

# Omoide Engineering

## - social use of personal memories -

Yoshio Nakatani, Ph.D.  
Ritsumeikan University

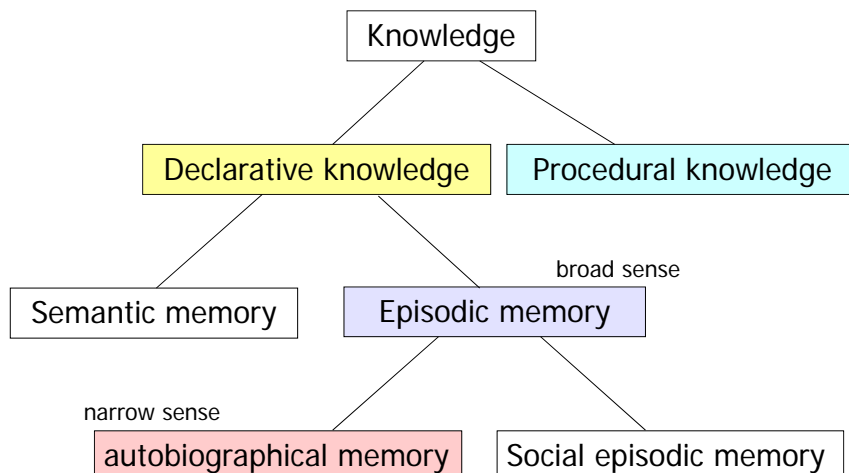
1



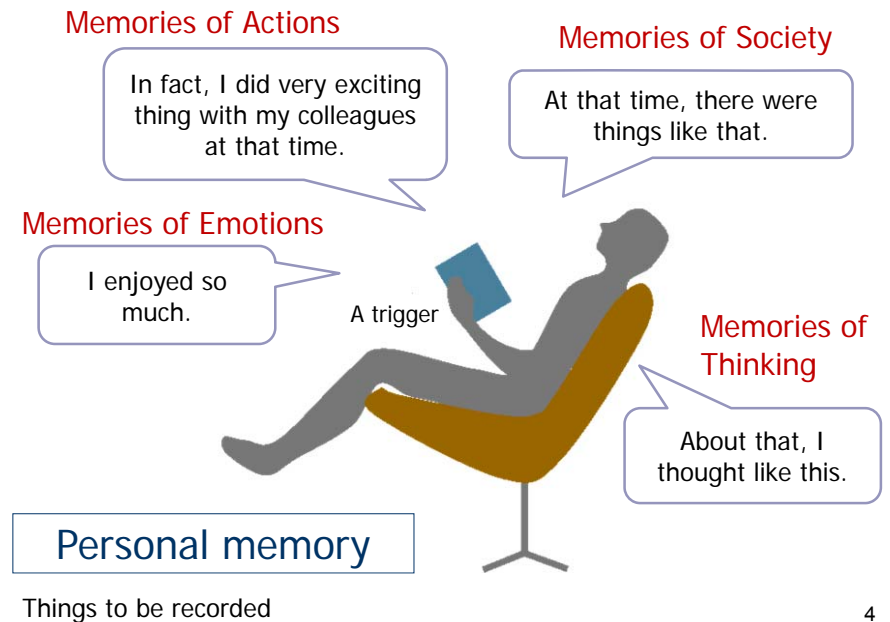
- A unique project about personal memory use
  - In 2004, I moved from an electric company to university
    - I tried to start up a quite new project to support people in a recovery and reconstruction phase from disasters which is not enough supported, especially mental recovery
  - "Personal memory" is generally received neither productive nor positive
    - The Great East Japan Earthquake was the changing point

2

## What is personal memory?



3



4

## Importance of Personal Memory

- Personal memory is not nostalgia for the past!
  - Amnesic patients usually lose their episodic memories rather than semantic memories
    - ⇒ They lose their identities of who they are
    - ⇒ They sometimes have suicidal thoughts
  - Memories are the foundation to forge identities of individuals
    - Reaffirming the pasts makes it possible to affirm identities
    - Without memories, people lose their identities and can not live positively

