GRACE - GUIDANCE AND RECOVERY AGEING CARE ENVIRONMENT

GOOD PRACTICE - PROJECT

Contents

Introduction to the Good Practice:

GRACE is a novel health care monitoring platform that combines wearable devices, mobile apps and Cloud solutions in order to bring together patients, families, health carers, emergency services, insurance companies and other players. The GRACE device is offered in the form of a jewel in order to reduce the stigmatization that users might feel towards heavy, ugly, medical devices that they usually are given. The Good Practise of this project relates with the Quadruple-Helix approach that was taken, since the Lead Participant invited several area entities to give insights and feedback on their needs, on the solution itself, what would be desirable and other important comments – e.g. clinical validation of the solution – in order to develop an effective solution.

Problem:

One of the main challenges that Europe (and most developed countries) is facing is its ageing population. In fact, it is estimated that by 2060, one in three Europeans will be over 65. This translates in a huge increase of the public costs for health and social care which, in a snowball effect, will put more pressure on the ever-decreasing active population to generate enough revenue to cope with this expense. In fact, the rate of working "active" people is currently on 4 to 1 when compared to "inactive" people but this will change to 2 to 1 by 2060. Although this seems an epic challenge for the European society, it also opens up a vast market opportunity - the "Silver Economy", as it is known. Europe is quite well-placed to benefit from this challenge. In fact, politicians and overall society are quite aware of the problem and there are currently several policies to address it in many ways. Europe has several strengths in economic sectors related to health and social care, as well as with ICT sectors that can foster solutions for this challenge. Plus, Europeans have a high adoption rate of technologies and there is a good technological and network infrastructure available. Nowadays, modern families suffer several dilemmas with their loved ones: in a first stage, the elderly population starts to manifest relevant health issues (including mental) yet, they refuse to upset or interrupt their sons' and daughters' busy lives and refuse to see their own independence as humans to become more limited. On the other side, families' worries increase, naturally, observing this kind of evolution. This puts more stress on the family, both mentally, physically and financially. Families try to cope with this through either contracting nursing/care systems that accompany their loved ones through a significant part of their days and nights. In more severe cases, they need to intern their loves ones in specific care homes and day- care centers. Both solutions are very costly for the families and the alternative is for the family itself to try to manage the problem and take daily direct care of the senior member - which implies quitting a paid job or trying to cope everything and getting burnt out. Moreover, many of the nursing/caring staff don't have a proper complete medical education or all the means in-site to correctly take care in case of an emergency and the majority of accidents - such as falls - occur when the seniors are briefly left alone or unattended. So, after spending quite a lot of money, families still can't feel less stressed about their loves ones' conditions. While at the same time these still feel that they are losing their independence and are being a burden.

Solution:

Given the above, GRACE - acronym for Guidance and Recovery Aging Care Environment – aims to provide a set of solutions to allow people to age actively and in good health, both physically and mentally, by also reinventing - at the same time - the current system for health and social care through the delivery of an innovative ICT-product that delivers in a more efficient (and cheaper) way health care monitoring services and improves the mental well-being of elderly people and their families, through the use of a tracking web-platform connected to mobile apps and existing wearable devices (e.g. necklaces, bracelets) that monitor health parameters, providing a constant non-invasive monitoring and alert platform, tranquilizing families, offering independence and safety to elderly people and providing important health- data in real-time to doctors, emergency services and carers online.

Impact:

This project has high impact on the sustainability of long-term care in an ageing Europe. As we know, Up to 10% of European Population care for an elderly member of their family to some degree. This will rise as demographic aging continues, affecting all of us. By employing wearable technologies that can reduce these costs effectively, the project impacts on a wide range of indicators, from less injuries to improved mental well-being, as well as reductions in costs. It a challenge to provide improved "peace of mind", especially to family members, and this projects addresses that goal, thus having a positive impact on people's everyday lives.

1. Relevancy of the Good Practise (GP) project

The "Relevancy of the GP project" section provides quick check and definition of its relevancy in regards to HoCare project objectives.

Good practice of quadruple-helix cooperation in R&I?	Yes, this GP project includes good practices of quadruple-helix cooperation in R&I
Good practice of delivery of Home Care R&I?	Yes, this GP project includes good practices of delivery of Home Care R&I.
If not in Home Care R&I, describbtion and proof of its potential for transferability to delivery of Home Care R&I	
Generation of innovation in home care through answering unmet needs identified by formal or informal healthcare providers?	Yes, this GP project includes good practices of innovation through answering unmet needs.
Generation of innovation in home care through public driven innovation?	No, this GP project does not include good practices of public driven innovation.
Generation of innovation in home care via quadruple-helix cooperation for quicker delivery to the market?	Yes, this GP project includes good practices of innovation via cooperation for quicker delivery to the market.

