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<b>Abstract (for dissemination)</b>	In the present document, we describe the user requirements specifications for all the T&Tnet services on the basis of the user studies and within the frame of the preliminary system architecture.



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NETWORKing**

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**User requirements and specifications of user groups**

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## TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION .....</b>	<b>5</b>
1.1	PROJECT OVERVIEW .....	5
1.2	PURPOSE AND SCOPE OF THIS DOCUMENT.....	6
<b>2</b>	<b>DEFINITION OF USERS .....</b>	<b>7</b>
<b>3</b>	<b>USER REQUIREMENTS .....</b>	<b>8</b>
3.1	FUNCTIONAL REQUIREMENTS .....	8
3.1.1	<i>User profile</i> .....	8
3.1.2	<i>Journey planner</i> .....	8
3.1.3	<i>Navigation</i> .....	9
3.1.4	<i>Social collaboration</i> .....	10
3.1.5	<i>Communication</i> .....	11
3.2	GENERAL USER REQUIREMENTS .....	11
3.3	USER INTERFACE REQUIREMENTS .....	11
3.4	ERROR RECOVERY REQUIREMENTS.....	13
<b>4</b>	<b>CONCLUSION .....</b>	<b>14</b>
	<b>REFERENCES.....</b>	<b>15</b>

## 1 Introduction

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### 1.1 Project overview

The idea of **T&Tnet** is to provide personalised context-based multimodal and multinational social journey planning with affective capabilities and an easy to follow adaptive real time guidance making use of artificial reasoning based on an information manager (filtering and combining). This solution will allow users to carry out and solve movement tasks and problems independently.

**T&Tnet** not only provides solutions helping elderly to get to a specific destination making use of different transport means, but offers navigation/orientation adapted to the user preferences in real time which makes use of transport information (schedule, delay, occupation ...), emotions, social networks, a collaborative evolutionary platform and message/alarm/bring-back to the route system.

The T&Tnet objectives have been to provide personalized context-based multimodal and multinational social journey planning with affective capabilities to enhance the elderly's everyday experience as to mobility. This challenging goal is jointly addressed from different approaches:

- Real-time guidance supported in the mobile.
- Artificial reasoning which helps to determine the best possible route in every moment.
- Guidance based on personal preferences to fit individual needs.
- Geo-located accessibility content added by seniors.
- Collaborative maps which enrich the information of each node and, in turn, enable to keep it updated on-the-go.
- The route takes into account friends on the surroundings and emotions so that mobility is no longer conceived as a negative action.

T&Tnet aims at achieving the following goals:

- New advanced services and models based on transport information and a collaborative platform are innovated and will be developed.
- The new services are planned to create increased value to senior users and nowadays no similar services have been found in the literature.
- The advanced information services are based on the idea of integrating different types of information to create added value.
- In addition to the challenges of data collection, intelligent aggregation and presentation using mobile social tools, new emotional information will be studied and integrated.

To achieve this goal, several innovations will be carried through the development of new technologies that apply to the AAL sector, such as artificial intelligence, multimodal planning, social intelligence, mobility and Web 2.0 technologies.

## **1.2 Purpose and scope of this document**

This document describes the user requirements specifications for all the T&Tnet services based on an analysis of the outcome from the focus group work and the interviews held to participants and within the frame of the preliminary system architecture.

This document is based on the public deliverables: D1.1 “User needs analysis” [1] , D2.1 “T&Tnet services mock-up” [2], and also the internal reports D3.3 “Lab and first prototype evaluation report and changes recommendation” [3] and R1.4 “First functional requirements and API Specification for T&Tnet Services [4]”. Also, the “Guidelines for developing and testing user interfaces” has been used [5].

## **2 Definition of users**

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As we present in this document a detailed list of user requirements, just a short review of the three main types of end user roles identified for the T&Tnet system.

- Primary user: The elderly person being assisted in travel.
- Friend: A role relative to the primary user role – a user can connect to other users, to locate them and to plan synchronized trips. So a friend is also a primary user.
- Secondary user: A support role relative to a primary user – to be notified of emergencies. This may be a relative, friend or professional carer. The same person may also have a T&Tnet account (access to primary user functions), but it is not required.

### **3 User requirements**

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User requirements represent the user needs observed from the studies of the users (focus groups, interviews and mock ups evaluation, etc.). They describe any function or constraint that must be provided to satisfy the user needs [6] and shall be considered in the development of the T&Tnet solution.

#### **3.1 Functional requirements**

The list of user functional requirements is grouped in the main categories of the T&Tnet functionalities:

##### **3.1.1 User profile**

- U1: The web platform shall be easy to use and require the minimum information possible to register and create an account (email address and password).
- U2: The web platform and the mobile application shall accept input to introduce the user preferences and to edit/change them each time that the user will need it.
- U3: The web platform shall provide the means to reset the password.
- U4: The system shall store a set of preferences of the user.
- U5: The web platform shall provide the functionality to input/change the preferences (application, travel, GPS position, visibility of friends).
- U6: The mobile application shall provide the means to change/input the appearance and functionality preferences (large fonts, contrast, etc).

##### **3.1.2 Journey planner**

- U1: The web platform and the mobile application shall have the option to browse a map.
- U2: The web platform shall provide the means to plan a trip in advance and to share a part with a friend (shared and synchronized trips).
- U3: The web platform shall have an option to see all the planned trips.



