

## **ASSISTIVE TECHNOLOGY FOR OLDER PEOPLE AND ITS POTENTIAL FOR INTERGENERATIONAL COOPERATION**

Critical review of the present situation and identification of key constraints for wider uptake

*Abstract. The article provides a concise insight into the present stage of development and usage of assistive technology in Slovenia. On the one hand, it shows that assistive technology for older people in Slovenia is not yet well developed while on the other hand, it emphasizes the important role of assistive technology for intergenerational cooperation. In its conclusion the article identifies the most obvious constraints on the uptake of assistive technology in Slovenia.*

**Keywords:** *assistive technology, aging, telecare, telehealth, intergenerational cooperation.*

### **Introduction**

Widespread population aging and rapid diffusion of new technologies are two distinctive trends that contemporary societies are facing, and there is a quite new interdisciplinary area, gerontechnology, that studies and combines both trends. Gerontechnology, as defined by Bouma (1992: 1; 2009: 5), is the study of technology and aging for the improvement of the daily functioning of older people<sup>1</sup>. Gerontechnology is used to ensure

an optimal technological environment for all aging and old people. In this regard, assistive technology (AT) for older people certainly plays an important role. Before defining AT more precisely, it should be stressed that the article will focus only on AT that is designed and used mainly by older people, even though AT in its broader sense is designed for all people who need it. As we know, we all use AT in our everyday life: thus, devices

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\* Mateja Nagode, B.A., Sociology, Senior Researcher at the Social Protection Institute of the Republic of Slovenia, Ljubljana; Vesna Dolničar, PhD, Teaching Assistant and Researcher at the Centre for Methodology and Informatics, Faculty of Social Sciences, University of Ljubljana.

<sup>1</sup> Gerontechnology is based on a combination of the sciences of aging (physiology, sociology, geriatrics, psychology) and the sciences of technology (building, information, robotics, design, business management, (bio)physics & (bio)chemistry) (Bouma, 1992: 1, 2009: 5).

like glasses, computers, trains, watches, washing machines, vacuum cleaners etc. help us to carry out tasks we cannot do or facilitate daily activities. These devices form a self-evident, obvious and natural part of our everyday life, and we use them regardless of gender, age, disability etc. Although, there are many devices and technologies we use in our everyday life, the article will focus particularly on the AT designed for and used by older people.

AT is defined as »an umbrella term for any device or system that allows an individual to perform a task they would otherwise be unable to do or increases the ease and safety with which the task can be performed« (Cowan and Turner-Smith, 1999). An alternative definition which emphasises the role of AT in maximising the independence of disabled and older people is, »AT is any product or service designed to enable independence of disabled and older people (King's Fund in Beech and Roberts, 2008). AT covers the range of aids and adaptations provided to assist people in the activities of daily living, but increasingly the term is used to include the application of technology such as sensor mats and tracking devices. Technology may be fixed, for example grab rails and stair lifts; it may be portable, such as walking sticks; or it may be electronic, providing community alarms or 'smart house' technology to alert carers to difficulties in daily routines (McDonald, 2010: 78). It is a priority in AT to help people remain in their own homes, increasing their independence and reducing their social isolation. The types of AT can be categorised according to their role (Doughty in Beech and Roberts, 2008):

- supportive technologies for helping individuals perform tasks that they may find difficult (for example, video entry systems, and medication reminder units);
- detection and reaction (responsive) technologies to help individuals manage risks and raise alarms (for example, unburned gas detectors and panic buttons/pendants);
- prediction and intervention (preventative) technologies to help prevent dangerous situations and, again, to raise alarms (for example, fall predictors, monitors for assessing physiological symptoms or room occupancy monitors).

There are numerous innovations in technological applications aimed at helping older people to retain independence and social engagement. While different approaches and concepts are used (e.g., independent living, tel-care and telehealth services, ambient assisted living, smart homes, ambient intelligence applications, etc.), in this paper we use the term »assistive technology« as a general concept for an ICT based system which assists, enables and empowers older people (and also informal and professional carers), addresses their needs and supports them in living independently in

their own homes. However, other terms are also used as appropriate and in accordance with the terminology used in the references cited.

After presenting AT's potential for intergenerational cooperation and reviewing the status of ATs in Slovenia, the key constraints on the uptake of home care technology are identified in the remainder of the article.

