DELIVERABLE

Project title: **LetItFlow: Active Distributed Workflow System for elderly**

Project reference number: **AAL-2013-6-128**

D6.1 Functional Market Analysis And Market Segmentation Report

Revision: 1.0

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REVISION HISTORY

Revision	Author	Organisation	Description
0.1	Pedro A. Ruiz, Miguel Baizan	Integrasys	The first draft of the deliverable. Table of contents. Responsibilities assigned.
0.2	Pedro A. Ruiz, Miguel Baizan Otilia Bularca, Simona Bica	Integrasys SIVECO	First round of contributions from Integrasys. First round of contributions from SIVECO.
0.3	Pedro A. Ruiz, Miguel Baizan	Integrasys SIVECO	Update table of contents (merging deliverables D6.1/D6.2).
0.3 (1)	Florina Sevescu	SIVECO	Second round of contributions from SIVECO.
0.3 (2)	Ben Loke	Noldus	First round of contributions from Noldus.
0.3 (3)	Otilia Bularca	SIVECO	First review of the deliverable.
0.4	All	All	Content to the all sections.
0.5	Simona Bica, Athena Mergeani	SIVECO, UHB	Review and final contribution from SIVECO and UHB.
0.6	Simona Bica, Valentin Gattol	SIVECO, AIT	First contribution proposed for updating the market analysis section and commercial strategy – Section 4 – Similar projects and solutions in the market and Section 9 – Initial market strategy
1.0	Jose Cordero	Integrasys	Finalized deliverable

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ABBREVIATIONS

AAL - Ambient Assisted Living

AAL JP - Ambient Assisted Living Joint Program

AARP - American Association of Retired Persons

DG ECFIN - Directorate General for Economic and Financial Affairs

EU – European Union

GDB - Gross Domestic Product

HUVM - Virgen Macarena University Hospital Seville, Spain

ICT - Information and Communication Technology

IT - Information and Technology

PEST - Political, Economic, Social and Technological

R&D – Research and Development

SWOT - Strengths, Weaknesses, Opportunities and Threats

UHB – Emergency University Hospital of Bucharest, Romania

US – United States

USA – United States of America

1. INTRODUCTION

1.1 Scope and objectives of the deliverable

The scope of this deliverable is to do market research for the LetItFlow project, which mainly contains task 6.1 (Functional market analysis) and 6.2 (Market segmentation report). This deliverable is aimed at increasing market knowledge, especially the market about assisted working operations for elderly people. The data, information and literature used to complete the deliverable come from previous deliverables D2.1, D.2.2 and D2.3, desk research, interviews, internet and related books as well as literature.

This deliverable can be divided basically into two parts. The first part aims to get insight into the external and internal environment of the market for LetItFlow project; the second part focuses on market segmentation analysis according to end-users' requirements, as well as an initial strategy. The segmentation is based on the outcome of the user requirements report (deliverable 2.1) and the external and internal analysis. This second part was going to be covered separately in deliverable D6.2 (market segmentation report) although finally will be integrated all information together in the deliverable D6.1. This deliverable will be input for the business model (deliverable 6.3) and exploitation plan (deliverable 6.4).

The exact scopes and purpose of this deliverable are showed below:

Purpose	1.Increase market knowledge	2.Conduct external and internal analysis	3. Provide initial Strategy
Detailed Market Plan	a. Desk research b. Interview c. Survey	a. Macro Environment Analysis (PEST) b. Industrial environment analysis. c. Competitive environment analysis. d. Stakeholder analysis. e. Internal strengths and weaknesses. f. SWOT Analysis.	a. Segment Market Analysis. b. Selected Segments. c. Input for Business Plan.

Table 1 Scopes and purpose of deliverable

External and internal analysis will contribute to our promotion strategies, distribution strategies and market segmentation. Based on this, possible segmentation and strategies are developed, which will help to access and develop the market for the outcome of this project.

1.2 Structure of the deliverable

This report is structured in a number of chapters that we will briefly comment below:

- Chapter 1 explains the plan, scope, objective and structure of the deliverable. Moreover, it introduces this project, product, main market and research questions.
- In chapter 2 the external environment is described based on PEST analysis.

- Chapter 3 presents the internal environment analysis.
- Chapter 4 provides similar projects and products.
- Chapter 5 formulates the SWOT analysis.
- Chapter 6 provides the results and conclusions of interviews.
- In chapter 7, the LetItFlow market is segmented and selected segments are described more elaborately.
- Chapter 8 provides several possible market strategies on the basis of segmented market.
- Chapter 9 gives an overview of the market strategy and positioning, also with regards to competitors.
- Chapter 10 gives the final conclusion.

1.3 Consortium, project and product description

With the increase of aging in our society, the need for technological devices by elderly people is growing. At the same time, the progressive deterioration of physical and psychological abilities diminishes the capacity to perform their daily life activities. So elderly people would like to feel safer by using technological devices in their environment, for example smartphones, because such devices could help them to keep in touch with their children or ease the daily operations in the work.

In order to help solving this problem, the project LetItFlow is conducted by several organizations and it is made up of six technology and final users partners spread over the European continent: Spain: Integrasys (Spain – Leader), HUVM (Spain), Noldus (Netherlands), AIT (Austria), SIVECO (Romania), UHB (Romania).

The LetItFlow project aims to design and implement a workflow support system to help elderly hospital workers (mainly nurses) to accomplish their daily tasks and to the adaptation to new procedures and methods. The system should enable assistance by means of workers activity monitoring, portable communication tools, alerting services, adapted interaction interfaces or workflow management. Although we will particularize the solution to hospitals, the system could be applied to different work domains.

LetItFlow combines two challenges: change management in companies and workflow technologies for elderly workers, being the general objective to facilitate the adaptation of older workers to changeable work environment and to perform their tasks by supporting them with real-time context aware tool for guiding them in daily tasks.

This tool will have two types of users:

- The instructors: the users that create the instructions (or tasks) and monitor the employee to guide the worker in their workday.
- The employees or the instruction receivers: the employees themselves who benefit from the tools. As we comment previously, our case the employees are mainly nurses.

LetItFlow is based on fixed and mobile platforms that interact with the nurses to guide them in their work activities. Different Human-Computer interfaces are considered in order to adapt to the user activities and user profile (tactile, voice, text, vibration and multimedia). After an extensive search no similar solution in the market have been found, although we will build it from existing technologies (Hospital Information System and Workflows implementation solution from SIVECO, user behaviour and tracking from NOLDUS, Context monitoring and communication framework from Integrasys and user-friendly and adapted interfaces from AIT), products and standards that are helping to the

adoption of the platform by the market. The lack of this type of framework and tools, together with the expertise of the consortium and potential market impact, will suppose incremental innovations as the approach is trying to use existing solutions as much as possible.

After analyzing the end-user requirements of the LetItFlow system through online surveys, focus groups, literature and project research and experiences from previous projects, the specific functional and non-functional requirements were developed from the data collected at two distinguished hospitals from Romania and Spain that are partners in the consortium. Finally, one proposed solution is formulated in base to these requirements where we have basically a mobile application on the basis of a smartphone or tablet and its final benefit is supporting elderly people to perform their works independently and help them to feel confident and safe while increasing the efficiency of their work.

Figure 1 Initial design of LetItFlow application on smartphone

1.4 Methodology for market analysis

A market analysis for a product or business is one of the most basic and useful tool for strategic business planning, basically it is an analysis that provides a straightforward model with strengths, weaknesses, opportunities and threats to create the foundation of a marketing strategy. Definitions of strategic analysis often differ, but the following attributes are commonly associated with it:

1. Identification and evaluation of data relevant to strategy formulation.
2. Definition of the external and internal environment to be analysed.
3. A range of analytical methods that can be employed in the analysis.

The analytical methods used in this market analysis include:

- SWOT for Internal Analysis. SWOT analysis is an acronym for strengths, weaknesses, opportunities, and threats and is a structured planning method that evaluates those four elements of a project or business venture. It involves specifying the objective of the business venture or project and identifying the internal and external factors that are favorable and unfavorable to achieve that objective.
- PEST for External Analysis. PEST analysis is a scan of the external macro-environment in which an organisation exists. It is a part of the external analysis when conducting a strategic analysis or doing market research, and gives an overview of the different macro-environmental factors that the company has to take into consideration. It is a useful strategic tool for understanding market growth or decline, business position, potential and direction for operations.

- Porter for Competitiveness Analysis. Porter's five forces analysis is a framework that attempts to analyse the level of competition within an industry and business strategy development. It draws upon industrial organization economics to derive five forces that determine the competitive intensity and therefore attractiveness of an Industry.

1.5 Market description

1.5.1 Main market

In this chapter we're going to analyse the target group of LetItFlow, taking into consideration the impact of ageing population over the long-run economic and budgetary projections.

LetItFlow solution is shaped around the specific workflows and assists elderly to perform their daily work tasks using various ICT communication tools. This solution is destined to be used by employees over 50 years old and is not limited by activity domain, country or region. LetItFlow is tailored to the needs, expectations, lifestyle, preferences and routines of the individual but at the same time, is focused on social, political and legal systems and technological environment.

Solutions like LetItFlow are relevant nowadays because worldwide population is growing old and average life and the expectancy has increased from 55 years in 1920 to over 80 years today. The Ageing Report[1] issued by The European Commission stated that "one in three Europeans will be over 65 by 2060. This implies that the EU would move from having four working-age people for every person aged over 65 years to about two working-age persons. So, aiming to keep elderly working and shaping the working environment so they can be more efficient and satisfied, becomes a desideratum. Even if future generations will be more technology-literate, there will always be people ready to try anything new and people who have difficulties or do not want to adapt to new media and devices.

For the EU market, total government spending on pensions, healthcare, long-term care, unemployment benefits and education will increase by almost 20% (or 4.1 percentage points of GDP), while expenditures for long-term care will double, between 2010-2060. The long-term budgetary projections show that population ageing poses a challenge for the public finances in the EU. The fiscal impact of ageing is projected to be high in most Member States, with effects becoming apparent already during the next decade.

Based on the same report, labour force projections show a rise in overall participation rates, particularly visible for ages 50+, reflecting the combined effect of the rising attachment of younger generations of women to the labour market, together with the expected impact of pension reforms. By large, the biggest increases in participation rates are projected for older workers (around 21 pp. for women and 10 pp. for men) in the EU for the age group 55-64, influenced by enacted pension reforms. Consequently, the gender gap is projected to narrow substantially in the period up to 2060. The total participation rate (for the age group 20-64) in the EU is projected to increase from 76.5% in 2013 to 80.1% in 2060.

On the same note, demographic developments have a major impact on labour market developments. Three distinct periods can be observed for the EU as a whole:

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[1] http://ec.europa.eu/economy_finance/publications/european_economy/2015/pdf/ee3_en.pdf

- *2007-2011 – demographic developments still supportive of growth*: the working-age population is growing, but employment is sluggish as the financial and economic crisis weighs on labour prospects during this period.
- *2012-2022 – rising employment rates offset the decline in the working-age population*: the working age population starts to decline as the baby-boom generation enters retirement. However, the assumed reduction in unemployment rates, the projected increase in the employment rates of women and older workers cushion the impact of demographic change, and the overall number of persons employed would start to increase during this period.
- *From 2023 – the population ageing effect dominates*: the projected increase in employment rates is slower, as trend increases in female employment and the impact of pension reforms will be less pronounced. Hence, both the working-age population and the number of persons employed start falling over the remainder of the period.

Graph 1: Population and employment developments, EU (million)
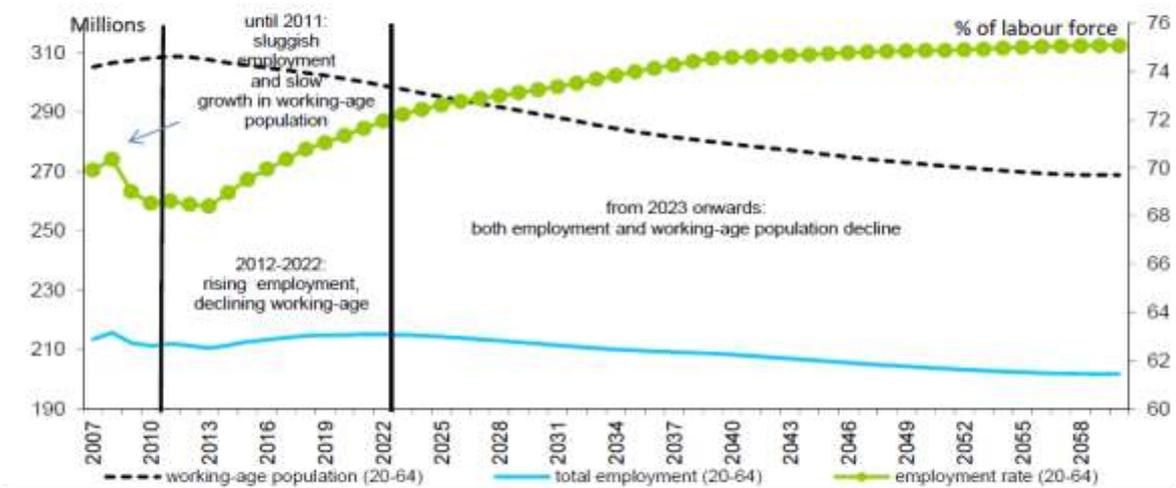
Source: Commission services, EUROPOP 2013, EPC.

Figure 2 Populations and employment developments in the European Union

Balancing the health care needs of the European population with spending resources, as well as continuous efforts to increase the efficiency and quality of health service delivery, will continue to be high on the political and economic reform agenda of Member States.

In one word "ageing well" becomes a desideratum of this era and IT solutions gain more trust when it comes about assisting older adults in their daily approaches. In this context a series of sectors have relevance. Ambient Assisted Living Program targets older adults (over 55 year old, pension-ready and freshly retired persons). Those persons are to be found more and more in large activity areas like enterprise, business, industries or public institutions. All those domains meet and tend to continue their "life" under this program that becomes a market of markets.

Efficiency and well-being (personal comfort)	Health care and monitoring
Remain engaged at their workplace as much as	Improve management of chronic conditions

possible	
Security and safety	Personal empowerment and quality of life

Together these sectors comprise a rather fragmented socio-technical environment for the deployment of a potentially very wide range of ICT-based solutions. Within LetItFlow project the ICT "offer" comprises of: Services, Devices and IT tools.
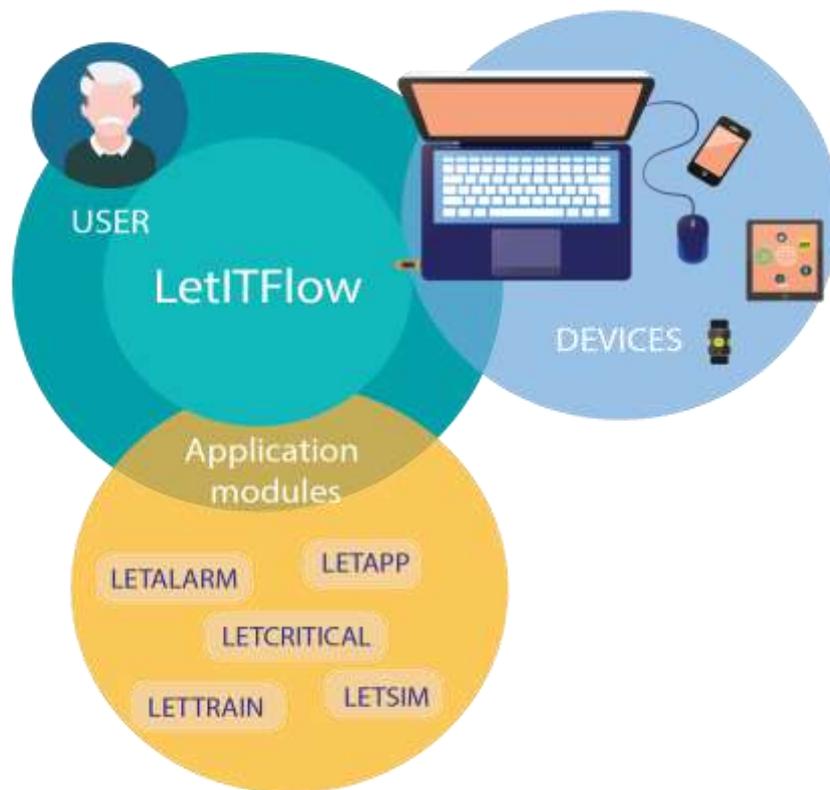
Figure 3 ICT devices & services relevant for LetItFlow project

User-friendliness and accessibility is the heart of LetItFlow. When developing LetItFlow are taken into consideration: personal constraints related to ageing, such as gradual loss of sensory abilities (hearing, eyesight etc.), physical impairments (speech, dexterity, mobility, strength, endurance, etc.) and cognitive and intellectual problems (memory loss, information processing, etc.) impact on the interest and ability to engage with new technologies and the confidence in using them.

