MIDAS

Multimodal Interfaces for Disabled and Ageing Society

Project number: ITEA 2 - 07008

ITEA Roadmap application domains:
Major: Home
Minor: Nomadic

ITEA Roadmap technology categories:
Major: Human-Computer Interface
Minor: Data and Content Representation

WP N°: 2
Deliverable D2.3:
Risk Analysis

Due date of deliverable: 01/07/2009
Actual submission date: 19/04/2010

Start date of project: 01/10/2008 Duration: 36 Months

Project coordinator name: Laure Chotard

Organisation name of lead contractor for this deliverable: ENERGY SISTEM SOYNTEC

Editor: Begoña Gonzálvez – Francisco Cano **Revision:**

TABLE OF CONTENTS

LIST OF FIGURES

1. Introduction

1.1. Purpose of this document

This document has the goal to describe and analyze all potential risks through the threats and vulnerabilities found in the different services developed in the previous work packets.
This risk analysis process is going to be developed below four main points which can affect the proper advance of the project. These four factors are:

- Usability Risks
- Technological Risks
- Legal and Ethical Risks
- Economic and Sustainability Related Risks

1.2. Document Overview

This document "D2.3: Risk Analysis" is related with WP Nº1 [T1.3 Usability requirements; T1.4 Technological Survey and Literature tool study; T1.5 Market Study; T1.6 Legal and ethical studies]

1.3. Editors

Begoña Gonzálvez - ESS
Francisco Cano - ESS

1.4. Change History

Date	Author	Update description	Doc. Version
29-05-2009	ESS	Table of Content definition	1.0
27-08-2009	Francisco Cano ESS	Table of Content - Introduction	1.1
26-10-2009	Francisco Cano ESS	Structure of the document – Methodology – Template - Integration	2.1
19-02-2010	ESS	CreativIT and ESS contributions integration	2.2
14-04-2010	ESS	Final adjustments	2.3
19-04-2010	ESS	Integration of final contributions (Intuilab, KaTron) and update template	2.4

1.5. Risk analysis methodology

MIDAS will implement a risk management plan based on a risk analysis methodology involving all the partners.

The typical managing risk involves the following steps:

- Threat and vulnerability assessment
- Risk assessment in terms of probability of occurrence and impact
- Identification of risk mitigation actions or a contingency plan

Once the risk has been identified the next step is prioritize the options to mitigate those risks

This analysis will focus on matters such as:
- Time
- Cost
- Functionalities
- Quality

Based on the results of such analysis and of additional factors such as the probability of the risk to occur and the importance of its impact, the risk will be registered in the Risk Register and classified with one of the three levels.

Risk Register

The risk register lists all the identified risks and the results of their analysis. The Risk Register identified in the project MIDAS includes, for each risk:

- Risk identification number: To track the item.
- Description of the risk: Describe the risk in detail.
- Probability of occurrence: Rate the probability or likelihood that the event will occur.
- Impact of occurrence: Rate the impact of the loss if the event were to occur.
- Risk level: The relation between severity of impact and the probability of occurrence.
- Risk mitigation/contingency plan: What can we do to prevent the risk from happening? What can we do if the risk happens?

The risk assessment form is a tool to asset the risks, and the template below will be the template that partners will use.

RISK ASSESSMENT FORM					
Risk Number: 1					
Raised by: ESS		**DATE**:			
Risk description: : [*A brief description of the risk, the type of the risk, the probability that the risk occurred and the quality of the impact (low/medium/high) in the service described.*]					
Suggested risk mitigation actions / contingency: [*Mitigation actions to try to reduce the chance of the risk occurring* *Contingency actions to try to minimize the impact of the risk once it has occurred*]					
Probability:	**LOW**	**Impact:**	**LOW**	**RISK Level:**	**LOW**

Risk Level Rating Chart

To analyze and assign ratings it has been developed the Risk level rating chart. Risk level is the combination of severity of impact and the probability of occurrence like is shown in the figure below.

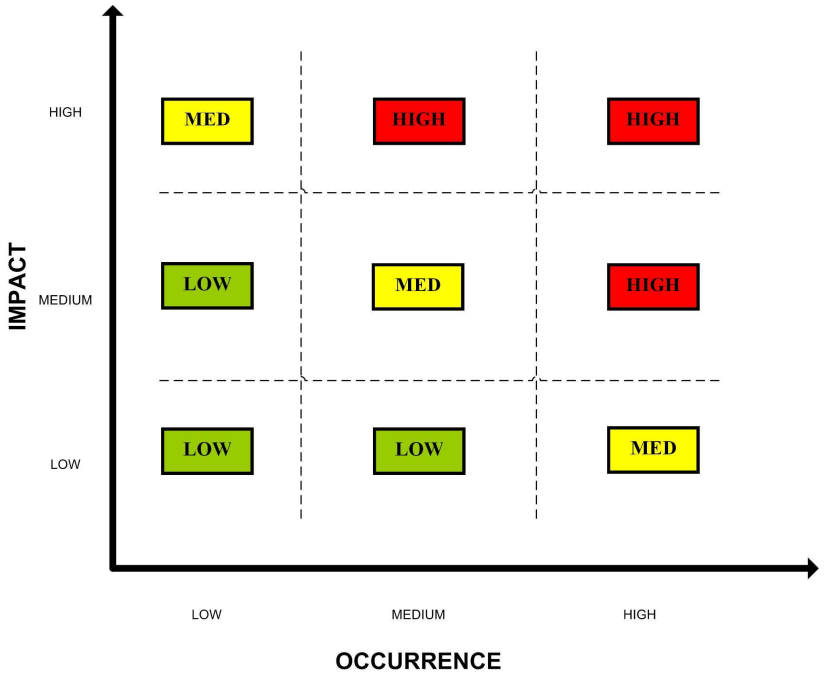

Figure 1 Risk Level Rating Chart

1.6. Scenarios

From the diverse scenarios suggested by the MIDAS consortium, and exposed in the previous chapter, the main domains to be treated in the project are now presented. The scenario selection will offer the starting point to define the specific requirements for each scenario. The demonstrators developed by the consortium will be elaborated based on this information, and they will be meant to fulfil the requirements raised as a consequence of each scenario.

The different categories to be exposed are gathered into the following diagram:

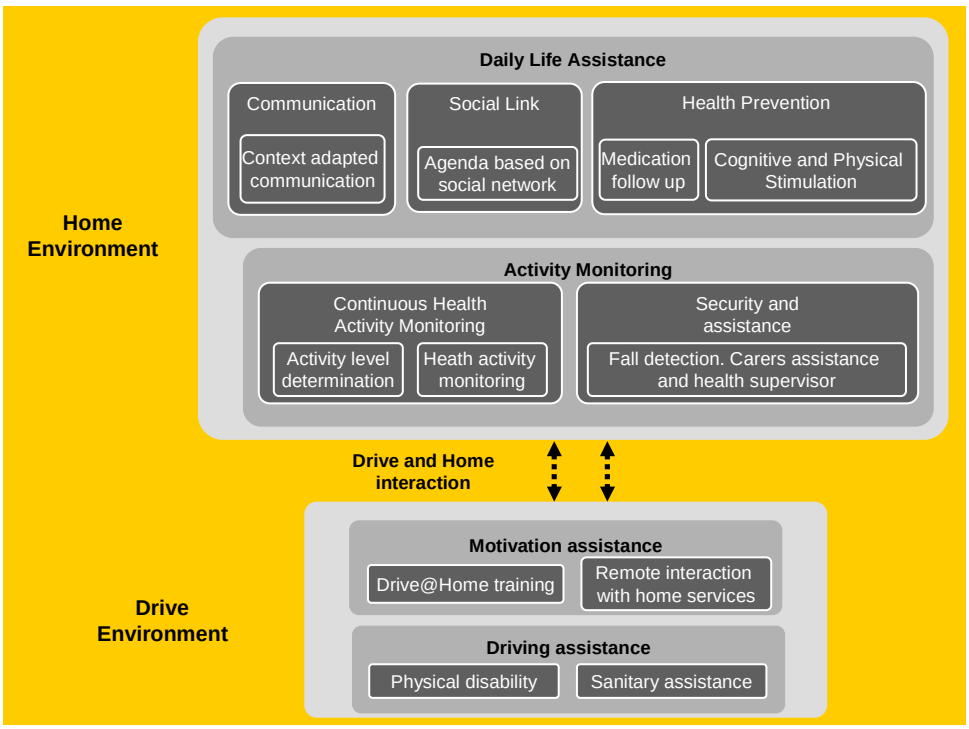

Figure 2 Scenarios overview

These categories will cover the different goals and expectations for MIDAS project. As it was planned from the FPP, the different innovative scenarios are divided in two main domains: home and drive environment. Inside both domains, the activities to be taken into account in MIDAS will be explained in the following sections.

1.6.1 HOME ENVIRONMENT: Super Scenario Description

MIDAS is focused on the development of new multimodal interfaces for the disabled and elderly people. These kinds of population spend most of their time at home, so this scenario is vital in order to produce good results for the project.

