AAL Joint Programme

HOME4DEM

HOME-based ICT solutions FOR the independent living
of people with DEMentia and their caregivers

D4.1 – Preliminary Business plan for the Home4Dem system

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	7	Trelleborg Kommunen	TREL
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Home4Dem

HOME-based ICT solutions FOR the independent living
of people with DEMentia and their caregivers

D4.3 – Preliminary Business plan for the Home4Dem system

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Executive summary

The world is currently facing a strong ageing trend. According to the World Health Organization: "Between 2000 and 2050, the proportion of the world's population over 60 years will double from about 11% to 22%. At a European level, in 2014, people above 65 represents almost 20% of the European population. The absolute number of people aged 60 years and over is expected to increase from 65 million to 2 billion over the same period." (World Health Organization, 2014)[1]. Concerning more precisely dementia, the WHO estimates the number of cases of dementia to triple by 2050 (World Health Organization , 2015)[2]. Thus it would require huge effort from the existing healthcare structure to absorb this growing population.

This implies a huge increase in the cost of cares specific for elderlies and people with dementia (PwD). This gives space for care innovations and new solutions to provide adapted cares to this particular population. The development of home care systems, as the Home4Dem product, are thus the future of the care of tomorrow. In addition to reduce the overall cost of the healthcare systems, those technological solutions will reduce the burden of care of the families and caregivers. They will allow PwD to stay at home as long as possible while being monitored and receiving good follow-up care from health professionals.

The Home4Dem project is an AAL Joint Program partially financed by the European Commission. The objective is to elaborate a smart homecare system. The project gathers existing technologies and knowledges from Italy, Norway, Sweden and Switzerland in order to design a solution optimizing the home care provided to PwD living in their home.

European competitors are quite small and none of them offers a complete solution for PwD including both domotic and telecare features. However, the worldwide competitors are bigger threats because they mainly are multinational companies and they propose complete solutions for cares at home, e.g. Philips, Tunstall or CareInnovation.

In this project two Use Case Models have been designed in order to target B2C customers (Use Case Model A) and B2B customers (Use Case Model B). Thus, the patient, informal caregivers and health professionals are targeted by our services and products. The B2B customers will be used as distribution channels to reach more end-users.

To sell the product, the idea is to install the devices in the home of the PwD and then to apply monthly fees that can vary according to the features included in the service. To spread the technologies, partnerships with insurance companies could be profitable in some countries because they would allow us to increase the prices. The main costs come from the human capital and the hardware system.

In the end, according the demographic evolution, cost-effective solutions for healthcare are required immediately in order to sustain the healthcare systems. Telecare services with both emergency alarms and monitoring services could be an alternative to expensive hospitalization in early phases of dementia.

[1] http://www.who.int/ageing/about/facts/en/

[2] http://www.who.int/features/factfiles/dementia/en/

1. Project description

1.1. The Home4Dem project

The Home4Dem project is an AAL – Active and Assisted Living Programme[3] that aims at enabling people with dementia to live at home independently and at improving their standard of living and that of their family and relatives. By developing a third generation ICT platform, Home4Dem will permit to people with dementia to stay the longest in their home and to benefit from monitoring services. It aims at supporting both formal and informal caregivers in their daily caring tasks. Thus, the Home4Dem solution may postpone the use of institutional care that is costly for the society as a whole while reducing informal caregivers' burden of care.

The consortium of partners will elaborate a system for behavioral analysis that will allow a constant interaction between users and the technological platform. The Home4Dem's technology improves two existing ICT solutions (Home4Dem, 2014):

1. The "**Up-Tech system**", an advanced sensors system realized during a project funded by the Italian Ministry of Welfare and developed by ARIELAB and AUTOMA in Italy
2. The "**DomoCare™ system**", a modular multi-sensing monitoring and feedback solution funded by a Swiss national funding agency developed by the Swiss EPFL Spin off company DOMO SAFETY.

Home4Dem partners are based in Italy, Norway, Sweden and Switzerland. In Sweden and in Norway, the platform will be carried out in association with formal care services whereas in Italy and in Switzerland the solution will be used as a product purchasable by informal caregivers in the private market.

1.2. Vision Statement & Mission

"Improve people with dementia's everyday life at home by providing an affordable health care solution"

The vison of Home4Dem is to provide a high quality, home-based health care service to improve people with dementia's daily life. This service has to fit to each customer's requirements, to be trusted on by the relatives of people with dementia, and to be recommended by physicians and other formal caregivers.

In the long run, our solution should be recognized as a certified health care service, thanks to investments in the development of new and innovative ways of improving and completing our services.

Our mission being customer-oriented, we need to meet the customers' needs taking ethics into consideration. To do so, we have to develop a sustainable business strategy for Home4Dem products in the European market in order to offer the right services to the different stakeholders in line with their needs.

[3] http://www.aal-europe.eu/

In this document, we provide a market analysis and identify the potential market in Europe and especially in the four countries involved in the project (i.e. Italy, Norway, Sweden, Switzerland). We will also bring innovative solutions to penetrate both B2B and B2C markets.

At this stage of the project, we can only elaborate a preliminary business plan that will be completed over time thanks to further analysis and to the improvement of the technological solution.

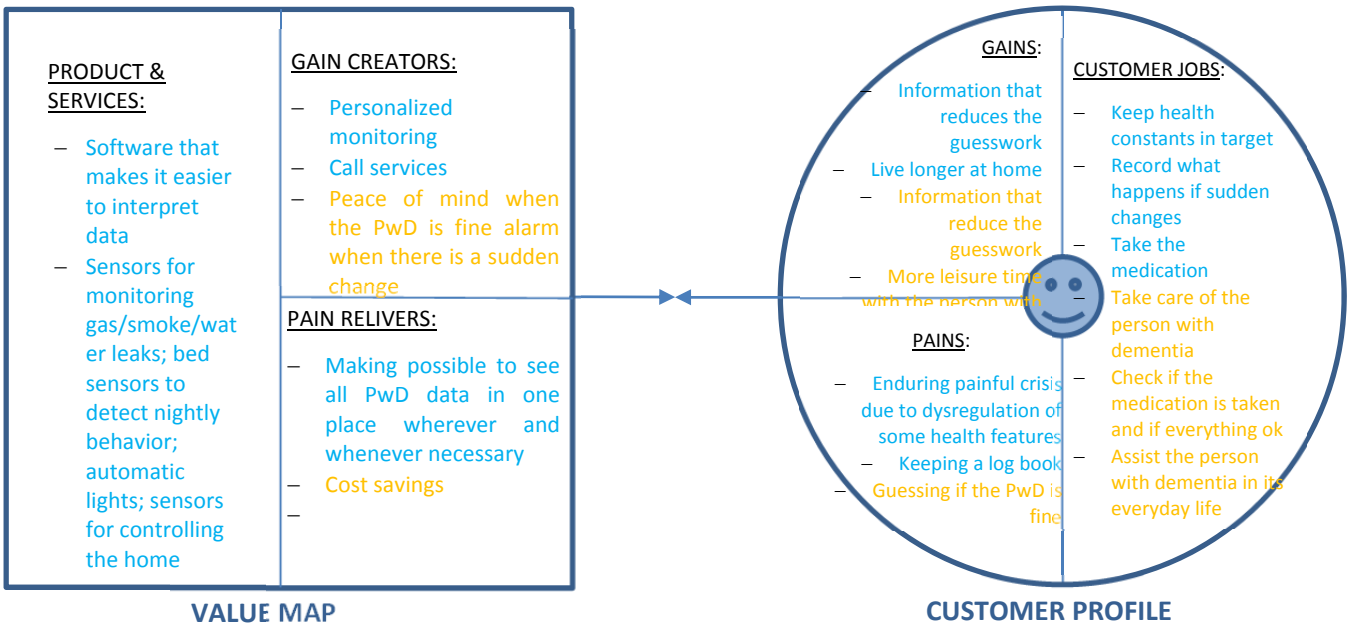
1.3. Value Proposition

We have hypothesized two different use case models. On the one hand, the ICT solution will be used as a product freely purchasable by families in the private market as to answer their personal needs (e.g. safety, control, prevention, etc.). We refer to this situation as "Use Case Model A". On the other hand, it will be possible to use the ICT solution as a tool to improve the effectiveness of existing care services (Use Case Model B). In this case, the professional caregivers will be users as well, and will have access to the information generated by the ICT solution. This will allow them to better tailor the care provided to the PwD and even react in case of adverse events.

Thus, there are two targeted markets. Indeed, the Home4Dem solution can be sold to either formal caregivers that are health professionals, or to informal caregivers that are families and relatives of the patient. (More precise definitions of the different types of caregivers can be found in Chapter 5.c.)

It is not possible to apply only one approach for the different type of customers. This is why we need to elaborate two value propositions: one for the B2C market and another one for the B2B market. All the components of these value propositions will be detailed through the different parts of the business plan.

