OLA – Organizational Life Assistant

FOR FUTURE ACTIVE AGEING

D4.5 Final Business Model

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1   Executive Summary

The aim of the OLA project was to create an innovative Organisational Life Assistant (OLA), to support activities relating to daily living needs of older adults for them to enjoy a more independent, self-assured, healthier, safer and better organized life. The key assumption was that elderly user would value the increased independence, safety, health and quality of life enough to pay for OLA either through a one-time purchase or by subscribing to OLA as a service.

Interviews and surveys provided support for this and showed that there is a need for a solution that can alleviate the pain points targeted by OLA.

The lessons learned during the pilots performed in the three countries led the OLA consortium to pivot regarding our market strategy. Instead of targeting end users directly we decided to instead target long term care facilities.

The successful tests in Hungary showed both a need and a demand for a service like OLA that can help the LTC professionals to manage and monitor the health situation of the elderly end users. OLA was much appreciated by both the elderly and the care workers who experienced several benefits in their daily work activities such as efficiency gains and a better monitoring of the health state of the patients (we have estimated a 25% reduction in costs of professional nursing per client).

2 Document Context

2.1 Role of the Deliverable

The purpose of the document is to provide a preparatory background for the consortium in order to facilitate the process of raising capital. The overall goal of the document is the development and commercialization of the OLA system. It showcases the product intended, the financials and operations as well as the market situation in three possible beachhead markets, Sweden, Portugal and Hungary.

2.2 Relationship to other Project Deliverables

Deliv.	Relation
D4.3	Title: Dissemination Plan The content of D4.5 aligns with the defined stakeholders and dissemination activities accomplished and described in D4.3.
D4.4	Title: Exploitation Plan D4.5 Expands on the business model work described in D4.4

2.3 Target Audience of the Deliverable

This document is a private deliverable intended for the consortium and the European Commission It is a living document that will be updated to reflect the current state of the project. The business model is a tool that guides the work on commercialization where different business hypotheses are developed and tested against the market. If the resulting document is deemed to be of value also outside the consortium at the end of the project a version without sensitive business information can be produced and made publicly available. The document will be updated to reflect the changes when applicable.

3   Project Description

3.1   General Description

This project aims to offer an answer to the societal challenges by providing an innovative Organizational Life Assistant (OLA), a virtual presence that supports instrumental activities relating to daily living needs of older adults allowing them to be more independent, self-assured and to have a healthier, safer and organized life, while easing caregivers work.

OLA will mediate and facilitate interaction (communication and collaboration) between senior citizens and their informal caregivers or other services or professionals, through technological devices such as standard computers, mobile devices (tablets) and home automation modules. These ICT (Information and Communications Technology) devices will be based on an innovative multimodal model, embracing various physical/healthy and cognitive characteristics of the older adults and will be specifically oriented to increase the level of independence of the elderly, by supporting the possibility of carers' assistance remotely and by improving the accessibility to existing services on the Web, such as on-line shopping services.

Moreover, the OLA will also provide personalized well-being and safety advices to older users in order to avoid unwanted age related health and safety situations in their own home. Such a well-being and safety advisor makes uses of a combination of user information that is collected (personal physical/health and cognitive characteristics) and extracted through emotion recognition and various sensors.

OLA also addresses a major issue that elderly face related to memory degradation and gradual decreasing of their cognitive capabilities, enabling them to remember primary health care and fiscal obligations (e.g. personal hygiene, medical and tax compliance) or helping them to find everyday items such as eyeglasses, wallet or keys. It is based on speech dialogue interfaces and space and object reconstruction and classification to capture and store daily routines and their related contexts.

The primary end-users are the big group of 65+ adults living alone with or without light physical or cognitive age related limitations, who need support from care systems. Secondary end-users are both formal and informal caregivers from public or private sectors, supporting them to cope with the increased demand for care.

3.2 System Description

OLA addresses specifically the following main issues:

- **Well-being advisor**: based on the combination of the collected user information (personal, healthy characteristics) and user interaction information (extracted through emotion recognition, sensors settings and contextual recorder capturing the routines as done by the older adult), the system will propose to the older adults personal advice adapted to their situation contributing to their preservation and well-being status in home environment. In case of risk (e.g. irregular heart rate, extreme fatigue) the system may ensure an alert to a local medical emergency service.

- **Collaborative care organizer**: based on the ISCTE-IUL and LM's knowledge of developing human-computer interaction platforms (HCI), OLA will provide online care collaboration between family and professional caregivers, by enabling a local care network to communicate, access sensor data, and coordinate care tasks. With the OLA assistant, seniors will be able to actively participate in the care organization through voice, even when they are unwilling or unable to use traditional web applications.

- **Safety advisor**: based on the combination of collected user environment information through real-time analysis and augmented reality settings, the system will propose suggestions of environment changes that interfere with accessible paths and provide alerts for intruders or other situations that can create hazard situations. In case of risk (e.g. checking intruders or fire), the system may contact local emergency services.

- **Every day instrumental daily living activities memory support**: the system will anticipate medical and fiscal compliances, remember primary health care and food requirements and could help elderly to find displaced everyday items.

- **Environment analysis**: algorithms for real-time object recognition and scene understanding will be developed based on a number of inputs (i.e. 3D object and space reconstruction by using time-of-flight and augmented reality technology) in order to analyze and decide which action to be taken in order support the elderly by suggesting environment changes and providing hints/advices for safety and accessible environments.

- **Multimodal interaction for elderly**: An adaptive organizational life assistant, a virtual presence will be developed in order to facilitating communication and collaboration between older-adults and informal caregivers or other services or professionals. This will be a user-friendly system that uses multimodal approaches based on non-invasive

and minimally obtrusive technologies (i.e. speech, silent speech, touch, gestures, RGB-D sensors).

The overall OLA system will be an easy to download and install software making use of multimodal integrated settings. OLA is in essence a service that enables the elderly user to reduce the demand of care through prevention and self-management, while at the same time also facilitating the supply of formal and informal care assistance.

A series of well-selected use cases where older adults have been supported by caregivers and care professional services will be developed, as well as pilots representing different use cases. Care units will use the system over a one year period. A new evaluation approach will be used during the pilots, investigating up to which point the OLA services alleviate caregivers support and maintain, or even improve the self-management, health and safe lifestyle of the older adult at home.

