

Transition from services at a distance to user generated content in intelligent homes.

(A view on the development of technology and services for remote care)

1. Introduction

Cause of the dual ageing in the Netherlands at this time, whereby fewer and fewer young people have to provide care for increasing numbers of elderly people, longer independent living and remote care became keywords in recent years

The author of this article since 1996 is developing building automation and care supporting ICT. In addition, he is for more than 10 years working on the question how ICT can support prevention and care. He has graduated on ' computerization of HMOs ' and is seen as a pioneer in this area. With his sociological background he is interested in the intersection of humans and technology.

He was one of the inventors of the virtual nursing home and is now commercial Director of Mextal, the developer of VieDome. He is currently closely involved in innovation projects such as the residential service Geldrop-Mierlo, VieDome, BrabantConnect and in transition projects in long-term care.

This article is based on 10 years of experience in remote care. This experience has led to a special way of thinking about the development of technique and services as a supporting factor in solving a number of issues as a result of the double ageing.

2. The history of Domotics

Domotics is a contraction of the word domus (House) and telematics. In the 1980s the first pilot projects were launched and Domotics is around 1994 introduced on the Dutch market.

Domotics is a continuation of the electrification of the home. Originally Domotics defined as all devices and infrastructures in and around houses, which use electronic information for measuring, programming and steering functions for the benefit of residents and service providers. This was mainly referring to home automation and only slightly on interactive measurement.

From 2004 the definition of Domotics is modernized. Now it is also about smart systems. The term Domotics is therefore replaced by Ambient Assisted Living.

Ambient Assisted Living is the whole of equipment, infrastructure and services in and around the House to allow independent life of the inhabitant, through the seamless integration of information technologies, where the quality of life and autonomy be increased.

Remarkable is that it is no longer just about technique but about the combination of technology and services.

Furthermore it's remarkable that to the definition also an objective has been added namely raising the quality of life and autonomy of the occupant. In fact, in the modern definition of Domotics the old terms remain and new components are added.

Around 2004 a large number of building automation projects was evaluated and these evaluations showed that only very small number of people was using Domotics. The reason was that either the residents did not know anymore that they had Domotics in their home or the residents no longer knew how to operate the building automation functionalities.

At the start of the virtual nursing home in Aalst (a project of ZuidZorg, Simac, Mextal and Aert Swaens) the evaluation of these building automation projects is investigated. In the final report (DRS. Stravers F.J.M.C., 2005), the findings of this investigation is shown. The main conclusion was that building automation facilities on the long term only work and contribute to the improvement of quality of life when they are accepted by the inhabitants and integrated in their daily pattern.

In particular in the demo project of VieDome a number of success factors were detected. It turned out to be much better not to think beforehand what facilities in a House to implement but to wait until the occupant was known and then tailor the facilities to the wishes and needs of the occupant of the home. Not previously conceived homes but homes that are afterwards tailored to the needs of the people who are going to live there.

This means that when in the project not all homes must be the same but that thought should be given to the need for individually targeted facilities.

To be able to make homes that were tuned to the individual needs of the people, the technical provisions had to be adjusted significantly. First the technology was very intrusive in the home, now the technology had to be placed afterwards without any facilities in the home. Also in the area of the human-machine interface things had to change. From an interface that is the same for everyone to the personal interface.

It turned out that technology only was not enough for Domotics to be included in the life pattern of the residents. It was mainly the services that were provided that determent the incorporation of Domotics in the daily life patterns.

As a result, not the technology but the services were paramount. The conclusion was that a technology follows the services concept was needed. Only that technology is implemented that is necessarily for the provision of the demanded services.

Since its introduction the technology of building automation is rapidly changed. Old techniques and functionalities have remained and new elements and functionalities have been added. Domotics initially only was home automation. In beginning through wired systems later on also wireless versions were developed. A lot of home automation systems today still require a separate cabling network in the home.

In the initial project of VieDome in 2004 remote control and video communication were added to the traditional building automation functionalities.

Later care Domotics and an integrated services concept also were added and there arose a remote controlled Home with a central communication point. With this integrated system the occupant could use a wide variety of different care, cure and other services.

Again sometime later (2007) also telemedicine came in view. Initially telemedicine was measuring tool for vital care data, later it was used as an observation tool for patient behavior. The first generation of telemedicine technology was only partly interactive. The patient could the measurements in the system and the system gave feedback if everything was in order. When there was something wrong a healthcare provider was automatically alerted.

