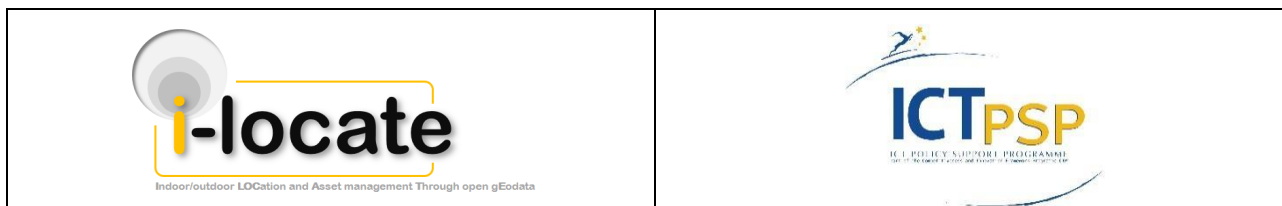




i-locate - Indoor/outdoor LOCation and Asset management Through open gEodata (GA 621040)

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DELIVERABLE

Project Acronym: i-locate

Grant Agreement number: 621040

Project Title: Indoor/outdoor LOCation and Asset management Through open gEodata

D4.2 – Technical evaluation of first version of i-Locate toolkit

Revision: 1.0

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REVISION HISTORY AND STATEMENT OF ORIGINALITY

Revision History

Revision	Date	Author	Organisation	Description
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V0.2	20/01/2015	Lucian Brancovean	INDSOFT	Contributions from technical partners
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1 List of references

Number	Full reference
1	<i>i-locate deliverable D1.1 – Use cases description and Privacy Threat Vulnerability and Risk Analysis. Available online from: http://www.i-locate.eu/public-deliverables/</i>
2	<i>i-locate deliverable D3.1 – i-Locate toolkit v1.0 (Accompanying report). Available online from: http://www.i-locate.eu/public-deliverables/</i>
3	<i>i-locate deliverable D1.4 – System Architecture. Available online from: http://www.i-locate.eu/public-deliverables/</i>

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2 Table of Acronyms

Acronym	Description
OGC	Open Geospatial Consortium
GIS	Geographic Information System
UC	Use Case
LBS	Location Based Services



3 Executive Abstract

This document provides an evaluation of the i-Locate Toolkit version 1.0. After the release of the first version of the toolkit (M12), a brief summarization of functionalities available against functionalities required by UCs described within D.1.1 – “Use cases description and Privacy Threat Vulnerability and Risk Analysis” was done. System assessment and recommendations are provided by reviewing the toolkit against the use cases for each pilot.

The set of recommendations emerging from the first technical assessment of toolkit, first version, (D.3.1 - “i-locate Toolkit v1.0”) will be forwarded to the technical developers for improvements towards the release of the second and final version of the toolkit planned at M20 (D.3.7 – “i-locate Toolkit v2.0”).

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5 Introduction

In order to assess the i-locate toolkit, we will go through the use-cases for each pilot, and check the degree to which the software components of the v.1.0 release of the toolkit provide the functionality and feature required to support the use-case. This checking is based on the specifications and toolkit documentation, and not on actual field-testing, as no deployment has been done at the time of writing.

For the first technical assessment of the toolkit, available functionalities, as described in the D3.1 deliverable, are:

- Core localization services:
 - Proxy: represents the unique entry point for LBS enablers to get localization data about system entities.
 - Indoor localization: processes raw positioning data coming from a variety of indoor localization technologies and exposes them to the proxy.
 - Outdoor localization: captures outdoor positioning data (GPS/EGNOS, WiFi, cell tower ID) and exposes them.
 - Upload/Download: allows upload of arbitrary files attached to a site in the portal and download of files from the portal through a web service. IndoorGML navigation data can also be downloaded.
 - Configuration: provides additional information of specific devices within various indoor localization technologies (e.g. battery status or firmware revision etc.)
 - Communication Bus: this module provide a communication channel on which pass all the information shared between different modules.
- Generic LBS Enablers:
 - Spatial service: the module provides an interface to the Open Data Repositories and to the current position of assets; it provides a spatial query interface, providing processes data to the caller.
 - OGC Spatial: this module provides access to the geographical information in a common way. Use of standard communication language (OGC protocol in this case) enables third-party software to ingest the information (spatial) without any conversion.
 - Routing: it is the component capable to generate a route plan and corresponding turn-by-turn directions for a trip with given origin and destination location.
 - Geofencing: this module is responsible to ingest the location information of an asset (person/object) and on that verify spatial roles (entry/exit from a room) defined case by case.
- Specific LBS Enablers:

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- Asset management: the module provides the ability to accurately represents assets and the definition of maintenance processes.

The i-locate toolkit v.1.0 further includes:

- Mobile app: a mobile app template, currently supporting Android OS, including support for computing a route, displaying it on a map and guide people by means of turn-by-turn navigation, across indoor as well as outdoor spaces.
- Web Client: a web client template that provides webGIS functionality to “see” and manage assets. This client is a point of convergence for different “worlds”: GIS, Asset management and LBS.

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6 Toolkit Vs Pilots evaluation

6.1 Santa Maria del Carmine Hospital, Rovereto, Italy

The pilot will be hosted at Santa Maria in Carmine Hospital in Rovereto. The hospital serves a health district of about 100,000 inhabitants and it has a total of 1,346 beds. The total number of outpatient attendances in the 2012 was around 485,000 and the total number of clinical pathology outpatient examinations was around 1,100,000.

The following use cases have been identified for this pilot:

- Wheelchair management.
- Patient welcoming.

6.1.1 Wheelchair management

i-locate will be used to track the position of the wheelchairs inside and immediately outside the hospital, in order to help the bearers find them easily. Moreover tracking the position of the chairs can help bearers indirectly determine the position of patients who are using them and therefore it can lead to optimization of the overall care provision time.

