



# Smart System for People with Dementia

Sharana Basava<sup>1</sup>, M. Kavitha<sup>2</sup>  
M.Tech Student<sup>1</sup>, Assistant Professor<sup>2</sup>  
Department of CSE  
SIT College, Tumukuru, India

## Abstract:

A many of reminder systems have developed to support older persons with dementia. However, existing reminder systems absence wakefulness of social awareness understanding human-machine communication of human circumstance, the sympathetic human-machine interaction, and the flexibility of personal adaptation. To cope with the limitations, we are currently studying a new reminder service for people with dementia. Specifically, we exploit a RFID-based indoor positioning system to capture the current location and context of the patient. We then use a virtual operator system for rich interactions. Finally, we develop a plan management system for personalized reminders. To integrate these heterogeneous systems, we re-design and deploy the systems as three services with Web-application programming interface: Area Service, Operator Service, and Plan Service. These services are loosely integrated by Manager Service, based on the service oriented architecture, in this paper, we first present the system architecture, and then discuss the key idea to implement the services. We also demonstrate “reminder at the entrance” as a practical scenario of the proposed services. In order to evaluate the Operator Service.

**Keywords:** Dementia, Area service, Operator service, Plan service, RFID, Organizer service.

## I. INTRODUCTION:

Dementia is a general word to describe a group of symptoms that damage human memory, communication, and thinking. Rendering to a statement in 2016, near to 60 million people are now suffering from dementia in all over world. Thus, family care for people with dementia becomes additional necessary, in order to assure the quality of life of the patient. But, sometimes the home carefulness could be a problem to the family or caregivers in exact circumstance. Later, there are strong need for assistive technologies that can care the independence of patients and reduction the problem to care-givers. A reminder system is an assistive technology to care patients. the system offers info that recaps a patient of something in his/her natural life. Bourgeois available the memory book, which a patient can remember daily kits and events established on picts and diagrams. The use of DCT (data and communication technologies) is new topic. The COGKNOW project exploited DCT for home-care of dementia. The project implements a configurable reminder service with dedicated home usages and portable phones. The service informs a user of the regular plan (e.g. taking medication, meeting at office, etc.). Hall berg et al. presented the feasibility of reminiscences with multimedia. They understood a semiautomatic device to remind patients of their from the past good days with pictures and videos. They also applied a media-rich life log device to record and review their on-going life. These tools aim to growth the patient's will to live by display the past events and worthy rumination. Developing application which is based on a java system with either RFID in capability or programmable with a specific function for dementia patients is not an easy task. Many challenges are to be faced while implementing a cost effective and user friendly device. The product must be efficient based on the cost, size, power and performance The smart system performs fast enough to process data in real time and reducing time. It responds to the system's environment and compute certain results in real time without any delay and updates it to the user. It continually monitors and reacts to RFID and its Tags. Connected peripherals are used to connect I/O devices.

Software is used for more features and suppleness. Hardware is used for performance and security. The everyday predictable of these patients must be observed and a plan must be made which should be served inside the device. The RFID attached must be active all the time. The software interface of the device must be made accurate. Different messages of voices are fed into the voice board for each and every event which is done by the caregivers. By completing all these The smart system is able to meet all the requirements. This system consists of voice board where predefined text stored to alert the patients. It uses GSM for communication.

## II. EXISTING SYSTEM: -

In Generally Alzheimer's, and Dementia peoples are memory less, they always forgot to take medicine or patient does not take correct decision. So, they are effected by facing health problems. Now a day these kinds of peoples are handled by the nurses who provide help at particular time and medicine to the Alzheimer and dementia patients. It is difficult to handle such patients because they need others support. A app is developed for mutual recognition of risky actions and regions to support the patients. Because of memory loss patients wander off and may end up in dangerous situations. In this app, to offer two main awareness functions to these decease people; Indoor and Outdoor. Dementia negatively thinking many number of patients, caregivers, and related words around the world, and cost numerous millions of dollar yearly. Memory harm cannot be cured and handling such patients is hectic. Even after multiple studies to help the people who forget, and does not take decision which are mainly focused on prevention and how to take care with these diseases. It's thekeyguidelines in which Internet of Thing can give to healthcare is through mobile health (or m-health) via phones. This study presents Alzimio; the first mobile app designed to spontaneously notice safe region exits and unsafe actions. Its proposal achieves incessant, energy-efficient, detect of unsafe regions and events to offer fast response in the case a patient walks off or takes part in 'unsafe activity'. Alzimios uses smart-phones two (without the

need for extra hardware) to offer two main structures; involuntary detection of safe zone crossing and detection of preset unsafe actions. Alzimios also offers a host of useful features to assist in providing help for the unfortunate case of sensing. Its new established and independently integrated algorithmic design, thought app execution with optimal trade-offs, and extensive data-driven costing it is able to see its project objectives of recognition, dependability, power competence and accessibility.

