Interreg CENTRAL EUROPE

niCE-life

European Union
European Regional
Development Fund

I.S.R.A.A.
Istituto per Servizi di Ricovero
e Assistenza agli Anziani

Coordination Meeting
|25/05/2020

Development of advanced GPS-based tracking system

niCE-life | PP7 |ISRAA

WP T.2.3
Development of advanced GPS-based tracking system

Interreg
CENTRAL EUROPE

niCE-life

European Union
European Regional
Development Fund

Dementia has become a major global concern and surveillance technology might provide support for informal caregivers and people with dementia

The system based on gps technology aims to guarantee a higher level of freedom to the person suffering from dementia, while ensuring a high level of protection and safety.

Main Challenges for an effective implementation of GPS tracking technology:

- User involvement in planning, developing and implementing technologies for persons with dementia;

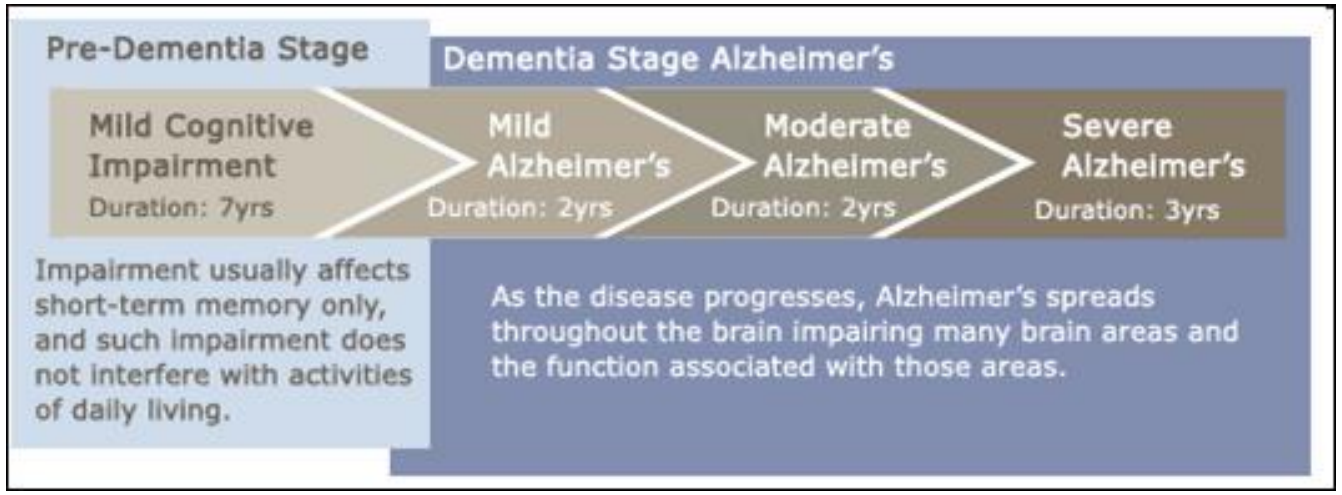
- Identifying, testing and Implementing GPS tracking solutions which do not interfere too much in the everyday lives of users, but support them in maintaining their individual lifestyles;

- Intergration of ICT solutions in the care model

TARGET GROUP: Persons with Dementia

Specific focus on MCI (Mild cognitive impairment)

Mild cognitive impairment (MCI) is a neurological disorder which involves cognitive impairments beyond those expected based on an individual's age and education but which are not significant enough to interfere with instrumental activities of daily living. MCI may occur as a transitional stage between normal aging and dementia, especially Alzheimer's disease. It includes both memory and non-memory impairments



Benefits of using gps tracking technology

Increasing the safety of the person with dementia, while supporting the formal and informal caregiver in the care activity. This will cover 3 main variables:

- ORIENTATION SUPPORT
- Preventing dangerous situations
- Reduce caregivers’ anxiety