Use case 1:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The wheelchair manager attaches a tag to a wheelchair and he/she registers it within the system	End-user action	--	--
	Asset management	Available	--
i-locate stores the information about the chair.	Asset management	Available	--
The wheelchair manager removes dismissed chair.	End-user action	--	--
The wheelchair manager updates relevant information.	Asset management	Available	--

Use case 2:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The stretcher-bearers use i-locate to find the position of the chairs	Indoor localization	Available	--
	Spatial service	Available	--

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i-locate shows the position of the wheelchairs on the map.	Web application	In progress	x
	OGC Spatial	Available	--
The stretcher-bearers can see the wheelchair on a map together with associated information regarding their state.	Web application	In progress	x
	Asset management	Available	--

Use case 3:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
If a wheelchair is not used (i.e. not moving) for a certain time, i-locate sends an alert to the PC or to the mobile phone (or any other portable device) of the stretcher-bearer and of the wheelchair manager.	Asset management	Available	--

Use case 4:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The stretcher-bearers update the status of the wheelchairs from a webpage or from a portable device.	Asset management	Available	--
	Web application	Available	x
	Mobile application	In progress	x
i-locate marks the chair according to the status.	Asset management	Available	--

Use case 5:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
A stretcher-bearer uses the system to locate one or more chairs.	Spatial service	Available	--
	Asset management	Available	--
	Web application	Available	--
	OGC Spatial	Available	--
i-locate filters the relevant chair(s) and shows them on the map.	Spatial service	Available	--
	Asset management	Available	--
	Web application	Available	--

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	OGC Spatial	Available	--
--	-------------	-----------	----

6.1.2 Patient welcoming

In this scenario, the user interacts with the i-locate mobile App to get guidance from home (via public transportation) to the consulting room inside the hospital.

Use case 1:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
Patient logs into the i-Locate application	Mobile application	In progress	x
i-Locate identifies the patient	Identity management	In progress	x
The patient uploads information to i-locate regarding his/her destination	Mobile application logic	--	--
i-locate stores this information.	Mobile application logic	--	--

Use case 2:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
i-locate sends a reminder.	Mobile application logic	--	--
The patient logs in the system.	Mobile application	In progress	x
	Identity management	In progress	x
The patient request to have more information.	Mobile application logic	--	--
	Integration with booking system	--	--
i-locate shows the information about the visit.	Mobile application logic	--	--
The patient confirms the visit.	Mobile application logic	--	--
	Mobile application logic	--	--

Use case 3:

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Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The patient logs into the system.	Mobile application	In progress	x
	Identity management	In progress	x
i-locate shows the list of the visits for the day.	Integration with booking system	--	--
	Mobile application logic	--	--
The patient selects the visit.	Mobile application logic	--	--
i-locate proposes different transportation options.	Mobile application	Available	--
	Routing	Available	--
The patient selects the preferred transportation mode.	Mobile application	Available	--
	Routing	Available	--
i-locate calculates the best itineraries(s) to reach the hospital according to the selected transportation modes.	Routing	Available	--
The user starts the trip.	Mobile application	Available	--
	Routing	Available	--
	Outdoor Localization	Available	--
i-locate provides contextual information on how to reach the hospital	Mobile application	Available	--

Use case 4:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
i-locate sends a notification to the nurse who manages the appointments within the hospital.	Integration with booking system	--	--
	Mobile application	In progress	x
	Mobile application logic	--	--

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Use case 5:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
When the patient enters the hospital, a "welcome message is provided". i-locate start tracking him/her.	Outdoor Localization	Available	--
	Indoor Localization	Available	--
	Proxy	Available	--
	Mobile application	Available	--
locate calculates the best path to reach the cashier desk. The path is calculated using the most recent map of the hospital	Indoor Localization	Available	--
	Mobile application	Available	--
	Routing	In progress	x
The patient pays for the service and notifies i-locate.	Mobile application logic	--	--
	Integration with booking system	--	--
	Mobile application	In progress	x
i-locate sends notification to the nurse regarding the processed payment.	Mobile application logic	--	--
	Integration with booking system	--	--
i-locate calculates the best path to reach the doctor's room and guides the patient using the most recent map of the hospital.	Mobile application	Available	--
	Routing	In progress	x
	Indoor Localization	Available	--

Use case 6:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
i-locate sends an updated notification to the nurse who manages the appointments.	Integration with booking system	--	--
	Mobile application	Available	--
	Mobile application logic	--	--

Use case 7:

Use-case requirement	Toolkit component/	Planned in	Planned in
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	function	toolkit V.1.0	toolkit V.2.0
The patient asks i-locate to be guided to his/her home.	Routing	Available	--
	Mobile application	Available	--
i-locate guides the patient outside the hospital using indoor localization.	Routing	In progress	x
	Mobile application	Available	--
	Indoor Localization	Available	--
i-locate proposes different transportation options to go home.	Routing	Available	--
	Mobile application	Available	--
The patient selects the preferred transportation mean.	Mobile application	Available	--
i-locate calculates the best itineraries to reach the patient's home according to the selected mean of transportation.	Routing	Available	--

6.2 Saint James Hospital, Malta

St James Hospital has an existing patient management system, which incorporates appointment scheduling amongst others. One of the requirements of this pilot site is to achieve bi-directional integration in order to deliver both the real time scheduling and location of users. The i-locate App will therefore be essential to provide real time feedback within a typically dynamic booking scenario.

6.2.1 Patient welcoming and guidance

Problems statement of this scenario are:

- Scheduling and rescheduling of appointments and medical equipment allocation due to delays.
- Auto check-in upon patient arrival at the premises.
- Help the patient move around the facilities up to the location of the appointment.
- Confirm patient visit at the clinic.
- Reduce waiting times and provide guidance and re-direction at IMCU (Immediate Medical Care Unit). It should be noted that St James Hospital has 4 IMCUs located in Sliema, Zabbar, Zebbug and Burmarrad.

Use case 1:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The patient logs into the system.	Mobile application	In progress	x
	Identity management	In progress	x
The patient requests the relevant information from i-locate.	Integration with booking system	--	--
	Mobile application logic	--	--
i-locate shows the information about the visit.	Mobile application logic	--	--
The patient confirms the visit	Mobile application	Available	--
	Mobile application logic	--	--

Use case 2:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0

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The patient logs into the system.	Mobile application	In progress	x
	Identity management	In progress	x
i-locate identifies the patient.	Identity management	In progress	x
The patient requires information on his/her visit.	Mobile application logic	--	--
i-locate queries the Compucare system.	Mobile application logic	--	--
i-locate shows the list of visits to the patient.	Mobile application logic	--	--
The patient selects the visit of interest.	Mobile application logic	--	--
i-locate shows the information about the selected visit.	Mobile application	In progress	x

Use case 3:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
i-locate sends a notification to the outpatient manager.	Mobile application logic	--	--
	Identity management	In progress	x

Use case 4:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
When the patient enters the hospital, i-locate starts tracking him/her.	Proxy	Available	--
	Geofencing	Available	--
i-locate calculates the best path to reach the cashier desk and it guides the patient using the most recent map of the hospital.	Proxy	Available	--
	Routing	In progress	x
The patient pays for the service and he/she notifies i-locate.	Web application logic	--	--
i-locate sends a notification to the nurse regarding the processed	Web application	--	--

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payment.	logic		
i-locate calculates the best path to reach the doctor's room and it guides the patient using the most recent map of the hospital.	Routing	In progress	x
	Indoor localization	Available	--

