

The business of ageing

Commercial challenges and opportunities in ambient assisted living

A discussion paper produced by the
Netcarity consortium – 2010/11

**Ambient technology to support
older people at home**



By 2020 around 25% of the population in Europe will be over 65

Many older people face barriers in exploiting ICT products to their full potential

Older people are more likely to adopt new technology if they are involved with its development

Government investment in Ambient Assisted Living (AAL) is unlikely to continue without demonstrable impact and results which can be exploited commercially

AAL systems and services need a clear business proposition to succeed

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Introduction

In March 2010 the Netcarity consortium¹ hosted a five-day workshop to identify routes towards the exploitation of its research into ambient assisted living (AAL), and to consolidate commercial opportunities arising from its AAL experience and the knowledge it has generated. This paper summarises discussions and findings from the workshop, and provides a guide to commercialising research in AAL.

For the purposes of this document, AAL refers to all products and services, technological or otherwise, which allow older people to live comfortably, safely and healthily at home, without the need to go into long-term care.

¹ Netcarity is a European project researching and testing technologies which will help older people to improve their wellbeing, independence, safety and health at home. For further information: www.netcarity.org

Situation analysis²

Europeans are living longer than ever thanks to economic growth and advances in health care. Average life expectancy is now over 80, and by 2020 around 25% of the population will be over 65. Spending on pensions, health and long-term care is expected to increase by 4-8% of GDP in coming decades, with total expenditure tripling by 2050.

The ageing population is a challenge for Europe's social and health systems. But ageing is also an economic and social opportunity. Over 65s in Europe are consumers with an estimated combined wealth of over €300 billion.

New technologies and communication systems offer the potential to allow older people to stay active and productive for longer, to continue to engage in society with more accessible online services and to remain healthy and enjoy a better quality of life. ICT can help older people overcome isolation and loneliness, increasing possibilities for keeping in contact with friends and also extending social networks. As eGovernment and eCommerce become more important, it is vital that everyone can use new technologies to access public and commercial services.

Many older people face barriers in exploiting ICT products, services and applications to their full potential. For example, 21% of over 50s have severe hearing, vision or dexterity problems, making it difficult or impossible to use standard ICT equipment. Only 10% of people over 65 in Europe use the internet.

Despite the potential of AAL, efforts to bring it into the mainstream have enjoyed little success to date. Remote care, for example, has not yet become a mainstream part of care delivery, despite thousands of trials. This is fairly typical of AAL projects. Small scale successes do exist, but pockets of excellence do not spread and pilot projects are not sustained.

AAL requires a profound and sensitive understanding of human expectations, social systems, healthcare infrastructure, privacy and the role of families, communities and carers. There are sociological, psychological, economic and market issues to be considered alongside the technology issues. Importantly, sustainable and practical business models are required to successfully develop technologies and systems which provide real support for older people on a large scale.

Until now there has been a lot of government investment in AAL at a regional, national and European level, but it is unlikely to continue without evidence of sustainable results which can be commercially exploited. Similarly, investors will not support AAL without evidence of its financial viability.

² All information in this section is based on information from the European Commissions e-inclusion policy unit (based on latest information available): http://ec.europa.eu/information_society/activities/einclusion/policy/ageing/index_en.htm

The experience of the Netcarity project

Netcarity is a European project researching and testing technologies which will help older people to maintain or improve their wellbeing, independence, safety and health at home. Project participants include academics, technology firms, psychologists, sociologists, carers, designers and regional authorities.

The project set out to understand people's relationship with technology and how technology supports successful ageing; and then to test a new technology infrastructure in real homes. This was achieved by involving users in the design process, not just the evaluation of final products, to help identify solutions to existing problems.

The aim was to create supportive home environments which include older people in society and provide new tools which help their caregivers, family and friends to support them without detracting from the appearance and ambience of a comfortable home.

The Netcarity project is delivering and testing Netcarity systems and infrastructure in 100 homes in Trento, Italy, and Eindhoven, The Netherlands. Research findings should lead to scalable products and systems that can support older people and generate an understanding of how older people adopt and use technology which can support the wider AAL community.

Netcarity aims to facilitate the creation of new markets and companies responding to demographic change. In addition to research findings and new technical knowledge, one of the primary outputs from Netcarity is a comprehensive understanding of the broader AAL environment, coupled with an ability to advise and consult on appropriate solutions to recognised challenges.

