




A VIDEOCONFERENCING TOOL ACTING AS A HOME-BASED HEALTHCARE MONITORING ROBOT FOR ELDERLY PATIENTS




Presented by : Mr.Z. Mapundu
Venue: Four Points By Sheraton
Sydney: Australia
Date: 21 November 2012
Time:11:30- 11:45

Tshwane University of Technology
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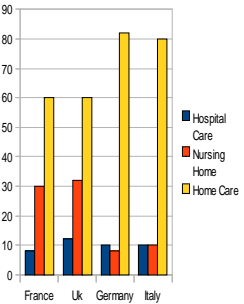
Presentation Outline

1. Introduction and Research Background.
2. Related work
3. Platform overview
4. SIP Proxy Operation
5. Development tools and & GUI modification
6. Experimental Network Topology.
7. Proposed remote control tab
8. Connection Results.
9. Destar Asterisk PBX system
10. Axis IP camera integration results
11. Future work with conclusion
12. Other publications
13. One of EU FP7 Companionable Projects: Video



Introduction and Research Background

- New discoveries based to pre-Alzheimer disease. (Health report of European initiatives on alzheimers disease, 2010)
- France and UK the figures currently stand at around 60%, Germany 82%, Italy 80% of aging patients live at home.
- In many European countries caring for elderly patients is a government and public health priority, and the new approach is to care for people in their own homes wherever possible.
- Patients are leaving hospital more rapidly because of medical expenses and they will need some additional care at their home premises while they recover

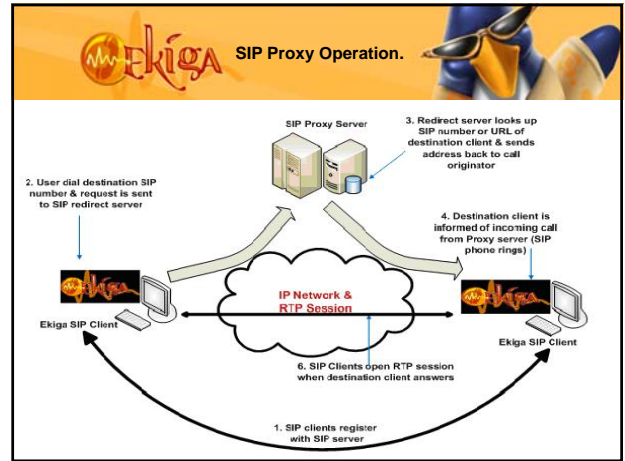
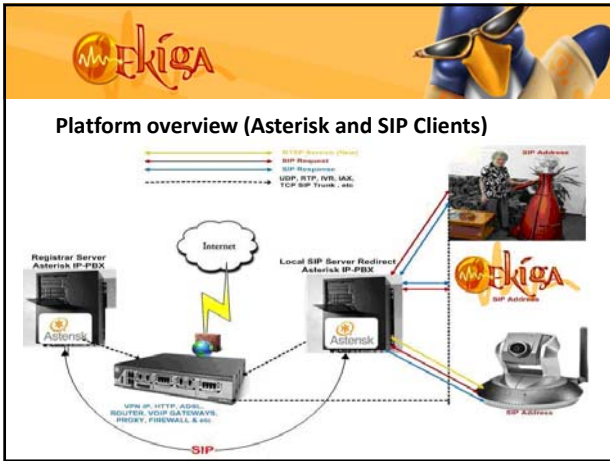


Country	Hospital Care (%)	Nursing Home (%)	Home Care (%)
France	10	30	60
Uk	12	32	60
Germany	10	82	8
Italy	10	80	10



RELATED WORK

- Responding to the above problems, ESIEE-Paris team operates & maintains Telemedicine Platform, thus a videoconferencing tool is acting as a main solution.
- A VoIP solution with 2 main components i.e. Central Server & Local Equipment for Domestic Internet Gateway (DIG).
- Main aim is to integrate & advance the communication process.
- Various challenges: managing communication between a distant operator and the robot-companion, graphical user interface of Ekiga is complex for old patients.
- The necessity of a remote control & a robot operator to control the robot-companion.



Security Approach

- Security in the possibilities of encryption, thus a VPN or stream encryption (HTTPS on the application level) and closed group of subscribers for confidentiality.
- No data duplication, the system has the ability to centralize all data for study purpose.


Graphical User Interface
Who is it for ? Why ?

ROBOT

SCENARIO 1 :

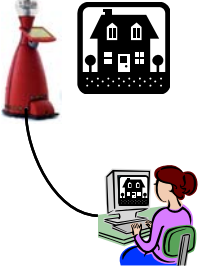
Regular checks

Manual




Graphical User Interface

Who is it for ? Why ?



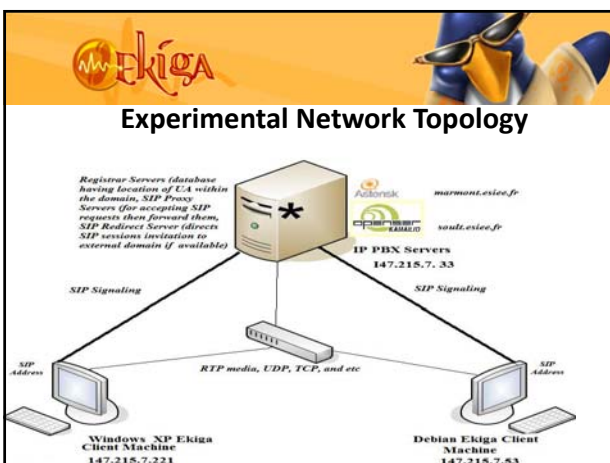

SCENARIO 2 :
Accident – An old lady living alone in her apartment accidentally fall and requires some help.

