SENIOR CO-HOUSING IN RURAL AREAS: TELEMEDICINE THE ANSWER?

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Abstract: Desertification of rural areas is a major problem that developed countries face; simultaneously, the percentage of the senior population in urban areas increases dramatically. This research is grounded on the theory that public and private investment in senior co-housing may help to fight depopulation in rural areas and, at the same time, help to regenerate both urban and rural populations, through relocation. Yet, the theory has a major constraint: health services are not, broadly speaking, promptly available in those locations and, by definition, surrounding areas and senior citizens require a higher standard of health care. This paper shows that the constraint can be solved with a dual approach to health care: including health care units and staff within the development, in an exclusive or shared concept, and telemedicine.

Key-words: Telemedicine; Cohousing; ICT; Inclusive Design; Domotics.

Resumo: Os países desenvolvidos e em vias de desenvolvimento confrontam-se com o grande desafio da desertificação das áreas rurais e remotas em simultâneo com o significado crescente da expansão do número de indivíduos mais velhos, no território em geral e nas áreas urbanas em particular. O conceito subjacente ao Cohousing, habitação em comunidade (ou em condomínio), financiado por investimento público e/ou privado, pode contribuir para o melhoramento da qualidade de vida dos indivíduos, minimizar a desertificação de áreas mais remotas e promover a gentrificação nas áreas urbanas, pela recolocação dos indivíduos, pela humanização do ambiente construído e pela actualização das suas funções aos requisitos do quotidiano. Contudo, as vantagens apresentadas pela teoria são contrariadas pela insuficiência ou inexistência de serviços nas mais diferentes áreas (social, cultural, etc.) com especial incidência na prestação de cuidados de saúde.

Esta comunicação objectiva que as contrariedades podem ser contornadas por uma diferente abordagem à concepção do ambiente construído e às funções aí desempenhadas e sobretudo pelas possibilidades permitidas e motivadas pelas novas tecnologias com especial atenção para a Telemedicina.

Palavras chave: Telemedicina; Cohousing; ICT; Design Inclusivo e Domótica.
1. Aims and Objectives

Depopulation of inland rural areas is a major problem that developed countries face. Portugal is no exception and there is an increasing number of small villages becoming deserted and depopulated especially in the inland area. The evolution of this problem is closely observed both by national and local authorities but the adopted measures adopted so far have produced a few results only.

Another problem that developed countries also deal with is the increase in the percentage of senior population. This segment has special requirements and specific problems with a strong impact on society, and most of them require policy measures. Among these problems, there is the housing and care issue which, combined with the distribution of the population in the country, generate massive concentration of elderly people in urban areas.

This research develops the theory that public and private investment in senior cohousing may help to fight depopulation in rural areas and, at the same time, help to regenerate both urban and rural populations, by relocating the required workforce.

Cohousing is a new concept of living in community, tailored by individuals with similar characteristics, such as age. Senior cohousing combines the concept of living in community with the concept of assisted housing. Senior cohousing in rural areas raises the concept of rural leisure housing, and they all blend into a sustainable environmental friendly concept.

The theory has a major constraint that needs tackling: health services are not, broadly speaking, promptly available in those locations and surrounding areas and, by definition, senior citizens require a higher standard of health care. This paper discusses that the constraint can be solved with a dual approach to health care: including health care units and staff within the development, in an exclusive or shared concept, and telemedicine.

In fact, telemedicine may provide the answer to the need of maintaining the cost of health care units at a reasonable level whilst keeping the required quality standard: ancillary means of diagnostic operating remotely and remote specialized attendance with local support can dramatically reduce the operating costs.

Should such hypothesis be proved, the main constraint to the underlying theory is solved and a conceptual model can be developed to implement senior cohousing in rural areas. This paper presents the preliminary findings of this matter.

2. Causes and Stimulus

2.1. Social and demographic considerations

Portugal is a small country on the west European coast, limited to the west and south by the Atlantic Ocean and to the North and East by Spain. History
has demonstrated a preference for settling on coastal areas, and the century XXI has brought no changes: the opportunities to develop activities and to grant economic requirements are significantly higher by the sea, where big metropolitan areas, such as Lisbon and Oporto are located; inland regions have low or non-existent employment opportunities, as well as a shortage of social equipment and services. These circumstances have fostered desertification and migration, leaving an elderly population in residence: According to the 2006 Portuguese statistical data, ratios of elder population are as follows: 112 younger to 100 seniors (INE, 2008); yet interior regions like the Alentejo achieved a ratio of 171 seniors to 100 younger (INE, 2006). This situation presents a considerable demographic challenge and a low birth rate only increases this problem. In 2006, Portugal recorded a resident population composed of 15,5% of young people (below 15 years old) to 17,3% of elderly people (65 years and over); which means 112 seniors to 100 younger (INE, 2008). Families’ structure presents also new challenges. The number of small families is growing, and the majority are composed of one or two individuals (45,7%); families with offsprings are decreasing and so is the number of offsprings: 42,8% without children; 32% with one child; 20,3% with two children and 3,9% with three children (INE, 2007).