Challenges

Netcarity has identified a number of challenges which are common to the AAL community, and which need to be overcome before AAL products and services become commercially viable.

Challenge 1: Adapting research outcomes to the real world

Like many other research consortia, Netcarity has a collection of projects designed to meet the challenges of an ageing population. Each project has a specific and valuable goal, but the work can be theoretical and difficult to adapt to real-world problems or integrate into existing infrastructures.

Challenge 2: Researchers aren't innovators

Netcarity has produced a lot of excellent research and a lot of thought has gone into what will work best in a variety of environments. What is lacking is an experienced business approach and an innovation mindset. Simply designing and creating a product or a system is not sufficient. It must be designed to meet a specific demand, and there must be people or organisations willing to pay for it. There needs to be a proper business plan, including customer identification, market analysis, manufacturing plans, sales and marketing and financial projections. This does not have to be done by researchers. But it has to be done by someone if these projects are to succeed.

Challenge 3: We aren't always clear about what we are trying to achieve

The innovation in AAL is hard to define. Netcarity has identified and characterised the overall problem of an ageing population, as well as a variety of solutions, but it is not always apparent how one relates to the other. AAL is a vast area in which different groups with different interests and capabilities try to identify solutions to a very broad issue. There needs to be more focus on what each project can realistically achieve, and recognition that a single approach will not provide the solution for all of Europe.

Challenge 4: Market differences outweigh the similarities

Beyond very broad themes, there is not a common AAL challenge in a single homogenous market. Older people in Italy do not have the same issues as those in Holland. 60-year-olds do not have the same needs as 80-year-olds. Indeed, even people of the same age do not necessarily have the same needs. Privacy laws are different across Europe. Technical infrastructure, healthcare and support service all have very different structures in different countries.

Challenge 5: We are trying to force a business model where there is no business

There are to date only very limited examples of business success arising from AAL. Few have succeeded in what Netcarity and other projects are trying to do. So far, there has been very little cost-benefit evidence for AAL, and no precedent for success. There is therefore little existing incentive for private or institutional investment in AAL.

Some governments and public bodies have shown interest, but the issues highlighted above have made it hard to show any large-scale return from local investments. Investors and businesses need to see evidence of financial returns from AAL before they will be willing to invest.

Challenge 6: There is no infrastructure to build on

The AAL research community is proposing to integrate products and services into an infrastructure that is not designed for AAL. To be successful, there is a need to work with existing infrastructures and service providers, such as broadband or energy providers, or to create an entirely new infrastructure.

Challenge 7: Older people aren't asking for AAL

The AAL community is developing solutions which already exist in another form. There is no clear case as to why people should make the added investment in AAL when there are already services and technologies that will do a similar job. In many cases, AAL provides an answer to a question which is not yet being asked. In other cases, solutions are available but users are not aware of them or how they might benefit from them.

Challenge 8: Older people's income is decreasing

In many European countries, older people are likely to have decreasing disposable income. Any new products have to be available at a very competitive price or funded by an external organisation, and offer a compelling case for uptake that would justify the financial outlay and the effort of learning to use them.

Opportunities

The commercial opportunities in ambient assisted living will arise from the ability and willingness of organisations to sustainably meet the recognised needs of older people, as well as their families, their institutions and their governments.

Governments, aware of the rising cost associated with an ageing population, are likely to be enthusiastic about practical solutions which are ready for large scale implementation. This is particularly the case in countries with a public expectation that the state will provide long-term care.

Importantly, all buyers of commercial services associated with AAL will need to see evidence of efficiency, sustainability and a reduction of health and care costs resulting from use of AAL.

Governments, organisations and individuals have an appetite for solutions and will be willing to invest in the right proposition.

This is a challenge which Netcarity, like many AAL projects, has been investigating. Netcarity has recognised the need to identify not just a specific problem and a practical solution, but also a business case for the implementation which addresses the challenges above, and an understanding of how a product or service will integrate into existing systems.

Building the evidence for a business case

Netcarity has identified the need for more robust evidence to support the development of business cases. It is this evidence that will increase interest and receptiveness by stakeholders, from investors to governments.

The Netcarity project has built its evidence partly through a rigorous programme of user-centred involvement in the development of technologies, services and systems (see box on User-Centred Design).

