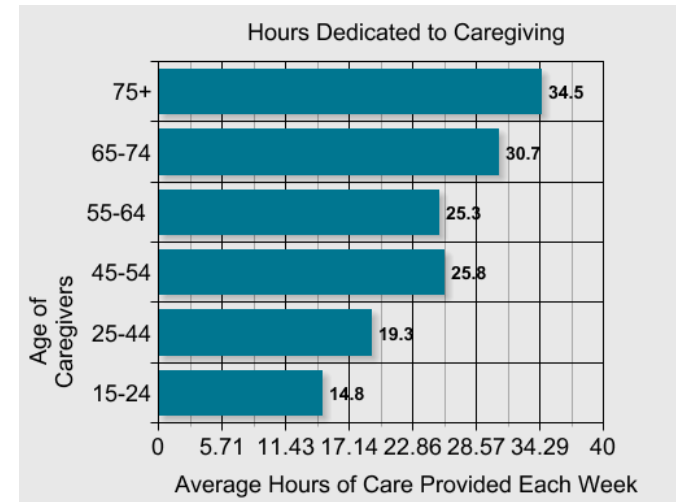
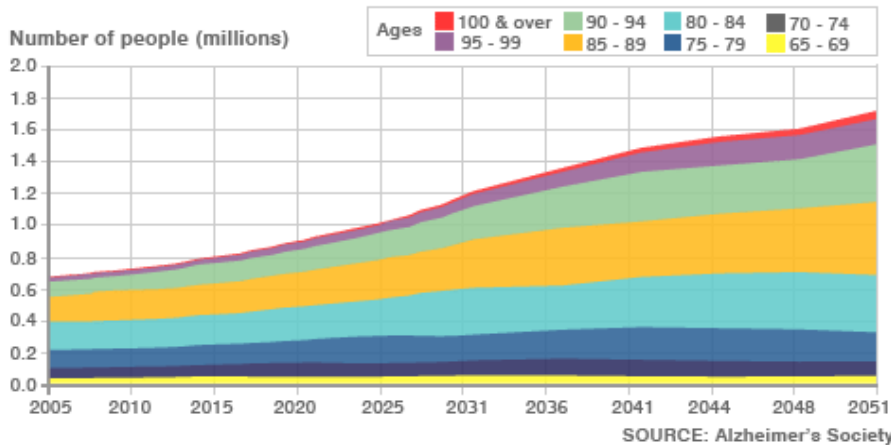
Introduction

■ Social issue of dementia



- National Clinical Director for Dementia, NHS England, World Alzheimer report 2015

EXPECTED RISE IN UK DEMENTIA CASES



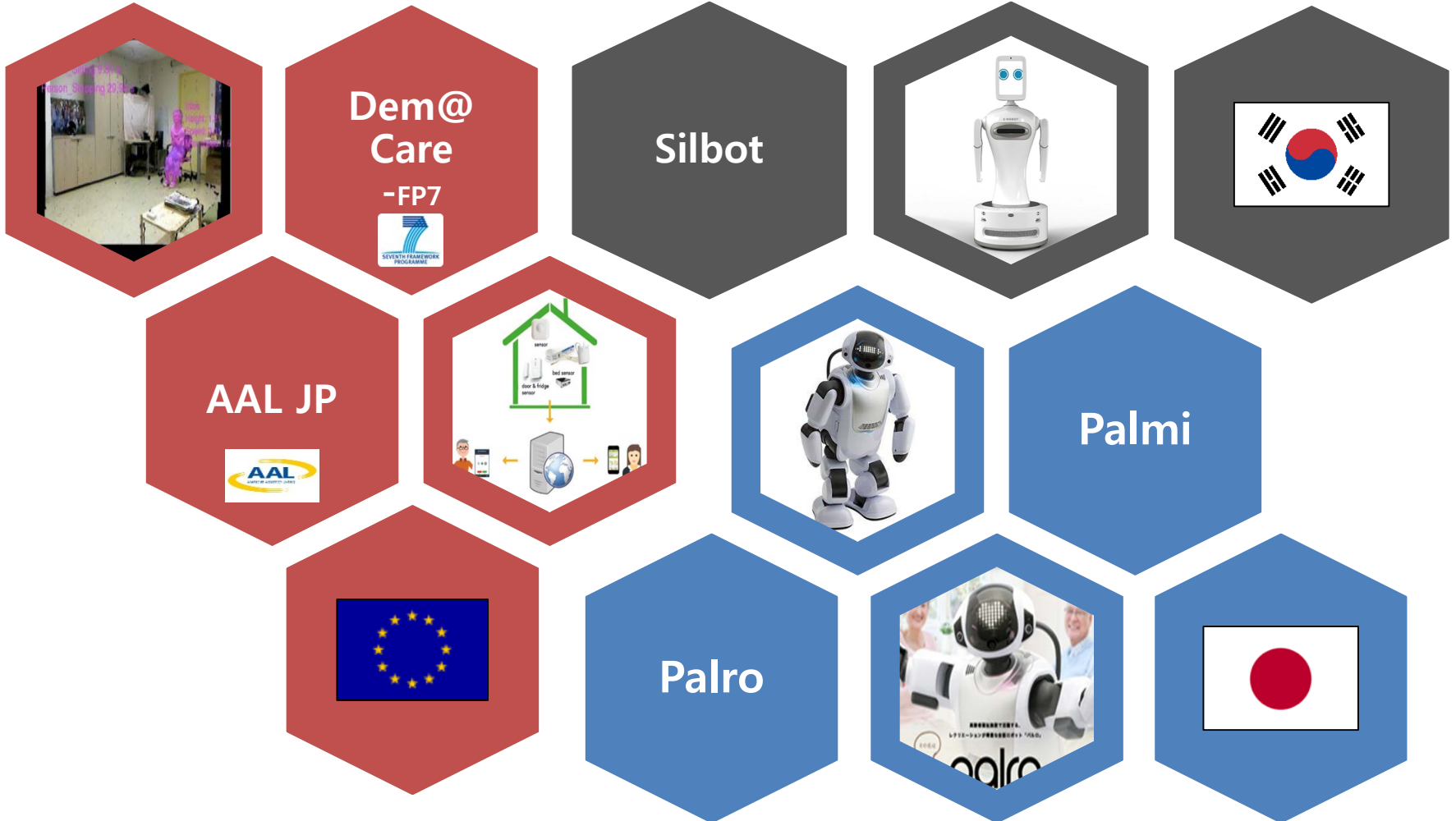
-National Center on Caregiving, Caregiver Statistics: Demographics