Figure 1 Value Proposition for the B2C



B2C market: people with dementia and informal caregivers

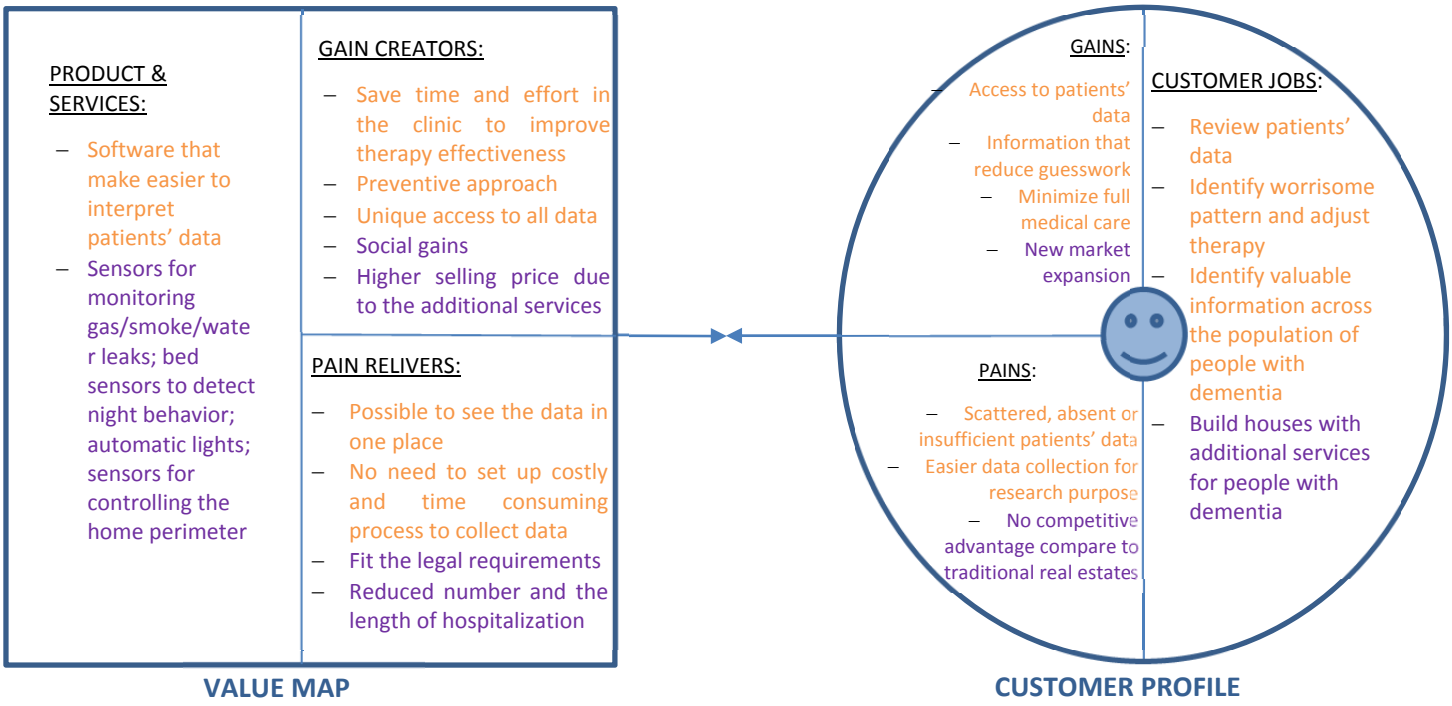
People with dementia are not the only beneficiaries of the Home4Dem services. Actually, their relatives are often involved in their everyday life because their dementia requires a lot of attention. They are considered as informal caregivers. Thus, according to the empathy map elaborated in the deliverable 1.1, our services are real pain relievers for the relatives and the family particularly when they intervene on a daily basis.

B2B market: formal caregivers

They are:

- Public or private health-social service provider
- "Real estates": adapted houses developers (private or public sectors)

Figure 2 Value Proposition for the B2B Market



In a nutshell, Home4Dem can penetrate the home care market through two ways:

- By selling directly in the private market to the end-user customers and their relatives
- By using distribution channels as health professionals or "real estates" that can be subsidized by governments.

The benefits are more important with regard to people with dementia. Indeed, their everyday life will be considerably impacted by the Home4Dem services in particular with the improvement in their monitoring and follow-up. Thus, their quality of life could be improved.

Because of the aging demographic trends in Europe and because of the correlation between aging and dementia, governments have large incentives to develop preventive actions in order to contain costs so as to increase the likelihood of their long-term sustainability. Thus, there is a potential market for housing providers either public or private that can be intermediaries in our value chain.

Our cutting-edge services gather basic security, and home care services. Assembling them together allows Home4Dem to provide a unique service on the market and permit customers to have “all in one” instead of mandating several companies for each need.

In addition, the collaboration between companies and labs from four different countries allows to have a better understanding of the European market and thus to go deeply in the market analysis. Finally, we have all the keys to create the most adequate and unique products and services that will meet customers’ need, especially thanks to the personalization of the service.

2. External Environment

2.1. Health Care Systems in Europe

In Europe, most of the health care systems are financed by the Universal health care through a mix of public and private contributions. As many countries are part of the European Union, it is important to know the framework set by the union. It does not have a major responsibility in the health care field even if it seeks at aligning national health care system to strengthen the European market and to improve the overall public health (Van Mosseveld, et al., 2000)[4]. Thus, there exist organizational differences across countries that have to be taken into consideration when commercializing a health care product on the European market.

At a national level, the health care systems are mainly publicly financed through taxation, and benefit every citizen. This is called the universal health care. In addition, private funding may be possible thanks to private insurance systems. Two of the main differences between countries are first the proportion of public and private funding of the health care system and secondly the degree of centralization. A study from the European Observatory on Health Systems and Policies Series demonstrates that it is difficult to solve this issue because decentralization can have either positive or negative outcomes according to some authors or in specific contexts. Thus, we have to determine the main type of health care systems in Europe in order to segment the market. As the four countries participating in this project have different health care systems, we will start by providing a brief overview of each of them (European Obervatory on Health Systems and Policies, 2016)[5].

Italy: (Lo Scalzo, et al., 2009) [6]

The Italian health care system is regionally organized by the National Health Service (Servizio Sanitario Nazionale, SSN). In addition to the government health insurance, it is possible to take out a private health insurance in order to cover expensive medical costs. At a national level, the Ministry of Health sets the fundamentals goals and allocates national funds to the regions, coming from the general taxation system. On the other hand, regions have the authority in execution-level planning and in delivering health care services. One of the main issue is that the Italian healthcare system is very heterogeneous as each region has its own health care model, implying that the quality of cares and follow-ups of the patients with chronic diseases varies across regions. The process of complete decentralization has been reconsidered after the 2008 financial crisis because of the large increase of regional health care spending.

Care for people with dementia has been traditionally organized through the so-called Alzheimer Evaluation Units (AEUs), established in Italy in 2000 with the aim of improving the care pathways for dementia patients. AEUs are multidisciplinary teams, usually led by a neurologist or a geriatrician, with a double-fold task: 1) performing a diagnosis of AD according to the most recent clinical recommendations; and 2) prescribing cholinesterase inhibitors, memantine and atypical antipsychotics under the reimbursement scheme of the Italian health care system. Thus, the patients followed by the

[4] http://ec.europa.eu/health/ph_projects/1998/monitoring/monitoring_project_1998_full_en.htm#7

[5] http://www.hspm.org/searchandcompare.aspx

[6] http://www.euro.who.int/__data/assets/pdf_file/0006/87225/E93666.pdf

AEUs are those using the aforementioned drugs and receiving regular follow-ups by the physicians working in the units. These patients do not usually receive other care services, except from AEUs as consequences of AD. Currently, following the release of a National Plan for Dementia Care, AEUs are under reform, as their competencies have been enlarged, including a stronger focus on the implementation and coordination of non-pharmacological intervention in the community. Other services available for people with dementia include, of course:

- General hospital inpatient wards
- Semi-residential facilities (day hospital and day center)
- Residential facilities (especially for those with more severe dementia).

The development of services for dementia people is very unequal across the Italian territory. Especially those services responding to social rather than health needs, which thus are not provided by the NHS. While regional governs are responsible for funding health care, socials services are financed entirely by the Municipalities. Such services are not free-of-charge and are generally linked to people's income. Sometimes elderly people and families may have to contribute to the costs using their own money, thus making these services less attractive compared to other options available in the private market, including the large and unregulated "grey" labour market.

As there is a big variability in the quality of services, it is thus difficult to compare regions and to set up a homogeneous care system for chronic diseases. However, the diminished budget allocation for health services has fostered the role of the **community**, and of **self-help organizations**. Therefore, we can see here a market opportunity for the Home4Dem products and services.

Norway: (Ringard, et al., 2013)[7]

The Norwegian health care system is semi-decentralized. Health care is organized at three levels: national level, health regions (RHAs owned by the Ministry of Health) and municipalities. The Ministry of Health is in charge of the regulation and the supervision of the system but many of these tasks are delegated to various subordinate regionals health agencies (RHA). Finally, the municipalities are in charge of primary care. The vision of this system is to provide an equal access to health care services for all citizens regardless their social background or economy. Private actors are involved in the health system but they are mainly enclosed in the public system through contracts with the municipalities. All Norwegian inhabitants are covered by the public insurance system. Thus, private insurance enrolment is not significant.

Concerning health care services, a National Dementia Strategy (Alzheimer Europe, 2012)[8] has been implemented in 2007. It is funded by the Norwegian government. Mental health services are developed at the municipal level and within specialist care that are under the responsibility of the RHAs. They provide:

- Primary health care in all municipalities
- Highly specialized hospitals

[7] http://www.euro.who.int/__data/assets/pdf_file/0018/237204/HiT-Norway.pdf

[8] http://www.alzheimer-europe.org/Policy-in-Practice2/Country-comparisons/2012-National-Dementia-Strategies-diagnosis-treatment-and-research/Norway

- Community health care centers

There is an increasing trend in the number of beds in cares institutions, the majority being in hospitals. Thus, we see that it is more difficult for Home4Dem to commercialize its products and services in such a market because there are rather few housing arrangements where Home4Dem systems could be set up. Also, hospitals already have the necessary structures and healthcare staff to insure a good follow-up of their patients.

However, people who do not have a serious mental/cognitive disorder, face substantial waiting times before consulting a specialist, unless they are willing to pay for treatment out of their own pocket. Here, we can see a potential market for Home4Dem by providing an affordable solution. We could even discuss with governmental insurances in order to obtain at least partial reimbursement for the Home4Dem products which could reduce high operational costs for maintaining care units and for slowing down the progress of the condition. In this kind of health care system, it is important to deal with **governmental agencies**.