Knowledge based on experience and experimentation is a key asset held by the consortium. This arises from the experience of melding technologies into systems, and applying them in the Netcarity trial homes (see box on Netcarity trial homes). This knowledge, alongside the Netcarity evidence base, can be applied to prove the effectiveness of AAL technology in allowing older people to live safely and securely at home. This is vital in making a convincing case for investment in the technology.

User-Centred Design

Netcarity recognises that to develop technology and deliver services that will be accepted and used effectively, particularly by older people, the end user must have input and involvement in its development. Netcarity has responded to this imperative by incorporating user involvement through questionnaires, focus groups, performance evaluations and other practical consultation exercises with large samples of typical users.

The following user groups were identified for the trial in the Netherlands:

- ▶ Older people at home and their informal carers.
- ▶ Service providers and care organisations who offer services to older people.
- ▶ Installation and technical support teams.
- ▶ Other service providers that could potentially offer services using the Netcarity infrastructure.

Some of the key findings of Netcarity's user consultations included:

- ▶ Older people want to keep control over their homes and be able to overrule automatic functions.
- ▶ Technology may be seen as an 'intruder' in the home environment.
- ▶ Technology may be seen as impersonal, hard to adopt, and an excuse not to leave the home.
- ▶ Older people, especially the very old, prefer a gradual introduction of any new technology.
- ▶ There is a fear that technology may not be accessible or usable if power is lost.
- ▶ Technology must be simple and all functions should be useful.
- ▶ Design must include clear text and menu interface; buttons must not be too small or close together.
- ▶ A positive attitude to the technology is vital to ensure older people actually use it. This can only be achieved when enough training and information is provided, the technology functions perfectly and problems are resolved immediately.
- ▶ Technology must support and not dominate the home environment. It should complement manual systems and be introduced slowly with adequate training and support.
- ▶ There must be focus on technology working correctly, simply and securely. Functionality is less important than ease of use.

In the Netherlands, a strong relationship was built with the employees of the service centre, SVVE, who will have a crucial role in service delivery at the Eindhoven trial homes. They played an active role in the design of the interface that will be used to offer Netcarity services. The consultation helped to define a life cycle of services, which will aid the future integration of Netcarity services.

Netcarity trial homes

Netcarity is developing assistive technologies and software which are being installed in a total of 100 trial homes for older people, in Trento, Italy, and Eindhoven, The Netherlands.

Members of the consortium are working together to produce a user-friendly interface which integrates a variety of ambient technologies, including sensors and remote care services, in a networked environment with plug and play capabilities and intelligent decision-making. The software is open source to allow additional AAL technologies and services to be integrated into the system in the future.

The interfaces have been designed with older people in mind. The aim is to help older people feel safe and secure in their homes while strengthening communication with friends and caregivers, reducing isolation and helping with everyday activities.

The project is focussed on developing low-cost solutions which could rapidly reach the market and be easily adapted into existing homes once their effectiveness has been proved.

Finding potential customers

Netcarity partners have been encouraged to consider not just the potential end users of the technologies and systems coming out of the project, but also those who may be asked to pay for them. In addition, partners have had to consider the next steps along the long supply chain between research outcomes and the market.

Netcarity has identified a number of potential buyers of future AAL systems and solutions, ranging from the institutional buyer to the individual customer.

Institutional

- ▶ Care authorities
- ▶ Local government
- ▶ Private insurance/healthcare
- ▶ Housing providers (retrofit)
- ▶ Construction companies (integration in new build)
- ▶ Service providers - cable TV, broadband, energy services, etc.
- ▶ Insurance companies

Individual

- ▶ Older people themselves
- ▶ Families of older people

For all potential buyers, Netcarity recognises the imperative to research and understand their particular need, and to address that need through

the application of a realistic business model. It is critical to understand the priorities of the target audience. If people believe something is important, and that it solves a recognised problem, then they will be prepared to pay for it (see box on ‘Who will pay?’).

Evaluating and fulfilling an economic need is not necessarily the role of researchers or other project partners as it may be taken on by investors, or customers themselves. However, technology developers will always benefit from being aware of the process.

Who will pay? – The national perspective

The Netcarity event discussed key economic stakeholders in several European countries and identified various potential funders of AAL. The following is a snapshot of perceived potential funders and is not meant as a definitive list.