2. Quick overview of the GP project

The "Quick overview of the GP project" section provides initial overview of the good practice project (GP project) and enables readers to see if this GP project idea is relevant for possible transfer to their organization potential innovation activities.

Name of the GP project	GRACE – Guidance and Recovery Aging Care Environment
Region of origin of GP project	Madeira (PT)
5 keywords that best describe the content of the GP project	Human Computer Interaction, well-being, health, interaction, data mining
Relevant Programme name through which the GP project has been funded	This project has been privately funded to the date. A proposal to Madeira's "ProCiência2020" R&D call is in the making.
Relevant support programme / intervention area name of the GP project through which it was funded	-
Single or multiple recipients?	single recipient
Type of lead recipient and its role (SME, LME, research centre, innovation centre, network/association, university/school, municipality, other public body, other (specify)	SME. The project origins from the Portuguese SME "Wow!Systems" which has been leading it's development in all aspects.
Types of participating partners and	1. M-ITI Madeira Interactive Technologies Institute (R&D

their roles (list all participating partner types. E.g.: hospital, social house, senior house, patient association, networks, SMEs, LMEs, research actors, business supporting organizations, public institutions/regulators, other (specify)	Centre, PT) Has contributing in terms of research in the fields of psychology and HCI); 2. NUUMStudio Lda. (SME, PT). Participating through the study an design of the most appealing jewels that encapsulate the technology; 3. Cardiology Dept. of Hospital Nélio Mendonça Funchal (hospital, PT) 4. NBC Capital Ltd. (VC/business supporting, UK). Has contributing in terms of studying and testing the prototypes in home cares in the UK. There are other entities that have been participating (e.g. Social Security Institution of Madeira and Civil Protection of the Azores – PT) but not in a formal way, therefore, not accounted on this section.

3. Transferability

The "Transferability" section provides more detailed review of strengths and weaknesses of this GP project including description of necessary basic conditions for region and leading organization to potentially transfer it. At the end of the section, the key threats in the successful transfer open up possibility to focus on specific relevant issues important for the successful transfer.

Strengths and weaknesses of the project

What are the GP project strengths? Why it was funded?	The project's strengths relay on the appeal that users feel towards the solution – both the end-users and carers/families – as well as the ease of use and the fact that it tries to solve several needs from the different actos (users, carers, families, medics, social security services). The project is privately funded by the Lead Participant who believes it could bring an innovative commercial solution to the market.
What are the key weaknesses of the GP project?	The major weakness of the project is related with the time-to-market. Since it's privately funded, the project's development has been slow and should be only available in the market by the end of 2018. Other solutions may appear, technology may evolve into other disruptive solutions, turning this obsolete although it's quite uncertain that it would happen.

Basic conditions for successful transfer

Why is this GP project transferable? – innovation, impact, financial, legal, and timeframe aspects	The current project is fully transferable as it's core functionality is based online (medical history, analytic-prediction system, user registration, emergency notifications, etc.). Also the platform supports multi-language and the GRACE device complies with regulatory standards within Europe and can be used by most health providers (private and public) without any modifications. Home carers gain access to real-time information and data history that can increase their ability in order to better serve their patients. This may be quite important as in many countries carers often don't have a vast academic expertise or knowledge in certain medical domains.

What are the basic conditions the region needs to have to be successful in transferring this good practise?	Transferability would be quite easy as setting up an account for the Home Care in the web platform and then associating to it the several users (medics, staff, etc.) and patients. Of course exploitation model such be defined by the entity interested in transferring the solution. GRACE devices should be purchased (defined quantity), team-size of carers and end-users should be estimated in order to see what would be the best quality/price relation for the transfer (in the existing platform/server or a fresh install specific for that Region?). Other common basic conditions would be basic knowledge of informatics by the medical/carers staff.
What are the basic conditions the leading recipient from the region needs to have to be successful in transferring this good practice?	The leading recipient needs to have a formal request from the interested region/entity that desires to benefit from the GRACE project, containing the estimated numbers of end-users, carers/staff that will use the platform on that region. This should include the amount of desired devices to be purchased. Funding should be secured by the destination region.

