# Video-Communication in Home Care: The Application and the Business Model

Thomas Pfeller, TELEMEDconsult, Faerbergasse 8/14, 1010 Vienna, Austria

Abstract-It is said that Video Communication in homecare can notably improve the quality of life, for both the elderly and their relatives, by increasing the independence, confidence and security of the elder person while reducing the cost of home care. However, there is a wide gap between the acceptance of video as a useful tool and the actual use of such a system. The main barrier is that suppliers don't have much information about the structure of care providers and, on the other hand, care providers have no clear idea about the real cost involved since manufacturers seldom offer turnkey solutions. This paper is the follow up of last year's paper: Telecare – Practical Experience with Video Communication in Home Care.
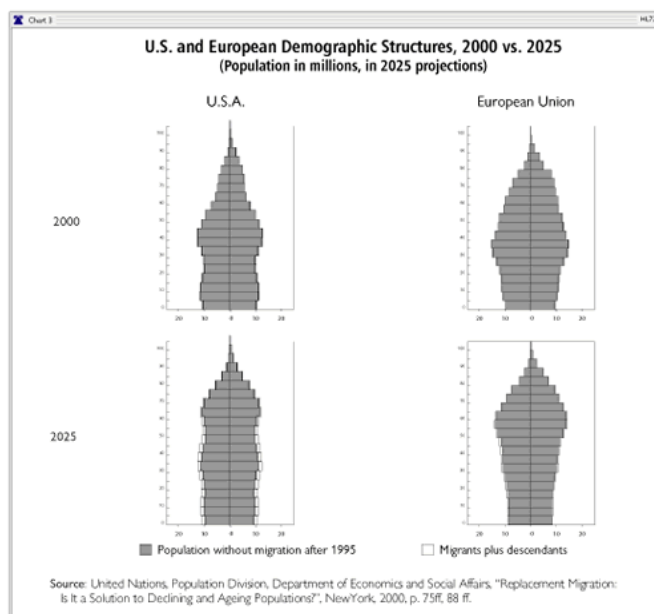
I. INTRODUCTION

Ageing societies face the challenge of maintaining a high level of care and fulfilling the requirements of a steadily growing clientele, as well as controlling the costs of care delivery. The number of Europeans aged 60 years and over has risen by about 50% over the last 30 years [3,4].

Proportion of elderly at least 65 years old by country (2000); www. paperlantern.net
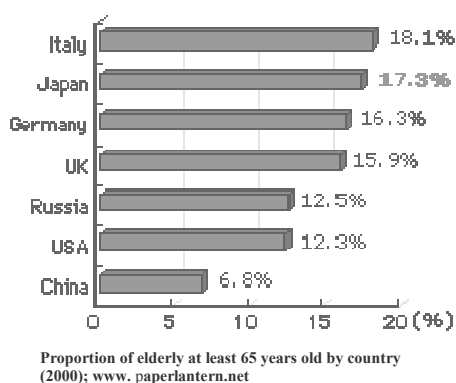
This trend is continuing. Another negative effect of this development is the increasing loneliness of a large portion of the elderly which also leads to a number of medical problems. In most cases this problem can only be solved by using supported living facilities, nursing homes or homes for the elderly. The cost arising from such services can often not be borne by the person and its relatives.

Therefore governments are trying to find methods which will allow people to stay longer in their homes, the environment they are used to. This, however, requires an active lifestyle in order to address problems such as loneliness, interconnection with family members, and interconnection to dedicated service providers. Additionally, finding ways of getting people out of the hospitals, which are a major contributor to increasing cost of social systems, has also priority. This goes hand in hand with finding solutions for the treatment of chronically ill people. Innovative approaches to care delivery must be found in order to confront this challenge. These approaches must enable care providers to maintain a high level of care, while also improving their services. Video communication as an additive to home visits can increase the efficiency and quality of home care as well as enabling closer contact with relatives and friends. Aguilar et al. recommends tele-assistance to include not only the specialized centers but also family members because this increases the confidence, health, and quality of life of the elderly [1].