### **AT for older people and its potential for intergenerational cooperation**

As has been established, population aging and rapid diffusion of new technologies are contemporary two distinctive trends. Since old age is often also a time of diminished abilities and health, we are embracing the potential of technological advances to improve the quality of everyday life, active aging, social cohesion and also intergenerational cooperation. We claim that AT has the potential to influence intergenerational cooperation. For this reason, we will first focus on intergenerational cooperation in line with AT, and later we briefly present demographic changes and the living patterns of older people as two important factors that influence patterns of intergenerational solidarity and cooperation and, of course, the development of and need for AT among older and frail people in contemporary society.

In today's society, intergenerational solidarity is very important, since relationships between generations are being modified by changing circumstances. We can observe different dimensions of intergenerational solidarity in the family<sup>2</sup>, but we will pay special attention to social support or exchange (functional solidarity), since this is certainly an important element of intergenerational relationships. The exchange of support is of great importance in the child – parent relation throughout the relevant lifetimes, but the pattern of exchange changes over a life course. On the basis of many foreign and Slovenian studies (Burt, 1991; Dremelj, 2003; Hojnik – Zupanc et al., 1996; Igljč, 1988; Kogovšek et al., 2003; Nagode et al., 2004), Hlebec and Mandič (2005, 4–5) ascertain that informal care of older people is mainly provided by family members. They claim that important sources of informal social support are the partner and children. Usually this means a spouse or daughter, as is the case in many other countries. Informal social support or support exchange usually consists of emotional, financial and instrumental support and is the basis and the central issue of intergenerational solidarity in the family. In many countries informal carers have the potential for work overload that leads to overburdening. To some extent

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<sup>2</sup> Bengtson and Roberts developed the basic six – solidarity dimension concept: structural, associational, consensual, affectional, functional and normative solidarity (Daatland and Lowenstein, 2005: 175).

this can be extenuated with ATs, because informal carers can also benefit from it. As Bowes and McLogan (2006: 133) claim, the benefit arises from the transfer of the burden of caring and the worries they may experience. One result of this may be better relationships and more prolonged periods of caring. Another important background fact is also Lowenstein's (2007) claim that it is presumed nowadays that older parents will be autonomous and independent for as long as possible, and there is less willingness today among both older parents and adult children to undertake co-residence. The development and usage of appropriate ATs can overcome this gap and these perceived trends. It is also necessary to stress that the use of AT can strengthen cooperation and relationships between generations: for example (Dolničar, 2009), a grandmother and grandson using chat applications (Skype, Messenger) to communicate when the grandson is studying abroad. It is often more likely that older people would be willing to put extra effort into learning how to use different technologies when the motivation is related to connecting to and keeping permanent ties with their grandchildren. This is also a reflection of better or worse quality, mutual and permanent relationships between family members in multigenerational families.

Intergenerational cooperation grows more important and self-evident when the proportion of young and old people in the population is changing rapidly. Nowadays this is reflected in accelerated population aging, which has a strong influence on the demographic shares of age groups. The demographic changes reflected in population aging are common to all European countries. There is an increasing proportion of older people and a decreasing one of children and young people in the population. According to population projections (Vertot, 2008: 10), by 2050 the number of older people will exceed the number of younger people for the first time in history. One person out of ten is already aged 60 or more; by 2050 this age will have been reached by one person in five, and by 2150 one person in three. The process of population aging in Slovenia started in the times of transition between the 19<sup>th</sup> and 20<sup>th</sup> centuries as a consequence of decreasing fertility and mortality, as well as emigration (Šircelj, 2009). It has intensified in recent years mainly because of low fertility and increasing life expectancy among the adult population. Therefore, the number of old persons is increasing and consequently the number of persons in need of help and support in everyday life, mainly on account of illness, disability or weakness, is increasing as well. Increased longevity is caused by various factors, one being advances in medicine. As McEvoy and others point out, progress in medicine and technology has resulted in many fundamental improvements in multiple areas of health care, resulting in better management of multiple pathologies and chronic diseases and thereby potentially increasing life expectancy (McEvoy et al., 2006). The long - lived society

opens many new dilemmas, questions and challenges referring to different aspects of society, such as reform of the pension system and health systems, the re-establishment of long-term care and incentives for active, socially-inclusive aging. From this perspective, it is very important to research and consequently understand the meaning and elements of (quality and needs<sup>3</sup> of) everyday life for this growing segment of the population (older people) and in this manner to consider the importance of the introduction and usage of AT.