The next step was adding self-care programs. This meant not only the measurement of vital data but also the influencing of the behavior of the patient by means of interactive feedback. Not just signaling when something was wrong but identifying in advance that there is something going to be wrong in the near future. Then the care provider can try to avoid the problem before it is too late so that the issue can be resolved with less care.

Development in home care and convenience



From home automation to ambient living

In the field of interactive telemedicine there are two development lines within the VieDome concept namely proactive diagnostics and ambient living.

Proactive diagnostics means data collection in the home ranging from sensors to human input by occupant and care provide. On the basis of statistical models the collected data is checked whether there are significant changes in the pattern of life of the inhabitant which may indicate diseases such as dementia or depression.

Ambient living goes even a step further by not only analyzing what has happened in the home but also to take action on this. For example if signaled that a resident has slept badly, the next day a the usual bedtime the system can offer him a relaxation program to help him to sleep better.

3. What does it take to keep living independently?

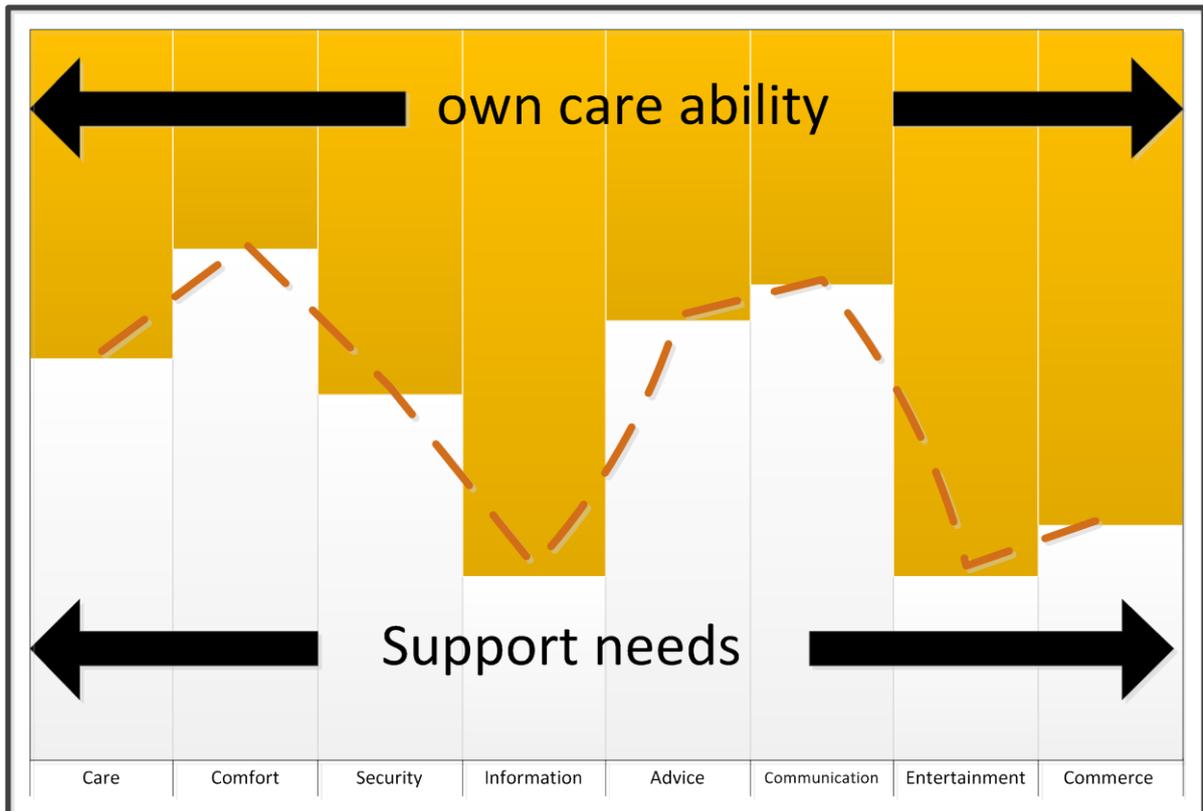
Experience of recent years has shown that a good solution to the dual ageing problem should be sought in a combination of longer living independently and remote care. The underlying problem is that there are fewer and fewer people available to give care and that there are insufficient places in elderly homes and institutions in the Netherlands.

