MIDAS

Multimodal Interfaces for Disabled and Ageing Society

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1. Introduction

1.1. Purpose of this document

This document describes what kind of services the MIDAS system provides in Supervisor centre, Home environment and Car environment. This document is closely related to the Deliverable 2.1.

1.2. Document Overview

In section 2, General architecture of the MIDAS system is shown. Then, various functions (services) in the MIDAS system are explained with an emphasis on the three environments. In section 3, corresponding technologies are listed with connection to each partner's expertises.

1.3. Editors

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2. Functional Requirements in the MIDAS system

In this section, it is described what kind of functions or tasks should be committed in each environment. This is mostly based on the scenarios made by WP1 illustrated in MIDAS_WP1_D1.1_v18.doc. Therefore, the functions explained in this section needs to be understood as a generalization of the scenarios developed in WP1.

Figure 1 represents the three main subsystems in which MIDAS project is divided. The home environment offers assistance to users in their daily living and gathers information of their behaviour. The assistance services are spread outdoors and are also covered in the drive environment. Finally, all the assistive activities are managed from the supervisor centre where a group of specialised caregivers and general practitioners offer support to patients. Through the following sub-sections, a complete picture of the three different MIDAS subsystems will be presented. Each of them will be analyzed identifying functionalities and equipment that will be necessary.

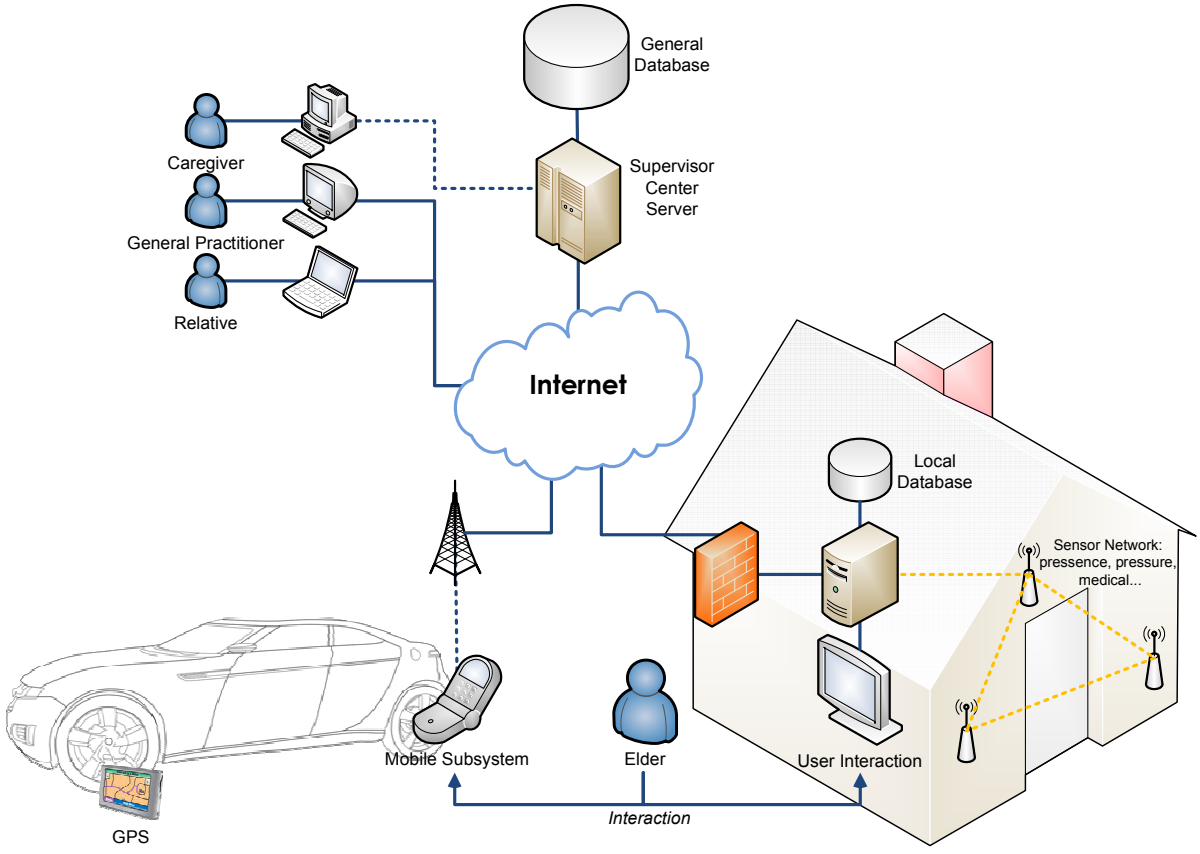

Fig 1. General architecture of the MIDAS system

2.1. Supervisor Centre

The Supervisor Centre hosts all the necessary elements to collect the information from the users and feed it to the caregivers and general practitioners. Several tasks carried out in the supervisor centre are listed in the following.

A. Continuous monitoring of the user's status and storing the data in DB.

From the home and car scenario, the monitored data about the user's health status is periodically transmitted to the supervisor centre where the data denotes, for example, the heart beat or blood sugar. Then, these data is automatically stored in the DB server with time stamp the data is measured. Since a corner stone of the MIDAS project is to develop a health care system using the state of the art IT technology, such monitoring is crucial.

MIDAS profiling information is also very important: user habits, preferences, skills and disabilities are gathered in the Supervisor centre. This information allows adaptation to user needs and complements the medical data received form sensors.