Over the ocean, in The United States of America the impact of ageing population is similar to Europe's situation.

The HEALTH INNOVATION FRONTIERS report[2] published by AARP in 2014 emphasises the importance of 50+ "longevity economy" as the third largest in the world. In fact, only the United States and China are larger. The medical system's efforts traditionally are oriented towards sickness rather than health, and treatment rather than prevention - thus leaving a 'healthy living' gap. Large opportunities exist for new and meaningful investment aimed at meeting healthy living needs of all ages.
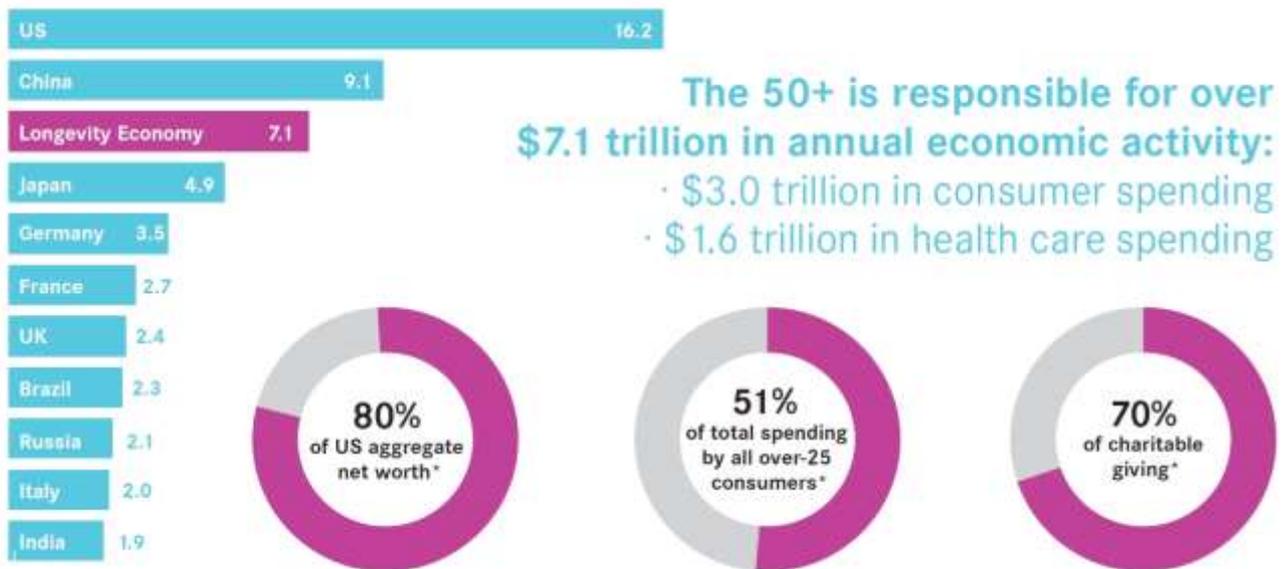
Figure 4 "Longevity economy" around the world

In United States of America, productive older workers, second-careerists and retirees will within 17 years account for more than half of the its gross domestic product. Older Americans will soon outnumber children, not only because of population growth but because they are living longer.

Investments related to the 50+ market continue to grow at the pace of investments in the larger digital health and wellness market.

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[2] https://ec.europa.eu/research/innovation-union/pdf/active-healthy-ageing/aarp.pdf

TOTAL FUNDING

2010: $0.56B / $1.05B
2011: $0.77B / $1.51B
2012: $0.93B / $2.22B
2013: $1.4B / $2.79B

● 50+ market ● Digital Health & Wellness Market

59% increase in 50+ funding between 2012-13

4X increase in deal flow between 2012-13

53% of all health funding is in the 50+ market
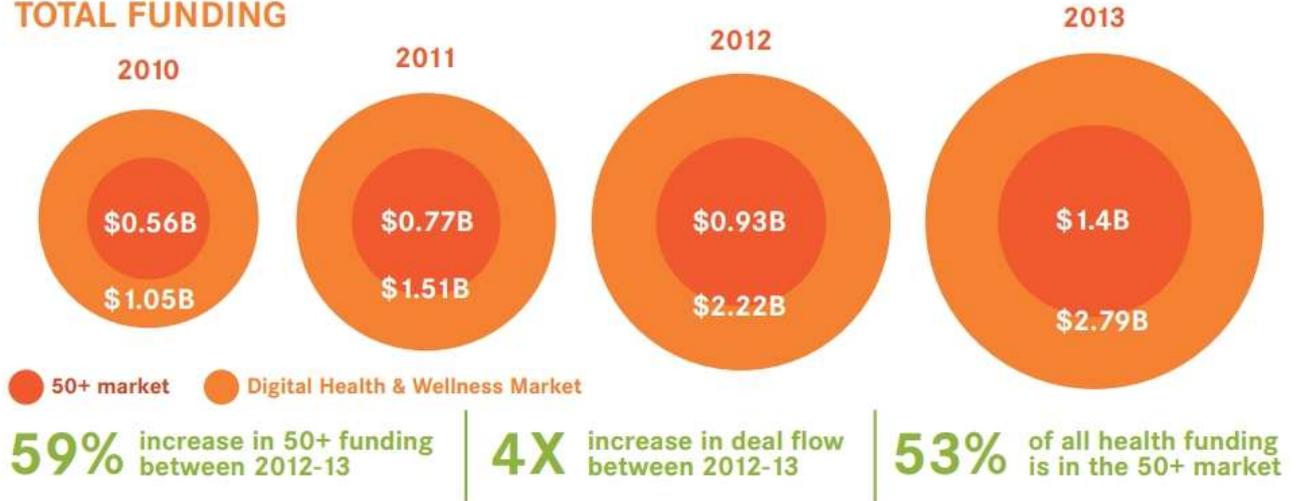
Figure 5 Rate of investments in 50+ market

This huge market is in many ways untapped, and the priorities of this massive population are often unaddressed by market players. Opportunity estimates to serve the 50+ with Health and Wellness products/services to generate $30 billion in cumulative revenue over the next five years (2014-19), across nine areas of Digital Health Innovation.

These areas of the healthy living market represent the best investment opportunities for break-through technologies, innovative products, and disruptive services. Together, AARP is confident that they represent the potential adoption of new products and services for over 100 million people and an opportunity for as high as $30 billion in revenue by 2019. Want to know more? Let's go.

AGING WITH VITALITY PAGE 12

VITAL SIGN MONITORING PAGE 16

CARE NAVIGATION PAGE 20

MEDICATION MANAGEMENT PAGE 8

BEHAVIORAL & EMOTIONAL HEALTH PAGE 40

SOCIAL ENGAGEMENT PAGE 36

DIET & NUTRITION PAGE 32

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Figure 6 Areas of Digital Health Innovation

In view of solution architecture, Gartner analysts predict that in 2016 "Algorithms Shift the Focus to Business-and Human-Centric Emerging Technologies"[3] in the report published on 3[rth] December 2015. Algorithms are becoming even more relevant today, because of the pervasiveness of highly connected devices and things, and the ripple effect this has on how organizations can use, scale and extend algorithms to increase their revenue.

Emerging technologies become more human-centric and reflect a significant shift in how humans and technology interact; emerging technologies reflect human behaviours, rather than humans adapting to technology. This results in humans creating unique and new relationships with their technology.

The focus shifts from technology to the information. Traditionally, technology has been a primary focal point, but not anymore. Since the majority of the technologies used to enable ambient digital experiences have existed and have been maturing for over a decade, the focus shifts to how edge technologies will generate new and meaningful insights with the enormous amount of information being generated.

We can conclude that there is a real market for LetItFlow solution in Europe and also in America and it is growing continuously. Moreover, adapting our solution to user needs, we can state that it a human-centric solution and is in line with IT industry trends.

Actors (key players)

Organisations and institutions that:

- Have a high rate of employees over 55 years.
- Belong to activity domains with lack of qualified personnel.
- Belong to activity domains with stress and workload (work in critical conditions).

1.5.2 Alternative markets

LetItFlow is a robust, attractive and customizable solution for various domains of activity. In this chapter, we're going to describe how the modules developed in LetItFlow can be used in other markets.

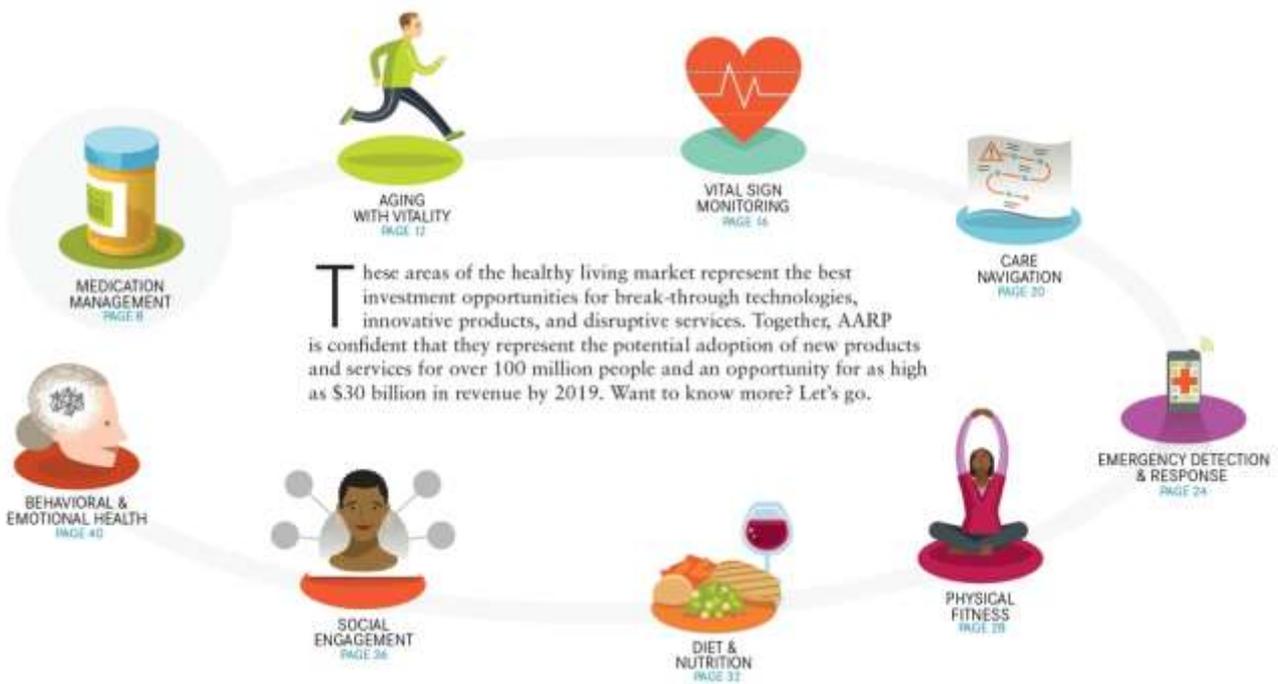LetItFlow is targeted to **elderly workers from hospital and laboratory (healthcare domain)**. However, as a side effect of the project requirements, other type of users might benefit from the LetItFlow solution. For instance the LetTrain application may serve to train **newcomer workers** and accelerate the learning process by offering an interactive guide about the different processes involved in the hospital and laboratory. While in this case the main market is still the same, by increasing the number of users' profile, new market opportunities are opened.

Guard and protection organizations need to have very fast solutions to transmit alarms/alerts in case of life threatening situations. Examples could be various but for each one, knowing the sender's location is essential. A guard should have a smart watch or smart phone to send the alarm using LetAlarm module. This module can be used in a similar way by **geophysicists** who deal with seismology and meteorological hazards and need to send alarm messages right away.

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[3] https://www.gartner.com/doc/3174921/predicts--algorithms-shift-focus

Water purification stations have strictly workflow processes as disinfection, fluoridation or filtration. Employees who work in this environment have a great deal of responsibility and need to have a lot of experience even though many processes are semi-automated. LetApp would guide them during their work day and they can check what was done and share this information with team members. LetAlarm could also be useful in case dangerous situations arise. New workers can be guided at first using LetTrain.

Other domains with strict activity processes as **chemistry/biochemistry**, **nuclear physics/isotopes**, and **waste management** can use these modules in a similar way. In all cases human error is possible and sometimes can have devastating results if for example one skips or switch steps during a process. Users could access LetTrain training content whenever necessary. Because these domains have high risks, is important to record vital signs of key users with health problems using LetCritical and when vital signs are hitting critical points it will send an alert/ notification to LetAlarm.

IT companies (IT / applied IT) can benefit of LetItFlow modules by assigning tasks with LetApp or by providing access to training content with LetTrain.

Identification of user location in the building/area can be of interest and it's done with LetAlarm.

For Noldus, the LetCritical application that is developed for monitoring the health condition of nurses, which in combination with localization services, could also be applicable in other market segments. At this stage we did not yet explore the opportunities in great detail, but there are more human behaviour research applications in which the behaviour of persons in combination with their location is relevant. Examples can be found in the area of consumer behaviour research, human factors and psychology.

Nowadays, business process framework and workflow engines are tools widely used in diverse industrial environments and with different scopes (i.e. not only hospitals, but any markets which needs to model business processes in the general sense). Even though the processes modelled in LetItFlow will be surely not adequate for these other markets, the technological infrastructure created together with the knowledge acquired in the project open a wide range of possibilities to develop new processes and facilitate the entrance to other markets. Some pieces of the LetItFlow solution might be reused in those cases (e.g. users' management, task assignation procedures, workflows visualization, etc.).

2. EXTERNAL ENVIRONMENTAL ANALYSIS

2.1 Macro environment analysis

Normally, macro environment is analyzed using the PEST method, which stands for the political, economic, social (including legal and cultural) and technological environment. Additionally the ethical factors are included.

2.1.1 Political environment

Political factors about how the government intervenes in the economy and the market relative to our product.

Local governments encourages R&D on health sector

The R&D investments in health generate each year tangible and positive outcomes for us today. The most self-evident direct benefit of investing in health R&D is the subsequent improvement in health outcomes and longevity of people what provokes a good opportunity of market for the next years. On the other hand, increased investment in R&D has also a fundamental role to play in economic growth in Europe as there are direct and indirect links between increasing R&D spend on healthcare, improved healthcare services, and the consequent wider benefits to the overall economy. An example of these investments by Local European governments is the AAL programme where this project is located.

Europe encourages to develop ICT for supporting the elderly

Information and Communication Technologies applied to health and healthcare systems can increase their efficiency, improve quality of life and unlock innovation in health markets. During the period 2014-2020, research and innovation will be supported under "Health, demographic change and wellbeing" of Horizon 2020, in the areas of:

- An ICT and computational science and engineering framework for digital, personalised, and predictive medicine, including advanced modelling and simulation.
- Innovative instruments, tools and methods for unlocking the value of data and for advanced analytics, diagnostics and decision making.
- New digital media, web and mobile technologies and applications, as well as digital instruments that integrate healthcare and social care systems and support health promotion and prevention.
- eHealth systems and services with strong user involvement, focusing on interoperability and the integration of emerging patient-centric technologies for cost-effective healthcare.

The AAL programme is the one of best examples of the interests in Europe to support elderly through ICT. Specifically, the programme is the funding activity that aims to create better conditions of life for the older adults and to strengthen the industrial opportunities in Europe through the use of information and communication technology. The AAL JP programme has invested significantly in almost 130 projects since 2008 and several of them are now beginning to show results and demonstrating real market potential.

Dealing with demographic changes is also one of the focus points in the Horizon2020 call, which is another example showing that European governments do see the urgency, and is willing to invest in related developments.

Healthy life years

Population ageing is one of the greatest social and economic challenges facing the EU. Projections foresee a growing number and share of elderly persons (aged 65 and over), with a particularly rapid increase in the number of very old persons (aged 85 and over). These demographic developments are likely to have a considerable impact on a wide range of policy areas: most directly with respect to the different health and care requirements of the elderly, but also with respect to labor markets, social security and pension systems, economic fortunes, as well as government finances.

In 2013, the number of healthy life years at birth was estimated at 61.4 years for men and 61.5 years for women in the EU-28; this represented approximately 79 % and 74 % of total life expectancy for men and women.