Another important issue in intergenerational cooperation (and consequently also in AT development and usage) is the living pattern of all generations, especially older people. Slovenia is known as a heavily institutionalised country in relation to care for older people. Three times as many people receive support and care in institutions (homes for the old people) as do at home (home help<sup>4</sup>). Intermediate options or special residential care arrangements are also evolving but are insufficiently developed. We could say that when older people in Slovenia need care and support they have little choice; in particular there is not enough formal support provided at home (community care). And, as we know, the quality of (everyday) life strongly depends upon the opportunity to choose the most individually appropriate life style and living arrangement, and we can say that (older) people should have the right to live independently and safely in their own homes. On the basis of the results of some studies and research, we can claim that in Slovenia the majority of people prefer to reside as long as possible and as independently as possible in their own homes. Researchers (Filipović and Hlebec, 2006) have ascertained that older people in Slovenia desire to live in their own apartments (homes) in their neighbourhood or in their local environment. This is especially typical of older adults in Slovenia (Flash Eurobarometer 247, 2008). At Census 2002 in Slovenia, most people aged 65+ lived in private households with two or more members. The shares of both men and women decrease with age. At that age 25.3% of them lived alone: 11.4% of the men and 33.5% of the women. In the age group 80–84, 41.8% of women and 5.3% of men lived alone. In collective households there were 3.4% of the older people (65+). The largest share of persons who lived in collective households (15%) was recorded for the age group 85+ (Vertot, 2008: 46). On the other hand, only 7% of respondents in

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<sup>3</sup> *The classification of generic needs (health, safety, independence, mobility and participation) seems to be an appropriate template to help us get more detailed knowledge about the specific needs of older people as regards technology. A number of empirical studies offer some important results on whether ICT can help satisfy the generic needs of older people (Malanowski, 2009: 112).*

<sup>4</sup> *Home help as the main community care service is evolving today, but insufficiently. Home help is used by only 6500 people, mainly old people. For more about the situation on home help and its challenges and opportunities, see Smolej et al. (2010).*

another research project (Sendi et al., 2002: 126–129) chose collective living (homes for older people) as their preferred type of residence. ATs (ICT and adapted housing conditions) can be used to ensure longer and safer independent living and to give an opportunity for more user-oriented services, since it has considerable potential for improving the quality of life of older people. Also, this should be one of the primary goals of active aging and independent living. Furthermore, from the intergenerational cooperation and solidarity perspective, the use of AT can improve the quality of life even for the younger generations that usually tender their help (by reducing their burden).

## Overview of ATs for older people in Slovenia

This overview of ATs for older people in Slovenia is elaborated on the basis of the definitions and classifications of different types of ICT-based applications or services defined by the ICT & Ageing project (Dolničar, 2008)<sup>5</sup>. The overview indicates that Slovenia is still at a very early stage of development regarding ATs for independent living. Slovenia also completely lacks two out of six types of ATs<sup>6</sup>: the combination of telecare and telehealth services and social communication technologies.

### *Social alarm*

The social alarm is described by the ICT & Ageing project (Dolničar, 2008) as a service that enables help to be called by an older person when needed (also called Lifeline or the Red Button social alarm service). The service typically involves a special telephone or portable alarm device that can be used to call an alarm centre in the event of a need arising (e.g., a fall). The alarm centre then contacts family members or the appropriate public services. Or as Fisk (2003: 4) puts it, social alarms are devices (with or without some intelligence) located in the home which, when activated, facilitate communication with a responder and the sending of information relevant to the user's well being.

The social alarm service is the most developed among other ATs in Slovenia and was first introduced in 1992 in Ljubljana. Despite this fact, social alarms are available only in five regions out of twelve and are not nationally