ORIENTATION SUPPORT

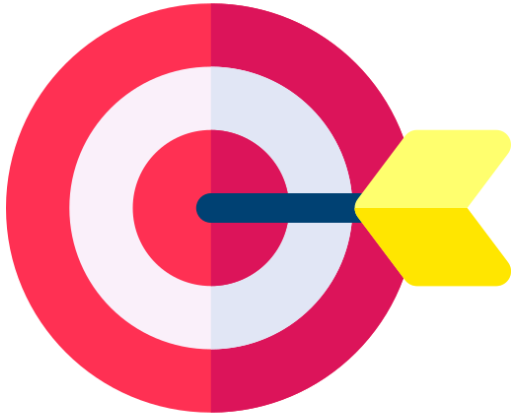
Interests on the implementation in the use case elderly person at home or at the cohousing;

Using this technology the elderly person will have the possibility to:

- Going out alone;
- Contact your caregiver or care facility actively and easily;
- Be contacted if you leave certain pre-set areas;

ORIENTATION SUPPORT

Purpose:



- Not survillance of persons
- But the possibility to reach persons in case of emergency
- Being able to offer help, if necessary

Preventing dangerous situations

Supporting people's orientation can play a key role in:

- Reducing the risk of severely disoriented people getting lost (with associated risk of falls);
- Ensuring greater freedom also for people living in retirement homes;
- Reducing those methods of restraint that limit people's freedom
- Protect users in cases of intrusions into their rights to freedom

REDUCE CAREGIVERS' ANXIETY

- Reduce the conflict between caregivers and older person;
- Increase the quality of life of the caregiver. As much evidence shows, in many European countries informal carers play a decisive role in providing care for people with dementia.

Use-case: Seniors in nursing home

The gps tracking technology can support the daily care work in elderly residences. This technology can provide greater autonomy to patients and offer a tool to facilitate control by formal caregivers.

- It would be useful to integrate gps tracking with a **fall detection system**;
- The technology would allow older people to leave the facility autonomously in predefined areas.

Use-case: Seniors in cohousing or at home

A useful implementation of gps tracking technology could be at people's homes or for those living independently in a senior cohousing;

In this case, the positive impact on informal caregivers is also massified;

In this scenario, the benefits of **orientation support** are maximized;

In addition, seniors can actively use the technology to contact both informal and formal caregivers.

Is there any added value in detecting dementia and any worsening of the disease?