The next charts from Eurostat show the healthy life years for women and men comparing the years 2010 and 2013, and where we can see how healthy living is increasing.
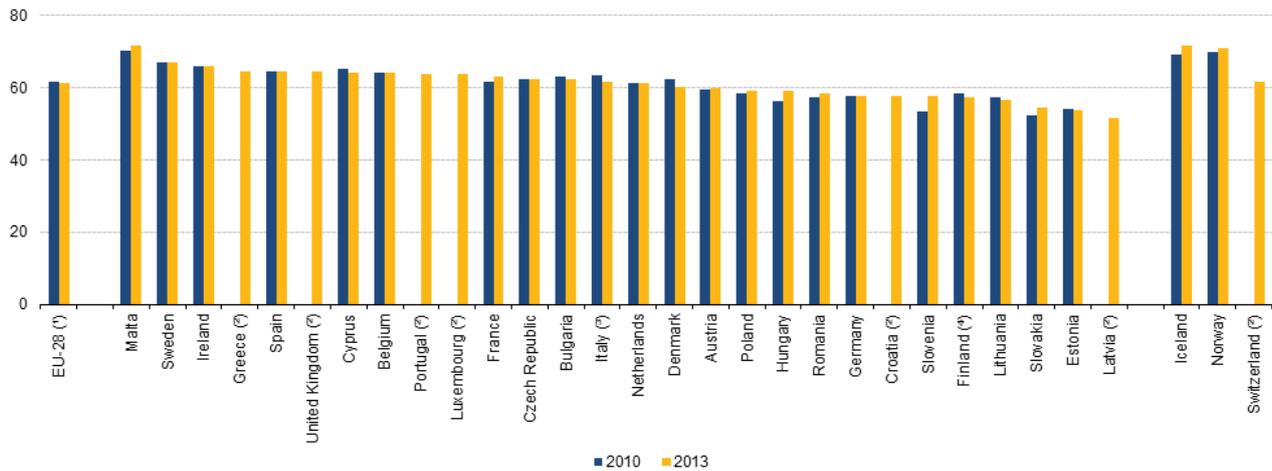
Figure 7 Healthy life years for women
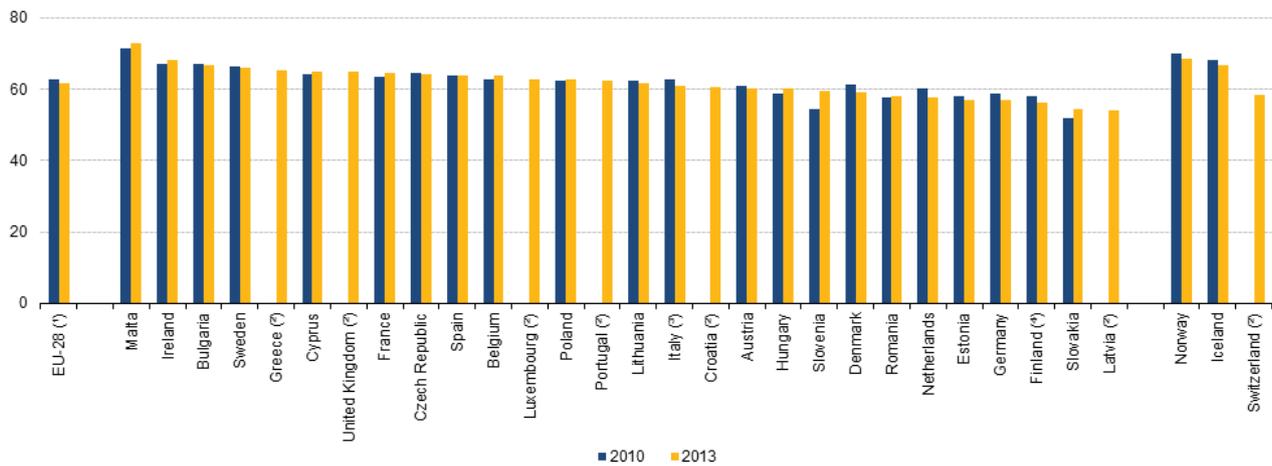
Figure 8 Healthy life years for men

Innovation for Active and Healthy Ageing, from concept to reality, from local to global

Demographic change opens a wide variety of new opportunities for European innovators and industrial players to develop new products and services, tailored to the needs of a growing number of ageing consumers. For the above, the governments are increasing the funding and the investing with different programs to promote to the companies the investigation in this group of population. Technological and systemic innovation together can increase the efficiency of our health and care systems, improve the quality of life of the older population and, at the same time, create new opportunities for innovators.

Ageing population political priority

Vastly improved life expectancy, one of the great triumphs of the last century, looks set to be one of great challenges of this one. Between 2015 and 2020, over a period when the general population is expected to rise 3%, the numbers aged over 65 are expected to increase by 12% (1.1 million); the numbers aged over 85 by 18% (300,000); and the number of centenarians by 40% (7,000).

Much of the costs of old age have arisen because growth in total life expectancy has outpaced growth in healthy life expectancy (i.e. the number of years we can expect to live in good health). Policies that improve preventative healthcare, and help people to remain active and healthy in later life, could help increase the proportion of life spent in good health and reduce costs.

A healthier old-age population would also allow greater numbers to remain in the labour market for longer, thereby mitigating the impact of an ageing population on the dependency ratio.
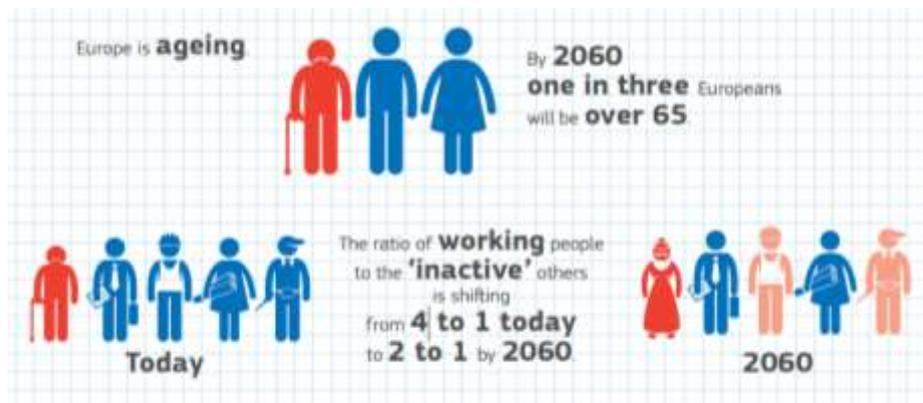
Figure 9 Different statistics about active elderly people

2.1.2   Economic environment

Economic factors include economic growth, interest rates, exchange rates and the inflation rate. These factors greatly affect how businesses operate and make decisions.

DG ECFIN reports

DG ECFIN produces economic forecasts on behalf of the European Commission. DG ECFIN's forecasts are published three times a year in sync with the EU's annual cycle of economic surveillance procedures, known as the European Semester. At the time of writing the current

document, the autumn 2015 European Economic Forecast, published on 5 November 2015, is the last forecast released. According to this report, the economic recovery in the euro area and the European Union as a whole is now in its third year. It should continue at a modest pace next year despite more challenging conditions in the global economy. Within the EU, the expected growth of GDP in 2016 is approximately of 2%.

2.1.3   Social environment

Social factors include the cultural aspects and health consciousness, population growth rate, age distribution, career attitudes and emphasis on safety.

The number of elderly people is increasing

The number of people aged 65 and above is increasing in many countries. Consistently low birth rates and higher life expectancy will transform the shape of the EU age pyramid. The ageing society will result in an increasing demand for health care services, while at the same time the number of health care workers will decrease.

The following figures, published by Eurostat, represent this tendency:
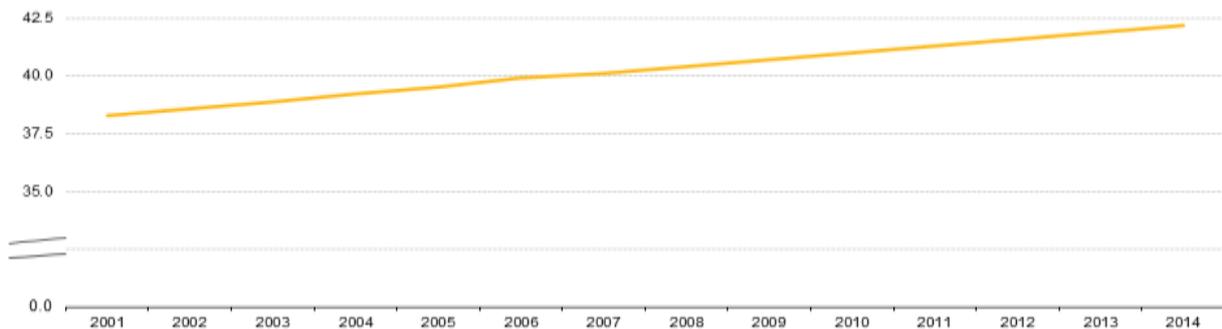
(¹) 2010, 2011, 2012 and 2014: break in series. 2013: provisional. 2014: provisional; estimate.
Source: Eurostat (online data code: demo_pjanind)

Figure 10 Median age of population, EU-28, 2001–14 period
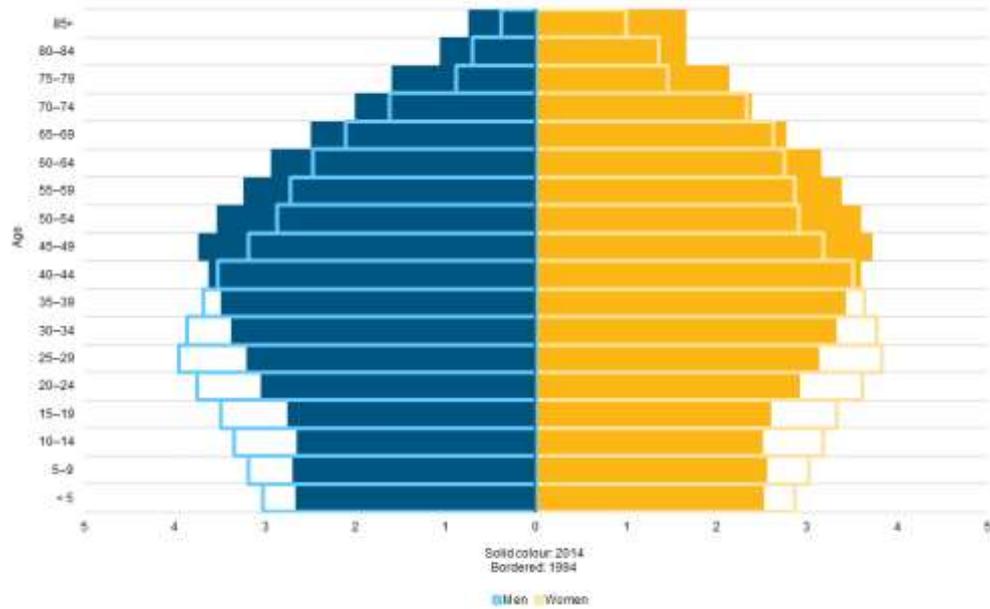
(*) 1994: EU-27. 2014: provisional, estimate.
Source: Eurostat (online data code: demo_pjangroup)

Figure 11 Population pyramid, EU-28, comparing 1994 and 2014
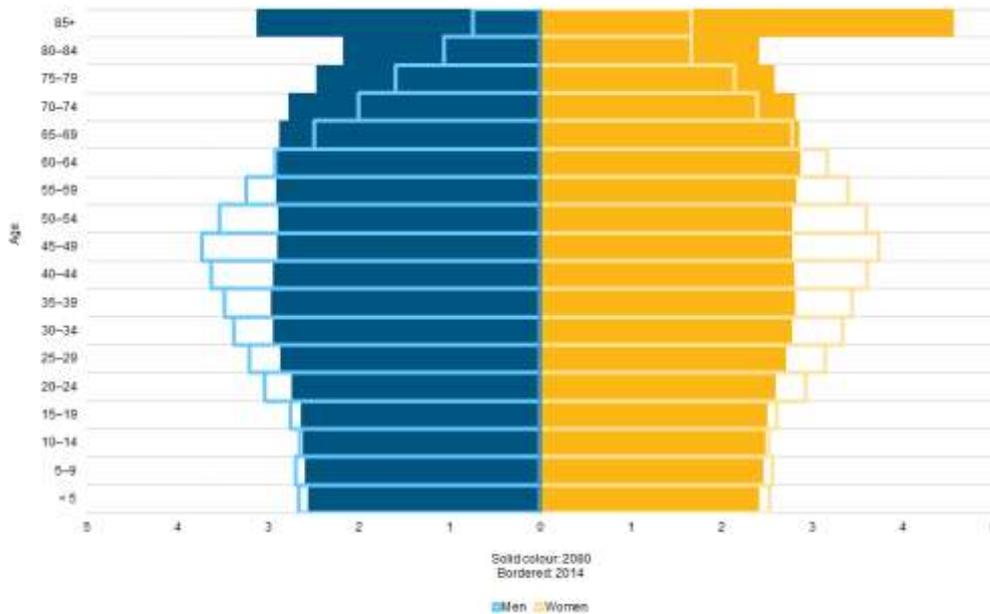
(*) 2080: projections (EUROPOP2013).
Source: Eurostat (online data codes: demo_pjangroup and proj_13npms)

Figure 12 Population pyramid, EU-28, forecast from 2014 to 2080

The retirement age is increasing in some European countries

As a consequence of what has been exposed in the previous section, some local governments are increasing the retirement age, as they see that elderly people is now in better health conditions to work as those of the same age a decade or two ago. An example of this fact is the Spanish government, who has recently increased this margin from 65 to 67 years.

Next table shows the current retirement age for the countries involved in the project and the projection to the next years.

EU	Current general retirement age	Future retirement age
	Men/ Women	
Austria (AT)	65 / 60	65 (2033)
Romania (RO)	65 / 60	65 (2030)
Spain (ES)	67month	67 (2027)
Sweden (SE)	61-67; 65	–
Netherlands (NL)	65 and 3month	67+ (2024)

Table 3 Retirement ages in Europe

In the EU15 states, the general retirement age is 65 years. In most new Member States, the retirement age will be raised to the same level over the next decade. Denmark, France, Germany and Spain have decided to increase the retirement age from 65 to 67 years. For the main part, the changes in retirement ages will occur in the 2020s.

2.1.4 Technological environment

Technological factors include technological aspects like R&D activity, automation, technology incentives and the rate of technological change. These can determine barriers to entry, minimum efficient production level and influence the outsourcing decisions.

Increased use of smartphone and tablet among elderly people

Despite new technologies have traditionally been a barrier for the elderly, the smart devices have grown increasingly common in recent years and are penetrating more and more into this population sector. Almost all statistics agree indicating that the penetration of the smartphones in people above 55 years is close to 60% and it is rapidly increasing. The increased penetration in society of inexpensive portable devices, sensors and cameras, enables the development of assistive tools at more affordable costs.

The statistic depicts the smartphone penetration per capita in Europe from 2011 to 2018:
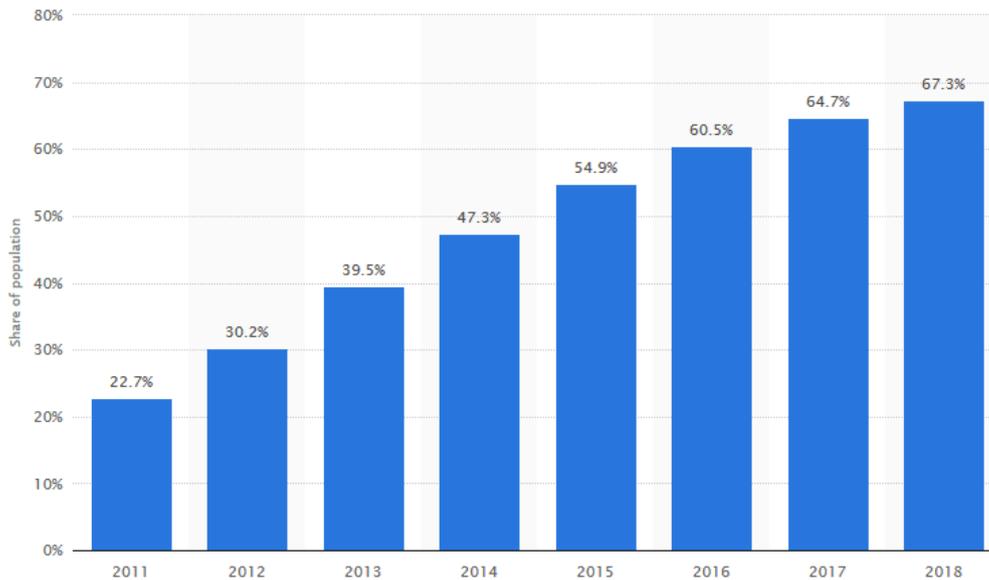
Figure 13 Smartphone penetration per capita in Europe from 2011 to 2018

Elderly workers more reluctant to adopt new technologies in the working environment

A commonly held belief is that older people are resistant to change and have negative attitudes toward the use of technology. However, the available data dispute this stereotype and indicate that, in general, older people are receptive to using technology if they perceive the technology as useful, if the technology is easy to use, and if they are provided with adequate training and support.