Sweden: (Anell, et al., 2012)[9]

The Swedish health care system is government-funded and decentralized. This system is based on the Health and Medical Services Act of 1982 certifying that everyone living in Sweden should receive the appropriate health care. At a national level, the Ministry of Health and Social Affairs is in charge of the overall health care policy. At a regional level, responsibilities are delegated to the county councils that are elected by the public every four years. They are responsible for hospitals management and for ensuring efficient and good-quality health care services. They also regulate the prices of health care services. Finally, at a local level, municipalities have to provide a healthy living environment for citizens (i.e. water supply, social welfare services). They are also to a large extent in charge of post discharge and long term care for elderly and psychiatric patients. Private health care does exist but it is not reimbursed if the care provider does not have a contract with the county councils. Moreover, private health insurances are not common and are mainly paid by employers.

Concerning mental health care, in addition to the basic health care legislation, there exists supplementary legislation for severe case of cognitive abilities. For minor health problem, people are taken up by the primary care settings. Besides, the National Strategy of the Swedish National Board of Health and Welfare (Alzheimer Europe, 2012)[10] focuses on community care and primary care and is more and more outpatient oriented while inpatient care is decreasing.

Thus, in this kind of system we have to reach **local governments and municipalities** that are in charge of long term care for elderly and mental ill people.

Switzerland: (De Pietro, et al., 2015)[11]

The Swiss health care system is a decentralized system involving both public and private institutions. The decision-making is sharing between:

[9] http://www.euro.who.int/__data/assets/pdf_file/0008/164096/e96455.pdf

[10] http://www.alzheimer-europe.org/Policy-in-Practice2/Country-comparisons/2012-National-Dementia-Strategies-diagnosis-treatment-and-research/Sweden

[11] http://www.euro.who.int/__data/assets/pdf_file/0010/293689/Switzerland-HiT.pdf?ua=1

- **Governments**:
  - Confederation: financing, public health, research and training, quality and safety of pharmaceuticals and medical devices
  - Cantons: secure health care provision, health related legislation, prevention and health promotion activities, hospital managements
  - Municipalities
- **Mandatory health insurances (MHI)**: determining tariffs for the reimbursement of services
- **Citizens** through public referenda: reallocation of responsibilities between the three levels of governance, legislative activity, responding to citizens' demands for change

Health insurance covers a part of the cost of medical treatments and hospitalizations that are detailed in the Federal Law of Health Insurance. This compulsory insurance can be completed by a private complementary assurance that allows for coverage of treatment that are not covered by the basic insurance. Moreover, there exists public, subsidize private and totally private infrastructures. The insured people then choose among those structures when health care are needed and according to their insurance coverage.

In 2015, the "*Loi fédérale sur le dossier électronique du patient"* (LDEP) was adopted and regulates the way patient's electronic data have to be managed. It has been developed in for the purposes of the eHealth strategy of the Swiss Federal Government.

Concerning mental health care, the patients are mostly taken in charge by psychiatric services in hospitals. The treatments are reimbursed only if there is a medical prescription from a GP, but there is still discussion about reimbursement from MHI. Moreover, psychiatric care is organized by canton thus we can observe variation across cantons. To achieve a better coordination of mental health care, the Confederation and other health agencies have implemented a national network in order to improve the collaboration between the different actors of the mental health care.

In addition to this, many private or public initiatives have emerged in order to avoid social exclusion of people with dementia. For instance, the "How are you? " (Comment vas-tu ?)[12] campaign have been launch by NGOs and cantons and aims to raise awareness on the importance of talking about psychological illness.

Thus, several markets could be potential target for the Home4Dem products and services. As the people with dementia are reimburse by **MHI**, we should deal with them in order to obtain total or partial reimbursement of our product and services. Then, the huge network of **NGO**s could help us to distribute our products by recommending us to their members that are mainly either formal or informal caregivers.

Conclusion for the European market:

We can observe very different heath care systems even across the four countries participating in the Home4Dem project. However, we can deduce three main types of potential customers: governments at a subnational level, insurances companies and caregivers, either formal or informal. The analysis of the different health care systems allows us to consider the two distribution channels: B2B and B2C.

[12] https://www.comment-vas-tu.ch/

Demand for assistive technology in everyday life is increasing because it is particularly cost-saving. Our solution will precisely save costs for all potential customers:

- As we as seen previously, even if health care systems are different across countries, all health authorities try to reduce the cost of the health care system. Indeed, our solutions could allow the governments to reduce the health care spending by allowing people with dementia to stay longer at home instead of being hospitalized or taking in charge in specific medical structure with large maintenance costs.
- Insurance companies will also reduce their costs by preventing the diseases progress if they allow more people to have access to our technology.
- Families will enjoy the PwD in a familial environment while reducing the health care burden.

Currently, very few companies offer solutions combining home care and security features, as we will see in the competition analysis (3.c). Thus, we should use our first mover advantage in order to spread over the overall European market and to take the opportunity of new businesses in each country of Europe.

Therefore, rather than overcoming a strong existing competition, our main challenge is to obtain the customer acceptance and brand recognition. Because, as our technology is unique, we should put many efforts in training them and making them comfortable with the Home4Dem system that will be part of their everyday life.

For the same reason, we should pay attention to the patenting of the technology, we have to be sure that we have all the patents necessary to be implemented in each country without being copied. In the same way, we have to be aware of all the governments' regulations that could force us out of a market.

2.2. Telecare/Telehealth Industry and Technological Environment

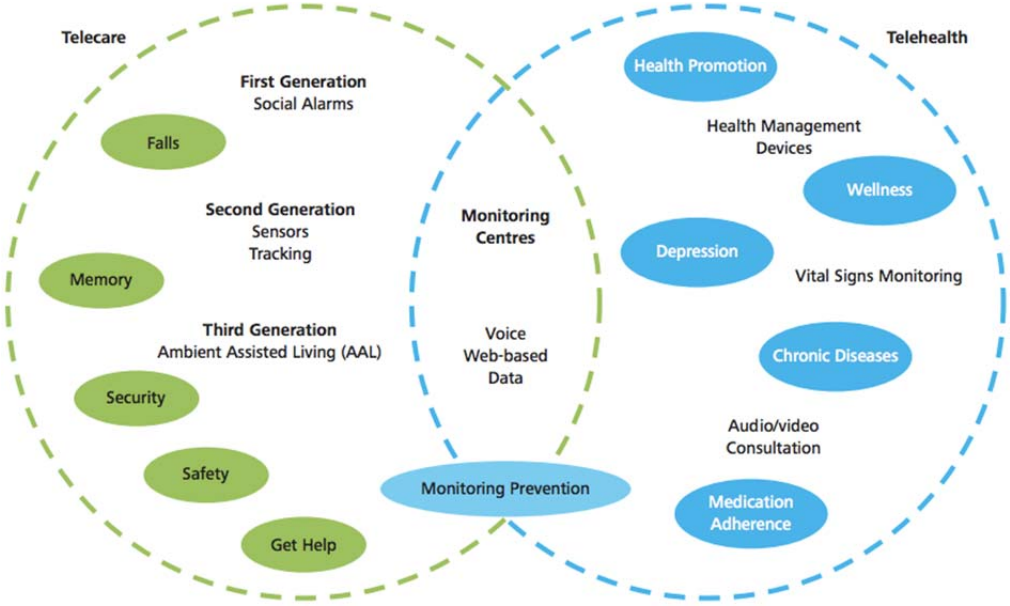
Telecare and telehealth industries are currently on the rise because they allow people with special medical needs to stay the longest at home while benefiting the adapted cares thanks to assistive health care technologies.

Deloitte's report (Deloitte Center for Health Solutions , 2012)[13] on telecare and telehealth defines both technological health systems as:

- **Telecare**: "uses of assistive technologies and services (e.g. alarms, sensors) to help people to live independently for longer, particularly those who require a combination of social care or health services."
- **Telehealth**: "supports people, typically with long term health issue, to monitor and manage their own condition. […] (it) involves the exchange of data between the patient and healthcare professionals."

[13] http://www2.deloitte.com/content/dam/Deloitte/uk/Documents/life-sciences-health-care/deloitte-uk-telehealth-telecare.pdf

Figure 3 The broad spectrum of telecare and telehealth uses and services – Deloitte Report



The **first generation** of telecare includes a telephone unit and a pendant or wristband with a panic button. When the panic button is activated, the call center receives a call with the identity and the location of the caller. Thus, care staffs can act according to the level of emergency.

The **second generation** systems include, in addition to the alarms, sensors and tracking for smoke, fire and flood. If one of the sensors is activated, then the monitoring center provides an immediate response according to the emergency of the situation.

The **third generatio**n telecare systems continuously collect data through the different sensors. They consist of front door open/close detectors, fridge open/close detectors, pressure mats, bed/chair occupancy and electrical usage sensors. Home4Dem is part of the European AAL Joint program where the European Commission invests in R&D projects for seniors and aims at commercializing these health care systems.

The Home4Dem technology is a third generation telecare solution combined with telehealth services thanks to the health management devices (i.e. mobile application), and security services thank to the security from intruders' service. There will be more detail on the products and services in part 4.

The market of telecare and telehealth shall have a good future ahead. Indeed, people with dementia are mainly elderly people and the silver economy is expanding over time. According to the European Commission report on the silver economy (European Commission, 2015)[14], the telehealth technologies are predicted to grow from $6.5 billion in 2013 to $24 billion by 2019. McKinsey Global Institute estimates the health care application market to have an impact of $1.1 trillion to $2.5 trillion per year by 2025. Therefore, we see that the potential market is growing and that this increasing trend is not about to stop. ICT based products and services have thus a real potential in future and the importance of the R&D should be one of our main concerns in order to keep our competitive advantage in the long run.

