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Silver Economy

Independent living

Business Innovation Observatory
Contract No 190/PP/ENT/CIP/12/C/N03C01

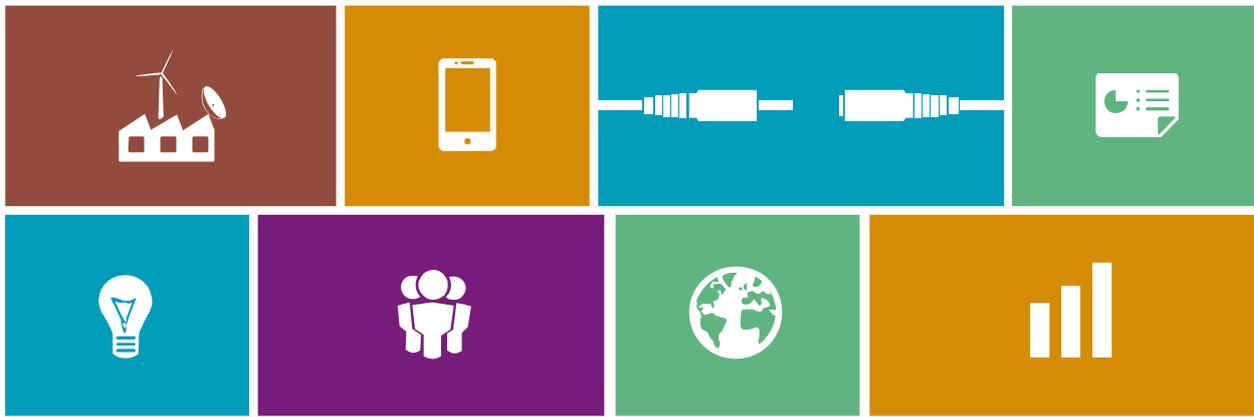
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1. Executive summary

In the coming decades, elderly people will account for an increasingly important share of the European population. At the same time, working age population will proportionately shrink. As a result, old-age dependency ratio will increase, that is, fewer working age people will have to support more seniors. These factors combined with budget constraints require new innovative solutions to keep ensuring high quality of seniors' life.

Such innovative solutions helping elderly people live independently as long as possible can take different forms which can be classified in the following groups. First, devices designed to make the household environment safer for elderly persons like sensors detecting falls and alarming the family. Second include telecare devices that offer companionship via online visits of carers and may also cater for seniors' health through online health checks. Third, accessible connectivity devices like laptops prevent digital exclusion of the elderly. Fourth, digital entertainment solutions like those offering games to help seniors remain mentally fit in their old age.

The European Union is a potential multi-billion euro market for the abovementioned products. Firstly, public expenditure on healthcare and elderly care in the EU is already significant and expected to increase as a percentage of the GDP. As an example, the EU-wide elderly care alone amounted to circa EUR 65 billion in 2012¹. It is estimated that tele-health coverage of 10% to 20% of the EU elderly and chronically ill population alone, would create a EUR 10-20 billion market². Secondly, in many Member States elderly people have significant spending power, adding to the already important public sector-stimulated market.

Independent living solutions bring two sets of social benefits to society. First, they generate savings for the healthcare system, on the part of hospitals. Second, independent seniors

are less likely to be socially excluded, thus contributing to Member State societies.

The market for independent living products in the EU is driven by strong social protection systems of the Member States. In Europe, the public sector is the main actor responsible for e.g. running healthcare and elderly care facilities. Consequently, it stands to benefit from products for independent living and has extensive funding to purchase significant quantities of them. The state is however not necessarily just a customer, but can also be a partner. This partnership, in the form of public-private cooperation, is another important market driver.

On the obstacle side, Member States differ greatly in their social models, purchasing power and cultural attitudes to the elderly. While this may cause some heterogeneity, the market is still strong and driven to a large extent by the public sector. For this reason, cost-cutting and a lack of urgency on the part of the public sector are the greatest obstacles in the development of the market.

