



# DOMEO Project

## AAL-2008-1-159

## D1.3 : Recommendations for Service Implementation

<b>Document Information</b>	
<b>Title</b>	Recommendations for Service Implementation
<b>Workpackage/Deliverable</b>	D1.3
<b>Responsible</b>	ROBOSOFT
<b>Due Date</b>	May 20 <sup>th</sup> , 2011
<b>Actual Date</b>	May 20 <sup>th</sup> , 2011
<b>Type</b>	Spec
<b>Status</b>	V2 (August 25 <sup>th</sup> , 2011)
<b>Dissemination Level</b>	Public
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<b>Project URL</b>	<a href="http://www.aal-domeo.eu">www.aal-domeo.eu</a>

### **Abstract:**

This document gives the methodology to install the robot (robuMATE) and follow up operations, including pre-requisites.

### **Revisions:**

- Revision 2 gives the public status instead of internal

### **Keyword List:**

Robot installation, preliminary check-list

## Summary

This document contains guidelines for robuMATE/Kompai implementation, as a set of recommendations for WP7.

It gives the methodology to install the robot and follow up operations, including pre-requisites.

Until now, no similar experimentation has been done anywhere in the world, and we are entering unknown situations.

Following extensive lab trials, we have reduced the functionalities to keep only those with the highest chance of robustness.

These recommendations will be updated using feedback from site trials.

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## 1. Existing functions

Kompai has still limited capabilities, the goal being to experiment in good technical conditions, and avoid to mix site experimentations with real people with function development.

These experimentations focus on 3 items:

- Doubt removing in case of needed help
- Tele-consultation
- Socialization, through enhanced communication capabilities

In lab trials, it appeared that communications are very unstable: Wi-Fi and other internet access being not always reliable, and sometimes very difficult to implement. It leads to instabilities of Lokarria. That is why we have decided to implement most of the functions on-board, and keep internet for limited, but needed, operations such as remote tele-presence. We have chosen to implement the following behaviors/functions:

- Allow navigation only to point of interest (PoI). Manual control by game-pad not allowed by the person
- A few scheduled functions based on the person "routine". These functions will be scheduled on-board (not through internet) :
  - reminders (medicines, appointments ...)
  - go to the docking station when battery level is low
- A few on-demand functions :
  - Skype, with only 2 or 3 contacts
  - Tele-consultation with doctors
  - Aid call (button)
  - Navigation to points of interest
  - Some website access (weather, shopping list, agenda, games ...)
  - See the [Graphical User Interface presentation](#) on the online documentation<sup>1</sup>
- To improve speech recognition robustness (and make it easier to use) replace sentences by simple keywords (not more than 20)
- If the person has any problem or question : call the platform (using Call Button, otherwise by telephone)

## 2. Step 1 : Preliminary visit

A detailed visit must be done before any installation, to analyze if the robot can operate properly in this specific home or apartment. The following check-list will help :

### 2.1. Communications

- Is there an operational Wi-Fi connection, available anywhere in the apartment? What are its performances?
- If not, is there a 3G (and not GPRS) communication?

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<sup>1</sup> [http://www.doc-center.robosoft.com/Kompai\\_home\\_page/Technical\\_documents/RobuBOX-Kompai/User's\\_manual/Interact\\_with\\_Kompai/Kompai\\_user\\_manual](http://www.doc-center.robosoft.com/Kompai_home_page/Technical_documents/RobuBOX-Kompai/User's_manual/Interact_with_Kompai/Kompai_user_manual)

## 2.2. Working space

- Is the space available for the robot large and open enough?
  - Otherwise, can we re-arrange furniture?
- Is there any "trap" for the robot. The best way to proceed is to test the robot in manual control with the gamepad :
  - Stairways?
  - Thick carpets?
  - Bad floor?
  - Small steps (transition between carpet and floor, cables, doorstep, rugs)?
- Can we manage the doors?
  - Can they remain open during the experiment?
  - Or any other solution?
- Where can we install the docking-station?
- ...