[14] http://ec.europa.eu/research/innovation-union/pdf/active-healthy-ageing/silvereco.pdf

A crucial point to pay attention in telecare and telehealth services is the protection and privacy of customers' data. Indeed, personal and especially medical data can be sensitive, thus we have to guarantee that those data will be treated with the maximum level of security and that we will achieve the best ethical commitment. In accordance with its activities Home4Dem is considered as a data controller by the European legal framework. Thus, we have to respect the EU's **Data Protection Directive** (European Commission, 2016). Particularly[15]:

- "Data controllers must ensure that data subjects can rectify, remove or block incorrect data about themselves." → customers will have to authorize the exchange of information with healthcare professionals and with other external systems.
- **"Data controllers must protect personal data** against accidental or unlawful destruction, loss, alteration and disclosure, particularly when processing involves data transmission over networks. They shall implement the appropriate security measures." → all personal information will have to be encrypted and anonymized.
- "These protection measures must ensure a level of protection appropriate to the data."

Following strict directives from the European AAL Joint program, before commercializing the products each partner will obtain ethical clearance from the competent national ethical authorities. For the overall project the Advisory and Ethical Board will take care of checking how personal data will be collected and processed.

Moreover, it has been defined that the Home4Dem project will follow the principles of ethical practice established within the ASTRID project (reference) for people with dementia and ensure that they identify and understand the proposed work and ethical approach.

To guarantee the confidentiality of the data, all subjects will be allocated a unique identifier (UI) that will be generated locally. The source information for the UI will be retained locally and only the code shared within the consortium. In order to guide the handling of personal data, the consortium will follow the 95/46/EC Privacy directive of 4th April 1995 about individual protection for personal data management and distribution. Particular attention will be given to systems for ensuring confidentiality of personal information and to the security of those systems**.**

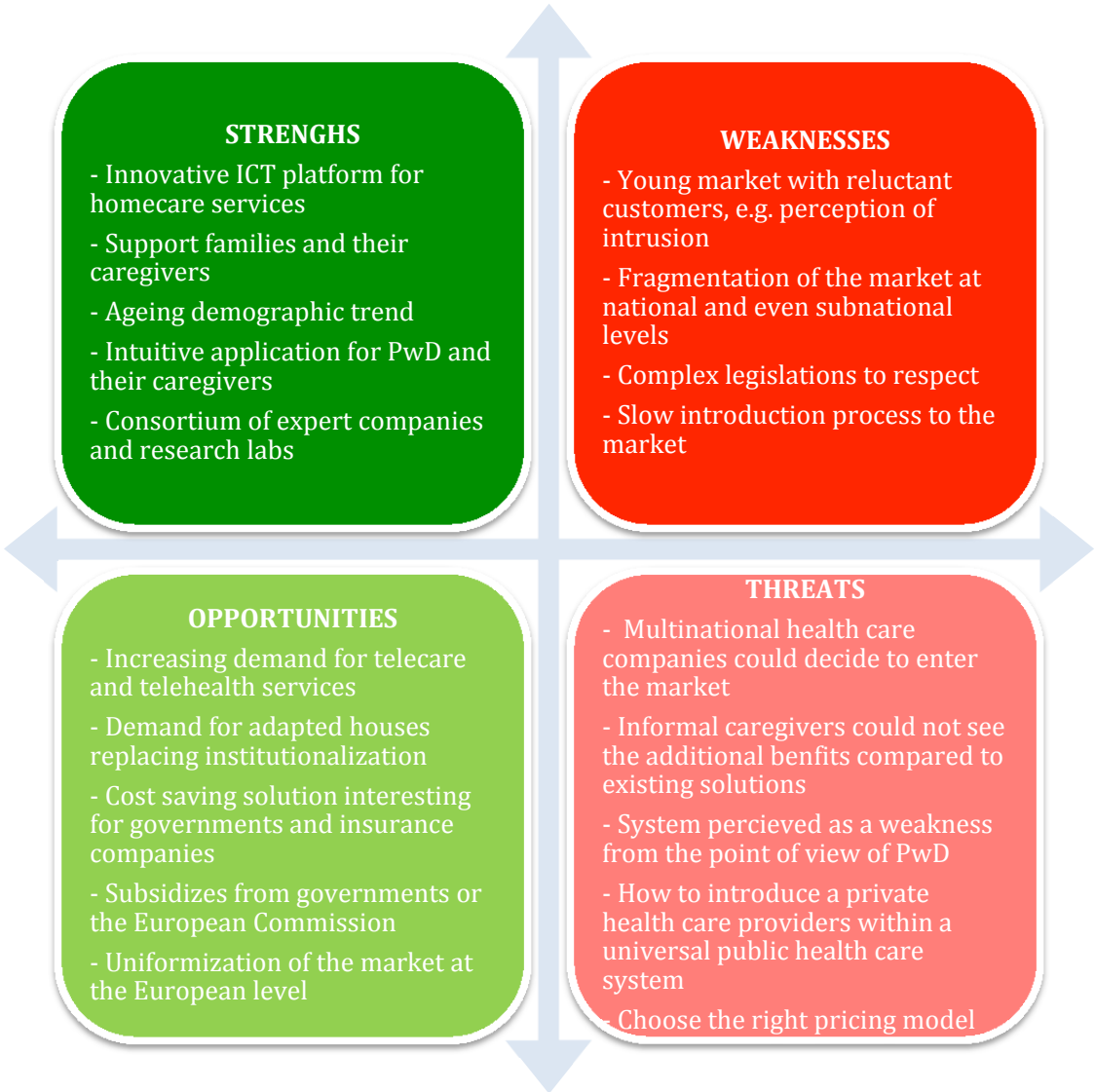
Respecting all the previous directives and collaborating with pioneer partners recommended for their ethical commitment, Home4Dem will keep its first mover advantage on the competition.

[15] http://ec.europa.eu/justice/data-protection/data-collection/obligations/index_en.htm

2.3. SWOT Analysis

The SWOT analysis permit to define the strengths and weaknesses of our products, and it also allows exploration of the possible opportunities and threats existing on the telecare market.

Figure 4 SWOT Analysis for the Telecare Market



All in all, we can sum up the environment where we are going to develop the project as:

Economic Drivers	•Increasing health expenditure •Cost saving governmental policies
Sociological Drivers	•Increasing number of PwD •Ageing population •Trend of ageing at home
Technological Drivers	•Development of E-health care services

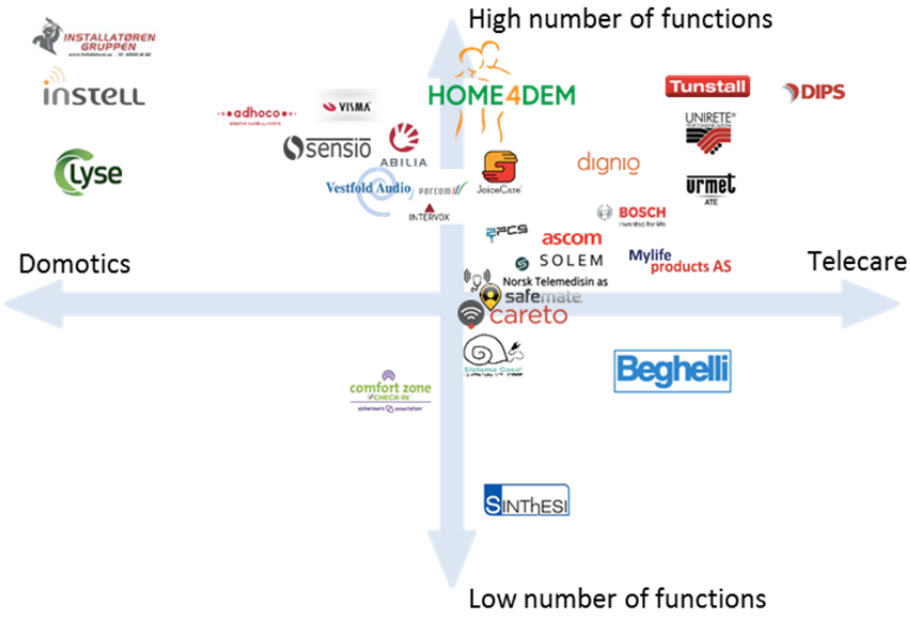
2.4. Competition Analysis

European Competition Overview:

The telecare and telehealth industries are quite new in Europe, but they attract more and more companies because of the huge potential market. Public programs are also more and more common as the Ambient Assisted Living Joint Programme. It is a program of approximately 60 on-going projects about ICT based solutions to support the active and healthy ageing of elderly people, with 23 partner countries in Europe.

For more details about the competitors mentioned below, refer to deliverable 4.1.

Figure 5 Positioning Map in Europe



In the four countries involved into the project, competitors that have been defined compete particularly on the home automation market and the ones providing telecare services are very specialized for health professionals or only offer few specific services, such as alarm buttons. Home4Dem is competitive in this market because it brings a personalized health care services that allow a preventive approach of dementia, bringing peace of mind to both people with dementia and their relatives.

Worldwide Competition Overview:

However, this is not the only existing competition. Indeed, there exist some worldwide competitors, especially in the US, that could be potential threats ince they develop similar solutions as the Home4Dem. Care innovation overseas is also a big issue because of the huge costs of hospitalizations. The main competitors are mainly multinational companies with subsidiaries all over the world. They could export their innovation to Europe without any surprise. Thus, we have to anticipate this move by strengthening our competitive advantage.

The three biggest competitors could be:

- Philips:

Philips US have a complete home telehealth division providing several services for delivering complete cares at home through different programs.

With the eCAC program[16], Philips develops an ambulatory telehealth program composed by a "eCareCoordinator" for the health care professional and a "eCareCompanion" that is the patient app. With this solution the patient is able to measure his vital signs at home thanks to wireless devices. Thus, the patient and his caregivers are connected as well as relatives of the patient.

With eIAC program[17], Philips delivers cares to patients with the highest-cost intensive ambulatory cares. It permits to coordinate the care among the different care givers while staying as long as possible at home.

The eTrAC program[18] aims at decreasing the number of hospital readmissions after discharge by creating a connection between the patient and the caregivers.