Remote care means that more elderly people can be given care with less manpower and remote care ensures longer independent living which prevents that elderly people should move to special homes or an institution to get the care that is necessary.

Many building automation projects and remote care programs lead only to a limited extent to the achievement of the solution described above. In many cases it appears that the participants still have the need to move to a more protected environment. In these projects efficient care given but there are many hidden problems that are not or only partially addressed. For example social isolation, loneliness, the problems of rural environments where many young people have moved away, etc.

In earlier publications (Stravers, 2009) was indicated that there is more than just care and technology is needed to ensure that elderly people continue to live independently.

From a number of projects with remote care is concluded that the elderly only continue to live independently as to their total support needs are met. To understand this problem better an 8 pillar model has been developed. Per person must be determined from each pillar what it own care ability is and what the need for support. The 8 pillars combined result in a personal profile. Since this is not a static model is a recalibration should take place regularly.



This means that in projects which are meant to enable elderly people live independently for a longer time the provided services always must cover all 8 pillars.

Services can cover a single pillar but it's better to shape the services in a way so that more than 1 pillar is served. Services that serve multiple pillars are more effective in both the results that they bring in as the extent to which the participants incorporate the service in their daily life pattern. When a service has good results and is incorporated in the daily life the effect on living independently for a longer time is greatest.

An example of a service that serves multiple pillars is the shopping service linked with a social encounter.

The user hereby orders groceries via his remote care technology (for example, VieDome) at a local supermarket. These messages will not be brought home but the user receives a notification that his groceries will be delivered at a specific time a specific point in his village (e.g. community center). All users from the village who have ordered groceries get the same message. Then if the user is going to pick up his groceries he will meet others who are also using VieDome and are picking up their groceries.

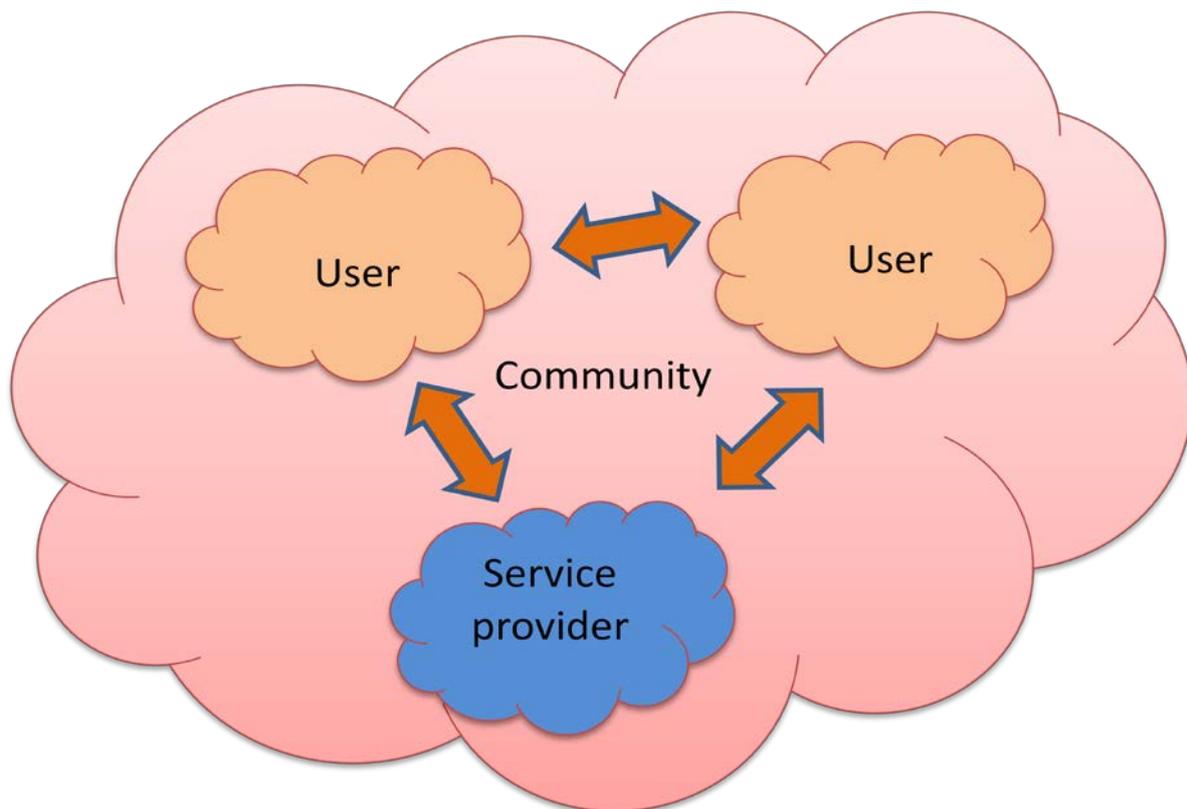
With this method several targets are achieved:

- *Users regularly use the technology (for ordering groceries)*
- *The delivery price of the groceries remains low because everything can be delivered in one place*
- *The user undertakes an activity outside his home*
- *The user can establish relationships and meet others.*

In this way the pillars comfort, communication and commerce are served.

Besides the fact that it is necessary for independent living that all pillars are covered, it is also of the utmost importance that the services be incorporated in the social context of the users. This means that it is not only about communication and services from service providers but that mutual communication and service between users is just as important.

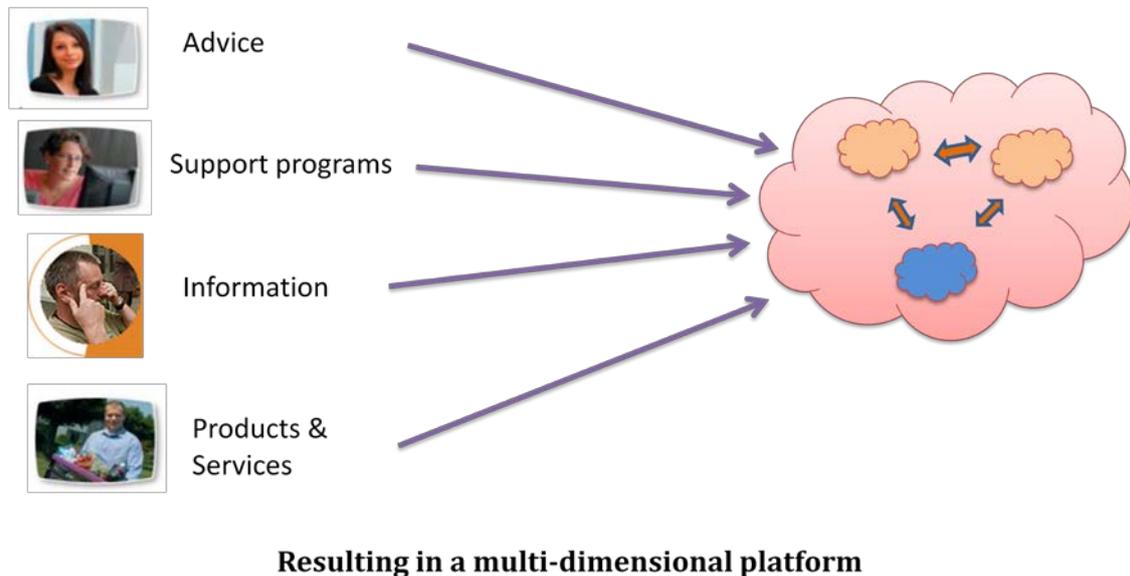
Community thinking is the answer here. Users are alone they must function in a social context (community). Problems of loneliness and social isolation are the result of the absence of a community in which the user is embedded. The theory of civil society can be applied here.



The fact that independent living services are distributed among the 8 pillars and the fact that it involves not only the relationship between the user and the service provider but also shows the relationship between users themselves for many traditional care organizations is a new concept which is difficult to comprehend. Many of care and welfare organizations are traditionally accustomed to think in customer-supplier-relationships and are focused on delivering services.

In modern community platforms as they are also used in all kinds of social media the user is much more centralized. The user wants freedom of choice as he fills in pattern needs. The time that the user got everything he needed from a single organization is over. This means that care and welfare organizations must take part in communities with other competitive organizations and must convince the user to use their services instead of the services of a competitor. That means that projects for living independently must be multidimensional in the field of services and service providers. For such a project to succeed in covering multiple pillars several services should be provided. That means that the expertise of one single organization usually is not sufficient. Cooperation is of great importance here.

Connecting multiple service providers to the platform



It should also be encouraged that the user himself becomes active within the community. The service provider must accept that within the community there are processes where they have no control over. Most importantly users should be encouraged create their own content thus shaping the community to fit their needs more precisely.