Key threats in GP project transfer

What are the key potential threats for the GP project transfer?	Since this is a platform that works with an associated device/jewel (hardware), besides the licensing cost of using the system there's an associated cost for buying the device/jewel for the amount of end-users/patients needed. Some cultural aspects that vary from region to region can also be problematic. Citizens from certain countries would probably feel comfortable in being tracked or in using technology, while from others, they might feel insecure or uncomfortable. Nevertheless, these issues and the potential cost would be insignificant comparing with the basic budget spending of a region's healthcare system and the benefits would most likely provide a quick return-of-investment (ROI).

4. Description of the GP project

The "Description of the GP project" section provides more detailed information on the Good Practice project (GP project) and enables readers to get further detailed inspiration and easy ready-to-use information for possible innovation transfer to other project applications. This includes: tackled problem, time length of the GP project, objectives, phases, activities and deliverables of the GP project, its main innovation and target group.

Description of the tackled problem

What was the problem / challenge tackled by the project?	The main problem tackled by the project was the resistance for patients – especially elderly ones – to use any kind of medical wearables. They feel stigmatized and controlled. This leads that the ICT solutions that have been reaching the market aren't effective as they could be since they end up not being used or used improperly.
What were the reasons for the problem?	The main reason for this problem to happen is the mental well-being struggle that goes on with these kind of patients. They fear of aging and fear of loosing their independence mostly makes them resistant to adopt any kind of wearable. Also, the fact that the majority of the available devices are either too large or too ugly for someone to actively and proudly use them.

Time length of the GP project

What was the time length of the GP project in months?	24 months

Objectives of the GP project

Describe the overall and specific objectives of the GP project	The overall objective of the project was to develiver an innovative solution to help families, carers and patients in their daily lives through the delivery of a new wearable that monitors patients and sends alerts in case of specific emergencies and situations. The specific objectives were : - Research and collect the current unmet needs from this target group ; - Develop a medical wearable in a form of a jewel ; - Develop a secure online platform that meets the needs of the target group ; - Study if the delivered solution is effective enough

Phases, activities and deliverables

List all main phases of the GP project including their time length	A1. Research and Requirements A2. Development and Design A3. Prototyping A4. User testing
List and describe all **main activities that were implemented by the GP project**	S1.Requirements and technical draft S2.Technical development of the software, sensors implementation, data collection and transfer S3.Design. Involves ergonomic studies, 3D design of possible wearable-jewels taking into account the sensors defined to be used by the team S4.Prototype implementation. On this stage the team will keep implementing/iterating prototypes, firstly in a skeleton basic form until embedding into 3D prints of the designs S5.User testing. Feedback on usability, comfort, problem-solving. S6.Final prototype. Deployment and final user-testing of the first two models (yet still prototypes) that will be used for marketing dissemination, investor pitching and polished to be a final commercial product.
List all main deliverables of the GP project	D1. Two distinct models of jewel wearable (Grace device) for male and female with embedded sensors and home router for data transfer. D2. Two mobile apps (iOS and Android) to register the device, monitor parameters/data and other actions. D3. One web platform for end-user, relatives and medical staff/emergency services to check updated data, behavior and manage requests. D4. Technical report for final product exploitation/deliverable (includes design report and schematics and software codes). D5. Business plan for the project.

Main innovation of the GP project

What was the main innovation of the GP project?	The main innovation is the creation of a new wearable device in the form of an attractive jewellery for male and female, embedded with sensors and actuators that feed and online platform.

Target group of the project

Who was the main target group of the GP project? (SME, LME, research organization, university, public institution, healthcare provider, business supporting organization, other (specify)	Healthcare providers Home carers Insurance companies Emergency services entities
Describe the main target group	The main target are end-users (citizens who suffer from a clinical condition that needs constant monitoring although not that severe that need to be admitted to health centres or hospitals) and their families/carers.

5. Impact

The "Impact" section provides more detailed information on the effect of the GP project implementation and dissemination of major outputs.

