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PeerAssist

A P2P platform supporting virtual communities to assist independent living of senior citizens

Deliverable D7.4
"Socio-economic and market issues"

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1 Introduction

1.1 Market overview

[Kubitschke, 2010] identifies eight barriers that are constraining growth:

•   Uncertainty about the case for ICT-based solutions(Health Care IT News).

•   Value case.

•   Business case.

•   Ethical issues.

•   Un-conductive reimbursement and incentives systems.

•   Fragmentation of systems and services.

•   Un-receptive or underdeveloped regulatory regimes.

•   Resistance to change and lack of capacity to innovate.

The first four can be clustered together around the theme that many people are sceptical that ICT can or should play a leading role in caring for the elderly. In 2010 there were a handful of concluded projects looking into ICT for the elderly. Between 2010 and 2013 tens of research projects have concluded that attempted to prove the value case for ICT. One of particular note is the Whole Systems Demonstrator (WSD) project conducted in the UK. The WSD followed a population of over six thousand people for two years. The conclusions consistently show potential for cost reduction and increasing the quality of care. Unfortunately the methodology of the WSD and degree of cost savings are contentious issues. Rather than have one, large definitive study to prove once and for all the value of telecare and telehealth; the WSD has proven to be a massive data set that proves proof for several different business cases. The failure to be definitive has given sceptics the space needed to call into question the value of the study. What is broadly agreed is that savings can be achieved, quality of care can increase and this can lead to better quality of life for users.

The next three barriers have a direct impact to how the market will develop and broadly deal with what organizations will support and pay for goods and services. Across Europe, very different kinds of organizations provide and subsidize social care and health care. This situation is the result of historical structures that usually stem from public policy – government typically handle social and health care through different organizations. In the past two years, significant progress has been made on this topic in several countries. One that will be discussed at some length is the move in Spain to combine the government organizations responsible for social and health care into one ministry. The Basque state is going further and in 2012 began a migration to managing services based on the individual need across organizational barriers.

Finally the last obstacle identified was resistance to change and lack of capacity to innovate. Like with the other barriers, some progress has been made on the general resistance to change. This is a very real barrier and the approach to address it continues to be a learning experience. The best examples that have occurring in 2012 bring all stakeholders together to review their

concerns, issues and desired outcomes. This generally aligns expectations and fears and creates a plan that lists the criteria that need to be addressed to create an unchallenged success.

The BRAID stakeholder analysis (BRAID, 2012)created a four-tier stakeholder model:

Categories	Type of stakeholders
Primary Stakeholders	Private users of ICT for ageing solutions ▪ Senior and impaired citizens, ▪ Private caregivers; usually family members or relatives
Secondary Stakeholders	Professional users of ICT for ageing solutions: ▪ Medical professionals, e.g. operating a tele-medicine centre 　o Professional care providers; care homes ▪ Other service providers 　o Housing associations ▪ "Mobility" providers 　o Tourism industry 　o Public Transport Members of this group have a B2C-relation to the primary stakeholders, i.e. they "sell" ICT for ageing solutions to clients, and a B2B-relation to tertiary stakeholder, i.e. they "buy" ICT for ageing solutions from suppliers.
Tertiary Stakeholders	Suppliers of ICT for ageing solutions ▪ Research organisations: Public and private ▪ Enterprises 　o (Large) Enterprises with a business in tele-medicine or tele-care (e.g. Bosch, Philips, Tunstall) 　o Providers of the IT infrastructure: Networks and databases (Telecoms, data warehouse providers) (side example: Personal Health Records 　o Small and medium sized enterprises: hard- and software and/or service provision
Quaternary Stakeholders	Supporters of ICT for ageing solutions ▪ Policy-makers ▪ Social (and private) insurance companies ▪ Employers ▪ Public administrations ▪ Standardisation organisations ▪ Civil society organisations ▪ Media

Primary stakeholders

End-users of AAL and Peerassist in particular, include a diverse group of both older people and their immediate environment (family, neighbours) that sometimes make up their informal carers. End-users of AAL usually live at home, but also in community based living arrangements or in institutions. When developing AAL solutions, one needs to keep in mind that older people are not a homogeneous group. They cannot be defined as belonging in an age group over a certain

numeric ceiling. Nowadays old age can span 30 or 40 years so putting everyone in one basket is simply not relevant. They have different needs and expectations: not all older people are frail and impaired, neither is everyone interested in using ICT. Many among them do not want to give up their privacy in order to feel safer at home. Seniors may be unaware of how technology can affect their lives or are misinformed. For those who do see the benefits, the lack of digital skills or limited financial resources may be important barriers preventing them from taking advantage of what the information society has to offer. It is important also to mention that older people, especially women, are particularly at risk of social exclusion. Poverty and lack of social contact therefore appears as an important living environment to take into account, as they are clearly barriers in AAL market deployment.

Users lack awareness of the benefits of new technologies, while sometimes developers fail to create technologies relevant to them, or fail to convey the message as to the usability of the technologies they create. Therefore, developers should always have in mind the improvement of quality of life of users and make reasonable efforts to raise awareness of the benefits and constraints of technologies. Developers should not take for granted that the users agree with and understand the usability of AAL solutions. AAL solutions should not sharpen existing inequalities ensuring that everyone has equal access to technologies. This means notably that AAL solutions and their maintenance need to be affordable to end users, but also accessible (language used, design for all) and available.

Secondary stakeholders

In particular we could identify as secondary stakeholders all public, private and voluntary organizations that assist seniors and their families in daily life and are interested in using AAL services and devices to optimise the job of socio-medical workers and improve the quality of the services. The healthcare professions that most of all represent secondary stakeholders are:

•   Hospitals and clinical centres caring elderly people suffering from chronic diseases

•   Home care and day-care providers

•   Voluntary associations

Tertiary stakeholders

The tertiary stakeholders are companies and service providers that design, develop and sell AAL tools and services to secondary stakeholders. Most of these are focused in designing AAL solutions for monitoring remotely elderly health, in other worlds telehealth and telecare systems. These tools work as follow:

1.   Acquiring vital signals and health parameters

2.   Elaborating sensor data for the recognition of abnormal events

3.   Transferring the information about user health to healthcare professionals and clinical experts

Currently the acquisition of vital signals and health parameters is carried out by point-of-cares, that are devices measuring the specific biomedical signals related to user pathology used inside the house and are connected to phone line or internet. The elderly decide autonomously or on

demand to use the point-of-care to measure their health status. The key aspect of these devices is the user interface because they should be enough simple and reliable to be used by inexpert persons like elderly. Actually AAL and ICT researches are studying wireless wearable sensors and wireless biosensors that will work without the user activation and automatically will acquire data, elaborate them on-board and send information to caregivers, and clinical and socio-medical experts.