5

## Functions of Personal Memory

- “Self” function
  - Memories have the role of reminding us of our consciousness of “self” ( ← Memories are the foundation to forge identities of individuals)
- “Social” function
  - Talking together on our pasts means exposing and exchanging a part of their egos, and we are able to prompt mutual understanding

6

## Functions of Personal Memory (cont.)

- “Directive” function
  - personal memories help people understand new situations and plan their actions based on their previous experience
  - Modelled as Case-based reasoning in AI

7



### How can we remember the past?



8

## Reminders and Remembering

- Personal memories consist of habitual activities, rather than special events
  - Episodes about daily activities, such as “I used to play with my friends in a nearby park”
  - Most of such activities are too much common to be recorded in photos
  - It is difficult to remember personal memories without goods of memories
    - Do you remember the second day of your honeymoon without photos?

9

## Remembering Support

- Goods of memories are *triggers* of remembering  
⇒ Can this function be provided by computers?
  - Candidates of triggers (= *reminders*):
    - Photos of neighborhoods and tourist spots
    - Maps
    - Popular songs
    - Social events
    - Nostalgic aroma
- Virtual community building, knowledge transfer, et al. by using personal memories

10

## Omoide Engineering

- Omoide = “personal memories” in Japanese
- Proposed by Hisao Nojima and Kiyomi Yamashita (2001)
  - Digitalized personal memories (blogs, GPS data, digital photos, etc.) have been rapidly increasing
  - Too many to manually manage and use such data
  - Engineering to support human communications by managing and using such personal memories
  - Existence of many digital data is presupposed

11

## Our Omoide Engineering

- Yoshio Nakatani (2004)
- Engineering to support remembering and utilization of personal memories
  - Aware of necessity to support people who lost their important things in disasters or for other reasons
  - No existence of reminders and other things about personal memory is presupposed



12

## Our Approach

- To help people recall memories by providing various kinds of triggers from a computer, and
- To use recalled memories
  - to manage personal histories of their own and families,
  - to organize on-line communities whose members share similar memories, and
  - to transfer know-hows and experiences of experts to novices
- These three purposes correspond to three functions of personal memories

13

## Goods of Memories and Disasters

### Great East Japan Earthquake

- Great tsunami attacked a very long coastal area and changed houses and goods into wreckage
  - Goods of memories: photos, videos, diaries, gifts, houses, townscape, people (family, friends, etc.)
  - Victims feel as if they have *lost everything* that can provide evidence of having lived here
  - Government issued the unprecedented guideline to the local governments *to store the salvaged goods and try to bring them back to their owners*
  - Quite difficult to find their goods through wreckage!

14

## "Salvage Memories" project

<http://www.dazeddigital.com/photography/article/19701/1/salvaged-memories-photography-book-2011-japanese-tsunami>

- Many quake victims in Tohoku strongly want to find their photos and goods driven by tsunami
- The Society of Socio-Informatics (Japan)
  - ⇒ This project aims to return salvaged photos to their owners

"Many people lost everything, but they wanted to find their family photos, which can be the only one thing from the past, from the piles of thousands." (Munemasa Takahashi)

15

<http://jsis-bjk.cocolog-nifty.com/blog/cat22743769/index.html>



Air-dry cleansed photos



Photo cleansing

- Remove all traces of dirt from salvaged photos
- Cleanse them
- Digitalized them by scanners
- Restore their damaged
- Publish them to find their owners

16



Salvaged things are published in a special venue

17

## Salvage Memories On-line

- 750,000 photos were salvaged
  - The self-defense force
  - The fire department
- Project published in the temporary photo show space at first
  - ⇒ Wanted to find as many owners as possible
  - ⇒ Digitalized photos are published on the web
  - ⇒ 340,000 photos have been returned



18

## "Lost Homes" Project

<http://losthomes.jp/en/>

- Restoring lost towns by 1:500 scale models in order to inherit and preserve memories accumulated in local scenery, environment and life, by architects and urban designers in Japan
  - Kobe Univ., Tohoku Univ., Ritsumeikan Univ., Waseda Univ., Nagoya City Univ., Yokohama City Univ., et al.
  - 1:500 scale (3m×1m) diorama made by volunteer students
  - Houses and buildings were made of Styrofoam, reproduced based on air photos of the past