### III. PROPOSED SYSTEM: -

In Proposal of new ideas for observing Dementia patients is put onwards. The system consists of RFID, Smart system and GSM.

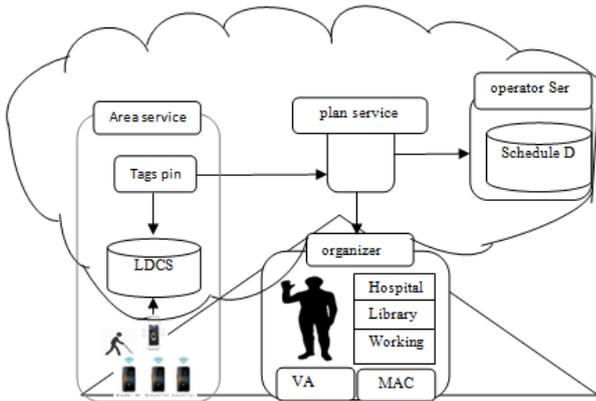


Figure.1. Architecture diagram

### IV. IMPLEMENTATION: -

#### IV.1 Area Service:

The Area of a patient within a home is beneficial information that redirects the current situation to patient. Similarly, anything patient has to remember seriously depends on the Area. To achieve such area-aware reminder activities, we feat the IPS (See Section II). We undertake that a patient carries a Smartphone with RFID and that RFID modules are deployed on various places at home (e.g., hall, bed room, kitchen). When the patient gets close to ideal module, the smart device detects the location and uploads the location tag to the cloud. In the cloud, the area tag is cached in area Data Cache Service. This facility stored the area label for positive time historical.

#### IV.2 Plan Service

Plan Service manners the plan managing for people with dementia. A care-giver records daily actions and things for the reminder.

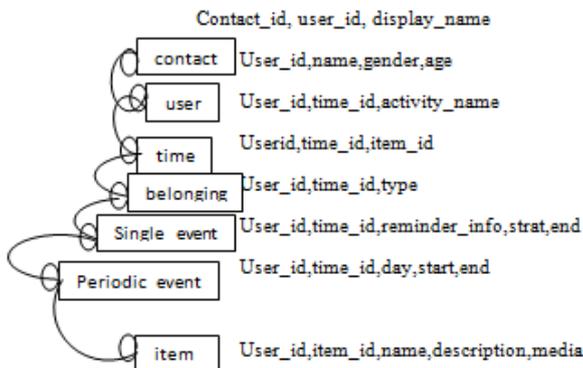


Figure2. Data scheme of PlanDB

To achieve personalized reminder, we have design a plan database (called PlanDB, for short), which manages individual plans and possessions.

### IV.3 Operator Service

Operator Service provides human-computer connections for people with dementia. It involves of two kinds of user interfaces. The one is Virtual Operator (VA) and the other is Memory Aid Client (MA-Client). The VA is an human-like 3D chatbotpackage (See the bottom of Figure 1).

```

“agent”: {“motion”:
    “say”}
“output”: {“type”:”text”,”message”}
“Input”: {“type”:”list”
    Listitems: { }
    }
    }
    }
    
```

Fig operation format of Organizer

Using the speech-totext and text-to-speech technologies, the VA can recognize the human voice and can speak a given sentence. The VA is also able to perform motions (e.g., smile, bow, shaking hands) to act like human-beings.

### IV.4 Organizer Service

Organizer Service participates the above Location, Plan and Operator Services, in order to completea area-aware and initialled reminder service.

Algorithm A doassist(s:screen\_id,a:area,t:time)

- 1.Operationformat=organizerservice.getorganizerformat(s)
- 2.Time=operatorservice.getoprator(userid,t)
- 3.Operation=generateoperation(a,time,operaionformate)
- 4.Organizationservice.execute(operation)

As above shown in Figure 1, the Organizer service is informed by the location service. Ie, when a user gets close to a certain Area A, the location service performs notify() method, telling that the user is at A. When notified, the Organizer service obtains user’s plan, using the plan service with the current time t. Established on the derived plan, the Organizer service generates assistive operations, which will be implemented by the operator service.