After the acquisition of health information by point-of-care, the data could be processed in two ways:

1.   Signals are transmitted to the service centre that elaborates them;

2.   Signals are partially processed by the point-of-care and then are transmitted to the service centre to be definitively elaborated and analysed.

Then the service centre sends alerts and summary of user health status and vital signal values to caregiver and clinical and socio-medical experts. The service centre related to the point-of-care is a key business aspect of telehealth services; because of its fundamental role in the recognition of abnormal events, primary and secondary stakeholders should buy or rent the service from the service centre. Several worldwide companies developing ICT and medical products consider the service centre like the real business related to telehealth.

The lack of progress is frustrating because the potential offered by ICT has received increasing policy attention. The European Commission adopted an Action Plan on Information and Communication Technologies for Ageing in the framework of its i2010 Initiative. The plan's goals are to raise awareness, overcome technical and regulatory barriers, accelerate take-up and boost research and innovation.

Quaternary stakeholders

The European Commission is very supportive to the development of AAL solutions and projects. The AAL programme, the European Innovation Partnership on Active and Healthy Ageing, the Framework Programmes for European Research, are the main funding programmes who supported broad EU projects. At the national level, AAL is at cross roads between different kind of policies: health, social, transport, housing, work, finances, energy, security, but also research and development. One of the most important is evidently the Health policy, which can be defined as the "decisions, plans, and actions that are undertaken to achieve specific health care goals within a society" .

i2010 is a package of proactive policies to improve the competitiveness of Europe's information society and media industries, and to harness the potential of digital technologies to drive innovation across the European economy and society. It set out three policy priorities:

o   Creating a Single European Information Space to seize the opportunities of digital convergence; by promoting a common set of regulations that govern the supply of content and services and the operation of networks, irrespective of the underlying technologies used.

o   Innovation and Investment in R&D, taking steps to ensure Europe puts more into ICT research and gets more out. i2010 proposes to set up trans-European demonstrator projects to test promising research results, and to better integrate small and medium-sized enterprises into EU research.

o   Promoting an Inclusive European Information Society by closing the gaps between the information society 'haves and have nots'. i2010 proposes providing better services for citizens, an Action Plan on eGovernment, and a far-reaching initiative on inclusion and related actions. The i2010 strategy will be implemented partly by the European Commission and EU-funded programmes, and partly by the Member States. A wide range of policy instruments will be used.

In 2012 the European Innovation Partnership on Active and Healthy Ageing established a goal of adding 2 healthy living years to the average resident. This partnership includes a diverse group of regions across the EU membership. The plan is very clear about the projects, goals an timelines for achieving better living standard. The objective of the partnership is best described in the overview document: As the overall programme develops, new regions, cities and communities throughout the EU will move from commitment to implementation where they can learn from the experiences of others,bringing forward their own local innovations for further development and replication. The European Innovation Partnership is a positive example of public policy development to accomplish change in a managed and accountable maner.

1.2 Competitive analysis

The project AALIANCE (AALIANCE, 2010) organized technology and service areas for the support of the elderly into five fields:

1.   Sensing: anything and anywhere: in-body or on-body,in-appliance or on-appliance or in the environment(home, outdoor, vehicles, public spaces,etc.).

2.   Reasoning: aggregating, processing and analysing data, transforming it into knowledge within different and often cross-connected spaces (body,home, vehicle, public spaces).

3.   Acting: automatic control through actuators, feedback(e. g. information, suggestions, guidance) –local or remote (e. g. call centre), instantaneous(e. g. in the case of alarms) or delayed (e. g. in the case of trend information and lifestyle recommendations),to relevant participants using personalized multi-modal interfaces, possibly across multiple spaces.

4.   Interacting: intelligent interaction interfaces between users and systems/services are a very important aspect of AAL applications and will have specific requirements in order to cope with the abilities of users.

5.   Communicating: sensors and actuators are connected to one or more reasoning systems that in turn might be connected (even dynamically, e. g. a person moving from home to a vehicle and then to some public space) to other reasoning systems,possibly with their own sensors and actuators.

In the beginning of 2013 there were few products, services and solutions that address all five of these areas. Those that do are mostly related to research projects, trials or proof of concept. AAL is still in it's infancy so to quality the market it is necessary to scale back what AAL is to it's core components. Today's AAL product market focuses primarily on the sensing of events. The AAL market in 2013 is best described as the intersection of three different markets: Telecare, Telehealth and Smart Homes/home automation. Of these three markets telecare is the most established with services available across Europe. Telecare services in Europe are typically

government funded or subsidised. Telehealth is smaller than telecare, but with potential for fast growth due to the clear connection to the broad health services market. To date in Europe the UK has made the most progress in scale deployment of telehealth by changing the care pathways used in the NHS and locally deploying telehealth. Spain and Denmark have both structurally included telehealth in their care pathway design in 2012 and both markets are expected to show significant telehealth growth in 2013. Outside of Europe the US Veterans Administration has established itself as the largest user of telehealth with over 65,000 patients (US VA February 2012). Smart Homes and home automation is also a developing market. For a decade the home automation market has been expecting a surge in market growth, but the surge has not yet begun. Mass deployment of smart electricity meters along with increasing energy prices may be the catalyst the market has been looking for. Several electricity-supplying companies are offering services to monitor evaluate and suggest how to use electricity more efficiently. This is creating a financial incentive for homeowners to consider automated systems similar to solutions found in commercial buildings like motion sensors to control lighting.

Based on this market understanding, Frost and Sullivan [Somsainathan, 2010] estimated that the European AAL market in 2009 generated over $154 million with Germany as the largest market with over 32% market share. At that point the growth was projected to be 22.3% CAGR between 2010 and 2015. If this is accurate the total market in 2013 should be around 350 million dollars or more than double the market in 2009. Another forecast from April 2011 by MarketsandMarkets.com [smart-homes-385, 2011] estimated the AAL market to be $174.15 million in 2013. The report is focused on the home automation market and seems to exclude include telehealth. It does serve to illustrate that AAL is not a defined market and the definition of the market components and size have a wide variance.

The market understanding gets more confusing because at the same time Frost and Sullivan were estimating the AAL market size and citing Germany as the leading market, ICT & Ageing published the European Study on Users, Markets and Technologies [Kubitschke, 2010] that identified Germany as a potential growth market, but cited the UK as the largest market. In any event the convergence of telecare, telehealth and smart homes are broadly believed to be significant growth markets in the next decade. AAL will benefit from their market growth. Today the public market is significantly larger than the private market for telecare and telehealth in Europe. To encourage development of AAL systems, governments need to create demand by creating a macro vision of the service they want to offer and provide funding models to support the vision. A coordinated vision for the future market will ensure that scale can be achieved and that system to system interaction points are organized to facilitate sharing information to create a holistic view people's needs.