Use case 5:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
i-locate sends a notification to the nurse who manages the appointments	Mobile application logic	--	--

Use case 6:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The patient requests i-locate to find an IMCU.	Spatial service	Available	--
i-locate retrieves from Compucare the availability of IMCUs and it selects the least busy unit.	Mobile application logic	--	--
i-locate guides the patient to the designated IMCU based on proximity and availability.	Routing	Available	--
i-locate provides the patient with contextual information to reach the IMCU.	Routing	Available	--
	Mobile application	In progress	x

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6.3 Mitera Hospital in Athens, Greece

6.3.1 User welcoming

As it has been described in deliverable D1.1 – “Use cases description and Privacy Threat Vulnerability and Risk Analysis”, the main objective of MITERA Hospital pilot is the arrangement of the annual check-up by a citizen. The pilot will take place within MITERA premises and this procedure actually consists of many rooms and floors. In summary, the citizen will be able to:

- Choose between three different check-ups (standard, full and manual selection).
- Receive a notification about the visit will be sent to him/her after the booking of the reservation.
- Guided from home (via public transportation or car) to the hospital.
- Check-in once the citizen enters the building & welcome message providing relevant information (e.g. pending list of examination, specific departments, examine rooms).
- Guided to the doctor's room and when the user finishes, the system will guide him/her to the information desk and it eventually notifies him/her about the cost of the check-up.
- Pause the examination and resume the list on another day.

Use case 1:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
Patient logs into the i-Locate application	Mobile application	In progress	x
i-Locate identifies the patient	Identity management	In progress	x
Patient enters information regarding his/her appointment.	Mobile application logic	--	--

Use case 2:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
i-locate sends a reminder	Mobile application logic	--	--
Patient requests information about his/her visit	Mobile application logic	--	--
i-locate sends the relevant information to the user	Mobile application logic	--	--
	Mobile application	In progress	x

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Use case 3:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
Patient synchronizes i-locate with health service	Integration with third part service	--	--
	Mobile application	In progress	x
i-locate shows the list of the visits for the day.	Mobile application logic	--	--
i-locate identifies the location the patient must reach.	Spatial service	Available	--
i-locate lists the transportation alternatives.	Routing	Available	--
Patient selects the means of transport.	Mobile application	Available	--
i-locate generates the route to destination.	Routing	Available	--
i-locate guides the patient step by step to his/her destination	Mobile application	Available	--

Use case 4:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The check – ups supervisor receives a notification that the patient enters the hospital	Identity management	In progress	x
	Geofencing	Available	--
	Mobile application logic	--	--
i-locate/Supervisor tracks the patient	Indoor Localisation	Available	--
i-locate delivers contextual information	Spatial service	Available	--
	Mobile application	In progress	x

Use case 5:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
i-locate detects the patient when	Geofencing/	Available	--

entering the hospital.	Indoor localisation	Available	--
i-locate offers different routing options inside the hospital: by foot or by wheelchair.	Mobile application	In progress	x
	Routing	In progress	x
Patient selects option, additional parameters.	Mobile application logic	--	--
i-locate displays the route.	Mobile application	Available	
	Routing	In progress	x
Patient requests a list of locations with auxiliary services	Mobile application	In progress	x
	Mobile application logic	--	--
i-locate provides list of locations	Spatial service	Available	--
Patient and/or Check-up supervisor selects destination	Mobile application	In progress	x
	Mobile application logic	--	--
i-locate displays path, offers guidance, recalculates – path to the helpdesk	Mobile application	Available	--
	Routing	In progress	x

Use case 6:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
Patient pauses/stops the check-up.	Mobile application logic	--	--
Confirmation for the pausing of the medical examinations	Mobile application logic	--	--
The check-ups supervisor receives a notification about the status of the use	Identity management	In progress	x
The user resume check-ups	Mobile application	In progress	x
	Mobile application logic	--	--

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6.4 Alba Iulia Emergency Hospital, Romania

Alba County Emergency Hospital provides specialized care for over 66,000 inhabitants of the Municipality of Alba Iulia, Romania and for over 373,000 inhabitants in Alba County, acting as well as an emergency hospital. The hospital covers over 25 medical specialties and includes departments such as: paediatrics, oncology, cardiology, surgery, gastroenterology, nephrology department, division of neonatology, obstetrics and gynaecology, ophthalmology, ENT section, orthopaedics, psychiatry, urology, neurosurgery.

6.4.1 Patient welcoming and assistance

The present use case will be implemented within the oncology department. The use case addresses outdoor and indoor tracking of people. Ambulatory patients use the i-locate application to be guided from home to the investigation room, where they have to undergo a medical check; if the patients need to move from one room to another (e.g. during health check-ups) the system can guide them through the whole process.

Use case 1:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
Patient logs into the i-Locate application	Mobile application	In progress	x
i-Locate identifies the patient	Identity management	In progress	x
Patient enters information regarding his/her appointment.	Mobile application logic	--	--
i-Locate identifies the location the patient must reach.	Spatial service	Available	--
	OGC Spatial	Available	--
i-Locate lists the transportation alternatives.	Routing	Available	--
Patient selects the means of transport.	Mobile application	Available	--
i-Locate generates the route to destination.	Routing	Available	--
i-Locate guides the patient step by step to his/her destination	End-user application	Available	--
	Routing	Available	--

Use case 2:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0

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i-Locate detects the patient when entering the hospital.	Geofencing	Available	--
i-Locate offers different routing options inside the hospital: by foot or by wheelchair.	Mobile application	In progress	x
	Routing	In progress	x
Patient selects option, additional parameters.	Mobile application logic	--	--
i-Locate displays the route.	Mobile application	Available	--
	Routing	In progress	x
Patient requests a list of locations with auxiliary services	Mobile application logic	--	--
i-Locate provides list of locations	Spatial service	Available	--
Patient selects destination	Mobile application	Available	--
i-Locate displays path, offers guidance, recalculates	Mobile application	Available	--
	Routing	In progress	x

Use case 3:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
i-Locate tracks the patient	Geofencing	Available	--
i-Locate delivers contextual information	Spatial service	Available	--

6.4.2 Asset management

This use case addresses the tracking of technologies and devices. I-locate is used to find pieces of equipment through use of smart tags and other indoor localisation technologies. The operator can be guided to the location of the piece of equipment by the software to perform maintenance activities.