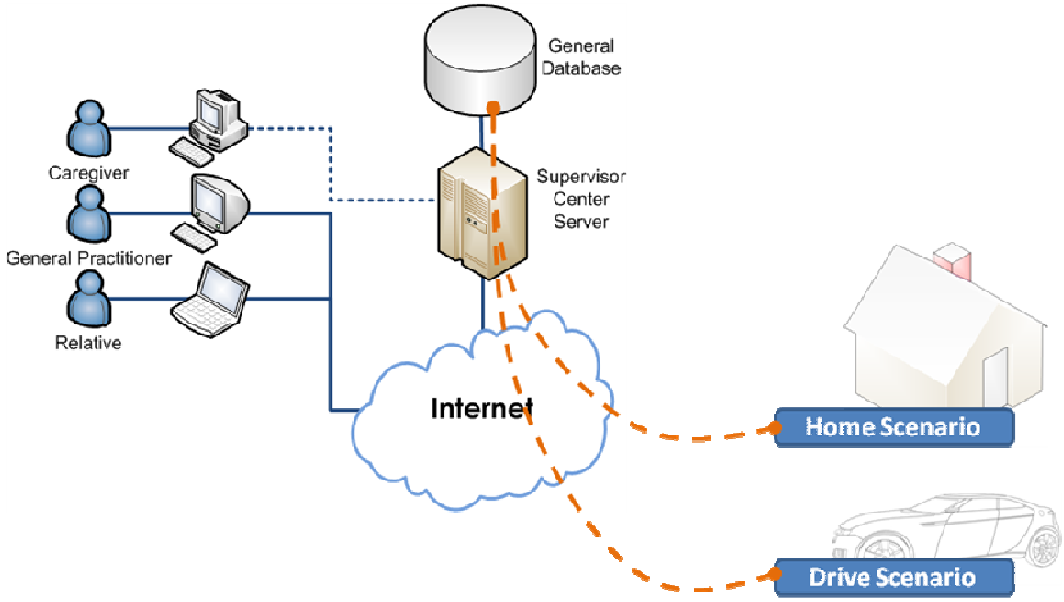

Fig 2. Information gathering in the Supervisor Centre from Home and Drive Scenarios

B. Regular checking the data in DB by a general practitioner.

The caregiver reports the data regularly to the general practitioner in the supervisor centre in order to make an early diagnosis in case the potentially bad symptom is found in the data. In other words, when the general practitioner finds any bad tendency in the data, he needs to contact the user and the user's relatives, and can give proper suggestion to them. In addition, the MIDAS system enable the general practitioner to watch the gathered data from the user whenever he/she wants to see by providing, for example, efficient GUI which shows the data on the screen.

C. Alerting the caregiver to the unusual data from the user.

The Event Manager (see Fig. 4) in the SC (Supervisor Centre) must have an alerting function to the abnormal data from the user which can foretell any bad symptom of the health

in the near future. To this end, the DB system must be able to discriminate the normal data from abnormal data. In other words, for example, if the heart beat is too fast compared with the pre-specified level, then the DB system has to inform the caregiver of this unusual data, and the caregiver should contact the user and the user's relatives in order to check his/her status or to suggest the user to do something for that unusual data.

D. Regular confirming the function of the modules in the home and car scenario.

Considering the objective of the MIDAS project, it is essential to monitor the user's various statuses continuously and without fail. To this end, the supervisor centre has to have a function enable to confirm regularly that the functional modules in the home and car environment work normally. For instance, WS Management plugin will be used in the MIDAS system.

E. Handing emergent calls from the user.

When the user feels an urgent problem in his/her health status, it must be possible for the user to contact the supervisor centre easily. For such a case, the SC should have proper contact points, for instance, general practitioner, hospitals placed near the corresponding user's house, a relief squad, and so on.