- U4: The web platform shall include an option to cancel a planned trip.
- U5: The platform shall notify the user by e-mail each time one of his friends plans a shared route with him and the user will be able to accept or reject it.
- U6: The mobile application shall provide request navigation only selecting the final destination.
- U7: The mobile application shall accept input to specify the final destination in the following modalities:
  - Writing the address using the touch keyboard.
  - Selecting the address pointing on a map.
  - Selecting from a touch scroll one of the previously used locations or home address.
- U8. The web platform shall have a functionality to print routes if a printer is connected to the computer.

### 3.1.3 Navigation

- U1: The mobile application shall notify the user ahead of starting time for planned trips.
- U2: The mobile application shall provide user position during a trip
- U3: The mobile application shall provide navigation for the following modalities:
  - Visual text on a map.
  - Voice.
  - Notifications.
- U4: The mobile application shall alert/notify if a deviation from the route is detected.
- U5: The mobile application shall notify the user if an error in the navigation functionality occurs (GPS or network unavailability).
- U6: The mobile application shall be capable of recalculating the route in case of a deviation. The deviation can be in space or time. .

- U7: It shall be possible to pause navigation. For instance, to preserve the battery.
- U6: The user is able to share or not his/her position with his friends.
- U7: The mobile application shall provide the functionality to find friends. The input modality will be entering the name.
- U8: The mobile application shall notify when a user's friend is nearby and be capable to guide the two friends to meet each other.

#### **3.1.4 Social collaboration**

- U1: The website platform and the mobile application shall provide feedback information for the different legs of a trip. The following matters shall be included:
  - General comfort in the trip and the different legs.
  - Availability of seats.
  - Travel speed.
- U2: The website platform and the mobile application shall include the possibility of entering tips. At least, the following tips shall be included:
  - Tips related to the location of escalators, stairs, elevator and toilets.
  - Tips related to temporal accessibility issues (strikes, construction works).
  - Tips related to leisure locations (restaurants, museums, etc.).
  - The input modalities shall be by clicking a map or writing an address on the web interface and using the current position given by the GPS on the mobile application. To enter the tip on the mobile the user shall have different options, like taking a picture, writing the tip or using symbols.
- U3: The website platform shall provide the user the functionality to delete his own tips and comments from the system.

- U4: The website platform shall accept reports of bad tips entered from other users.
- U5: The web platform and the mobile application shall provide the means to give feedback of the trip and the different legs of transport modes.
- U6: The web platform shall provide the means to the user to input information of his friends in order to make friends requests.

### 3.1.5 Communication

- U1: The mobile application shall provide an alarm button.
- U2: The mobile application shall include a button to initiate a call to one pre-configured contact to easily call for help.
- U3: The website platform shall have a web message box functionality (request of friendship, shared routes).
- U4: The website platform shall notify users by e-mail when a new web message is received in user's box.
- U5: The system shall notify secondary users when needed.

## 3.2 General user requirements

These are a list of user requirements that apply to all the T&Tnet functionalities:

- U1: The service shall be stable and work in any conditions.
- U2: The system should be as predictable as possible.
- U3: The system shall provide the possibility to customize the preferences at any time.
- U4: If an action takes more than one second, a progress bar or other relevant information should be displayed to the end-user.

## 3.3 User interface requirements

In this section, a list of user interface requirements is included:

- U1: The system shall be intuitive and extremely easy to use.
- U2: The user interface shall be consistent and display common tasks (help, search information) always at the same place.

- U3: The system shall provide self-explanatory interface.
- U4: The system shall provide easy-to-read maps.
- U5: The system shall provide different input modalities: including the possibility to point on map in addition to writing an address.
- U6: It shall be easy and intuitive to scale maps by zooming in and out.
- U7: The system shall provide minimal screen menus with few choices and low hierarchy of choices.
- U8: The system shall provide clear and understandable symbols, big fonts and buttons and high contrast.
- U9: The action buttons shall be located at the bottom of the screen and they will be always visible.
- U10: The user interface shall have a help/information button located at the bottom-right corner.
- U11: The user interface shall present all action buttons as a combination of icons and text.
- U12: The user interface shall present relevant information to describe a problem or give detail explanations.
- U13: All information and help texts should be context sensitive, the information and help text should be relevant and to the point.
- U14: The focus points of the map shall be at the centre of the screen.
- U15: The textual information shall be meaningful.
- U16: Symbols used in the user interface shall convey the same meaning across cultural borders.
- U17: All buttons should be so large that they are easy to tap, and surrounded with clear boundaries.
- U18: Buttons should not be smaller than the size of the thumb.
- U19: All confirmation, information, help and error pages should have the same look-and-feel throughout the system.

### 3.4 Error recovery requirements

- U1: The system shall be predictable and understandable when unexpected errors occur.
- U2: The system shall communicate when errors occur in a clear way, describing the problem and the possible ways to solve it.
- U3: The system shall provide mechanism for graceful degradation of functionality when an error situation occurs.
- U4: The system shall not require re-enter any data when an error situation appears.
- U5: The mobile application shall launch at the same state as it was when the error occurred, when a restart of the application occurs.
- U6: The system shall provide guidance and help to recover for errors made by end-users.
- U7: The system shall notify the end-users when communication problems occur.

## **4 Conclusion**

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In this deliverable, the user requirements for the T&Tnet services have been specified. The requirements are based on the analysis of the outcome from the focus group, interviews and mock-ups evaluations that have been held in four countries: Austria, Norway, France and Spain.

The general, user interface and error recovery requirements apply to all the common T&Tnet services while the functional requirements have been split by the main characteristics of the system.

All the user requirements take into account the needs of the users and shall be developed in the different prototype versions in function of their priority.

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