19



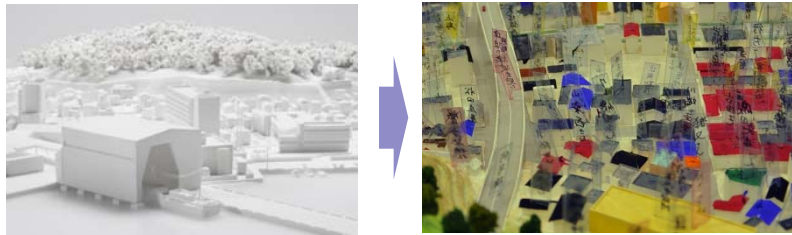
宮古市田老ワークショップ [2013.04.09～04.14]

photo: Jason Halayko

"City in Memory" Workshop in Miyako city

20

- Participants recalled many memories triggered by the diorama.
  - Keywords are collected from the memories recalled.
  - Keywords are put on the corresponding buildings and places as tags
  - This project do NOT have any plan to utilize collected personal memories



21



Participants who find their own house paint colors on them, which promotes remembering

Keywords that represent participants' memories are tagged on the corresponding buildings and places



22

## Research Themes of Omoide Remembering Support

- Contents of Omoide
- Appropriate triggers for remembering
- How to record Omoide
- Utilization of Omoide
- Collaborative remembering support

23

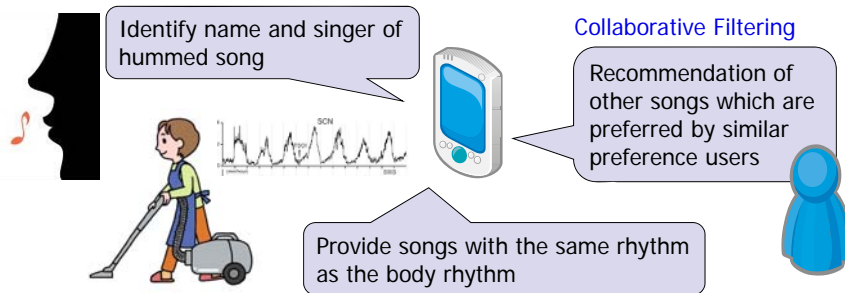
## Appropriate Triggers

- Attempted triggers in the past
  - Photos, maps, air maps, newspaper articles, popular songs, aroma, memories of other people, etc.
- Findings:
  - Combination of a map of a specific location and its photo (or related information) is effective
  - Music prompts remembering memories of certain days, along with certain episodes
  - Aroma: has a strong effect to prompt remembering of memories

24

## Remembering and Communication Support by Using Hummed Songs 2011

- Humming is an unconscious activity → it could be related to memory remembering deeply
- System promotes remembering by providing information of a hummed song identified by the smartphone app.
- Provide songs with the same rhythm as the body rhythm sensed by the smartphones in case of cooking, housecleaning, and so on



## Remembering Support by Aroma

- Aroma generating device by blending oils
- Experiment reveals
  - Aroma has a strong effect to promote remembering
    - Proust effect: the author was vividly reminded of childhood experiences by the smell of a madeleine (*À la recherche du temps perdu*, M. Proust)
  - We do not have appropriate words to express aroma which has relation to memories
    - When we say "I remember a very good scent of the grass in spring, " what does "good" mean? How can we generate this scent?