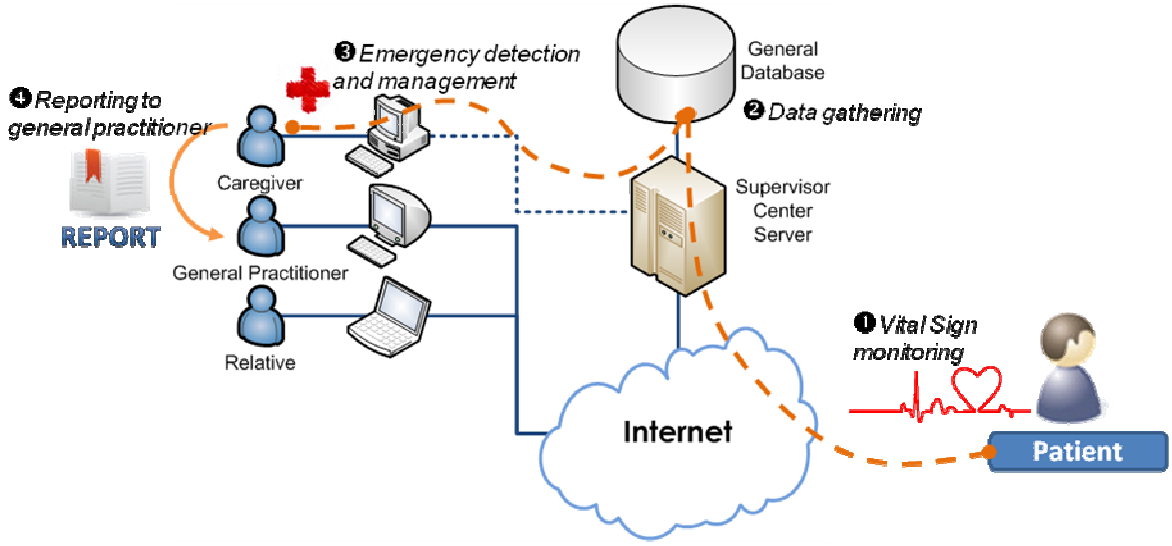

Fig 3. Situations presented in points B, C & E

In the previous figure a common situation of the Supervisor Centre is presented. Vital signs measured in the Home or Drive Scenario are promoted to the Supervisor Centre where information is stored in the database. That data can suffer some processing and then is presented to the caregiver who detects and solve the potential risky situations for patient's health. Finally, compiling information from the emergency and the vital signs measured, a report is generated. The report is available for the general practitioner in order to provide enough information to do an accurate diagnosis of patient's health status.

F. Communication Management

One of the objectives of MIDAS is to allow seniors to maintain or even increase their social network. Communication with other people is vital to reach this objective. The Supervisor Centre includes a communication server that routes incoming calls to the

caregivers in the call centre sited in CITIC's facilities. Communication can be also held with other MIDAS users as the infrastructure needed is the same.

G. Server

For the successful implementation of the MIDAS system, there are many information exchange between the SC and application in both the HE and CE. To support this, several servers are run in the SC. Figure 4 (taken from D2.2) illustrates how the several servers are run in the SC. For the sake of convenient user interface, a portal service is also provided.

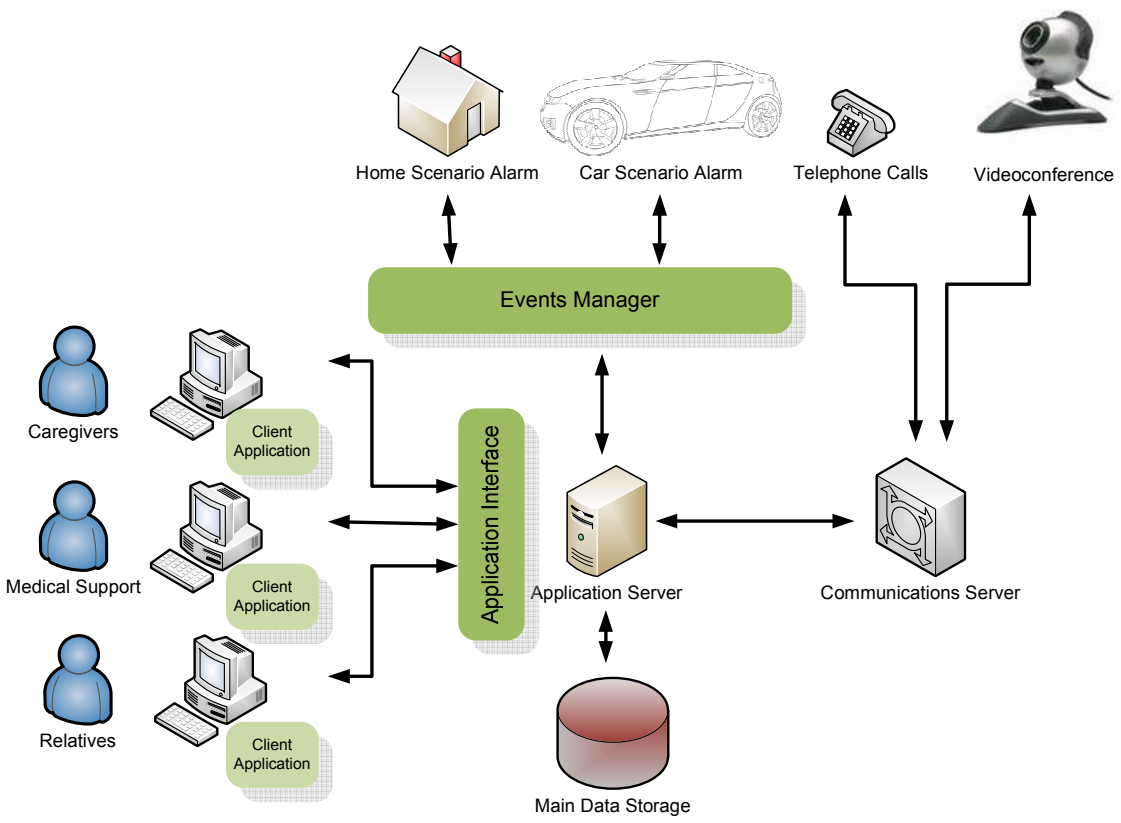

Fig 4. Servers in the Supervisor Centre

2.2. Home Environment

This subsection is devoted to describe the functions supposed to take place in the home environment which is a key part of the whole project. Through a wide range of heterogeneous sensors, information is collected and a first processing is done. Multimodal communication is the keystone of this scenario and many of the devices are devoted for this purpose. User assistance and health monitoring rely on the ability of the system to interact with the user.