4 Introduction

The pace at which digital technologies are affecting our everyday lives is constantly increasing, coupled with the projection that costs of health and social care will rise to about 9% of EU GDP in 2050 according to the European Commission, paints a clear picture of a European health and social care landscape that will go through radical changes. E-health is one of the main powers transforming European healthcare. New technologies and interfaces can enable senior citizens to be more active and independent taking a more active role in the management of their health and home care.

It is against this background of great challenges and equally great opportunities that the OLA business model has been compiled. The business model canvas was chosen as the strategy tool. With the shifting landscape being a clear argument for an agile methodology that allows for swift and frequent changes.

Product and Services

OLA collects biometric data from elderly users with or without the help of care givers as well as enable better communication between seniors and caregivers. OLA runs on a tablets PC and use bands and wearables, health and well-being devices, panic buttons and NFC readers to collect the data.

The OLA solution is based on a physical setup consisting of a tablet pc, medical devices and a Health IoT sensor gateway. This setup is installed at the home of elderly users or at care homes where elderly live and receive some assistance from professional care givers.

We monitor health data captured from multi-vendor electronic medical devices. Sensed raw data collected from glucose, body weight and blood pressure values collected from medical devices is robustly securely and anonymously transmitted to the cloud via our Health IoT sensor gateway.

 Raw data, subject to digital rights management, is consumed by OLA´s caretaker app via our cloud services API. After being analysed, data can trigger patient-specific alerts which are related to chronic disease prevention and early detection. The caregivers can then keep track of health conditions of their respective user.

The solution showcases how a senior's health condition can be improved and more easily tackled. Regarding daily well-being support, OLA is also used to prevent future

diseases, tackling the general population of seniors, which have a low rate of mobility and activity levels. For this purpose, the solution analyses several types of activity-related information to monitor, detect abnormalities and suggest daily-life changes such as walks taken, distance ran, calories burned, cardiac frequency and body balance.

Legal

At all times, OLA will comply with all laws and regulations regarding governing personal data and the services and products that are a part of OLA's operations and offerings. OLA is GDPR full compliant.

The products and services offered by OLA is further described on the OLA webpage at http://project-ola.eu.

5   E-health business models

An aging European population and rapidly growing costs for healthcare are a combination that underlines the need for innovation in the health care sector.

Assistive solutions that use ICT in new and innovative ways to help seniors to live healthier and less dependent life for a longer time are expected to play a big role in finding the necessary solutions. At the same time, it has proven difficult for innovation projects to find a financially viable business model Chen et al (2013). A problem that have limited the impact of e-heath initiatives.

It is against this background that the OLA business model has been developed.

The Business Model is however a vital tool for the consortium to deliver our innovative product to a complex market.

5.1   Market Overview

The opportunities related to the greying population of Europe are often called the silver economy. It refers to both the emerging consumer markets and the change of markets and behaviours needed to sustain the public expenditure linked to ageing. Worldwide, it has been estimated at $7 Trillion per year which makes it the 3rd largest economy in the world.

Private spending by persons 65+ is projected to reach $15 trillion globally by 2020. At 25% of GDP in Europe or about 50% of general government expenditure it is expected to grow by 4% until 2060.

5.2   The AAL Market

The AAL market is the collective name for the wide variety of products and technological solutions that could be defined as ICT-based solutions for ageing well at home, in the community, and at work, thus increasing the quality of life, autonomy, participation in social life, skills and employability of older adults.

AAL is moving beyond its initial definition. The evolving technological possibilities together with a rapidly growing number of elderly is attracting investors and industry alike.

The global market for ambient assisted living is estimated to grow from USD 1.20 Billion in 2015 to USD 3.96 Billion by 2020.

5.3 Demographics

According to the 2015 Ageing Report[1] and EUROPOP2013[2], the total population of Europe is projected to grow slightly in the future decades from the 508.5 million population of the EU-28 on 1 January 2015 to 525.6 million in 2048, a growth of 3.4 % before starting a slow decline.

Projections and trends in births, deaths and migratory flows outline a future with a progressive ageing population of Europe. The working-age population is projected to decline significantly in the period between 2015 and 2050. Thus, the proportion of elderly vs working-age age will demand a radical shift in elderly care, away from the labour intensive and low-tech methods in use today.

A telling indicator of the challenges ahead is the demographic old-age dependency ratio (people aged 65 or above relative to those aged 15-64). This is projected to increase from 27.8% to 50.1% in the EU until 2060. This implies that the EU would move from having four working-age people for every person aged over 65 years to about two working-age persons.

Country	Sweden	Portugal	Hungary	EU
Population	10 million	10.4 million	9.9 Million	330 million
Aged 65+	20.12%	19.15%	18.65%	-
Potential support ratio	3.1	3.1	3.8	-

FIGURE 1 - DEMOGRAPHIC ON AGEING AND POTENTIAL SUPPORT

5.4 Target Users

The target user for the OLA platform was initially defined with help of the data gathered in the questionnaires and in-depth interviews performed as a part of D1.1 (User requirements specification and use case definition). It was then adapted to fit with what was learned during the OLA pilots.

The target users described herein are the users deemed the most promising early market for OLA. These are elderly living in care home facilities in in Hungary and Portugal. We have excluded the Swedish market for now as it has shown itself to be less approachable from OLAs perspective. The governmental spending of long term care is one of the highest in Europe at 3.6% of GDP compared to 0.6% in Hungary and 0.1% in Portugal

(OECD Health Data 2010). These low levels of spending are an opportunity for products such as OLA that can provide health benefits at a low cost per user.

Care homes for the elderly in Portugal and Hungary

The care homes are the economic buyer in most cases i.e. the entity that controls the budget and writes the checks for new product purchases. Whether they pass the cost on to the elderly users or not, it is with the care homes and LTC organizations that OLA will enter agreements and contractual obligations.

Portugal

In Portugal out-of-pocket LTC financing accounts for 45% total LTC cost. 48% of providers are misericórdias, 23% are private institutions, 9% are public national health services organisations and 20% are other non-profit organisations. Care provided by the national health services is normally free of charge or requires only nominal payments by users. Long term care relies to a great deal on informal carers, of which 75% are women, lately a change is taking place due to increased availablility of quality care through RNCCI.