Compared to existing products in the market, Peerassist stands well against the competition, concentrating around a number of advantages:

- **P2P secure communications:** The platform developed in the context of the project managed to satisfy the requirements set in the workplan for enabling peers to build efficiently virtual communities based on matched interests. Using this platform, a query travels through the network searching for matching peers in the framework of PeerAssist. When this occurs, the matched user is informed of the request and a virtual peer group (community) can be formed dynamically. A similar sequence of events is followed when a support organization wants to "push" a service or content that should be received only by the elderly peers interested in it.

- **Integrated social interaction, telecare and telehealth capabilities:** While most solutions focus only to one service area of the elderly, Peerassist manages to cover well a wide set of services. Starting from social interaction, the platform provides a flexible way to form virtual communities and support easy communication of the elderly, including text, voice, and video calls, as well as a blog for each user. An easy direct communication to a doctor or caregiver can be setup, to get direct medical advices or ask for help, giving a tool for telecaring. Finally, the use of external sensors (at the moment this includes panic button and motion detection sensor but can be easily extended) provides telehealth capabilities.

- **Small portable terminal:** The selected solutions for design and implementation, allowed for packaging the whole platform into one small practical portable terminal, that can be easily carried and used by the elderly both in the house and outside. This makes the service a close companion of the user that can be with him/her at any time. Moreover, the specific terminal is not restrictive and can be replaced with other more advanced equipment in the future based on needs and availability.

- **Simple and easy-to-use user interface:** The user interface was designed and implemented in two phases, to cover both functionality (focus of phase one) and usability (focus of phase two). The Spanish and the Greek trials were used for the verification of phase one and phase two respectively, proving its effectiveness. This can be a significant advantage of the service for its acceptance by the highly demanding audience of potential users that it targets to.

- **Open platform, easy to extend:** The current design and implementation is based on open solutions and can be easily extended and adapted to future needs. This allows not only for improving and updating the current service, but also providing new services probably to other end-user communities. Thus, the know-how, experience and implementation blocks developed in the context of the project may extend the degree of exploitation, strengthening the position of the involved partners in the wider scientific and business community.

2 Business model analysis

2.1 The business model canvas

In this section, we describe the Business Model Canvas (BMC) introduced in **http://www.businessmodelgeneration.com/canvas**. Specifically, the BMC refers to a strategic management template for realizing new or documenting existing business models (BM). The BMC is represented through a visual chart with certain fields (components) briefly describing the following:

- A firm's value proposition (offering),

- Infrastructure,

- Customers, and,

- Finances.

The BMC is primarily used for assisting firms in documenting/aligning their activities and concepts by demonstrating potential trade-offs. An enterprise can easily describe its BM by adopting and analyzing the main components of the BMC. Such components are introduced as follows for reasons of completeness.

Component: Infrastructure

The elements that describe this component are:

1. Key Activities: One has to report the most important activities in order to be realized the company's value proposition.

2. Key Resources: The business modeler has to refer to the necessary resources in order to create value for the customer. Specifically, resources are referred to as assets to a company, which are needed in order to sustain and support the business. Such resources can be human, financial, physical and intellectual.

3. Partner Network: In order to optimize operations and reduce risks of a BM, organization usually cultivate buyer-supplier relationships so they can focus on their core activity. Complementary business alliances also can be considered through joint ventures, strategic alliances between competitors or non-competitors.

Component: Offering

The basic element for this component is the Value Proposition. This refers to the collection of products and services a business offers in order to meet the needs of its customers. The value proposition provides value through various elements such as newness, performance, customization, design, brand/status, price, cost reduction, risk reduction, accessibility, and convenience/usability. We can distinguish two types of value propositions: (a) the quantitative-price and efficiency, and (b) the qualitative- overall customer experience and outcome.

Component: Customers

The basic elements for the Customers component are:

- Customer Segments: Ideally, a company should identify which customers it tries to serve. Various set of customers can be segmented based on the different needs and attributes to ensure appropriate implementation of corporate strategy meets the characteristics of selected group of clients. Such types of customer segments include:

  - Mass Market: There is no specific segmentation for a company that follows the Mass Market element; we deal with a wide view of potential clients.

  - Niche Market: Customer segmentation based only on specialized needs and characteristics.

  - Segmented: The business may further distinguish its clients based on gender, age, and/or income.

  - Diversify: A business serves multiple customer segments with different needs and characteristics.

> ➢ Multi-Sided Market: A company can serve mutually dependent customer segment. For instance, a credit card company will provide services to credit card holders while simultaneously assisting merchants who accept those credit cards.

•   Channels: A company can deliver its value proposition to its targeted customers through different channels. Effective channels will distribute a company's value proposition in ways that are fast, efficient and cost effective. An organization can reach its clients either through its own channels (store front), partner channels (major distributors), or a combination of both.

Component: Customer Relationship

A company should identify the type of relationship it wants to create with their customer segments. Various forms of customer relationships include:

1. Personal Assistance, which is represented through the form of employee-customer interaction.

2. Dedicated Personal Assistance: A sales representative is assigned to handle all the needs and questions of a special set of clients.

3. Self Service: An organization provides the tools needed for the customers to serve themselves easily and effectively.

4. Automated Services: A personalized form of relationship such that the organization has the ability to identify individual customers and his/her preferences.

5. Communities: The concept of a community allows for a direct interaction among different clients and the company; knowledge can be shared and problems are solved between different clients.

Component: Finances

The elements for this component are Cost Structure and Revenue Stream. Specifically,

•   Cost Structure: This refers to the most important monetary consequences. The classes of Cost Structure are:

> ➢ Cost-Drive. We focus on minimizing all costs and having no frills.

> ➢ Value-Driven. We focus on creating value for products and services.

The characteristics of Cost Structure are:

> ➢ Fixed Costs. Costs are unchanged across different applications

> ➢ Variable Costs. Costs vary depending on the amount of production of goods or services.

> ➢ Economies of Scale. Costs go down as the amount of good are ordered or produced.

> ➢ Economies of Scope. Costs go down due to incorporating other businesses which have a direct relation to the original product.

-     <u>Revenue Streams</u>: This refers to the way a company makes income from each customer segment. Several ways to generate a revenue stream are:

> ➢ Asset Sale. Selling ownership rights to a physical good.

> ➢ Usage Fee. Money generated from the use of a particular service.

> ➢ Subscription Fees. Revenue generated by selling a continuous service.

> ➢ Lending/Leasing/Renting. Giving exclusive right to an asset for a particular period of time.

> ➢ Licensing. Revenue generated from charging for the use of a protected intellectual property.

> ➢ Brokerage Fees. Revenue generated from an intermediate service between two parties.

> ➢ Advertising. Revenue generated from charging fees for product advertising.