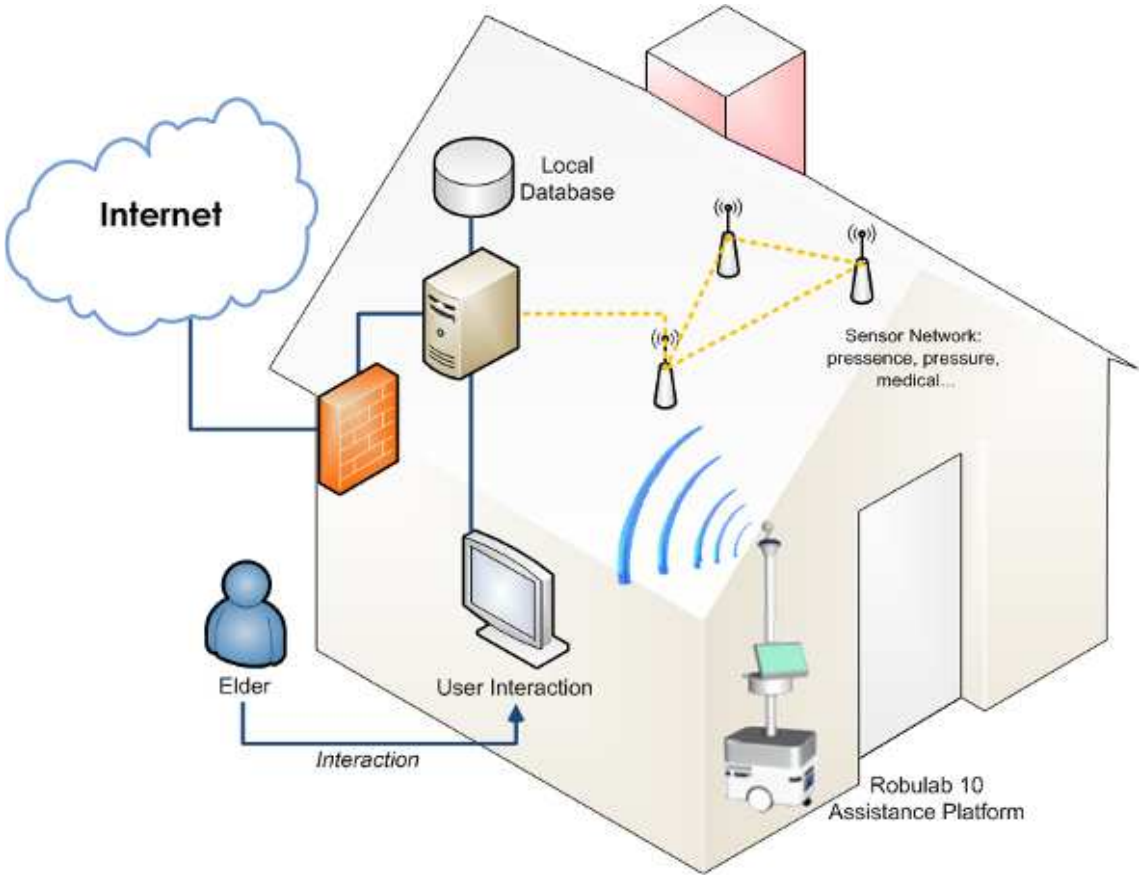

Fig 5. Home Environment main components

2.2.1 Scenario 1: Context adaptive communication

These services include communication with friends, family, and physicians using interactive table, robots, and any mobile devices. For example, phone call, text messaging, or video chatting between friends and relatives are possible using a screen with HCI provided by the MIDAS system, or with a robot.

A. Adapted Communication

One of the keystones of MIDAS project is the multimodal communication adapted to user profile, context information, preferences and equipment availability. Considering the information gathered from sensors, it is possible to determine the best way to offer messages to the user. Voice messages, events displayed on TV, mobile SMS, multitouch table and

others are some of the available communication means considered in MIDAS project. The decisions will be based on business rules that use information collected from sensors.

B. Robot Assistance

To cover the assistance to users inside the home environment, a Robot equipped with a robotic arm will give support. The Robot must have abilities to guide itself through the house, recognize and grab objects and follow the elderly person to check its status. Besides, it will also offer image information processing and communication interfaces based on voice recognition and images displayed in a screen.

C. Sensor Information Gathering

An efficient way of managing information is required to constantly monitor the situation in which the user is involved. Location information, elder behaviour data, environmental conditions… will be managed in an ontological model that allows knowledge extraction. Using some reasoning rules it will be possible to tune system operation to adapt to each concrete situation the best as possible.

2.2.2 Scenario 2: Social link

Social link service helps a MIDAS user to keep relation with other people and social activity by providing efficient and easy management of agenda. It aids the user to read selected news. In addition, chat and video conference tools are endowed with for the purpose of active interaction with others.

A. Planner

The elderly and the disabled have often difficulty to manage their daily schedule. Because of this, it is recommended for the MIDAS system to provide a planner which reminds the user of daily events regularly, for example, an appointment with their grandchildren or friends.

B. Information provider

Normal young people can search any information they need. However, it is not a trivial task in the case of the elderly or disabled person. Therefore, the MIDAS system endows the user with selected news or articles whose topics are chosen in advance. The information is given on the multitouch table or mobile device.

C. Communication

Video, chatting, and mobile device are provided for communication with acquaintances.

2.2.3 Scenario 3: Medication follow-up

One of the most important activities of MIDAS users on a regular basis is taking pill and consulting a doctor. This service notes the users when they have to take a pill and consult a doctor when the pill is exhausted. In addition, this service shows how to take a pill. This is because they need to take several kinds of pills, which makes the users confused with their dosage. If the user does not take a pill at a presubscribed time, the system warns the user and their caregiver of this fact.