1.6.1.1. Daily life Assistance

The following diagram shows an overview of the daily life assistance scenario:

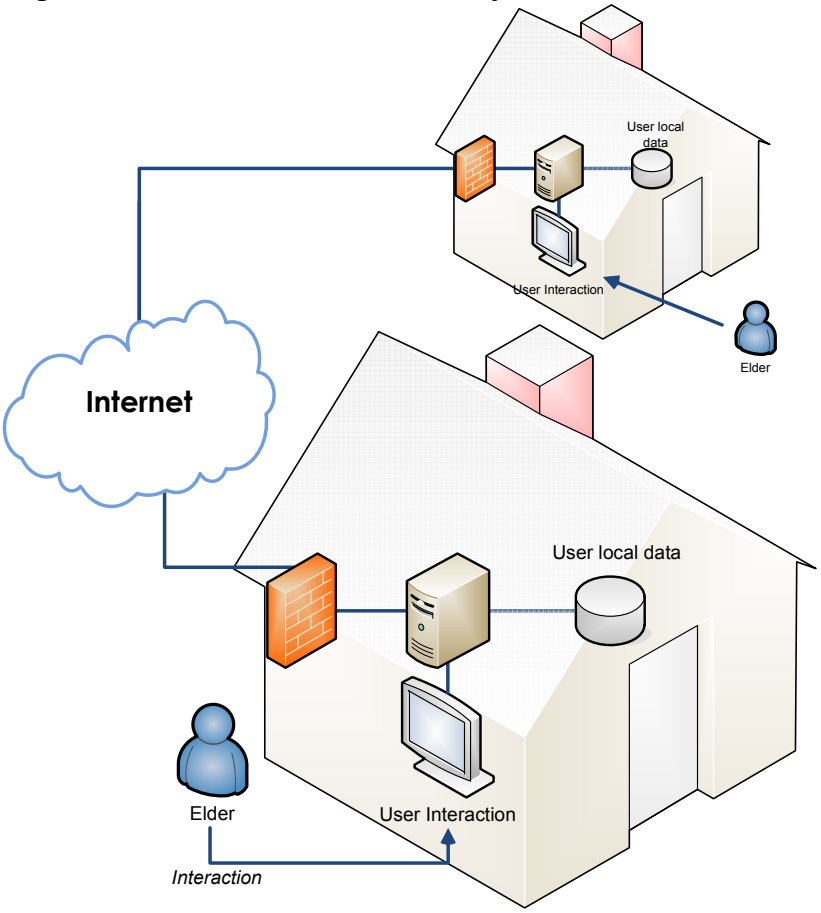

Figure 3 Daily life Assistance

Scenario Description

This scenario covers the need of elderly people of keeping in contact with their relatives. This enhance their psychological relationship with other users as well as it improves the attendance of other user may have to this sector of the population. Through this scenario, users are able to communicate using video conference tools adapted to the cognitive difficulties caused by their third age. It also brings the possibility of using several tools to maintain the social contact with their relatives without the need of going out of their safety home.
The entertainment of elderly people is the basis for a good psychological maintenance. Through the correct device and using dedicated software for that purpose, the user can stimulate both physical and cognitive aspects.

Features to be tested

Use cases to be tested inside this scenario:

- Adaptive communication between two elderly users.
- Agenda as remembering support system for an elderly user.
- Contact with relatives using a social network designed specially for this scenario.
- The user is able to use and play with dedicated software in order to improve his/her cognitive abilities.

- A robot may guide the user in order to carry out physical activities suitable to his needs.

1.6.1.2. Activity monitoring

The following diagram shows an overview of the activity monitoring scenario:

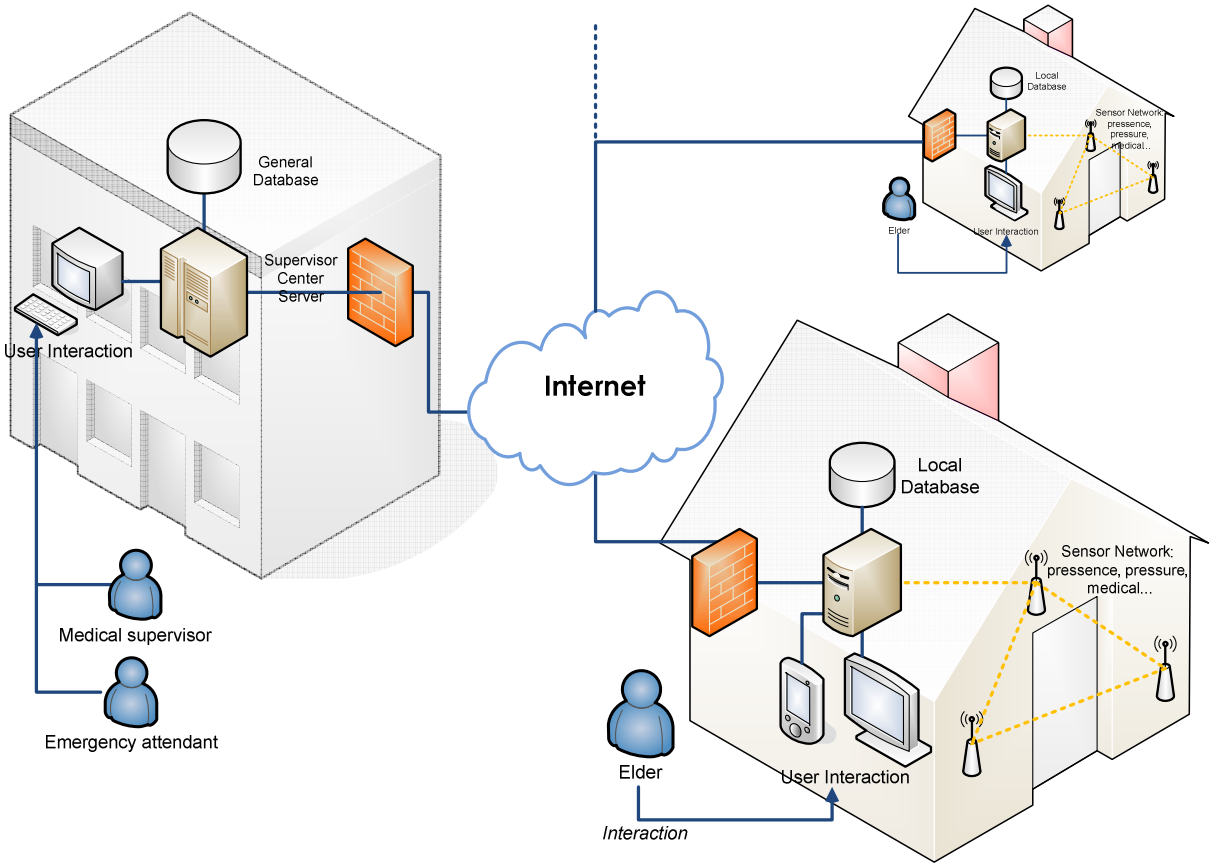

Figure 4 Activity monitoring

Scenario Description

A home environment allows the routine activities of the individual to be used as a basis for extracting information on normal or abnormal domestic activity. Consequently, it may generate alert messages and/or activate additional functions if necessary, or set off actual alerts if required. The basic idea of the usage situation is to highlight the ability of a sensor system to qualify levels of activity (and therefore of independence), prevent accidents and diagnose from distance.

The importance of the patient involvement in the disease monitoring and care process is high. Patient empowerment seems to be a well-recognized success factor in long term care and patients should be generally encouraged to proceed with self-monitoring (possibly also with the use of appropriate personal measurement devices e.g. peak expiratory flow meters in bronchial asthma or glucometers in diabetes).

These devices may bring substantial benefits including: improved quality of life for patients, decreased consumption of the health care resources (less hospital admissions and emergency visits) as well as increased patient satisfaction with interactions with health care providers.

Specific requirements

This scenario is focussed on the continuous monitoring of the user in order to prevent and reduce the number of incidents that an elder may suffer. As it is fundamental for a good supervision and prevention process, the system at home is connected with a supervision centre located anywhere in the city. This supervision centre will offer necessary support in case of any abnormal situation takes place.

The following requirements are needed in order to test the different use cases of this scenario:

- Supervision Centre with monitoring devices.
- Communication devices to perform contact with the Supervision Centre.
- Biomedical data recording sensor of blood pressure, weight, diabetes, oxygen saturation…
- PDA or mobile device with wireless communication in order to monitor the process in a portable device.

Features to be tested

The use cases to be tested inside this scenario are the following:

- Continuous activity monitoring
- Continuous vital signs monitoring
- Fall detection
- Use of localization service in case of alarm raising
- Professional recommendation to the user in case of detection of a problem

1.6.2 DRIVE ENVIRONMENT: Super Scenario Description

Driving scenario will consider two main types of users, people with a disability and the elderly. The first scenario will be focused on the first one and the second scenario will be focused on the elderly, both of them trying to simplify driving activity and car environment in order to maintain their autonomy.

Driving scenario will be simulated using car simulators, and the mentioned scenarios conditions are described on a more detailed way in the followings sub-sections. It means that the following two environments will be developed using the car simulator:

- Generation of urban driving environment with all of its characteristics (sounds, moving cars, weather and road conditions).
- Generation of highway driving environment with all of its characteristics (sounds, moving cars, weather and road conditions).

Besides, the second scenario will integrate the home scenario in order to re-use some services at home but from the car. It means that car will be an extension of home for some special features.

Super Scenario General Requirements

From the functional point of view, driving scenario will take into account that systems developed will be physically versatile in functionality and emotionally human friendly, mainly HMI and multimodal solution adopted. This means that besides facilitating the driving activity, it has to be performed without causing inconvenience (pain, noise, movement restriction, panic, etc). Therefore, the devices or the technologies proposed will not be intrusive and cables and devices have to be hidden or in a discrete way.

From the ethical point of view "sensitive data" like ethnicity, medical records, etc. will be protected and users will be informed, consent required is needed, and data made anonymous immediately by the use of codification. The real identity will be only use to back checking if needed and cannot be passed to third parties.

From the technical point of view, driving scenario will take into account the following general technologies:

- Multimodal GUI system (screen / head-up display).
- Sensor network for heart diagnostic.
- Out car communication system (between home and car scenarios).
- Driving simulation platform.
- Existing information from the car system (CAN network, and so on).
- Ergonomic joystick / haptic device.
- Voice-Command recognition system.
- Out door localisation system (GPS).

See the following scenarios for more details related to the technologies used in each scenario.

1.6.2.1. Motivation assistance

Specific requirements

User at home, should be provided of a similar car environment supported by a simulator where will be able to handle main in-car controls, making possible to exercise and improve disabilities to carry out later, car main functions in a real car.