Italy

- ▶ Local government – concerned about supporting older people.
- ▶ Church – provides charitable support for older people.
- ▶ Older people – low pensions, unlikely to be able to pay for themselves.
- ▶ Family – caring for older relatives is important, but often see technology as a threat to human interaction. They might pay if they were convinced it offered a worthwhile service.

The Netherlands

- ▶ The social support act (WMO) provides funding, usually on a small scale, for social support systems for those who can’t look after themselves. Housing associations abide by ‘the Robin Hood principle’ and are prepared to offer subsidised housing for those who need it. Many are struggling to fill homes and may be interested in ways to add value.

Czech Republic

- ▶ Most care is funded by families, as pensions are very low and few older people can pay for themselves.

Germany

- ▶ Energy companies, health service, insurance and charities may all be in a position to pay.
- ▶ The system is very federal and fragmented. Approaches will vary between regions.

UK

- ▶ Building/housing companies – many homes are designed with older people in mind. May be interested in AAL technologies at the design stage to add value.
- ▶ A significant number of older people have benefitted from the property boom and are in a position to buy new properties with supportive systems, if they are convinced of their value.

Identifying the surrounding infrastructure

One major problem identified for AAL is the lack of specific existing infrastructure to support AAL. Traditional infrastructure to support older people tends to be focussed on personal interaction. Given that this is unsustainable, there needs to be a move towards a new infrastructure which is more supportive of AAL technologies. Netcarity has considered the different challenges of integrating AAL solutions into existing infrastructures so that it can be used effectively.

The main issues are:

- ▶ Who will manufacture the technology?
- ▶ Who will install it into homes?
- ▶ Who will provide training for older people to use it?
- ▶ Who will provide ongoing support and maintenance?

It will usually be necessary to work with existing infrastructures, such as in-home service providers, care providers and technology developers/manufacturers. Some of these may be addressed by potential commercial buyers, such as existing service providers. Others may require commercial or government partners who will support AAL products and services for a fee, or because they add value to their existing service. The key to success lies in an understanding of who will provide these services and how this fits into business and financial plans (see box 1 & 2 on 'Learning from the success of others').

Learning from the success of others: 1

The Netcarity business event looked at the experience of other organisations in similar markets and explored business models which could have potential for AAL.

Docobo

Docobo, an SME formed from an EC FP5 project, developed a handheld technology which collects and analyses patient data to allow remote monitoring by clinicians.

The product is funded by the UK's National Health Service (NHS) Primary Care Trusts, which pay Docobo an annual service fee based on usage per person, with no upfront fee charged for the technology. It integrates well into the existing workload of clinicians who previously had to make personal visits or use less effective means of remote monitoring. Healthcare providers are target-driven, fragmented, focussed on treatment not prevention, often have a lack of understanding of AAL, and can be reluctant to use new technology. All these factors needed to be overcome. The Docobo sales team identified potential customers within the UK health service and talked to them personally about how the Docobo product could help meet their goals.

There was a need to build evidence of effectiveness to convince both the user and the NHS Primary Care Trust funding the project. For older people and their families, this meant proving it could help them remain happy at home, increase contact with family and carers and deliver services they see as important. For Primary Care Trusts, it meant demonstrating a return on investment through reduced hospital admissions, visits and calls.

Docobo found that adoption of a new system takes around six weeks. It needed to make sure users keep using the technology to build up evidence of success. Docobo began by identifying willing early adopters and providing them with the technology and appropriate support. Over time an evidence base demonstrated its effectiveness for both parties and a business case was successfully built to stimulate future sales.

Communicating the AAL offer

Once a product or system with market potential has been developed, it is necessary to communicate the offer to those with money to invest, and in a way that will convince them to make that investment. Netcarity's communication and marketing team has identified six key steps in this process:

Situation analysis

Understand the market and any potential barriers. It is critical to identify what opportunities the technology can bring, but also what challenges it raises (see section on challenges) and how they can be overcome.

Communication objectives

Be very clear about specific communication objectives, and how they are aligned with business, organisational and research objectives.

Audiences

Clearly understand who is being communicated with, whether it is a handful of government decision makers, hundreds of businesses or thousands of older people. AAL organisations need to understand how audiences differ, what influences their decisions, what publications they read, how they currently perceive technology and AAL and what needs to be done to change this perception.

Messages

Identify a set of credible, clear, memorable and inspirational messages supported by evidence and clearly tied to business objectives. These messages become the basis of all communication to each audience.