A. Dosage gudance and relevant monitoring

The elderly are frequently confused with when and how to take pills or even forget to take them. To cope with this problem, the MIDAS system provides a service which directs the elderly how to take pills at a prescribed time. In addition, the service monitors the reminded pills and if the reminded pills are almost exhausted, the service informs the user of that.

B. Communication with medical staffs

The MIDAS system helps the user to meet and consult physicians by informing the user of the appointment or providing video consulting with physicians.

2.2.4 Scenario 4: Cognitive and physical stimulation

In order to improve the user's physical vitality and check it, the MIDAS system provides games which can enhance the user's cognitive ability. Together with this improvement, this service allows to check the user's status using the cognitive reactions and face when they are playing the games. Moreover, physical stimulation given by a robot can prevent user's physical status deterioration or treat some diagnosed illness.

A. Entertainment activity for cognitive stimulation and monitoring it

For the purpose of stimulating the user's physical and cognitive ability, the MIDAS system provides several games and relevant software. While the user plays the game, some features chosen a priori are detected in order to analyze the user status.

2.2.5 Scenario 5: Activity level determination

This service monitors the user activity in the house. In other words, it observes the places where the user visits in the house and saves the history. If the user visits very limited area, this means that there might be some problems. Besides this, if there are unusual prespecified situations are detected, for example abnormal use of the electric devices and excessively high temperature; this is reported to the user and the supervisor centre. For this service, the following functional requirements provided.

A. User monitoring activity and storing motion history

The MIDAS system monitors the user's movement in the house and stores the data. The collected data can show the history about the user motion feature. By analyzing the history, the MIDAS system can get more information about the user's status which is unknown even to the user himself or family.

B. Emergency call

When there is urgent or very strange situations, an emergent calling service try to contact the SC or hospitals.

2.2.6 Scenario 6: Health activity monitoring

For this, we need to choose what kind of biomedical data of the user the MIDAS system monitors. For example, since weight, heartbeat and blood sugar are important biomedical data of which the abnormal level can lead to any lethal situation in health, it is

critical to monitor these data of the elderly. For the purpose of monitoring these, the elderly regularly need to measure these data and send the SC the measure using communication devices in the house equipped by the MIDAS system. In addition to this monitoring, this service enables the user to consult a doctor when he feels abnormal symptom in his health.

A. Measure biomedical data and transferring to the SC

Since the elderly or disabled usually have poor health condition, it should be monitored carefully. For this reason, the MIDAS system measures the user's biomedical data (e.g. heartbeat or blood pressure) and transfers them to the SC for further analysis.

B. Consulting

Based on the measured data, the user can consult with a physician. Furthermore, when the user has strange feeling about his health status, the MIDAS system helps the user to get some medical helps.

2.2.7 Scenario 7: Security and assistance

One of the key tasks for this function is to supervise the user's movement carefully. For instance, the service has to watch if the user falls by accident carefully. This is because it is well known in gerontology that falling is one of main causes for the elderly to loose their physical health or have serious health status. Another example for this is to monitor the case where the user does not move for a long time. Namely, if the user does not move longer than any pre-specified time, the MIDAS system needs to check if everything with the user is fine. Such monitored data is saved for later use and an emergent calling is possible for any emergent situation. The service also supervises any possible intrusion and security status of the house. If there is an unexpected intruder, the system starts to record for later use. The system can also allow the user to check easily whether there any opened or unlocked windows or doors.

A. Activity monitoring for security

In order to check that there is a bad situation regarding the user (e.g. user falling), the monitoring system in the MIDAS system records a video.

B. Safety

Since the elderly or disabled are bit insensitive to what is happening in the house, the MIDAS system needs to check whether there is an invader or not. When there is any, a warning message is sent to the SC and the service records a video for later use. In addition, the MIDAS system helps the user to take care of the house. For example, it helps the user to check whether there are any opened or unlocked doors or windows before going to bed.

C. Assistance

In order to help message exchange between the elderly and his family, the MIDAS system can store messages and the user can check it. In addition, it makes it easy for the family to make a video or text message for the elderly.

2.3. Car Environment

This subsection summarizes the services that the MIDAS system provides in the car. The Drive Scenario aims at offering a complete assistance while the user is out of home in his car. The system will have vital sign sensors to provide health monitoring and will collect information to adapt system to user's needs.

A. Helping the elderly or disabled to drive easily

It is common for the elderly or disabled to have difficulty to drive with normal drive system (e.g. steering wheel or accelerator) in the car because of their physical weakness. To deal with this inconvenience, the MIDAS system helps them to drive using joystick or something similar device rather than the normal drive system.

B. Monitoring health status of the user (TH3)

When some bad symptom is recognized during driving, the user can measure his/her biomedical data and send it to the SC or contact the SC for proper suggestion or advice. This includes emergent call to the SC as well.

C. Facilitating to access to the home environment

When the user needs to access to the home environment during driving because of some reason, the MIDAS system provides access to the home environment.

D. Localization

When the user encounters some health problem in the car environment, the user would contact the SC. Then, the SC should know the user's current position. For the case where the user does not know his/her current position, the SC should have a way to know it. In addition to this, there are many different reasons to localize the user's current position. Therefore, the MIDAS system has to provide a function for this.