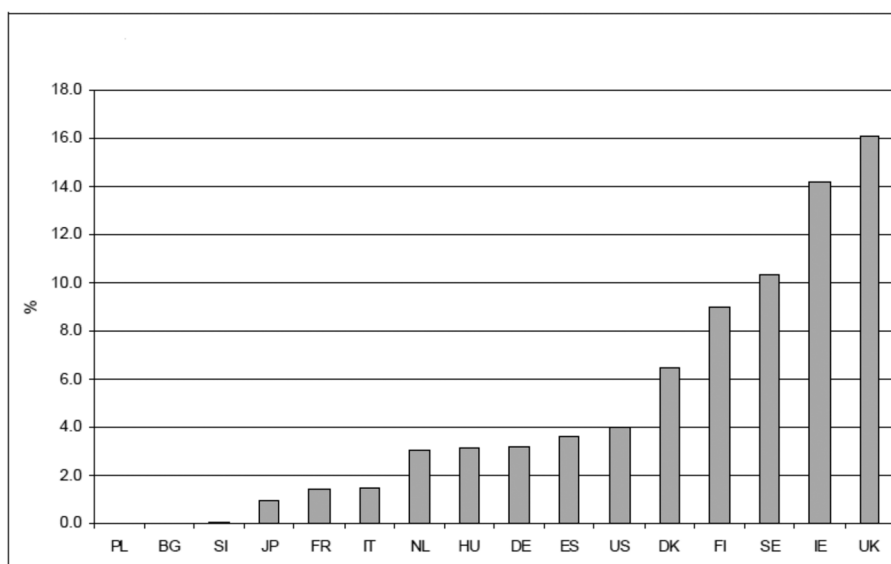
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<sup>5</sup> The overview is not provided in such a way as to present every single available type of AT in Slovenia, because it is directed at AT for the older people, who we know are a very heterogenous group. This group can, of course, and often does encompass disabled people. Classification of AT for the disabled (the blind and partially-sighted, the deaf and hard-of-hearing, people with movement disabilities and people with mental disorders) is presented in greater detail by Kerbler (2010: 53–66).

<sup>6</sup> The six types of ATs are social alarms, telecare, telehealth, a combination of telecare and telehealth, smart homes / standalone (advanced) assistive technologies and social communication technologies.

covered. The fact is that the social alarm service is not part of the public network, and for this reason the state and municipalities are not obliged to assure and (co)finance at least some part of the cost<sup>7</sup>. There are reported to be approximately 300–350 older and disabled people using the service at present (Dolničar, 2008; Nagode, 2009). Compared to some European and other countries, social alarms in Slovenia are among the less developed and wide spread systems. The project ICT & Ageing offers the following facts: some countries (the United Kingdom and Ireland) have a relatively high take-up at between 14% and 16% of older people; some are a bit lower but still relatively high (Denmark, Finland and Sweden) at between 6% and 10% of older people; most have a more moderate level, at somewhere between 1% and 3%, and a few have low take-up at less than 1%. Slovenia falls into this last group (ICT & Ageing, 2010).

Graph 1: PENETRATION OF SOCIAL ALARMS  
(% OF PEOPLE AGED 65 YEARS AND OLDER)



Source: ICT&AGEING, 2010

The current services are provided by social care services in co-operation with municipalities, which also to a differing extents subsidise the service. Evaluation studies (Hojnik-Zupanc et al., 1996; Hlebec et al., 2003; Zajec, 2006) have shown that users are very satisfied with the service, on the one

<sup>7</sup> In 2008 only ten out of 210 municipalities cofinanced a social alarm service, and the given amount differed among them (Nagode, 2009: 134).



hand, but, on the other that the service is not financially and geographically accessible to the vast majority of potential users in Slovenia. The service is not accessible under the same conditions and to the same extent and is treated more like a higher standard offer/service. Another weak point is the incompatible technology that service providers are using, meaning that the few established centres providing a social alarm service are not using the same technology. This leads to greater expense because multiple centers are operating 24 hours a day instead one centre providing the entire service.

Social alarm systems represent a basis for other, more advanced ATs, and that is why Slovenia must and should in the first place spare no effort to evolve and develop this kind of service. For this reason, it is necessary to briefly highlight how this subject is and was treated through national strategies and recently planned changes in legislation from the perspective of the most important documents regarding demographic change, with special attention to the older generation as one of the vulnerable groups. The Programme of Social Care of Older People in Slovenia till 2005 (MDDSZ, 1997), written in 1997, has already proposed a network of 15 regional social alarm response centres. This concept was accepted as capable of meeting the needs of 30.000 potential users. After more than 10 years this goal has not yet been achieved, even though it was further supported by The Strategy of Care for the Older People till 2010 – solidarity, good intergenerational relations and quality aging of the population (MDDSZ, 2006). This interdisciplinary strategy envisages a widening of the network with joint efforts by the state and municipalities and projects a rational organisation of services provided at home on the national level. The goal should be achieved by 2010. So far, only the pilot project of introducing a social alarm centre at the national level is being introduced, but at present it is only in the pilot stage. No practical output or and results are yet known. Moreover, The Resolution on the National Programme of Social Care 2006–2010 (Official Journal of the Republic of Slovenia, 39/2006), shamefully gave only minimal attention to social alarms within a broader provision, but no exact goals and directions were given. It is obvious that the field of ATs is underestimated in strategies concerning care for older people in Slovenia and also in the national programme on social care. For this reason, planners of the new strategy and the national programme (which is expected to be a continuation and upgrade of the previous one) should reconsider the importance of introducing and developing ATs in Slovenia and give reasonable directions and goals to regulate this important area of social care for older people. In 2010 the Act on Long – Term Care and Insurance for Long – Term Care (MDDSZ, 2010) was introduced to the wider public through public debate. One of the goals presented refers to stimulating the use of new technologies in the field of long – term care. What this means in practice is not clear, and since the act