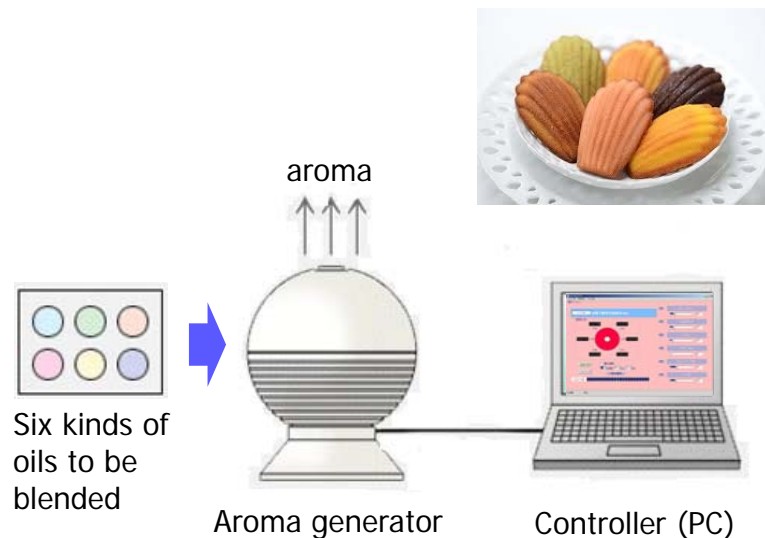
26

## Location-Aware Remembering Support

2008

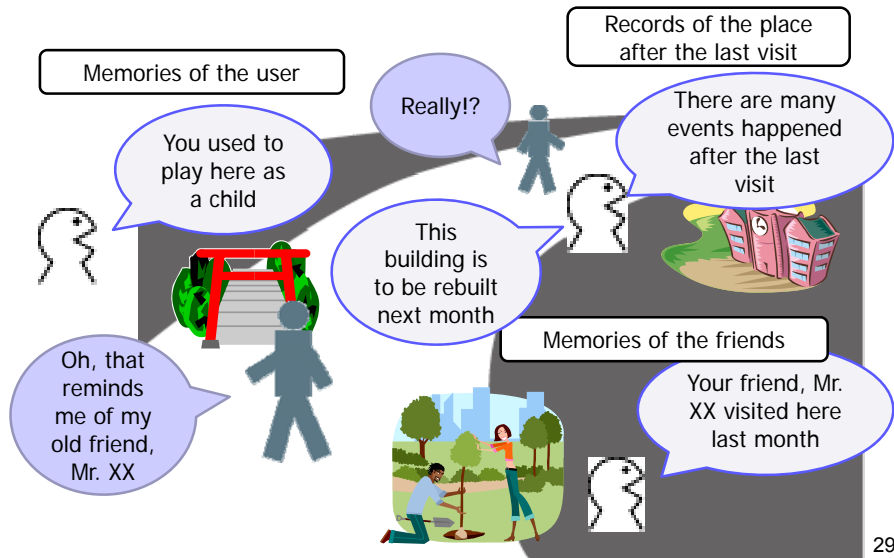
- Location = a node of connecting the present and the past, and myself and others
- Remembering support by the location of the user
  - **Connection between the present and the past** ... the visiting record of the user is provided by the software agent which manages the place and the facility
  - **Connection between myself and others** ... if the user and the accompanying person share similar memories about the place, the system provides them
  - **Communication between the user and the place** ... provision of information of the place in the days after the last visit, the future memories (plan) of the place, et al.

28



27

# Image of Location-Aware Support

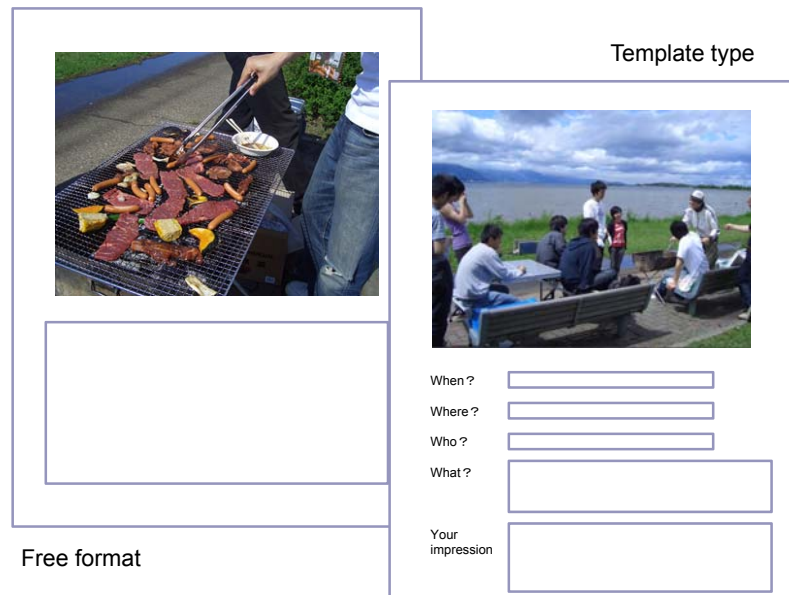


29

# Entry Support of Memories

- Comparison of two kinds of entry format
  - Free format
  - Template: input items of 5W1H (When•Where•Who•What•Why•How)
- Experiment
  - Subjects were provided with four photos of their own episodes
  - They are required to entry their recalled memories in two kinds of entry format (two photos for each format)
  - 10 men and women of 22-23 years old