- DbW (Drive-by-wire) in car
- COMMUNICATION MODULE IN CAR
- Wireless channel(in order to communicate car and home)
- COMMUNICATION MODULE AT HOME
- DbW (Drive-by-wire) at home
- Monitor display at home
- PC SW Simulator
- PC User Profile and statistic SW
- PC (desktop)

Features to be tested

- PC SW simulator performance
- PC user profile and statistic SW performance,
- Test communication between car and home,
- Test user profile parameters downloading to car
- Performance of downloaded user profile in driving commands
- Downloaded user profile and statistics at home software performance.

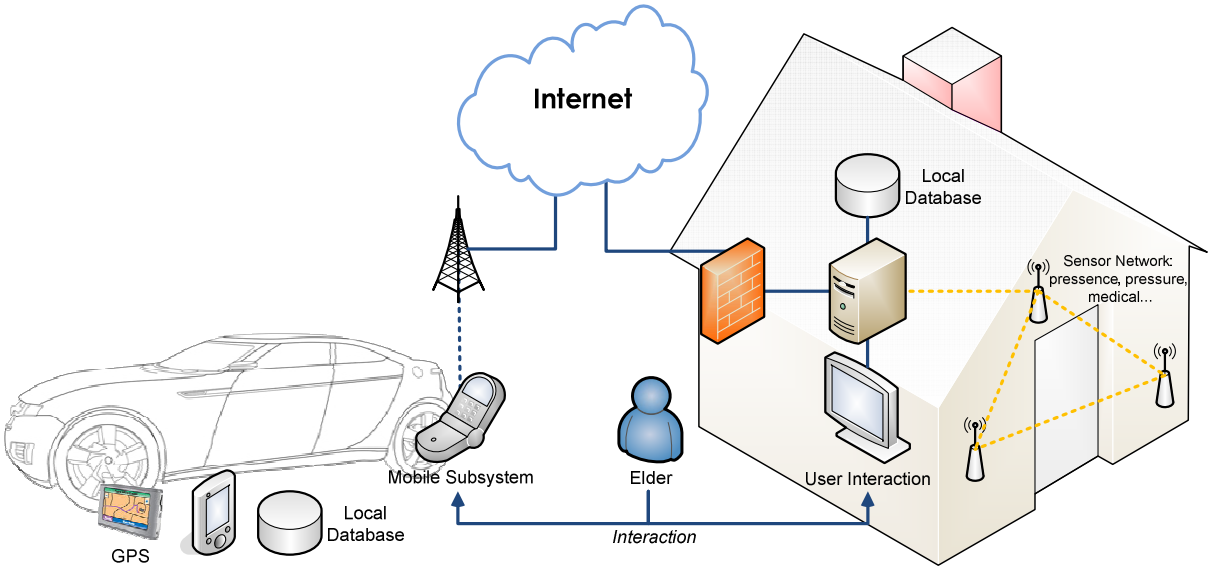

Figure 5 Home and drive interaction

1.6.2.2. Driving assistance

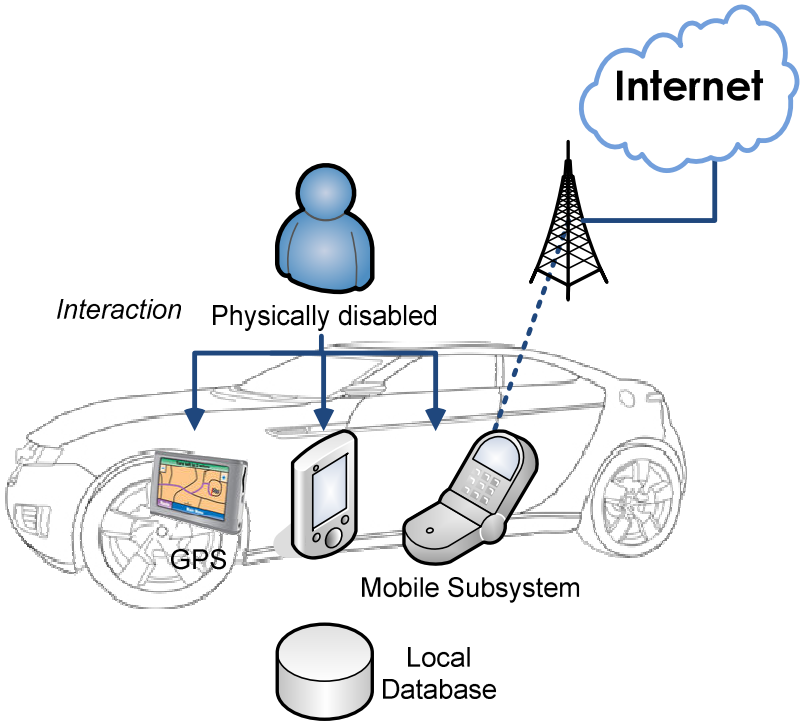

Figure 6 Driving assistance

In this case specific requirements have been specified for Physical Disability and Sanitary Assistance.

Physical Disability

Specific requirements

- Driving simulation platform.
- Simulated urban driving environment (nighttime conditions, different weather conditions, etc…)
- Existing information from the car system (CAN network, and so on).
- Ergonomic joystick / haptic device.
- Voice system.
- Multimodal GUI system (screen / head-up display).

Features to be tested

- Generation of urban driving environment with all of its characteristics (sounds, moving cars, weather and road conditions).
- Adaptive HMI system. Intelligent and dynamic adaptation of HCI and system behaviour to the user's preferences and needs.

Sanitary Assistance

Specific requirements

- Driving simulation platform.
- Simulated urban driving environment (highway traffic with aggressive drivers, environmental sounds, etc).
- Sensor network (ECG,…).
- Existing information from the car system (CAN network, and so on).
- GUI interface for assistance.
- Out car communication system.
- Out door localisation system (GPS).
- USB Camera for face detection and facial analysis

Features to be Tested

- Generation of highway driving environment with all of its characteristics (sounds, moving cars, weather and road conditions).
- Quick heart diagnostic.
- Quick relative contact.
- Quick assistance system contact.
- Communication system between home and car scenarios.
- Drowsy driver detection system

2. Identification of Risks

2.1. Usability Risks

MIDAS has a very special target group of users. In Task 1.3 deliverable (Usability Requirements) disabilities that can be found in this users where analyzed. Attending to these handicaps, a set of user profiles where defined.

Usability is a goal to be achieved in any project, but in MIDAS case, this goal is mandatory: User disability is not a possibility, but a fact. Most of people above 65 people have memory, attention, hearing, visual or physical handicaps, so interfaces design must always keep in mind types of people are using them.

2.1.1 General Risks

RISK ASSESSMENT FORM					
Risk Number: U1					
Raised by: CITIC		**DATE**: 2009/09/09			
Risk description: <u>Lack of consideration of user profiles</u> Interfaces design must always take into account different user profiles. If end user characteristics are not considered with the appropriate level of importance, design could lead to non-usable interfaces. An interface with a very small font size is obviously non-usable for somebody with vision handicaps.					
Suggested risk mitigation actions / contingency: Interfaces design must always consider all of possible profiles are going to use it. If a particular interface design finds a conflict and it is not possible to define an interface to satisfy every requirement imposed by profiles special features. A suggested action could be to design two or more interface for the same scenario, installing the most suitable depending the profile to which a specific user belongs to.					
Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

RISK ASSESSMENT FORM					
Risk Number:U2					
Raised by: CITIC		**DATE**: 2009/09/09			
Risk description: <u>User physical and intellectual deterioration</u> User's physical and intellectual deterioration (i.e., restriction of sensorial capabilities, physical problems) could lead to non-usability interfaces if not such considerations are taken into account. This is a risk with a high probability of occurrence, and its impact in the provided service is also very high.					
Suggested risk mitigation actions / contingency: Interfaces must be adaptable. If the interface can be configured with a set of parameters, any change in user characteristics would make possible an adaptation in the interface. I. e. a parameter with voice volume for people with deafness loss, size of fonts for people with blindness loss, …					
Probability:	**HIGH**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

RISK ASSESSMENT FORM					
Risk Number: U3					
Raised by: CITIC		**DATE**: 2009/09/09			
Risk description: <u>Environmental noise</u> Of course environmental conditions are not always perfect, and interfaces design should consider this point. Although voice communications is the most affected case, if the concept noise is extended to anything that could dull communications, almost every type of communication is affected. This is a risk with a high probability of occurrence, but its impact should not be too high.					
Suggested risk mitigation actions / contingency: This case has special importance in voice communications (in both of the senses). Not always this noise can be avoided, so some type of mechanism to minimize this problem. At least the possibility to repeat an incoming or outgoing message from/to interface should be available.					

Probability:	**HIGH**	**Impact:**	**LOW**	**RISK Level:**	**MED**

RISK ASSESSMENT FORM	
Risk Number: U4	
Raised by: CITIC	**DATE**: 2009/09/09
Risk description: <u>Non-intuitive interfaces</u> MIDAS end-user usually has not high technological skills. A mandatory characteristic is that interfaces must be intuitive in every sense: general aspect, mechanisms to get/introduce information, language … If give recommendations by deliverable D1.3 are followed, the probability this risk takes place is very low. Nevertheless, its occurrence has a very high impact.	
Suggested risk mitigation actions / contingency: This risk is not directly associated to any user profile, but is a general characteristic to every MIDAS user. Lack of formation in technology is common to almost every user, so this issue has to be considered in all of interfaces design.	

Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**MED**

RISK ASSESSMENT FORM	
Risk Number:U5	
Raised by: CITIC	**DATE**: 2009/09/09
Risk description: <u>Adaptability to different physical environments</u> An interface for users with same profile, could reach different levels of usability if physical environments are different. An example could be an interface that detects user movements: if user clothes colour and background wall colour are the same, it is possible these movements are not correctly identified. Situations like this are not easy to predict and usually don't take place, but if they do, they have a high impact.	
Suggested risk mitigation actions / contingency: The solution to previous example or any other equivalent situation could be a set of parameters to take into account this type of situations.	