- Beds in day centres, nursing homes and residences for elderly: 120 000 (2005).

Hungary

The health care system that was previously under state control is moving towards a to a more varied model with both private and public facilities. It is mostly funded through social insurance contributions and cost sharing where the personal contribution is determined by household income and the social situation. Contributions cannot exceed 80% of total income. Of persons 60 and over 2.4% received institutional care and 2.1% received professional home care.

- Beds in day centers, nursing homes and residences for elderly: 77 400 (2008).

5.5   Market Needs

- An easy way for professional care givers to easily measure the health status of elderly in their care.
- A way to track biometric data over time that can alert care givers to indicators of health status changes that might otherwise be missed.

- A way for both the elderly and relatives to stay informed of the current situation that can limit feelings of worry and a lack of control over the situation.

5.6 OLA Value Proposition

- To enhance the life quality of senior population by increasing their autonomy and safety while monitoring their health conditions and providing an easier access to healthcare services.
- To make available to health professionals tools able to improve the efficiency of their services, to improve the information flow and to reduce costs associated with patient monitoring and appointments.
- To provide informal caregivers with tools that enable a constant support to the elderly, releasing their effort for monitoring and also giving them a feeling of peace of mind / Greater sense of security of the patients and to their informal caregivers.
- Self-Management
- Shorter response times and timely interventions, increasing the efficiency of the provided services.
- Measurement of medical parameters and automatic record of these data with a personalised generation of alerts.
- A simple and effective analysis of data in order to enhance the human and material resources, leading to cost reduction.
- Easing the Communication processes between the triangle elderlies – informal caregivers – formal caregivers.

5.7 Competition

Regarding the market for OLA exploitation, it is clear that there are some similar solutions but without the vision, i.e. access and designed to be used by the three parties involved (user, formal caregiver and informal caregiver). Some are listed below with a brief description:

- **OG Medical** ([Sigmov](#)): presents a similar equipment with data collection by Bluetooth, This solution has the limitation of only working for single users, being mono-user. Sigmov integrates the kit devices, which are customizable to the needs

of each entity, to perform home care - any device can be integrated, as long as it is certified by the Continua Alliance. Monitoring, like OLA, includes monitoring of patients with diabetes and with cardiac dysfunctions; as differentiation also includes monitoring of patients with COPD and skin problems;

- **VitalJacket 1L**: ECG in 1-lead outpatient clinic for long-term monitoring (can save up to 5 days of continuous data), high-throughput training situations or cardiac rehabilitation. The VitalJacket 1L is a medical device capable of functioning as a continuous event detector: the cardiologist can analyse all events marked by the patient but also possible asymptomatic periods throughout the entire stroke. Access to the electrocardiographic data can be done in real time (differentiate) or after the end of the monitoring (like OLA). Vital Jacket also offers a solution – Motion 5L – system able to record 72 hours of continuous signal and is used for cardiac screening in patients with arrhythmias. This Portuguese competitor of OLA in the market, in spite of collecting the data to formal caregivers illustrated the data results on charts as OLA, is a system that targets users with cardiac problems.

- **Intellicare** by Smart Monitoring provides health and well-being remote monitoring solutions. Intellicare offers a group of solutions that are similar to what OLA offers with one major difference. The *OneCare Sensing* controls the glycaemia, *OneCare Safe* to call assistance, *OneCare Dori* for registering reminders for taking medication and *Vivago* solution for permanent monitoring of activity levels and well-being with personalised alerts. The major difference is that these solutions works on one kit per user, while OLA can share one kit per multiple users.

- **Plux** is an organization owning a bio-signal monitoring platform that integrates wearable body sensors such as electromyography (EMG), electrocardiography, respiration, and accelerometers combined with wireless connectivity and software applications. On competing with OLA, plux solutions on wearables include:
    - o **CardioBAN** (Handy toolkit for wireless ECG) and motion data acquisition. Price: 875€
    - o **RespiBAN** Explorer (wireless respiration and motion data acquisition in low mobility). Price: 875€
    - o **MuscleBEN** (Wireless single-channel Electromyography (EMG) device for real-time muscle sensing.) Price: 295€

- Alert Life Sciences Computing implements patient centered solutions. Alert owns a catalogue of products in Personal Health Record, Electronic Medical Record and other Product Lineages on patient administration and Information Systems. The system includes the management of appointments together with the creation and managing the Personal Health Record (record, monitor and share various aspects of your medical history). Alerts can be personalised and received on SMS notifications. Services of mobile licenses under subscriptions starts at a 20€ per year for a single person or 30€ for a family pack (up to 5 users).

- Other Multinational Organisations who have a large impact and power in the market are also competitors to OLA. These include Atos solutions, everis Health delivers next generation cloud apps for integrated care.

5.8   OLA Partner Markets

The Figure below presents the Market Values, Compound Annual Growth Rate (CAGR), Household penetrations in 2017 and for 2021, the average AAL revenues and the labour costs in the three locations of OLA partners (Sweden, Portugal and Hungary) in comparison with the overall values in EU.

Country	Sweden	Portugal	Hungary	EU
Market Value 2017 In millions USD	8	0.9	1	216
CAGR	66.2%	83.8%	73.8%	65.2%
Household Penetration 2017	0.4%	0.1%	0.1%	0.3%
Household Penetration 2021	3.2%	1.3%	1.1%	1.7%
Average AAL Revenue per Household	€ 402	€ 163	€ 242	€ 316
Labour Cost Per Hour	€ 40.90	€ 13.10	€ 8.40	€ 25.70

FIGURE 2 – MARKET VALUES

6   The OLA Business Model

The OLA business model is a simplified view of how OLA will operate. The model is reduced to the essential elements and relationships between these in order to underline the core business logic. It is meant to clarify the workings and to further discussion rather than to fully map every detail.

6.1   Business modelling method

In recent years the business model canvas proposed by Ostervald (2008), have been a widely used strategic tool for developing evolving business models. The popularity of the business model canvas grew, partially as a result of the inability of previous methods to handle the increased range and speed of business opportunities that IT and the internet economy opened up (Osterwalder et al., 2005).