-Alzheimer's association, 2017 Alzheimer's Disease Facts and Figures

Related works

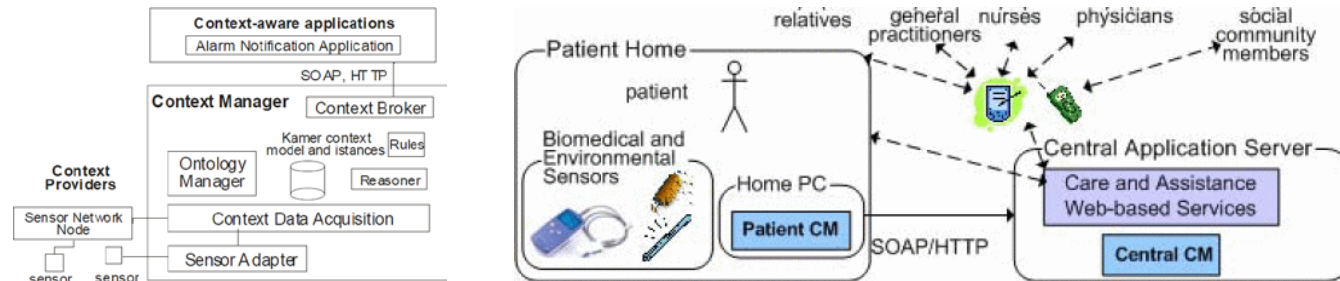
- Dementia patient care with Robot



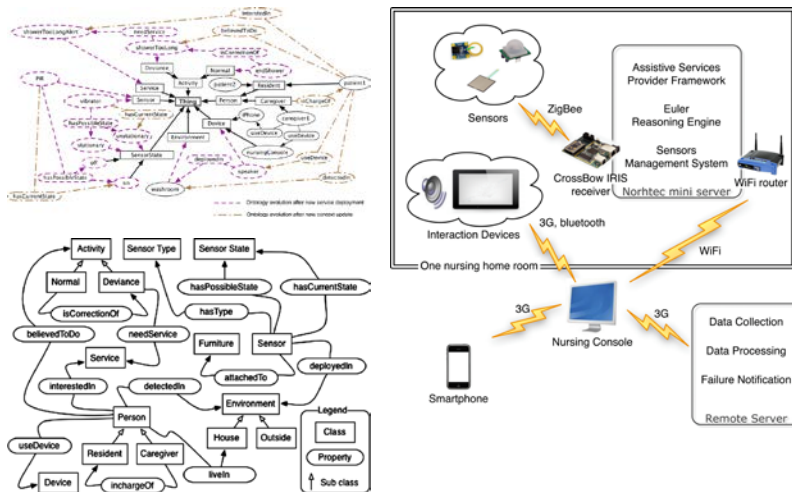
Related works

Knowledge based approaches

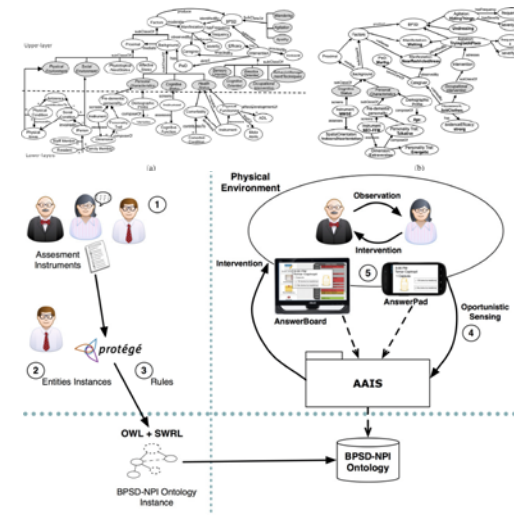
Home Health Monitoring Knowledge System ¹⁾