has not yet passed, it is difficult to judge the potential for realisation of the planned goal. We are afraid that Slovenian social policy continues to neglect the important role of assistive technology in the field of social care for older, frail and disabled people, even though its relevance has been stressed in many important documents. Recently the right of older people to equal access to new technologies and to learning and support in how to use them was established in the European Charter on the rights and responsibilities of older people in need of long - term care and assistance (Age Platform Europe, 2010).

### *Telecare*

Since social alarms form the base for all other types of AT, and since in Slovenia even these are not yet well developed, we will present the situation regarding social alarms in more detail. Later, we will briefly present other existing types. Telecare, as defined by the ICT & Ageing project (Dolničar, 2008), describes a range of enhancements to the basic social alarm service concept and is concerned with the provision of social care (i.e., non -medical services) in the home. Typical examples include the provision of various sensors in the home (e.g., fall detectors, bed/chair occupancy sensors, smoke, gas and flood detectors, and so on) that alert social care services in the event of a problem arising in the home. Often, but not always, such telecare services are developed as add-ons to the basic social alarm services and are implemented over the social alarm infrastructure. In addition, videophone-based or other remote social care to the home can also be considered to be forms of telecare. According to the UK's Audit Commission report on implementing telecare, telecare should comprise three components: monitoring safety and security, physiological parameters and activity (lifestyle) and information provision (Audit Commission, 2004: 5).

Telecare services are in principle available in four of the Slovenian regions. There is no exact figure on take-up; however, it is extremely low, as the use of sensors in the home is very rare. Trial activities have recently been initiated in the context of the IRIS Smart Home project. No specific policy has yet been developed for telecare. However, an Act on Long - Term Care and Insurance for Long - Term Care (MDDSZ, 2010) that is still in preparation and reconciliation, promises to include telecare.

### *Home telehealth*

Home telehealth, according to the by ICT & Ageing project (Dolničar, 2008), refers to the use of ICTs in the delivery of medically-oriented care services to older people in their homes. It can include a variety of somewhat different services or applications, including telemonitoring (e.g., blood pressure, blood glucose and ECG), teleconsultation (e.g., online, by videophone

or by telephone) and telerehabilitation (e.g., by videophone), as well as self-care devices to be used by people in their own homes to help them monitor and manage their health themselves. Some telehealth applications/services may be developed as add-ons to the basic social alarm services and are implemented over the social alarm infrastructure.

Home telehealth services in Slovenia are under-developed to date and, as Rudel (2007; 2008) ascertains, Slovenia is lagging behind Europe by almost 10 years. Some services have been developed but all are only at the demonstration stage and have not yet been integrated within the mainstream home care services. We will later name and briefly describe some of these. The IRIS Smart Home project in Ljubljana includes trials of telerehabilitation and telemonitoring of blood pressure and pulse. Rudel (2008), as one of the existing telehealth services, also offers a telemetric service called Telelink that enhance the relationship between a doctor and a patient with heart/cardiac difficulties. The service allows the recording and transmitting of ECG copy by telephone. In the field of health care telephone consultations are also common, and online access to doctors is actively encouraged by legislation (the Act on Patients' Rights). Each doctor is expected to have an email account for this purpose; however, only a small number of doctors have taken this up so far. For this reason, test results, prescription renewal and appointment scheduling are not available online. These can only be done in person or by phone call. Furthermore, compulsory health insurance does not cover telehealth services. Voluntary (additional) health insurance schemes may cover the »red button« telecare service in some cases. While an IT strategy for health care in Slovenia has been developed, it focuses on eHealth and health care informatics rather than on home telehealth. There is no specific policy on home telehealth in Slovenia.