6.2   OLA Business Model Canvas

A final Business Model was designed considering what we learned while testing the OLA prototype in the pilot trials in 3 countries and from discussions with the stakeholders and the contacts that were established with the different end-users – elderlies, informal and formal caregivers.
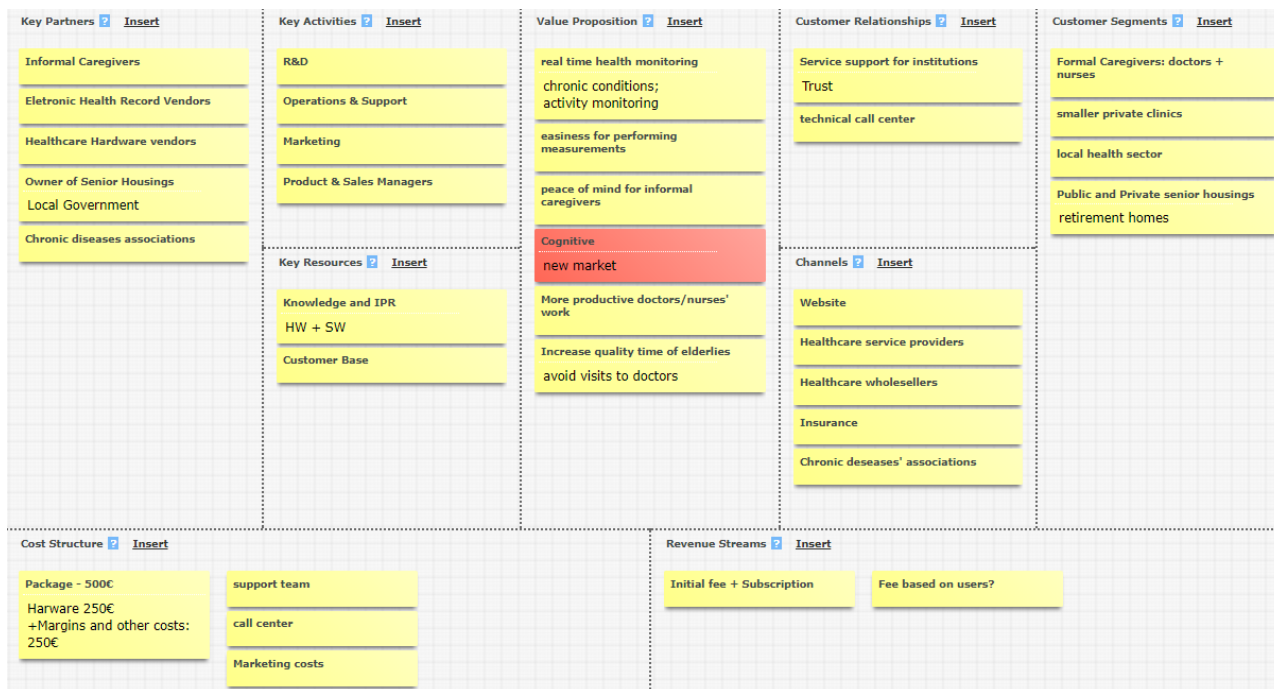
Key Partners ❓ **Insert**

Informal Caregivers

Eletronic Health Record Vendors

Healthcare Hardware vendors

Owner of Senior Housings
Local Government

Chronic diseases associations

Key Activities ❓ **Insert**

R&D

Operations & Support

Marketing

Product & Sales Managers

Key Resources ❓ **Insert**

Knowledge and IPR
HW + SW

Customer Base

Value Proposition ❓ **Insert**

real time health monitoring
chronic conditions;
activity monitoring

easiness for performing measurements

peace of mind for informal caregivers

Cognitive
new market

More productive doctors/nurses' work

Increase quality time of elderlies
avoid visits to doctors

Customer Relationships ❓ **Insert**

Service support for institutions
Trust

technical call center

Channels ❓ **Insert**

Website

Healthcare service providers

Healthcare wholesellers

Insurance

Chronic deseases' associations

Customer Segments ❓ **Insert**

Formal Caregivers: doctors + nurses

smaller private clinics

local health sector

Public and Private senior housings
retirement homes

Cost Structure ❓ **Insert**

Package - 500€

Harware 250€
+Margins and other costs: 250€

support team

call center

Marketing costs

Revenue Streams ❓ **Insert**

Initial fee + Subscription

Fee based on users?

FIGURE 3 – OLA CANVAS MODEL

6.3 Customer segments overview

The OLA platform provides a way for care home staff and non-medical caregivers to monitor the health state of senior end users over time. Informal caregivers such as family members and friends can be kept up to date on the health and overall state of their loved ones. OLA helps to alleviate the problem with a lack of accessible and understandable information.

- **Formal caregivers**

  Formal caregivers have surfaced as the most promising early market. The pilots conducted in Hungary were very successful and proved popular with elderly and staff alike. This led the consortium to re-evaluate our go-to-market strategy. Care homes for the elderly are now our primary early target. As a beach head market this strategy comes with many advantages as it limits the complexity of early roll-outs including the need of support while also providing a clear and defined target market.

- **Elderly end users**

The elderly living at care homes are the end users and prime beneficiaries of using OLA. Every other potential customer's role in the OLA business model is dependent on the successful acceptance of elderly end users.

- **Family members and friends (informal care givers)**
  With a lower threshold for technology and ICT than the elderly end users, the informal caregivers are a potentially more receptive target for marketing. They should at least be tested as potential economical buyers of the system even though they may not be the primary users.

- **Data customers**
  An important potential future revenue stream could arise from the sale of aggregated data, Big data is highly relevant to the health sector and has been emerged as one of the fastest growing sectors in e-health. The full market potential has yet to crystalize and the integrity of the user's needs to be safeguarded but it is a highly sought-after commodity that could play a major part in getting financing at a later stage. It is worth mentioning is that OLA is fully GDPR compliant.

Customer segment	Needs	Provides
Formal caregivers	Health services	Revenue, data
Elderly end users	Health services, communication channel, security	Revenue, data
Family members and friends	Information, communication channel, convenient interface	Assistance to end users

FIGURE 4 - CUSTOMER SEGMENTS

6.4   Market validation

The pilots generated some interesting results regarding where OLA will fit in the burgeoning European e-health market. It revealed that the system is overall proving to be easy to use, with both caregivers and seniors finding it a great advantage to use OLA for communicating and health data sharing; despite the technology limitation associated with the short range of the panic button, the end users feel safer about having this functionality available in OLA; furthermore, not only did the

users find the agenda a great functionality, the caregivers are also reporting that the system is as an extremely useful feature for today's market.