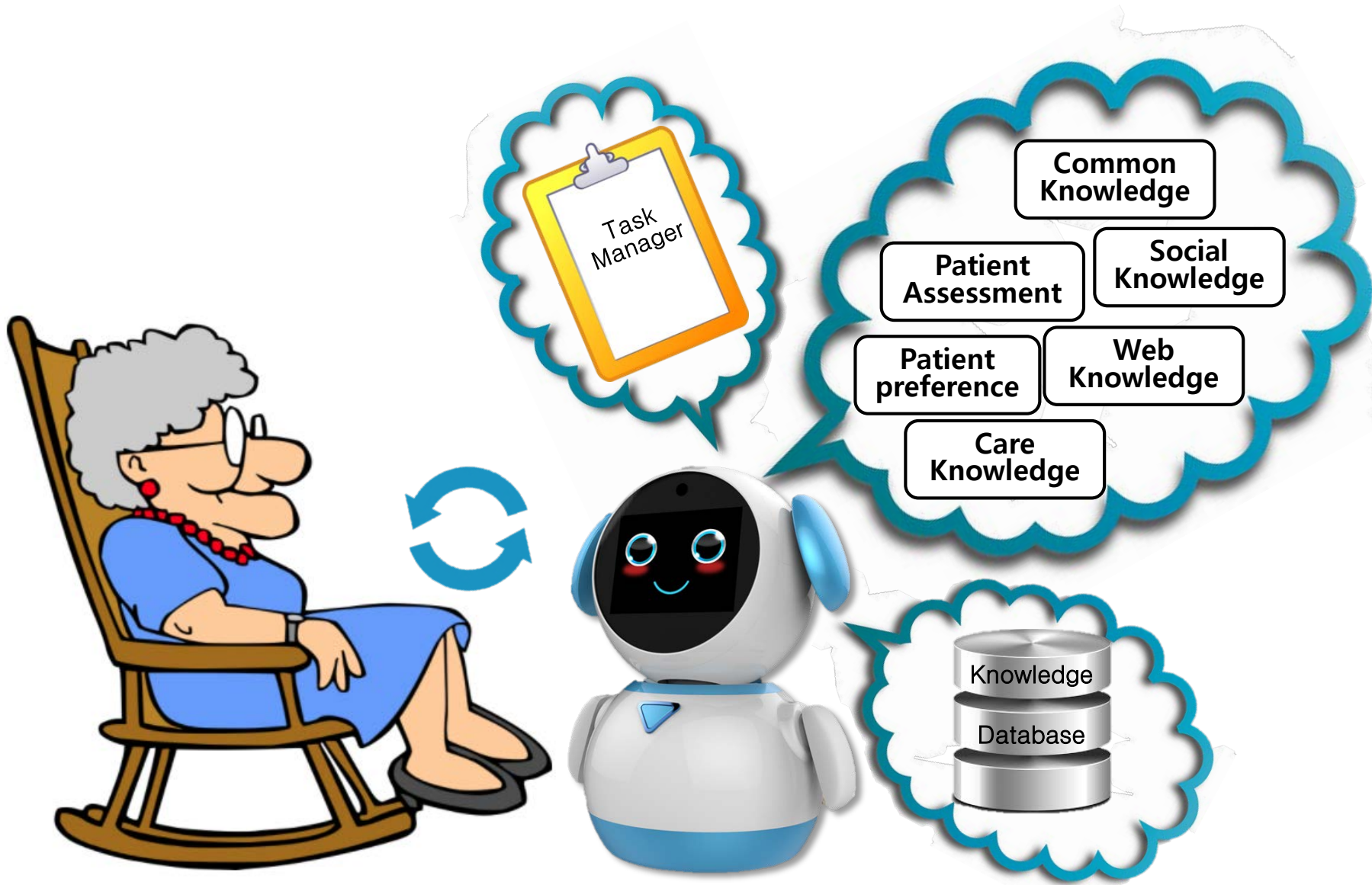
Monitoring and remote care ²⁾