Use case 1:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The equipment manager places a smart tag to the medical equipment inside the hospital.	End-user action	--	--
	Asset management	Available	--
The equipment manager associates	Asset management	Available	--

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metadata to each piece of equipment (name, ID, information on the maintenance related operations).			
i-locate displays an inventory of the medical equipment and the information related to each entity.	Asset management	Available	--
	Web application	Available	--
The equipment manager asks for assistance to locate a piece of equipment.	Asset management	Available	--
	Web application	Available	--
The equipment manager introduces the name / ID of the equipment.	Asset management	Available	--
i-locate displays the exact position of the equipment, marking the entity with a different colour.	Asset management	Available	--
	Web application	In progress	x
	OGC Spatial	Available	--
i-locate issues an alert that certain medical equipment should undergo maintenance services.	Asset management	Available	--
The equipment manager asks i-locate for guidance to the location of the relevant piece of equipment.	Web application	In progress	x
	Mobile application	Available	--
	Asset management	Available	--
	Indoor Location	Available	--
	Routing	In progress	x

6.5 Utrecht Medical Centre, The Netherlands

The UMC Utrecht is one of the largest healthcare organizations in the Netherlands, with about 10,000 employees and over 1,000 hospital beds. Its core activities are built on gaining and sharing in order to ensure the highest level of patient care, research, education and training.

The “indoor and outdoor navigation” use case has been identified for this pilot, as detailed in the reminder of this section.

6.5.1 Patient guidance

The use case at UMC sees a patient who has an appointment for a light therapy treatment at the UMC. (S)He has to report to the light therapy or light diagnostics technician on the appointed time. The person will be able to use i-locate to get guidance from his home to the light therapy location where (s)he has to report in the hospital.

Use case 1:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The user enters the data of the appointment (such as the name of the department, the name of the specialist, the date and the time of the appointment).	Mobile application	In progress	x
	Mobile application logic	--	--
	Spatial service	Available	--
The system displays the locations of interest on a map of the hospital terrain (such as building and entrance of the building).	OGC spatial	Available	--

Use case 2:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The user enters the data of the origin location of the trip.	Mobile application	In progress	x
	Outdoor localization	Available	--
The system displays the origin location and destination location (entrance of the hospital) on a map.	OGC spatial	Available	--
The user enters the complementary data for the trip.	Routing	Available	--
	Spatial service	Available	--
The system shows a suggested travel plan for each optional transport mode (such as by public transport and by	Mobile application	In progress	x
	Routing	Available	--

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private car) and for each plan the expected door-to-door travel time and expected arrival time for each optional travel plan.			
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Use case 3:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The user starts the navigation based on the selected travel plan.	Mobile application	Available	--
	Routing	Available	--
The system shows the current geographic position of the user and the route plan on a map.	OGC Spatial	Available	--
	Mobile application	Available	--
The system navigates the user all the way (via parking place and next entrance of the building) to indoor destination.	Mobile application	Available	--
	Routing	Available	--
	Outdoor localization	Available	--

Use case 4:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The user acknowledges that (s)he is inside.	Proxy	Available	--
	Geofencing	Available	--
	Mobile application	In progress	x
The system navigates the user to the indoor destination. The system shows continuously updated expected travel time and expected arrival time to destination during the trip.	Routing	In progress	x
	OGC Spatial	Available	--
	Mobile application	In progress	x

Use case 5:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The system shows continuously updated expected travel time and expected arrival time to destination during the trip.	Mobile application	In progress	x
	Routing	Available	--

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The patient checks the time required to get to his/her destination with i-locate.	Mobile application logic	--	--
	Mobile application	In progress	x

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6.6 Elder Nursing Home Baia Sprie, Romania

The home for the elderly in Baia Sprie, Romania offers accommodation for indefinite period, in terms of nursing and care, preparing and serving meals, psychological counselling, social and leisure. The institution hosts 26 employees and 68 assisted people aged 58-90 years old, coming from different localities of Maramures county, out of which 15 assisted addicted as a result of various diseases that occurred with age and 51 independent. The Institution includes 2 buildings joined one to the other, one being newly built.

The “elder person localisation” use case has been identified for this pilot, as detailed in the reminder of this section.

6.6.1 Elder person localisation

Elder people in the nursing home need to be located in order to administer them medicine; in the meantime the staff needs to identify elder users’ habits in order to improve quality of service. In some cases, the users need to be monitored in real time and staff members must be warned if someone leaves the premises.

Use case 1, 2,4 and 5

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
A staff member uses i-locate to locate a patient for different purposes	Web application	In progress	x
	Proxy	Available	--
	Indoor Localisation	Available	--

Use-case 3

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
i-locate uses indoor and outdoor localization to ensure that patients suffering from mental disorder do not leave the premises unattended	Web application	In progress	x
	Identity management	In progress	x
	Spatial services	Available	--
	Geofencing	Available	--
	Indoor localisation	Available	--
	Outdoor localisation	Available	--
	Proxy	Available	--

Use-case 6

Use-case requirement	Toolkit component/	Planned in	Planned in
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	function	toolkit V.1.0	toolkit V.2.0
i-locate uses indoor and outdoor localization technologies to improve quality of services by analysing preferred activities and patterns in elder.	Web application	In progress	x
	Identity management	In progress	x
	Location Analytics	In progress	x

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6.7 University of Applied Science Dresden, Germany

The University of Applied Sciences is the second largest university in the capital of the state of Saxony. The University campus is divided in various buildings. The main administration building consists mainly of offices (workers/employee/professors) and lecture halls for the students. The seminar building is mainly separated in classrooms, laboratories and lecture halls. The library is separated and it is located in an independent building with small working places for students next to the archives at every floor. There are 5,000 students that use the campus area fulltime during their studies. Next to the students, 180 professors and other employees are working inside the buildings.

6.7.1 Visitor/students guidance

The use case will be implemented within the campus of the university. The university consists of various buildings and the trial addresses indoor tracking of people in the main building and the seminar building. Visitors or students uses the i-locate application to be guided from entrance to the Point-Of-interest (seminar room or exhibition stand).

Use case 1:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The visitor uses i-locate to select a relevant POI	Mobile application	In progress	x
The user adds information and specifies additional preferences to i-locate	Mobile application logic	--	--
i-locate calculates the best path to reach the POI	Routing	In progress	x
i-locate shows the information in the surrounding of the users location during the visit	Spatial service	Available	--

Use case 2:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
Student logs into the system and synchronizes the i-locate app	Mobile application	In progress	x
	Identity manager	In progress	x
i-locate shows the list of visits today	Spatial service	Available	--
Student select visit	Mobile application	In progress	x
i-locate recheck possible changes	Spatial service	Available	--

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Student ask for room	Mobile application	In progress	x
i-locate calculate best path to reach seminar room	Routing	In progress	x
i-locate provide contextual information to reach the room	Mobile application	In progress	x
	Spatial service	Available	--

Use case 3:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
Secretary request from the system position of professor	Proxy	Available	--
	Indoor Localization	Available	--
i-locate localizes professor and notifies him about the request	Proxy	Available	--
	Indoor Localization	Available	--
	Geofencing	Available	--
Professor accepts to inform secretary about his/her position	Mobile application	In progress	x

6.8 Municipality of Rijeka, Croatia

The municipality of Rijeka comprises several buildings including:

- Korzo 16 (the mayor's office, main city office, city department of culture, city department of health and social welfare, city department of finance, information technology institute, office of internal audit and office of financial management control).
- Titov trg 3 (the registry office, city department of public utilities, city department of urban development, environment and asset management, department of property management).
- Trpimirova 2 (city department for the enforcement of urban planning and building documents, city department of sports and technical culture, department of local government and self-government, city department of education and schooling).
- Dolac 8 (city department of public utilities - division of community wardens, city department of public utilities – traffic warden division).
- Trg sv. Barbare 2 (city department of entrepreneurship).