These three programs have demonstrated that telehealth can reduce the costs of the health care for the patient and their families but also for hospitals.

More generally, a digital platform is being developed and it is called HealthSuite. It should provide health propositions to improve care at lower costs.

- GE Healthcare:

[16] http://www.usa.philips.com/healthcare/product/HCNOCTN509/ecac-program-telehealth-program-for-chronic-ambulatory-care

[17] http://www.usa.philips.com/healthcare/product/HCNOCTN508/eiac-program-telehealth-program-for-the-highestcost-intensive-ambulatory-care-patients

[18] http://www.usa.philips.com/healthcare/product/HCNOCTN510/eTrAC

GE Healthcare is selling wireless networks allowing caregivers to obtain information about their patients at any time. There also exits a clinical alarm management in order to improve patients' monitoring at hospitals. Nevertheless, those products are mainly used in hospital contexts.

A joint venture between GE Healthcare and Intel Corporation has developed a program called Intel-GE Care Innovation[19] by providing intuitive and easy-to-use technology and a device platform for the clinician, patient, and family caregiver. They have also developed a smart system of sensors QuietCare measuring patients' activities of daily living with an alarm system.

- McKesson:

McKesson is an American company providing health information technologies and care management tools. Their product McKesson Homecare[20] gathers and shares all the information needed by the clinical agencies. This product is not for private individuals but aims at optimizing management issues in? health care institutions. Thus, they could easily extend their product to adapted homes.

All in all, existing competitors propose global assisted living solutions but do not focus on the specificities of dementia. Thus, this gives us space for developing our products that is diseases-oriented.

[19] http://www.careinnovations.com/

[20] http://www.mckesson.com/providers/home-care/agency-management/mckesson-homecare/

3. Products and Services

3.1. Technical Specification and Core Services

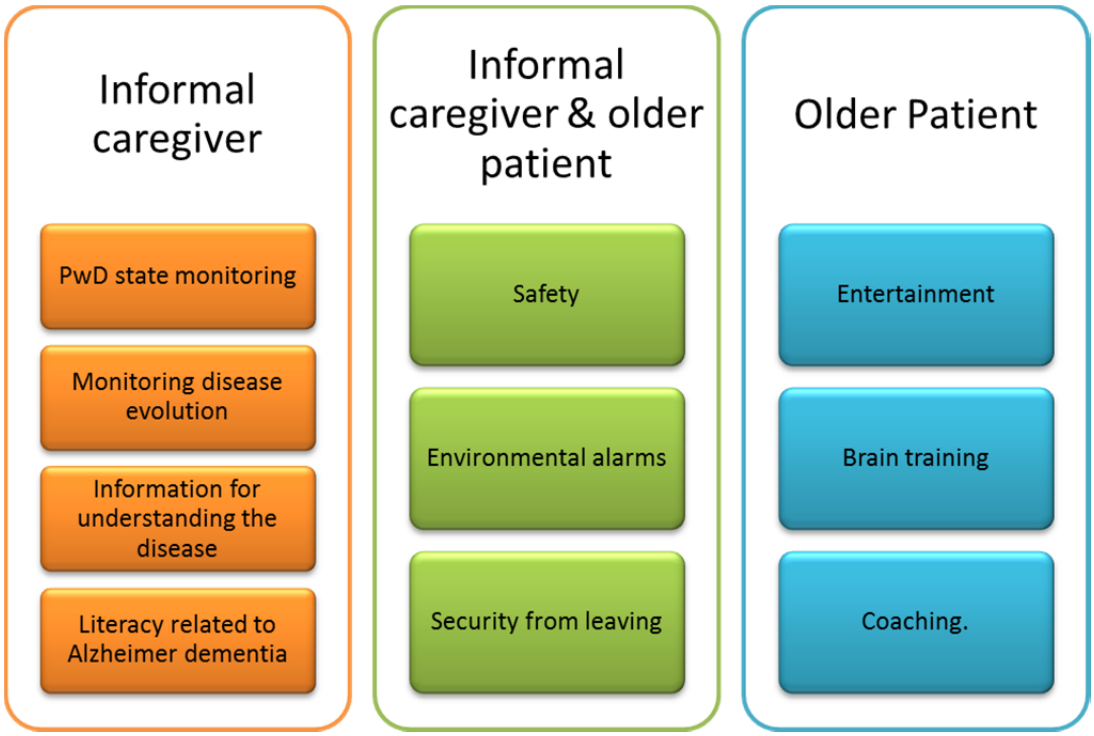
See WP1 and WP2 for more details.

The Home4Dem technology combines two functioning solutions that are available among the consortium' partners, both have their advantages and limitations. The Home4Dem project allow them to:

- Build and integrate new components and additional sensors into already available systems that will overcome obstacles and limitations of the existing solutions.
- Develop new smart behavior analysis algorithm for the personalization of patients' care.
- Create a new interface tailored to the PwD characteristics, their houses, as well as the formal and informal caregiver.

Following the User requirement and Use Case definition work package, the following list of services has been defined as being in line with the customer's needs.

Figure 6 Services Definition



The possibility to add new services or to update the existing ones will allow us to avoid technological obsolescence and to keep our competitive advantage. To keep room for innovation is essential because it will permit us to improve our product according to the customers' need.

The partners have discussed and evaluated the proposed services, on the basis of the innovation and benefits for the end-users, the technical feasibility during the project lifetime, and the marketability.

The result of this evaluation is a set of five use cases (described in D1.1) that will be implemented during the project including the services that were considered more relevant according to the above described rules:

1. Safety, environmental and PwD state monitoring;
2. Entertainment, brain training, physical and leisure activities coaching;
3. Security from leaving;
4. Improving the literacy related to Alzheimer dementia;
5. Monitoring disease evolution.

The main innovative part of our product is the mobile application that will be developed for formal and informal caregivers including among others a responsive design, a carer messaging and alarm, a call-back option, a sensors' analytic set up *(refer to the user interface principles D2.1)*. The platform should be suitable for both iOS and Android systems.

Intellectual Property Rights

"IPRs are still chiefly protected by national rather than EU laws. Defending them in each individual EU country can be complicated and costly. **You can save time and money by protecting your intellectual property at EU level"** (European Comission, 2016)[21]**.**

At the European level, an online application costs €850 and is filed in just one language. When the European Union Intellectual Property Office (EUIPO) receives the application form, it checks it and processes it. Once registered, the trademark can be renewed indefinitely every 10 years.

In the Consortium Agreement, Parties agree upon the general terms and conditions for creation, protection, sharing and ownership of Background and Foreground Knowledge, generated by the participants in the Home4dem project (see the consortium agreement chapter 06. INTELLECTUAL PROPERTY RIGHTS, EXPLOITATION AND DISSEMINATION). During the project specific decision will be taken on every exploitable result emerged during the activities.

3.2. Competitive Advantage

Home4Dem products and services aim at providing more than an emergency services to the PwD. They allow for building the behavioral profile of the ill people based on the information collected by the sensors based system. Thus, analyzing the data in real time, it is possible to implement preventive action allowing the PwD to stay at home as long as possible and to increase the quality of everyday life.

Our competitive advantage is differential because our product is different from the competitors' ones by its uniqueness particularly thanks to the mobile application available for both informal and formal caregivers. Indeed, our services offer a personalized follow-up for the PwD and their caregivers either formal or informal. Thus, our targeted customers would see in our services a complete solution allowing better care and quality of life for PwD.

[21] http://europa.eu/youreurope/business/start-grow/intellectual-property-rights/index_en.htm

Our competitive advantage is based on an innovative and relevant ICT solution. In addition to the existing technologies of Up-Tech and DomoSafety, Home4Dem solution includes:

- A new action recognition functionality based on depth signals to provide more accurate information regarding food intake habits by the person in the house.
- a **prevention-oriented smart behavior analysis algorithm** which will interact with the users of the ICT solution, providing real-time feedback regarding ongoing risk and/or other relevant events in the home (medicine reminder, lifestyle recommendation - e.g. reminder in case of low physical activity etc.).

The possibility to integrate of new services, thanks to the flexible architecture of the system, allows us to have a long term road map, ensures continuity and leaves space for innovation and creativity.

In addition, our collaboration with both private companies and home care public institutions strengthen our capacity to elaborate services fitting customers' needs. The test and field studies insure that the information collected by health care professional are relevant and that the overall system works correctly.

3.3. Pricing Strategy

Comparing to our competitors, we have a more complete product since it is associated with a full follow-up service specific to dementia. This added value allows us to sell our product with higher prices than simple alarm button products. From the above positioning map, we can deduce the pricing strategy that we would like to implement.

According to the existing strategies implemented by the partners, it would be easier to adopt and adapt one of them in order to set up the pricing strategy. For instance, it could be relevant to use the DomoSafety strategy based on different packages sold at adapted prices according to the features included into it. It would be interesting to elaborate a basic package and a premium package that could be personalized.

The idea would be to sell the devices and take commission fees for the installation of the system and then take monthly fees. Thus, a constant revenue would be generated every month.

The process implemented will have to be specific to each country. Indeed, we cannot apply the same prices across the different European countries because of the huge variation of purchasing power. Thus we have to align the prices on the existing competition taking an additional margin.

More details have to be decided by the partners of the consortium. The prices used in the financial projection (8.a) are for guidance purpose only in order to have an average estimation

4. Marketing Plan

4.1. Targeted Customers

The target markets of Home4Dem are the families and PwD who would like to keep autonomy and live independently with a secure environment at home (Use Case Model A). However, the project intends to also focus on the B2B distribution channels (Use Case Model B), which means to establish partnerships with adapted/assisted living planners, installers and health care providers in addition to selling the products directly to the end users.