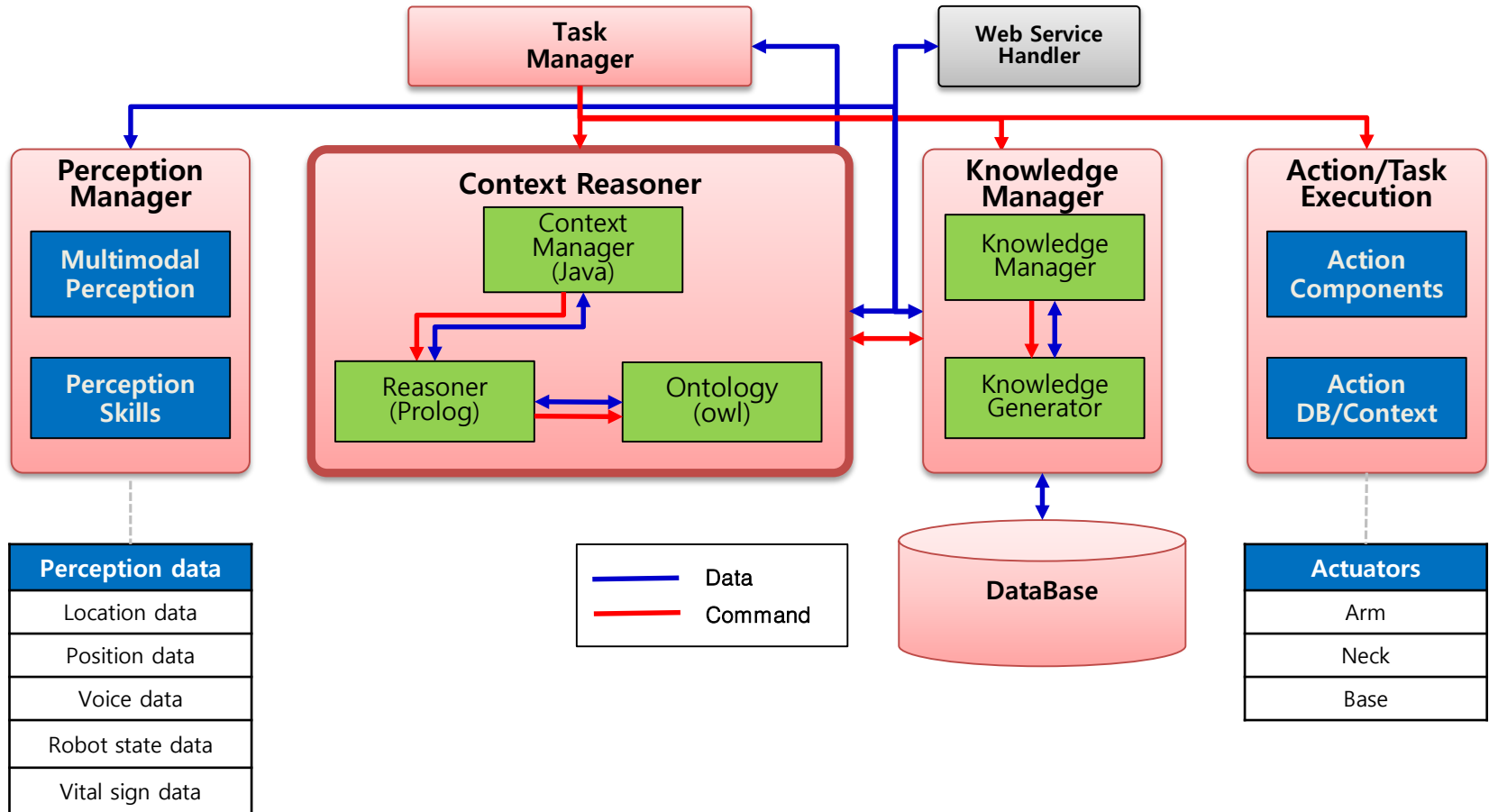
Personalized and nonpharmacological interventions ³⁾