The BMC is usually printed out on a large surface so groups of people (modelers) can jointly start sketching and discussing business model elements with notes (e.g., post-it-note) or board markers. It is a hands-on tool that fosters understanding, discussion, creativity, and analysis. The board of the BMC is shown in Figure 1.
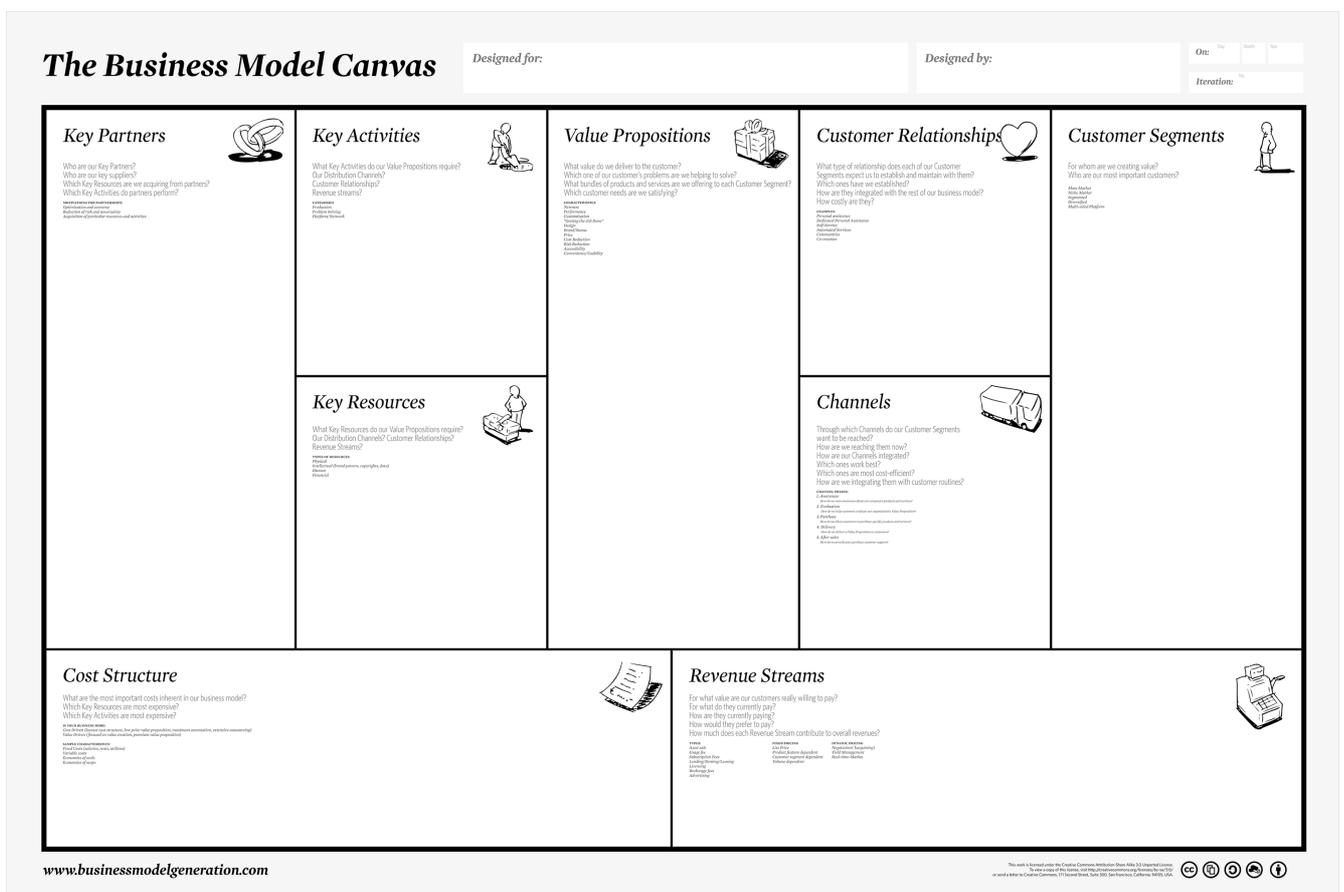

Figure 1. The Business Model Canvas

2.2 Basic exploitation options

Before analyzing the segments of the canvas, and how these apply in our case, we have to identify two different exploitation categories that may affect our approach in each case:

Business-to-customer (B2C): B2C marketing is when a business markets products directly to a consumer market. A consumer is a buyer of products that are not business related. In this case, the project partners directly offer the service to customers and take advantage of the profits. The B2C revenue includes:

- Sponsoring or advertising – Free or inexpensive service financed by advertising or sponsors, provided the service provider attracts a wide audience interesting to sponsors.

- Subscription – Service providers attract consumers that subscribe to the service for a specified time period.

- Transaction based – Consumers pay for what they use (pay per use) in a more granular fashion.

- Free information – A service provider offers relevant and compelling information for free that draws users to do other things, which generate revenue (in our case use external services for example).

Business-to-business (B2B): B2B marketing describes commerce transactions between businesses, such as between a manufacturer and a wholesaler, or between a wholesaler and a retailer. In service provision, the B2B models include:

- The enabler – Providing technology, content or competences that enable the final service to be realized and delivered to consumers.

- The concept owner – Inventing the concept, possibly implementing the system, building up the initial business relationships and certifying suppliers.

The enabler or concept owner (in our case the consortium) can make money by licensing out or selling the technology, content or concept to a business providing the final service. A revenue share agreement may be specified where the enabler or concept owner have good possibilities of getting a decent share. Considering that brand recognition is very important, takes a long time and a lot of money to achieve, enablers or concept owners usually need to partner with a well known brand owner. Similar examples in the past have shown that marketing cost will be the largest expense when launching such a service on the market. Therefore it may be necessary for enablers or concept owners to partner with large organizations to deal with the marketing expenses.

Each of the two above mentioned exploitation options has pros and cons. For example, B2C is product driven, maximize the value of the transaction, it targets a large market, it has a single step buying process with shorter sales cycle, while brand identity is created through repetition and imagery. On the other hard, B2B is relationship driven, it maximizes the value of the relationship, targets a small, focused market, it requires multi-step buying process with longer sales cycle, while

brand identity is created on personal relationship. Below, we analyze the canvas segments, differentiating when required our approach for these two categories.

2.3 Customer segments

The Customer Segments Building Block defines the different groups of people or organizations an enterprise aims to reach and serve.