More legal certainty and less burdensome compliance procedures would improve the development of the market. In particular, updating and/or providing guidance on the Medical Devices Directive would clarify the legal status of independent living products and, hence, facilitate market uptake by e.g. hospitals. Along the same lines, the future updated EU data protection regime should offer a clear set of rules translatable to the context of products for independent living. In terms of compliance, obtaining the CE marking should be made cheaper and less bureaucratic. Lastly, establishment of a uniform, EU-wide data protection certification should be considered. This would help companies expand within the Internal Market and not be slowed down by differing national data protection compliance procedures.



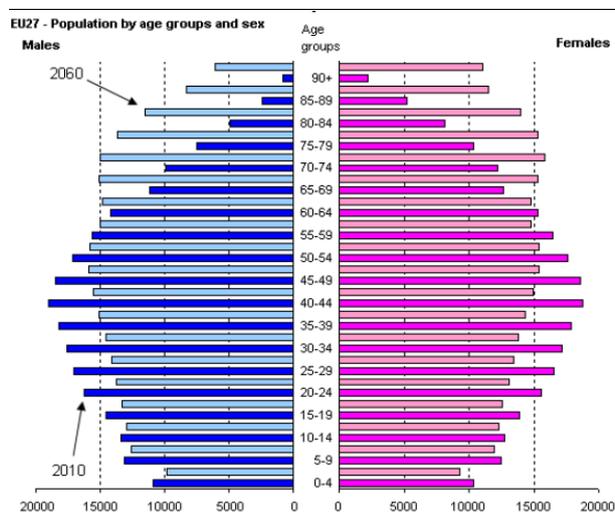
2. Independent living

The trend “Silver Economy” deals with recent developments in products and services catering for the needs of a growing European population of the elderly. The trend is examined through two case studies. This paper describes products that help seniors live an independent life at home or in external care facilities. Please also check the case study no 48 “Active aging”.

2.1. Trend presentation

In 2012, people aged 65 or above accounted for nearly one-fifth of the population of the European Union³ and this figure is expected to reach 30% by 2060.⁴ In other words, elderly people will account for a larger part of the European society, coupled with a proportional decrease in the number of staff potentially able to care for them. This demographic shift results in a rising old-age dependency ratio, which means that fewer economically active people will have to support an increasing number of seniors. This trend is likely to increase the burden on social and health systems of the EU Member States.

Figure 1: Age structure of the EU-27 population in 2010 and 2060



Source: Eurostat

In light of the above, the present study examines “Independent living”. The idea behind it is to give seniors innovative tools helping them deal with everyday life independently. Innovation for independent living does not necessarily mean absence of care or seniors living alone. For example, it is also applicable to people in elderly care homes. However, the ultimate objective stays the same: to assist

seniors in handling independently as many daily activities and chores as possible.

Fostering independence of seniors brings benefits to them, their families and the entire society. An elderly person who is able to tackle everyday challenges on their own is likely to consider themselves an autonomous member of society, and not a burden. This increases their well-being and as well as the one of their relatives and, consequently, life quality.

Also, the more a senior can do independently, the less they need carers. For instance, one staff member can take care of a larger number of seniors. As a result, social care and healthcare systems could be made more efficient and sustainable, even though demographic trends are not in their favour.

Since innovation for independent living touches many aspects of everyday life, the private sector has come up with a wide array of products that can be organised into the following groups:

- The first group includes products making it easier for seniors to stay safely at home. These include devices making house interiors more age-friendly, like sensors or alarms. They aim to enhance independence by decreasing the need for supervision;
- Second are devices dedicated to telecare and companionship. These could be robots or avatars allowing carers to check on elderly people without physically being there. They can also be combined with elements of tele-health and allow seniors to fight isolation;
- The third group is related to connectivity and includes accessible laptops and other devices adapted to the needs of seniors. These enable elderly people to stay connected with relatives and foster digital inclusion of seniors;
- Finally, the fourth group is entertainment products that not only amuse, but also train and, at times, help heal elderly people. They make sure seniors can maintain an active lifestyle.