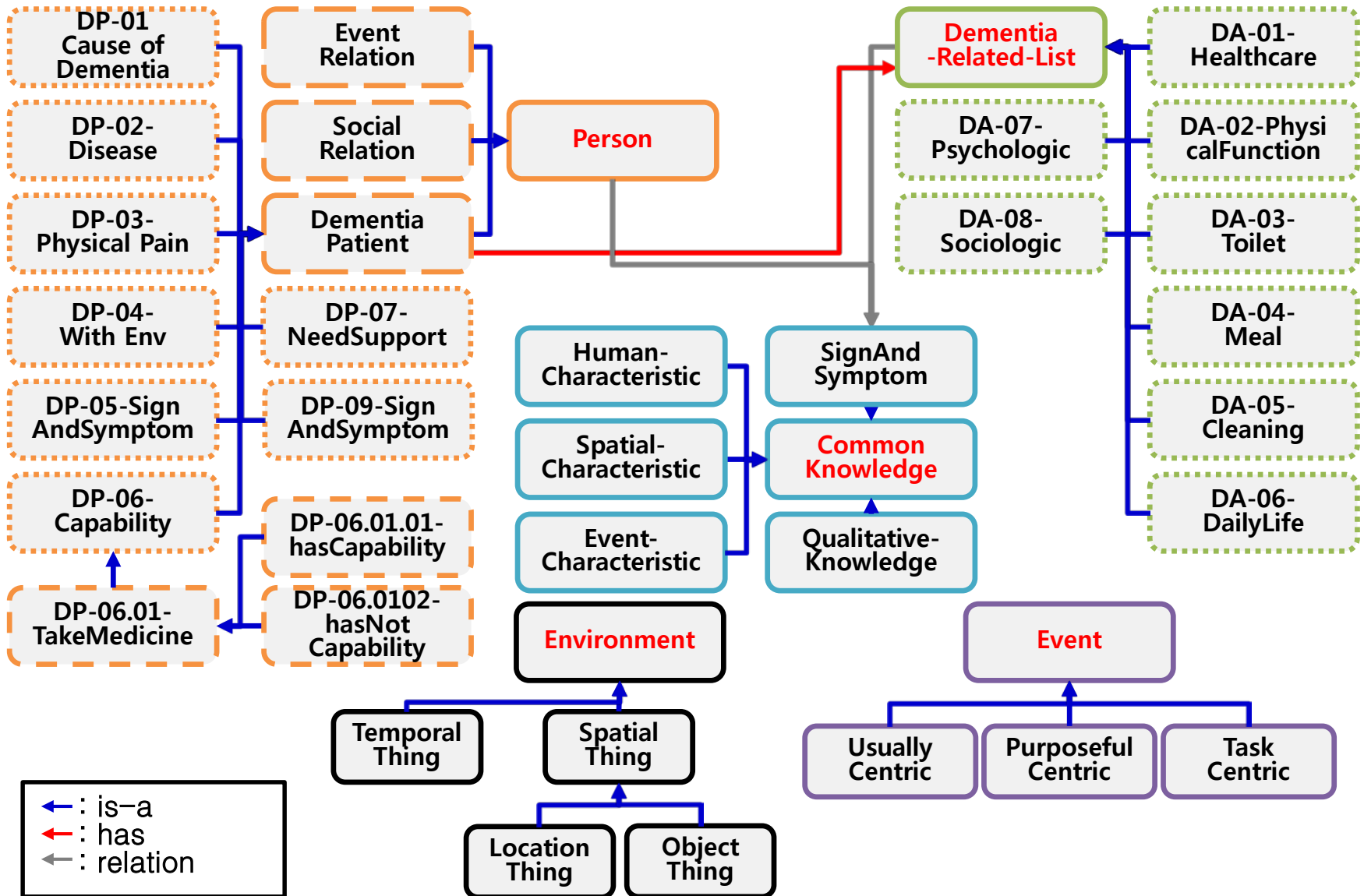
Life-Care Robot for Dementia Patient



Life-Care Robot Software Architecture



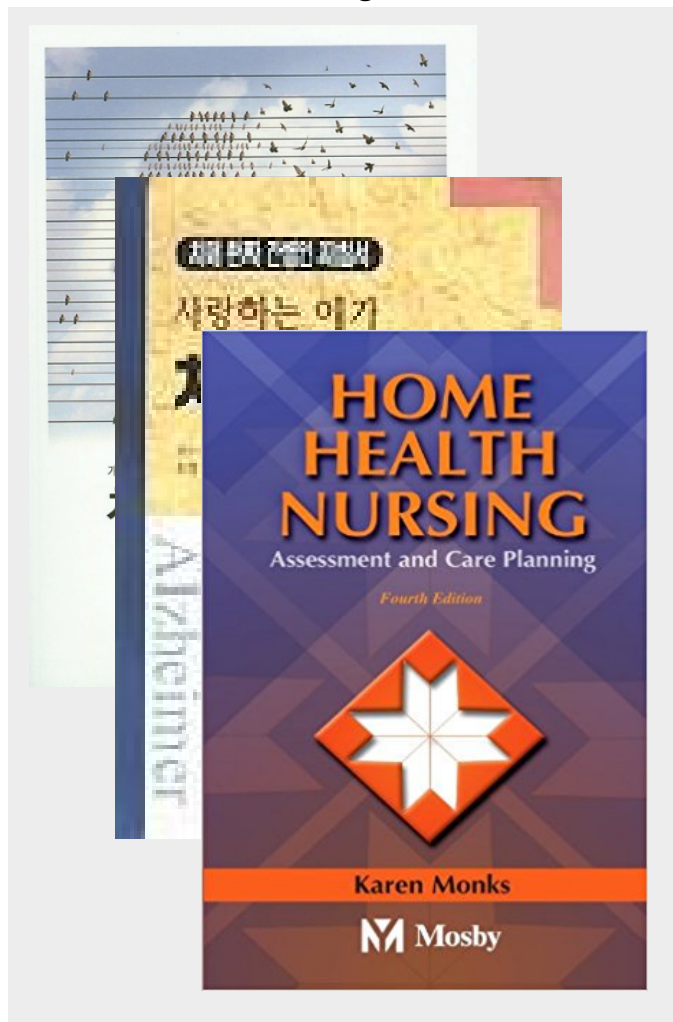
Knowledge of caring dementia patient



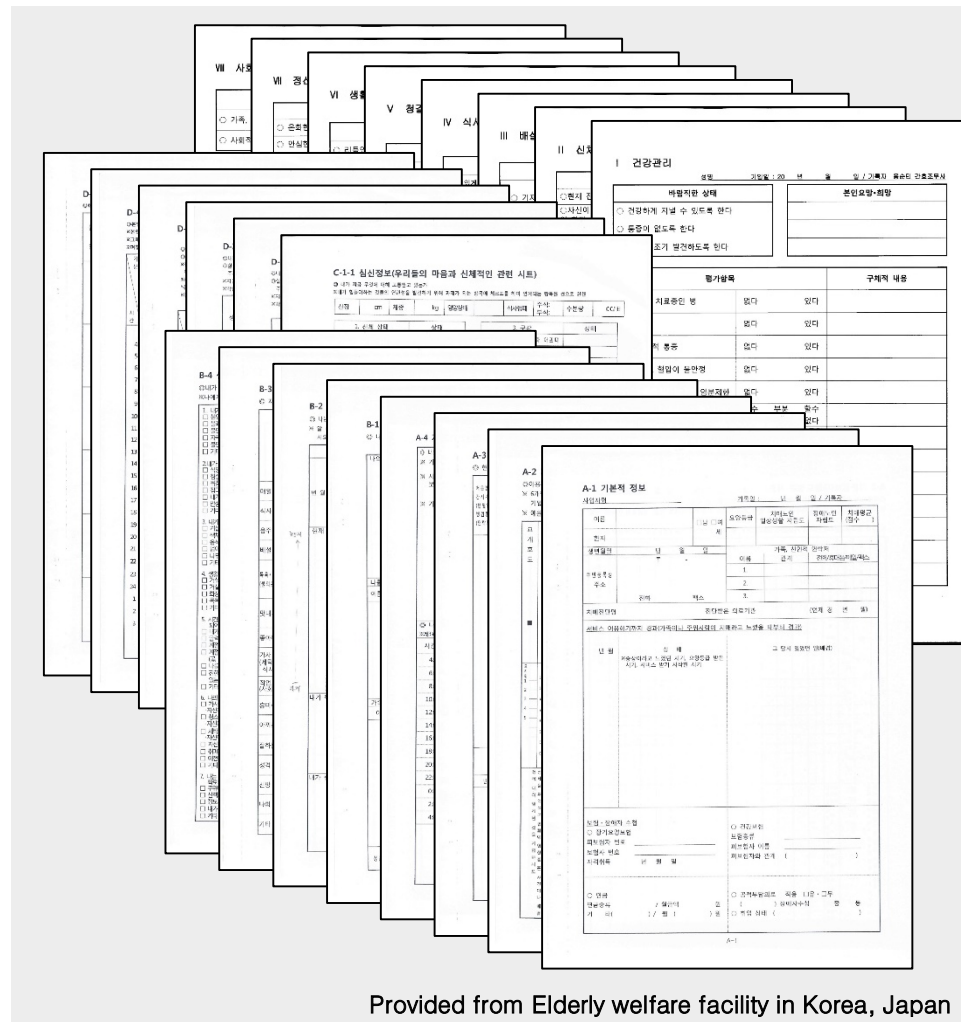
Knowledge of caring dementia patient

■ Knowledge resource

- Care knowledge



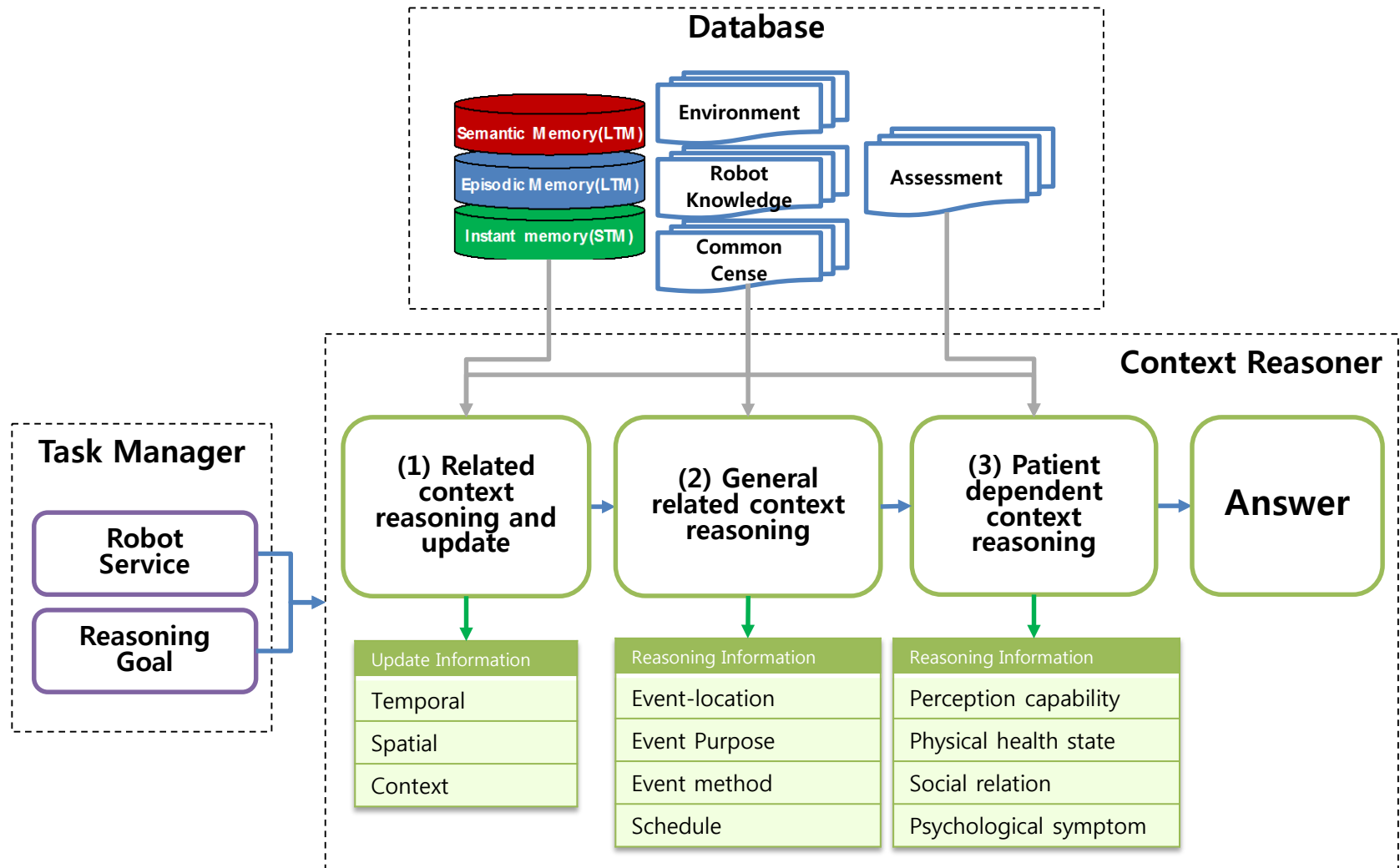
- Dementia Assessment



Provided from Elderly welfare facility in Korea, Japan