Probability:	**MED**	**Impact:**	**MED**	**RISK Level:**	**MED**

RISK ASSESSMENT FORM	
Risk Number: U6	
Raised by: CITIC	**DATE**: 2009/09/09

Risk description: : **Users mistakes**

As was mentioned in a previous risk description, MIDAS end-users have not got technological skills. A very common situation is to commit a mistake selecting an item, describing a situation …

The probability to find this type of situations is extremely high. If it is not possible to change previously introduced information, derived consequences can become into a disaster.

Suggested risk mitigation actions / contingency:
The suggested behaviour is to allow users to review and change any previously introduced information, especially in those cases in which this information is sensitive or derived actions are important.

Probability:	**MED**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

RISK ASSESSMENT FORM	
Risk Number: U7	
Raised by: THALES	**DATE**: 2009/23/09

Risk description: : Users refuses the technology

Patient refuses to use the technology because he had bad information or refuses to communicate its confidential medical data.

The probability to find this type of situations is high.

Suggested risk mitigation actions / contingency:
- inform patient in advance - training of medical staff - stimulate patient
- implement encryption mechanism - sign patient agreement

Probability:	**HIGH**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

RISK ASSESSMENT FORM	
Risk Number: U8	
Raised by: THALES	**DATE:** 2009/23/09
Risk description: : <u>Failures in making diagnostics</u> 1- medical data not sufficient 2- specialist not appropriate 3- unexpected telecommunication disconnection 4- bad data quality The probability to find this type of situations is extremely high.	
Suggested risk mitigation actions / contingency: 1- prepare data in advance / pre-view patient case 2- select appropriate specialist 3- set-up automatic recovery mechanism / backup of GSM connexion ? 4 - increase dedicated bandwidth	

Probability:	**MED**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

2.1.2 Home Scenario

2.1.2.1. Communication

RISK ASSESSMENT FORM	
Risk Number: U9	
Raised by: THALES	**DATE**:23/09/2009
Risk description: : **Alarm or alert from home is not arrived to the call center/ Medical experts** 1- application problems 2 - networking problems 3- Nobody is checking demands/answers 4- demand is not properly transmitted	
Suggested risk mitigation actions / contingency:	

1 - monitoring of applications / availability of IT responsible
2 - availability of IT responsible / call help-desk / back-up connection
3 - ask for acknowledgment / call him by phone
4- appropriate training / have a written procedure / have a local expert available

Probability:	**MED**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

RISK ASSESSMENT FORM

Risk Number: U10

Raised by: THALES	**DATE**:23/09/2009

Risk description: Computer failure
Description: computer break down.
Sources can be
1 - power supply
2 - operative system failure
3 -malicious software

Suggested risk mitigation actions / contingency: Corrections
1- use appropriate UPS
2- re-install op. System / have spare components / technician available on site
3 - set-up regular update of the protective system / perform regular deep analysis of the system

Probability:	**MED**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

RISK ASSESSMENT FORM

Risk Number: U11

Raised by: THALES	**DATE**:23/09/2009

Risk description: : **Network connectivity failure**
Sources :
1- LAN problem
2- WAN problem

Suggested risk mitigation actions / contingency: Corrections 1 - check cables / have spare components / technician available on site 2 - contact Call-Centre / have spare components / technician available on site					
Probability:	**MED**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

RISK ASSESSMENT FORM	
Risk Number: U12	
Raised by: THALES	**DATE**:23/09/2009
Risk description: : **Application failure** Sources : 1- launching process 2- software crashed 3 -malicious software	
Suggested risk mitigation actions / contingency: Corrections 1 - Quick start procedure - call IT responsible/ Call center 2 – automatic re-install SW / Distant support 3 - set-up regular update of the protective system / perform regular deep analysis of the system	

Probability:	**MED**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

2.1.2.2. Social Link

RISK ASSESSMENT FORM	
Risk Number: U13	
Raised by: ESS	**DATE**:

Risk description: <u>The size of the information</u> One of the main problem of elderly people is the lack of vision, as older is a person more difficulties have this person to see properly the text displayed.					
Suggested risk mitigation actions / contingency: To solve the problem of the lack of vision all the text that appear in the device must be able to be re-size by the users in order to allow elderly people to read the information displayed.					
Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**LOW**

RISK ASSESSMENT FORM					
Risk Number: U14					
Raised by: ESS		**DATE**:			
Risk description: <u>Usable and changeable interface</u> If the interface used to communicate the user and the platform is not usable and is not designed for all many disabled groups can be out of MIDAS target group.					
Suggested risk mitigation actions / contingency: The interface must be usable and able to be changed in order to satisfy different disabilities from different users					
Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**MED**

RISK ASSESSMENT FORM					
Risk Number: U15					
Raised by: ESS		**DATE**:			
Risk description: <u>Easy to learn and easy to use</u>					

The social network system will be used by elderly people and people with any kind of disabilities, so the consequence of a not easy-to-learn and a not easy-to-use system is the disappearance of the system. Old people have problems to learn new and complex things and disabled people have problems to use something very complex and not intuitive (mobility and cognitive disabilities)
Suggested risk mitigation actions / contingency: The system must be usable and intuitive and developed according with international agreements about accessibility of people with disabilities to Society information.

Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**LOW**

RISK ASSESSMENT FORM	
Risk Number: U16	
Raised by: ESS	**DATE**:
Risk description: <u>Multimodal Alarm</u> The alarm service must be used for everyone, independently the type of disability the person have.	
Suggested risk mitigation actions / contingency: The alarm should be multimodal (different ways to notice a concrete situation) in order to inform to the user independently his disability (a noise for blind users, a light or a buzz for deaf people, etc)	

Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**LOW**

RISK ASSESSMENT FORM	
Risk Number: U17	
Raised by: ESS	**DATE**:

Risk description: <u>Usable Device</u> A non usable device means that elderly people and disabled people is not able to use the system and the platform developed.					
Suggested risk mitigation actions / contingency: The device should have got some characteristics to be usable: - The device should not be very small (difficult to be used for elderly people and people with mobility disabilities). - The size of the mobile phone keys must be appropriate to elderly people and people with disabilities (f-e People with Parkinson)					
Probability:	**MED**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

2.1.2.3. Health Prevention

RISK ASSESSMENT FORM					
Risk Number: U18					
Raised by: MOV		**DATE**:			
Risk description: <u>Intuitive Interface</u> The system used to remind the user to take the pills must be intuitive so that they don't have any doubt of the medicine to be taken. The system should propose a validation to be sure that the elderly has taken it.					
Suggested risk mitigation actions / contingency: Intuitive, clear and easy to understand interface developed.					
Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**LOW**

RISK ASSESSMENT FORM
Risk Number: U19

Raised by: MOV	**DATE**:

Risk description: <u>Multimodal reminder system</u>

The reminder system must be a multimodal system and should be displayed on several devices in order to be adapted to several context and disabled users.

Suggested risk mitigation actions / contingency:

There will be different types of alarm.

Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**LOW**

RISK ASSESSMENT FORM

Risk Number: U19 bis

Raised by: IntuiLab	**DATE**:

Risk description: <u>Pills application</u>

The pills application should clearly guide the user to fill in the pill's box in order to avoid errors.

Suggested risk mitigation actions / contingency:

There will be several steps of confirmation/

Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**LOW**

2.1.2.4. Continuous Health Activity Monitoring

RISK ASSESSMENT FORM					
Risk Number: U20					
Raised by: CITIC		**DATE**:			
Risk description: <u>Communication fault</u> Any type of monitoring needs a continuous communication or at least availability in certain periods of time. If communication is not available for a quite long period of time this functionality should be disable. Attending to nowadays communications quality, this is not a probably situations, but if it happens, the consequences have a deep impact					
Suggested risk mitigation actions / contingency: From MIDAS project point of view, not too much can be done to ensure communications availability from telephone company, but MIDAS communications system can be built as a fail-safe system, maybe with hardware components redundancy.					
Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**LOW**

RISK ASSESSMENT FORM	
Risk Number: U21	
Raised by: CITIC	**DATE**:
Risk description: <u>No comfort of use</u> If a user does not feel comfortable using monitoring systems for a long period, simply will not use.	
Suggested risk mitigation actions / contingency: Monitoring system should be comfortable to use. For example, weight and size can be a drawback when being used for a long time. It must be taken into account ergonomic aspects in the selection of monitoring systems, keeping in mind that they must be used for a long time	

Probability:	**MED**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

RISK ASSESSMENT FORM	
Risk Number:U22	
Raised by: CITIC	**DATE**:
Risk description: <u>Weakness</u> Monitoring system could be beaten, wet, etc, making it useless or provoking a malfunction	
Suggested risk mitigation actions / contingency: Monitoring system should be robust to impacts an drops, as well as splashes of water and hits on them	

Probability:	**MED**	**Impact:**	**HIGH**	**RISK Level:**	**MED**

RISK ASSESSMENT FORM	
Risk Number: U23	
Raised by: CITIC	**DATE**:
Risk description: <u>Hard to use</u> A monitoring system difficult to use can lead to a rejection by the MIDAS end-user	
Suggested risk mitigation actions / contingency: Monitoring system should be selected taking into account ease of use for every type of MIDAS end-user.	

Probability:	**HIGH**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

RISK ASSESSMENT FORM	
Risk Number: U24	
Raised by: THALES	**DATE**:

Risk description: Biomedical sensors failure Sources : 1- device broken 2- driver problem 3- power supply					
Suggested risk mitigation actions / contingency: Actions 1- spare device / check connectivity 2 – automatic re-install drivers 3 - use appropriate UPS					
Probability:	**LOW**	**Impact:**	**MED**	**RISK Level:**	**MED**

RISK ASSESSMENT FORM	
Risk Number: U25	
Raised by: THALES	**DATE**:
Risk description: Application failure (see before)	
Suggested risk mitigation actions / contingency:	

Probability:	**LOW**	**Impact:**	**MED**	**RISK Level:**	**MED**

RISK ASSESSMENT FORM	
Risk Number: U26	
Raised by: THALES	**DATE**:
Risk description: Networking connectivity failure	

Suggested risk mitigation actions / contingency:					
Probability:	**LOW**	**Impact:**	**MED**	**RISK Level:**	**MED**

RISK ASSESSMENT FORM	
Risk Number: U27	
Raised by: CNRS	**DATE**:
Risk description: <u>Power dependency</u> Portable monitoring systems need regular power charges. Without this periodic recharge, the whole system became useless.	
Suggested risk mitigation actions / contingency: Monitoring system must be able to warn the user about its power level and also the recharging system must be easy to use by the elderly.	