As a result, the user is no longer to define in one dimension. Within a community a user can have different roles. He can have the role of client who receives care from the home care provider while at the same time he has the role of neighborhood Coordinator in which he cooperates with the welfare organization as a representative of the neighborhood users in negotiating a service deal.

This way of thinking about communities is based on the idea of the "civil society" Civil society can concisely be described as the institutional domain of voluntary associations. It is an indication of organizations or institutions outside the sphere of the State, the market and the relationships of family and friends. People take voluntarily part in it. Civil society is synonym for involvement of citizens in the public good, increasing civil self-government, limitation of commercial influences and strengthening of a sense of community and tolerance. Especially in the Netherlands the law of social support (WMO) is based upon the idea of civil society.

The law obliges the local government to offer a choice to citizens to use a personal budget, with which the care or assistance itself can be purchased.

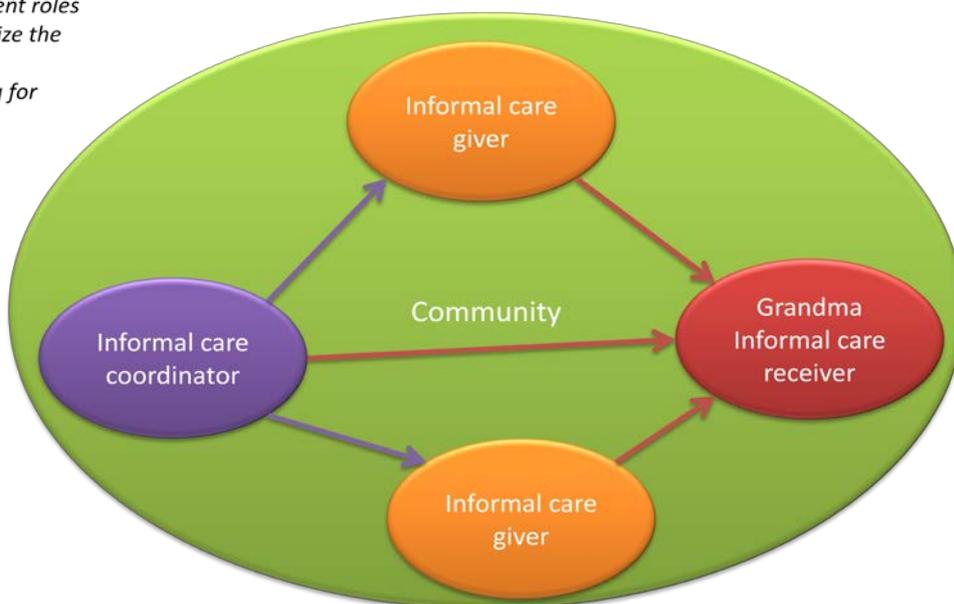
The recently proposed change of the WMO is based on the various roles that people can fulfill. Premise is not which problems a person has but what someone still can contribute to society.

Within a community the different roles that someone can fulfill can be used to develop new services which can be shaped by users themselves. For example to create common activities, for sharing of experiences or to take care of each other. Thus there are projects where the residents of an apartment building under construction are being joined together in a virtual community so they can get to know each other. When the community is establishment the residents then can use the community to guide the construction of the apartment building. When the building is finished the community of residents is already in place so wan the residents populate the building they already know their neighbors.

An example of a service that uses different roles within the community is support for volunteer caregivers such as this is developed by Mextal. Three roles within a community are here defined that people may have in relation to each other (informal care provider, coordinator of volunteer caregivers and informal care receiver). One can have a different role in different constellations. The informal coordinator puts the tasks to perform in the system. For example, the grass should be mowed at Grandma. An informal care provider indicates in the system that he is going to perform the task. He also tells when he is going to perform the task. The informal care recipient then will receive a message which tells him at what time which informal care provider will be mowing the grass

Informal care system (taking care of each other)

By defining different roles people can organize the informal care in a community caring for someone

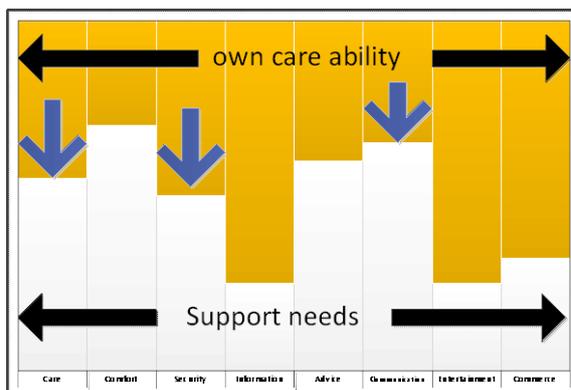


4. Consequences for technology

Now what does all this mean for the development of technology. More than ever the development of technology has to follow the development of the services concept. Technology must allow services in an individual way.