### *Smart home*

A smart home is a system that is responsive to people's needs and actions, a pervasive accessory to human cognitive and physical capabilities. The simple juxtaposition of sophisticated devices or services does not alone lead to a smart environment (Pecora and Cesta, 2007). The ICT & Ageing project (Dolničar, 2008) defines it as a range of environmental control, home automation and home network systems that can help older people to remain living independently in their own homes. In addition to such 'systems', there are also a variety of more standalone, ICT-based ATs that can help older people to remain independent, including computer-based or other electronic communication aids, object locators, reminder systems and so on.

The development of smart homes in Slovenia is in the very earliest stage. The first and only smart home in Slovenia is called the *IRIS Smart Home* (<http://www.dom-iris.si>) and is located at the Institute of Rehabilitation. At

present, it is in the demonstration and promotional phase and has received financial support from the Slovenian government. It comprises a demonstration apartment and clinical research facility. The apartment is fitted with equipment and technical aids to assist older people and people with disabilities. Adapted equipment, technical aids and electronic systems enable the user to control the living space (opening doors and windows, drawing curtains, television, radio and telephone control, turning the heating on and off, and so on) in various ways (remote control, voice control, wheelchair joystick, eye control etc.). At the same time, the system allows monitoring of the services to provide a safe and secure living environment. It is not possible to live in this IRIS smart home, since the aims of this smart home are practical:

- to enable viewing and testing of various technical aids and technologies for independent living in the home environment,
- to serve as a test base for clinical research in ambient assisted living technology and services,
- to provide advice to older people and people with disabilities as well as to their family members or caregivers, and
- to offer equipment producers and service providers the opportunity to demonstrate, test, upgrade and integrate their solutions.

### **Key constraints on AT uptake in Slovenia**

From this brief introduction and description of AT in Slovenia, we can conclude that Slovenia is in its infancy regarding the use and development of ATs. Some of the most recent national papers and strategies are belatedly putting this issue on the agenda, but a more strategic and systematic approach is needed, since moral support and awareness are not enough.

Barriers to or constraints on using AT can be distinguished on the individual and structural levels. At the individual level and on the basis of number of foreign studies, we can identify many psychological factors that influence the use of AT, such as attitudes to ICTs, lack of interest in and motivation for using, lack of confidence and fear, willingness to learn and acquire ICT-related skills, loss of privacy, recognition of ICT quality and its utility, as well as expectations, needs and interests of older persons (see Dolničar, 2009; Dolničar and Nagode, 2009). However, the emphasis in this article is given to barriers that appear on the structural level and that are typical of Slovenia. At the structural level and on the basis of a few small - scale studies (Nagode, 2003;2009; Dolničar, 2008; Rudel and Fisk, 2005) carried out in Slovenia, we can identify the main situational constraints on AT uptake. Since social alarms form the basis of AT and are the most developed in Slovenia within other types of AT, the remarks mainly arise from the situation and experience with social alarms:

- Unequal access and unequal price  
For social alarms, the amount of payment and access to the service depend on several factors. Since there are five different providers (centers) using different technologies, they charge different prices for the phone and the technology. Municipalities are not obliged to contribute to the total price, and for this reason the municipalities each contribute a different share of the total price. The social alarm service is not accessible throughout the country, and the service has differing costs, depending on where you live.
- Unknown service - Marketing strategy  
The social alarm service lacks promotion, and for this reason the service is not sufficiently familiar among the potential population (Nagode, 2009). People are interested; on the other hand, a proper marketing strategy is needed.
- Lack of cooperation  
Successful implementation of the Lifeline system demands co-operation, communication and interaction between politicians, professional bodies and individuals. Waiting for the other party to make the first move has characterised behaviour in many regions. Furthermore, there has been a historical legacy of non co-operation between professionals. Additionally, the reorganisation of municipalities into tiny local communities has almost precluded regional initiatives. At all levels, however, there has been moral support for the implementation of the system.
- Lack of funds  
Although initial capital investment in any new care network is required, the resulting service would be expected to yield considerable savings on national residential care costs. The government, it is suggested, should cover 30% of the cost of response centre infrastructure. Local funds would be required for the purchase of carephones, for workforce costs and for the response centre facilities. End-users would accept the programme if it were paid for by social and health insurance; health insurance agencies have included the service in their optional insurance schemes; and private companies are willing to offer technical support. The social and health services are interested in participating, although it is not clear what body or institution would administer the services and pay for them (Rudel, 2005).
- Lack of political will  
A review of important national strategies and programmes shows that AT, especially social alarms, has not been explicitly planned and consequently implemented in Slovenia. Even the planned goals have not been realised. Insufficient attention and political will are given to this important area of care for older people.