4.1.1. PwD and Informal Caregivers (Use Case Model A)

4.1.1.1. People with Dementia:

A major part of PwD are older.. With the trend of pursuing autonomy and aging in place, older people have specific needs in their daily life at home. Understanding these needs will allow Home4Dem to design better products and services in order to satisfy their customers. For the deliverable 1.1, workshops have investigated in each country the services that PwD would like to benefit in their lives at home, based on different focus groups of PwD and of informal caregivers. The result has listed out specific needs and preferences within the categories of household activities, social networking, health service and mental needs.

4.1.1.2. Families and Relatives:

According to the HAPPI[22] report (CLG, DH and HCA, 2010), the families desire peace of mind resulting from less pressure of taking care of the older person. Moreover, families also want to have access to immediate information of the older person's health condition, and have a long-term monitoring, according to the "Privacy Versus Autonomy" study (Townsend, et al., 2011)[23].

Home4Dem products could increase the families':

- Level of comfort and peace of mind
- Involvement in the care process
- Relationship with the PwD
- Purchasing power by allowing them to save money on the care bill.

In the study conducted for deliverable 1.1, the informal caregiver groups show different characteristics among the countries involved: in Italy, for example, the informal caregivers group is almost totally constituted by sons or daughters of PwD, while in Sweden we found that the majority of them are spouses or partners of the same age. This implies that there is a wide range of caregivers and that all should be targeted by the communication strategy.

[22] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/378171/happi_final_report_-_031209.pdf

[23] http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=6091176&url=http%3A%2F%2Fieeexplore.ieee.org%2Fxpls%2Fabs_all.jsp%3Farnumber%3D6091176

4.1.2. Formal Caregivers (Use Case Model B)

4.1.2.1. Health Care Providers:

Health care providers will be key partners for promoting the product to the private individuals. They will benefit from the Home4Dem product by having a better access to their patients' information. Thus, they will be able to adopt a preventive approach and to adapt the cares needed for PwD depending on the evolution of their personal situation.

For each country, we need to determine which are the main health care providers in order to create new partnerships that will extend our network depending on the countries' health care system specificities described previously, it will be more relevant to contact either private or public health care providers.

For the overall public health systems, the Home4Dem services will save costs by reducing the number and the length of institutionalizations.

4.1.2.2. Real Estates:

Real estate developers would be in charge of installing the products during the construction of the adapted apartments and houses. Real estate developers and architects will have to be contacted in order to analyze their perception and interest in the project. One important criterion to choose the right companies is their interest in green markets, since they are more likely to expand into new markets.

4.2. Other Stakeholders and Partners

Not only direct customers either B2C or B2B are involved in this project. Indeed, it would be interesting to build other partnerships to extend our network. Influential organizations in the health care industry that have an influence on the older people's perception of health care products will play an important role in the marketing process. Moreover, the health insurance companies should be essential stakeholders as well.

A more detailed primary research will be conducted later on collecting field data.

4.2.1. Insurances

In countries where private health insurances play a significant role (i.e. Switzerland, Italy), these can be key partners. Indeed, they will allow more customers to buy Home4Dem products and services if they cover parts of the costs related to the utilization of our solution. Our product will be able to reduce the cost or frequency of compensation for PwD's accidents. However, we will need to prove the market potential and financial prospects of the Home4Dem products because they will be the determining criteria when considering it the part of the insurance coverage.

4.2.2. Third Party Organizations

The most influential organizations in the health care industry should be identified in order to understand their perception of the Home4Dem products. Indeed, they often play a crucial role when selling our product because people trust them and they are quality guarantee.

They can be:

- Health professionals

Home4Dem products will allow health professionals, such as occupational therapists, nurses and physicians to act in prevention and to adapt the provided care more easily towards the changing needs of the PwD and the family. They would have the same benefits than the regular health care providers mentioned above.

- NGOs:

For instance, the Red Cross is often mandated by governments to carry out public tasks aiming at helping people in need by providing emergency solutions. In our case the most relevant ones are call centers, alarm watches and transportation for medical cases.

- Non-profit organizations and associations:

They aim at promoting the social integration of elderly and ill people. They offer opportunities for social relations, cultivate cultural interests, strengthen human relationships. They often are in charge of giving the best advices and organizing activities in order to engage the ill people. They are often specialized on the elderly segment.

4.2.3. Distribution Channels

Through the B2B market, Home4Dem has to build a strong network of partners distributing the Home4Dem solution in order to become a market leader. In order to penetrate the most Europeans markets, building a strong network of partners being major players of the health care industry should reinforce Home4Dem's attractiveness and power.

External distribution partners should be reliable and will be mainly health care providers and real estates. In order to protect the reputation of our project, each partner will be informed of the best practices to set up.

4.3. Strategic Objectives

Our objective is to build brand awareness in the European market. Since Home4Dem can create different benefits for diverse health care stakeholders, tailored communication strategies are therefore required for each of them.

Many challenges will have to be overcome. Indeed, our services are innovative and go beyond traditional health care services by bringing complex ICT solutions in home. Thus, PwD and especially elderly people could reject our technology because of considering it intrusive. They can perceive the system as a surveillance system rather than a health care system. Thus, it is important to focus on the added value of prevention when communicating.

Moreover, we have to tackle the idea that our technical solution will decrease the level of human touch. On the contrary we have to demonstrate that our solution will allow families and PwD to enjoy their shared moment without worry. We will have to put constant investments for further communication plans due to upgrades of products resulted from fast evolution of the technology.

All in all, we have to design an efficient communication campaign that explains a complex concept in a comprehensive way to every segment targeted.

4.4. Promotion Strategy

We cannot use the same communication strategy for B2C or B2B customers. Therefore, we have to design two different strategies. On the one hand, for the end consumers including PwD and their relatives we have to insist on the emotions and on the relief brought by our solution. On the other hand, we have to emphasize the practical side when addressing to the health care professionals. There, we have to concretely prove that our solution will enhance the quality of life of the PwD and their relatives.

We also have to take into consideration the mainstream ways of communication in each country.

General Communication Features:

Newspapers are very common in Europe and in all countries involved in the project they are common mean of advertising. Also, in Switzerland, there are three national languages and main newspapers are not the same in each language region. Thus, it is really important to select only the most relevant newspapers, which will have a greater impact on the potential end consumers. Follows some examples of important newspapers in each country:

- Italian Newspapers: La Republica, Corriere della Sera;
- Norwegian Newspapers: Afteenposten, Bergens Tidende, Stavanger Aftenbladet;
- Swedish Newspapers: Dagens Nyheter Sydsvenska Dagbladet;
- Swiss Newspaper: 20minutes (available in the 3 national languages), Le Temps, Tages Anzeiger.

In Sweden, in particular the professional papers would be important communication channels. These include for example Äldre i Centrum, Arbetsterapeuten, Vårdfacket, Vårdfokus and Fysioterapeuten. Another idea is to advertise on public transportations such as trains, buses, metros and trams, by using posters. In addition, pharmacies, fitness centers, hospitals, doctors' offices, supermarkets and real estate agencies could also be used as advertisement spots by using leaflets and flyers.

Regarding the online communication, a website (Home4Dem, 2015)[24] is designed in six languages: English, German, French, Italian, Norwegian and Swedish. We also have to start applying search engine optimization (SEO), in order to be present on the top of the first page on the most popular search engines such as Google. Pay Per Click (PPC) advertising and Google AdWords will allow us to place an advert on the side of search engines result pages, then we only pay when a user clicks on our advert, opening our website. Thus, we know how many people click on our advert, what they are searching for and when they do it.

[24] http://home4dem.eu/

4.4.1. B2C – People with Dementia and Informal Care Givers

The end consumers of Home4Dem are defined as PwD or families who support them. Thus, the profiles of both parties are different to each other. It is important to design appropriate communication in order to maximize the impact of the campaign.

- Main Message: Home4Dem makes your life at home safest by preventing unexpected behavioral modification. You will be able to live independently at home while bringing peace of mind to your families and relatives at an affordable cost. Home4Dem takes care of you without watching you. Only authorized people have access to your data. Families and relatives have access to the reports of PwDs' health and behavior pattern any time of the day thanks to the mobile application.
- Targeting specifically PwD:

PwD can have difficulties to use Internet, particularly the oldest ones. Thus, it is important to focus more on offline publications. We can target both national and local newspapers and specialized reviews targeting older people. We would thus increase the awareness among people in old ages.

Even if PwD obtain most of their health care information from their families and house doctors, some of them are familiar with Internet and use it regularly. Therefore, online communication can also be an effective communication channel. Introducing Home4Dem products online requires seeking for popular online communities among the PwD. For example, Senior Web (www.seniorweb.ch) is a Swiss website where the majority of members are seniors. Those seniors discuss on forums, exchange private messages with others, share regional groups and interests, post pictures and chat online through this website.

- Targeting Informal Caregivers:

Although family members of the older people are not the consumers of the products, they are the ones who will most probably buy it. Therefore, it is very important to approach them differently and appropriately. Since they are more interested in new technologies, we will reach them mostly through online communication.

Due to the increasing number and popularity of social media, it is highly recommended to introduce Home4Dem through this channel. According to the Alexa web ranking, the most popular social media in Europe are Facebook, Twitter and LinkedIn (Cosenza, 2016)[25]. From this analysis, we can thus create profile on these three social media. A Facebook page will allow us to post new products advancement, and to update informal caregivers especially targeting the youngest caregivers. Twitter will permit real-time sharing of information. Finally, a LinkedIn profile will demonstrate our professionalism.

The mobile application where families could check on their PwD at all times is also be a way to promote the project. To maximize its impact, the application should be designed in a very intuitive way to allow people that are not comfortable with new technologies to use it easily.

[25] http://vincos.it/world-map-of-social-networks/

4.4.2. B2B – Formal Care Givers

There are many formal caregivers. Thus, in addition to the general public communication campaign, we should design special marketing tools for health care professional in order to reach them through rational communication.

- Main Message:

Home4Dem is part of the care of tomorrow. It will permit to provide personalized cares in order to prevent disease evolution and to have a better understanding of the health condition evolution. It will be possible to add extra services and sensors at any time according to specialists' advices.