30



31

- Results
  - No difference in amount of description
  - Free format
    - Allows free description of what people recalled
    - Makes people at a loss about what to describe
  - Template
    - A kind of Q&A, which promotes remembering
    - Promotes filling in all items
    - Restricts free description of what people recalled

32



## Memory Outburst

- One trigger prompts so many memories at once
- During describing one memory, we forget other memories
- Is keyword selection effective for writing down recalled memories?
- An experiment revealed
  - Keywords prompt remembering in time and in volume
  - Keyword selection is not easy

33



- Popular seasonal photos are used as triggers
- Keywords which are supposed to be used or are actually used are listed up (size of keywords corresponds to frequency in use), and the user selects keywords which represent recalled memories
- The user uses the selected keywords to represent recalled memories after all memories are recalled

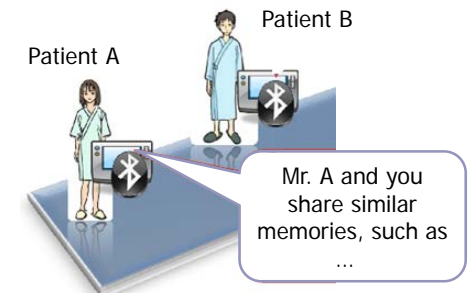
34

## Utilization of Memories

- Communication support
- Support of demented person and his/her family caregivers
- Collaborative remembering support
- Knowledge transfer support

35

## Meeting and Communication Support System for Patients during Treatment



- Patients in long-term treatment often feel lonely and anxiety about recovery
- This study proposes a framework of supporting them by providing the chance of self-introduction and communication when they meet in the hospital
- The system models how Japanese start a conversation with a stranger

# Communication Support System Between a Patient with Dementia and Family

2012

- Patients with cognitive dementia are losing their memories
  - Family members share memories of family activities
  - Family memories unite family mentally
  - The fact that one of family members is losing family memory means a crisis of the family
  - Purpose: to support remembering family memory and to keep a "sense of unity" of the family
  - From personal memories to family memory

37

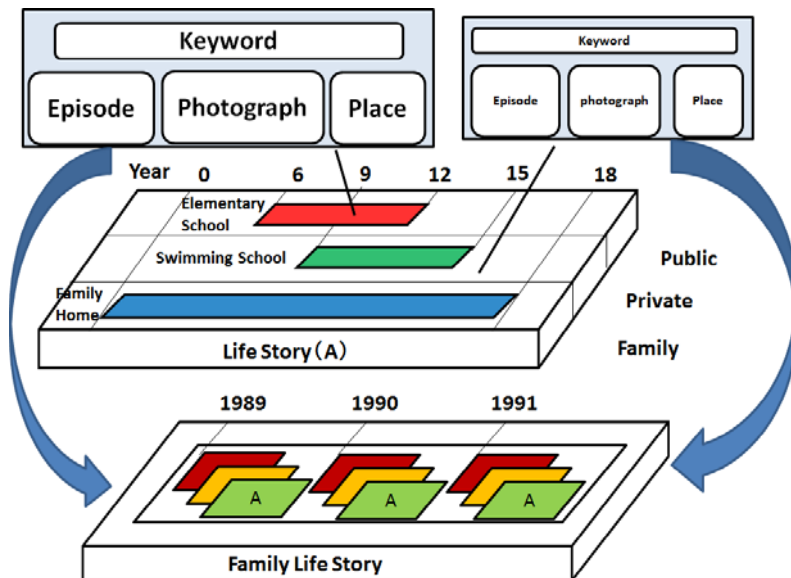
- Photos are used as triggers of remembering
  - Each memory is classified into a "community" to which users have been belonged in their lives

Community	Example	Category
Schools, Education	Elementary school	Public
Hobby, Private Activity	Club activity	Private
Family life	Family travel	Family