B2B Exploitation

In this strategy, we focus on the Segmented Market customer type and distinguish between market segments with specific needs e.g., Hospitals, Municipal Organizations of Welfare Protection. Following and expanding the successful example of the PeerAssist project demonstrators, public municipalities are seen by the PeerAssist platform provider (PAP) as first-class citizens in the pool of prospective customers. PAP can be also advertized and promoted by municipalities and provided to the residents in certain Open Care Centers for the Elderly (OCCE). That is, a municipality can provide a set of PeerAssist nodes (PAnodes) to citizens in certain centers, e.g., OCCE., where the citizens can have access to public PeerAssist services, i.e., chatting, talking, being informed by doctors for certain issues. In addition, the PAP may make revenue by exposing the platform's programming interface to third-party service providers. Then, an online tool will be used to consolidate all third-party services available, and offer them to prospective customers/PeerAssist users. Regarding mobile device vendors, the PAP can expose the client API to mobile device vendors, rendering possible the development of end-user applications running on the mobile device of the PeerAssist user.

B2C Exploitation

In this strategy, the PeerAssist system can be provided to municipalities for public use of the residents. That is, residents are provided with an instance of a PAnode individually. Moreover, like public municipalities, public or private elder houses are considered the main customer segment for the PAP. From this perspective, the PAnodes can be provided to residents of the elder houses individually. Moreover, the concept of monitoring elder people from mobile devices is of high importance (e.g., a caregiver or doctor could prefer a tentative health monitoring of an individual). In this case, PAnodes can be provided to such groups of customers with certain capabilities corresponding to mobile devices.

2.4 Value propositions

The Value Propositions Building Block describes the bundle of products and services that create value for a specific Customer Segment. The basic values that we deliver to the customer in the case of PeerAssist are: "customization" to the elderly user needs, "low price", "accessibility", "convenience/usability", and "getting the job done".

2.4.1   Customization

Regarding the "customization" value, the PeerAssist platform can be customized to meet the specific needs of elder users. Thanks to the notion of services, the platform can be easily adapted and used by different groups having different purposes and interests.

B2B Exploitation

In this strategy, the customization of the PeerAssist platform can be provided by third party entities which take into consideration the special needs of the targeted group of users. Hence, the PAP could support such entities with certain customizable interfaces and parameterized functionality.

B2C Exploitation

In this strategy, the end-user can easily customize the basic functionality of a PAnode in order to exploit the required services.

2.4.2   Low price

Regarding the "Low price" and "accessibility" value, the PAP explicitly targets a very specific group of users, i.e. elder people. In doing so, PeerAssist is tailor-made to their particular needs, which have been taken into account from the design of the user interface to the implementation of the core functionalities.

B2B Exploitation

N/A

B2C Exploitation

In this strategy, with PeerAssist, elder people are given an intuitive, multi-modal interface that allows them to easily interact online, communicate with their friends, family and doctors, and actively participate in social networking activities. Price should be taken into account, because the income of a large percentage of these users is limited to their pension. A reasonable price combined with the definite usability of the service can be an attractive package. Much will depend of course and on the competition.

2.4.3   Convenience/Usability (smart/specific GUI)

Regarding the "Convenience/Usability (smart/specific GUI)", the PeerAssist Graphical User Interface (GUI) has been designed to address the various peculiarities of elder people, such as limited vision, technological inexperience or even fear, lack of the ability to use typical input devices such as the keyboard, etc.

B2B Exploitation

In this strategy, the PeerAssist's context aware capability can be supported by third-parties entities with wireless sensor networking expertise. Specifically, a PAnode can provide the important tasks

such as alarm-raising in case of emergency through movement detection sensors and urgency through handheld tiny devices, e.g., "panic" buttons.

B2C Exploitation

In this strategy, the PAnode provides to the end-user (e.g., elder) a GUI, which is intuitively structured into well-organized areas, the content of which easily visible and does not overwhelm the elder with too much information. Furthermore, the elder user can leverage the built-in voice-over-IP functionality to directly chat with their friends, family and doctors in a physical manner.

2.4.4 Getting the job done

Regarding the "Getting the job done", the PAP will take over all tedious tasks related to the installation and administration of the platform, both in terms of software and hardware.

B2B Exploitation

In this strategy, the PAnodes can be installed and administered by a third-party enterprise in order to provide the PeerAssist functionality to the end-users. Moreover, the enterprise will be capable to update any software component related to the PAnodes, install and verify its operation. That is, the PAP should release any upgrade for a given PAnode version and the enterprise is responsible on the dissemination of the corresponding upgrades to the considered end-users.

B2C Exploitation

Regarding this strategy, the end user will be simply presented with an out-of-the-box solution that is easy to be used without knowledge of low-level technical details. In this case, the PAP is responsible to install and upgrade individually the PAnode of an end-user. This might be a difficult task as long as the number of end-users increases.

2.5 Channels

The Channels Building Block describes how a company communicates with and reaches its Customer Segments to deliver a Value Proposition. The basic channel types in our case are "Direct sales and possible partner stores", "Internet", "Targeted workshops and presentations". The first option do not seem relevant in our case, due to the nature of the service and the customers.

2.5.1 Direct sales and possible partner stores

The motivation for the channel "Direct sales and possible partner stores" is the adoption of the PAnodes as Commercial-Off-The-Shelf Software components (COTSs). The PAnode as a COTS implies reduction of the overall system-development and costs (as PAnodes can be bought or licensed instead of being developed from scratch) and reduced long-term maintenance costs.

B2B Exploitation

N/A

B2C Exploitation

In this strategy, we can envisage the PAnode as a 'PeerAssist-in-the-box' "social communication vehicle" which is ready to be used by the interested individual. In this case, the PAnode refers to COTS usually offered by a 3rd party vendor, e.g., shopping malls. Such COTS can be purchased, leased or even licensed to the elderly persons in an easy way.

2.5.2 Internet

The Internet constitutes the main communication vehicle that will allow the PAP to access its customer segments. Dedicated web pages, detailed documentation, and additional services will be made available online.

B2B Exploitation

In this strategy, the PeerAssist platform can be advertized through an advertising enterprise (AE) throughout specific sites. Such advertisement might include the possible classes of the end-users and information related to the PAnode functionality and its importance of use for elderly persons. The AE could advertise the PeerAssist product while advertising the benefits one can obtain from Hospitals, Municipal Organizations of Welfare Protection, etc.

B2C Exploitation

In this strategy, the functionality and importance of the PeerAssist platform can be solely projected to end-users.

2.5.3 Targeted workshops and presentations

The targeted workshops and presentation will project the main research ideas behind the Peerassist platform and the concepts of supporting elderly persons with novelty technology in order to easily build virtual communities dynamically based on interests and needs they share.

B2B Exploitation

The PAP can project the functionality and several research and industrial issues related to its application domain through certain research teams and R&D teams of the enterprises.

B2C Exploitation

Through the organization and conduction of dedicated events, or participation to existing ones (e.g. AAL-related workshops), the PAP will be given the floor to spread the word about the tool, and demonstrate its assets to a targeted audience.

2.6 Customer relationships

The Customer Relationships Building Block describes the types of relationships a company establishes with specific Customer Segments. The basic communication types in our case are "Automated services" and "communities" (especially among elderly peers and caregivers).