Tactics

Decide the best way to deliver the message. This can range from meetings with potential customers, use of the media or online tools or events for large audiences.

Evaluation

Review feedback from the users, work out what was effective and what was not and continuously build upon and improve the process.

Learning from the success of others: 2

Simac Triangle

Simac Triangle helps suppliers of products and services use the 'pay for use' business model. It manages the whole process including the offer, billing of the usage and compensation for all associated service providers. Applied technology becomes an integrated part of the usage fee or will be charged in a fee per period. The business concept is also known as 'pay per click', where different 'clicks' can be priced differently.

One of the advantages of the pay for use business model is the possible access to high-end technology without an initial outlay; the investment is encapsulated in the service fee for the applied services facilitated by the enabling technology.

This business model could apply to AAL by offering a contract which provides access to AAL services and technology. Customers would pay a service fee which includes standard services such as remote care. Additional services, such as care, wellness, comfort and security services, could be offered at an additional charge based on the services provider's cost, plus a handling fee.

Bills could be managed for the service providers and split multiple ways depending on who is paying for the services: older people, families, Primary Care Trusts, housing associations/landlords, insurance providers, etc.

Conclusion

Research and development in AAL has largely been very good, though implementation has been poor to date. What is lacking is a clear evidence-based business proposition for implementation of proposed systems, an understanding of how they will work in practice and a considered way of communicating their benefits to potential customers.

Netcarity is aiming to meet this challenge, and for the remainder of the project its priorities will include:

- ▶ Identify Netcarity technologies that can realistically be commercialised. These will include products, services and consultancy.
- ▶ Decide who will develop them and assign responsibility.
- ▶ Decide where the business will be launched.
- ▶ Undertake market analysis of that area.
- ▶ Draft a comprehensive business plan for each opportunity.
- ▶ Abandon businesses that will not work and focus on those that have most potential.
- ▶ Seek expert support to drive businesses forward.

It is hoped that Netcarity will be able offer a successful demonstration of AAL systems by 2011. If data can be accurately collected from the Netcarity trial homes, showing clear benefits as well as potential for savings over care homes or other alternatives, it will provide compelling evidence to persuade critical stakeholders to take up AAL technology.

For example, trial data showing that AAL systems keep older people safe at home, at a cost less than that of bed space in a care home, will provide a strong case for care-funding organisations to support the uptake of AAL technologies. Similarly, proof of a rapid response following a fall will offer an incentive for insurance companies to offer customers AAL technology as part of a package, or lower rates to those using the technology, thereby stimulating demand.

If the experience demonstrates that users consider that AAL technology leads to an improved quality of life, it will make a convincing case to sell directly to older people and their families.

Once it is demonstrated that AAL technology is in demand and profitable, then there is a strong business case to sell to the broader commercial sector. This may include companies such as broadband providers who can bundle AAL technology and services with existing broadband packages, and sell to a new audience of older people. Other potential customers include companies which construct, fit or manage homes for older people. They could add value to their homes, and thereby charge more by integrating AAL technology.