6.8.1 Citizen guidance

Since the Municipality of Rijeka has offices located in 5 different building within 1 km distance, citizens need to be guided to the correct office in order to get the service they need. This scenario implies combined outdoor and indoor localization to ensure a better service to the citizens.

Use case 1:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The citizen accesses the Mobile application (Rijeka ONLINE) to get the information about the service he/she requires.	Mobile application	In progress	x
i-locate app asks the user for permission to let the service use his/her location.	Mobile application	Available	--
A user selects weather to let the app use the location.	Mobile application	Available	--
i-locate app provides information about the service.	Mobile application	In progress	x
The user searches for the service information.	Mobile application	In progress	x
i-locate provides the guidance option for the service.	Mobile application	Available	--

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Use case 2:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The user clicks on the guiding option.	Mobile application	Available	--
i-locate proposes different transportation options.	Mobile application	Available	--
The user selects the transportation mean.	Mobile application	Available	--
i-locate calculates the best itineraries to reach the building according to the selected mean of transportation.	Routing	Available	--

Use case 3:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
When the citizen enters the building, i-locate gives him/her a welcoming message.	Geofencing	Available	--
	Mobile application	In progress	x
i-locate calculates the best path to reach the front desk and it guides the citizen by using the most recent map of the building.	Routing	Available	--
	Mobile application	Available	--
The citizen checks in at the front desk and he/she notifies i-locate of the completed check-in.	Mobile application	In progress	x
(Optional) i-locate sends a notification to the appropriate officer informing that a new person has entered a building. The notification also includes basic information about that particular guidance (time of visit, requested service, etc.).	Geofencing	Available	--
i-locate calculates the best path to reach the office/desk and it guides the citizen by using the most recent map of the building.	Routing	In progress	x
	Mobile application	Available	--

Use case 4:

Use-case requirement	Toolkit component/	Planned in	Planned in
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	function	toolkit V.1.0	toolkit V.2.0
The user requests i-locate to be guided to his/her home.	Mobile application	Available	--
i-locate guides the citizen to the exit of the building by using indoor localization technologies.	Routing	In progress	x
	Proxy	Available	--
	Indoor localisation	Available	--
i-locate proposes different transportation options to reach his/her home.	Routing	Available	--
The user selects the preferred transportation means.	Mobile application	Available	--
i-locate calculates the best itineraries to reach the citizen's house according to the selected mean of transportation	Routing	Available	--
i-locate gives contextual information to reach the user's house.	Mobile application	Available	--

6.9 Municipality of Brasov, Romania

The Municipality of Brasov, Romania is a local authority that is organized and operates based on the principles of autonomy and decentralization.

The Municipality of Brasov has several locations, out of which 3 are going to be involved in i-locate:

- Brasov City Hall, No 8 Eroilor Boulevard: the interaction with the citizens is done through the Citizens' Information Centre and the main administrative offices of the municipality.
- Direction for Social Welfare, No 23 Mihail Kogalniceanu Boulevard. The building hosts few subordinated services: social allowances (No 23 Mihail Kogalniceanu Boulevard), child and family support (No 23 Mihail Kogalniceanu Boulevard), the social welfare canteen (No 11 Noiembrie 15 Boulevard), elder people support (No 33 Tudor Vladimirescu Street), protection of disabled people (No 23 Mihail Kogalniceanu Boulevard), social services (No 23 Mihail Kogalniceanu Boulevard).
- Fiscal Direction, No 4 Dorobantilor Street: the offices deal with local taxes' management according to the national legislation.

6.9.1 Citizen guidance

In the Municipality of Brasov pilot a use case regarding citizen guidance is considered. The following are an overview of the sub use cases expected.

- Indoor positioning / localization: visitors can use at their smartphones to see their indoor locations in real time.
- Save locations: visitors save important locations within the city hall, to make it easier to get back.
- Hyper local content: due to its indoor positioning technologies, the application can track the visitor's location and enable the delivery of useful hyper-local information.
- Content management: online tools make it easy to update content, with changes appearing instantly when the application is launched.
- Wheelchair accessible: opt-in accessible routing for citizens with mobility impairments makes it easier for everyone to get to their destinations.
- Indoor fire evacuation system: to be able to set up an evacuation model based on indoor routing.

Use case 1:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The user logs into the i-Locate application	Mobile application	In progress	x
i-Locate identifies the citizen	Identity	In progress	x

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	management		
i-Locate displays a menu with options	Mobile application	In progress	x
i-Locate localizes the citizen's geographical coordinates	Proxy	Available	--
	Indoor Positioning	Available	--
	Outdoor Positioning	Available	--
i-Locate displays the results and shows the user location into the building	Mobile application	Available	--

Use case 2:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
User selects the option "Save location"	Mobile application	In progress	x
i-Locate saves the current location as local information on the citizen's device	Mobile application logic	--	--

Use case 3:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
User asks i-Locate to list the indoor locations	Mobile application	In progress	x
	Spatial service	Available	--
User selects destination	Mobile application	Available	--
i-Locate identifies selected destination	Spatial service	Available	--
i-Locate displays optimal route to destination	Routing	Available	--

Use case 4:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
User introduces information related to the public office he/she wants to reach	Mobile application	In progress	x
i-Locate localizes the point of interest	Spatial service	Available	--
User selects option for wheelchair	Mobile application	In progress	x

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accessible routes			
i-Locate displays route, considering the restrictions imposed by the mobility impairments of the citizen	Routing	In progress	x
	Mobile application	Available	--

Use case 5:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
User follows route to reach his/her destination	End-user action	--	--
i-Locate tracks the location of the citizen while passing by different offices	Proxy	Available	--
	Indoor positioning	Available	--
	OGC spatial	Available	--
	Spatial service	Available	--
i-Locate delivers contextual information	Mobile application	Available	--
	Spatial service	Available	--
	OGC Spatial	Available	--

Use case 6:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
User logs into i-Locate	Mobile application	In progress	x
i-Locate identifies the citizen	Identity management	In progress	x
User hears fire evacuation alert	End-user action	--	--
User checks tablet / smartphone	End-user action	--	--
User selects fire evacuation route evacuation	Routing	Available	--
i-Locate displays fire evacuation route	Mobile application	Available	--

6.9.2 Parking management

The Municipality of Brasov is responsible for the management of the parking areas on the public domain. Due to its large population, the city gets crowded, especially in the central locations. This generates an increased difficulty in identifying outdoor public parking areas. A citizen driving a car

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in the centre of the town asks for guidance to get to the nearest public parking place. The system administrator updates the outdoor map of the Municipality marking the parking places belonging to the public domain.