We mainly focus on the distribution channels and third parties since they have direct contact with the end consumers and they will promote the project through word of mouth. The objective is to build trust between the audience and Home4Dem in order to be recommended in the future and reach a wider range of potential customers.

- Targeting Health Care Providers:

The most relevant way to promote Home4Dem to health professionals is through medical conferences and fairs. When attending the conferences, Home4Dem should be present on a stand with a realistic scenarios of the service where the health care professionals can be directly involved with the concept. It is very important to focus on the added value of the product for this segment. It is not about substituting the human touch but about prevention, security and providing personalized health services and advices.

Moreover, we should provide them leaflets and flyers that they can distribute in their waiting room. They should also have access to the mobile application in order to have direct and fast access to their patients' data and then to implement the personalized cares as soon as possible.

- Targeting Real Estates:

Architects and developers are working under commission, which means that they do not take the final decision and they have to execute their work according to their clients' wishes.

Therefore, targeting the directors of the adapted homes through direct visits should be the most efficient way to reach them. We should build a scale model to show them how Home4Dem system works in a creative way.

In general, it is highly recommended to purchase a Customer Relationship Management (CRM) tool such as Sales Force or Microsoft dynamics CRM (cloud based). These tools will help Home4Dem to manage their interactions with clients and sales prospects as well as retain existing customers, create online marketing campaigns, deliver timely, relevant and personal services through all channels.

- Targeting Organizations and Associations:

The most efficient way to reach these stakeholders is also by visiting them directly. During the meeting, an expert from Home4Dem will explain the products and services in an intuitive way allowing the testing of different sensors. In order to give an incentive, the company could consider sponsoring activities for the PwD, since most of these channels are non-profit organizations and are often searching for funds.

In addition, be present in health specialized newspapers either through ads or articles can extend our marketing reach. The advantage of this tool is that it reaches all health care professionals.

Some gadgets and goodies could be offered to all the stakeholders, for example a portable alarm, in order to promote the project and remind them at any time that we are there to help and enhance the quality of life of PwD.

5. Operational Plan

5.1. Pilot

After having developed the interface and algorithm systems and before starting to produce and commercialize our product, it is important to test it with a field trial. This will reinforce our credibility among health care professionals. According to the work plan organization, the Work Package 3 includes the field trial led by INCRA. The main objective of this WP is to validate the developed ICT system in real life environment in each test-site, involving the elderly, their families and/or informal or formal care givers. It should last the 19 last weeks of the project. The overall aim of this phase is to evaluate the consumers' reaction to the product and if our system satisfies them and health care professionals.

The first step is to define the ethical pilot methodology. It will last 6 weeks. Using the User Cases Definition elaborated in the WP1, a qualitative analysis will be defined thanks to metrics and benchmarks related to a) the effectiveness of the system in providing and supporting the planned services; b) the usability and of platform and its services; c) the impact on quality of life perceived by elderly persons and their caregivers. Ethical clearance before the pilot execution will be obtained by each partner from the competent ethical authorities. At the same time the instruction for the users training will be designed.

Then, the second step is to identify the involvement of the end users by developing a recruitment protocol in order to create 30 dyads in each country.

The third task is the real field trial and the training of the users. During this phase, a training for the users will be organized in order to make them accustomed to the technology and to show them what they can effectively expect from this service. This will last approximately 10 weeks.

Finally, during the last 4 weeks, we will gather all the results collected in order to estimate the impact of our ICT solution regarding the Cost-Benefit analysis, the impact on the psychological wellbeing and the improvement in the users' quality of life and the acceptability and usability of the system.

5.2. Commercialization & Expansion

To go one step further and to commercialize the product on the market, we should use the preexisting network built by the different partners in their home country. To do so, a dissemination plan and exploitation strategy should be implemented within the first 28 weeks.

During this phase, a concrete strategy is developed for the dissemination aiming at communicating the project and outcome to the outside world meaning related stakeholders identified in the market analysis realized above.

In the long run, we should consider a European expansion in order to target a bigger market and to reach much more potential users.

6. Management & Organization

The project will be developed by a consortium of nine partner organizations, based in four European countries; Italy, Sweden, Switzerland and Norway.

For launching the business, different expertise is necessary: IT-experts, Web-designer, Marketing and Sales, Finance and Accounting. This is ensured by the complementarity of the consortium's partners

The consortium includes: five SMEs, two universities (iHomeLab and ULUND), and two end-user organizations (INRCA and TREL).

Italian National Institute of Health and Science on Ageing (INRCA), Research organization, Italy:

INRCA is the only Italian Research institute specifically focused on geriatric and gerontological topics. This peculiar position allows INRCA to carry out high-quality clinical and translational research in biomedical and health care services areas, as well as to provide evidence and recommendations to private and public institutions concerning the socio-economic impact of ageing.

Competence and role in the project. INRCA will be responsible for project management, user testing in Italy; Ethics and test protocol definition; Data analysis and management; Administrative issues and Market analysis.

DomoSafety, SME, Switzerland:

DomoSafety is a start-up company created in 2011 with the purpose to help increase independence and security for the elderly living at home. We propose innovative prevention and alarm services in the e-health and e-care sector, thus bringing peace of mind, not only to the elderly, but also to the family and professional caregivers.

Competences and role in the project. Integration and full test, as a service provider, of the CarePlan tool; development of Algorithms for Behaviors Analysis; Information analysis and graphical presentation on profiles for mobility, cognition and nutrition.

ArieLAB Srl, SME, Italy:

ArieLAB Srl was established in 2004 as a spin-off company of the Marche Polytechnic University, initially aimed at working in the field of systems and applications for the upcoming Digital Terrestrial Television Broadcasting service. Experiences and know-how developed in this field were later applied in the area of Ambient Assisted Living. ArieLAB provides R&D services for the design of assistive devices and applications, with a specific focus on the needs of elderly and people affected by dementia, and their families or caregivers, both in home or nursing-home environments.

Competences and role in the project. ARIELAB will lead the WP1 on platform integration and up-date. It will bring in the consortium her strong expertise in Telecommunication and in the depth and movement analysis.

iHomeLab, Research Organization, Switzerland:

iHomeLab at the Lucerne University of Applied Sciences and Arts (HSLU) is a leading research center for building intelligence in Switzerland. Its main goal is to promote and implement our vision of assistive technology in a networked world to bring true value to all stakeholders. Together with over 200 partners the interdisciplinary team conducts applied research in the areas of ambient assisted living, human system interaction, energy efficiency and the Internet of Things.

Competences and role in the project. Requirements engineering; Support system architecture and design; Software development (server/web, embedded, mobile); Specialists in integration and lab testing; Human-machine interface; user testing; ethics.

KARDE, SME, Norway:

Karde is an advisory, multidisciplinary SME. Karde provides innovation-based consultancy and development services in two main areas: 1) Ecosystems of accessible and useful assistive technologies for persons with cognitive challenges. 2) Interoperability in the public sector and industry, with special emphasis on semantic and organizational interoperability.

Competences and role in the project. In Home4Dem, Karde contributes with end user involvement, system and service design and development, as well as user experience design.

Trelleborg Kommun, End-users organization, Sweden:

Trelleborgs kommun, the municipality of Trelleborg is most southern municipality in the country of Sweden with approximately 43 000 inhabitants. The demographic development for Trelleborg until 2030 (15 years) indicates that the population over 80 years increases with 60%. The elderly care in Trelleborgs kommun has since mid 2014 been involved in a couple of project in digital health and welfare technology.

Competences and role in the project. TREL will work in close cooperation with end user groups on requirements collection, requirements translation, iterative development and user trials.

Lund University (ULUND), Research Organization, Sweden:

With eight faculties, Lund University has strong research in many different fields and conducts cross-disciplinary research to tackle complex challenges. Centre for Ageing and Supportive Environments, CASE is a national center of excellence for research on ageing and older people involving three of the faculties at Lund University. The Deparment of Health Sciences at the Faculty of Medicine is the host of Home4Dem

Competences and role in the project. Support with the definition of user's needs, market and scenario analysis, support and quality assurance in the development of the trial in Trelleborg.

AUTOMA, SME, Italy:

Founded in 1987 with entrepreneurial spirit supported by considerable creative skills, Automa is a company involved in design, engineering and production of systems, electronic equipment and software for applications in the professional, industrial and civil field.

Competences and role in the project. AUTOMA will contribute to WP1 and WP2. It will be responsible for the assembling and installation of the final ICT solutions during the pilot in Italy

Ralph Eichenberger-Szenografie, SME, Switzerland:

Eichenberger-Szenografie is a design company based in Lucerne, Switzerland. We develop design concepts and produce exhibitions, films, objects and graphic user interfaces for a wide range of clients. Our award winning graphic user interfaces for the two AAL projects «Confidence» and «RelaxedCare» are based on a user centered design process and entirely focused on user experience.

Competences and role in the project. Development of the graphic user interface for the mobile application. Involvement in the development of the overall concept, the design of the application (provider, website, user). Provision of the corporate design and related electronic and print media.

7. Financial Plan

7.1. Revenue

The revenue will come from the initial installation of the ICT systems and from the monthly fees paid by the end customers. However, we will not have regular revenue during the developing phase as we will only test the product and collect feedbacks from the potential customers participating in the trial and from the other stakeholders.

After the end of the field trial we expect that, due to the dissemination activietis performed during the project and to the word of mouth, we can find a number of potential customers.

We can extimate the number of 100 early adopters of the product. We expect the number of potential customers to grow over time.

The price of the subscription will depend on the country. Indeed, we cannot apply the fees in the different countries of Europe.

Refer to the Pricing Strategy to have more details on the prices.

Moreover, the home based telehealth technologies market growth has been estimated around 24% (MANA, 2015)[26] for the next years. Thus, we can then roughly estimate our future potential market. In the following table, we have forecasted, for the first 7 years, our potential market and revenue based on the 20% growth rate. Since the 5th year we use an annual growth of 18% in order to obtain more realistic results. We use exponential growth formula.

