Adaptive Services for Elderly and Caregivers in Assisted Living Homes

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Outline

Introduction

Assisted living home
  - Networking infrastructure and service platform

Prototype and example of services

Experimentations & feedbacks

Conclusion
Introduction
ICT for maintaining high quality of life of an increasing elderly population

Our societies are aging
- In Europe, 28% of the population will be aged over 65 by 2050 (SHARE, 2005)

Develop healthcare solutions while maintaining the overall costs
- Improve quality of life, health care effectiveness, autonomy, wellbeing and social inclusion, ...

Need of ICT technologies in assisted living homes to
- Offer wide range of services
  - eHealth services (alerts, health status monitoring, care activity support, etc.)
  - wellbeing services (leisure & entertainment, social link maintaining, etc.)
- Address needs of both elderly and professionals (nurses, caregivers, doctors, staff, ...)

⇒ Adaptive service platforms tackling the diversity of services in the optimal way
Assisted living home
Networking architecture

Innovative service environment for residents & professionals
- Networking infrastructure coupling professional environment (IP-PBX, service platform and applications) and consumer devices (Set-Top Box/TV)

Assisted Living Home Network

Architecture of the French pilot site of the ITEA/NUADU project
- French partners: Pace (former Philips Fr Set-Top Box div.), Alcatel-Lucent (Bell labs and enterprise division), CEA/LIST, Streamvision, INT, C2Innovativ systems, MEDETIC

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Assisted living home

Adaptive Notification service platform for various applications

Service platform to enable various applications for residents and professionals

- *Entertainment activities* (e.g., invitation to local events, proposition to visit a city or attend a concert)
- *Appointment or medicine reminders* (e.g. displayed on TV with option to call/request a nurse via the TV remote control)
- *Alerting* (e.g. alert sent on the nurse(s) PDA when an abnormal situation -as fall- is detected by sensors)

⇒ Adaptive multimedia notification system of the service platform
Adaptive multimedia notification system

Platform enabler to optimize the efficiency and impact of a multimedia notification (info, reminder, alert, ...)
- Deliver the multimedia notification to the right person(s), at the best moment, on the best terminal and in the best way
- Automatic adaptation to the end-user profile (e.g., disabilities, preferences, role/position), end-user context (e.g., presence, availability), notification semantic (alert, information, criticality, ...), terminal capabilities, ...

Example of multimedia notifications
- Notify [From: Activity proposition, To: Johanna; Content: “Musical event in Khunheim”, INFORMATIONAL]
- Notify [From: Medicine reminder, To: Mr Yale; Content: “Take your medicine”, IMPORTANT]
- Notify [From: Dr White, To: Dr White-Staff; Content: “Need a nurse and a caregiver”, URGENT]

User Notification module: handle a notification sent to one user
- Select the best terminal & time to deliver the notification (e.g., in a specific context as ‘when switching on the TV’)
- Adapt the device behavior (e.g., beep, time-shift, text-to-speech)
- Adapt and handle interactivity (e.g., ack needed, call trigger)
- Enable alarm escalation (e.g., no response received before a given time)

Group Notification module: handle a notification sent to a user group
- Orchestrate the notification delivery in the group (e.g., sequentially, simultaneously, or using any group delivery policies)
- Manage notification acknowledgement over a group of people and enable alarm escalation (if no response received)
- Rely on user notification adaptation to notify each individual
Application in the healthcare domain: residence for elderly people
Example of multi-device notification delivery

Resident
On her/his TV

Medicine reminder and activity proposition

Nurse, caregivers
On her/his PDAs

Alert, resident help request

Medical Staff
On her/his IP phone with screen

Escalation of notification, management, etc
Experimentations & Results

In the context of the ITEA/NUADU project
- In a French Pilot Site, an elderly residence “La Roselière”, in Kunheim.

Applications
- For elderly, on TV: help request, call nurse, activity proposition, medication reminder
- For professionals, on PDA or IP Phone: alarm management (on automatic abnormal situation detection), help request management

Operation mode
- Presentation of the applications to the end-users
- Observation of users behaviour

Feedbacks from users
- Importance of adapted & personalized approach of information delivery to residents
- Call nurse by TV, activity proposition & medication reminder well accepted
- Friendliness of the system for alarm management (for example, automatically get the name of the member of the staff managing the alarm)
- “Help request” application difficult to use for old people (needs to precise the requested help)
- Easy configuration of the system for taking into account
  - Professional environment (staff availability, work organization, residents type)
  - Resident profile (preferences, interests, disabilities)
Conclusion

Innovative service platform with an adaptive notification technology for
- Multiple users (resident and professionals)
- Multi services (health, well-being, entertainment)

Enable the creation of new services based on a central communication system (IP-PBX with its service platform) and combining
- The capacities of telecom devices (IP phones, WiFi PDA), media devices (TV, Set Top Boxes)
- The connection with sensor technologies either embedded with the resident (e.g., on-body sensor to detect e-Health problems) or installed in the resident environment (e.g., camera to detect abnormal situations or postures)

Enable the creation of an ecosystem of actors (SW vendors, SW integrators) that may develop new applications on top on this service infrastructure

Initially defined for assisted living homes, this system could also be extended to home networks
- With a VPN between the user home and an assisted living home or hospital
- Using the service platform of the public operator