Impact

What was the level of geographical impact of the GP project? (village, city, county, country, international, other (specify)	This project has high impact on the sustainability of long-term care in an ageing Europe. We are understanding how ICT and other fields can play a more impactful role in the future mix of services and supports that are available to the elderly and their carers. As we know, Up to 10% of European Population care for an elderly member of their family to some degree. This will rise as demographic aging continues, affecting all of us. By employing wearable technologies that can reduce these costs effectively, the project impacts on a wide range of indicators, from less injuries to improved mental well-being, as well as reductions in costs. It a challenge to provide improved "peace of mind", especially to family members, and this projects addresses that goal, thus having a positive impact on people's everyday lives. Since this is still an on-going project and prototype is still under development, the impact cannot yet be completely measured only estimated. The project will be tested during 2018 in several home care centers and health centers/clinics both in Portugal and the United Kingdom. These will
What were the final impact indicators including their quantification?	This is an on-going project, so the final impact can't be determined yet. However, at least more than 100 users and 200 family members and carers will test the final prototype and benefit from it.
Describe the changes resulted from the project	This is an on-going project, so the changes seen on the subjects cannot be determined yet. However, the expectation is that it will reduce the spending costs

activities	in health-care from both sides (public carers/hospitals/etc. and families/patients). The usage of the GRACE will also lead to the increase of the mental well-being of patients, given their independence will be reinforced and of their families by taking away stress.

Dissemination of outputs

Describe dissemination activities of the project outputs carried out during the GP project	The project is producing a large amount of *papers* that have been submitted to international conferences in this field of area, mostly in the HCI focus area (Human-Computer Interaction).

6. Risks

The "Risks" section provides more detailed review of potential risks of this GP project implementation including their defined mitigation strategies to eliminate them.

Describe risks involved in implementing this GP project including their mitigation strategies	The main risk is directly linked with the possibility of the target users in abandoning the usage of the solution in short-term. It is known that a small percentage of elderly people do not like to use any kind of jewelry or fashion artifacts and this might be a problem in convincing them to use the device. The mitigation strategy for this risk is the marketing strategy in underlining to the relatives that this is should be given as a gift to their relatives and loved ones. Also, the traditional design and the ability to incorporate/personalize the jewel themselves (engraving names or adding a small family photo) will reduce this risk. Another risk relates to the actual electronic systems that public health sectors already use. Authorities may feel that there's no need to try to address this problem in a different way and/or investing to cope with it or may feel that their staff would need to learn and deal with yet another platform which may take it's time and be ineffective in terms of learning curve and spent time. The mitigation risk is again through pure marketing by underlining that this would represent. A small investment in terms of their annual budget and that the return of investment (ROI) would be quite quick (up to 2 years max.) as well as the advantages for the users and care staff.

7. Budget

The "Budget" section provides more detailed review of costs regarding the project implementation as well as operational sustainability after its end. In addition, if relevant, public tenders within the project and additional generated incomes by the project are showed and explained.

Budget

What was the overall budget of the project in EUR?	The current budget is around 350.000€ for the 24 month period. Altough since this is privately funded, this amount is less than it would be if the company focused and allocated solely on this project or constituted a full-time team for it.
List relevant budget lines of the project including their % share from total budget	143.000€ Human resources (40,85%) 51.000€ Design and 3D prints (14,58%) 45.000€ Equipments and materials (12,85%) 25.000€ Promotion/Dissemination (7,14%) 35.000€ Indirect costs (10%) 51.000€ Other external consultancy services and R&D (14,58)

Additional income generated by the project

Did the project create any additional income?	no, the GP project did not generate additional income
If yes, specify which type of income and what amount in EUR?	

Public tender

Did the project include any public tender?	no, the project did not include a public tender
If yes, specify what kind of contract (specific contract, general contract, other)	
If yes, specify in what amount in EUR	
Describe the public tender subject	

Financial sustainability after GP project end

Was there an operational financial sustainability plan in the project after its end?	yes, the GP project included an operational financial sustainability plan
If yes, specify where the operational funds after project end came from?	In accordance with the current business plan, the economic viability of the project in long-term is achieved by the direct selling of the devices in retail spaces and online, by the subscriptions models associated to the devices and by the high-volume licensing to operators such as insurance companies.
If yes, specify the amount of operational funds in EUR	~175.000€/year in the EU market only (1-2 years) ~550.000€/year in the EU market only (3-5 years)

8. Other information

In this section, specific additional information about the GP project could be revealed.

Please describe any other relevant information about this GP project (if relevant)	

9. Information gathered by …

The information about this good practise (GP) project has been gathered for the purpose of the HoCare project (Interreg Europe Programme) by the following organization:

Region	Madeira (PT)
Organization name(s)	IDERAM
Name of the contact person(s)	Cristina Gouveia
Contact email(s)	cristinagouveia@ideram.pt

AUTHOR – PARTNER OF THE HOCARE PROJECT

Instituto de Desenvolvimento Empresarial – http://www.ideram.pt/