Use case 1:

Use-case requirement	Toolkit component/ function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
User logs into the i-Locate application	Mobile application	In progress	x
i-Locate identifies the citizen	Identity management	In progress	x
User asks for guidance and selects the "Where am I?" option	Mobile application	In progress	x
i-Locate localizes the citizen's geographical coordinates	Proxy	Available	--
	Outdoor positioning	Available	--
User asks i-Locate to list the outdoor locations (public parking)	Mobile application	In progress	x
i-Locate displays the list of public outdoor parking places	Spatial service	Available	--
	OGC spatial	Available	--
User defines preferred options: nearest to his/her position	Mobile application	In progress	x
i-Locate identifies the selected destination	Spatial service	Available	--
i-Locate displays the optimal route to the destination	Routing	Available	--
	Mobile application	Available	--

Use case 2:

Use-case requirement	Toolkit component/ function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
System manager logs into i-Locate	Web application	In progress	x
	Identity management	In progress	x
i-Locate displays menu according to user role and access rights	Web application	In progress	x
	Identity management	In progress	x
System manager updates the item	Web application	Available	--

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and the map related to it	Spatial service	Available	--
	OGC Spatial	Available	--
i-Locate issues a confirmation message	Web application logic	--	--
i-Locate stores the latest updated map into the i-Locate database	Web application logic	--	--
	OGC Spatial	Available	--

6.10 Municipality of Genoa, Italy

The pilot case will be developed in the “Matitone” building. This is the main location of the Municipality offices whose official name is San Benigno Torre Nord. The building is where people have to go for services released both to professionals (or enterprises) and citizens. It is a building 109-meter high, of which several floors out of 26 host municipal offices. There is then a high presence of officers and public. This building houses the majority of technical departments of the Genoa Municipality (e.g. municipal police, offices related to land management and urban planning, municipal buildings management, management information system and ICT etc.). The total floor area is of 39,000 square meters of which 37,500 are in use at the Genoa Municipality offices. The offices host about 1,400 employees and around 80,000 visitors per year, composed by private citizens, professionals and enterprises

6.10.1 Safety at the Matitone

A user with mobility impairments needs to use some services offered by the Municipality situated within the Matitone. i-locate allows the information desk to monitor the user’s movement inside the building. In an emergency, the information desk can retrieve the position of the user and inform the nearest safety officer to easily find the user and help him/her carry out the correct procedure. The current system running emergency alarm is not adequate to the needs of employees with mobility impairments.

i-locate allows the employees with mobility impairments to be monitored by the information desk and localised if (s)he leaves their usual position: in emergency case, desk’s operator can localise him/her and inform the nearest safety officer.

Use case 1:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The disabled user logs in the system	Mobile application	In progress	x
	Identity management	In progress	x
i-locate localizes the person with mobility impairments.	Proxy	Available	--
	Indoor Localization	Available	--
i-locate guides the person with mobility impairments inside the building	Routing	In progress	x
	Geofencing	Available	--
	Indoor Localization	Available	--

Use case 2

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
i-locate localises the employee with mobility impairments	Proxy	Available	--
	Indoor Localization	Available	--

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i-locate notifies to the information desk where the employee with mobility impairments is	Web application	In progress	x
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Use case 3:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
i-locate localises the closest safety officer	Indoor Localization	Available	--
	Spatial service	Available	--
i-locate notifies the information desk where the closest safety officer is	Web application	In progress	x
Information desk notifies the closest safety officer where the employees with mobility impairments are	Web application logic	--	--

6.10.2 Guide visitors inside Matitone

A professional needing to use some services offered by the Municipality hosted within the Matitone, uses i-locate to be guided among the offices. The professional is able to select the right service among the ones offered by the Municipality and i-locate then guides him/her until he/she can find the office in charge to execute the selected procedure.

Use case 1:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The professional logs in the system	Mobile application	In progress	x
	Identity management	In progress	x
i-locate shows all the available services	Mobile application logic	--	--
The professional selects the services	Mobile application	In progress	x
i-locate guides the professional to the selected office	Routing	In progress	x
	Indoor Localization	Available	--
	Geofencing	Available	--
i-locate guides the user toward the exit.	Routing	In progress	x
	Geofencing	Available	--
	Indoor Localization	Available	--

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i-locate notifies the information desk if the user stays inside the building outside the set opening hours.	Mobile application logic	--	--
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Use case 2

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The professional requests i-locate to reach the exit	Mobile application	In progress	x
	Identity management	In progress	x
i-locate guides the user towards the exit	Routing	In progress	x
	Geofencing	Available	--
	Indoor Localization	Available	--
i-locate notifies the information desk if the user stays inside the building outside the established time	Mobile application	In progress	x
	Proxy	Available	--

6.11 Technoport, Luxembourg

Technoport is a high-tech incubator for start-ups, located in a science park. It is being used by entrepreneurs as a more or less permanent workplace and by visitors for individual meetings/coaching sessions with experts or entrepreneurs. Public events are moreover organised in the building on a regular basis. The total surface of Technoport building is 4,000 m².

6.11.1 Visitor welcoming and guidance

The “visitor welcoming and guidance” use case have been identified for this pilot.