Apart from this, the technological advances are usually perceived as a threat for the job position, as in many cases it has meant a reduction on the work force and has derived in dismissals.

The following chart shows how much cell phone use differs between different age groups.

The Generational Divide in Cell Phone Use
% of American cell phone owners who use their phone to do the following, by age group

Legend: 18-29, 30-49, 50-64, 65+

Send/receive text messages: 97%, 94%, 75%, 35%
Access the internet: 84%, 72%, 45%, 19%
Send/receive e-mails: 73%, 60%, 43%, 17%
Download apps: 77%, 59%, 33%, 14%

Get directions/recommendations: 68%, 57%, 37%, 19%
Listen to music: 80%, 59%, 26%, 8%
Video chat: 40%, 24%, 10%, 3%
Check in or share location: 13%, 9%, 5%, 3%

Figure 14 Smartphone use in different groups of age

2.1.5 Ethical environment

The ethical environment analysis provides a basis for what is right and what is not based on elderly people.

Recording a location of people

Recording and tracking the location of persons at the workplace is a sensible subject. Data protection law doesn't prevent monitoring in the workplace. However, it does set down rules about the circumstances and the way in which monitoring should be carried out. Before deciding whether to introduce monitoring, it is necessary to sufficiently inform the workers (reasons for monitoring, benefits that this will bring, identify negative effects, etc.). In general, apart from legislation, people are more aware of privacy and confidentiality of data.

Confidentiality of information

Compared to younger people, the information of elderly people is more easily to be leaked when they use ICT, because they have less experience and knowledge. Some older users may not

choose the right way to use the service or may not be conscious about the openness of their information. In addition, some devices need personal information, like health status, to service the elderly better. Many patients want to employ digital and mobile technologies in their medical care. However, many of them are worried about the privacy and security of mobile devices and wonder whether increased reliance on handheld devices will compromise the confidentiality of their medical information. They fear loss of a smartphone or tablet that contains personal material and are concerned that their medical information might end up in the hands of employers or private individuals. Moreover, in many countries, neither public nor private insurance plans cover such applications. So security and privacy technology are very important for developing mobile devices for elderly (West, 2012)[4].

Loss of personal autonomy

The inclusion of a workflow engine together with electronic devices in the workday of elderly workers can provoke a feeling of loss of personal autonomy and a feeling of rejection when using it due to lack of use in their daily lives.

2.2 Micro environment analysis

Porter's Five Forces model identifies and analyses five competitive forces that shape every industry, and helps determine an industry's weaknesses and strengths. These forces are *Threat of new entrants, Bargaining power of suppliers, Competitive rivalry, Bargaining power of buyers, Threat of substitutive products.*

Porter identified these five undeniable forces that play a part in shaping every market and industry in the world. The forces are frequently used to measure competition intensity, attractiveness and profitability of an industry or market.

2.2.1 Threat of new entrants

A company's power is affected by the force of new entrants into its market. The less money and time it costs for a competitor to enter a company's market and be an effective competitor, the more a company's position may be significantly weakened.

Threat of new entrants	
Strength: Medium	• Entry barriers are relatively high due to high capital requirements/ Long payback period • High scope on product Differentiation • High government incentives

Table 4 Threat of new entrants

2.2.2 Bargaining power of suppliers

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[4] http://www.insidepolitics.org/brookingsreports/mobile_health_52212.pdf

This force addresses how easily suppliers can drive up the price of goods and services. It is affected by the number of suppliers of key aspects of a good or service, how unique these aspects are and how much it would cost a company to switch from one supplier to another. The fewer number of suppliers, and the more a company depends upon a supplier, the more power a supplier holds.

Bargaining power of suppliers	
Strength: Low	• Suppliers: BPM solution providers, Mobile Devices suppliers, Server suppliers. • We are committed to grow strong partnerships with suppliers to maintain a low bargain power.

Table 5 Bargaining power of suppliers

2.2.3 Competitive rivalry

The importance of this force is the number of competitors and their ability to threaten a company. The larger the number of competitors, along with the number of equivalent products and services they offer, dictates the power of a company. Suppliers and buyers seek out a company's competition if they are unable to receive a suitable deal.

Competitive rivalry	
Strength: Low	• Nowadays are less differentiated products dedicated to older employees. • In the next few years, growth opportunities arise worldwide due to governmental incentives and a genuine interest to help elders integrate better and be more productive at work.

Table 6 Competitive rivalry

2.2.4 Bargaining power of buyers

This specifically deals with the ability customers have to drive prices down. It is affected by how many buyers, or customers, a company has, how significant each customer is and how much it would cost a customer to switch from one company to another. The smaller and more powerful a client base, the more power it holds.

Bargaining power of buyers	

Strength: Medium	- Buyers | organizations that activate in the following domains: chemistry / biochemistry, nuclear physics, waste management, purification stations, geophysics, medical, guard and protection, IT / applied IT. - Bargaining power of buyers is relative. This could be related to their lack of interest to adapt new solutions. - Buyers are very price sensitive. - High switching costs.

Table 7 Bargaining power of buyers

2.2.5 Threat of substitutive products

Competitor substitutions that can be used in place of a company's products or services pose a threat. For example, if customers rely on a company to provide a tool or service that can be substituted with another tool or service or by performing the task manually and this substitution is fairly easy and of low cost, a company's power can be weakened.

Threat of substitutive products	
Strength: Low	- Preference for less customized solutions for elders - Patent protection. - Threat of other innovations.

Table 8 Threat of substitutive products

3. INTERNAL ENVIRONMENT ANALYSIS

The resources and capabilities of project partners have decisive influence on market strategies. Resources will be analysed from financial, physical, human and technological perspectives while capabilities will focus on the management and marketing. We will conclude the section by listing the strengths and weaknesses of both, resources and capabilities.

3.1 Resources

3.1.1 Financial

Six project partners are involved in LetItFlow project. The exact financial resources of these organizations will, where relevant, be addressed in future deliverable 6.3 (Business models and exploitation).

3.1.2 Physical assets

Table 9 enumerates the different physical resources of the LetItFlow partners related to plan, equipment, assets, technology and raw materials.

Partner	Physical Resources
Integrasys	Offices at two physical locations (Madrid and Seville). Hardware, computers, smart devices, software applications, manufacturing systems and test equipment for demonstration purposes.
Noldus	Headquarters in Wageningen (NL), where most of R&D development takes place. Additionally offices in China, US, Germany, France, Italy, Spain and Hungary, and a worldwide network of distributors. In addition observation labs, hardware, computers, smart devices, software applications, manufacturing systems and test equipment for demonstration purposes.
AIT	Headquartered in Vienna with several other locations in Austria. As Austria's biggest non-university research institution (more than 1200 employees), AIT can rely on substantial physical resources related to key infrastructure topics such as energy, mobility, safety & security, health & environment, and innovation systems. Most relevant for this project is the UX Laboratory based at the Technology Experience Business Unit, which is equipped with state-of-the-art technology for user research and demonstration activities.
SIVECO	SIVECO has four international offices (Brussels, Ankara, Astana, and Dubai). Most of its IT equipments are in the headquarter of Bucharest and include: computers, servers and smart devices.
UHB	University and Emergency Hospital of Bucharest (UHB) is a public health unit having a role in assuring medical services (emergency, prevention, recovery, and palliative care). UHB is composed of academic clinical and non-clinical units, which provide medical assistance, university activities, clinical research, and post-academic education having contractual relationships with approved medical faculties. UHB is since 2011 a Category 1 regional emergency hospital, with a high level of competency. The Research and Development Unit in the University and Emergency Hospital of Bucharest collaborates with national and international partners in order to perform clinical studies and clinical research. The research activity strengthens the quality of medical act, while guaranteeing patients' rights, morals and ethics. The Research Unit is currently involved in two international financed grants, 3 grants with internal financing and 183 multicentric international studies. The Neurology Research Unit has participated in the last 4 years in 7 grants with internal financing, more than 20 international multicentric clinical trials, one grant with external financing regarding genetic assessment of risk in stroke subtypes.
HUVM	It is placed in Seville and has assigned a population of 551856 inhabitants. Yearly they handle more than: 36000 admissions, 40000 operations, 800000 specialized consults, 64000 patients in day hospital, 11000 home assistance and 200000 attended urgencies. It consists of two main buildings (Hospital and polyclinic) together with other ones distributed around the area for academic purposes.

Table 9 Physical assets of the LetItFlow partners

3.1.3 Human Resources

Table 10 enumerates the different technology and management expertise of the LetItFlow partners.

Partner	Technology and management expertise
Integrasys	Integrasys has a lot of talented persons with technical and managerial experience gained in the last 25 years. The technology background of the Integrasys' staff covers the most advanced and general use technologies and platforms. Integrasys have researchers, software developers, system architects, and product and project managers.
Noldus	Noldus has over 130 employees, most with an academic degree. One of the key resources of Noldus is the domain and application knowledge, which is used for developing products and offering consulting services. Over 1/3 of the staff is involved in R&D, including UI designers, system architects, documentation specialists, and testers.
AIT	AIT's Technology Experience Business Unit can rely on the skills, expertise and knowledge of 30 employees. It is composed of a multidisciplinary research staff (e.g., design, human-computer interaction, computer science, psychology, marketing, sociology, communication sciences, educational sciences, and biology) and deals with user experience (UX) and its various contextual influence factors. The business unit has a long-standing track record specifically in the application of user-centered design approaches with dedicated methods and tools to support the development of high-quality ICT-solutions. The Technology Experience business unit is currently involved in 22 national and international research and development projects, of which it currently coordinates/manages 7.
SIVECO	SIVECO has experience in developing and implementing IT solutions for over 24 years on 4 continents. The company has about 600 employees with experience in national & international projects and with international certifications for various technologies and platforms.
UHB	UHB has managerial resources for international projects, which could manage various teams of physicians in a consortium working on different subjects. UHB is also member of the RO-Health cluster. Moreover, in various projects UHB has collaborated with various companies and research institutes such as: Termobit, Medinst, Romanian Medical Technical Institute.
HUVM	HUVM is made up over 5400 employees among doctors, nurses, laboratory technicians, administrative personal, etc. most with an academic degree.

Table 10 Technology and management expertise

3.2 Capabilities

3.2.1 Management of partnerships

Table 10 enumerates the experience of LetItFlow partners on management of partnerships in other projects.

Partner	Management of Partnerships
Integrasys	Integrasys has managerial resources for international projects, which could manage various teams of engineers in a consortium working on different subjects and taking care of different tasks.
Noldus	Noldus plays an active role in a range of leading research projects around the world. In most cases our role is that of a technology partner: we develop tools and methods, and researchers use and validate them. This way we contribute to scientific progress. In the past Noldus has managed several international projects and usually we lead one or more work packages within projects.
AIT	As mentioned also above, AIT's Technology Experience Business Unit is currently involved in 22 national and international research projects, where it contributes its expertise mainly in the domain of User Experience (UX) research (e.g., requirements elicitation, user interface design, prototyping, user evaluations). In addition to being a partner, the business unit has a long-standing experience in managing applied research projects. It currently coordinates 7 research projects.
SIVECO	SIVECO has strategic partnerships with international organisations (Intel, ORACLE, Microsoft, IBM, HP, BULL, Ventyx, T-Systems, Samsung, Lattanzio Group, Selex ES, CLICO). The company is involved in international projects as consortium leader or partner and has management specialists with extensive experience in collaborating with remote teams.
UHB	UHB has managerial resources for international projects, which could manage various teams of physicians in a consortium working on different subjects. UHB is also member of the RO-Health cluster. Moreover, in various projects UHB has collaborated with various companies and research institutes such as: Termobit, Medinst, Romanian Medical Technical Institute.
HUVM	UHB has managerial resources for international projects, which could manage various teams of physicians in a consortium working on different subjects.

Table 11 Management of Partnerships

3.2.2 Sales and Marketing

Table 10 enumerates the experience of LetItFlow partners on marketing products in similar products as LetItFlow.

Partner	Sales and Marketing

Integrasys	Integrasys has no experience on marketing products such as the LetItFlow systems. However, Integrasys has a remarkable product portfolio in the field of signal monitoring and control. The product line of the company is commercialized abroad and thus it has a very talented and experienced sales department, which can apply its experience to other markets and distribution channels.
Noldus	Noldus has a worldwide distribution network, experienced in selling solutions and consultancy projects for behavioral research. Our product portfolio contains a large range of different solutions for behavioral researchers, as such our sales staff is well equipped building relationships with high educated users. Although experiences selling systems comparable to what is being developed within LetItFlow are limited, Noldus is becoming more active and more experienced offering solutions for health applications, for example in the area of health simulation.
AIT	AIT has been involved as a partner in numerous research and development projects, also in the AAL domain, and therefore has repeatedly contributed to the exploitation and dissemination of project results. AIT, however, is typically not marketing individual product and service outcomes from project work. As an applied research institution it serves as an important link between basic research (usually at universities) and industry (= technology transfer).
SIVECO	SIVECO has been involved as partner in R&D projects to develop similar IT solutions. The company was not involved though in the Sales & Marketing process. SIVECO has experience in direct sales, in developing dissemination materials and with newsletter campaigns for B2B sector.
UHB	UHB has no experience on marketing products such as the LetItFlow systems.
HUVM	HUVM has no experience on marketing products such as the LetItFlow systems.

Table 12 Sales and Marketing

4. SIMILAR PROJECTS AND SOLUTIONS IN THE MARKET

This section is dedicated to analyze other similar projects and solutions with LetItFlow, existing on the market, in order to determine its specificity and innovative characteristics, and support our approach of highlighting LetItFlow solution as scalable and marketable product, based on USP (Unique Selling Proposition or Unique Selling Point) marketing method, techniques, principles and benefits.

Within our study, several similar projects were explored and the results of the analysis are presented in the following table:

PROJECT	Main goals	Year	Website
HELP	The HELP project has designed a system that is able to	36 Months Starting June 1, 2009	http://www.aal-europe.eu/projects/help/

	anticipate when a patient will develop an OFF state or dyskinesia by means of a "Parkinson's" sensor which sends relevant information to the platform and which automatically establishes a new level of drug administration for the pump to overcome that state.		
Inclusion society	The aim of the inclusion society project is to give potential users and customers of technology assisted living solutions the lead by using experience led innovation methods to understand their needs, from the very beginning and tailor solutions to these.	36 Months Starting March 1, 2012	http://www.aal-europe.eu/projects/ins/
Softcare	The SOFTCARE project has developed a prototype of a monitoring system for seniors that allow carers (formal and informal) and senior users to get real-time alarms in dangerous or potentially dangerous situations and warnings on long-term trends that could indicate a future problem.	36 Months Starting November 1, 2009	http://www.aal-europe.eu/projects/softcare/
DOMEO	Focused on the development of an open robotic platform for the integration and adaptation of personalized	Finished on Dec 31st, 2012	http://www.aal-domeo.org/

	homecare services, as well as cognitive and physical assistance.		

Table 13 Similar projects to LetItFlow

4.1 Benchmarking market analysis about other similar solutions

Within our detailed benchmark analysis several similar platforms installed in hospitals and clinics all over in Europe and USA were explored.

We have studied the similarities (similar concepts, similar approaches, similar components) of the proposed LetItFlow solution with the other solutions analyzed, and also the specificity and innovative features of LetItFlow solution, comparing with the analyzed solutions.

We have analyzed various existing solutions, suites, platforms or applications, which we have considered the most appropriate, functionally and operationally, with the LetItFlow solution.

At first glance, we can emphasize that the found solutions are mainly focused on improving communication between the hospital staff and the patient and the management of medical resources, while our solution, specific developed for the AAL Programme, is particularly focused on hospital staff allowing *elderly hospital workers (nurses, orderlies, lab technicians, medical staff)* to carry out their daily tasks and to adapt to the new procedures, protocols, methods and manoeuvres.

When comparing different solutions, an important benchmarking dimension is the extent to which the user interfaces account for the needs of older users (e.g., nurses, orderlies, lab technicians). Older medical staff constitute a special user group that may differ from other user groups in distinct ways. For example, important limitations more commonly found among older users include impaired vision and hearing, a decline of motor skills and memory, and idiosyncrasies in attention and decision-making.

Specifically for this type of benchmarking, it is useful to compare the different solutions against existing guidelines and best practices in "designing for the elderly" (see Campbell, 2015, http://www.smashingmagazine.com/2015/02/05/designing-digital-technology-for-the-elderly).

For a better understanding of the analysis, in the following we present the major functional components belonging to the LetItFlow solution:

- *Workflow engine*: This is the core component that manages all the business processes logic in LetItFlow, and allows defining, executing and monitoring the business processes. It also allows managing and monitoring the status of activities and the transition between different tasks inside a process.
- *LetApp*: This is a smart device application (smartphone, smartwatch, tablet) designed to support nurses / orderlies, laboratory technicians and other operators in their daily work tasks. It represents the main front-end for the workflow engine, guiding the workers throughout the business processes implemented in the workflow engine.
- *LetAlarm*: This represents the alarm component used for notifying the workers about high priority tasks / emergencies, and about some of the tasks triggered by timers (e.g. in the form of reminders).