E. Communication

While the user is out of his/her home, it is beneficial if the communication functionalities used in the home environment are also available. The MIDAS system tries to provide almost similar communication functionalities in the driving environment to those in the home environment.

F. Simulator

In order to provide the services listed above in a car, the partners in the MIDAS Consortium will have to integrate various existing or newly developed technologies in new, unique, unconventional, and untested ways. Because of the high safety risks of using such new and untested services in a real car, the development, integration, and testing of these services should be conducted first on a driving simulator.

3. MIDAS Technological Modular Architecture

In the previous section, all system's functional elements were introduced. In this section, various technologies, which are necessary in order to realize/implement the functional elements depicted in the previous section, are listed and briefly described. Finally, the related partners are listed.

3.1. Supervisor Centre

Several technologies are listed which is going to be placed in the SC.

3.1.1 Data Management

A. DB (Data Base) server (PostgreSQL, MySQL)

The SC stores and manages the data from the HE (Home Environment) and CE (Car Environment) in the DB server. The DB gathers and stores the data and backups the data properly and periodically. In the course of doing this task, the security about the user's private health information must be guaranteed. According to the size of database, PostgreSQL or MySQL are good candidates for the database for the MIDAS system.

Related partners: CITIC, Thales

B. GUI to show the gathered data on the screen used by the caregiver in the SC

There are caregivers in the SC who watch the data stored in the server displayed on the computer screen. To support this task in an efficient manner and include communication (videoconference, audio), a proper GUI is provided for the computer used by the caregiver in the form of stand alone client.

Related partners: CITIC

C. Data analysis software to find any abnormal data pattern

In the DB server, a simple analysis software is installed which always runs and discriminates if the gathered data shows a normal pattern or not. For the sake of this task, several predefined abnormal data patterns need to be specified in the system, for example, abrupt heartbeat increase or body temperature change. When abnormal data pattern is detected by the software, it immediately sends the caregiver a warning massage via the computer screen, or the user and the relative SMS message to inform this. To this end, the software is made with the help of data mining techniques and ontology.

Related partners: CITIC

3.2. Home Environment (HE)

Several technologies are listed which is going to be placed in the HE. The more information of the index in the 'related partners' can be found at the end of this document.

3.2.1 Sensors and actuators

In order to check the user's real time status, the MIDAS system needs to have information from the user. To this end, several sensor modules are installed in the house.

- Blood pressure with Bluetooth
- Facial analysis
- Motion heat maps
- Person localization from smartcam
- Fall detection sensor
- Mobile camera
- Expiratory flow device
- Weight device
- Pulse-oxymetry

Related partners: Orange Labs, CNRS, CEA LIST, Thales

3.2.2 Communication and user interface

A. Multitouch interactive table

For user's convenient access to the MIDAS systems, a multi-touch table as a HCI is provided with which the user can play a game, use video conference and chat, manage social agenda and so on.

Related partners: INTUILAB

B. Video conference or chatting

Video conference or chatting allows the users to be able to talk to their friends and family. Moreover, the user can consult a doctor at home using them.

Related partners: Orange Labs, I&IMS

3.2.3 Robot

In the MIDAS system, there is a robot which plays several roles in servicing. For example, it receives simple instructions from the user and can remind the user of taking a pill and so on. For this, the robot is supposed to be able to support the following

- Robot arm with a camera and mobile video camera
- Advanced dialog capability

- Advanced use of voice information to control the robot
- Remote control functionality
- Intuitive human robot interface for non-specialist
- Health care monitoring interface on robot
- Knowledge representation for assistive robots
- Robot navigation functionality
- Robot localization functionality
- Person following
- Contextual behavior of the robot from image understanding
- Robulab 10 healthcare mobile platform
- Hardware module: PRIMO IROBIQ
- Object grasping and manipulation with the arm robot

Related partners: Robosoft, CEA LIST, Orange Labs

3.2.4 Software

There are several software applications providing various functionalities in the MIDAS system. They are listed in the following:

- Agenda application for mobile device
- Multimodal software for social network
- Agenda and ToDo list based on voice interface
- Social network management
- Social network management API
- Agenda alarm reminder for medical support running in a mobile device
- Software game application running in the multi-touch table
- Scenario management for stimulation of elderly or handicapped people
- Driving training software and device
- Videoconferencing software (UBIK)

Related partners: Robosoft, CEA LIST, Orange Labs, ESS, FICO TRIAD S.A., Thales

3.2.5 Medical care

Several medical care services are run in the MIDAS system in order to help the elderly take care of the health.

- Medical following up with agenda and reminder
- Daily medical questionnaire

- Medical assistance
- Cognitive stimulation
- Image remote diagnosis

Related partners: Orange Labs, Intuilab, I&IMS

3.2.6 Application running on TV

Several applications running on TV are provided. Using TV, the user can get text messages with various contents and have video conference.

Related partners: Orange Labs

3.3. Car Environment (CE)

Several technologies are listed which is going to be placed in the CE.

3.3.1 Sensors and actuators

A. Device to measure heartbeat and blood sugar

When the user feels strange symptom during driving, he/she can test the status after stopping the car. The sensors to measure the biomedical information are the same as those in the HE. The measured data is tranmitted using the communication device installed in the car.

Related partners: Robotiker, Thales

B. Devices to make the user drive easily

Joystick is installed in the car instead of the usual wheel in order to enable the elderly or disabled to drive without any difficulty.