Each of the groups above is represented by one company. The table below presents an overview of these companies, the business innovation they propose and signals of success.



2.2. Overview of the companies

Table 1: Overview of the company cases referred to in this case study

Company	Location	Business innovation	Signals of success
Giraff	Sweden	Giraff produces an electronic device (“avatar”) helping carers conduct a virtual visit at an elderly person’s home.	<ul style="list-style-type: none"> - Broad coverage in European and international media - Winner of many awards including top 100 global innovators in 2014 by the K.E.Y. platform conference in Seoul and the “most promising” innovation of the year 2012 by the AAL Forum; deployment in 10 EU countries.
Imaginary	Italy	Imaginary specialises in advanced interactive technologies supporting training, learning and eHealth.	<ul style="list-style-type: none"> - Portfolio of more than 20 EU-financed projects providing game-based solutions in many areas, including eHealth for elderly people.
Senior@Home	France	Senior@Home developed a sensor-based intelligent system monitoring and analysing seniors’ behaviour at home and alerting the family	<ul style="list-style-type: none"> - Laureate of the “call for ideas” of the 2015 Smart City forum in Montpellier aimed at creating an intelligent city
Duka PC	Denmark	Duka PC developed an easy-to-use computer adapted to the needs of elderly people	<ul style="list-style-type: none"> - Successfully expanded its operations to several countries in Northern Europe - Growing number of private and public sector customers

Problem 1 – Modern families often cannot visit their elderly relatives as often as needed due to lack of time and international mobility. Even visits by professional caregivers are often constrained by time and cost. Consequently, seniors are more likely to feel alone and excluded from society, and less likely to receive the supervisory care required to extend independent life at home.

Innovative solution 1 – Giraff developed an “avatar”, i.e. a connected screen allowing for virtual home visits to elderly people. It targets both caregivers, who can check on their patients more regularly, and family members who are away or cannot visit as often as they would like to.

The avatar – affectionately called “Mr. Robin” by one elderly user offers the opportunity to physically move around the house and interact with residents via videoconference over the Internet. The device is part of a platform that monitors the environment in the home via sensors, the health of elderly people via physiological devices and allows for face-to-face interactions with other people. The platform also constantly analyses data from the home and elderly person to alert caregivers to potential problems.

As a result, elderly people are less likely to require transition to an assisted living facility due to the difficulty in looking after them. They are also likely to feel less lonely, as someone can virtually call in on them anytime every day.

Giraff serves as a virtual companion for seniors living alone



Source: Giraff

Problem 2 – Strokes and memory impairment affect a number of elderly people. While these people do receive medical help, they may not have access to “mental rehabilitation”, stimulating their brains and reducing probability of memory loss.

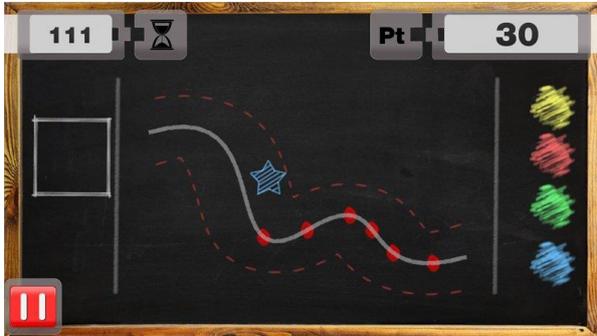
Innovative solution 2 – For more than ten years, Imaginary has been employing enabling technologies such as serious games, simulations, immersive technologies and social media in the service of rehabilitation of seniors.

Serious games and simulations can be used for multiple purposes: active ageing, socialisation and physical rehabilitation as well as memory exercise and monitoring mental health. Hence, the target group are both high-functioning elderly people and those needing substantial assistance in everyday life.