These initial results from the pilot activities are showing good reasons for being optimistic about presenting OLA into the challenging but exciting silver market.

6.5 Pricing

At sign on fee of 500€ per kit for the purchase of the OLA system covers the costs for the technical components and deployment.

A monthly fee of 5€ per month per user is charged for the OLA connected services and basic support. At this price point it is estimated that also institutions that are subject to strict budgetary constraints can be potential buyers.

6.6 OLA Value proposition

- To enhance the life quality of senior population by increasing their autonomy and safety while monitoring their health conditions and providing an easier access to healthcare services.

- To make available to health professionals tools able to improve the efficiency of their services, to improve the information flow and to reduce costs associated with patient monitoring and appointments

- To provide informal caregivers with tools that enable a constant support to the elderly, releasing their effort for monitoring and also giving them a feeling of peace of mind / Greater sense of security of the patients and to their informal caregivers.

- Self-Management

- Shorter response times and timely interventions, increasing the efficiency of the provided services.

- Measurement of medical parameters and automatic record of these data with a personalised generation of alerts.

- A simple and effective analysis of data to enhance the human and material resources, leading to cost reduction.

- Easing the Communication processes between the triangle elderlies – informal caregivers – formal caregivers.

6.7   Customer Relationships

6.7.1   Personal Assistance

OLA will rely on human to human interaction to a large degree in the sales process. The customers will communicate with customer representatives and get help both during and after the sales process. This may happen on site at the point of sale, through call centres, by e-mail, or through other means.

6.7.2   Online presence

OLA will steer as many of the services as possible towards online solutions. Support, sales, tutorials and service tasks such as battery replacements and requests for services will be handled by the home care personnel themselves via the OLA website.

Initial sales will to a large extent take place through face to face meetings but add-on sales and orders of additional kits, then be gradually transferred to OLA's website.

Lead-gathering and marketing will be done to a large extent through online providers such as Google AdWords and through directed marketing campaigns that are aimed at decision makers in the long-term care market environment.

6.7.3   On Trust

The most important relationship for OLA is the one with the end user. The nature of the tasks and interactions that OLA handle requires that this relationship involves a high level of trust. Elderly customers have a higher than average threshold for acquiring new services, even higher when that service involves some form of new technology. This needs to permeate every interaction with OLA.

6.8   Channels

- **Nursing Homes / Personal selling**
  The main sales channel to end users will be through personal selling in which dedicated sales staff visits the premises of care homes and other long-term care providers for meetings and demonstrations.

- **Direct Online Sales**
  An increasing trend of more active customers who are actively searching out researching and ordering what they need without first being approached by a sales person can benefit OLA. For this to happen the OLA online presence needs to provide all the information necessary as well as clear calls to action so that the customers' journey from fact gathering to completed purchase is as easy as possible.

- **Health fairs**
  Trade shows are still a very effective marketing tool. IT combines the face2face aspects that are an important part of creating trust between OLA and the intended customer and it provides us with a possibility to meet customers who we are otherwise less likely to meet. It also gives OLA an opportunity to raise our visibility and to become better known in the AAL marketplace.

- **Health Products Suppliers**
  Partnerships and collaborations with health product suppliers is an effective way of getting a foothold on the market. This way OLA can more easily reach the customers through already established relationships.

6.9   Key resources

6.9.1   Intellectual

- OLA Technology
- OLA Trademark
- Website, e-business platform
- Cloud based platform

OLA has the potential to expand on the results of the project and build up a highly valuable portfolio of Intellectual property rights in the form of patents and exclusivities that can raise the value of the entity considerably. It is not an obvious choice though. The case could be made that the project has been at least in part payed by public fund and it should therefore benefit the public. This can be done either by open sourcing results or similar routes.

6.9.2   Human

- Support team
- HR with sales know-how on healthcare

The expertise and knowledge of the OLA development team is a crucial asset and need to be protected contractually. There is no fool proof way to ensure continuity in a team but there are some methods that have proven more effective than others. Those include vested co-ownership plans, de-centralized decision making and transparent communication among others. Support and sales teams are more transient by nature, but it should be pointed out that there to, a good personality policy is essential for a productive working environment.

6.9.3   Physical

Working spaces and equipment is of relatively low importance for the OLA business model. There are rudimentary needs for a working environment, computers and good communications etc. They are very generic needs however and are easily replaced if need be.

6.9.4　Financial

A long -term financing plan where one or more investors back the project up with enough capital to develop a mature product is necessary to guarantee that OLA will be around for the running time of all commitments to early customers. E-health initiatives as a rule move slower than other types of start-ups, a time frame of five to 10 year minimum have been suggested for a e-health venture to reach maturity. This requires a lower burn rate or a larger cash cushion.

6.10 Key activities

The OLA prototype has now been tested in real-world settings with end users. OLA was continuously improved with regards to stability, core functionality and user interaction improvements. The outcome overall was positive, in some settings very positive. The users, both elderly end users and care home professionals expressed a high level of user satisfaction and in the case of the care home workers a clear demand for the product.

Before this there are a number of short term and long-term Activities that will need to take place in order to make OLA available to the customers. A management team for the commercialisation process should be assembled to deal with the following tasks:

6.10.1　Short term

- Secure Financing
- Establish a production line for the OLA kits.
- Put in place a Software development for the OLA software platform
- Create a sales organisation for OLA
- Establish partnerships with public and private health care institutes
- Ensure that OLA has the necessary Certification

6.10.2　Long term

Platform maintenance and development

For OLA to remain an attractive platform for all stake holders it needs to stay near the frontline of what is available with regard to technology and user friendliness. This requires a long-term investment in qualified personnel and the corresponding infrastructure.

User support

OLA users both care home staff and elderly end users are expected to need a significant amount of support in the early stages. There needs to be an easily reached contact point available for every language/region supported by OLA. Physical setup staff for installation of sensors etc. will be based locally, although this can be solved through local partnerships in order for the OLA operation to stay lean.