## 2.3. Define the needs

Needs are different from one person to another one. A discussion with the person about the habits will allow defining the programmed functions, which are basically time-activated scripts: where to go, what to say, what to remind ... We shall limit the number of scripts to make things easy for the user at the beginning.

## 2.4. Person

- Analyze if the person understands well the experimental approach: this is not a commercially available robot, but a robot under development, and they must agree that they will contribute to fix bugs and improve the overall system.
- Check that the person is able to carry out preliminary diagnosis in case of

## 3. Step 2 : Installation

### 3.1. Check the robot

- After unpacking the robot, fill the check-list

### 3.2. Check communications

- Using the test SW, check internet communications (with Lokarria)
- See instructions at the [Network configuration section](#) on the online documentation<sup>2</sup>.

### 3.3. Build map

- See instructions at the [Map creation section](#) on the online documentation<sup>3</sup>.

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<sup>2</sup> [http://www.doc-center.robosoft.com/index.php?title=Kompai\\_home\\_page/Technical\\_documents/RobuBOX-Kompai/User's\\_manual/First\\_configuration/Connect\\_Kompai\\_R&D\\_to\\_Lokarria](http://www.doc-center.robosoft.com/index.php?title=Kompai_home_page/Technical_documents/RobuBOX-Kompai/User's_manual/First_configuration/Connect_Kompai_R&D_to_Lokarria)

<sup>3</sup> [http://www.doc-center.robosoft.com/Kompai\\_home\\_page/Technical\\_documents/RobuBOX-Kompai/User's\\_manual/First\\_configuration/Mapping/Map\\_creation](http://www.doc-center.robosoft.com/Kompai_home_page/Technical_documents/RobuBOX-Kompai/User's_manual/First_configuration/Mapping/Map_creation)

### **3.4. Finalize map**

- See instructions at the [Map edition section](#) on the online documentation<sup>4</sup>.

### **3.5. Validate navigation**

- Run the test program and report results

### **3.6. Set up schedules**

- Fill the medical reminder agenda depending on the person needs.

### **3.7. Train the person**

- Run the training program, which includes at least :
  - Basic robot understanding
  - Understanding basic functions
    - Move the robot to a point of interest
    - Learn keywords
    - ...
  - What to do when ...
  - ...

## **4. Step 3 : Initial follow-up**

An initial follow-up is needed. A few days of operation with someone at home until the person feels comfortable is needed (1 day to 1 week, to be experimented).

## **5. Step 4 : Real experimentations**

A 24/24 availability simulating platform assistance is available. Each call will be reported in the "register" section of Lokarria, to keep track and allow further analysis. A daily call to the person will be done.

## **6. Metrics**

The goal of experiments is to evaluate how robotics can improve:

- Doubt removing in case of needed help
- Tele-consultation
- Socialization, through enhanced communication capabilities

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<sup>4</sup> [http://www.doc-center.robotsoft.com/Kompai\\_home\\_page/Technical\\_documents/RobuBOX-Kompai/User's\\_manual/First\\_configuration/Mapping/Modify\\_a\\_map\\_to\\_include\\_or\\_remove\\_obstacles](http://www.doc-center.robotsoft.com/Kompai_home_page/Technical_documents/RobuBOX-Kompai/User's_manual/First_configuration/Mapping/Modify_a_map_to_include_or_remove_obstacles)

## **6.1. Doubt removing**

This is probably the most difficult criterion to evaluate and quantify. By principle, doubt removing is only in case of emergency.

In our case, the presence of the robot will generate "traffic" through the Call Button : if we suggest the person to call for any question (providing that unexpected situation will occur), this is a very good way to observe how the person use it, how it works, how the platform react, how many times the call will generate a visit ...

## **6.2. Tele-consultation**

The best is probably to schedule tele-consultations and follow-up: how many consultations, how long do they last compared with face-to-face consultations, how long does it take to find the person and start consultation (providing that a reminder is activated ...) ...

## **6.3. Socialization**

Only a questionnaire can help to quantify the increase of socialization perceived by the users.