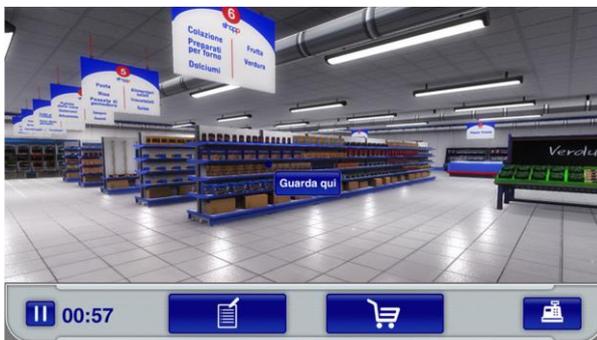


Video games have been shown to have a beneficial influence on both physical and cognitive abilities of seniors, especially memory and attention. This helps people remain sharp even in their old age. As a result, they tackle their daily life challenges better and, hence, are able to live by themselves for a longer period of time.

Age-friendly serious game for physical rehabilitation



Simulation cognitive game in familiar environment



Source: Imaginary

Problem 3 – Some elderly people are diagnosed with neurodegenerative diseases, in particular Alzheimer disease. This increases the risk of falls. However, even though seniors become more vulnerable, they often want to carry on living at home.

Innovative solution 3 – Senior@Home developed a sensor-based intelligent system monitoring and analysing behaviour of elderly people at home.

A senior does not have to carry anything as the sensors detect any change of behaviour (e.g. a fall) and alert the family in real time.

As a consequence, elderly people, in particular with cognitive diseases, are taken care of in a way that does not require them to remember about wearing or doing anything. This contributes to them living with their condition in a familiar environment of their homes instead of an assisted living facility.

Senior@Home sensors are installed all around the house



Source:Senior@Home

Problem 4 – Many seniors find it challenging to use computers and therefore have more difficulties staying in touch with their families who live far away.

Innovative solution 4 – DukaPC developed a personal computer targeting people struggling with ordinary computers.

DukaPC offers a tablet, a laptop and a touchscreen desktop that are simple to set up and easy to use. The company provides telephone helpline support, takes care of all updates and maintains safety and security software. The PC system is built around several modules: e-mail, news, weather, Skype, pictures and other.

Thanks to DukaPC, elderly people can stay in touch with their families living abroad and effectuate administrative formalities faster and with modern means of communication. Consequently, seniors are less isolated and can live independently even if their families cannot meet them face to face.

The interactive interface is easy to use for seniors



Source:DukaPC



3. Impact of the trend

In order to assess and understand the full impact of the trend, both its market potential and its social relevance are discussed in the following sections. As the percentage of elderly people in the population rises, demand for products and services enabling seniors to stay at home will boom. This market represents potentially several billion euros and is already creating jobs in most European countries.

3.1. The market potential of the trend

Elderly care comprising care allowance, accommodation, and assistance to elderly people in performing their daily chores, accounted for 0.5% of the EU GDP in 2012. This expenditure varied from more than 2% in countries like Sweden or Denmark to less than 0.5% in many EU Member States.⁵

Given that the EU GDP in 2012 was equivalent to nearly EUR 13 trillion⁶, elderly care services that year cost the Member States nearly EUR 65 billion. These estimates are still conservative as they do not include healthcare expenditure, disproportionate part of which is in fact directed at elderly people.

As far as the future is concerned, according to the European Commission, healthcare expenditure is expected to reach 8.3% of the EU GDP in 2060.⁷ Public spending on long-term care is projected as 3.4% of GDP in 2060, double the figure from 2010.⁸

The result is a potentially multi-billion euro market for products and services helping elderly people maintain their independence. Projections estimate that coverage by telehealth or telecare of 10 to 20% of the EU elderly and chronically ill population could generate a new market for products and services amounting to EUR 10-20 billion.⁹