Market supporting activities

Sales, outreach and marketing including advertising will be needed to grow the customer base. This will initially be done market for market and could at a later stage scale towards a multinational setup depending on the similarity and level of maturity of markets.

Data aggregation and analysis

The data collected needs to be analysed and refined to sift out valuable knowledge that will used to improve the OLA platform. Statistical insights, once depersonalized, can be marketed to commercial entities or used by research organizations.

6.11 Key partners

Homecare / Healthcare Services/ Organizations

The partnership with organizations for Elderly homes and professional care givers will be essential for the OLA to reach the market. The importance of a strong and mutually rewarding relationship with care homes and their interest groups cannot be overstated and they are an integral part of the beach head market for OLA.

Healthcare professionals

OLA will require access to the updated knowledge of trained medical professionals. This will be solved through partnerships with heath care organizations that can provide with the sought after medical expertise.

Technology and Solutions Industries

OLA is actively pursuing collaborations with established developers of technology solutions to the healthcare market. IPR and knowledge developed in the OLA project can leverage similar products targeting the AAL market.

Public and Private Health ICT Systems

The ICT service providers of the platforms and systems that are used to store, analyse and refine medical and health related data are potentially valuable partners. The OLA system can help in providing an easy to use interface that facilitates the collection of data from elderly end users with a low ICT proficiency level.

User groups and organizations

Cooperating with representatives of the different types of end users is essential to remain relevant for the end users. Giving back to the community in the form of data that can be used for research that can further the AAL field would also benefit OLA in the long run.

6.12 Revenue streams

OLA's revenue streams can be divided into transactional revenue (i.e. that occurs once). and recurring revenue in the form of subscription or service fees.

6.12.1   Transactional revenue

- Equipment purchase
- Sales of modular packages of OLA kit

One-time sales of parts or complete OLA provides front-heavy revenue, lowering the necessary level of financing and as a consequence the risk for potential financiers of OLA. These benefits come with drawbacks, most prominently a smaller total revenue per customer and a raised threshold for acquisition. One-time purchases are preferred by many users, who are often vary of signing up for longer subscription periods (Patrick and Park 2006). Hardware such as medical devices and security sensors can be sold by OLA with or without a mark-up. This requires a larger investment in logistics and infrastructure that could be offset if this is handled by partners who would then would then retain part of the revenue per each sold Kit and/or a share of the revenue per monthly user.

6.12.2   Recurring revenue

- Service subscription fees
- Services provided to suppliers
- Equipment support and maintenance

Subscription fees brings significant benefits to OLA with regards to the predictability of the revenue stream and to the higher average customer lifetime value (ACLV) that subscriptions generate over one-time purchases. The increased cost of not charging a full prize for OLA at the time of the sale could be partially solved by having the customer provide payment in advance for a period such as a year. Giving customers a longer time to grow attached to a service also increases the probability that customers stay with a service.

6.12.3   Licensing

Licensing of IP from of the OLA system is a potential revenue stream that should be considered unless the uniqueness of OLAs features outweigh the benefits and additional revenue available through feature licensing. A strategy regarding licensing technology to third parties will be addressed by the OLA consortia at a later stage when and where the opportunity arises.

6.13 OLA cost structure

- Maintenance of website and platform;
- Marketing costs
- Technical and Commercial activities
- Logistic structure
- Human resources

OLA's costs can be divided into platform related costs, i.e. development and maintenance of the technology, marketing costs, and user related costs (e.g. support). The platform related costs are not fixed in the sense that they are not directly connected to the numbers of OLA users as is the case with the customer related costs. This clearly

points at a market of scale type cost structure where the average cost per user falls with an increased number of users.

Marketing costs and other costs for acquiring new OLA users can be considerable, however they should be separated from other running costs due to the different nature of decision-making processes concerning them.

7 IP and patents

7.1 Patents

OLA has identified the potential to expand on the results of the project by building up a portfolio of Intellectual property rights in the form of patents and exclusivities that can raise the value of the entity considerably. Patents are sometimes a requirement for getting funded as it is traditionally seen as the strongest form of protection for IPR.

This is not an obvious choice. The case could be made that the project has been at least in part payed by public funds and it should therefore primarily benefit the public. This can be done either by open sourcing results or similar routes. This is an important decision and one that required discussions and careful consideration by the whole consortia.

7.2 Protection by publication

An alternative strategy to consider is to publish as much as possible of the results, thereby securing the freedom to operate for OLA by stopping others from others patenting crucial technologies and methods. The pros and cons to this approach are a matter of difficult discussion. Beyond this is also the important question of whether publicly or in part publicly funded research belongs to the public domain. This, perhaps more ideology based, standpoint is also to be seriously considered before deciding on a strategy for the consortium. Meanwhile the possibly patentable methods and technologies are to be documented and evaluated internally. The European community as well as the different NCPs have ample resources to help with this after the completion of the development stage of the project.

7.3 Trade Secrets

Most of the IP has generated in the OLA project is not suitable for patenting or copyright protection. This includes trade secrets, customer relations, processes, methods, knowledge and other assets that is of benefit to the consortium. In order to protect these assets OLA is having restricted information to members of the consortium when deemed necessary. The consortium agreement regulates how and when knowledge can be distributed outside of the consortium in order to maintain OLA's competitive advantage.

7.4   Design

OLAs IP also contain the design assets that are an integral part of the product that adds value to the overall OLA experience.

Among these are:

- OLA logo and other design assets
- OLA look and feel

8 Financing

To take OLA from a prototype to a running company will require capital. The amount and source of this capital matters greatly and needs to be discussed thoroughly as any source of Financing comes with strings attached.

8.1 Sources of Financing

Private VC

Private venture capital actors expect a return on their investments on a time frame of a few years. They expect the monetary value of their investment to be the number one priority and any other considerations will have to stand back. These investors also tend to push for a higher risk, higher reward strategy that may or may not be in the interest of the OLA consortium and do not seem like the best match for OLA.

State backed financers

State backed financers can allow themselves to have a wider focus, but still usually expect a financial return on any investment. There are exceptions. This "Soft money", i.e. sources of funding that does not require equity in return for the investment have definitive advantages and should be OLA's first route. However, the amount of financing is rather limited as a rule and it may not be enough to satisfy OLA's capital needs.