Use case 1:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The visitor logs in the system.	Mobile application	In progress	x
i-locate identifies the visitor.	Identity management	In progress	x
The visitor provides information about the meetings / events he/she is planning to attend at Technoport (date, location i.e. building and specific room).	Mobile application	In progress	x
After authentication, the visitor can access information about the meetings he/she has recorded in the i-locate system.	Mobile application	In progress	x
i-locate provides information needed to download / use the service.	Mobile application	In progress	x

Use case 2:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The visitor logs into the system.	Mobile application	In progress	x
i-locate shows the list of events/meetings recorded by the visitor.	Identity management	Missing	--
	Mobile application	In progress	x
The visitor chooses a recorded meeting / event.	Mobile application	In progress	x
i-locate proposes different transportation options.	Routing (outdoor)	Available	--
	Spatial service	Available	--

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The visitor selects the transportation mean.	Mobile application	In progress	x
i-locate calculates the best itineraries to reach the right building according to the selected mean of transportation.	Routing (outdoor)	Available	--
i-locate gives contextual information to reach the right building.	Routing (outdoor)	Available	--

Use case 3:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
When the visitor enters the building door, i-locate tracks him/her. i-locate calculates the path to reach the meeting room and guides the visitor using the most recent map of the building.	Indoor localisation	Available	--
	Routing	In progress	x
	Proxy	Available	--

Use case 4:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The visitor asks i-locate to another location (outside the building).	Mobile application	Available	--
i-locate guides the patient outside the building using indoor localization technologies.	Routing (Indoor)	In progress	x
	Routing (Outdoor)	Available	--
i-locate proposes different transportation options to go to the given destination.	Routing (Outdoor)	Available	--
The visitor selects the transportation mean.	Mobile application	Available	--
i-locate calculates the best itineraries to reach the destination according to the selected mean of transportation.	Routing (Outdoor)	Available	--
i-locate provides contextual information to reach the destination.	Routing (Outdoor)	Available	--

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6.12 Brukenthal National Museum, Romania

The Brukenthal National Museum, Romania is a complex of five museums, which, without being separate administrative entities, have different locations and their own distinct cultural programs:

- the Brukenthal Art Gallery,
- the Museum of History,
- the Museum of Pharmacy,
- the Museum of Natural History, and
- “August von Spiess” Museum of Hunting.

6.12.1 Visitor welcoming and guidance

This use case is targeted at the outdoor and indoor localization of people. The use case concerns the following:

- Usage of indoor positioning technologies, allowing visitors to use their smartphone or tablet to look for guidance inside a building / exhibition.
- Interactive directories: visitors browse event schedules and gallery information so that they can enjoy everything the museum has to offer.
- Location aware content: indoor positioning technology tracks a visitor's location and automatically exposes layers of content about nearby exhibits. Visitors access video, audio and text.
- Visitor insights: the staff can extract location analytics to find out what content is viewed, which exhibits are popular, and where visitors actually spend their time. Indoor positioning technologies enable deep insight into visitor behaviour and gallery use.
- Content management: when exhibits and floor plans change the online tools make it easy to update content; changes appear instantly when the application is launched.

Use case 1:

Use-case requirement	Toolkit component/ function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
Visitor logs into i-Locate application	Mobile application	In progress	x
i-Locate identifies the visitor	Identity management	In progress	x
i-Locate displays a list of points of interest	Mobile application	In progress	x
	Spatial service	Available	--
Visitor selects destination	Mobile application	Available	--
i-Locate identifies the location	Spatial service	Available	--

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i-Locate lists the transportation alternatives	Routing	Available	--
	Proxy	Available	--
	Outdoor positioning	Available	--
Visitor selects preferred means of transport	Mobile application	Available	--
i-Locate generates a list of routes	Routing	Available	--
Visitor selects route	Mobile application	Available	--
i-Locate guides visitor to the museum	Mobile application	Available	--
	Routing	Available	--

Use case 2:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
i-Locate detects the visitor when entering the museum	Geofencing	Available	--
i-Locate guides the visitor to the ticket office	Mobile application	Available	--
	Routing	In progress	x
i-Locate displays a list of topics of interest	Mobile application	In progress	x
User selects an exhibition	Mobile application	In progress	x
	Spatial service	Available	--
i-Locate generates the route to destination	Routing	In progress	x
i-Locate detects the visitor when reaching the destination	Geofencing	Available	--
i-Locate generates a route for visiting the exhibition	Routing	In progress	x
i-Locate guides the visitor inside the exhibition	Mobile application	Available	--
	Indoor localisation	Available	--

Use case 3:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
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i-Locate locates the visitor while passing by each exhibited piece	Geofencing	Available	--
	Indoor positioning	Available	--
i-Locate delivers contextual information	Spatial service	Available	--

Use case 4:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
i-Locate identifies the visitor	Identity management	In progress	x
i-Locate asks the visitor for permission	Mobile application	In progress	x
i-Locate detects the visitor's position	Indoor positioning	Available	--
i-Locate records the time spent in each room	Location analytics	In progress	x
Museum staff can retrieve this information	Location analytics	In progress	x
	Mobile application logic	--	--

6.12.2 Tracking of assets

The Brukenthal National Museum hosts valuable (some of them unique) collections. The lack of an asset indoor tracking system makes it difficult to have real time information on the exact position of each asset that is exhibited inside the museum. Moreover, this has a great impact on ensuring the security of the respective assets, as the surveillance and protection of assets is rather based on the vigilance of the personnel of the museum.

This scenario addresses the indoor tracking of assets, both for inventory management purposes, and for security means.

Use case 1:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
Asset manager attaches a smart tag to the asset	End-user action	--	--
	Asset management	Available	--
Asset manager associates metadata	Asset management	Available	--
i-Locate displays an inventory of the assets	Asset management	Available	--
	Web application	In progress	x
Manager asks for assistance to locate	Asset management	Available	--

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a piece of equipment	Web application	In progress	x
i-Locate displays the location of an asset	Web application	Available	--
	Asset management	Available	--
	OGC spatial	Available	--
Manager asks for guidance to the location of the asset	Web application	In progress	x
	Asset management	Available	--
	Indoor location	Available	--
	Routing	In progress	x
i-Locate issues an alert when the asset is moved from its initial location	Asset management	Available	--
	Geofencing	Available	--

6.13 Municipality of Velletri, Italy

Government offices in the Town of Velletri are located in two historic buildings in Piazza Cesare Ottaviano Augusto:

- Palazzo Comunale strong mark of the political autonomy of the city, whose main floor houses the “Boardroom”, where it is still visible Augustus and the Sibyl’s prophecy;
- Palazzo dei Conservatori was established by 1870 judicial offices and headquarters of the courthouse today welcomes the institution’s technical offices.

The municipality has more than 54 000 inhabitants, but it is the second Court of Lazio and the main administrative center of the South bound the greater Rome area.

6.13.1 Citizen welcoming and guidance

Use case description: Citizens are guided from home to the town hall and among the offices of the town hall in order to complete all the steps required to perform a given procedure (related to, e.g., authorizations etc.)