- Association of personal memories
  - If there are different memories in the same community among family members, the system use them as a trigger of further remembering
    - Ex. If a father stores a memory of one-sided love in his high school days, but other family members do not store such memories, the system asks members about memories of such one-sided love in high school

38

Life Story of Mr.A



39

- If there is the same community and similar memories among some family members, such information are shown together on the screen, and the family can compare them, which promotes communication.
- If a patient with dementia cannot recall his memory, the system proposes his life story by guessing from the other members' memories and asks the patient for confirmation, which activates the patient
- The system searches for memories common to all or some of family members and integrates them as a "family life story" interactively
- An experiment for one family (6 adults) showed the effectiveness of this approach

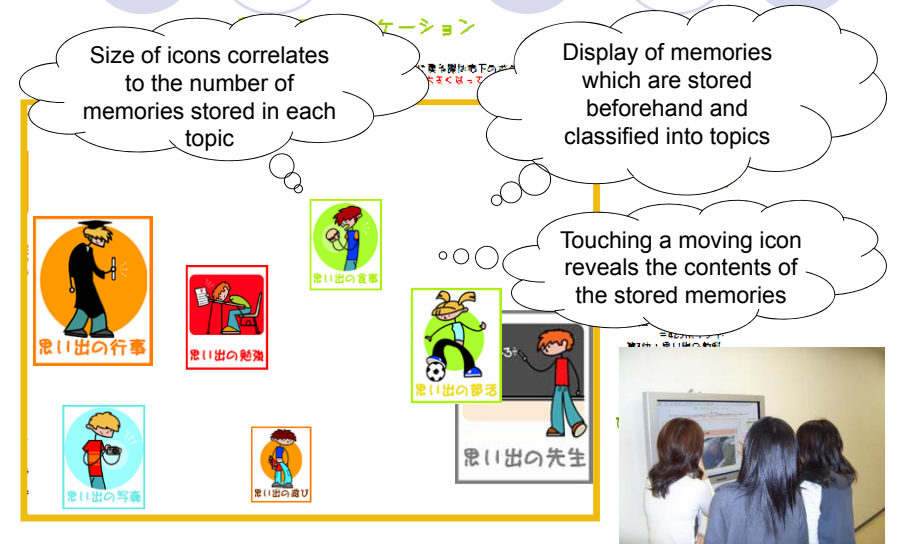
40

# Collaborative Remembering Support

- Recall by groups rather than by an individual
  - Remembering of social events becomes easier by collaboration of the event members
  - False memory of a member can be modified by correct memory of other members
- ↕
- There can be many viewpoints to a certain event
    - Members say different things about the same event

41

# On-site Collaborative Remembering Support



- A prototype system (2007) was for a class reunion party
- The end goal is to support victims in temporary houses talk together about their town when they meet again at the temporary gathering place



Dome-shaped gathering place "ODENSE" by Shinsaku Munemoto (Ritsumeikan university)

- Pleasure of reunion
- Pleasure of sharing experiences
- Pleasure of remembering
- Pleasure of talking memories

43

# Collaborative Remembering of the Town On-Line

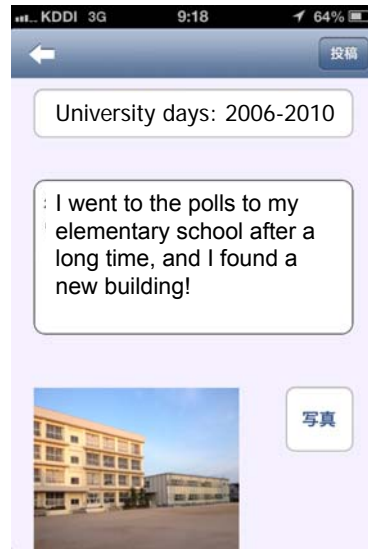
2012

- "Cooperation" among victims, essential just after disaster, requires intimate human relations in a local community
  - After the Great East Earthquake, a Web questionnaire survey shows that 54% of victims realizes an importance of communication and connections with their neighbors
- Our purpose is to provide a memory-sharing platform that activates communication among inhabitants
  - Map-based microblog
  - Memory sharing of the area where the users lives or lived
- In designing a reconstruction plan of the town, the system provides the essential elements required for a fascinating community by analyzing what kind of memories are preferred to be followed

44



Map display of memories



Content of a memory

45

- Experiment of usability in Miyako city, Iwate Pref.