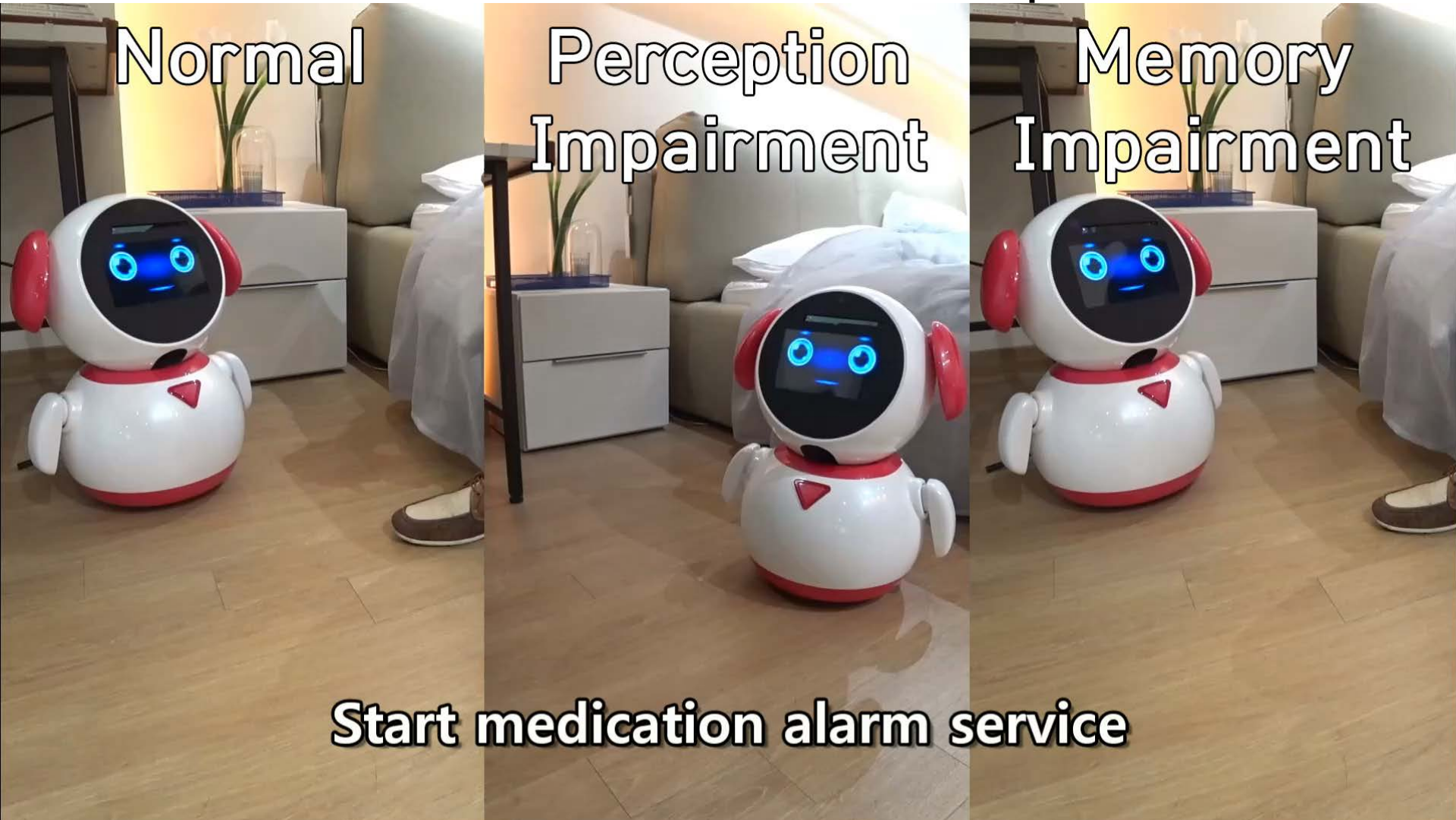
Reasoning process

■ Patient-centric reasoning process



Human-robot interaction example

- Reasoning whether the patient needs additional help to complete the situation

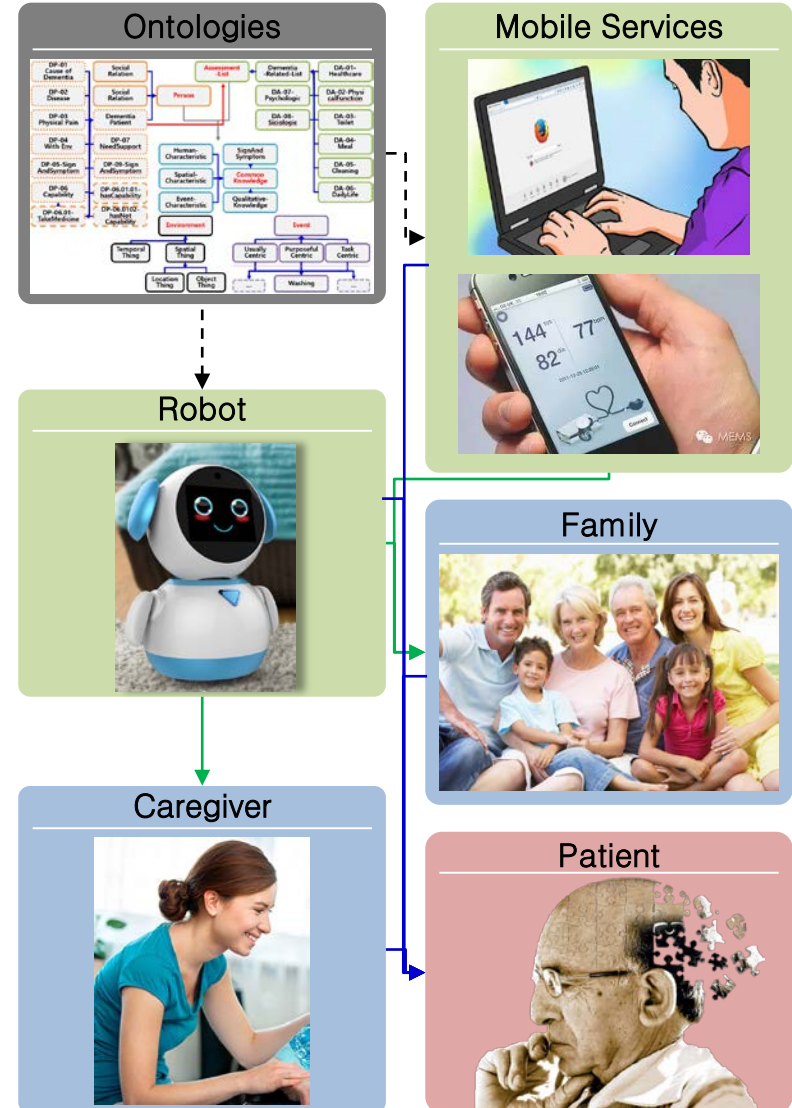


Future works

■ Dementia patient care knowledge evaluation

상황 Situation	옷갈아 입기 상황 ✓						
현재 행동 특성	공격적 성향 ✓						
평소 성향	차분함 ✓						
개인 정보	나이	64					
	성별	남					
	직업	자영업					
	좋아하는 것 ✓	파란색	검은색	사진	원형	TV	