- *LetCritical*: This represents the alarm/warning component for notifying the workers about critical situations. In this case, the alarm is triggered by humans or monitoring devices (e.g. vital signs monitoring application). The innovative approach of this component is that the most of its functionalities will be implemented into the smartwatch interface, ensuring a high comfort and confidence for the user.
- *LetTrain*: This represents a training component based on LetApp (task related content, recording status of the task…). This component allows staff to be trained and get familiar with the different business processes (implementing change management processes).
- *Monitor Manager*: This represents a particular component for monitoring the status of workers during their daily activities. This application will be able to monitor in real time a set of vital signs like heart rate, galvanic skin response (GSR) and some environmental aspects like working hours, pausing schedules, in order to determine the health status of the older workers, suffering of possible chronic diseases.
- *Observational data analysis (Contextual behavior)*: Related to the LetTrain component, this component allows observing and analyzing the worker' behavior in specific situations - what the worker is doing while performing an existing or new procedure.
- *Location Tracking*: This represents a context monitoring component, based on the location tracking engine. This application tracks the workers on the room level.

The *relevant features* of LetItFlow solution are the following:

- Alarm
- Alerts / Notifications
- Monitoring / Location
- Monitoring / Contextual Behavior
- Messaging
- Optimized Task management
- Optimal coordination
- Guidance
- Training / Change management support.

Considering the above-mentioned functionalities and features of the LetItFlow solution (Integrated Applications Suite), hereinafter are presented the results of our analysis.

For a good perception of the relevant aspects, the results of our study were included into two categories: *"Similarities, Common features"* [between LetItFlow and the analyzed solution] and "*Particularity, Distinctive features and innovative approach"* [between LetItFlow and the analyzed solution].

4.1.1   Similar solutions in USA (United States of America)

Patientsafe solutions

From the Patientsafe solutions, two of suites were considered appropriate to be included in our study: PatientTouch Clinical Communications and PatientTouch Coordinated Care.

1. PatientTouch Clinical Communications
   (http://www.patientsafesolutions.com/patienttouch-clinical-communications)

Pursuant to the analysis of the relevant functionalities of LetItFlow and PatientTouch Clinical Communications platform, we have acquired the following results:

As described on the website: "PatientTouch Communications elevates patient care by combining contextual collaboration with secure communication and alerts. […] Unlike products that must be customized for use in healthcare environments, it was designed natively as a solution for clinical communications and has been shown to improve quality of care and operational efficiency – a natural outcome of our focus on and dedication to the healthcare industry."

The solution is centered on the patient needs and care.

Similarities, Common features of LetItFlow and PatientTouch Clinical Communications:

- Ensuring *unified* ("all in one" suite) and *contextual* communications.
  - Unified functionality: patient care (Workflow engine, LetApp), personnel guidance (LetApp, LetTrain), monitoring/location (Monitor Manager, Location tracking, LetCritical, LetAlarm), alarms/alerts (LetAlarm), messaging (LetApp), optimal coordination (Workflow engine, LetApp);

  - Contextual functionality: managing emergencies (LetAlarm), optimal decision-making (Monitor Manager, LetCritical, LetAlarm).
- Clinicians communicate to collaborate around patient care. Clinicians can easily determine the "who, what, when, and how" of communications for better patient care.
- Providing functionalities like: Secure messaging, Voice communications and Alert / Notifications integration.

Particularity, Distinctive features and innovative approach of LetItFlow:

- The solution is focused on *the medical elderly staff needs and care*.
- Ensuring unified and contextual communications – ensuring *the elderly personnel guidance and care* (LetApp, LetCritical, LetAlarm, LetTrain, Monitor Manager, Observational data analysis); implementing specific features for: *change management* (LetTrain) and *behavior analysis* (Monitor Manager, LetCritical).
- Medical staff communicates to collaborate around patient care, *but also around the personnel care*. Medical staff can easily determine the "who, what, when, and how" of communications for better patient care, *but also for better personnel care*.

2. PatientTouch Coordinated Care (http://www.patientsafesolutions.com/patienttouch-coordinated-care)

Pursuant to the analysis of the relevant functionalities of LetItFlow and PatientTouch Coordinated Care platform, we have acquired the following results:

As described on the website: "PatientTouch Coordinated Care is a comprehensive patient engagement and care coordination platform designed to make it easier for hospitals and health

systems to implement innovative new models of care aimed at patient centered outcomes and reduced costs."

"To reduce risk and cost, PatientTouch Coordinated Care Solutions help keep patients on track with their care plans."

The solution is centered on the patient needs, engagement and care.

Similarities, Common features of LetItFlow and PatientTouch Coordinated Care:

- Both represent care coordination solutions customized and collaborative.
- Optimize Care Flow
  - Optimizing care flow (Workflow engine, LetApp).
- Smart and versatile solutions for ongoing care that guide patients on their journey to better health.
- Implement the same innovative approach – *Engage the concerned people within the care process – Engage Patients within the computerized care process* (PatientTouch Coordinated Care: "We help your patients stay engaged in their care plans and recovery with mobile applications and personalized check-in's from dedicated care liaisons of PatientTouch Coordinated Care") versus *Engage elderly people belonging to the medical/laboratory staff within the computerized care process* (LetItFlow – We support the elderly personnel stay engaged in their specific daily activities with mobile smart and personalized applications).

Particularity, Distinctive features and innovative approach of LetItFlow:

- Smart, flexible and versatile solution for ongoing care that *guides elderly medical staff on their daily activity / journey*.
- Engages elderly people belonging to the medical/laboratory staff within the computerized care process – *We support the elderly personnel stay engaged in their specific daily activities with mobile smart and personalized applications*.

The solution is focused on *the medical elderly staff needs, engagement and care*.

Ascom

From the Ascom solutions, were considered appropriate to be included in our study two of them: Telligence Nurse Call and ASCOM UNITE – Unite Messaging Suite for Healthcare.

1. Telligence Nurse Call (http://www.ascom.us/us-en/index-us/systems-division/ascom-telligence.htm#overview)

Pursuant to the analysis of the relevant functionalities of LetItFlow and Telligence Nurse Call solution, we have acquired the following results:

As described on the website: "The comprehensive Ascom Telligence communications platform connects patients and caregivers for streamlined, patient-centered care. Designed with the busy caregiver in mind, Telligence simplifies workflow, optimizing time spent on mission-critical functions and reducing pressures in the care environment."

The solution is centered on the patient care.

Similarities, Common features of LetItFlow and Telligence Nurse Call:

- Solutions focused *on both patients and caregivers needs.*
- Solutions "designed with the busy caregiver in mind", intending to simplify workflow, "optimizing time spent on mission-critical functions and reducing pressures in the care environment".
- Scalable *clinical workflow and communications management* solutions based on *specific communication devices with embedded specific software.*
- Integrated network of staff and patient-room devices ensuring that "the right information is delivered to the right caregiver at the right time" for the appropriate response / decision, "when and where needed".
- Enhanced productivity and efficiency of the medical staff in the patient benefit with task management and prioritization.

Particularity, Distinctive features and innovative approach of LetItFlow:

- *Scalable and flexible clinical workflow and communications management* solution based on *mobile communication devices with embedded specific software.*
- Ensuring *the right and "just in time" response for a specific situation* (optimization, prioritization, guidance, support, acting / reacting in emergencies or critical situations).
- LetItFlow it's not only a communications management solution (nurse call system) but a *mix of "smart" mobile applications* ensuring a unified and contextual communication for the medical staff.

    2. ASCOM UNITE – Unite Messaging Suite for Healthcare (http://www.ascom.us/us-en/index-us/systems-division/ascom-unite.htm#overview)

Pursuant to the analysis of the relevant functionalities of LetItFlow and ASCOM UNITE – Unite Messaging Suite for Healthcare solution, we have acquired the following results:

As described on the website: "Ascom Unite is a powerful middleware platform that connects mission-critical systems with mobile staff members, delivering advanced two-way messaging to a variety of mobile devices. It enables quicker response to information which ultimately saves time and resources, not to mention improving the experience for your customers or patients."

The solution is focused on the medical staff needs.

Similarities, Common features of LetItFlow and ASCOM UNITE – Unite Messaging Suite for Healthcare:

- Smart and powerful integration, advanced alarm & messaging and system management in one single package.
- Delivering the right message, to the right person, at the right time.
- Ensuring the mobile staff to remain connected at all times and communicate on-the-go.
- Allow for alarms, alerts, notifications and other problems can be quickly and easily located and solved.
- Implementing the same architectural approach: *Smart Devices + Middleware = Revolutionary Healthcare.*

Particularity, Distinctive features and innovative approach of LetItFlow:

- Smart Devices + Middleware (Business logic layer) = *Innovative Integrated Applications Suite*
- Flexible and scalable architecture allowing starting small and growing the system as desired, implementing new components like: interface/connector for integrating with clinical or HIS (Hospital Information System) solutions, reporting and statistics component, eLearning platform or applications for training of the personnel etc.
- Requiring specific functionalities and features for the elderly people belonging to the medical staff:
  - *Intelligent task assignments:* LetItFlow will support managers in assigning work tasks based on user profiles;
  - *Change management support*;
  - *Communication and mentoring*: given the valuable knowledge of experienced nurses, LetItFlow will facilitate communication among older and younger healthcare professionals. This bidirectional communication is enabled by the combination of LetApp and LetAlarm components;
  - *Alarm and notification*: the proposed solution includes two modules that support older nurses affected by certain medical conditions (LetAlarm, LetCritical);
  - *Usability of interfaces*: usability is a key factor for the adoption of ICT solutions by end-users, even more so if the target group includes older users. In making sure that the LetItFlow solution and services are oriented towards the AAL (Active and Assisted Living Programme) communities, considerable efforts have been and will be placed on the design of the human-computer interfaces;
  - *Assisted reporting and documentation*: Support to older healthcare professionals with the reporting and digitization of information through semi-automatic reporting. Based on the activities that are tracked by LetItFlow, the solution will provide specific templates for older nurses, which facilitate the reporting of their tasks, according to standardized format used in the clinical environment.

Stanley Healthcare

From the Stanley Healthcare solutions, the appropriate application to be included in our analysis was Nursing & Staff Workflow.

1. Nursing & Staff Workflow (http://www.stanleyhealthcare.com/solutions/health-systems/clinical-operations-workflow/staff-workflow)

Pursuant to the analysis of the relevant functionalities of LetItFlow and Nursing & Staff Workflow solution, we have acquired the following results:

The solution is dedicated to improve clinical processes with optimized staff workflow.

Similarities, Common features of LetItFlow and Nursing & Staff Workflow:

- Intend to eliminate manual documentation specific for the daily activities of medical staff
- Deliver real-time data that helps correlate specific workflows to the patient satisfaction.
- Capability to deliver reports and analytics
- Minimizing the variability in the care process - designing staff workflows based on patient-to-nurse interaction (task management / prioritization), patient-nurse / staff interaction time.

- Real-time alerts/notifications to a wide variety of staff-specific devices ensure real-time response for those difficult situations.

Particularity, Distinctive features and innovative approach of LetItFlow:

- LetItFlow is a solution centered on the nurses and caregivers *status* and *acting capability*, by measuring the vital parameters of the staff and monitoring their behavior.

4.1.2 Similar solutions in European Union

We have studied various clinical and HIS (Hospital Information System) solutions / platforms / suites / systems existing in the European Union, the most of them based *on the same modular architecture and business logic*, and we have selected the suite of Imatis AS Norway, as the most complete and complex similar solution and appropriate to be included in our analysis.

Imatis AS Norway

The analyzed solution was IMATIS Platform and Software Suite (http://www.imatis.com/imatis/nurse-station.html).

Pursuant to the analysis of the relevant functionalities of LetItFlow and IMATIS Platform and Software Suite, we have acquired the following results:

IMATIS Platform and Software Suite belongs to the Care Orchestration with Lightweight ITC Solutions of Imatis AS Norway and is based on the IMATIS Fundamentum platform.

As described on the website: "Imatis solutions around secondary nurse call is a breakthrough in safe and efficient two-way patient communication and treatment, including use of mobility, a flexible nurse station application and room displays management system, we can even forward notifications to wearable devices such as modern digital watches."

IMATIS Platform and Software Suite comprises the following major features: security, pervasive technology integration, messaging, data storage, business rules, workflows, web portal, widgets, telehealth video and voice communication, location-based services and an application store with apps and widgets for PC, Mac, tablets and smartphones.

Similarities, Common features of LetItFlow and IMATIS Platform and Software Suite:

- Implementing strong security mechanisms, pervasive technology integration, messaging, data storage, workflows, location-based services.
- Unified, smart and secure platform of communications
- Fast and safe management of critical alarms and messaging
- Flexible and modular solutions, based on a "Care Team Collaboration" infrastructure, including workflows, check-lists, tasks, content, messages, chat; voice and video communication.
- Ensuring "that important and secure messages and critical alarms are delivered to the right place, at the right time, anywhere and in a secure manner".
- Implement mobile applications (mobility) by using smart mobile devices and wearables.
- Include tools for vital sign checklists.

Particularity, Distinctive features and innovative approach of LetItFlow:

- Implementing smart mobile applications with respect to the AAL Programme specificity, easy to adapt and personalize for different domains at a convenient price.
- Distinctive features for smart mobile applications (LetAlarm, LetCritical).
- Ensuring the measurement of vital signs in real time and acting just in time, when critical situations arise, comparing with the other similar solutions where the results of measurement the vital signs are registered into the system after their measurement.

4.1.3 Conclusions

As result of our detailed benchmark analysis, addressing the above-mentioned "Particularity, Distinctive features and innovative approach of LetItFlow" sections, we present in the following the major distinctive features of LetItFlow, functionally and operationally, which have arisen from the comparison with the similar solutions:

- Scalable and flexible clinical workflow and communications management solution based on smart mobile communication devices with embedded specific software.
- The solution is particularly focused on *the medical elderly staff **needs, engagement** and **care***.
- Ensures unified and contextual communications – ensuring ***the elderly personnel guidance and care*** (LetApp, LetCritical, LetAlarm, LetTrain, Monitor Manager, Observational data analysis); implementing specific features for: ***change management*** (LetTrain) and ***contextual behavior analysis*** (Monitor Manager, LetCritical).
- Ensures *the right and "just in time" response for a specific situation* (optimization, prioritization, guidance, support, acting / reacting in emergencies or critical situations).
- Flexible and scalable architecture allowing starting small and growing the system as desired, implementing new components like: interface/connector for integrating with clinical or HIS (Hospital Information System) solutions, reporting and statistics component, eLearning platform or applications for training of the personnel etc.
- Implements smart mobile applications with respect to the AAL Programme specificity, easy to adapt and personalize for different domains at a convenient price.
- LetItFlow is a solution centered on the elderly people ***status*** and ***capability of acting***, by measuring in real time the vital parameters of the staff and monitoring their behavior.
- Requires specific functionalities and features for *the older people*:
  - ***Intelligent task assignments***
  - ***Change management support***
  - ***Communication and mentoring***
  - ***Alarm and notification***
  - ***Usability of interfaces*** (specific technical approach for UI – User Interface and UX – User Experience)
  - ***Assisted reporting and documentation***.

One of the important future addressed aspects within the Business and Exploitation Plan (D6.3 – Business model and D6.4 – Exploitation plan) will be the financial one. The price of LetItFlow solution is more convenient like the other prices / costs for similar proprietary solutions. We intend to propose a convenient formula, comprising installation in cloud infrastructure with a paid access considered as monthly subscription.

5. SWOT ANALYSIS

In this chapter we have carried out a SWOT analysis of the Consortium. SWOT acronym stands for Strengths, Weaknesses, Opportunities, and Threats. SWOT analysis enables a group to move from traditional strategies to a fresh perspective.

Strengths - characteristics of the business that give it an advantage over others in the industry.

Strengths
• Technological skills. • Experienced and certified specialists. • Committed employees. • Trust and reciprocity. • High quality solution developed by the consortium. • Solution tailored for elders needs at work. • Value chain covered by consortium. • Similar experience with other AAL projects.

Table 14 SWOT, strengths

Weaknesses – characteristics that place a firm at a disadvantage relative to others.

Weaknesses
• Lack of brand recognition for LetItFlow. • Lack of a mature solution at this stage. • Exploitation and market strategies not included in the LIF budget.

Table 15 SWOT, weaknesses

Opportunities – chances to make greater profits in the environment. Represent external attractive factors that represent the reason for an organization to exist and develop.