2.6.1   Automated services and Communities

B2B Exploitation

In this strategy, the PAP can assign the automated services for handling queries and users' feedback for the PAnode functionality to automated-services enterprises, e.g., an enterprise customer service provider (ECSP). An ECSP provides efficient, effective services that enable the PAP to retain and reward its best end-users. They map the end-users' contacts into a revenue-generating, multichannel customer retention center. They can process and fulfill orders in direct-to-consumer operations. This requires that the PAP must specify the unique needs and preferences of all customers throughout the customer life cycle, i.e., marketing, sales, order processing, shipping and logistics, and customer service.

B2C Exploitation

In this strategy, the PAP supports end-users with certain Q&A-like components for handling any problem or query over the PAnode. Moreover, the PAP can provide a series of tutorials and simulations on the use of the PAnode, thus, the individual can exploit the PAnode functionality as much as possible. Moreover, the PAP can keep a community over the commenting and criticizing on the PAnode behavior, thus, obtaining any useful feedback from the end-users.

2.6.2   Communities

Social communities engage elder people, in which interact each other through their PAnodes. A social community utilizes friends, family and care-professionals connected to the elderly. In such communities, the elderly persons are involved in a process to identify their wishes, interesting, and needs in terms of what factors, relationships and communication issues are meaningful and generate the greatest impact on their social life.

B2B Exploitation

N/A

B2C Exploitation

The PAP can keep certain social communities for providing comments/ideas/propositions for several activities for the elderly, open and private chatrooms for distance elder persons, and dedicated communication channels with caregivers and doctors.

2.7 Revenue streams

The Revenue Streams building block represents the cash a company generates from each Customer Segment (cost must be subtracted from revenues to create earnings). In principle, a business model can involve two different types of Revenue Streams, namely Transaction revenues resulting from one-time customer payments, as well as Recurring revenues resulting from ongoing payments to either deliver a Value Proposition to customers, or provide post-purchase customer support.

B2B Exploitation

In this strategy, Transaction revenues can be generated in the following ways:

- <u>Asset sale</u>. The PeerAssist owner can sell either all or part of the developed technology to another stakeholder (e.g. software house) wishing to further develop, expand, and commercialize the software.

- <u>Licensing</u>. The PeerAssist owner may wish to keep ownership of the developed technology as intellectual property, and instead charge third-party stakeholders for a lifetime license to use the product for their own purposes.

Besides, there are many possibilities for Recurring revenues, as described below:

- <u>Usage fee</u>. The PeerAssist platform, or specific parts of it, may be seen as individual services. In this sense, the PeerAssist owner can charge businesses on a pay-per-use basis. This recurring revenue could be generated for instance by charging the use of the centralized PeerAssist Content Management Service.

- <u>Brokerage fees</u>. Being essentially a social network and service platform at the same time, PeerAssist could leverage its user basis in order to earn revenues, by taking a percentage of the value of each sales transaction executed between third-party, commercial services and its users.

- <u>Advertising</u>. The PeerAssist product could be exploited as a platform for advertisements targeting elder people. As such, the PeerAssist owner could create recurring revenue by allowing businesses to advertise their products, brands, or services, in a similar way as Google does.

B2C Exploitation

In this strategy, Transaction revenues can be created as follows:

- <u>Asset sale</u>. The PeerAssist owner can sell its main asset, i.e. the PeerAssist box, directly to the end user.

Recurring revenues are also feasible in the following ways:

- <u>Usage fee</u>. The PeerAssist owner can charge on a usage basis, thus allowing fees to differentiate among frequent and less frequent users, or among users of different scope. This model is particularly fair in the case of caregivers, who make use of the system only in order to provide monitoring assistance to the elder people.

- <u>Subscription fees</u>. It is possible that the end users of the PeerAssist platform be charged for different kinds of subscriptions. For instance, there may be subscriptions for the base (core) platform, and additional subscriptions for the more sophisticated services being offered (e.g. video calls). Moreover, the PeerAssist owner may decide to offer special subscriptions to cover technical support and/or software update services.

2.8 Key resources

The Key Resources Building Block describes the most important assets required to make a business model work.

B2B Exploitation

Key resources in case of the B2B exploitation strategy are the following:

- Intellectual. This includes the proprietary knowledge of the PeerAssist consortium, and copyrights of the produced source code. These assets are deemed essential to guarantee a successful B2B exploitation model.

- Human. Human resources are crucial to sustain the intellectual resources of the PeerAssist consortium, and exploit them accordingly.

B2C Exploitation

In the case of B2C exploitation, the most important resources are the human ones, including the required software developers, hardware/software administrators and installation experts, platform testers and documenters. In addition, there is a need for physical resources such as manufacturing facilities for the production of the PeerAssist box, and the establishment of appropriate distribution networks.

2.9 Key activities

The Key Activities Building Block describes the most important things a company must do to make its business model work.

B2B Exploitation

The B2B strategy implies the PeerAssist platform as the key resource including its intellectual properties. As a platform provider, the PeerAssist consortium should therefore be engaged in the following activities:

- Platform promotion. The PeerAssist solution must be advertised to the maximum extent possible so as to attract potential stakeholders who wish to invest on the platform. Activities that fall into this category include the maintenance of a web site, the participation to various related events and exhibitions, and the use of targeted advertisements in digital media.

- Knowledge management and continuous training. Facing the fact that the people behind PeerAssist may come and go, the PeerAssist consortium should invest in activities pertinent to sustaining its intellectual assets. Managing and expanding the acquired knowledge is key to a long-term successful business model.

B2C Exploitation

Should the PeerAssist consortium decide to exploit the PeerAssist platform as a product, the following main activities are required:

- Software development and testing. The PeerAssist platform provider will invest in considerable software development and hardware configuration activities, in order to produce a high-quality solution

- Software/hardware installation, troubleshooting, and maintenance. Maintenance of the PeerAssist platform is another key activity of the PeerAssist business model. As technology constantly evolves, the PeerAssist platform provider must ensure that the latest updates of third-party technologies are applied, and that the PeerAssist platform remains competitive and appealing to its existing and prospective user base. At the same time, it must be ensured that the exposed API is updated accordingly

2.10 Key partnerships

The Key Partnerships Building Block describes the network of suppliers and partners that make the business model work.

The following partnerships are important for the PeerAssist platform provider to optimize the B2C business model and acquire the resources needed.

- Buyer/seller relationships (acquisition of particular resources and activities). This refers to the need of partnerships with the various hardware vendors (e.g. PCs, smart devices, sensors, monitors, etc.), which are required for the production of the PeerAssist box. The PeerAssist platform provider should only cater for, develop and maintain the software part of the platform.