Probability:	**HIGH**	**Impact:**	**MED**	**RISK Level:**	**MED**

2.1.2.5. Security and assistance

RISK ASSESSMENT FORM	
Risk Number: U28	
Raised by: CITIC	**DATE**:
Risk description: <u>Unknown or forgotten actions to maintain system security</u> There are actions related with a safe use of the system that could be unknown or forgotten by MIDAS end-user (e.g. introduce a password)	
Suggested risk mitigation actions / contingency:	

Aspects related with security of system should be totally transparent to the Midas end-user or have some assistance to perform needed actions					
Probability:	**MED**	**Impact:**	**MED**	**RISK Level:**	**MED**

RISK ASSESSMENT FORM	
Risk Number: U29	
Raised by: CITIC	**DATE**:
Risk description: <u>Actions that affect the system's integrity</u> Technological knowledge of MIDAS end-users is usually very low and actions that lead to a system fault could be performed by these users (e.g. deletion of important data)	
Suggested risk mitigation actions / contingency: To minimize these actions impact, MIDAS should implement mechanisms to prevent this kind of actions. A second option could be a system to detect these actions and allow an automatic recovery.	

Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

2.1.3 Drive Scenario

2.1.3.1. Motivation assistance

RISK ASSESSMENT FORM	
Risk Number: U30	
Raised by: ROBOTIKER	**DATE**: 2009/09/04
Risk description: **<u>New technologies and ageing society</u>** The majority of aged population is not yet taking the most of the digital era, as only 10% of people over 65 are familiar with Internet. Some visual or audio problems combined with some impairment and losses of dexterity discourage many of elderly people from using internet in their daily life (some 21% of the over 50 year old). Moreover, people who are not familiarized with new technologies, usually they are reluctant to use them.	

Suggested risk mitigation actions / contingency:

Possible solutions in order to solve or mitigate this problem consist on designing and developing friendlier Human-Vehicle Interface (HVI). Always, it is necessary to have in mind that these new HVI require a higher and specific degree of ergonomic adaptation.

Probability:	**HIGH**	**Impact:**	**MED**	**RISK Level:**	**HIGH**

RISK ASSESSMENT FORM

Risk Number: U31

Raised by: ESS	**DATE**: 2009/09/04

Risk description: **Adaptable car**

People with degenerative diseases need an adaptable car in order to be able to use it during the different step of the disease

Suggested risk mitigation actions / contingency:

Possible solutions in order to solve or mitigate this problem consist on developing technical helps to try to adapt the car to the state of the disease.

Probability:	**HIGH**	**Impact:**	**MED**	**RISK Level:**	**HIGH**

RISK ASSESSMENT FORM

Risk Number: U32

Raised by: MOV	**DATE**: 2009/09/04

Risk description: **Authentification**

User should be identified before starting the car travel in order to provide to the drive environment the user profile with all the statistics from home environment services.
Suggested risk mitigation actions / contingency: The authentication should be multimodal to let all Midas users make use of the platform.

Probability:	**MED**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

2.1.3.2. Driving assistance

RISK ASSESSMENT FORM	
Risk Number: U33	
Raised by: ROBOTIKER	**DATE**: 2009/09/03
Risk description: <u>New systems (Hardware-Software) on-board and Disabled and Ageing society's acceptance factor</u> New hardware and software system on-board implies an adaptive period, and especially elder people have a limited capability of adaptation.	
Suggested risk mitigation actions / contingency: Design and develop user-friendly systems. They must be easier to use and understand.	

Probability:	**MED**	**Impact:**	**MED**	**RISK Level:**	**MED**

RISK ASSESSMENT FORM
Risk Number: U34

Raised by: CNRS	**DATE**: 2009/09/25

Risk description: Warning vs. Panic

Warning messages generated by the assistance system can lead to a shock or a panic situation on elderly during car driving.

Suggested risk mitigation actions / contingency:

Warning messages must be well designed in terms of HCI.

Probability:	**MED**	**Impact:**	**MED**	**RISK Level:**	**MED**

RISK ASSESSMENT FORM

Risk Number: U35

Raised by: KaTron	**DATE**: 2010/02/16

Risk description: Simulator Sickness

A considerable number of people experience simulator sickness (occulomotor discomfort, disorientation, nausea, etc.) while using a driving simulator. The elderly and people with poor eyesight are more susceptible to simulator sickness. Among the elderly, those who spend less time driving in traffic are more prone to suffer from simulator sickness.

The incidence of simulator sickness can range from very low to exceedingly high. In most individuals the symptoms of simulator sickness subside in less than one hour. Residual after effects lasting longer than 12 hours are relatively rare.

Adaptation is the single most effective solution to the problem of simulator sickness. Most individuals adapt within a few sessions, some individuals require considerable exposure to adapt, and 3%-5% of individuals never adapt.

Suggested risk mitigation actions / contingency:

Inform the users about simulator sickness and guidelines for reducing it.
Provide adaptation training.

Fine-tune the simulator for the targeted user base.					
Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**MED**

2.2. Technological Risks

In large, complex and relatively long projects where many partners are involved it is unavoidable that problems turn up from time to time. In addition, research projects carries many risks associated to technological constraints. In this section potential technological risks are identified and described.

2.2.1 General risks

RISK ASSESSMENT FORM					
Risk Number: T1					
Raised by: TID		**DATE**: 2009/09/09			
Risk description: : **Use of new technologies** Technology evolves fast and there are many new tools that solve concrete new problems. Deciding which technology to use implies many consequences in terms of learning time, complexity in development and adaptation to the use cases considered.					
Suggested risk mitigation actions / contingency: A good technological study is important in order to identify the most suitable tool to fulfil each requirement identified in MIDAS project. The expertise of the partners in the different technologies should be also considered.					
Probability:	**LOW**	**Impact:**	**MED**	**RISK Level:**	**LOW**

RISK ASSESSMENT FORM					
Risk Number: T2					
Raised by: TID	**DATE**: 2009/09/09				
Risk description: : **New technologies are not mature enough to provide a solution to identified use cases** Once theoretical study of technologies is done and a decision is taken about which solution to use; many problems can appear during development phases of the project. New technologies usually report bugs or have little technical support to solve any issue during development. It even can come across a requirement that cannot be accomplished with the selected technology.					
Suggested risk mitigation actions / contingency: In this case, an alternative solution has to be founded. It is also important to minimize the impact in other works carried out in parallel. Some technologies prone to report risky situations due to lack of maturity are: • Face Tracker and emotional behaviour analysis • Voice recognition • Car modelling: kinematic model, GPS location, data compilation… • Robot: guidance, object grasping, person following…					
Probability:	**LOW**	**Impact:**	**MED**	**RISK Level:**	**LOW**

RISK ASSESSMENT FORM	
Risk Number: T3	
Raised by: TID	**DATE**: 2009/09/09
Risk description: Partner's expertise doesn't match some decisions taken related to the system's implementation In collaborative projects not all partners have the same technical expertise as each of them are specialised in different sectors. However, some technical decisions force the use of some technologies or imply constraints to developments. These decisions can impact severely on partners that have not the technical knowledge to achieve the objectives required.	
Suggested risk mitigation actions / contingency: In these situations, technological partners must provide support and assistance to reach the defined targets.	

Probability:	**LOW**	**Impact:**	**LOW**	**RISK Level:**	**LOW**

RISK ASSESSMENT FORM	
Risk Number: T4	
Raised by: TID	**DATE**: 2009/09/09
Risk description: : **Conflict between developers in Java/JEE and C/.NET** Traditionally the Java and C worlds have been incompatible in terms of integration, development, reusability... As partners' expertise is very heterogeneous, it is possible to find a conflict between modules implemented in Java and others implemented in .NET.	
Suggested risk mitigation actions / contingency: To solve the problem, it is necessary to find communication solutions to integrate the two technologies.	

Probability:	**MED**	**Impact:**	**MED**	**RISK Level:**	**MED**

RISK ASSESSMENT FORM	
Risk Number: T5	
Raised by: TID	**DATE**: 2009/09/09
Risk description: : **Prototype requirements are too demanding** Use case identification and description must be clear to start defining requirements and system definition. However, it is always easy to do an imagination exercise and describe situations that cannot be implemented in real life. It is vital to identify which use cases should be implemented and verify that objectives planned can be achieved.	
Suggested risk mitigation actions / contingency: Identify which use cases should be implemented in a demonstrator and verify that objectives planned can be achieved.	

Probability:	**LOW**	**Impact:**	**LOW**	**RISK Level:**	**LOW**

RISK ASSESSMENT FORM	
Risk Number: T6	
Raised by: TID	**DATE**: 2009/09/09
Risk description: : **Problems integrating heterogeneous devices and services** Every partner will start the developments having as basis the architecture definition and some guidelines about the communication framework. In the integration phase it is possible to find some problems due to heterogeneity of devices and services.	
Suggested risk mitigation actions / contingency: Interfaces and information shared should be reviewed and adapted to the circumstances	

Probability:	**MED**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

RISK ASSESSMENT FORM	
Risk Number: T7	
Raised by: TID	**DATE**: 2009/09/09
Risk description: : **Information shared/required by modules is not well specified** Ambient intelligent systems consider all the information generated by devices and sensors. Data is processed and stored to feed information to any other module in the system.	
Suggested risk mitigation actions / contingency: Be aware of which information is provided by sensors and which should be available to other modules in order to adapt system's response to user needs, preferences and context.	