8.2 Funding needed

The Pricing model that is currently being considered where care providers pay a one-time fee that covers OLAs cost for the devices and deployment and after this a monthly subscription fee per user offsets some of the initial acquisition cost per users but for will still require a mid- to large user base before the costs for running and developing the OLA connected services are covered by revenue.

The preliminary calculations have indicated that we will need to raise €2500.000 – 3000.000 to fund the OLA corporate venture. This will most likely be done in several stages. At each stage the ownership of the initial founding partners is diluted so that the total stake of the OLA project partners will be less than 50% when this is achieved.

9 Risks and Challenges

Most health information systems fail in one way or another, Heeks (2006) and it has been claimed that up to 75 percent of e-health programs fail during the operational stage Chen et al. (2013)

One challenge that needs to be addressed is the route and strategy required to reach critical mass. OLA will need to reach a large enough user base to cover running costs within a timeframe that is decided by the financing amount raised and the running costs. Revenue from sales of the platform and subscription fees will need time to reach the amount needed to cover the continued development and up-keep of the technology.

Any increase in the cost for the end users will raise the level of difficulty in attracting more end users that should be avoided if possible as OLA will require a stable and significant number of end users to offer value to partners such as device providers and service providers.

The potential risks related to the commercialisation of OLA are indirectly related to all project risks, as a project which overpassed the major risks faced, is closer to achieve success during the commercialisation period. The risks were discussed between partners and the contingency plan with identified risks and their counters is presented on the D5.1.

10 Individual Exploitation plans

10.1 Summary

- INOVA+: Commercialization of the software product adding new functionalities and platforms to run. Possibility for leading a large-scale pilot.
- LM: Long term commercialization and future development of software product.
- BZN: Long term development and commercialization of software and hardware product. Balance Scale IPR.
- ISCTE-IUL: Long term development of software and hardware product. Health box IPR.

10.2 BZN

The Bay Zoltán Nonprofit Ltd. for Applied Research (BZN) (http://www.bayzoltan.hu/bay-smart) is the largest and most successful non-profit applied research organization in Hungary. Its mission is to enhance and support the development of sustainable competitiveness for Hungarian companies through innovation and technology transfer. This is accomplished through many successes and hard work of the various research and development projects the five divisions undertake.

RDI activities focus on the areas of material science, laser and nano-, biotechnology, ICT, environmental technologies, logistics and industrial production technologies and control engineering. BZN has participated successfully in different types of international programs, including the PECO-program, COPERNICUS, INCO-COPERNICUS, NATO, TEMPUS, FP 5, 6, 7 and Horizon 2020. It has successfully implemented about 80 FP projects as partner and project coordinator and gained extensive experience in FP project management. Main professional fields: ambient intelligence, embedded systems, sensor networks, intelligent traffic systems, ad-hoc communication networks, intelligent healthcare systems. Based on these activities BZN is particularly interested in contributing to the development and integration of support strategies in the field of the upcoming European challenge of Personal Health and Care solutions for elderly people providing healthcare and quality of life.

Title of the Exploitable Result	Balance Scale with all accessories (tablet's app, boot loader app, Multi Support Device for Balance Scale, measure methodology of fatigue) Indoor localization for object detection (application for Raspberry PI, application for backend, methodology and localization algorithm) Gateway extension board, authentication with NFC tag
Dissemination level	Under development
Exploitation form	Software, Hardware
Owner	BZN
Negotiations with other project partners needed	-
Interest in the exploitable result	Long term development and commercialization of software product
Description of result	Balance Scale suitable for mental and physical condition Device that helps users (elderly people) find their objects (e.g. keys, glasses etc.) in indoor environments (e.g. at their homes) NFC board that allows personal identification of multiple users using the same measurement kit
Strategy for result	Internationalization / Knowledge Transfer / Entrepreneurship
IPR Status	Trade secrets
What additional R&D is required for exploitation	Make more comfortable to switch on the balance scale, reduction of energy consumption and height of spacers (legs)
Strategic partnerships	Weight scale manufacturers Governmental social insurance programmes
Need for external financing	Yes
Intended source of financing	AAL, H2020, National Funding

10.3 INOVA+

INOVA+ is a company specialized in supporting the growth of organisations through innovation, internationalization and access to financing.

One of the key Business Areas of INOVA+ is conducting the Applied Research directed towards higher levels of technological maturity of the TRL scale (Technology Readiness Level), also providing know-how to mediate processes of Technology Transfer through our internal R&D department.

INOVA+'s great experience in ICT for Health projects and also in Sustainable Cities, Smart Buildings and Security, having a vast know-how to mediate Technology Transfer processes, access to a network of academic and business partners, experience in valorisation of technologies and launching own spin-offs. This knowledge and experience gained through the years will be used and consolidated by applying it in OLA project.

Health was the first area of application in INOVA+, being part of already a vast number of projects which includes Medical applications, Assistive Technology and Solutions to Support Health.

Title of the Exploitable	OLA system
Dissemination level	Institutions at European level
Exploitation form	Commercialisation and Development
Owner	INOVA+
Negotiations with other project partners needed	Yes
Interest in the exploitable result	Commercialization of the software product adding new functionalities and platforms to run
Description of result	Introduction to market / Client Management / Support on development
Strategy for result	Internationalization / Knowledge Transfer / Entrepreneurship
IPR Status	-
What additional R&D is required for exploitation	To be available on new platforms (OS); combining new sensors technology
Strategic partnerships	Public and private organisations established with INOVA+ (including spin-offs)
Need for external financing	Yes
Intended source of financing	National and European level (with funding programmes)

10.4 Liquid Media

Partner profile:

Liquid Media AB is an R&D SME active in the development and deployment of state of the art interface technologies with a strong focus on communicative interfaces such as natural language interfaces, avatar technology and Augmented Reality interfaces. Liquid have participated in a number of nationally funded as well as EU funded research projects as a technical and commercial partner. Liquid's approach to rich communicative interfaces on the user's terms have a wide application area including AAL, assistive technologies, Ed-tech, entertainment etc. Liquid have expertise in the areas of:

– Spatially aware systems
– Natural Language interaction
– Avatar technology
– Augmented reality
– Virtual Reality

As a state of the art developer of new interface technologies, Liquid is often ahead of market demand, thus Liquid continuously evaluates the results of collaborative projects to identify commercial opportunities. Results that have a commercialization potential are then further refined before potential exploitation. The exploitation efforts depend on Liquids long term strategy, previous projects have resulted in one-time sales of IPR and the creation of independent corporate entities and special purpose vehicles. For example:

TeleCoach – part-owned start up.