- Strategic alliances between non-competitors (Motivations: acquisition of particular resources and activities). Alliances with third-party service providers are needed to ensure that the PeerAssist platform will be enriched with services that go beyond the basic functionality and appeal to the interests of particular groups, or the elder people in general. While the PeerAssist platform provider may develop and offer its own services, third-party services will be needed to sustain the platform and render it competitive.

2.11 Cost structure

The Cost Structure describes all costs incurred to operate a business model.

B2B Exploitation

The cost structure of a B2B model for PeerAssist includes fixed costs, such as the salaries of the people involved, and variable costs, such as the number of services that need to be maintained in the core platform.

B2C Exploitation

The B2C business model for PeerAssist is cost-driven. The PeerAssist box will have to be as cheap as possible in order to be affordable for the average elder man or woman. In this light, there are various variable costs that the PeerAssist consortium should take into account, such as the

number of installations, the kind of enabled functionality and/or services, as well as the kind of equipment used by the PeerAssist box.

3 Exploitation plans per partner

3.1 University of Athens

UOA is a non-profit, public University and as such it does not aim at direct commercial exploitation of PeerAssist. However, it has a strong commitment in pursuing the public interest objectives set by its charter and, in that sense there is a strong interest in the exploitation of the results from PeerAssist research project to fulfill such objectives. Postgraduate and Ph.D. students will benefit from the applied research activities observed through PeerAsssit. Further, UOA leverages know-how from past projects to further investigate concepts/fields studied in PeerAssist like:
- context-aware computing (involving wireless sensors and inference capability of the PA components),
- social computing (involving services over PeerAssist component, e.g., chatting, notification, video conference, search, profile matching and friends communities),
- P2P communication (involving dedicated social network of PeerAssist end-users, caregivers and doctors), and

- ontological engineering (involving profile and context representation and reasoning).

UOA aims at increasing the understanding of the research community on the subject of middleware for social networking combined with context awareness and Semantic Web technology; establishing UOA as a significant research center for these activities. The UOA Research Unit participating in PeerAssist has direct connections to companies specializing in sensor-based IT solutions and ontological engineering systems. Therefore certain PeerAssist components may be rapidly pushed to the commercial exploitation path. As a consequence, the product portfolio of interested companies will be extended and rendered far more innovative and competitive. Applications and social network services like profile matching of elderly people profile, chatting and friends community creation, emergency and notification to caregivers and direct contact to doctors are high priority items in the product development agenda of UOA research unit.

More specifically, the final exploitation plan of UoA revolves around the following axes:

·   Use of the PeerAssist use cases and platform in post-graduate courses

·   Further development and/or expansion of the PeerAssist P2P network layer in the context of student projects and theses

·   Presentation of the PeerAssist results in both scientific and industrial venues

·   Reuse of the PeerAssist technology and the attained expertise as a basis for future research and development projects

Post-graduate courses and seminars

The developed P2P communication layer and its successful application to the PeerAssist platform are excellent material for teaching post-graduate courses and organizing targeted seminars, workshops etc. By means of such exploitation activities, UOA will enable its students to learn more about P2P computing, get a grasp of real-world P2P applications such as the PeerAssist platform, and will motivated them in undertaking projects and theses that relate to those topics.

Student projects and theses

UOA intends to build on the P2P communication layer of PeerAssist, improving and expanding its capabilities. In doing so, UOA will engage students into a number of undergraduate and graduate projects and theses.

Presentation in scientific and industrial venues

UOA maintains links to the following Greek industrial venues, which will be used to introduce and present the PeerAssist project outcomes, with the aim of identifying prospective up-takers of the platform, as well as collaborators for related future projects. Regarding scientific dissemination and exploitation, UOA will pursue publications in prestigious international conferences and journals.

Future projects

The JXTA-based P2P communication layer of PeerAssist that was developed by the UOA team will be leveraged in the context of future projects. We anticipate that, thanks to its generic nature, the established P2P network can be easily applied to many different application domains, where there is a need for end-to-end communication, resource sharing, distributed computation, etc. The organization of nodes into groups and the ability of each node to participate to more than one such group provide a flexible base solution to the above needs.

At the same time, many interesting research challenges related to issues such as workload distribution and load balancing will need to be further researched in the context of future projects. The service-oriented nature of the PeerAssist communication layer also significantly contributes to its flexibility in adapting to diverse application domains.

UOA intends to exploit all these aspects by requesting funding for improving/commercializing the P2P asset, or by engaging in large-scale experimentation. There are currently many funding schemes supporting such activities, such as ICT-PSP, Fed4Fire, etc.

3.2 STI-IBK

STI-IBK exploits the project results primarily for educational purposes in order to improve their research and teaching portfolio: books, lectures, Master and Bachelor student projects, and PhD theses, during and after the project. It is in the interest of UIBK to foster stimulating educational and commercial applications of scientific results, and to support the formation of innovative start-ups, as well as co-development of the technology with industrial exploitation partners. STI-IBK has launched a technology spin-off program for the protection and exploitation of its IPR. Through STI

International (www.sti2.org), UIBK moreover collaborates with other research institutions and industrial bodies in order to promote the uptake and commercialization of research results.

Individually STI-IBK, has been developing semantic service and ontology technologies and applying them to the domain of AAL, including health and social networking. The Semantic Layer implementation supported by PeerAssist is to be used and of benefit in a number of follow-up projects.

Project-wise, as a follow up of PeerAssist activities at the national level, STI-IBK project members have recently acquired a competitive FWF (basic research) project OntoHealth - Problem-aware Semantic eHealth Services, which is to start in October 2013.

The worldwide increase in patients comes along with a permanent increase of techniques and medical knowledge that are available for diagnosis and treatment, in turn resulting in e.g. higher costs and the need for a close collaboration between various health professionals, as healthcare becomes increasingly more specialized. Applying semantic technologies, OntoHealth addresses the need of design and implementation of the information systems that foster the collaboration of various health professionals, integrate the patient in his/her medical treatment, that are highly flexible and guarantee a high level of quality along the process of patient treatment.

The solution will partially leverage on the STI-IBK developments in PeerAssist, and continue to design and develop semantic service and ontology technologies in the domain of health.

In the domain of social networks and information sharing there, organizations of all sizes, commercial and not-for-profit, regularly face the challenge of communicating with their stakeholders using a multiplicity of channels, e.g. websites, videos, PR activities, events, email, forums, online presentations, social media, mobile applications, and recently structured data. STI-IBK and Seekda are extremely active and developing further in this related to PeerAssist direction e.g. by launching a joint project SESA: SEekda Social Agent (http://sesa-project.sti2.at/). The Seekda Social Agent (SESA) will help the hotelier in dealing with the challenge to improve and maintaining his communication needs in a world with an exploding number of channels in order to maintain or better increase his market share (i.e., the number of bookings and the attached price) by keeping the related transactions costs for on-line communication and booking manageable.