FORMAL CAREGIVER

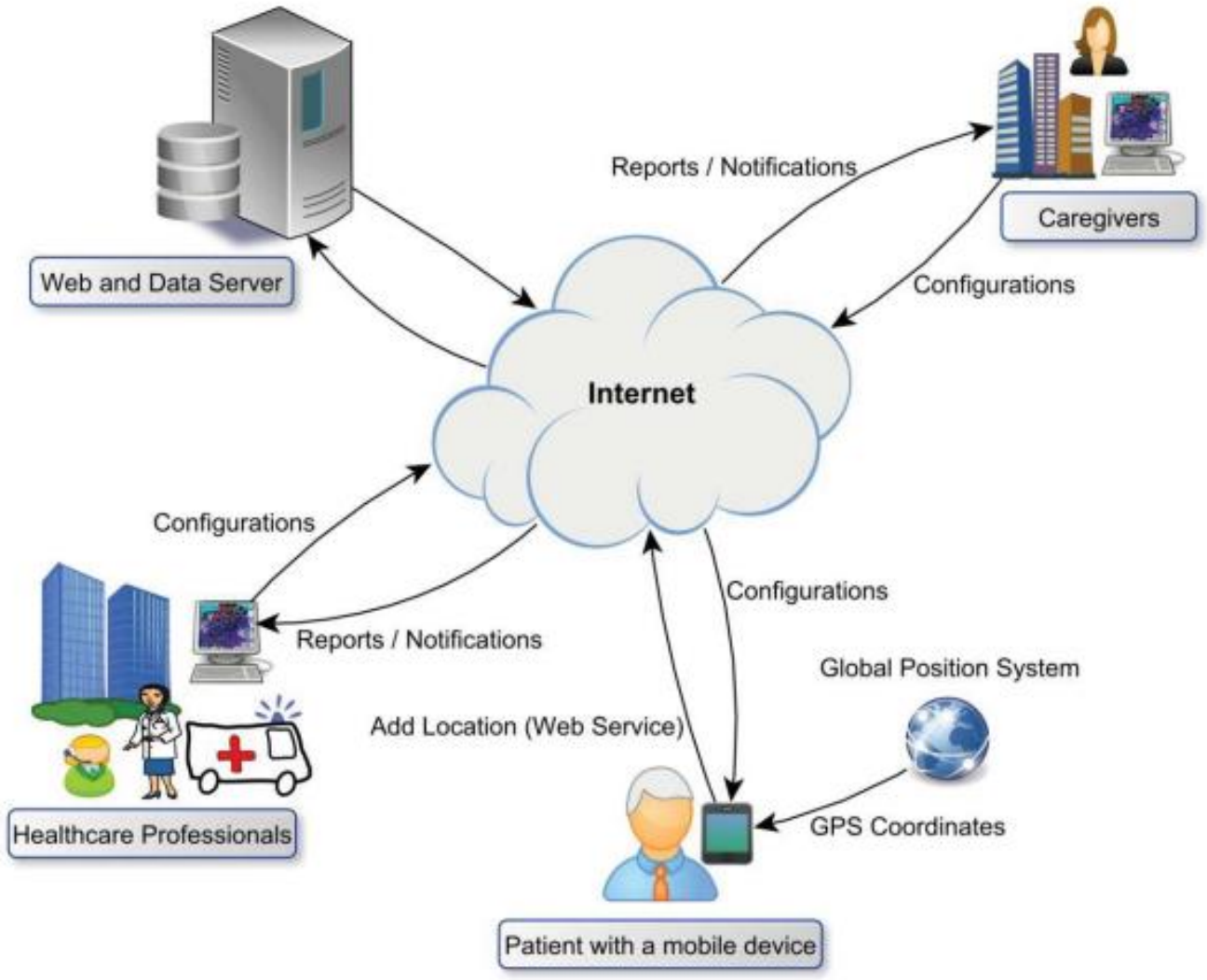
The care provider will make available to the care manager/nurse the monitoring station that will play a useful role in the monitoring:

- Responding to requests from senior citizens;
- Entering the rescue chain in the event of an emergency

INFORMAL CAREGIVER

Through a mobile or web based application the informal caregiver:

- will be the first in the chain of care in case we consider elderly person not living in a nursing home;
- Seniors will be able to live with greater serenity thanks to technological support



Operating hypothesis of the overall model

Figure 1: An architecture for a GPS tracking solution (Sara Paiva and Carlos Abreu / Procedia Technology 7 4234).

A key issue to address: PRIVACY

Privacy has become a central topic, these days, especially in the tech and software domains. People don’t like to be excessively monitored and observed. For Alzheimer patients, the same holds true in particular for people with mild conditions, in early stages, when a free and normal life is desired. It becomes imperative that sensitive or private data is not disclosed without the consensus of the person or unless the system detects an almost certain risk to the patient.

It is essential to define together with the technology partners a model and technologies consistent with the European privacy standards!

THE CRITERIA TO BE ANALYSED TO IDENTIFY THE RIGHT TECHNOLOGY FOR THE PROJECT

- EFFECT (**SAFETY**, INDIPENDENCE, CONFIDENCE, FREE TIME..)
- PRODUCT CHARACTERISTICS (**PRICE**, SIZE, **SOS BUTTON**, FALL DETECTION)
- USER- FRIENDLINESS (SIMPLE AND USEFUL)
- USER – CONTEXT (**ACCEPTANCE**, ACCURACY, PERFORMANCE, COMMUNICATION)
- PRIVACY (**DATA**, AUTONOMY, LEGAL)
- DESING DETAILS (**BATTERY**, SIMPLICITY)

Owerview of GPS technologies for seniors:

https://www.seniorlink.com/blog/the-50-best-gps-trackers-for-seniors

https://www.caringvillage.com/product-review/top-10-products-track-elderly-location/

SOME EXAMPLES TO START THE DISCUSSION:

Laipac S-911

Device type
Personal

Special features
Internal Battery, SOS

Communication methods
GPRS (2G), SMS

Manufacturer URL
http://www.laipac.com

How to connect to GpsGate
gpsgate.com/howtoconnect
Plugin name **Laipac**

Now Laipac also offers a solution based on a mobile application (Guardian Angel Connect App: https://laipac.com/guardian-angel-connect-mobile-app/), they also using wearable technologies (https://laipac.com/wearables/).