Opportunities
• No rival similar solutions dedicated to elder's needs. • European research and development investments. • Opportunities in public and private organizations. • Growing number of older adults with professional knowledge and expertise willing to adopt newer technologies. • Long term strategies to support active ageing. • Engagement after retirement of former/actual employees.

Threats – external elements in the environment that could trouble for the business. Represent external factors, beyond a organization's control, which could place the organization's mission to operate the risk.

Threats
• Rival firms adapt new strategies. • Entry of foreign competitors. • Threat of substitution by better solutions. • Challenge for users' adoption, retention and monetisation. • Potential reluctance of organisations.

Table 17 SWOT, threats

6. INTERVIEWS WITH EXPERTS

A questionnaire is set to tackle new markets is applied on potentials business areas. Thus, in Romania, SIVECO identified potential users for LetItFlow applications in domains with workload and workflows. Examples are health laboratories, security guard and patrol, wastewater treatment plant.

Interviews with experts for alternative markets

For the purpose of this project, SIVECO, AIT and HUVM interviewed 42 experts based on the following questionnaire:

Questionnaire

The implementation team of the European research and development project **Active Distributed Workflow for Elderly (LetItFLow**) is interested in your opinions concerning the applicability of the IT solutions dedicated to increasing work efficiency and monitoring the staff and resources within an institution/organization.

You will receive the results of this study via e-mail and will be able to use the information in the undertakings regarding optimization of working processes and the activities developed within your the institution/organization.

The **LetItFlow** project aims at designing and implementing specific work flows to support the medical staff aged over 50, i.e. medical nurses, caregivers and laboratory technicians, in fulfilling the daily tasks and aiming to smoothly adjust their work to new procedures, protocols and operation techniques.

1.	What field of activity has the institution / organization[5] you represent?

❑chemistry / biochemistry;

❑nuclear physics / isotopes;

❑waste management;

❑purification stations;

❑geophysics;

❑medical (neurology, cardiology, laboratory for medical tests, hematology and blood transfusion);

❑guard and protection;

❑IT / applied IT.

2.	Are there any persons over 50 years old employed in this institution / organization?
❑Yes
❑No

3.	Is the activity developed within your institution/organization managed by an information system?
❑Yes
❑No (=> MOVE to question no. 8)

4.	In case you have answered affirmative to question no. 3, please state whether the existing information system has a software component / application / tool for the management of workflows, processes or activities (for example, BPM – Business Process Management, Task Management)[6].
❑Yes
❑No
❑I do not know (please redirect to a person who might be able to answer this question).

5.	Can you please provide details? *(such as: implementation location, number of users of the solution, optimized processes and activities, transfer and automatic taking over of responsibilities)*

………………………………………………………………………………………………..

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[5] Organizational entity of department, compartment, section, unit type etc.

[6] BPM – Business Process Management, Task Management represent specific information solutions for increasing the efficiency and/or monitoring the activity developed within an institutions/organizations

6.	Does the existing information system have a software subsystem / component / application / tool for staff monitoring?

❑Yes
❑No
❑I do not know (please redirect to a person who might be able to answer this question).

7.	Can you please provide details? (such as: video, acoustic, access/ identification card, location, alarm, intelligent equipments/devices)

……………………………………………………………………………………………..

8.	Do you find useful having in your institution an information solution for the management of workflows, processes or activities and/or staff monitoring in order to increase the work efficiency, comfort and security in the workplace of employed persons, especially for those aged over 50?

❑Yes
❑No
❑Only for those staff categories that develop their activity under stress factors or in critical/special conditions
❑Other categories ....

9.	Did you undertake any actions in procuring an IT solution / components / applications / software instruments of the type mentioned above?

❑Yes
❑No
❑Do not want to answer

10.	Have you received any offer from specialized suppliers? In case your answer is yes, please provide details.

....

Thank you for your collaboration!

Date:
Name *:
Institution/Organization:

Table 18 Questionnaire

The interviewed employees have different age and work for the following organisations: University of Veterinary Medicine Vienna, SeneCura Sozialzentrum Grafenwörth, University Municipal Hospital from Bucharest, Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering (IFIN-

HH), National Institute for Research and Development in Optoelectronics in Romania, Sibiu Military Hospital, Dinamic Guard Force, Hospital Universitario Virgen Macarena, Duna-Guard and SIVECO Romania. All these organisations are targeted as an alternative market and we detailed that in section *1.5.2. Alternative markets,* of this deliverable.

According to the questionnaire results, 54% of our respondents are working in a medical organization (neurology, cardiology, laboratory for medical test, haematology and blood transfusion) and 34% in a related field, biochemistry as stated in the chart below (Figure 15).
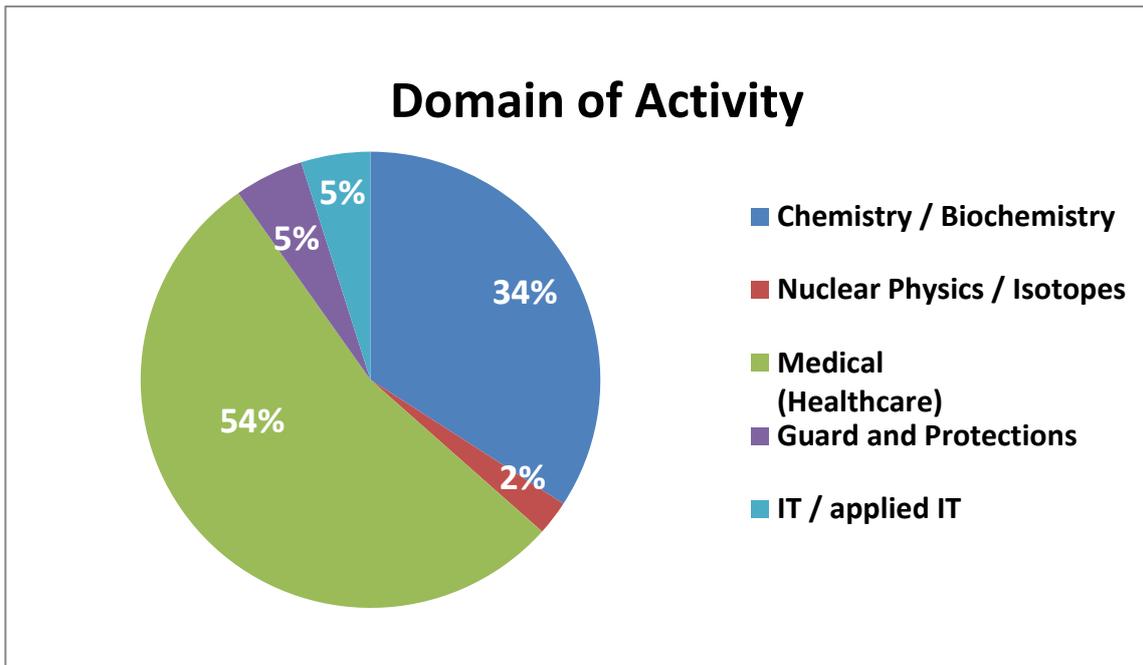

Figure 15 Respondents' domain of activity

In unanimity, all these organizations have employees over 50 years old, as we assumed when we selected the domain for the alternative markets.

Overall, 71.3% of respondents answered that in their organization exists a management information system. The rest who answered "No" are from different domains of activity each. We can speculate that the process of computerizing a business is not strictly related to its activity domain.

Going further, respondents were asked to answer whether the existing information system has a software component / application / tool for the management of workflows, processes or activities as BPM – Business Process Management or Task Management. 43% of them answered "yes" and 22% "don't know" this information. We can assume that over 40% don't have a workflow system because all employees would have been engaged in this process.
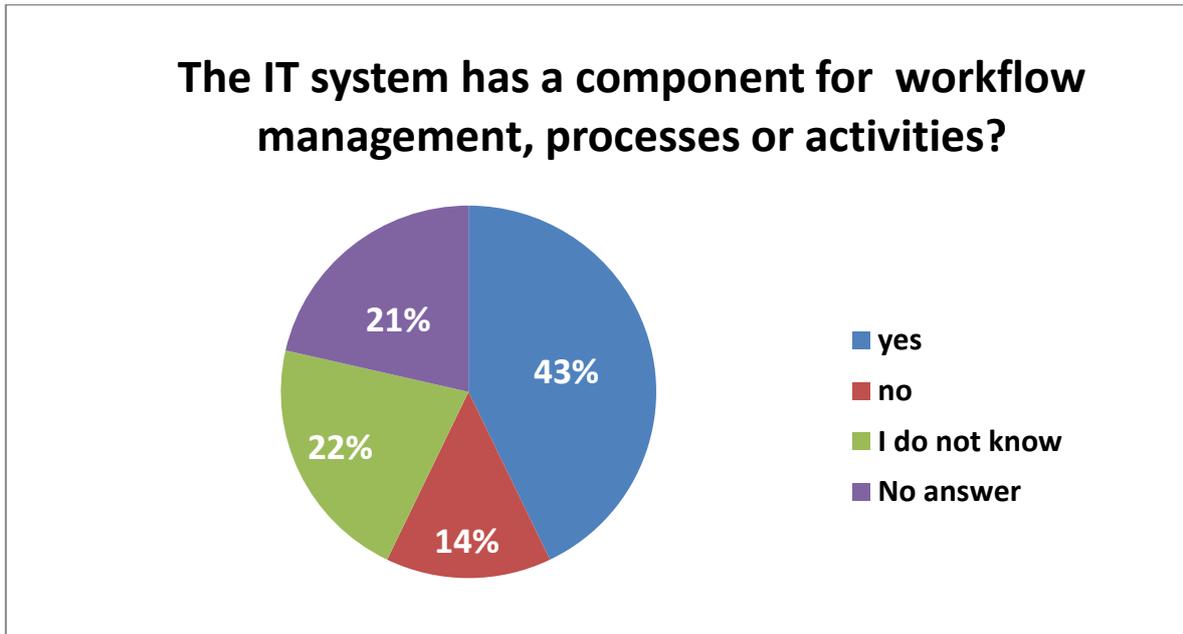
The IT system has a component for workflow management, processes or activities?

- yes **43%**
- no **14%**
- I do not know **22%**
- No answer **21%**

Figure 16 Existence of workflow management component in the IT system of the questioned organization

When asked to give extra details about implementation location, number of users of the solution, optimized processes/activities, transfer and automatic taking over of responsibilities, 61% didn't answered while 28% couldn't or didn't knew other details. Only 2 employees from medical and IT domain gave some example, such as: document workflow, access card and Laboratory information management system (LIS). For Laboratory information management system, most equipment is connected into an internal network and each employee has a user for the system. Analysis results are being validated and transmitted through the network.

Asked if the existing information system has a software subsystem / component / application / tool for staff monitoring, 33% answered "No", while 26% have chosen not to answer this question as stated in the chart below (Figure17).
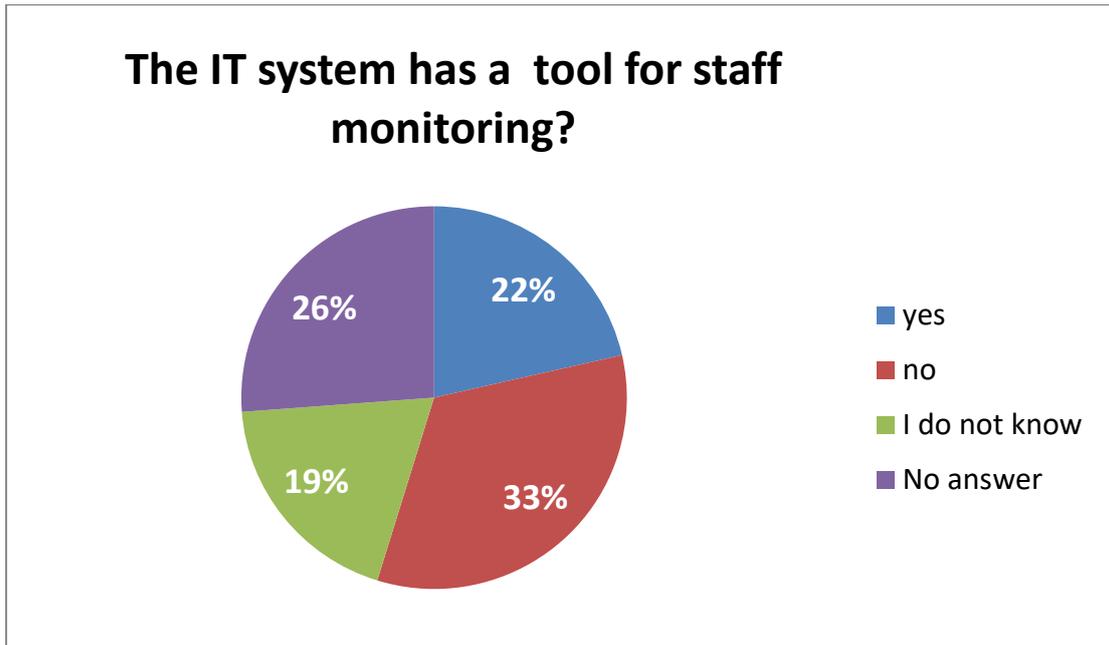
Figure 17 Staff monitoring tool existence

Moreover, when asked to give examples of monitoring tools such as: video, acoustic, access/ identification card, location, alarm, intelligent equipment /devices, 72.2% have chosen not to answer, others answered "No" and only two respondents (11%) answered "Yes". Among their examples they state: mobile phones, transceiver stations, access card and software modelling.

The next question is directly related to the scope of our solution and mainly to change management. The results state that 67% believe that an information solution for the management of workflows, processes or activities and/or staff monitoring would increase the work efficiency, comfort and security, especially for those aged over 50. From different reasons 28% answered "No" and we can assume that they are not prone to change.
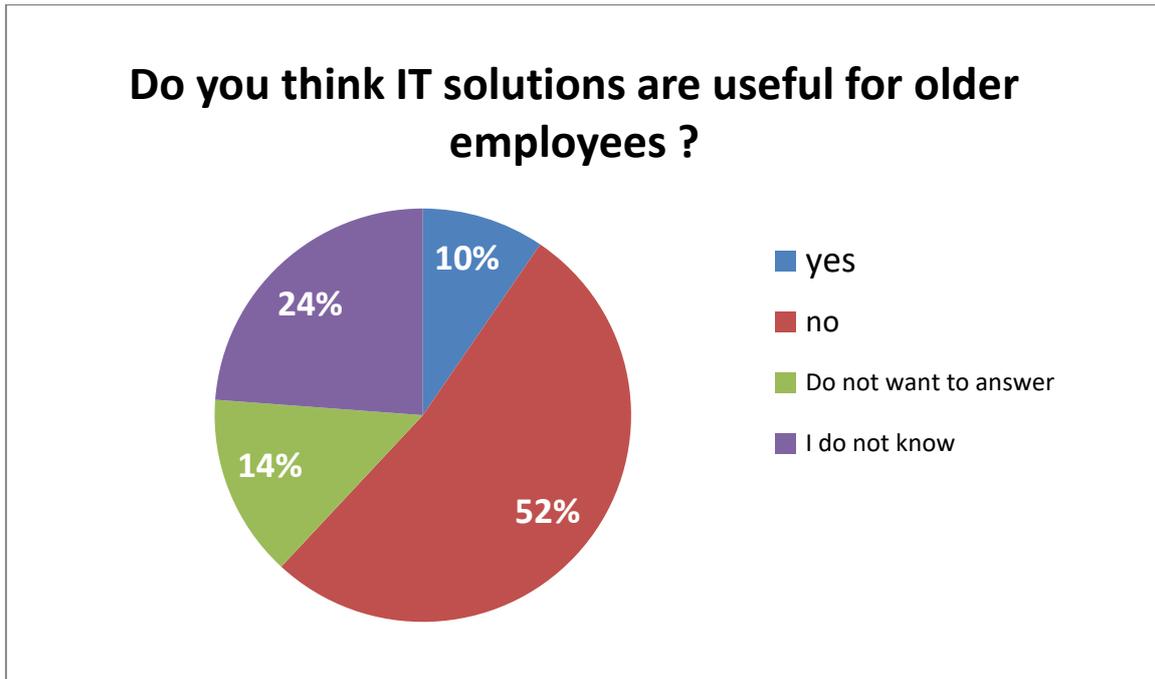
Figure 18 Usefulness of IT solutions for elders

Almost in unanimity, 95% answered that they never undertook any actions in procuring an IT solution / components / applications / software instruments solution for the management of workflows, processes or activities and/or staff monitoring. Taking in account that most of our respondents manage budgets and are involved in decision processes in their activity, we can assume that there is neither budget or there is no interest for this type of solutions.

Related to the previous question, 85% stated that they never received an offer from a specialized IT supplier and the rest chose not to answer.