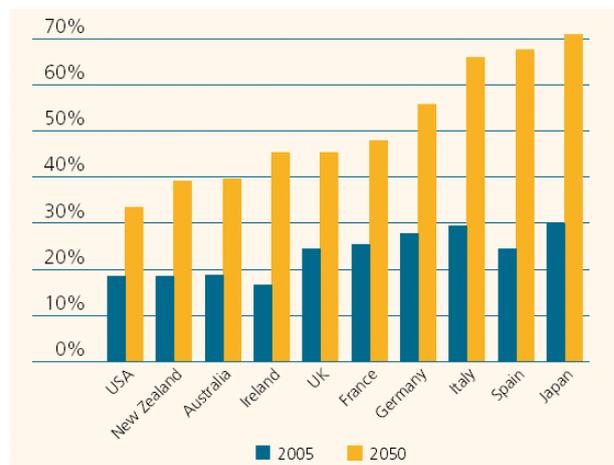
Moreover, in many European countries the elderly generation has a significant spending power. In the EU, a median disposable income of people aged 60 or more is superior to those of people under 59 in 8 countries and is increasing.¹⁰

As an example, the net disposable income of married couples aged 65 and over in Germany averages EUR 2,440, and their per capita income is higher than that of younger people. Against this background, European seniors are likely to consume more and more products and services, including those that help them live independently.

3.2. The social potential of the trend

The increase in the old-age dependency ratio is threatening for most European healthcare systems, as fewer economically active people will pay taxes to fund retirement pensions. As an example, in the UK the number of people of working age for every person over 65 is expected to decrease from 3.7 in 1999 to 2.1 in 2040. This shift might require for policy makers to raise the taxes paid by the workforce¹¹.

Figure 2: Forecast for dependency ratios in different countries



Source: Department for Work and Pensions¹²

However, it has been shown that supporting independent living generates savings. One example is a Scottish Telecare Development Programme supporting independent living. Between 2006 and 2011 the programme allowed to save GBP 78.6 million of hospital costs thanks to reduction in hospital admissions and shorter stays.

In figures, nearly 50,000 people received a telecare service, which helped avoid 8,700 unplanned hospital admissions and 3,800 care home admissions.¹³ This is not an isolated example of cost savings. For instance, the Department of Veterans Affairs of the United States launched a tele-health service that helped save EUR 1,760 per patient for the year 2013.¹⁴

The above examples are socially relevant in two ways. First, generating savings on elderly care leaves a government with more funding for education, infrastructure, innovation and others. Second, supporting elderly people in independent lives helps them maintain their sense of value and importance to the society.



4. Drivers and obstacles

This section deals with drivers and obstacles in the market uptake of products and services fostering independent living of elderly people.

First, generally strong social protection systems in Europe act as a driver, since there is a clearly identifiable customer potentially willing and able to purchase products. Second, cultural differences within Europe make the market heterogeneous, which is not necessarily an obstacle, but may require different selling approaches, depending on each country. Third, necessity to care for a growing proportion of elderly people with often fewer resources is conducive to public-private cooperation. Fourth, cost pressure and low sense of urgency on public sector may actually act as an obstacle, as public entities are often the largest customers of products for independent living.

4.1. Strong social protection in Europe creates market traction

The European market for the products supporting the independence of seniors at home is driven by well-developed social protection systems of EU Member States. This high level of development is illustrated by the fact that total public expenditure on social protection in 2012 accounted for 29.5% of the EU-28 GDP.¹⁵ The outcome is a vast market where the client is an entity with a considerable purchasing power and reliability – the State. This potential scalability encourages companies to take risks of developing new products in the European Union.

An example is Giraff, a company with business ties to the United States. Giraff first got the idea of producing independence-enhancing products for the elderly from its American origins. However, the product was ultimately developed and marketed in Sweden and is now available in ten European countries.

The reason for the above is that Giraff found customers in Europe. Contrary to conventional wisdom, customers are not

“Back then, we would have not been able to start our company in the United States”
- Giraff

elderly people and their caretakers: they are the users of a product. The actual customer, i.e. an entity who purchases the product, are European social protection systems, particularly in the countries where they are more developed. An obvious example is Sweden, where it is the municipality that is responsible for elderly care at home and, subsequently, in nursing homes and hospitals.

