The independent living of the elderly and home automation

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Introduction

This Article is about the promotion of the independent living of seniors in relation with adaptations of and in the house. According to demographic forecasts, ageing will become a big international issue in the future decades. The part of the population aged 60 and over will increase from 6.9% in 1900 up to 28.1% in 2100 (Figure 1). Also the average life expectancy increases from 44 years in 1950 up to 77 in 2050. In 2020 almost 50% of the European population will be over 50.

![Figure 1. Three centuries of world population ageing [Population Division, UN]](image)

In the Netherlands the increasing number of population over 60 years old is growing faster than in any other European country. The baby boomers of the 1950’s, who are also called the grey wave, are the seniors of the coming decades. It is evident that the housing stock for seniors in the future will turn out to be insufficient to facilitate this ‘grey tsunami’. A big rising need for adaptable houses for the elderly is expected in the near future. In the Netherlands one is aware of the approaching problem concerning housing of seniors.

Today’s senior wants to continue to live independently and participates more actively in society and if necessary, he will stipulate the way of care and services. The market has discovered this growing
target group with its great purchasing-power. It’s a booming business. This target group is very heterogeneous with regard to age, health, level of education, lifestyle and financial capacity. With regard to age we can distinguish between younger seniors (50-65 years), the seniors (65-75 years) and the older seniors (more than 75). However behaviour, ideas etc don’t depend on age, thus prudence is in order.

![Figure 2. Active ageing; mature seniors](image)

The government policy aims at the substitution of intramural care by extramural care. This means that housing, care and services are separated. Independent living is stimulated by the government and is in fact also the desire of the present emancipated senior. This can be accomplished if the conditions are met. The key factors are the quality (adaptability) of the house and the availability of necessary healthcare in the close surroundings.

Independent living of the seniors is part of a complicated social problem in which many fields are involved, such as the gerontology, demography, the government policy, the health care and the construction sector. The result is stipulated by the interaction and cooperation between these actors. Unfortunately, as the Dutch proverb applies, ‘a chain is as strong as the weakest link’.

![Figure 3. Independent living of the seniors is part of a complicated social problem in which many fields are involved.](image)

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Construction sector

The construction sector will face on one hand; a big desire for adaptable housing, suitable for various ways of living, and in the other hand; the changed levels of quality demanded by the modern seniors. The construction sector can help to improve the senior’s level of being independent. New forms of housing and new types of houses need to be developed. The construction sector is tasked with innovation but this sector doesn’t anticipate the coming housing demand.

The current construction process has been lagging far behind the other social developments with regard to its technique, process and organisation. The construction process is traditional and is not open to innovation. The only form of innovation it uses is addition. The construction sector is continuing along the lines of well-accepted concepts. The transition from a supply-led market to a demand-oriented market, in which the mature user can make his personal demands, happens only incidentally.

Housing conditions and affordability

There are big differences in desire of different housing conditions, varying in preference for independent living, communal housing, sheltered housing or move to a ‘seniors-city’ in their own or a foreign country.

Also there are big differences in the attitude of seniors towards sophisticated technologies as Internet and home automation. There has to be careful indexation of the wishes, needs - and satisfaction research with regard to living of seniors. However, prudence has to be ordered with regard to the solutions. There must be distinction between the complaint/wish and the solution. The complaint ‘few sockets’ doesn’t automatically mean ‘installation of more sockets’. There are also other possible solutions, like using wireless systems.

The elderly often have no notion of new technical possibilities and they only mention what they are familiar with. In this situation expertise is necessary.

The ‘satisfaction’ of the occupant is created by several motives and criteria. It is a mix of factors. At satisfaction research the ‘end score’ isn’t the most important item for the researcher, but the analysis of basic motives and criteria.

Seniors have built up their own lifestyle throughout the years of their life. This lifestyle can be recognized by several features: home furnishing and decoration, clothes, daily habits, traditions, social contacts, the use of certain values and ethics, etc. Lifestyle is a value to everyone, not only to the elderly. The lifestyle can be violated by serious changes as moving to a new house or the installation of home automation in the house. This can result in a refusal of change. The lifestyle (life - or living pattern) of the senior must be known and respected. Nowadays the mature senior demands personal requirements with regard to living and care attribution. The conceptions of the government and social housing corporations, concerning ‘suitability’ of the housing for the elderly, have changed through the years. It appears that sometimes occupants have a different opinion than the experts. 25% of the housing stock in the Netherlands is ‘suitable’ if one chooses ‘no thresholds’ as a standard. But when one uses ‘accessible for wheelchair’ as a standard, only 0.9% is ‘suitable’. Thus ‘suitability’ of the houses for the elderly depends on the used ‘standard’. Opposed to this ‘objective thinking’ is the opinion of the occupant himself: does he want move or stay? It is more realistic to begin with the occupants themselves. This means that the solution of the seniors’ difficulty in finding new premises has to be specifically looked for in adaptation of the existing houses. Furthermore the construction of new housing types for the elderly, which anticipate on new housing desires and new modes of living, is important.