If compare the development of many platforms for remote services to the 8 pillar model we see that the developments are often limited to 2 or 3 pillars. Traditionally, these are care, safety and communication.

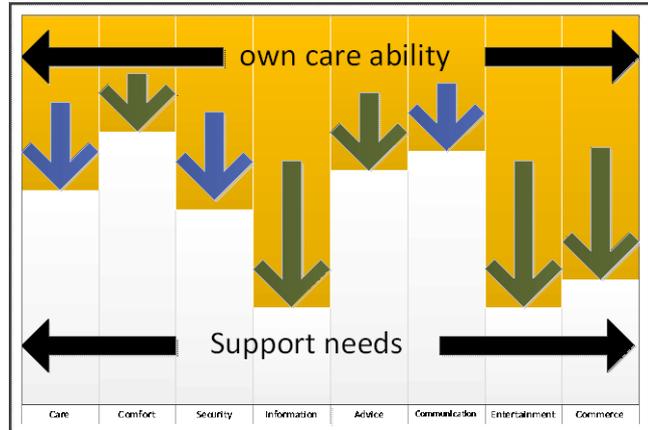
This has to do with the fact that the history of many platforms lies in the hospital care where the systems were services invented to make care more efficiently. Also in the home care technology efficiency was the main driver for development. Main features were the personal alarm call,



acoustic monitoring, fire protection and nurse call. When a patient was communicating, the communication was mainly to a care center or healthcare provider.

To fore fill the total needs of elderly people to assist him to live independently the technology now should focus on the full spectrum of the 8-pillar model.

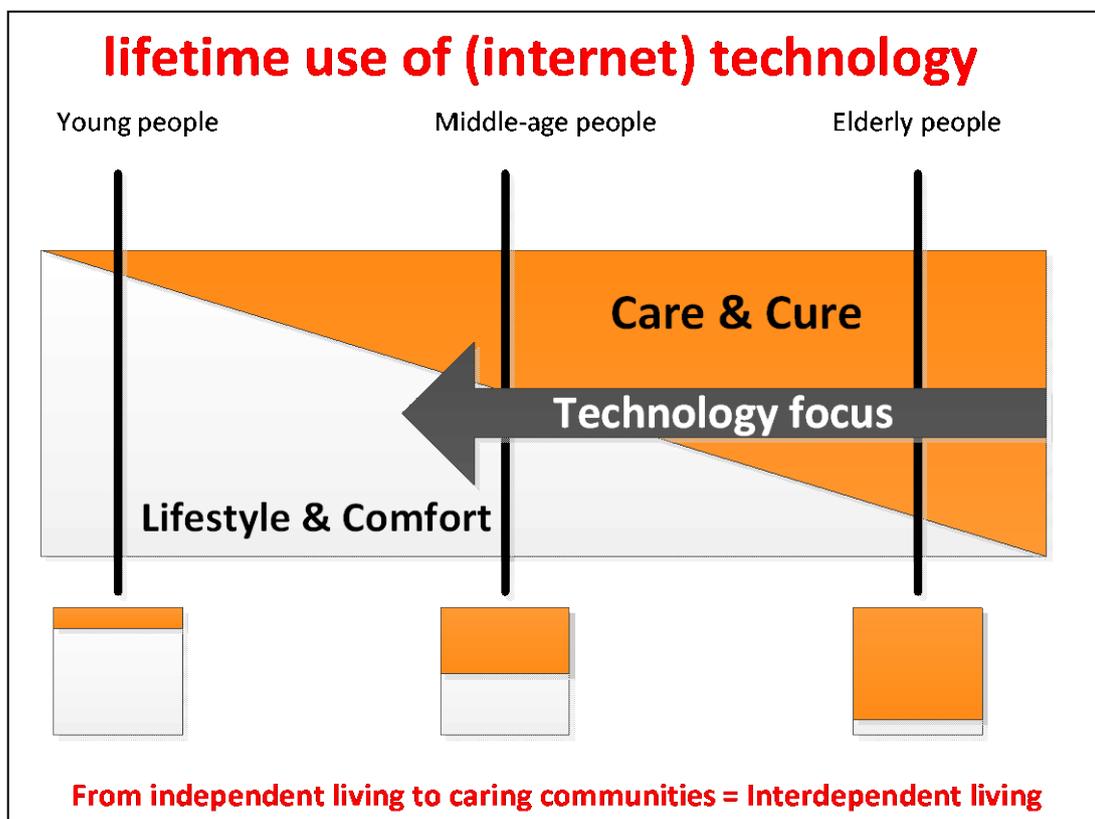
VieDome is already doing so for the last 6 years. Also the VieDome platform is sprung from traditional healthcare but with the realization of the virtual nursing home, it soon became clear that these functions were not sufficient to let people live independently for longer time.