Public sector support and demand were also instrumental in the development of Senior@Home. The start-up is located in the French region of Languedoc-Roussillon, known for being particularly attractive for seniors. While originally created for individual buyers and elderly care homes, the company was subsequently contacted by local hospitals. Now, leveraging on the inter-hospital network, Senior@Home is testing its product in hospitals in other French regions and is preparing to expand the tests to hospitals in other Member States.

The above examples clearly illustrate the importance of social protection for SMEs offering products for independent living. When public care institutions like hospitals and sheltered homes are well-developed, there is potentially significant room for indirect public procurement of services from private sector, enabling it to develop.

“Public sector: that’s where the interest is” – Duka PC

4.2. Cultural differences between Member States

While all EU countries have a certain degree of social protection, they differ significantly in their approach to elderly care. As a result, market for independence-enhancing products across Europe is heterogeneous.

Interviewees with Duka PC and Giraff highlighted that elderly people in countries like Scandinavia, Netherlands or Germany tend to rely more on themselves and support from the State or specialised private actors like insurers. On the other end of the spectrum, seniors in Southern European countries like Spain, Italy or Portugal are more likely to receive informal help from their families than from the State. These differences are not necessarily an obstacle to the market uptake of independence-enhancing products, but call for a different approach.

In many Northern European countries, welfare State traditionally covers the cost of numerous services to its citizens, including the elderly. Now, budgetary and demographic pressures call for reconciling quality service with cost savings. This creates two types of opportunities in the market of products for independent living.

First, companies could tap into part of public spending that was previously directed at a wide array of social benefits as it was the case with Giraff. Second, there is a potentially strong individual consumer base for certain products. An example is Duka PC that leveraged on the high Internet penetration in the Northern Europe.



In Southern Europe, market uptake is primarily driven by public sector. This is particularly visible in Italy, where the

“I think we would exist even if there was no interest from public sector” –

Senior@Home

proportion of elderly people in the population is one of the highest in Europe. This creates pressure on public care systems, making hospitals look for assistance from companies like Imaginary and Giraff. Nonetheless, there are places, where demand from individuals is significant, like Northern Italy and Southern France where Imaginary and Senior@Home originally started to operate.

4.3. Public-private cooperation

While, overall, there are vast sums of money in the pockets of social protection systems, economic slowdown and looming demographic changes are likely to force many EU countries to look for savings, if they have not done so yet.

Companies producing solutions for independent living are natural partners in this process. Their cooperation with the State can be twofold.

First, the State can assist companies in producing solutions and bringing them to the market. Companies highlighted the

“Eleven years ago, many hospitals were suspicious of us. Now they are comfortable with our products” –

Imaginary

importance of diverse instruments at different stages of product research and development. Senior@Home benefitted mostly from French regional innovation ecosystem, while Duka PC received advisory assistance financed by Denmark. Imaginary co-financed its research thanks to FP7, the EU Research and Innovation funding programme for 2007-2013. Finally, Giraff won longer-term financing from both FP7 and the Ambient Assisted Living Joint Programme.

Second, helping companies develop products and launch them in the market may not be sufficient to improve senior care. Many European pensioners have low income and cannot afford independence-enhancing products. They may also be wary of new, unfamiliar technologies. The State could tackle this by stepping in and subsidising the product to make it affordable to seniors, within the limits of the applicable State Aid legislation.

In both cases, the State would still incur expenses, but they need to be weighed against the cost of maintaining elderly people in hospitals and nursing homes. It may turn out that subsidising a one-off purchase of a product costing a few hundreds of euros helps save much more. This could be the

case if using a product delays moving out to a care facility that often costs the senior’s family or the taxpayers several thousand euro a month.