TeleCoach is an automatic behaviour treatment technology company, specializing on substance abuse treatment and interventions. Developed together with Karolinska Institutet in Stockholm.

IPR protection method: All results are published. No Patents.

Financing: Self-sustaining.

Nagoon – fully owned start up.

Nagoon is a cloud-based platform for the development of spatially aware systems, apps and services with no need for programming.

IPR protection method: Patent portfolio. Some results are published for protection.

Financing: Seed.

Identified opportunities:

Liquid have identified several promising results that fits well with our long-term road-map. The OLA system as a stand-alone product shows great potential and Liquid have a strong interest in being a part of the commercialization efforts. Liquid also sees OLA as a long-term opportunity to build customer relations with elderly end-users that are a potential market for products developed outside of the OLA project.

Value propositions:

The OLA system provides professional care givers in care homes for the elderly a tailor made and economical way to continuously track the overall health of the elderly users.

Exploitable results:

Title of the Exploitable Result	OLA system
Dissemination level	Ongoing user tests.
Exploitation form	Software, hardware
Owner	Consortium
Negotiations with other project partners needed	-
Interest in the exploitable result	Long term development and commercialization of software product
Description of result	An interface that helps seniors to use ICT solutions
Strategy for result	Market research.
IPR Status	Trade secrets
What additional R&D is required for exploitation	API development, improved speed, ease of integration, product development, design.
Strategic partnerships	-
Need for external financing	Yes
Intended source of financing	National funding agency, VC.

10.5 ISCTE-IUL

University Institute of Lisbon (ISCTE-IUL) is a public university established in 1972 pursuing teaching, research and community service activities. With more than 9000 students and 450 teachers, ISCTE-IUL is one of the most dynamic and innovative universities in the country producing, transmitting and transferring knowledge to society. It is a research-oriented university with a multi-disciplinary and interdisciplinary approach, including 8 research units, 6 laboratories, as well as the Departments and Schools (www.iscte.pt). The strategic objectives of ISCTE-IUL are: innovation, quality, internationalization and development of an entrepreneurial culture in the main scientific fields of Business Studies & Economics, Sociology & Public Policy, social sciences & humanities and Information Technologies & Architecture. The ISTAR-Information Sciences and Technologies and Architecture Research Centre (istar.iscte-iul.pt/) is an ISCTE-IUL unit that has the mission to carry out applied and multidisciplinary research to create knowledge that can address current human, organizational and societal problems, by adopting user-centered approaches to information technologies and digital worlds. ISTAR`s research lies in the convergence of Computer Science and Information Technologies, Mathematics (applied to computational problems) and Architecture and Urbanism (in its digital dimensions). ISTAR stimulates flexibility in its structure, diversity and cross-fertilization of scientific and technological ideas.

Title of the Exploitable Result	**Monitoring kit of biometric data of older adults with all accessories (cloud enabled tablet's app, raspberry PI gateway, and sensors for several health data, like glucose, blood pressure, heart beat, and weight)**
Dissemination level	-
Exploitation form	Software, hardware
Owner	ISCTE-IUL
Negotiations with other project partners needed	-
Interest in the exploitable result	Long term development and commercialization of software product
Description of result	An easy to use platform solution to monitor health data of seniors providing an effective communication tool between formal and informal caregivers, and the elderly
Strategy for result	Internationalization / Knowledge Transfer / Entrepreneurship
IPR Status	Trade secrets
What additional R&D is required for exploitation	Improve the data transfer protocol between the sensors and the gateway. Integration of new sensors technology.

Strategic partnerships	Measurement devices, used in the platform, manufacturers
Need for external financing	Yes
Intended source of financing	National funding agency, VC.

10.6 Comfort Keepers

Comfort Keepers - Comfort in Home, Lda. is the Master Franchisor of Comfort Keepers for Portugal. Comfort Keeper's offices provide in-home care for seniors and other adults with permanent or temporary disabilities. The company is responsible for the development of the network of Comfort Keepers offices in Portugal and supports them. The support covers all business functions (i.e.: marketing, business development, operations, financial, human resources, IT, including R & D). The Comfort Keepers 'concept' was born in 1997 in the USA and currently the in-home care services are delivered through 750 offices worldwide, 15 in Portugal.

In Portugal CKPT has 350 caregivers and provide in-home care in B2C and B2B markets. In B2B market, CKPT is pioneering the way to deliver the in-home care services for third sector organizations using innovative service delivery models. The Comfort Keepers 'concept' has two major strategic differentiators. One is the special way that CKPT provides care (interactive caregiving) the other is technology, the services and products that CKPT has to offer its clients and provide care.

It is in this context that we will have an interest in developing this concept, integrating the technologies available in the market of home support for the elderly population, technologies rigorously selected and adapted to the functions necessary to improve the quality of life of the population.

Title of the Exploitable Result	Management / Disclosure / Commercialization / Use
Dissemination level	-
Exploitation form	Management / Development
Owner	Conforto em Casa, Lda (CKPT)
Negotiations with other project partners needed	-
Interest in the exploitable result	Software product marketing adding new functionalities and platforms to execute, as long as it includes easy communication module between formal caregivers and users of the product (users and family).
Description of result	Introduction to market / Client Management / Support on development
Strategy for result	Knowledge Transfer

IPR Status	-
What additional R&D is required for exploitation	Selective selection of equipment and sensors to be integrated in the platform, with a view to involving two types of potential users: a. seniors over 65 with some physical limitations and need for specialized support in their day to day; b. population with concerns about maintaining a high state of vigilance about their quality of life, through available technology; c. Be available on new platforms (OS);
Strategic partnerships	Technological partners interested in this area and who need specific knowledge of who has made the support to the seniors to better their quality of life a real priority
Need for external financing	Yes
Intended source of financing	-

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