Probability:	**LOW**	**Impact:**	**MED**	**RISK Level:**	**LOW**

RISK ASSESSMENT FORM	
Risk Number: T8	
Raised by: TID	**DATE**: 2009/09/09

Risk description: **Data mining and user profiling need real user's data**

Acquire knowledge of user habits and behaviour is vital to adapt the system to the user. A good way of extracting information to describe user behavioural patterns is applying data mining techniques to information stored in the database. These techniques allow identifying correlations and clustering uses with the same interests in order to predict future behaviours.

There are many advantages that recommend the use of data mining, however the principal requirement to do this is user data collected during a long period of time. Due to project planning and requirements of raw data to process, data mining techniques will not be applied.

Suggested risk mitigation actions / contingency:

A good scheduling of the project is vital. First trials should be done in time in order to extract as much information from users as possible. With this data, it would be possible to extract some more knowledge about user behaviour and profile.

Data Mining is not the strongest point of MIDAS project, so if this final study is not achieved, project development would not be affected.

Probability:	**MED**	**Impact:**	**LOW**	**RISK Level:**	**LOW**

RISK ASSESSMENT FORM	
Risk Number: T9	
Raised by: TID	**DATE**: 2009/09/09

Risk description: : **Use of a unique Ontology**

It is difficult to define a common ontology that matches the requirements of all different modules. It is important to manage all the knowledge and allow the modules being aware of it. However each partner has experience in concrete parts of MIDAS system and it is necessary to integrate and compile it in a single ontological domain.

Suggested risk mitigation actions / contingency:

It is possible to merge ontologies finding common points. Each partner can edit the concepts

necessary to manage its “piece of the world” and try to merge all into one single ontology. To do this work in parallel it is necessary to have a basis universe of concepts shared by the partners.					
Probability:	**LOW**	**Impact:**	**MED**	**RISK Level:**	**LOW**

2.2.2 Home Scenario

2.2.2.1. Communication

RISK ASSESSMENT FORM					
Risk Number: T10					
Raised by: THALES		**DATE**:			
Risk description: UBIK (our video-conferencing applicatiion) development demands to much effort to be compatible with the Middleware.					
Suggested risk mitigation actions / contingency: – limit the interaction with the Middleware : what is exchanged between UBIK and the other service modules					
Probability:	**HIGH**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

2.2.2.2. Social Link

RISK ASSESSMENT FORM
Risk Number: T11

Raised by: ESS	**DATE**:

Risk description: <u>The size of the information</u>

One of the main problem of elderly people is the lack of vision, as older is a person more difficulties have this person to see properly the text displayed. The information must be displayed in the device in an appropriate way independently the size of the information.

Suggested risk mitigation actions / contingency:

To show the information in an appropriate way independently the device used, it is needed to use a proportional information size

Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**LOW**

RISK ASSESSMENT FORM

Risk Number: T12

Raised by: ESS	**DATE**:

Risk description: <u>Easy to learn and easy to use</u>

The social network system will be used by elderly people and people with any kind of disabilities, so the consequence of a not easy-to-learn and a not easy-to-use system is the disappearance of the system. Old people have problems to learn new and complex things and disabled people have problems to use something very complex and not intuitive (mobility and cognitive disabilities)

Suggested risk mitigation actions / contingency:

The system must be usable and intuitive and developed according with WAI standards.

Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**LOW**

RISK ASSESSMENT FORM					
Risk Number: T13					
Raised by: ESS		**DATE**:			
Risk description: <u>Usable Device</u> A non usable device means that elderly people and disabled people are not able to use the system and the platform developed.					
Suggested risk mitigation actions / contingency: The device should have got some characteristics to be usable: - The device should not be very small (difficult to be used for elderly people and people with mobility disabilities). - The size of the mobile phone keys must be appropriate to elderly people and people with disabilities (f-e People with Parkinson)					
Probability:	**MED**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

2.2.2.3. Health Prevention

RISK ASSESSMENT FORM	
Risk Number: T14	
Raised by: MOV	**DATE**:
Risk description: <u>Intuitive Interface</u> The system used to remind the user to take the pills must be intuitive so that they don't have any doubt of the medicine to be taken. . The development of intuitive systems involves spending more time getting the last version of the product because is needed to make more tests to verify the usability of the interface.	
Suggested risk mitigation actions / contingency: To develop interfaces following WAI standards	

Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**LOW**

RISK ASSESSMENT FORM	
Risk Number: T15	
Raised by: MOV	**DATE**:
Risk description: <u>Multimodal reminder system</u> The reminder system must be a multimodal system in order to be adapted to several context and disabled users. The development of multimodal interface involves different types of alarm depending on the user profile and some of those types of alarms could not be on the device.	
Suggested risk mitigation actions / contingency: The alarm should be multimodal (different ways to notice a concrete situation) in order to inform to the user independently his disability (a noise for blind users, a light or a buzz for deaf people, etc)	

Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**LOW**

2.2.2.4. Continuous Health Activity Monitoring

RISK ASSESSMENT FORM	
Risk Number: T16	
Raised by: CITIC	**DATE**:
Risk description: <u>Communication fault</u> Any type of monitoring needs a continuous communication or at least availability in certain periods of time. If communication is not available for a quite long period of time this functionality should be disable. Attending to nowadays communications quality, this is not a probably situations, but if it happens, the consequences have a deep impact	

Suggested risk mitigation actions / contingency: From MIDAS project point of view, not too much can be done to ensure communications availability from telephone company, but MIDAS communications system can be built as a fail-safe system, maybe with hardware components redundancy.					
Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**LOW**

RISK ASSESSMENT FORM					
Risk Number: T17					
Raised by: CITIC		**DATE**:			
Risk description: <u>Electromagnetic Interferences (EMI) on Health Monitoring System</u> Use of health monitoring systems could be affected by EMIs produced by wireless communication system like WIFI, Bluetooth, mobile phones, video home transmission systems, etc					
Suggested risk mitigation actions / contingency: Identification of potential risks in the application scenario. Identify Health monitoring characteristics related to EMI. Identify characteristics of the environment in which devices will be used.					
Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**LOW**

RISK ASSESSMENT FORM					
Risk Number: T18					
Raised by: THALES		**DATE**:			
Risk description: <u>Too much effort for Patient telemonitoring application development to be compatible with the used Middleware</u>					
Suggested risk mitigation actions / contingency:					

Limit the interaction with the Middleware					
Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**LOW**

2.2.2.5. Security and assistance

RISK ASSESSMENT FORM					
Risk Number: T19					
Raised by: CITIC		**DATE**:			
Risk description: <u>Loss of health information privacy of Midas end-user</u> Maintaining health information privacy of MIDAS end-user is an important issue. The loss of medical information could have fatal consequences for end-user and service provider					
Suggested risk mitigation actions / contingency: Take into account standards in this area like ISO 27799:2008. This standard specifies a set of detailed controls to manage health information security and provides health information security best practice guidelines					
Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

2.2.3 Drive Scenario

2.2.3.1. Motivation assistance

RISK ASSESSMENT FORM

Risk Number: T20					
Raised by: ROBOTIKER		**DATE**: 2009/09/07			
Risk description: <u>Wireless communications and their restrictions</u> This kind of technology implies a great dependence with mobile network operators and related to their nature, it is relatively easy losing the connexion.					
Suggested risk mitigation actions / contingency: In order to reduce the chance of the risk occurring, mitigation actions are basically improve service's quality by phone operators and develop better hardware and software systems. In the other hand, a contingency action should be improved wireless connections through better hardware and/or software modules.					
Probability:	**MED**	**Impact:**	**MED**	**RISK Level:**	**MED**

RISK ASSESSMENT FORM					
Risk Number: T21					
Raised by: MOV		**DATE**: 2009/09/04			
Risk description: **<u>Authentification</u>** User should be identified before starting the travel by car in order to provide to the drive environment the user profile with all the statistics from home environment services. Authentication system requires having a more complex system located in the drive environment.					
Suggested risk mitigation actions / contingency: The authentication should be provided only with login and password so that the needed deployment is smaller.					
Probability:	**MED**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

2.2.3.2. Driving assistance

RISK ASSESSMENT FORM					
Risk Number: T22					
Raised by: ROBOTIKER		**DATE**: 2009/09/07			
Risk description: <u>Systems on-board: an electric noise environment problem</u> Due to features of car environment, including new elements, as biometrical sensors, imply a lot of additional problems related to electric noise. At the same time, standards and normative related to develop of vehicles are very strict, so sometimes manufacturers are not interested in some new HW and SW systems, because needs (economic and standardized) to add them on-board imply a lot of resources and it is not always profitable.					
Suggested risk mitigation actions / contingency: Problems related to electric noise could be solved through using specific hardware in order to filter this noise. At the same time, all devices should pass tests of EMC (Electromagnetic Compatibility). In order to mitigate standards and normative problems could be a good solution, reuse approved solutions by manufacturers, adding some improvements.					
Probability:	**MED**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

RISK ASSESSMENT FORM	
Risk Number: T23	
Raised by: CNRS	**DATE**: 2009/09/25
Risk description: <u>Resources sharing</u> Some of the computer vision related functionality needs high computational power to perform required tasks which can lead to freeze or delay other tasks.	
Suggested risk mitigation actions / contingency: In case of CPU sharing problem, distinct CPU modules or a second PC module can be used. But this also increases the total cost of the implementation.	

Probability:	**MED**	**Impact:**	**HIGH**	**RISK Level:**	**MED**

RISK ASSESSMENT FORM	
Risk Number: T24	
Raised by: KaTron	**DATE**: 2010/02/16
Risk description: Java and C++ KaTron developers use the C++ programming language in all projects. Because KaTron does not have Java expertise, having to develop Java applications for the OSGi Framework on the Car PC might be problematic.	
Suggested risk mitigation actions / contingency: Use a mechanism like CORBA to enable software written in Java and C++ to work together.	