An example is the cooperation between Duka PC and one of the British municipalities. The end-users are mostly people living in sheltered accommodation. Thanks to the easy-to-use computers, they will be able to stay in touch with their families and with the municipality, in particular social services. This is likely to increase the efficiency of municipal service, bring cost savings and contribute to the better quality of life of residents.

4.4. Cost-cutting and low sense of urgency

The section above presented pressure on social protection as a potential market driver. However, the very same factors could have the opposite effect and hamper the development of the market.

Cost-wise, since the public sector is a customer, cost-cutting could mean lesser demand for products enhancing independence of elderly people. Faced with lower demand, European companies may respond in different ways. Some will go out of business. Others will not innovate and offer average products. Finally, some will attempt to compete in the international, non-European markets.

Examples of the latter strategy are Giraff, branching out to the U.S., and Imaginary, setting its eyes on Asia. In the U.S., Obamacare is creating the framework conditions that were previously nearly non-existent. In Asia, governments are laying down foundations of social protection systems for sick and elderly, forced by developmental advancement, economic growth and demographic challenges. This is particularly the case in China.

There is a higher sense of urgency on the part of public authorities in countries like the U.S., notes Giraff. In Europe, aging has been a trend for so many years now and has been progressing visibly but not exponentially. Consequently, while supportive actions are in place, they are mostly oriented at research and development and less at launching the actual products. In the U.S., however, public sector and private investors – experiencing more disruptive change because of Obamacare – act more decisively and present a higher risk appetite, helping companies bring products to the market.



5. Policy recommendations

5.1. Update Medical Devices Directive for greater legal certainty

As revealed in the interviews, hospitals are a major client of producers of independence products for seniors. While such products may facilitate rehabilitation, medical checks-ups and patient supervision, they are not necessarily medical equipment per se. For instance, the serious games-based products of Imaginary do not help diagnose or cure illnesses, but assist in elderly care and rehabilitation.

While, intuitively, products for independent living may not be seen as medical equipment, their legal status remains unclear. Facing such legal uncertainty, hospitals may require producers to comply with the legal requirements applicable to medical devices, to hedge their risks. Medical devices are regulated by the Council Directive 93/42/EEC of 14 June 1993, amended by Directive 2007/47/EC. Back in 2007, the silver economy and products for independent living were a relatively unknown concept in Europe. The review process has been on-going since 2012, however, a new directive has not been adopted yet. Meanwhile, technological progress has been very fast as some of the companies interviewed did not even exist back in 2012. Consequently, it is recommended that, when updating the directive, the European Commission takes into account the developments in independence products for seniors and clarifies their status.

Alternatively, as the review process is time-consuming, the Commission could produce a guidance document on the status of products for independent living. The document could set out the characteristics and give examples of independence products for seniors requiring certification. The ultimate outcome would be more legal certainty, encouraging customers to try new products and producers to develop them.

5.2. Simplify CE mark formalities

As mentioned above, uncertain legal status of products for independent living of seniors may make hospitals reluctant to use them. Even if hospitals choose to procure these products, they may require producers to present specific safeguards. One such safeguard could be a CE marking, which is a declaration of the producer that the product complies with the essential requirements of the relevant European legislation.

Once a company holds the CE certification, offering products to hospitals and expansion in Europe becomes easier, as confirmed by Giraff. However, the process of obtaining the

CE certification may prove challenging. An example is Imaginary that was requested to present the CE marking in order to test its product in a hospital. According to the company's CEO, the cost of getting certified (circa EUR 2,000) and the waiting time were a burden to this small and fast-moving company.

In light of above, the European Commission could provide the relevant national authorities with the guidance on the CE marking cost and procedure in order to make it more affordable, faster and uniform across the EU.

5.3. Facilitate compliance with data protection rules

Since 2012, the Commission has been working towards reforming the EU data protection legal regime. An important driver of this change is the need to protect data in the times of widespread electronic communication.