U.S. and European Demographic Structures, 2000 vs. 2025 (Population in millions, in 2025 projections)

There are basically two different type of products used in a number of European projects. These are regular video phones and phones with added value. The latest technology allows the parallel transfer of vital data into centralized databases located in the contact centre. The main advantage of this technology is the continuous observation of vital data such as blood pressure, ECG, SPO2, glucose levels, weight, and more… Additionally, a higher frequency of social contacts either to family members or to the care provider is possible.

The most important issues when it comes to discussion regarding the introduction of such services are the usability for the end-user as well as the actual cost of the service. Most of the care providers having insight in this topic know about the application and about the benefits. They are just unsure about the financial frameworks they have to take into consideration and how such technology will change the lives of the end-user. The reason is that the manufacturers of such products don't look much into the environment of the care provider. So they are therefore not aware about the actual needs. On the other hand, the care provider has only little information about the real pricing structure of such a project because the manufacturers cannot offer turnkey solutions.

II. TARGETS

Care providers who want to take a closer look into the possibilities video services offer have to consider a number of issues including usability and financials. The following topics are important when initially thinking about video communication:

- What are the actual requirements of the video system and how should the system be designed in terms of handling by the client?
  - o Quality
  - o Simple handling
  - o No disturbance of the current living situations
- What handling factors are important for the care provider?
  - o Number of clients per call centre operator
  - o Duration of video visits
  - o Training and qualification of call centre agents
- What is the financial framework a care provider has to consider?
- What are the costs for call centre personal?
- What type of financing and business model is applicable?
  - o Investment or leasing?

The presented data and outcome is based on the evaluation of a number of projects in the Netherlands and Austria as well as from some other European projects where data was available. The main focus was on the actual application, the technical barriers, and the cost involved. The size of the projects evaluated was quite different starting with projects including some few video installations going to projects with some few hundred installations.

III. FINDINGS

The ease of use for the end-user and the technical maturity are important factors for the successful introduction of such services. Additionally, the integration into existing infrastructure is important because the living situation of the end-user should not be changed too much [6]. Only if the system is not affecting a user's daily life, it will be used

properly. The success of the introduction is pending on a variety of factors which have direct impact on the use of the system. Some of the most important ones are:

- 1-touch connection to the call centre
- Use of own TV set via SCART
- Discreet system design
- Quality of video

For the care provider, who intends to introduce such a system, the most important issue is the training of the call centre operators on how to use the system properly. State of the art contact centre software allows some sort of remote maintenance and problem solving which shall be done by the call centre agent. As we will see later, additional important issues for the care provider are:

- 100 clients per call centre agent
- Average call time 7 minutes

A. Video Phone Hardware

The cost of the video phone hardware reaches from 33 Euro per month to 60 Euro per month whit a 2 year leasing contract. The price is mainly determined by the size of the project and the used hardware but includes the cost of the call centre software licenses, service and maintenance. In case a one time investment is preferred, the cost will be between 1100 euro and 1600 Euro. A big portion of the hardware cost is up to the used camera. There are 2 possibilities. First, using a professional pan-tilt-zoom camera (PTZ) priced between 400 and 600 Euro per piece. Second, the use of low cost cameras. These cameras have impact on the video quality and therefore on the quality of the service.

- High End solution (PTZ cam)
  - o 100 clients – a' 60 Euro/month
  - o 500 clients – a' 54 Euro/month
  - o 1000 clients – a' 48 Euro/month
- Economy solution (fixed cam)
  - o 100 clients – a' 38 Euro/month
  - o 500 clients – a' 35 Euro/month
  - o 1000 clients – a' 33 Euro/month

B. Network Infrastructure

A large proportion of the cost is generated by the network connection. There are a number of factors which can reduce the cost of the network connection such as the use of dynamic IP addresses instead of using fixed IP addresses. Dynamic IP is usually less expensive than fixed IP addresses but has a major disadvantage. You cannot reach a person under the same "telephone number". However, modern technology allows using dynamic IP addresses by providing internal numbers to its participants. The following calculation is based on the use of dynamic IP addresses:

- Basic installation, ADSL modem – around 250 Euro per client
- Network access min. 512/512 – around 30 – 40 Euro per month with unlimited data volume.