For the construction sector there are many changes in this field and the sector should make use of the possibilities that are available at the moment. The construction sector is supposed to follow the developments in the field of sustainability, energy and ICT. Vital in this purpose is the innovation of the construction method. For instance using the method ‘Slimbouwen’, the application of new materials and techniques, and the use of technology transfers by applying ICT in the house.

The government describes the housing market as a ‘typical market’ with a dynamic demand and a relatively inflexible housing offer.

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Home automation

A more or less new feature which can enhance the independent living of seniors is home-automation or domotica. It is the integration of technology and services within the house. It contributes to the level of independence, security and comfort of its occupants. Home automation can offer a solution to the inconveniences of general daily life restrictions experienced by seniors. It exists already for about 25 years (e.g. Xanadu, the USA). Technologically it has been developed, but it has not yet been applied on a large scale. Home automation has not dominated the market while the possibilities are almost unlimited. Obviously there is stagnation on the route from developer to consumer. By home automation the whole process, from technological development to implementation of the user, is concerned.

Independent living depends on the houses and the living environment that is available. One aspect of the living environment that is of crucial importance to independent living, is the availability of associated care and services for the elderly.

Comment

A point of attention is the ‘image’ of home automation. The application of domotica can be stigmatising for the elderly. They do not want to be labelled as ‘in need of healthcare’. The ways of living and communication by elderly, as well as their feelings towards technology in their own house, will be critical in their willingness to accept domotica. Domotica must be freed from the label ‘for the elderly’. At the moment the market of home automation is underdeveloped; the prices will decrease if the consuming market grows.

It is recommended to aim the marketing of domotica at the relatively more young seniors and young people; the ones who like ‘luxuriously’ and ‘comfort’ and are open for technology in the house. Young seniors are more open towards ICT and generally have financial possibilities. The application ‘comfort’ seems to be specifically suited. The improvement of comfort can be a possible strategy to get acquainted with home automation. They will gradually get used to it. By this, they will be more open towards future applications like security. For this reason the image will improve if products and services (houses, home automation and services) have been offered to everyone and not just to the elderly. Moreover the technological developments in home automation area are still subject to change, and therefore they can be directed towards the lifestyle of the target group.

Satisfaction researches have stated that also the ‘usability’ of home automation must be improved. There is a gap between the elderly and the many possibilities home automation has to offer. Lots of applications are still too complicated for the users. Furthermore there needs to be checked whether the application of home automation is necessary, useful, wished or superfluous. It isn’t just about technical possibilities; the point is satisfying the senior’s demand. Home automation has to be integrated in the patterns senior of the daily life. There is clearly a need for further research on the possibilities which can help to close this gap.

The so-called ‘virtual distance care’ can lead to loneliness and social isolation. One must realise that it is a surrogate human contact. On one hand there is the security aspect, and on the other hand the big brother effect. However people must keep the situation under the control concerning intelligent systems. Research has shown that there is a psychological border whenever people are prepared to delegate tasks to a machine. The senior who lives independently must be able to control his own life for as long as possible. Control possibilities must be remained for the user at any time.

In the near future we will be confronted with new applications, new control systems, new arrangements with care institutions, teleservices, wireless connections, fibre glass cable, etc. The danger is that the elderly will be flooded by these technological developments. New technologies have, certainly for seniors, the disadvantage to be very expressively present in the house. Home automation is still a ‘strange element’ in the life of the elderly and this can sometimes lead to ‘rejection phenomena’.

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The research for appropriate home automation to the elderly people

By the research method ‘User Centred design’ study has been done into human behaviour and the patterns of the daily life. User Centred design speaks about ‘ambient Intelligence’: the invisible presence of intelligent technologies in house. Home automation lacks this. Further research has to been done into how the elderly experience ‘home’, and how the interaction is among senior and technology. Home automation needs to link up with this method. A foresaid method seems very suitable to study the needs and the usage of home automation by seniors. It’s all about the clarity of interface between human and technology. The designer of intelligent systems has to incorporate both technical knowledge, and information about the user and his environment in his solution. Domotica applications need to be a synthesis of technology, healthcare, residential construction, environment and the user himself.

For advancing into domotica which is ‘user-centred’, further research and development has to be done.

Other points of attention are the architectural aspects. During the construction of the house it is important to make architectural arrangements which will enable the immediate or future application of domotica. In the course of time the possibility should exist to incorporate applications in different rooms, which serve an increase of security, communication and comfort. This implies a flexible floor-plan; many of the technical systems will be added when the house is in use.

Finally

Many seniors want to continue to live independent in their house for as long as possible. Because of this the adaptation of existing houses to fit their needs, is an important alternative to new construction. The quality of independent living can be improved considerably by home automation, provided home automation is more customized to the wishes, characteristics and lifestyle of the elderly. Quality improvement of existing home automation supply is more important than its extension. More differentiation and flexibility in adaptable housing is needed with regard to infrastructure and installation methods.

The adapted house gives the senior ‘empowerment’ by which he is able to continue to live independently for longer.

The aim is to preserve the ‘quality of life’ for seniors. Independent living is a factor that promotes the quality of life of the senior.

References


Laberg, Toril. 2004, Smart Home Technology; Technology supporting independent living: does it have an impact on health?, The Delta Centre Directorate for Health and Social Affairs, Oslo.