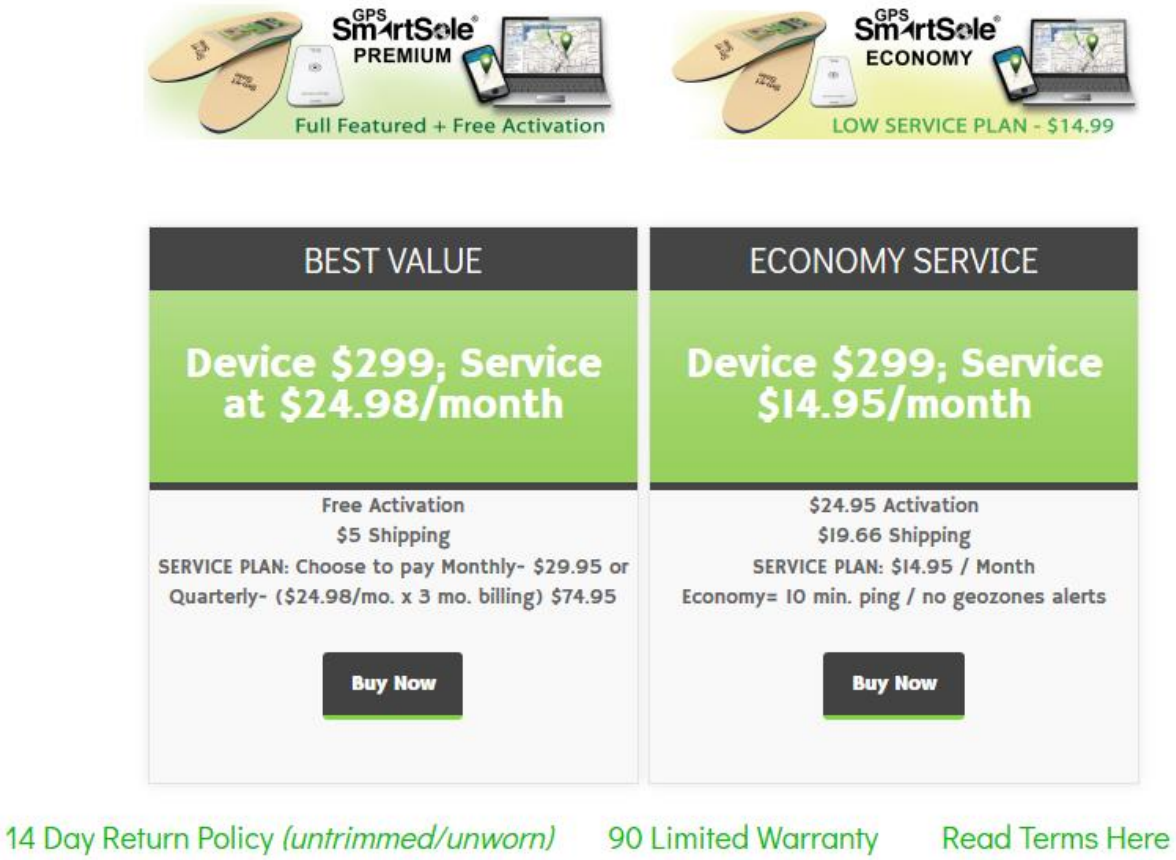
SOME EXAMPLES TO START THE DISCUSSION:

Samsung SmartThings Tracker (https://www.samsung.com/us/smart-home/smartthings-tracker/, cena: 99.99 USD), with LTE but with monthly fees.