Use case 1:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
User logs into the system	Mobile application	In progress	x
	Identity management	In progress	x
User requires information on the procedure she needs to perform	Mobile application logic	--	--
i-locate shows list of offices to be visited	Mobile application	In progress	x
	Spatial service	Available	--
User selects one of the offices in the list	Mobile application	Available	--
i-locate connects the citizen to the selected office via phone in order to book a meeting with the relevant officer	Mobile application logic	--	--

Use case 2:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
User logs into the system	Mobile application	In progress	x
	Identity	In progress	x

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	management		
User requires information on the procedure she needs to perform	Mobile application logic	--	--
i-locate shows list of offices to be visited	Mobile application	In progress	x
	Spatial service	Available	--
User selects to download the list of offices	Mobile application logic	--	--

Use case 3:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
User logs into the system	Mobile application	In progress	x
	Identity management	In progress	x
User chooses the list among the ones downloaded	Mobile application logic	--	--
i-locate looks up the offices and gets the corresponding geographical coordinates	OGC Spatial	Available	--
The user selects the transportation mean	Routing	Available	--
i-locate calculates the best itineraries to reach the town hall according to the selected mean of transportation	Routing	Available	--
i-locate gives contextual information to reach the town hall	Mobile application	Available	--
Once the town hall is reached i-locate connects transparently to the indoor positioning system in place	Proxy	Available	--
i-locate guides the user to the first office in the plan	Routing	Available	--
	Mobile application	In progress	x

Use case 4:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
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Once done with an office the user clicks 'next' in the plan being executed	Mobile application	In progress	x
i-locate checks the coordinates of the following office to be visited according to the plan	OGC Spatial	Available	--
	Spatial service	Available	--
i-locate localizes the citizen indoor	Proxy	Available	--
i-locate calculates the best path to reach the next office	Routing	Available	--
i-locate guides the citizen by using the most recent map of the town hall	Mobile application	In progress	x

Use case 5:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The user click 'done' once he/she is done with the last office in the plan	Mobile application logic	--	--
i-locate asks the citizen if she wants to be guided back home	Mobile application	Available	--
The user confirms she wants to go home using i-locate	Mobile application	Available	--
i-locate guides the citizen outside the town hall using indoor localization.	Proxy	Available	
	Mobile application	In progress	x
i-locate proposes different transportation options to go home.	Mobile application	Available	--
	Routing	Available	--
The user selects the transportation mean.	Mobile application	Available	--
i-locate calculates the best itineraries to reach the citizen's house according to the selected means of transportation.	Routing	Available	--
i-locate gives contextual information to reach the citizen's home.	Mobile application	Available	--



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6.14 Tremosine, Italy

Tremosine is a municipality in Italy in the region of Lake Garda in the North of Italy. The municipality is home to 18 small urban centres of which Pieve hosts the Municipality offices and Vesio is the most populated. On 19 November 2014, the hamlet of Champion, in the municipality of Tremosine, was the subject of a landslide with significant magnitude. This event, fortunately without casualties, caused severe infrastructural damage in the north of the town. Due to the hydrological instability of the area, the competent authorities have ordered the evacuation of the buildings in the vicinity, and a security zone was setup. At the request of the mayor of Tremosine, the scenario originally planned for this pilot was reformulated in order to use the LBS technology for purposes of surveillance / security upon the area subject to the landslide.

6.14.1 Control of an outdoor area

The Scenario concerns the following:

- Tracking of people: to detect location of persons in not permitted area.
- Tracking of vehicles: the system must be able to count passing vehicles (e.g. to assess traffic levels, to detect queues and to detect when a car stops in a critical position).

Use case 1:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The user accesses the system from a webpage or mobile device.	Web application	In progress	x
i-locate requires authentication and logs accesses to the system.	Identity management	In progress	x
The user can access to the live views of the video cameras, save screenshots locally on their device or share them with other users.	Web application logic	--	--
The system logs all activities carried on by the users (authentication is requested to carry on advanced tasks such as taking screenshots, etc.).	Web application logic	--	--
	Identity management	In progress	x

Use case 2:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The user logs in to the system.	Identity management	In progress	x
i-locate shows all the available	Location analytics	In progress	x

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features including access to statistical information regarding hourly transits etc.			
The user can download non-sensitive statistical data regarding number of persons or vehicles transiting from the road, etc.	Location analytics	In progress	x
	Identity management	In progress	x
	Web application logic	--	--

Use case 3:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The user logs in to the system.	Identity management	In progress	x
i-locate shows all the available features including access to statistical information regarding hourly transits etc.	Web application	In progress	x
	Location analytics	In progress	x
The user can set a command to receive automatic notifications regarding specific traffic conditions or area violation.	Web application logic	--	--
The user receives the alert on his/her device.	Web application logic	--	--
In case of event (as set by the user) i-locate sends a message (e.g. an SMS, e-mail or other) to the user.	Web application logic	--	--

Use case 4:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The user logs in i-locate with the appropriate credentials.	Identity management	In progress	x
	Web application	In progress	x
i-locate identifies the user.	Identity management	In progress	x
i-locate displays a list of advanced	Web application	--	--

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features.	logic		
The user selects the area of the video images where to run video analysis to track vehicles or persons.	Web application logic	--	--
	Geofencing	Available	--
The system starts analysing video feeds. Whenever a traffic jam or an incursion in a restricted area is detected, a message is shown. The system allows downloading statistics data or short video.	Web application logic	--	--
	Geofencing	Available	

Use case 5:

Use-case requirement	Toolkit component/function	Planned in toolkit V.1.0	Planned in toolkit V.2.0
The user logs in i-locate with the appropriate credentials.	Identity management	In progress	x
	Web application	In progress	x
i-locate identifies the user.	Identity management	In progress	x
i-locate displays a list of alter conditions that can be set.	Web application logic	--	--
The user selects the conditions that should trigger an alert. This include: When a person (or something) is in a not permitted area. When a queue is identified. When a queue is finished. Etc.	Web application logic	--	--
	Geofencing	Available	--
The user selects the message to be sent (e.g. SMS, e-mail, etc.) for each of the alert.	Web application logic	--	--
In case an alert condition is met, a message is sent together with the associate image (or video) via e-mail etc. (as set by the user). The message includes a map with the location of the event.	Web application logic	--	--

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The user can download relevant data or save images of relevant events.	Up/Download	Available	--
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7 Conclusions

As reported in the previous sections, in the first release of the i-locate toolkit, most of the core modules are already available or almost done. In fact, in this first part of the project, and in the early stage of the deployment phase, most of the effort was devoted to implement/integrate transversal modules usable in commons Pilot Use Case.

In the second phase, a more "dedicated development time" around user-specific modules per specific pilot will be allocated. The fact that many aspects related to end-user application are in progress is in line with the actual plan and does not represent a deviation from the workplan. Indeed, the toolkit per se is not meant to include application-level logic able to support all the specific features of each single pilot site. The Mobile application and web GUI shipped with the toolkit are indeed meant to act as technological enablers, able to provide a flexible and easy to extend 'template' to be used by technical supporting partners in order to develop the application logic required in the single pilot sites.

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