Probability:	**MED**	**Impact:**	**MED**	**RISK Level:**	**MED**

RISK ASSESSMENT FORM	
Risk Number: T25	
Raised by: KaTron	**DATE**: 2010/02/16
Risk description: Integration of Ficotriad's joystick with the simulator Ficotriad let us know that they will not send their joystick to KaTron. Sending our simulator to Ficotriad will not be easy either because of its size. Therefore, it seems that both Ficotriad and KaTron will have to develop their software without physical access to the device of the other party. As a result, unexpected problems are likely to appear during integration.	
Suggested risk mitigation actions / contingency:	

Designing the interface between the joystick and the simulator carefully might decrease the risk of problems during integration. However, no matter how well the interface is designed it is very likely that some debugging will need to be done. In that case, we can try to develop special tools for remote debugging or find ways to work together over the Internet.					
Probability:	**HIGH**	**Impact:**	**MED**	**RISK Level:**	**HIGH**

2.3. Legal & Ethical Risks

2.3.1 General Risks

RISK ASSESSMENT FORM					
Risk Number: L1					
Raised by: [*MOV*]		**DATE**:			
Risk description: : **Attempt to violate privacy rights** Due to the use of cameras and other surveillance methods to monitor the elderly the privacy of the users is exposed. On the other hand, medical data about patients is handled, therefore security vulnerabilities in the technology may lead to attempt to violate Privacy Rights if there is any problem with the technology the security objective related to the confidentiality of the data will not be achieved and thus there will be no compliance with legislation.					
Suggested risk mitigation actions / contingency: Inform the users about the fact that there will be devices that will follow track of their behaviour and agree with them the surveillance levels. Make them aware as well of the level of security of the systems. The impact reaches non compliance with Legislation about Privacy Rights.					
Probability:	* **MED**	**Impact:**	* **MED**	**RISK Level:**	* **LOW**

2.3.2 Home Scenario

2.3.2.1. Communication

RISK ASSESSMENT FORM					
Risk Number: L2					
Raised by: THALES	**DATE**:23/09/2009				
Risk description: <u>medical error due to a communication misunderstanding</u>					
Suggested risk mitigation actions / contingency: The following main recommendations and corrective measures to reduce medical and legal risks associated to the practice of telemedecine via a virtual connection: - Records should be kept including patient's medical and social characteristics, technical occurrences and any information considered of interest by the MSP or practitioner involved or reason given by the patient. - Acknowledgment of the teleconsultation by the form - Automated acquisition of the minimum information for labeling of the records - Automated recording - Securities have to be implemented to avoid mistakenly destroyed files - Double recording (back-up server) - Back-up library on stable data storage					
Probability:	*	**Impact:**	*	**RISK Level:**	*

RISK ASSESSMENT FORM	
Risk Number: L3	
Raised by: THALES	**DATE**:23/09/2009
Risk description<u>: Doubts/oppositions/difficulties in the patient should be detected</u>	
Suggested risk mitigation actions / contingency: Legal information to the status of telemedicine in the relevant country should be given to the patient if such obstacles are detected Extra attention effort from the patient should be taken into account according to the foreseen examination by the practitioner. Practitioner should be aware of patient's general condition before scheduling session.	

Practitioner should be trained to adapt to how the patient's coping with the teleconsultation and to the special needs of teleconsultation (speech, time schedule, proper lighting on practitioner's side…) Practitioner should make sure that the patient is comfortable (bed or special seat if needed) First evaluation of patient's hearing and cognitive function prior to teleconsultation to assess technical requirements					
Probability:	*	**Impact:**	*	**RISK Level:**	*

2.3.2.2. Social Link

RISK ASSESSMENT FORM					
Risk Number: L4					
Raised by: ESS		**DATE**:			
Risk description: Less personal contact The intensive use of Internet and social network has the risk of losing personal contact.					
Suggested risk mitigation actions / contingency: To mix the advantages of social networks and Internet with presence services.					
Probability:	*	**Impact:**	*	**RISK Level:**	*

2.3.2.3. Health Prevention

RISK ASSESSMENT FORM					
Risk Number: L5					
Raised by: MOV		**DATE**:			
Risk description: <u>Personal medical data in non-medical networks.</u>					

Suggested risk mitigation actions / contingency: The communication between doctor and final-user must be private and only send it through medical networks.					
Probability:	**LOW**	**Impact:**	**MED**	**RISK Level:**	**LOW**

2.3.2.4. Continuous Health Activity Monitoring

RISK ASSESSMENT FORM					
Risk Number: L6					
Raised by: CITIC		**DATE**:			
Risk description: <u>Gather information about health activity that end-user wants to keep private</u>					
Suggested risk mitigation actions / contingency: Should be defined a protocol to establish the information to be collected, as well as where, when and who will use it. Moreover, MIDAS end-user should be informed about the information to be gathered, and how this information is used.					
Probability:	**LOW**	**Impact:**	**LOW**	**RISK Level:**	**LOW**

RISK ASSESSMENT FORM					
Risk Number: L7					
Raised by: CITIC		**DATE**:			
Risk description: <u>MIDAS end-user can't manage their own data</u>					

Not always Continuous Health Activity Data cannot be managed by its owner (e. g. limited intellectual capacity)
Suggested risk mitigation actions / contingency: Define a protocol to establish if MIDAS end-user (or relatives) can access and manage user data

Probability:	**LOW**	**Impact:**	**LOW**	**RISK Level:**	**LOW**

RISK ASSESSMENT FORM	
Risk Number: L8	
Raised by: CNRS	**DATE**: 2009/09/25
Risk description: <u>Elderly can feel uncomfortable because of the cameras inside the home</u>	
Suggested risk mitigation actions / contingency: As the system will never record any visual scene at home, there is no need to use traditional camera shaped devices. Instead, sensor like cameras can be used.	

Probability:	**MED**	**Impact:**	**HIGH**	**RISK Level:**	**MED**

2.3.2.5. Security and assistance

RISK ASSESSMENT FORM	
Risk Number: L9	
Raised by: CITIC	**DATE**:
Risk description: <u>Create high expectations to MIDAS end-user, regarding the assistance that the service may provide</u>	

If the created expectations are too high, final results could lead to end-users to be disappointed.

Suggested risk mitigation actions / contingency:

Explain in detail to MIDAS end-user the scope of assistance. This information will lead users to real expectations

Probability:	**LOW**	**Impact:**	**LOW**	**RISK Level:**	**LOW**

RISK ASSESSMENT FORM

Risk Number: L10

Raised by: CITIC	**DATE**:

Risk description: **Lack of responsibilities about information and rights of MIDAS end-user**

Suggested risk mitigation actions / contingency:

Establish well-defined responsibilities about information and rights of MIDAS end-user

Probability:	**LOW**	**Impact:**	**LOW**	**RISK Level:**	**LOW**

RISK ASSESSMENT FORM

Risk Number: L11

Raised by: CNRS	**DATE**:2009/09/25

Risk description: **Frequency of false positive warning**
Use of new technologies can produce unexpected false positive results which will create a disappointed end-user. In addition, it also makes the MIDAS system unreliable. This risk always exists when using technologies that are not mature yet.

Suggested risk mitigation actions / contingency: Use of well-tested modules with high precision value in the final platform. Using both adaptable and high threshold values for the warning messages.					
Probability:	**LOW**	**Impact:**	**LOW**	**RISK Level:**	**LOW**

2.3.3 Drive Scenario

2.3.3.1. Motivation assistance

RISK ASSESSMENT FORM					
Risk Number: L12					
Raised by: ROBOTIKER	**DATE**:02009/09/07				
Risk description: <u>Privacy intrusion: unauthorised access</u> Data concerning MIDAS's services will be held on a webpage with open access to public and with authorised access to participants. So the main goal is to be cautious and follow the ethical rules applying to internet and the transfer of data. Due to nature of Internet, unauthorised access to the system is a great risk.					
Suggested risk mitigation actions / contingency: Concerning the unauthorised access to the system, the electronic system should ensure that filtering of incoming data meets the consumer's requirements. It should ensure that the critical outgoing data is secure and adequately encrypted.					
Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**MED**

RISK ASSESSMENT FORM
Risk Number: L13

Raised by: ROBOTIKER		**DATE**: 2009/09/07			
Risk description: <u>Privacy intrusion</u> See risk number L10					
Suggested risk mitigation actions / contingency: See risk number L10					
Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**MED**

2.3.3.2. Driving assistance

RISK ASSESSMENT FORM					
Risk Number: L14					
Raised by: [*PARTNER*]		**DATE**:			
Risk description: : [*A brief description of the risk, the type of the risk, the probability that the risk occurred and the quality of the impact (low/medium/high) in the service described*.]					
Suggested risk mitigation actions / contingency: [*Mitigation actions to try to reduce the chance of the risk occurring* *Contingency actions to try to minimize the impact of the risk once it has occurred*]					
Probability:	*	**Impact:**	*	**RISK Level:**	*

RISK ASSESSMENT FORM					
Risk Number: L15					
Raised by: KaTron		**DATE**: 2010/02/16			
Risk description: Regulatory Compliance Use of the devices and sensors to be developed for the car environment might not comply with relevant laws and regulations.					
Suggested risk mitigation actions / contingency: Identify which regulations are important requirements for the MIDAS project and ensure that these requirements are part of the development process from requirements analysis through design, implementation, and testing.					
Probability:	**MED**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

2.4. Economic and Sustainability Related Risks

2.4.1 General Risks

RISK ASSESSMENT FORM	
Risk Number: E1	
Raised by: MOV	**DATE**:
Risk description: : **Cost of system maintenance** If the cost of maintenance MIDAS infrastructure is too high, the MIDAS final-user is not going to be able to afford the final price.	
Suggested risk mitigation actions / contingency: Try to get a system easy to maintain by users without professional help.	