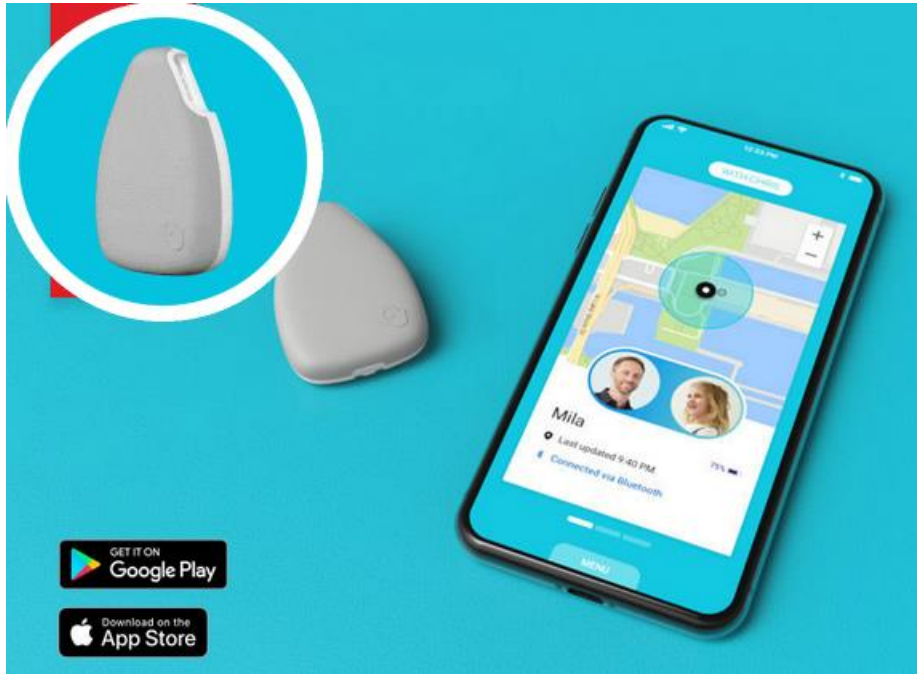
iTraq Nano (https://www.itraq.com/?rfsn=608069.1c25a, price 129 USD includes je activation for one month)

Trax 3G (https://traxfamily.com/product/trax3g/, price 1599 SEK)

SOME EXAMPLES TO START THE DISCUSSION:



SmartSole – GPS locator as insole (https://gpssmartsole.com/gpssmartsole/)



Jiobit (https://www.jiobit.com/product, 129.99 USD per device and 8.99 USD monthly with contract for 2 years)

SOME EXAMPLES TO START THE DISCUSSION:

Finally, all-inclusive solution, which also takes into account the needs arising from the spread of COVID.19

- ✔ Watch usability
- ✔ Measurement of Heart Beat
- ✔ Measurement of SpO2 on the WRIST (Oxymeter)
- ✔ Measurement of Body Temperature
- ✔ Detection of movement and falling
- ✔ Indoor and outdoor Localization
- ✔ Detection of presence and removing from wrist (PROXIMITY DETECTION)
- ✔ Class1 medical device compliance
- ✔ Resistance to Sterilization
- ✔ Smartphone or tablet connectivity
- ✔ Direct Cloud connectivity

Good practice identified at European level:

SPES PROJECT

SPES project implements tele-health and entertainment platform in 4 cities: Ferrara, Vienna, Brno and Kosice, focusing on the following diseases: respiratory problems dementia, disabled people and social exclusion.

SPES aims at transferring the approach and results achieved in the implementation of the OLDES. project.

SUPPORT PATIENTS THROUGH E-SERVICE SOLUTIONS

PILOTS

SPES project implements tele-health and entertainment platform in 4 cities: Ferrara, Vienna, Brno and Kosice.

Good practice identified at European level:

FOLLOW.ME

Follow.Me aims to satisfy people's desire - mainly family members and doctors - of monitoring the position of elderly people with different forms of dementia and Alzheimer, in order to prevent danger situations. There is nothing more frightening than losing a loved person. Satellite tracking devices can help quickly locate missing people. Keeping track of an elderly adult, with health or mental problems, is an important challenge for ageing well

http://followmeproject.eu/overview.html

EVALUATION PROCESS

We need partners contribution to define the process of evaluating the implementation of GPS technology.
In any case, we believe that the following actors should be included:

INVOLVED PARTNERS

WP 2		T2.3
		GPS tracking
PP1	Petržalka	
PP2	Brno	Involved
PP3	Olomouc	Involved
PP4	STU, Bratislava	Involved
PP5	LEPIDA, IT	Involved
PP6	LHA Bologna	Involved
PP7	ISRAA	Lead+Testing
PP8	Austria	
PP9	Warsawa	
PP10	Slovenia	

INVOLVED PARTNERS

How to implement the DT.2.3.2 deliverable together?