Let us summarise the main situational incentives and barriers affecting AT uptake in Slovenia. In practical terms, the main facilitating factor has been the public provision (in some parts of the country) and the public financial support that is available. More generally, pressure to provide an alternative to institutional care through improved homecare services seems to be the main underlying impetus. Practical barriers include the lack of coverage of all regions and also the fact that services are not always/fully reimbursed. A number of other factors have also been highlighted as key obstacles to development and take-up of social alarms in Slovenia:

- Alarm services are not paid for by social and health insurance.
- Although social and health services are interested in participating in such provision, it is unclear what body or institution would administer the services and pay for them.
- Another crucial barrier is the fact that the alarm service is not well recognised among the general public.

There has also been little provision or adoption of telecare to date, and thus no tangible impetus to date. Some more general factors apply, as for social alarms. As regards barriers, even social alarms constitute a new technology in the Slovenian context. Consequently, there is limited awareness, and telecare services as a technical innovation have not yet fully been accepted. Insufficient cooperation between the parties concerned has also been reported to be a disincentive. Additionally, the reorganisation of municipalities into tiny local communities has almost precluded regional initiatives. More generally, lack of funding has been a limiting factor, even though that the resulting service would be expected to yield considerable savings on national residential care costs. The slow transformation of the health insurance system and fragmented responsibility for older people's services are also reported to be barriers.

There has been very little implementation of home telehealth to date, and no concrete incentives, as such. More generally, the following factors can be expected to provide motivation in the future: demand for more efficient health care services, increased involvement of the private sector in health service provision, accessibility and affordability of ICT services, increasing shortage of health care professionals and changes in the regulatory framework. Lack of awareness and skills seems to be a key barrier. Progress is also limited by the lack of a concrete policy and legislative framework on home telehealth as well as on eHealth more generally.

## Conclusion

The use of assistive technology is important in enabling older people to stay in their own homes for as long as possible and can play an important role in supplementing institutionalisation (ie., homes for older people). Assistive technologies are used to ensure longer and safer independent living, to facilitate more user-oriented services and to offer better quality of life. The development and employment of assistive technology nowadays has a great potential, owing to the change in demographic proportions in favour of older people. Long-lived societies are facing the fact that more people need help and support in everyday life, mainly because of illness, disability or weakness. Another reason is the expressed need of older to live independently in individual forms of living for as long as possible, causing services to be brought to their own homes. To feel safe and independent at home is one potential benefit of assistive technology. From the intergenerational cooperation perspective, which is a crucial potential of assistive technology, it is important to be aware that AT can improve the quality of life even among the younger generations that usually offer help to older people and not only to older generations. In this sense, AT can have a positive impact on intergenerational cooperation and solidarity.

However, there are still several barriers that exclude groups of people and countries from IT society benefits; Slovenia lags behind most European countries in terms of the adoption of ATs. In Slovenia, ATs are not well developed, and there is a lack of strong and determined political initiatives towards AT development. Even the simplest technologies, such as is social alarms, are not well distributed or used among older people. The more advanced technologies (like the smart home and ambient intelligence) are present only at the pilot stage in Slovenia. Telecare is available, but take-up is extremely low and no specific policy has been developed yet, as is also the case for telehealth. Home telehealth services in Slovenia are underdeveloped to date, and as Rudel (2007; 2008) ascertains, Slovenia has been trailing Europe for almost 10 years.

Some of the most obvious key constraints on AT adoption in Slovenia are lack of funds for initial investment, although considerable savings can be expected on national residential care costs; lack of cooperation between politicians, professional bodies and individuals; lack of political will observed through national programmes and strategies; unequal geographical and financial access and the absence of a marketing strategy (for an unknown service).

Many dilemmas regarding further AT uptake in Slovenia remain unsolved, and for this reason it is crucial to plan and develop these services carefully and with optimal direction.

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