Probability:	**MED**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

2.4.2 Home Scenario

2.4.2.1. Communication

RISK ASSESSMENT FORM					
Risk Number: E2					
Raised by: [*PARTNER*]		**DATE**:			
Risk description: : [*A brief description of the risk, the type of the risk, the probability that the risk occurred and the quality of the impact (low/medium/high) in the service described*.]					
Suggested risk mitigation actions / contingency: [*Mitigation actions to try to reduce the chance of the risk occurring* *Contingency actions to try to minimize the impact of the risk once it has occurred*]					
Probability:	*	**Impact:**	*	**RISK Level:**	*

2.4.2.2. Social Link

RISK ASSESSMENT FORM	
Risk Number: E3	
Raised by: ESS	**DATE**:
Risk description: : **<u>Usable and changeable interface</u>**	

The development of a usable and adaptable interface involves spending more time during the tests to verify the usability of the interface. If it is needed more time to develop the product it means more money will be needed.					
Suggested risk mitigation actions / contingency: Spend only the minimun time needed to test the interface					
Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**MED**

2.4.2.3. Health Prevention

RISK ASSESSMENT FORM					
Risk Number: E4					
Raised by: IntuiLab		**DATE**:			
Risk description: : The main application is developed on a multitouch and tangible table. If this kind of device is too expensive, the elderly won't be able to buy it. multitouch technolog					
Suggested risk mitigation actions / contingency: Study strategies or alternatives to permit many end users to buy a multitouch and tangible devices.					
Probability:	*	**Impact:**	*	**RISK Level:**	*

2.4.2.4. Continuous Health Activity Monitoring

RISK ASSESSMENT FORM					
Risk Number: E5					
Raised by: CITIC		**DATE**:			
Risk description: <u>High cost for MIDAS end-user</u> Given the profile of the Midas end-user, if the system is unaffordable to end-user, the project cannot be carried out					
Suggested risk mitigation actions / contingency: Study if the cost to acquire and maintain MIDAS different parts is affordable by end-user					
Probability:	**MED**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

2.4.2.5. Security and assistance

RISK ASSESSMENT FORM	
Risk Number: E6	
Raised by: CITIC	**DATE**:
Risk description: <u>Insufficient qualified assistance personal</u> A problem will arise if the number of qualified personal to keep the system running is too high	
Suggested risk mitigation actions / contingency: Established the number of needed qualified personal needed to have a viable system from the economical point of view	

Probability:	**LOW**	**Impact:**	**HIGH**	**RISK Level:**	**LOW**

2.4.3 Drive Scenario

2.4.3.1. Motivation assistance

RISK ASSESSMENT FORM					
Risk Number: E7					
Raised by: ROBOTIKER		**DATE**: 2009/09/07			
Risk description: <u>The high cost of the systems involved</u> New systems to include on-board are too expensive, so this issue could be a problem.					
Suggested risk mitigation actions / contingency: The solution for this risk is inherent to itself, because in Europe, society is ageing and it means two things: first, more and more systems will be included on-board because the rate of life expectancy is growing up, i.e. more elderly that it implies more systems, and more systems imply cheaper costs. Second, the advanced of new technologies, that it implies that these technologies become cheaper.					
Probability:	**HIGH**	**Impact:**	**MED**	**RISK Level:**	**HIGH**

RISK ASSESSMENT FORM	
Risk Number: E8	
Raised by: ESS	**DATE**: 2009/09/04
Risk description: **<u>Adaptable car – No developed</u>** People with degenerative diseases need an adaptable car in order to be able to use it during the different step of the disease. The main obstacle of this possibility is there is not any car in the market nowadays and it is extremely expensive to make an adaptable car.	
Suggested risk mitigation actions / contingency: Possible solutions in order to solve or mitigate this problem consist on developing technical helps to try to adapt the car to the state of the disease.	

Probability:	**HIGH**	**Impact:**	**MED**	**RISK Level:**	**HIGH**

RISK ASSESSMENT FORM	
Risk Number: E9	
Raised by: MOV	**DATE**: 2009/09/04
Risk description: **Authentication** User should be identified before starting the travel by car in order to provide to the drive environment the user profile with all the statistics from home environment services. The authentication should be multimodal to let all Midas users make use of the platform. Thereby system should support voice recognition, eye recognition, touch recognition … and these types of systems are very expensive.	
Suggested risk mitigation actions / contingency: Develop an authentication system for only potential MIDAS users.	

Probability:	**MED**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

2.4.3.2. Driving assistance

RISK ASSESSMENT FORM	
Risk Number: E10	
Raised by: ROBOTIKER	**DATE**: 2009/09/07
Risk description: The high cost of the systems involved and Disabled people The risk is the same that the previous risk, systems involved are very expensive, but in this case, its impact is higher, because disabled people's growth is not so big as elderly people's growth	
Suggested risk mitigation actions / contingency:	

Mitigation actions can be: investing more money by manufacturers or associations for disabled people. At the same time, governments should give more grants.					
Probability:	**HIGH**	**Impact:**	**HIGH**	**RISK Level:**	**HIGH**

3. Conclusions

Given the contribution by partners regarding the risks due to potential threats and vulnerabilities at this moment there is a more clear picture of them and the realistic impact on the parameters related to time, cost, functionalities or quality.

Usability Risks

Some of the problems that may be encountered by the systems in this field and that have the highest impact in the service are the level and real time personalisation features regarding the interfaces that will affect directly the quality of user centric design and the acceptance of the devices. Non-friendly interfaces lead to rejection of automated solutions by non customary users. For emergency situations either at home or while driving this would lead to unreliable solutions that will not serve their final purpose. Data about health state of the patient is sensitive information that is extremely relevant so special concern in the secure transmission must be taken, users will not like to feel invaded and it is very important their perception of the systems. In the case of Drive environments Situation Awareness for the elderly/disabled would lower drastically when the interfaces increase the workload of the user and that would lead to important threats to safety. The elderly/disabled should feel comfortable about the tools so that they do not go into panic when unexpected events occur while driving.

Services that are intrusive (in terms of health or complicated instalment) would be discarded by the target users and their relatives. It is also important that the systems work with bad environmental conditions (current situation in drive environment)

Isolation of the elderly/disabled is at risk for abusive use of automated solutions in social life, as they would limit the direct contact of the users with other people.

For the data transfer it is important a reliable and effective sending of the information designing communications in a way that they fit the context of use and are tailored to the user. It is important to prevent computer failures and propose alternative means for communication, especially in emergency situations. For the medical experts they must receive updates about health state of users when it is required and it has to be assured that the elderly/disabled receive and take notice of the reminders and alarms that are sent to them.

Technological Risks

The technological risks are mainly referred to the effective integration of innovative systems (often not mature) due to the use of non-interoperable systems. The interfaces for the communication must be adapted to the middleware and, furthermore, the whole service needs to be tested in real situations. For the user and context profiling the ontology has to be compatible in the different parts of the system. The way to interact with the devices needs to be well adapted to changing user profiles.

The information to be shared has to be very clearly defined (input/ouput modules, format to adapt to DPWS platform) with existence of alternative ways to communicate in emergency situations. The security vulnerabilities have to be prevented introducing the required mechanisms in each case. Integrity is basic for non misunderstandings regarding information sent and confidentiality needs to be assure to respect the privacy of the users. For the use of video surveillance systems they should not invade the privacy of the user further than it is strictly required (and agreed with the elderly/disabled and their relatives).

Another problem that needs to be in mind in the designs is the possibility of interferences between communication means or health sensors (health monitoring systems could be affected by EMIs produced by wireless communication system like WIFI, Bluetooth, mobile phones, video home transmission systems).

It has to be targeted a technologically possible and realistic systems with a given level of confidence, especially in critical situations and that is cost-effective.

Legal and Ethical Risks

Due to the use of cameras and other surveillance methods to monitor the elderly the privacy of the users is exposed. On the other hand, medical data about patients is handled and transferred between different networks, therefore security vulnerabilities in the technology may lead to attempt to violate Privacy Rights if there is any problem with the technology. If the security objective related to the confidentiality of the data is not achieved there will be no compliance with legislation.

Economic and Sustainability related Risks

Cost of solutions (devices) would be one of the main risks in this case. It is advisable to use devices that the intended users have used already, as that will benefit their familiarity with the services proposed and will of course lower their 'prize'. Regarding the automated solutions proposed the cost of system maintenance needs to be considered: cost-effective solutions,, realistic requirements adapted to user and context of use. Prioritise the investment in the most relevant aspects (best practises and tailored solutions)

4. Bibliography

1. Daniel M. Byrd III, C. Richard Cothern. 'Introduction to Risk Analysis: A Systematic Approach to Science-Based Decision Making'.

2. Gary Stoneburner, Alice Goguen, and Alexis Feringa. National Institute of Standards and Technology. Technology Administration U.S. Department of Commerce. 'Risk Management Guide for Information Technology Systems. Recommendations of the National Institute of Standards and Technology.

3. MIDAS Project. D1.1. Application Scenarios

Consortium

ORANGE LABS
France
www.orange.com

Project Coordinator :
Laure Chotard, Orange Labs
laure.chotard@orange-ftgroup.com

CEA LIST
France
www.cea.fr

CITIC
Spain
www.citic.es

CNRS
France
www.lifl.fr

ENERGY SISTEM SOYNTEC
Spain
www.energysistem.com

FICOTRIAD
Spain
www.ficosa.com

GEOMOBILE
France
www.whereru.eu

I&IMS
Spain
www.ims.es

INTUILAB
France
www.intuilab.com

KATRON
Turkey
www.katron.com.tr

KIT
South-Korea
http://www.kitvalley.com/

LI2G
France
www.chu-grenoble.fr

MORGAN CONSEIL
France
www.morganconseil.com

CREATIV IT
Spain
www.creativit.com

ROBOSOFT
France
www.robosoft.fr

ROBOTIKER-TECNALIA
Spain
www.robotiker.es

SIEL BLEU
France
www.sielbleu.org

TELEFONICA I+D
Spain
www.tid.es

THALES ALENIA SPACE
France
www.thalesaleniaspace.com