Further work in the field of multi-channel online dissemination, to which the PeerAssist has also subtantially contributed with the built expertise, is performed within the framework of STI-IBK's Online Communications working group: http://oc.sti2.at.

3.3 Seekda

Specialized in the eTourism sector, seekda is continuously searching for opportunities to improve the services offered to its main clients - the hoteliers. The data processed by seekda is mainly information about hotel bookings (prices, availability, but also competition and events in the area). The amount of data that needs to be processes is in the magnitude of 100 thousands spanned across several thousand properties.

Given this order of magnitude, one problem faced by seekda is improving the data storage and information processing and retrieval. In the PeerAssist project seekda's main contributions were

regarding particularly these issues: information modelling (the PA ontology), storing, processing and retrieval (the SLA and the CMS). Although the data that needs to be addressed in quite different (user data vs accommodation information), the principle applied for PeerAssist can be extended to the overall seekda scenario. As such, the first step in adopting the PeerAssist technology will be the development of a so-called AccommodationOntology, based on the lesson learned form the development of the PAGeneralOntology.

The second step consists of answering the scalability question: will SLA and CMS scale to several thousand times more data? The PeerAssist user-data was rather limited, less than one hundred users. On the other hand, seekda is dealing with several thousands properties, and for each of them the data that needs to be stored and processed is more complex than simple user-data. From a purely theoretical point of view the answer is yes, but these two components need to be further tested internally by seekda.

The third step will be adjusting the SLA and CMS to the new set of data , as the methods developed as part of the PeerAssist project are tailored to specific used data.

Seekda is currently addressing all these issues internally.

3.4 Ingema

There are many projects that have developed different kind of technological solutions in the last years. It is well known that older people that live as long as possible in an autonomous way at his/her own home have a better quality of live, keeping them active. Nevertheless, there are some age-related health problems or disabilities that can force them to spend longer periods at home, away from social activities. When this situation occurs, they start feeling lonely and disconnected as their involvement with social activities diminishes. Peer Assist project will help elderly people in their everyday needs in a user-friendly way.

In the case of INGEMA, Peer Assist is fully aligned with its strategy and vision since it allows the older people to keep active, to continue learning and to live in an autonomous way at his/her own at home as long as possible.

There will be two possible approaches to the market:

- Each user has access to the Peer Assist platform through his/her device.
- The users have access to the Peer Assist platform through a terminal located in different centers for the elderly (associations, Senior Citizens Day Centre, etc.)

There are also several activities addressing the dissemination of the results of the Project:

- Dissemination activities through publications in scientific journals, participation in conferences and in Workshops
- Dissemination of the results of the project through the presentation of the results in the senior citizens' social club of Lasarte and in the supervised housing of Mons and Benta Berri in San Sebastian.

3.5 Inaccess

As it is evident from the market research reports in the previous sections, there is a tremendous potential for the home networking market complemented with healthcare, home automation and monitoring services. inAccess has already a product line (Home gateways) targeting this market, with products that seamlessly blend IP networking with home automation functions. Our Home gateways can be easily integrated into wireless or wired LAN to provide local and remote access over twisted-pair, powerline and wireless control nodes.

inAccess Home Gateways complemented with the rest of the PeerAssist network and various Smart Home Peripherals add new Home Automation experience on top of existing broadband service bundles, implementing an impressive Connected Home environment. This connected peer-to-peer architecture provides the means to deliver a wide range of free and for-fee services to the home, enabling new business models for the Home Market, as the one for healthcare.

Our business model is focused on enabling service providers and telecom operators to develop and offer managed services addressing the home automation and healthcare market, easily adopted on customer needs, leading the way to the next generation integrated and connected smart home environment.

inAccess opts to use some of the outcomes of the PeerAssist project in building a next generation home gateway for the realisation of adaptive pervasive environments, enhancing the connected smart home experience for the end-user and allowing the service provider to offer new advanced value-added services as the PeerAssist services.

A preliminary marketing mix (4Ps – Product, Price, Place and Promotion) for the next generation home gateway is envisioned as follows:

- Product: The product will be positioned as a next generation home gateway, offering advanced capabilities for the end user and enabling a variety of new services, as the ones for healthcare. The product will be offered as a end-to-end solution to the provider, as an extended package of inAccess inHome product integrating PeerAssist services.

- Price: As a next generation gateway, the price will be set in the mid range of the prices that will prevail in the market at the time of launching. Setting a price at the market's low end, would depreciate our product by not making obvious its added value, while selecting a price at the high end would make the mass market adoption difficult. Hence, selecting a price in the mid range emphasizes the added value of the new product and simultaneously facilitates the mass market adoption

- Place. The new product will be merchandized through telecom operators and broadband service providers, utilizing their distribution channels and possible partnerships with insurance and healthcare providers. Hence the end-user will be approached through the operators following a B2B2C marketing approach.

- Promotion. Since, the envisioned product shall be promoted to telecom operators and service providers, who will be our direct customers, the following promoting actions are scheduled:

    ○ Press releases

    ○ Participation in relevant international fairs

    ○ Publications in relevant scientific conferences and journals.

    ○ Direct contact with the telecom operators and service providers, for presenting our product, delivering samples and scheduling field trials. This undertaking will be supported by the already established partnerships and communication channels between inAccess Networks and various operators.

4 Conclusions

As reported by several studies in the area, the European elderly supporting system is experiencing a critical situation and in the current context the provision of advanced services using innovative ICT solutions offers the great opportunity of a containment of the costs, while maintaining the expected levels of quality of care. Especially solutions like Peerassist, that can cover the full range of services, from social inclusion and communication to e-care and medical support, are considered promising business opportunities. Among the economic benefits we have to include the creation of new jobs produced by the uptake and growth of the e-care industry with an important role of the SMEs.

Sustainability and viability of the business are still to be proved and efforts are needed in the identification of effective business models (Bonfiglio, 2009). A threat could be represented by the overall economic situation and by the earning capacity of the older part of the population since it is clear that currently social care solutions have to adopt a "private" or a mixed "public-private" approach with regard to the payment of the related costs. Furthermore a negative aspect is represented by a lack of commitment by the large enterprises in this sector due to the slow uptake of the market and the doubtful return of the investments (at least in the short-medium terms). Better leveraging of the potential provided by ICT represents a challenge but at the same time an economic opportunity. It has become evident that market forces alone have been insufficient to ensure the realization of this potential. Several barriers have to be removed and often they are not linked to the shortage of suitable and advanced technologies but – preponderantly – are related to political, legal and cultural issues. All the stakeholders need to find the way to cooperate in a common effort. Especially social interaction services have to create value for all stakeholders by devising appropriate supporting business models. Failing to do so will just create a situation where social care professionals and institutions would lose trust in these solutions and, as a consequence, refrain from exploiting the benefits brought by these e-care systems and solutions.

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