As a conclusion, we can state that the targeted domains have employees over 50 years old and 50% of them have an Information system with a software component / application / tool for the management of workflows, processes or activities. The most important aspect is related to the willingness of people to adopt a new IT solution for employees over 50 years old. 70% believe that an information solution alike LetItFlow would increase the work efficiency, comfort and security for elders.

7.   MARKET SEGMENTATION

Market segmentation is the process of dividing consumers into groups based on shared needs, desires and preferences. Normally, a market can be segmented according to four categories: demographics, geography, behaviour and psychographics, where each category can be divided into different groups.

7.1 Segmentation by Demography

Demographic market segmentation is one of the most common approaches to segmenting markets based on: age, gender, work state, occupation and income.
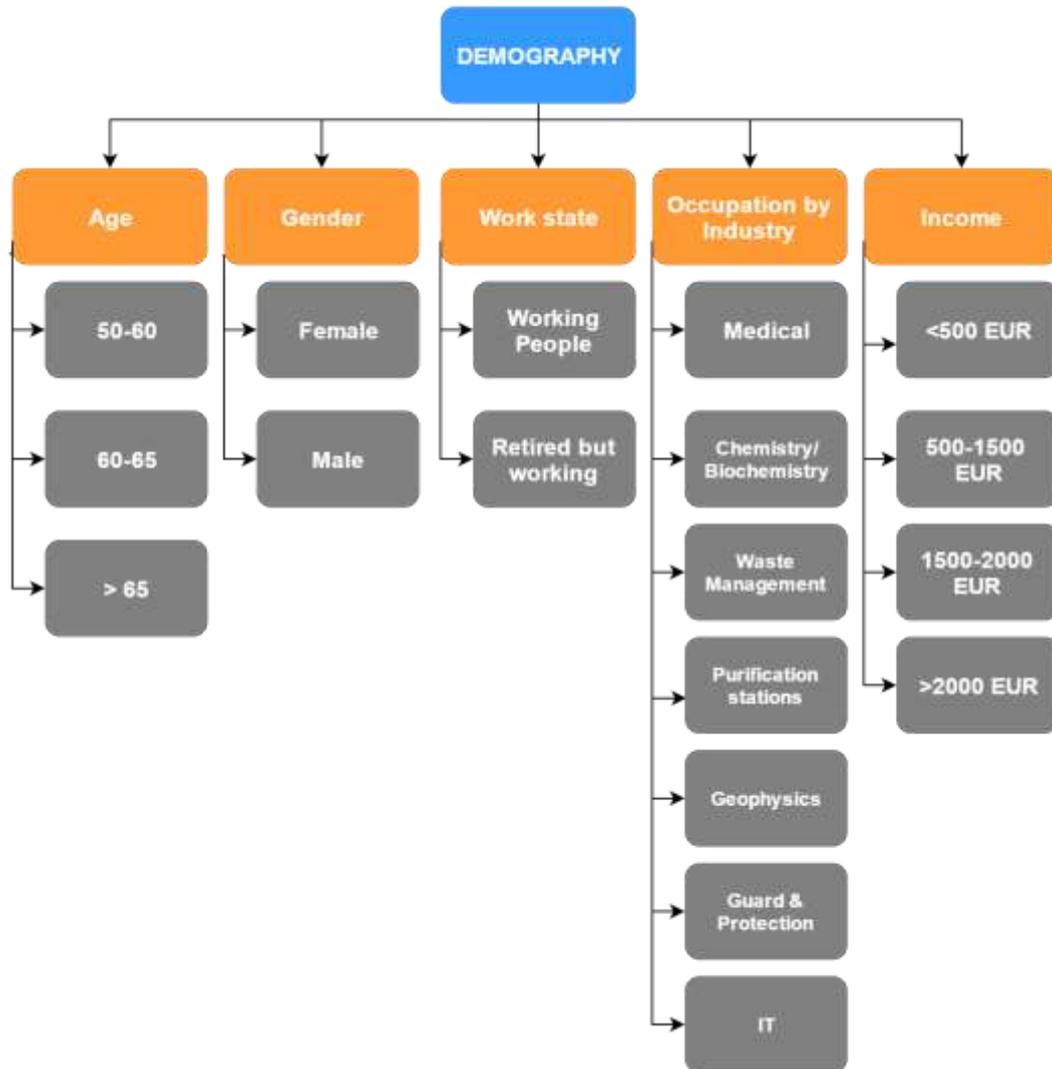
Figure 19 Segmentation by Demography

Age segmentation

Based on project's scope, we need to divide our market into several segments: people aged between 50 to 60, aged between 60 to 65 and aged larger than 65. Each group could have different requirements regarding products.

Segmentation by gender

This type of segmentation is relevant because the number of female elderly people is higher than the number of male elderly people and they have different behaviours related to technology. Men are generally more attracted by electronics and computing equipment in comparison with women. Moreover, prediction (see Chapter 2) state that women's involvement in the labour market will increase by 2060.

Work state segmentation

Elderly people in our target group are aged more than 50 years and they are either working (full-time or part-time) or are retired but still have a job. So the market can be segmented along this line: working people and retired people with jobs.

Occupation by industry segmentation

Is related to our main an alternate markets we target with LetItFlow. Each industry has their own particularities and the people have different specialisations and need different IT tools. According to the targeted market this segment is divided in: chemistry / biochemistry, nuclear physics, waste management, purification stations, geophysics, medical, guard and protection and IT.

Segmentation by income

Taking into account the fact that the medium wage in Romania (where we have one of the pilots) is around 500 EUR, the first range is beneath <500 EUR. Therefore, more groups can be made.

7.2 Geographic segmentation

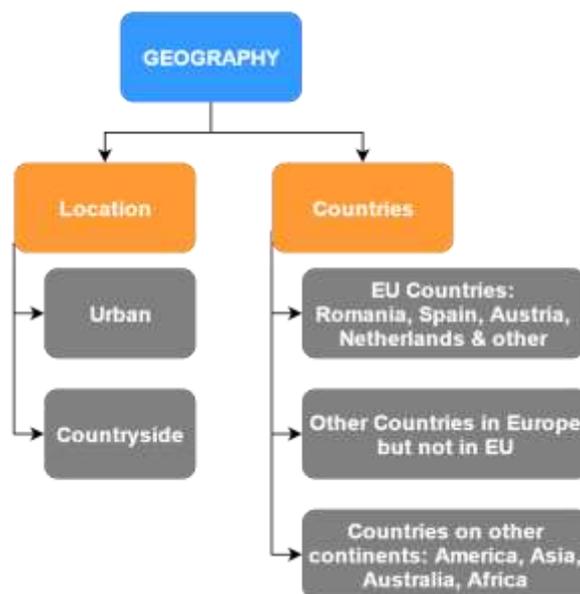Geography could also be taken into account from two aspects.

Figure 20 Segmentation by geography

Living in an urban area or in the countryside

People living in cities have different living conditions than people living in village/rural areas. They have different jobs, have better access to technology. In Romania, for example, countryside areas are low developed and in most cases are focused on agriculture and people's interest for technology is significantly decreased.

Countries

Normally, consumer behaviours are diverse in different countries due to local traditions, cultures, policies or economy. Therefore, this factor is important to analyse if we want to sell our products to

different countries. We considered non-EU countries separate because of different legislation laws that need to be taken into account.

7.3 Behavioural segmentation

Based on desk research and surveys, a lot of behavioural aspects can be considered as segmentation criteria in the project.
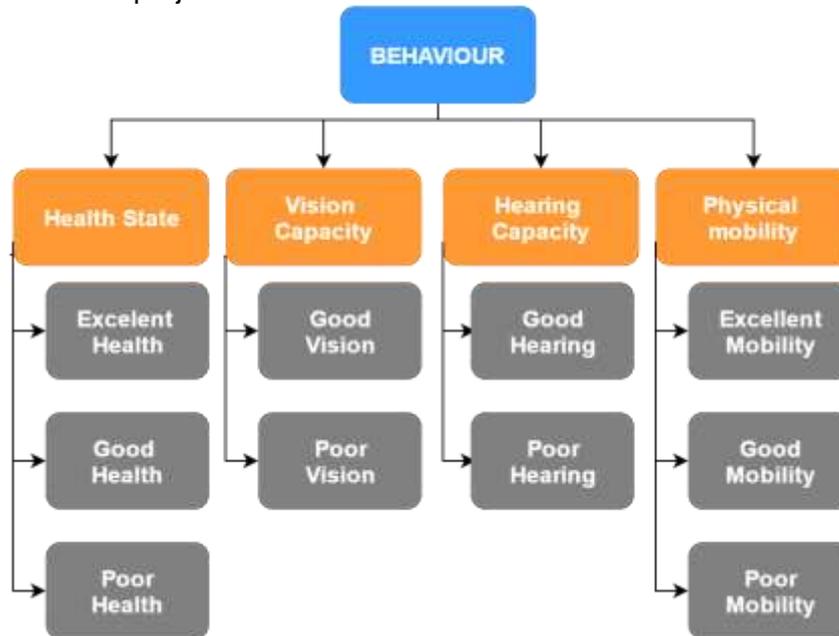
Health state segmentation

Segmentation by health state is relevant because LetItFlow solution needs to adapt to elder's different disabilities so they can accomplish their daily tasks. This segmentation is divided in: excellent health, good health or poor health.

Vision and hearing capacity
Regarding vision and hearing capacities we can separate them into good or poor.

Physical mobility

Physical mobility here means the ability to move and we can separate them into: excellent, good or poor.

7.4 Segmentation by Psychographic

Psychographics or lifestyle segmentation and is related to consumers interests and activities.

Figure 22 Segmentation by psychographics
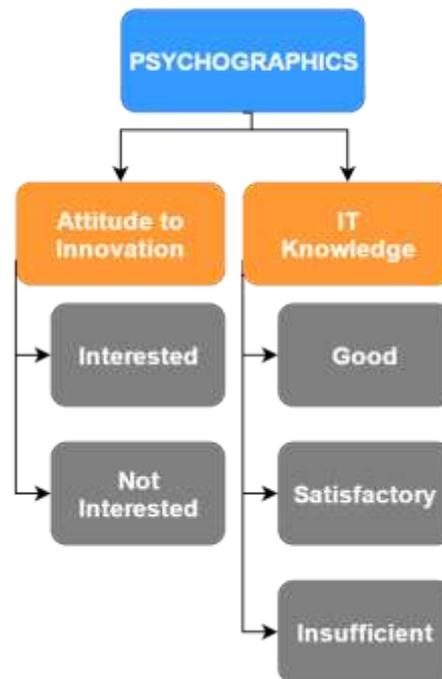
Attitude to innovation

The surveys for alternative markets revealed that that the interest in technology innovation for elderly support is high. 67% of respondents thought that technology innovations can help elderly to satisfy their needs and problems; 28% of respondents claimed that IT solutions dedicated to elders, as LetItFlow, won't help them improve their work activity. According to these data, the market could be divided into two groups: interested in innovative technologies and not interest in adopting newer technologies.

IT knowledge

Smart phone, tablets, laptops are common devices that people frequently use for internet access and for different applications. We can divide them into categories: good, satisfactory and insufficient.

LetItFlow has to be accompanied by ongoing training, and long-term technical support. Such support should be an integral part of the package offered. If experiences with the service are positive or expectations are confirmed, people are more likely to use technical services in the future.

8. SELECTED SEGMENTATION MARKET

In order to make the segmentation effective, several important and effective segments of project are selected according to the following criteria:

 a. *The organization must be able to identify and measure each segment;*

 b. *The market must be substantial enough;*

 c. *The organization must be able to reach customers;*

d. *Customers in the selected segment must be responsive (money and willingness);*

e. *Characteristics of the segment are relatively stable over a long period.*

Assisted group

This target group focuses on the elderly who are limited in some capacity, such as vision, hearing, mobility, etc. LetItFlow shall provide special functions for these people. Older adults experience a lot of restrictions and challenges related to the process of aging. Since visual and cognitive abilities decrease with age, the solution developed within this project could help them in their work productivity.

Assisted group		
Working /Retired but working people over 50 years	Poor Vision or Hearing capacity	Satisfactory or Good IT Knowledge

Table 19 Assisted group

Productivity increase group

This segmentation aims at the elderly who want to increase their productivity at work. The project will support the elderly in their daily activities by providing applications for their daily tasks. The people in this group are elderly adults who are interested in innovative IT solution, are excited to use them and have satisfactory/good IT Knowledge. In addition, they have an excellent or good health state.

Productivity increase group		
Excellent/Good Health State	Interest in innovative technologies	Satisfactory or Good IT Knowledge

Table 20 Productivity increase group

Price sensitive group

End-users could choose a mix of functions based on the price and their needs. The economic situation and the number of elderly people in each country should be taken into account, for

example, the average income of elderly people in the Romania is lower than that in Spain. Elders in this group are interested in innovative technologies and have satisfactory/good IT knowledge.

Price sensitive group		
Income	Interest in innovative technologies	Satisfactory or Good IT Knowledge

Table 21 Price sensitive group

9. INITIAL MARKET STRATEGY

This chapter gives a preliminary version of market strategy and business exploitation following the business canvas model approach. A detailed business and exploitation plan will be provided at the end of the project on the deliverable D6.3.

9.1 Integrasys

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
National healthcare Services (public and private) Large IT solution provider in Health domain Healthcare network BPM platform providers	*Development of LetItFlow solution* After the end of the project, the developed prototype needs to be mature to become a commercial product. Exhaustive testing in real environment. Need to comply with hospital standards related to privacy, data protection We do not aim an self-installable product, but a customizable platform for the customer needs. In order to be competitive, functions for easy maintenance and remote support need to be developed. *Commercial Release*	*Change management improvement* LetItFlow combines solving the problems of change management in companies and workflow technologies for older nurses by supplying real-time context-aware tools for guiding them in their daily tasks. This will increase their motivation and independence. Also for their colleagues this will therefore	Hospital: They are the main customers, since they are the user of the platform. They participate in the requirements stage, to create their customized workflow. Post-sale support is also foreseen. Government: Governments may want to adopt this technology to develop systems that will make it possible for older people to still participate in the working community. Large IT Companies, willing to embedding our workflow solution in their product portfolio.	Hospitals Government

LetItFlow as a platform that would be customized for different workflow. It also is can be integrated with other IT solutions.

offer a benefit.

Economic benefit

Introduction of these technologies will have a positive influence on the working situation of elderly nurses and their motivation. This will help to reduce absence and prevent mistakes. This is a benefit for the nurses but also for their employers

Key Resources

Product development

Specialized IT software developer and system integrators, and business process management designer

Distribution network

Sales team in EU and US of Integrasys.

Post-sales team

Support team

Usability

Interfaces are defined to be usable.

Channels

Sales channels

Partner managers will establish relationships with potential OEM partners for embedding and reselling the LetItFlow tool in solutions they offer. Direct sales network can contact governments and hospitals directly.

Communication & PR

In order to create awareness, different tools will be used: newsletters, emailing campaign, social media (blogs), website, press releases. In addition we can visit relevant conferences and tradeshows to present our tools and get in contact with potential clients and partners.

Cost Structure

This describes the most important monetary consequences while operating under different business models

Development costs
Costs to complete the LetItFlow Tool, including documentation.

Communication
Personnel costs, plus out of pocket costs (conferences/tradeshows, printing, webhosting, etc.)

Sales costs
Direct (personnel) for sales, training and support and out of pocket (travel, office space, etc.)

Revenue Streams

The way a company makes income from each customer segment.

- Customization of platform for each customer – Implementation cost
- Post-sale Support – Subscription model

Running costs Post-sale support	

Table 22 Initial Business Plan - Integrasys

9.2 SIVECO

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
National healthcare Services (public & private) Large IT solution provider in Health domain BPM platform providers Own strategic partners (e.g. TSystems for health domain).	**Development of LetItFlow** In order to have a mature solution SIVECO needs to continue testing the prototype developed during the project. For the solution to be easily customizable, further development might be necessary to have a valid product for the market. **Commercial Release** LetItFlow would be customizable for different domains.	✓ Development technology ensures the portability on various hardware and software configurations ✓ Flexibility to integrate with other systems ✓ Tailored to elder's needs and disabilities **USP (Unique Selling Propositions)**	SIVECO is targeting: own customers, new customers, and also competitors.	Public (B2P) & Private (B2B) Organisations
	Key Resources Product development and experience in IT for over 24 years. Management and IT experts with know-how and various certifications. Big distribution network with Projects in over 27 countries, across 4 continents.	✓ LetItFlow: Simple & Intuitive IT solution for elderly ✓ Working environment is tailored to elder's needs with LetItFlow ✓ LetItFlow is making change easier for the elders	**Channels** **Communication &PR** SIVECO is going to use various tools to disseminate information about LetItFlow solution, such as: press releases, emailing campaigns, telemarketing, social media (FB), own website. The company is also going to participate at fairs, events & conferences to create awareness.	