Deliverable D.T2.3.2	*Deliverable title* Design and development of the GPS tool	*Description of deliverable* Design and construction of localisation device and peripheral devices upscaled on the basis of the technological solutions developed by SPES project and as a result of the pilot investment (applying various inexpensive sensors).	*Delivery month* 04.2020	*Quantification/target* 1,00

INVOLVED PARTNERS

Deliverable D.T2.3.3	*Deliverable title* Development of customised monitoring software	*Description of deliverable* Programming of customised software for care givers integrating GPS tool with intelligent monitoring platform and allowing monitoring of health conditions and social activities of persons suffering from dementia and analyse received data.	*Delivery month* 09.2020	*Quantification/target* 1,00

European Union

Interreg CENTRAL EUROPE

niCE-life

Thank you for your attention

ISRAA
Davide Tuis – Oscar Zanutto
tuis.davide@israa.it / faber@israa.it

COORDINATION MEETING

Deliverable D.T2.3.1

Version 1
05 2020

1. Attendants:

- Daivde Tuis
- Radim Burget
- Cristina Malvi
- Jan Bendik
- Michal Stybnar
- Oscar Zanutto
- Sabrina Raspanti
- Teresa Gallelli

2. General project info:

- Report about status of the application – Davide presented

- Presentation of result

3.Status of T2.3.1:

- Security needs to be discussed with technology partners
- Radim: is there consent of patients / family to store the information?
- Criteria – several point of view, research what is the best
- Compared to solution available in USA
- Radim: Samsung GPS - what are montly fees?
- Teresa, Davide:
    - tool with compicance to Class 1 medical device (150€ – 200€)
    - Radim: access to data programmatically?
    - Teresa: security is important to check
- GP:
    - SPES project (Support patients through e-service solution)
    - FOLLOW.ME
- Radim: will check who is involved from Brno into SPES project (Support patients through e-service solution)

3. Discussion

- T2.3.1 – almost done
- T2.3.2 (Design and development): until half of June – there will be a document.
- Contribution of other involved partners: evaluating the technology
- Teresa + Davide: common platform for e.g. 3 tools
- STUBA(Jozef Bendik) + Leipida(Teresa) : can offer to Davide expertise for GPS tracking devices
- BUT: SPES project (Stepnickova, CVUT), Daniel Novak (Dementia specialization, CVUT)

Interreg
CENTRAL EUROPE
niCE-life
European Union
European Regional
Development Fund
I.S.R.A.A.
Istituto per Servizi di Ricovero
e Assistenza agli Anziani
TAKING
COOPERATION
FORWARD
Coordination Meeting
|
Development of advanced GPS-based tracking system
niCE-life | PP7 | ISRAA

WP T.2.3
Development of advanced
GPS-based tracking
system
Interreg
CENTRAL EUROPE
niCE-life
European Union
European Regional
Development Fund

Dementia has become a major global concern and surveillance technology might provide support for informal caregivers and people with dementia

The system based on gps technology aims to guarantee a higher level of freedom to the person suffering from dementia, while ensuring a high level of protection and safety.

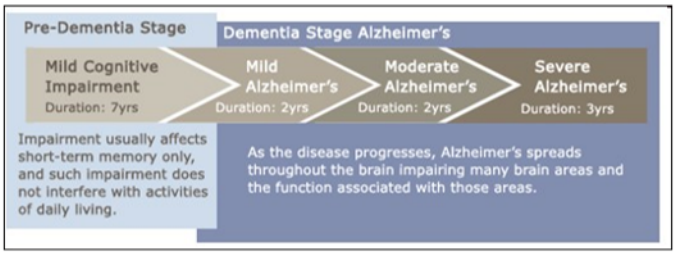
Main Challenges for an effective implementation of GPS tracking technology:

- User involvement in planning, developing and implementing technologies for persons with dementia;
- Identifying, testing and Implementing GPS tracking solutions which do not interfere too much in the everyday lives of users, but support them in maintaining their individual lifestyles;
- Intergration of ICT solutions in the care model

TARGET GROUP: Persons with Dementia

Specific focus on MCI (Mild cognitive impairment)

Mild cognitive impairment (MCI) is a neurological disorder which involves cognitive impairments beyond those expected based on an individual's age and education but which are not significant enough to interfere with instrumental activities of daily living. MCI may occur as a transitional stage between normal aging and dementia, especially Alzheimer's disease. It includes both memory and non -memory impairments



Benefits of using gps tracking technology

Increasing the safety of the person with dementia, while supporting the formal and informal caregiver in the care activity. This will cover two main variables:

- ORIENTATION SUPPORT
- Preventing dangerous situations
- Reduce caregivers' anxiety

ORIENTATION SUPPORT

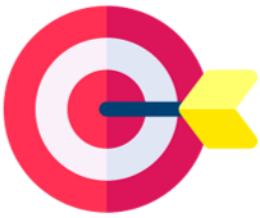
Interests on the implementation in the use case elderly person at home or at the cohousing;

Using this technology the elderly person will be able to leave their home freely, but at the same time have the possibility to:

- Going out on your own
- Contact your caregiver or care facility actively and easily;
- Be contacted if you leave certain pre-set areas;

ORIENTATION SUPPORT

Purpose :



- Not survillance of persons
- But the possibility to reach persons in case of emergency
- Being able to offer help, if necessary

Preventing dangerous situations

Supporting people's orientation can play a key role in:

- Reducing the risk of severely disoriented people getting lost (with associated risk of falls);
- Ensuring greater freedom also for people living in retirement homes;
- Reducing those methods of restraint that limit people's freedom
- Ptoects users in cases of intrusionsinto their rights to freedom

REDUCE CAREGIVERS' ANXIETY

- Reduce the conflict between caregivers' and older person;
- Increase the quality of life of the caregiver. As much evidence shows, in many European countries informal carers play a decisive role in providing care for people with dementia.

Use-case: Seniors in nursing home

The gps tracking technology can support the daily care work in elderly residences. This technology can provide greater autonomy to patients and offer a tool to facilitate control by formal caregivers.

- It would be useful to integrate gps tracking with a **fall detection system**;
- The technology would allow older people to leave the facility autonomously in predefined areas .

Use-case: Seniors in cohousing or at home

A useful implementation of gps tracking technology could be at people's homes or for those living independently in a senior cohousing;

In this case, the positive impact on informal caregivers is also massified;

In this scenario, the benefits of **orientation support** are maximized;

In addition, seniors can actively use the technology to contact both informal and formal caregivers

Is there any added value in detecting dementia and any worsening of the disease?

FORMAL CAREGIVER

The care provider will make available to the care manager/nurse the monitoring station that will play a useful role in the monitoring:

- Responding to requests from senior citizens;
- Entering the rescue chain in the event of an emergency

INFORMAL CAREGIVER

Through a mobile or web based application the informal caregiver:

- will be the first in the chain of care in case you're talking about an elderly person not living in a facility;
- He will be able to live with greater serenity thanks to technological support

Operating hypothesis of the overall model

Figure 1: An architecture for a GPS tracking solution (Sara Paiva and Carlos Abreu / Procedia Technology 7 4234).

A key issue to address: PRIVACY

Privacy has become a central topic, these days, especially in the tech and softwaredomains. Peopledon't like to be excessively monitored andobserved. For Alzheimer patients, the same holds true in particular for people withmild conditions, in early stages, when a free and normal life is desired. It becomesimperative thatsensitive or private data is not disclosed without the consensus of the person unless the system detects an almost certain risk to the patient.

It is essential to define together with the technology partners a model and technologies consistent with the European privacy standards!