This also applies to products for independent living of seniors. Whenever an elderly person goes through a medical check-up via an "avatar" or has sensors installed at home, personal data is electronically transferred. Moreover, it is often health-related and, thus, sensitive data.

At present, a uniform data protection regime for the EU, in the form of the future data protection regulation, is still in the making. As stated in the 2015 Digital Single Market Strategy for Europe Communication¹⁶, the general data protection aims at protecting individuals and thus increasing trust in digital services. Its provisions should be clear enough to determine matters like who, a device producer or a medical facility, is responsible for protecting the data. Where higher level of detail is needed, the Commission could provide additional guidance, e.g. in the form of a working group report.

Draft regulation includes a possibility to establish a certification mechanism and data protection marks. This could make compliance more predictable and not dependent on individual administrative decision of Member State bodies. This is the case e.g. in France, where Senior@Home is currently waiting for its products to be certified for compliance with data protection legislation. First, since the process is partly discretionary on the part of national authorities, it creates legal uncertainty as to the future of the product. Second, even if a product is certified in one country, it may not be accepted by another one. A uniform European certification based on objective criteria could resolve this problem.



6. Appendix

6.1. Interviews

Company	Interviewee	Position
Imaginary	Lucia Pannese	CEO
Giraff	Steven Von Rump	CEO
Senior@Home	Ziad Alaeddine	CTO
Duka PC	Erik Hougaard	CEO

6.2. Websites

Company	Web address
Imaginary	www.i-maginary.it/
Giraff	www.giraff.org/
Senior@Home	www.seniorhome.fr/
Duka PC	www.dukapc.com/

6.3. References

¹ Please see chapter 3.2 for the information on how this amount was calculated.

² Stategic Intelligence Monitor on Personal Health Systems, Phase2 – Impact Assessment Final Report, 2012, <http://ftp.jrc.es/EURdoc/JRC71183.pdf>

³ Eurostat, Available at: http://ec.europa.eu/eurostat/statistics-explained/images/b/b7/Population_age_structure_by_major_age_groups%2C_2002_and_2012_%28%25_of_the_total_population%29_YB14.png

⁴ Available at: http://ec.europa.eu/economy_finance/articles/structural_reforms/2012-05-15_ageing_report_en.htm

⁵ Data for 2012. Available at: [http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Expenditure_on_care_for_the_elderly,_2012_\(%25_of_GDP\)_YB15.png](http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Expenditure_on_care_for_the_elderly,_2012_(%25_of_GDP)_YB15.png)

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⁷ From 7.1% of GDP in 2010, data for EU-27: The 2012 Ageing Report; Economic and budgetary projections for the 27 EU Member States (2010-2060).

⁸ Ibid.

⁹ Stategic Intelligence Monitor on Personal Health Systems, 2012, Phase2 – Impact Assessment Final Report, Available at: <http://ftp.jrc.es/EURdoc/JRC71183.pdf>

¹⁰ Data for 2013, Available at: <http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tespn060&plugin=1>

¹¹ Department for Work and Pensions, Available at: <http://webarchive.nationalarchives.gov.uk/20081024030345/http://www.dwp.gov.uk/pensionsreform/summary/improving.aspx>



¹² Ibidem

¹³ In current market prices: Available at: <http://www.jitscotland.org.uk/wp-content/uploads/2014/07/TDP-Final-Evaluation-July-2011.pdf>

¹⁴ Available at: <http://c.ymcdn.com/sites/www.hisa.org.au/resource/resmgr/telehealth2014/Adam-Darkins.pdf>

¹⁵ Available at: [http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Expenditure_on_social_protection,_2002%E2%80%9312_\(%25_of_GDP\)_YB15.png](http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Expenditure_on_social_protection,_2002%E2%80%9312_(%25_of_GDP)_YB15.png)

¹⁶ European Commission, 2015, Communication to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, “A Digital Single Market Strategy for Europe”, Available at: http://ec.europa.eu/priorities/digital-single-market/docs/dsm-communication_en.pdf