	싫어하는 것 ✓	빨간색	흰색	뜨거운 것	땀		
주변 환경	물건	침대	원형 의자	옷장	모자	이불	장문
		배게	화분	빨간 상의	파란 상의	검은 상의	검은 하의 ✓
		빨간 하의	청소기	물	PVC 컵		
장소	침실						
과거 병적 기록	관절염						
시간적 정보	현재 시간	오전 10:00					
	현재 해야할 일	환복					
	앞으로 해야할 일	식당으로 이동 ✓					
증상 별칭 기록	공격적 성향 ✓	망상	혼란 ✓	단기기억 손실			
주론된 대응	1. (옷갈아 입는) 이유를 설명한다. ✓ 2. (좋아하는 색상의 옷을 이용하여) 설득 한다. 3. (물만들) 물어본다.						
결과	적절 ○ ✓	모호 △	잘못된 X	추가정보 필요 ?	기타		
점수 (○)	1	2	3 ✓	4	5	6	
추가 의견 (△, X, ?, 기타)							
추가 환경 변수							

■ Possible applications



- We have designed an ontology for caring dementia patient.
- Proposed ontology can describe the knowledge for patient, environment, event and common senses.
- We have shown the feasibility of the ontology by applying it to simple human-robot interaction scenarios.
- More knowledge on robot and human-robot interaction will be added.
- Whether or not the proposed knowledge is valid needs to be tested.

Thank You !