It should also be mentioned that such a DLS line will make a regular telephone line redundant. The cost for such telephone line can therefore be deducted from the cost of the DSL line. Additionally, the video system can also function as a personal alarm system. The cost for such a system can therefore also be deducted.

C. Personnel Cost

As found in a number of projects the average call duration is about 7 minutes [6]. Based on an average use of 3 calls per client per week we expect a duration of 21 minutes. In case the call centre is occupied 8 hours per day, 5 days a week, a theoretical volume of 114 clients with each 3 calls per week is calculated per operator station (which in this case is a health care professional with appropriate education). To give a bit more flexibility we further calculate with 100 clients per call centre station. The weekly cost for a call centre agent is around 600 euro brutto (~ 2500 per month). The personal cost for each client is therefore 6 Euro per week or around 25 - 30 Euro per month.

- 3 calls per week for each a' 7 minutes are 21 minutes per week for each client
- Call centre on duty 8 hours a day, 5 days a week
- 100 clients per call centre agent
- Average cost per client – 6 Euro per week

What we see from the above calculation is that the end-user of such a system has to consider around 70 to 100 Euro for the infrastructure and around 30 Euro for the delivered health care services. An important influencing factor is of course the used hardware configuration and the size of the project. Both have major impact on the actual cost. If we now include the cost we saved from the regular telephone line and, in some cases, the cost for the personal alarm system, a complete service could be offered for something between 80 to 100 Euro per month including infrastructure and delivered services.

If you put this cost in contrast to the improved living situation, reduced need for medication, and increased efficiency of health care delivery, a relatively high cost-value factor can be achieved. The final question is if insurance companies, which benefit from better health condition and more efficient health care delivery, should contribute more to make current and new projects more successful.

IV.   CONCLUSION

The growing elderly population requires additional services and care, which increase quality of life while reducing costs. One of the major challenges for the successful implementation of video communication is the acceptance by the various stakeholders such as the care provider, the elderly, and their relatives. Since the elderly are often technologically averse, ease of use and the integration into existing home infrastructure such as the television set is critical. Additionally, Wakefield et al. states that usability, clinical appropriateness, training, and support will likely play a crucial role in the future growth of home tele-health. [5].

References:

[1] Aguilar, J.; Cantos, G.; Exposito, G.; Gomez, P.; "The Improvement of the quality of Life for Elderly and Relatives throught two Tele-Assistance Services: The TeleCARE approach" InnovaTD – Grupo Skill, Tecnologia 9 41120 Gelves (Sevillia), Spain,

[2] Asthana, Sheena; Halliday, Joyce; "What can Rural Agencies do to Address the Additional Cost of Rural Services? A Typology of Rural Service Innovation" Health and Social Care in the Community, 2004, 12(6), pp.457-465.

[3] Banahan, E.; "The Social/Non-Technical Challenges in Developing Technology to Support Elderly Care - The TeleCARE Experience" RoundRose Associstaes Ltd, Southbank House, Black Prince Road, London SE1 7SJ, UK.

[4] Camarinha-Matos, Luis; Afsarmanesh, Hamideh; TeleCARE: "Virtual Elderly Care Support Communities" The Journal on Information Technology in Healthcare, 2004, 2 (2), pp.73-86.

[5] Wakefield, Bonnie J.; Holman, John E.; Ray, Annette; Morse, Jane; Kienzle, Michael; "Nurse and Patient Preference for Telehealth Home Care" Geriatric Times, March/April 2004, Vol. V, Issue 2.

[6] Pfeller, Thomas; Huber, Elisabeth; VanVenroy, Bart; Striekwold, Rolf; Hermsen, Andre; "Telecare - Practical Experience with Video Communication in Home Care" Published for the Med-e-Tel conference 2006.