Related partners: FICO

3.3.2 Communication

A. Device with 3G

3G device plays two roles in the CE. First, the measured biomedical data in the car is sent to a device with 3G (e.g. cellular phone) at first using bluetooth or zigbee and the device transfers the data to the SC. In other words, it is used as a gateway for the communication devices. Second, it allows the user to connect the data server in the HE in order to use some application or data in the data server. For example, this device acts as the remote desktop client and the data server in the HE as the remote desktop server. In addition, this is used for the emergent call to the SC.

Related partners: MOV

B. Remote desktop between home and car

During driving, the user sometimes needs to connect to the HE via remote desktop in order to control something at home or use running application in the HE. This service uses 3G or Wi-Fi.

Related partners: Robotiker

C. GSM and GPS device and its application

In order to support the localization, GPS and GSM, and its web platform are provided. Web service makes it easy to interface with other service or application.

Related partners: Geomobile

3.3.3 Simulator

The simulator system is built around a mock-up of a car cabin. The driver's field of vision is simulated using multiple large LCD monitors placed in front of the cabin mock-up.

The use of real car parts in the cabin mock-up (seat, dashboard, steering wheel, gearstick, acceleration, brake, and clutch pedals, etc.) creates an immersive environment for the driver. All of these hardware parts are driven by powerful computers to create a realistic driving experience, including all environmental sounds, road conditions, etc.

The joystick being developed by FICO will be integrated to the simulator to enable dual control of the vehicle. The driver will be able to choose whether he or she wants to command the vehicle using the conventional control systems (steering wheel, gearstick, pedals) or the joystick.

CNRS's drowsiness detection system will also be integrated non-intrusively to the simulator. Similarly, the car PC and all devices connected to and controlled by it (Geomobile's geo-localization control system; Robotiker's biomedical sensors; and Robotiker's multimodal interface system, which consists of a small touchscreen monitor and a microphone for voice recognition) will be mounted to suitable locations on the cabin mock-up.

The communication between the simulator and the car PC will be over an Ethernet connection. The simulator will accept certain commands from the multimodal interface system and also report to it certain status information. The simulator will also supply geographical location information of the simulated environment.

Finally, all communication devices that connect the CE to the HE and the SC will also need to be integrated to the simulator.

Related partners: KaTron, CNRS, Ficotriad, Geomobile, Robotiker

4. Conclusions

This deliverable investigated what kinds of services and corresponding technology are necessary in the MIDAS system based on the scenarios from WP1. In other words, conceptual services are extracted from the scenarios and required technology realizing the services are mapped into the partners.

Three major subsystems have been identified considering different functionalities that should be developed in each of them. Supervisor centre collects all data from Home and Car environment and take proper actions according to the data. Home environment provides several communication tools for helping the user to have and maintain social links, and monitors the user's safety. Car environment aids the user to drive easily and monitors their health status during driving.

Among all the general requirements presented across the document, multimodal communication is very important; in this way, sensor information management is vital to reach this objective. To determine the best way to communicate with the user it is necessary to solve the question of how to organize and process information. Ontological modelling and rule-based systems are the technological solutions to provide this adaptation.

Communication within subsystems and information sharing is also vital to have a complete overview of user's behaviour and do a better adaptation to their needs.

Data Management is also very important. Medical information must be carefully managed and will be presented to caregivers and general practitioners in the Supervisor Centre.

The subsystems identification and functional analysis will be developed in D2.2 and more accurately defined in WP4 and WP5 where concrete services will be identified.

5. Appendix: list of the partner's expertises

The following table shows the partner's expertises.

Partner with index	Device, Service or Application Name	Type	Use cases	H: Home C: Car S: Supervisor
MOV_1	Agenda application for mobile device	Application	Agenda based on social network	Home
MOV_2	Agenda alarm reminder for medical support	Application	Medication follow up	H
MOV_3	Software game application for cognitive stimulation	Application	Cognitive and Physical stimulation	H
MOV_4	Modules for communication between home and drive	Service	Drive and Home training	H&C
ESS_1	Multimodal software for social network	Application	Agenda based on social network	H
ESS_2	User profile, statistic monitoring and recommendation SW	Application	Drive and Home training	H&C
FIC_1	Haptic steering device for home & drive scenario	Device	Drive and Home training / Physicall disabilities.	H&C
Robosoft_1	Robulab10 Healtcare mobile platform	Device	Home scenarios	H
Robosoft_2	Robot navigation functionnalities	Application	Home scenarios	H
Robosoft_3	Person detection by vision	Application	Home scenarios	H
Robosoft_4	Robot localization functionnality	Application	Home scenarios	H
Robosoft_5	Advanced Dialog capability	Application	Home scenarios	H
Robosoft_6	Advanced use of voice information to control the robot	Application	Home scenarios	H
Robosoft_7	Agenda and toDo list based on voice interface	Application	Home scenarios	H
Robosoft_8	Person following	Application	Home scenarios	H
Robosoft_9	Remote control functionnality	Application	Home scenarios	H
Robotiker_1	Sensors in drive scenarios (Temperature, Humidity, pressure, light and ECG)	Device	Drive scenarios: Physical disability and sanitary assistance	C
Robotiker_2	Car-PC + Screen	Device	Drive scenarios.	C
Robotiker_3	Software for remote desktop between car and home	Application	Home & car remote interaction.	H&C
Robotiker_4	Software to use information from car sensor network	Application	Drive scenarios.	C
CNRS_1	Motion heat maps	Application	Scenario 5 Activity level determination	H
CNRS_2	Facial analysis	Application	Scenario 6 Health activity monitoring	H
CNRS_3	Abnormal situation detection software	Application	Scenario 7 Security and assistance	H
CNRS_4	Eye gaze detection - Focus of attention (tired-not tired)	Application	Scenario 11 Sanitary Assistance	C
GEO_1	GSM/GPS Localisation Web Platform - device localisation - device configuration - Alert management (SOS, fall detection, zone detection) - Call reception/routing with caller	Application	Home and Drive scenario	H&C