			Sales & Distribution Assisted by communication tools, SIVECO's sales team, is planning to find potential customers through own customers, partners and own sales network. For both B2B and B2P, the company focuses on direct sales.	

Cost Structure	Revenue Streams
Product management costs Management costs to extend solution's capabilities **Development &Testing** Personnel cost to improve system's capabilities according to market's needs and to make it easy for customisation. **Communication & Sales** Costs with dissemination materials, with personnel and for participation at different events to create awareness.	✓ LetItFlow solution customization of for each customer ✓ Technical support post implementation

Table 23 Initial Business Plan – Siveco

9.3 Noldus

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
	Development of LetItFlow After development of the prototype during the project, the tool will be completed. **Commercial Release** Release of the LetItFlow Tool as an independent product, or as a tool that can be embedded in a set of products and services. This will be done after testing and validation. The full	**Guidance of nurses in their daily activities** LetItFlow combines solving the problems of change management in companies and workflow technologies for older nurses by supplying real-time context-aware tools for guiding them in their daily tasks. This will increase their motivation and independence. Also for their colleagues this will therefore offer a benefit.	**Nurses** These are the main end users. **Hospitals** Hospitals can adopt this system to support older staff members and thus increase productivity and reduce absence. **Governments** Governments may want to adopt this technology to develop systems that will make it possible for older people to still participate in the working community.	**Nurses** The LetItFlow tool can be sold directly. To be decided during the project how to define the actual target group, based for example on age, acceptance of technology, educational level. **Hospitals** The solution can be offered in batches to

			hospitals.
product will also include documentation. The release will be supported by a range of PR & communication activities, with the aim to create awareness.	**Cost reduction** Introduction of these technologies will have a positive influence on the working situation of elderly nurses and their motivation. This will help to reduce absence and prevent mistakes. This is a benefit for the nurses but also for their employers. **Easy to learn** The tool should be simple to use and easy to learn.		

Key Resources

Data integration

Experience how to integrate different datastreams into one system, and how to generate information from combining all the available data.

Expertise in automatic recognition of behaviour and emotions

using computer vision, physiological data and real-time analysis of interaction logs

Distribution network

Noldus has a worldwide sales network.

Channels

Sales channels

Partner managers will establish relationships with potential OEM partners for embedding and reselling the LetItFlow tool in solutions they offer.

Direct sales network can contact governments and hospitals directly.

Communication & PR

In order to create awareness, different tools will be used: newsletters, emailing campaign, social media (blogs), website, press releases. In addition we can visit relevant conferences and tradeshows to present our tools and get in contact with potential clients and partners.

Direct sales to nurses

This can be established via a webshop.

Cost Structure	Revenue Streams
Development costs	**Subscription**
Costs to complete the LetItFlow Tool, including documentation.	A subscription model offers the possibility to create a sustainable income flow. Licenses can be sold in batches, price per batch can depend on batch size and time period.
Communication	
Personnel costs, plus out of pocket costs (conferences/tradeshows, printing, webhosting, etc.)	This model makes it also more affordable for partners who want to use this technology.
Sales costs	**Start Price**
Direct (personnel) for sales, training and support and out of pocket (travel, office space, etc.)	In order to make sure costs of support during implementation are covered, there will be a start fee for people who want to start embedding the LetItFlow tool into their application.
Running costs	
Server hosting for the LetItFlow solution (when running on servers).	

Table 24 Initial Business Plan – Noldus

9.4 UHB

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
Health clusters; RO-Health	**Development of LetItFlow**	Improve patients and medical staff quality of life	Not relevant for UHB – hence the institution is not allowed to sell products.	Not relevant for UHB hence it is a public institution.
Large IT solution provider in Health domain	UHB tests the LetItFlow prototype as an end-user / direct beneficiary in order to provide quick feedback to the development team and have a reliable solution by the end of the project.	Strengthens the quality of the medical act.		
Providers / vendors of medical equipment and devices		Monitoring and support in critical care.		
National healthcare Services providers (public & private)	**Commercial Release**	USP (Unique Selling Propositions)		
Pharmaceutical companies	LetItFlow will be disseminated in different domain related workshops and conferences.	✓ LetItFlow: Simple & Intuitive IT solution for elderly		
Own strategic partners (Medical universities)	**Key Resources**	✓ Working environment is tailored to elder's needs with LetItFlow	**Channels**	
	Key experts in research and development projects with and	✓ LetItFlow is making change	Communication &PR UHB is going to use various tools to	

	overall background of 20 years.	easier for the elders.	disseminate information about LetItFlow solution by participating in different activities, such as: conferences and congresses.	
	Access to shared knowledge with active international health organisations clusters.			
	Key members in European Boards of different academies/societies.		UHB will also contribute to the results of the project in different academic and scientific research papers published in national and international journals.	
Cost Structure **Not applicable**			**Revenue Streams** **Not applicable**	

Table 25 Initial Business Plan – UHB

9.5 HUVM

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
Health clusters; Spanish-Health	**Development of LetItFlow**	Improve patients care, medical and laboratory technician staff quality of life	Not relevant for HUVM - hence the institution is not allowed to sell products.	Not relevant for HUVM hence it is a public institution.
Large IT solution provider in Health domain	HUVM tests the LetItFlow prototype as an end-user of the project / direct beneficiary in order to provide quick feedback to the development team and have a reliable solution by the end of the project.	Improve care and clinical laboratory diagnostic quality of the hospital..	In any case if it is offered as a model for the presentation of the results of the project.	
Providers / vendors of laboratory autoanalyze, and clinic analysis reactive, medical equipment and devices	**Commercial Release** LetItFlow will be disseminated in different domain related workshops, conferences and national and international congress of	Enhance and support monitoring the work of clinical laboratory technician by medical laboratory. help monitor the work of laboratory monitoring quality		
National healthcare				

| Services providers (public & private)

Pharmaceutical companies.

Own strategic partners (Medical universities) | clinic laboratory.

Key Resources
Key experts in research and development projects with and overall background of 30 years.

Access to share all the knowledge and the experience of this project with active international health organisations clusters.

Key members in European Boards of different academies/societies, and quality commissions to evaluate the accreditation of the clinical laboratory of the region. | control of clinical laboratory

USP (Unique Selling Propositions)
✓ LetItFlow: Simple & Intuitive IT solution for elderly staff.

✓ Working environment is tailored to elder's needs with LetItFlow

✓ LetItFlow is making change easier for the elders in the work. | **Channels**
Communication &PR
HUVM is going to use various tools to disseminate information about LetItFlow solution by participating in different activities, such as: conferences and congresses of clinical laboratory.

HUVM will also contribute to the results of the project in different academic and scientific research papers published in national and international journals in collaboration with the different partners of the LetItFlow project. | |

Cost Structure	Revenue Streams
Not applicable	**Not applicable**

Table 26 Initial Business Plan – HUVM

9.6 Preliminary aspects regarding the business strategy

9.6.1 LetItFlow solution – scalable and marketable product

This section is dedicated to define the preliminary aspects of our business strategy, which addresses the potential targeted markets for the scalable and marketable product LetItFlow.

The proposed business strategy is based on two categories of results: the results issued from the analysis of questionnaires (section 6. Interviews with experts) and the results issued from the benchmark analysis (section 4. Similar projects and solutions in the market).

Regarding the interviews with experts, the scope of our analysis was to determine other potentials business areas (alternative markets), different from the healthcare domain. The potential business areas as alternative markets which could be addressed by LetItFlow being explored are the following:

- Chemistry/ biochemistry
- Nuclear physics / isotopes
- Waste management
- Purification stations
- Geophysics
- Healthcare (neurology, cardiology, laboratory for medical tests, hematology and blood transfusion)
- Guard and protection
- IT / Applied IT.

In the first stage of analysis, were interviewed 42 experts having a manager role, more than 50 % of them working in a medical organization, more than 30 % in biochemistry and only a little part in the other fields. The obtained results were not relevant for the scope of analysis.

In the next stage, we intend to change the questionnaires, including new questions regarding all the features and capabilities of LetItFlow solution, not only the major components of task management and BPM (Business Process Management). The fact that in the first stage of interviews, the people interviewed weren't the older final users was also a source of inconsistence of results.

To this effect, we intend to enlarge the networking and update the Questionnaire, considering the major functionalities and multiple capabilities of LetItFlow. The planned actions are presented in the following section 9.6.2.

Regarding the benchmark analysis, we have studied various similar solutions installed in hospitals and clinics all over in Europe and USA, in order to determine the specificity and innovative characteristics of the LetItFlow solution and highlight the distinctive functionalities and features as USP – Unique Selling Points. The resulted distinctive features are formalized as differentiators of the LetItFlow product, in order to facilitate the commercial approach.

Advantages and benefits of LetItFlow

Three prospects regarding the distinctive and innovative features of the LetItFlow solution have been analyzed namely:

- Functional and operational perspective (addressing the scalability, flexibility, modularity and accessibility)
- AAL specificity perspective (addressing the older people needs in specific contexts)
- Financial perspective (addressing a convenient formula of selling-off the product).

1. Functional and operational perspective (solution scalable and marketable):

LetItFlow is an Integrated Applications Suite (IAS), based on an open technological platform, complying with the principles of the SOA (Service Oriented Architecture) "pluggable", scalable architecture. The LetItFlow Suite is *able to integrate / encapsulate any other application* with added-value for our purpose – eLearning solutions, collaborative platforms, reporting and statistics applications, tutorials, serious games, Augmented reality, GIS/maps, clinical applications etc. Considering this aspect, it should be facile to particularize LetItFlow to any business area which demands the functionalities and capabilities of LetItFlow.

2. AAL specificity perspective (AAL compliancy)

LetItFlow is a solution specific developed for the AAL Program, particularly allowing elderly hospital workers (nurses, orderlies, lab technicians, medical staff), to carry out their daily tasks in an optimal way and to adapt easy to the new procedures, protocols, methods and manoeuvres.

When comparing different solutions, an important benchmarking dimension is the extent to which the user interfaces account for the needs of older users (e.g., nurses, orderlies, lab technicians). Older medical staff constitutes a special user group that may differ from other user groups in distinct ways. For example, important limitations more commonly found among older users include impaired vision and hearing, a decline of motor skills and memory, and idiosyncrasies in attention and decision-making.

Specifically for this type of benchmarking, it is useful to compare the different solutions against existing guidelines and best practices in "designing for the elderly" (see Campbell, 2015, http://www.smashingmagazine.com/2015/02/05/designing-digital-technology-for-the-elderly).

The following table includes several of these recommendations.

Vision and hearing	Motor skills and memory	Attention and decision-making
- Font sizes of at least 16 pixels - Possibility to have users adjust font size - High contrast ratios - Avoid blue for important interface elements - Provide subtitles when video or audio content is essential	- Buttons on touch interfaces at least 9.6 millimeters diagonally - Buttons to be clicked with a mouse at least 11 millimeters diagonally - Avoid devices with small screens - Reminders/alerts for common tasks and actions - Clear feedback on task progress - Avoid feature overload	- Allow for enough time in interactions (careful with inactivity warnings, etc.) - Allow older people to focus on one thing at a time (avoid multi-tasking) - Older people value the opinion of experts in their decision-making

3. Financial perspective

The price of LetItFlow solution is more convenient like the other prices / costs for similar proprietary solutions. We intend to propose a convenient formula, comprising installation in cloud infrastructure with a paid access considered as monthly subscription. More details about this proposal will addressed in the deliverables D6.3 – Business model and D6.4 – Exploitation plan.

Analyzing the marketable solution / product

As above mentioned, the analysis of LetItFlow as marketable solution / product is based on USP (Unique Selling Proposition or Unique Selling Point) marketing method, techniques, principles and benefits.

a) *Market analysis*

To this effect, several similar platforms installed in hospitals and clinics all over in Europe and USA were explored. We have studied the similarities (similar concepts, similar approaches, similar components) of the proposed LetItFlow solution with the other solutions analyzed, and also the specificity and innovative features of LetItFlow solution, comparing with the analyzed solutions. We have analyzed various existing solutions, suites, platforms or applications, which we have considered the most appropriate, functionally and operationally, with the LetItFlow solution.

b) *Solution positioning (unique / competitive advantages)*

The solution positioning (unique / competitive advantages) resulted from the benchmark analysis.

The *relevant features* of LetItFlow solution are the following:

- Alarm
- Alerts / Notifications
- Monitoring / Location
- Monitoring / Contextual Behavior
- Messaging
- Optimized Task management
- Optimal coordination
- Guidance
- Training / Change management support.

As result of our benchmark analysis, addressing the sections "Particularity, Distinctive features and innovative approach of LetItFlow", we present in the following the major distinctive features of LetItFlow, considered as unique / competitive advantage, which have arisen from the comparison with the similar solutions:

- *Scalable and flexible clinical workflow and communications management solution* based on *smart mobile communication devices with embedded specific software*.

- The solution is particularly focused on *the medical elderly staff **needs, engagement** and **care***.
- *Ensures unified and contextual communications* – ensuring **the elderly personnel guidance and care** (LetApp, LetCritical, LetAlarm, LetTrain, Monitor Manager, Observational data analysis); implementing specific features for: **change management** (LetTrain) and **contextual behavior analysis** (Monitor Manager, LetCritical).
- Ensures *the right and "just in time" response for a specific situation* (optimization, prioritization, guidance, support, acting / reacting in emergencies or critical situations).
- Flexible and scalable architecture allowing starting small and growing the system as desired, implementing new components like: interface/connector for integrating with clinical or HIS (Hospital Information System) solutions, reporting and statistics component, eLearning platform or applications for training of the personnel etc.
- Implements smart mobile applications with respect to the AAL Program specificity, easy to adapt and personalize for different domains at a convenient price.
- LetItFlow is a solution centered on the elderly people **status** and **capability of acting**, by measuring in real time the vital parameters of the staff and monitoring their behavior.
- Requires specific functionalities and features for *the older people*:
  - ***Intelligent task assignments***
  - ***Change management support***
  - ***Communication and mentoring***
  - ***Alarm and notification***
  - ***Usability of interfaces*** (specific technical approach for UI – User Interface and UX – User Experience)
  - ***Assisted reporting and documentation.***
- Medical staff communicates to collaborate around patient care, *but also around the personnel care*. Medical staff can easily determine the "who, what, when, and how" of communications for better patient care, *but also for better personnel care*.
- Ensures the measurement of vital signs in real time and acting just in time, when critical situations arise (LetAlarm, LetCritical), comparing with the other similar solutions where the results of measurement the vital signs are registered into the system after their measurement.

  c) *How we attract the potential beneficiaries/consumers?*
  d) *How we highlight the solution advantages?*

The solution advantages and benefits resulted from the three perspectives described above.

  e) *Finding a USP motto for our product like:*

"Taking care about the others by caring about you".

9.6.2 New commercial contacts or demonstrations

- Enlargement of networking

Based on the results of benchmark analysis and the commercial approach depicted in section 9.6.1, we intend to enlarge of networking, acting as follows:

- o Proposing an updated form of the Questionnaire (Interviews with experts for alternative markets), considering all the specific functionalities and capabilities of the Integrated Aplications Suite LetItFlow, highlighting these distinctive features as USP differentiators

- o Interviewing most of elderly people as final users of LetItFlow

- o Developing the relevant functionalities of the LetItFlow prototype and making demonstrations with an increased impact, involving potential beneficiaries (e.g. clinics/hospitals, security guards)

- o Developing possible commercial contacts in the target countries (ES, RO, AT and NL) and offering a convincing roll-out plan for the rest of Europe.

- Demonstrations, field trials and implementation of the final users' feed-back

- o Developing the relevant functionalities of the LetItFlow prototype and making demonstrations with an increased impact, involving potential beneficiaries (e.g. clinics/hospitals, security guards)

- o Testing the business model and evaluating the users' reaction (feed-back) to the product, in order to validate the proposed business model.

10. CONCLUSIONS

This document combines both qualitative and quantitative analysis methodologies which provide a good analysis for the market launch and commercial exploitation of the project's results. The methodologies analyse the market from a functional and segmentation point of view. Moreover, this report collects market information and data, providing interesting references for further research and opportunities to be addressed for this project in the future.

Through the external and internal analysis, we now are aware of the opportunities we can benefit from and threats we must care about from a political, economic, social-cultural, technological and even ethical perspective. Besides of the environment, we gained insight into our strengths which could help us compete with our competitors and weaknesses we should overcome. Then it is concluded that our core competence is basically the technology and the innovation. We could provide advanced and innovative technology to help the elderly to do their labour in an independent and intuitive way. Moreover, our strengths could help us to benefit from opportunities better and deal with threats in market. At the same time, we have less experience in marketing and distribution, which is our biggest weakness. Therefore, we should take measures to reinforce this aspect.

Finally, we conclude the document with a basic business plan that will be completed at the end of the project when this project will be more mature and all pending development issues will be finished.

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