### V. CONCLUSION AND FUTURE SCOPE

In this paper, we have offered a circumstance aware and personalized reminder facility, called Memory-PAL (Memory-aid service with Personalization, Operator and Area technologies), for people with dementia. The Memory-PAL contains of Area Service, Plan Service, Operator Service and Organizer Service. These services are established as Web services, and integrated based on the service-oriented architecture (SOA). We have implemented a prototype of Memory PAL that performs a practical use case: Reminder at Entrance. Finally, we have conducted initial evaluation specially to see the usability and feasibility of the operator service. Our future work is to complete the implementation of Memory-PAL based on the proposed design. Moreover, we have to evaluate the practical feasibility of the entire Memory PAL, through longer-term experimentations with actual people with dementia.

### VI. REFERENCES

[1]. E. A. Boyle, T. M. Connoly, T. Hainey, and J. M. Boyle, “Engagement in digital entertainment games: A systematic review,” *Computers in Human Behavior*, vol. 28, 2012, pp. 771-780, doi: 10.1016/j.chb.2011.11.020. [14] T. T. Cota, and L. Ishitani, “Motivation and benefits of digital games for the elderly: a systematic literature review”. *Rev Bras Comp Aplicada*, vol. 7, 2015, pp. 2-16, doi: 10.5335/rbca.2015.4190.

[2]. T. Baranowski, R. Buday, D. I. Thompson, and Baranowski, "Playing for Real: Video Games and Stories for Health Related Behavior Change," *American journal of preventive medicine*, vol. 34, 2008, pp. 74-82, 2008, doi: 10.1016/j.amepre.2007.09.027.

[3]. Koskinen, I., Zimmerman, J., Binder, T., Redström, J. and Wensveen, S. (2011) *Design Research Through Practice: From the Lab, Field and Showroom*. Waltham, MA: Morgan Kaufmann. Langa, K.M., Chernew, M.E., Kabeto, M.U., Regula Herzog, A., Beth Ofstedal, M., Willis, R.J. and Fendrick, A.M. (2001) National estimates of the quantity and cost of informal caregiving for the elderly with dementia. *J. Gen. Intern. Med.*, 16, 770–778. Lindsay, S., Brittain, K., Jackson, D., Ladha, C., Ladha, K. and Olivier, P. (2012). Empathy, Participatory Design and People with Dementia. In *Proc. SIGCHI Conf. on Human Factors in Computing Systems (CHI'12)*. New York, NY: ACM Press, pp. 521–530.

[4]. Nygård, L. (2006). How can we get access to the experiences of people with dementia? Suggestions and reflections. *Scand. J. Occup. Ther.* 13, 101–112.

[5]. Ogonowski, C., Ley, B., Hess, J., Wan, L., and Volker, G. (2013). Designing for the Living Room: Long-Term User Involvement in a Living Lab. In *Proc. SIGCHI Conf. on Human Factors in Computing Systems (CHI'13)*. New York, NY: ACM Press, pp. 1539–1548.

[6]. Prince, M.P. and Guerchet, M. (2013) *World Alzheimer Report 2013*. London, UK: Alzheimer's Disease International.

[7] Rose, K. and Webb, C. (1998) Analyzing data: maintaining rigor in a qualitative study. *Qual. Health Res.*, 8, 556–562.

[8]. J. Vassileva, "Motivating participation in social computing applications: a user modeling perspective," *User Modeling and User-Adapted Interaction*, vol. 22, pp. 177-201, doi: 10.1007/s11257-011-9109-5.

[9]. M. Richetti, "What makes social games social?", retrieved from: <http://www.gamasutra.com/view/feature/6735/>, UBM, Feb. 2012.

[10]. Vygotsky, L. "Interaction between learning and development". *Reading on the Development of Children*, vol. 23, 1978, pp. 34–41.

[11]. R. H. Schaffer, "Key Concepts in Developmental Psychology", London: SAGE Publications, 2006.

[12]. H. Oinas-Kukkonen, and M. Harjuma, "Persuasive Systems Design: Key Issues, Process Model, and System Features," *Communication in the Association for Information Systems*, vol. 24, pp. 485-500, 2009.