SOLUTION:
Robot (Automatic): Calls the ambulance
Robot (Remote): Specialist




DEVELOPMENT TOOLS AND RESOURCES

- Ubuntu (Linux OS), Debian Machine and Windows XP (cross compilations)
- Ekiga documentation: website
http://wiki.ekiga.org/index.php/Main_Page
- Asterisk documentation, RTSP and SIP documentation
<https://wiki.asterisk.org/wiki/display/AST/Home>
<http://www.voip-info.org/wiki/view/Kamailio>
- Glade Interface Designer, Text editor & Compiler.
- Programming Languages: **C & C++**, **HTML** markup language.

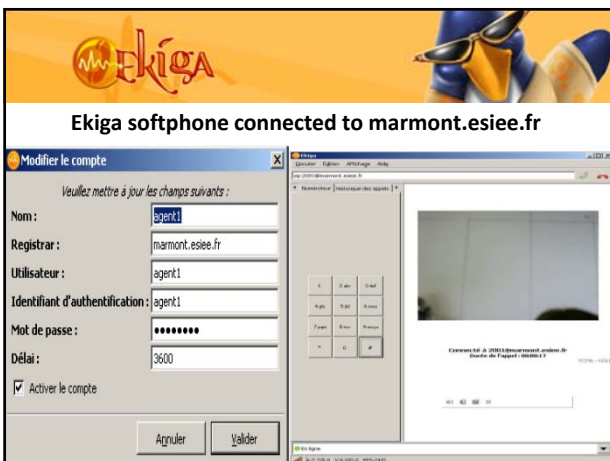
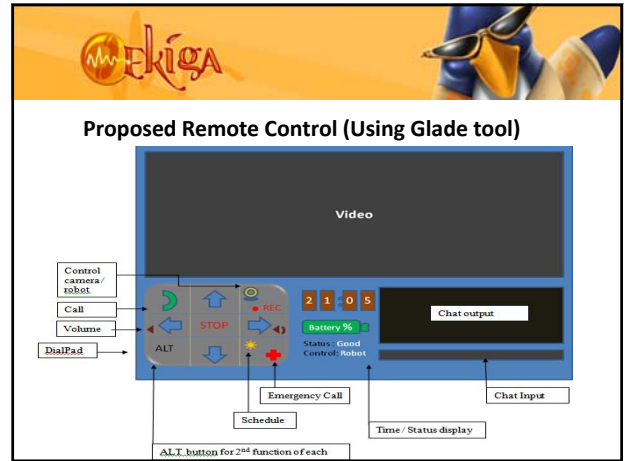
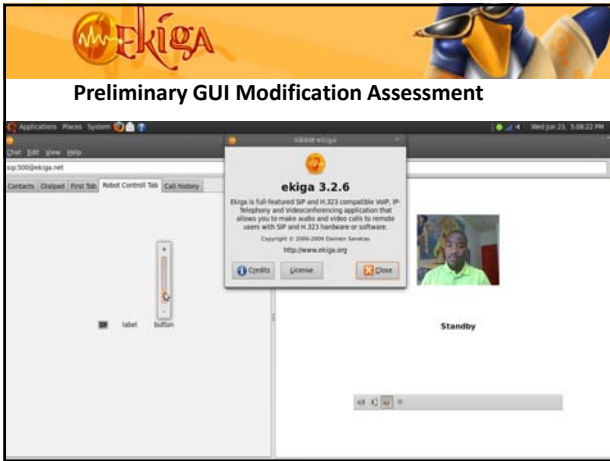



Graphical User Interface

Understanding “User Friendly”



Automatic **Manual**






FUTURE WORK & CONCLUSION

- VoIP nowadays enjoys the fruits of labors during the past few years and it can be considered a mature technology.
- In particular, the deregulation of Videoconferencing will lead to many new opportunities, thus improving communication and cost savings for elderly patients.
- Time vs Technology: this result on new VoIP integration tools, certain services & applications that are carried out daily by researchers.
- Security is still an issue in this technology.
- QoS consideration and Bandwidth Availability.
- For more info, please visit: <http://www.ekiga.org/> and <http://www.asterisk.org/>






Project Information

- **Project Name**
Integrated Cognitive Assistive & Domatic Companion Robotic Systems for Ability & Security
- **Project Acronym**
CompanionAble
- **Strategic Objective**
ICT-2007.7.1 ICT and Ageing
- **EU Funding** € 7,800,000.00
Project Start Date: 1st January 2008
Project Duration 72 months
- **Project Coordinator**
The University of Reading, UK, Prof. Atta Badii

You can visit: www.companionable.ne



One of EU FP7
Companionable Projects
Eindhoven University:
Netherlands



ANY QUESTIONS....?

!!!! Thank You !!!!