THE CRITERIA TO BE ANALYSED TO IDENTIFY THE RIGHT TECHNOLOGY FOR THE PROJECT

- EFFECT (**SAFETY**, INDIPENDENCE, CONFIDENCE, FREE TIME..)
- PRODUCT CHARACTERISTICS (**PRICE**, SIZE, **SOS BUTTON**, FALL DETECTION)
- USER- FRIENDLINESS (SIMPLE AND USEFUL)
- USER – CONTEXT (**ACCEPTANCE**, ACCURACY, PERFORMANCE, COMMUNICATION)
- PRIVACY (**DATA**, AUTONOMY, LEGAL)
- DESING DETAILS (**BATTERY**, SIMPLICITY)

Owerview of GPS technologies for seniors:

https://www.seniorlink.com/blog/the-50-best-gps-trackers-for-seniors

https://www.caringvillage.com/product-review/top-10-products-track-elderly-location/

SOME EXAMPLES TO START THE DISCUSSION:

Laipac S-911

Device type
Personal

Special features
Internal Battery, SOS

Communication methods
GPRS (2G), SMS

Manufacturer URL
http://www.laipac.com

How to connect to GpsGate
gpsgate.com/howtoconnect
Plugin name **Laipac**

Now Laipac also offers a solution based on a mobile application (Guardian Angel Connect App: https://laipac.com/guardian-angel-connect-mobile-app/), they also using wearable technologies (https://laipac.com/wearables/).

SOME EXAMPLES TO START THE DISCUSSION:

Samsung SmartThings Tracker (https://www.samsung.com/us/smart-home/smartthingstracker/, cena: 99.99 USD), with LTE but with monthly fees.

iTraq Nano (https://www.itraq.com/?rfsn=6080691c25a, price 129 USD includes je activation for one month)

Trax 3G (https://traxfamily.com/product/trax3g/, price 1599 SEK)

SOME EXAMPLES TO START THE DISCUSSION:

SmartSole – GPS locator insole (https://gpssmartsole.com/gpssmartsole/)

Jiobit (https://www.jiobit.com/product 129.99 USD per device and 8.99 USD monthly with contract for 2 years)

SOME EXAMPLES TO START THE DISCUSSION:

Finally, all-inclusive solution, which also takes into account the needs arising from the spread of COVID.19

- ✔ Watch usability
- ✔ Measurement of Heart Beat
- ✔ Measurement of SpO2 on the WRIST (Oxymeter)
- ✔ Measurement of Body Temperature
- ✔ Detection of movement and falling
- ✔ Indoor and outdoor Localization
- ✔ Detection of presence and removing from wrist (PROXIMITY DETECTION)
- ✔ Class1 medical device compliance
- ✔ Resistance to Sterilization
- ✔ Smartphone or tablet connectivity
- ✔ Direct Cloud connectivity

Good practice identified at European level:

SPES PROJECT

SPES project implements tele health and entertainment platform in 4 cities: Ferrara, Vienna, Brno and Kosice, focusing on the following diseases: respiratory problems dementia, handicapped people and social exclusion.

SPES aims at transferring the approach and results achieved in the implementation of the OLDES. project.

Good practice identified at European level:

FOLLOW.ME

*Follow.Me*aims to satisfy people's desire - mainly family members and doctors - of monitoring the position of elderly people with different forms of dementia and Alzheimer, in order to prevent danger situations. There is nothing more frightening than losing a loved person. Satellite tracking devices can help quickly locate missing people. Keeping track of an elderly adult, with health or mental problems, is an important challenge for ageingwell

http://followmeproject.eu/overview.html

EVALUATION PROCESS

We need partners contribution to define the process of evaluating the implementation of GPS technology.
In any case, we believe that the following actors should be included:

INVOLVED PARTNERS

WP 2		T2.3
		GPS tracking
PP1	Petržalka	
PP2	Brno	Involved
PP3	Olomouc	Involved
PP4	STU, Bratislava	Involved
PP5	LEPIDA, IT	Involved
PP6	LHA Bologna	Involved
PP7	ISRAA	Lead+Testing
PP8	Austria	
PP9	Warsawa	
PP10	Slovenia	

Interreg
CENTRAL EUROPE
European Union
niCE-life
Thank you for your attention
ISRAA
Davide Tuis– OscarZanutto
/ faber@israa.it