- One week in September, 2013
- Subjects: participants in "Lost Homes" project
- Purpose:
  - Support of remembering of the victims
  - Research on how long is it required for the victims to remember their painful memories
  - How is the style of remembering? (at once or incrementally)
- Result:
  - A feeling of hesitation toward Smartphones for aged people
  - Some people were still painful to remember the disaster
  - Map reading was unexpectedly difficult and people were difficult to find their place of memories

46

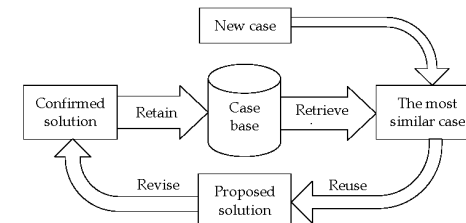
## Knowledge Transfer Support

- Know-hows and heuristics are easy to transfer to other people by talked as personal memories
  - Speaker: Easy to talk as real experience
  - Audience: Easy to understand by associating a talk with real situation
- *Concreteness* (=field-orientedness) is a key
  - An effective way is to talk memories at the scene where the experience was obtained

47

- Difference from case-based reasoning (CBR)

- CBR: reuse of the processes and results of the past problem solving cases
  - Usually only the objective facts are reused
  - Mainly success cases are reused



- Our approach

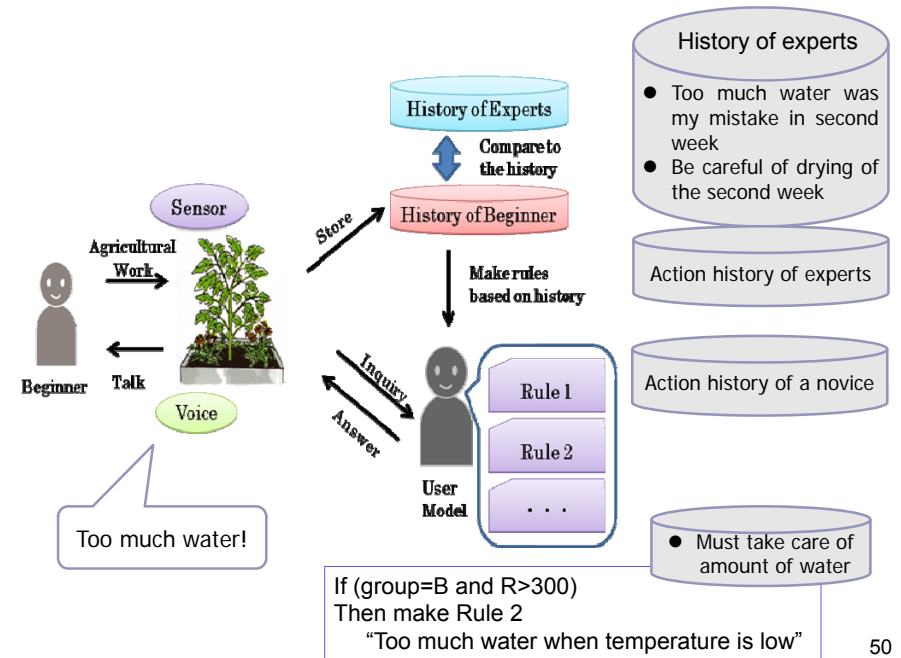
- Personal hypotheses learned from failure cases are recorded and provided

48

# Knowledge Transfer in Agriculture

- Target: Novice kitchen gardener using plant pots
- A plant pot provides the user with suggestions during agricultural work, monitoring the user's tasks
- The system compares the work history of a novice and registered histories (cautions, hypotheses, etc.) of expert gardeners, and detects wrong or problematic works
- Detected problematic works are used to make suggestions to the user and are stored as rules

49



50

# Future Themes

- Record of recalled memories
  - Many memories are recalled at once by a reminder, recording memories requires a thorough investigation of a memory, which makes people forget other recalled memories
  - Typing and voicing a recalled memory makes people forget the details of the memory, now that they have taken the trouble to recall
- Development of various kinds of memory-based service

51