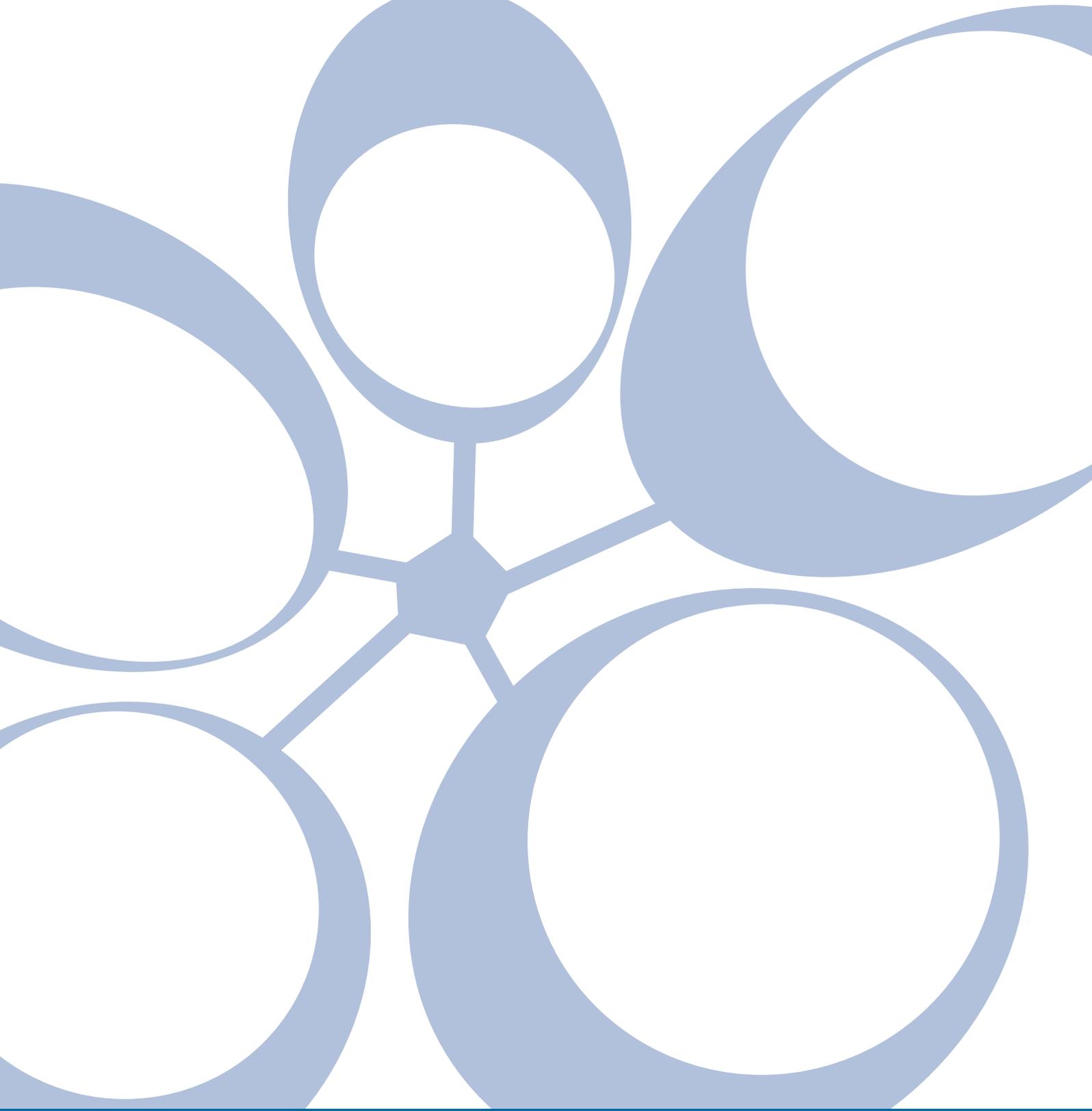
The experience of Netcarity has been a valuable one for the partners and the AAL community. The project has identified a number of key challenges around implementing and scaling up the technology, and has begun to find solutions.

AAL has the potential to make a real difference to the health and comfort of thousands of people. There are still challenges to overcome before AAL can reach this potential, but by approaching it in the right way – looking at the market, identifying the benefits AAL technology brings, establishing the evidence and communicating it effectively – AAL solutions can become a commercially viable way of helping older people live at home for longer in the near future.

Recommendations

The Netcarity business workshop identified key recommendations to be considered at the start of any AAL or related project.

- ▶ Researchers should identify a draft business plan early in the design process to help ensure that their project meets a genuine market need, and will be able to fulfil its intended goals.
- ▶ Where commercial skills do not exist, it is advisable to seek professional business training.
- ▶ Research into product viability should not just be technical; it should also investigate whether there is a specific need that someone is willing to pay for. This will assess the viability of the product and help build a case for commercialisation.
- ▶ Funded projects must start with the goal of successful implementation, including a plan of how to install and maintain the technology to be developed, not just the delivery of a product. Thought must be given to how the project will be scaled up for real social and economic impact. Potential partners should be identified and consulted at the start of the project.
- ▶ There should be consultation and communication with other AAL research teams, as well as those working in similar areas, e.g. care home designers, in-home service delivery and technology developers, to learn from and build upon their experience.
- ▶ Development of partnerships with investors, care providers and local authorities will help focus the project in the right direction and identify and solve weaknesses early on.
- ▶ There should be an evaluation of opportunities to launch an initial offer to build brand awareness while more sophisticated products/upgrades are developed.



Netcarity (a networked multisensor system for elderly people: healthcare, safety and security in the home environment) is an Integrated Project supported by the European Community under the Sixth Framework Programme (IST-2006-045508)

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