	identification (TBC) - outdoor/indoor localisation			
GEO_2	GPS Device	Device	Home and Drive scenario	H&C
GEO + FT_1	Inertial Device for indoor localisation	Device	Home scenario	H
FT_1	Person localisation from Smartcam	Device	Home scenarios	H
Geomobile + FT_1	Person localisation from zigbee and/or wifi technology	Device	Home scenarios	H
FT_2	Context management service	Service	Home scenarios	H
FT_3	Context learning service	Service	Home scenarios	H
FT_4	Context Data storage	Application	Home scenarios	H
FT_5	activity level determination with central electrical device	Device and service	Activity Level determination	H
FT_6	activity level determination with wearable sensors	Device and service	Activity Level determination	H
FT_7	activity level determination SW	Application	Activity Level determination	H
FT_8	Primo Healtcare mobile platform	Device	Communication @ home	H
FT_9	Advanced Dialog capability	Service	Communication @ home	H
FT_10	Medical follow up with agenda and reminder	Service	Medication follow up	H
FT_11	Remote control functionnality including visioconf tech	Service	Communication @ home	H
FT_12	Daily medical questionnary	Service	Health activity monitoring	H
FT_13	Healthcare monitoring interface on robot	Device +Service	Health activity monitoring	H
FT_14	Social Network management SW	Application	Home scenarios	H
FT_15		Service	Home scenarios	H
CEA_1	Robot arm with video cameras	Device	Home scenarios	H
CEA_2	Object grasping and manipulation with the arm robot	Application	Home scenarios	H
CEA_3	Mobile video surveillance	Device	Home scenarios	H
CEA_4	Knowledge representation for assistive robotics	Application	Home scenarios	H
CEA_5	Scenario management for people stimulation	Application	Home scenarios	H
CEA_6	Contextual behaviour of the robot from image understanding	Application	Home scenarios	H
CEA_7	Intuitive human robot interface for non specialists elderly people	Application	Home scenarios	H
IntuiLab_1	Adaptation communication applications on the multitouch table	Application	Home scenarios - 쁌	H
IntuiLab_2	Dedicated software to help elderly to take their medicine.	Application	Home scenarios - Medication follow up	H
IntuiLab_3	Stimulation software for cognitive stimulation	Application	Home scenarios -Cognitive stimulation	H
I&IMS_1	Video conference system	Device & Application	Agenda based on social network	H
I&IMS_2	Remote diagnosis	Application		H
Thales_1	Security	Service	Firewall, IDS, Multicast routing, VPN access	S
Thales_2	Storage	Service	NAS	S
Thales_3	Database	Service	Database, Content management	S
Thales_4	Network Management	Service	Nagios, Mrtg...	S

Thales_5	Portal	Application	Application : Portal Access, browsing tool, Data sharing and Import, Typical portal functions : Webmail, Forum, Blog…, User support and profile management, -Workflow Editor	S
Thales_6	DNS	Device+service	DNS	S
Thales_7	DHCP	Device+service	DHCP	S
Thales_8	UBIK	Application	Home scenarios : Collaborative working, videoconferencing...	H
Thales_9	Videostreaming	Application	Home scenarios	H
Thales_10	Pushes files	Application	Home scenarios	H
FICO_1	Haptic steering device for home and drive scenario	Device	Home and drive	H
Orange Lab_1	Person localization from smartcam	Device	Home	H
Orange Lab_2	SMS on TV	Service	Context adaptive communication	H
Orange Lab_3	Hardware module: PRIMO IROBIQ	Device	Context adaptive communication	H
Orange Lab_4	Medical follow up with agenda and reminder	Service	Medication follow up	H
Orange Lab_5	Visioconf software	Service	Communication in general	H
Orange Lab_6	Daily medical questionaire	Service	Communication in general	H
Orange Lab_7	Healthcare monitoring interface on robot	Service+Device	Health activity monitoring	H
Orange Lab_8	Social network management API	Service	Home Scenario	H
Orange Lab_9	Social network management	Application	Home Scenario	H
Orange Lab_10	Content sharing on TV	Service	Context adaptive communication	H
Orange Lab_11	Push-Notification on TV	Service	Context adaptive communication	H
CITIC_1	Event manager, Application manager, communication server		Supervisor centre	S
KaTron_1	Simulator cabin mockup.	Device	Car environment	C
KaTron_2	DAQtron™ Simulation Data Acquisition and Recording Database software module.	Application	Car environment	C
KaTron_3	TERRAtron™ Terrain Simulation Server software module.	Application	Car environment	C
KaTron_4	NAVItron™ Navigation Simulation Server software module.	Application	Car environment	C
KaTron_5	DBtron™ Simulation debrief and after action review (AAR) software module.	Application	Car environment	C

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