Now, several techniques have been developed to support users on all pillars. Also tools have been created to enable users to create their own content. An example of this is that one can add own data and multimedia material to the community and share this data with others.

The technology faces another trend as a result of community thinking and that is rapidly the changing content of the system. If the 8 pillars are covered that this means that the focus is shifting from monitoring and care to lifestyle and comfort

This means that system architecture is no longer only meant for the elderly but also for the next generation. It is known that if someone in an early stage of disease development is using a community platform like VieDome then they will have more benefits of using in a later stage of life. All this requires a different view on the development of technology.



What goes for service providers also applies for technology vendors. The platform is so wide that not one single technology vendor can provide the Total technology that is needed. Expertise and services within a platform should therefore be combined from different vendors. Within the VieDome platform therefore different technology vendors are active to provide the Total technology.

The technology must leave the user optimal freedom of choice. This means that all interfaces can be individually set. But this also means that a platform should be available on different media.

Many devices can be used



By joining with your own PC by the internet the cost for the hardware are lowered to a minimum.



The Touch PC is simple and has a stylish design. Control via touchscreen.

Through the advanced echo canceling is hand free video communication possible



The home unit is mobile and wireless. Control by touchscreen.

Through the use of the handset private conversations are possible.



The TV solution makes use of the TV of the inhabitant. Control by remote control.

Through the use of own TV there is less technology added in the home



The tablet solution is mobile and modern.

More and more applications are usable.

In addition to that the technology should be available on different media it also must use individually tuned interfaces for different target groups.

Several screen configurations



Met deze loketten kunt u contact maken

For people who find using the internet to difficult.



Whit an own internet connection.

In short, the technology must be open so that different technology vendors can work together on a single platform. A technology vendor must want to work together with other vendors.

Where possible the technology platform must be hardware independent, must have various interfaces and technologies and must be individually adapted to the wishes and possibilities of the user and the service provider. Within the VieDome technology and platform all these requirements are met.

5. Conclusion

The transition from services at a distance to user generated content in intelligent homes actually means the transition from supply-oriented service to demand-driven services. But it also means the transition from a one-dimensional customer supplier relationship to a multidimensional user network. This kind of concepts must therefore be offered within a community concept where multiple organizations are active both in the area of service as of technology.

These concepts work only if the customer fully integrates the community technology and services in his life pattern and therefore the community technology and services must have a positive effect on the user, must be individually focused and must be controllable by the customer.

Therefore, it appears to work well if the customer early stage is involved and starts to use these platforms. Don't wait until a problem arises but ensure that it is regarded as a positive addition. Within a project as BrabantConnect this is achieved by three groups of services pointed at three different target groups of elderly.



Just easy Life and comfort



Prepared for tomorrow



At home with care

The first group of services is targeted on the Group of elderly that can take care of their own life but want some more comfort and fun out of life. In this group there are services like ordering concert tickets, lending books at the library, home automation functions, video communication and others

The second group targets elderly who have had their first experience with care of dependencies. These are elderly who can live independently with only a little help of the family and friends. In this group personal alarm, informal care, video communication and burglar alarm commonly are used.

The third group of services is targeted at elderly who need daily care. For this group care services are provided such as wander detection, out of bed alarm, man down alarm, mobile personal alarm, and more.

But also in terms of organization of such projects the experience in several VieDome projects has lead to other insights. In the pas many community projects would be initiated by service providers. With the change of the WMO in the Netherlands project are now more and more initiated by neutral parties like the local government. Of course, the budgets tight here but precisely by the multi dimensional approach, there is room for business models that can achieve economical success alongside social profit.

Finally, in the Netherlands the ageing is in full intensity going on. The time for experimentation and subsidies is over. Care and service in remote communities is "serious business" that is feasible and affordable.

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