The prices used in the financial projection are for guidance purpose only in order to have an average estimation.

The price of the competition in Europe goes from around 15€/month to 35€/month. Thus, we could fix our monthly fees, on average, to 30€/month considering that our services are more developed and have more features than than the competition. Then, after one year, we will raise our prices to 50€/month if we obtain partnerships with insurance companies. Indeed, the extra part will be supported by them,and all in all it will not be more expensive for end-users. Obviously, this price will vary across countries in order to fit the best to the market.

Table 1 Average Revenue from Monthly Fees over 8 Years with Insurance Partnerships

YEAR	*1*	*2*	*3*	*4*	*5*	*6*	*7*
NUMBER OF CUSTOMERS	100.00	153.76	293.16	693.10	1 585.64	4 280.53	13 635.51
MONTHLY FEES (€)	30.00	50.00	50.00	50.00	50.00	50.00	50.00
REVENUE/MONTH(€)	3 000.00	7 688.00	14 658.13	34 654.94	79 282.11	214 026.35	681 775.36
TOTAL REVENUE/YEAR (€)	36 000.00	92 256.00	175 897.50	415 859.30	951 385.34	2 568 316.24	8 181 304.34

[26] http://mana-llc.com/mana-blog/telemedicine-market-growth/

Table 2 Average Revenue from Monthly Fees over 8 Years without Insurance Partnerships

YEAR	*1*	*2*	*3*	*4*	*5*	*6*	*7*
NUMBER OF CUSTOMERS	100.00	153.76	293.16	693.10	1 585.64	4 280.53	13 635.51
MONTHLY FEES	30.00	30.00	30.00	30.00	30.00	30.00	30.00
REVENUE/MONTH	3 000.00	4 612.80	8 794.88	20 792.96	47 569.27	128 415.81	409 065.22
REVENUE/YEAR	36 000.00	55 353.60	105 538.50	249 515.58	570 831.20	1 540 989.74	4 908 782.60

What we can conclude from these forecasts is that even when not taking into consideration the price of installation, the project will generate revenue that overcome the initial budget after the 6th year, both with or without insurance partnerships. However, without insurance partnerships the project will be much less profitable than with them.

7.2. Costs

We have different types of costs. The first one are the costs of the pilot phase for the development of the product and the second one is the cost links to to the production of the product. In addition to these production costs there are costs due to the use of the products.

If the cost of the first development stage are covered by the initial budget from the AAL Programme, we will have to find new way of funding either generated by direct revenues as described before or by external financing (see next section – External Funding).

The costs for the first development phase are dived according to three categories.

- Human resources **€ 2 846 900**

They represent the main part of the budget. It has been planned to use 327 PM, including the efforts of the:

- Technical staff engaged in the development of the final ICT solution;
- Clinical and technical staff involved in the field trial;
- Professionals responsible for dissemination and exploitation plans;
- Administrative staff responsible for management

- Direct Costs: **€ 235 700**

Including:

- Devices for test prototyping: €20 000
- Devices for the trials: €96 000
- Internet connection costs: €45 200
- Shipping costs: €2 000
- Consortium meetings and other travels: €45 500
- Advisory and Ethical Board: €10 000
- Promotional materials and videos: €17 000

- Subcontracting: **€57 000**

Including:

  - Expert technicians: €47 000
  - Collaboration for Kinect algorithm: €10 000

The other costs to take into consideration are the Costs of Goods Sold (COGS).

We have to foresee production costs that we will have to discuss with our suppliers. Indeed, when customers subscribe to our services they receive monitoring devices. But, we do not produce them internally. Thus, we do need to establish a contract with devices suppliers fitting our requirements.

Besides, in order to allow the exchange of data between the stakeholders, we need partnerships with mobile network operators that provide us wireless communication services.

Potential telecommunication providers:

- Italy: TIM, Vodafone, Wind
- Norway: Telenor, Telia,
- Sweden: Telia, Tele2, Telenor
- Switzerland: Swisscom, Salt, Sunrise

Finally, our main development tools are linked to computer sciences and mainly require computer licenses. Thus, for the IT infrastructure we have to create contracts with IT providers that will host our platforms.

7.3. External Funding

In order to develop the project further, we need to find additional funding sources in order to be sustainable in the long run.

First, we should look at business angels. In Europe, many business angel networks are present in the different countries. For instance The European Confederation for Angel Investing[27] gathers members from many European countries as Switzerland and Italy thanks to the membership of the S.E.C.A[28] in Switzerland and the IBAN[29] in Italy.

Another solution would be venture capital funding to raise additional capital. For instance, the European Investment Fund[30] is active in the European market and has a strong expertise in the ICT sector and manly focus on early-stage technology enterprises. The Home4Dem project meets those two first criteria

[27] http://www.businessangelseurope.com/SitePages/default.aspx#

[28] http://www.seca.ch/

[29] http://www.iban.it/

[30] http://www.eif.org/what_we_do/equity/venture/

8. Conclusion

All in all, we have a huge potential market where our unique ICT solution could be implemented in, first, four European countries that are Italy, Norway, Sweden and Switzerland. Even if those markets have many differences, as their national health care system, they all share the increasing trend of people with dementia as well as the research of cost efficient solutions. The targeted marketed is growing because of the strong aging trend in Europe.

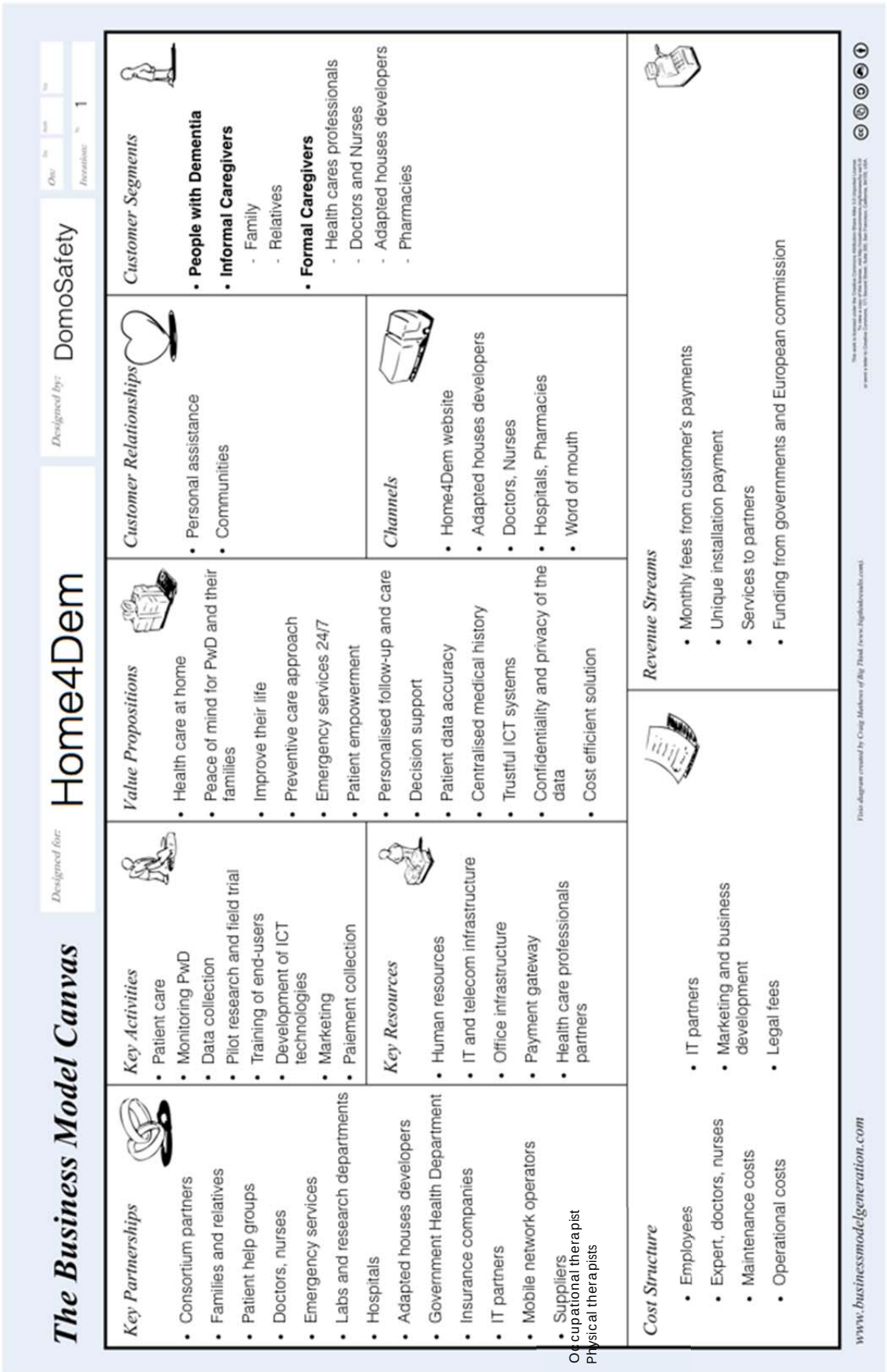
Our technological system allows us to prevent the deterioration of the PwD's general health status thanks to the daily monitoring. Our services gather relevant information and send them to the health care professionals in charge of the PwD and to their families and relatives. Thus, it is easier to notice abnormal changes in the health condition.

Several marketing proposition have been designed in order to reach both informal and formal care givers in the most effective way. The website being designed will allow customers to find out more about the services we deliver.

A clear pricing strategy still needs to be defined as well as a more precise operational plan. Thus, we will be able to draw a complete financial plan to propose to potential investors.

To have a complete overview of this preliminary business plan, we can design a Business Model Canvas that will summarize the information developed above. (next page)

Figure 7 Business Model Canvas



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