Although most senior citizens are included in some social welfare situations, 62% of them are still working because social allowances are small and they can hardly eke out a living. This segment of the Portuguese population is quite vulnerable to poverty and social exclusion, as a considerable number of individuals earn an income below the poverty line. This sector of population is characterised by a low education level and poor health and housing conditions (BRANCO & GONÇALVES, 2001). This situation makes this sector largely dependent on social services, as less than half of the relatives that are employed are allowed to change their professional schedules to deliver family assistance and only 13,4% would want to work less to be allowed to spend more time with their children and other dependable relatives (INE, 2007).

As it is, public services are insufficient and inefficient; waiting lists for health care are long and usual and house care is broadly unavailable. In consequence, senior people survive with few stimuli, insufficient care, at home, on their own, while they can as their (or their relatives’) economic resources leave them with no further options.

The alternatives are not sympathetic. Retirement houses are, in most cases, the only possible solution to solve the question until nature takes its course. These institutions have different quality levels that impact on the cost, but the general quality level is low; the cheapest are the non-licensed institutions, despite their general conditions being poor. The licensed institutions must fulfil some licensing criteria matching facilities and services standards, but still the average level is poor. Some institutions receive self-sufficient individuals during the day and provide them with some indoor and outdoor activities; other institutions receive disabled or less able individuals providing them with some
medical assistance and a place to stay. Most of the supporting institutions are privately owned and public institutions supply assistance to just a small percentage of the population: in Lisbon municipality, public institutions offer assistance to 2.5% of the senior population (JPB, 2008). Altogether, a visit to the average senior support institution in Portugal gives us the feeling of visiting a storage facility of, as the great 20th century Portuguese poet, Fernando Pessoa once wrote, “Postponed dead bodies” (PESSOA, 1998).

The problem starts with funding but hardly ever ends there. The Portuguese community doesn’t include senior citizens or does not offer them any other special benefits. A small tour around parking lots proves that disabled parking plots are occupied by individuals that present no physical disability, leaving us with the feeling that the mental disability is the most frequent in Portugal: no other reason for an apparently healthy individual to occupy a disabled parking is obvious... Broadly speaking, the community offers no services and those that do exist are poor and inefficient and in most cases are located a long distance from the users who have, in most cases, limited displacement capabilities. For the past decade the country has suffered a renovation of the health care system based solely on economic reasons: emergency services are closing and some of the remaining close for the night, speciality medicine is only available in some urban centres, thus forcing individuals to travel long distances to receive health care. These situations are very well documented by the Portuguese press, media documents, blogs, daily news and political demonstrations and some of the most dramatic examples come from borderline municipalities, where people have decided to look for Spanish neighbouring villages for cross-border health care. The most ridicule situations are the ones within interior border, where population prefer, or are forced, to use Spanish services (MARTINS, 2007).

During the second half of the 20th century inland rural areas became deserted because of internal migration to the coastline in search for better professional opportunities. This process still happens and some counties have serious problems with a significant decrease in the number of population, and the settlement of old individuals forced by memories or economic possibilities to stay. Desertification of areas is strongly influenced not only by the non-existence of employment but mainly (and for young seniors and individuals with economic possibilities) by the lack of social equipment regardless of its speciality: health and education. Demographic studies illustrate just that (INE, 2006).

The problem of the desertification of interior areas has been a very convenient political issue, being referred to in political shows and campaigns. To promote the settlement of individuals some municipalities and parishes promote a subsidy, an amount of money for each marriage or birth; the subsidy of birth increases with the number of children, and provide economic help along the first five years of the child’s life. Some parishes add kinder garden allowances. The subsidy to attract the settlement of emigrant families has also been a solution to tackle this problem.
Although these solutions present some results, they have not been successful; economic subsidies are not enough for individuals who require social assistance and life opportunities. Children stay when they do not need school, then start to go out, mainly on teen age to attend specialised school or university; the emigrants after a small period of time give up of subsidy and move to the cost line or cities in search for work.

2.2. Economic considerations

Most Portuguese own their own houses. Reasons for this are mainly political, because lease legislation in Portugal imposes limits to the rents value and to its yearly update since the 1920s (Silva, 1994). Real estate investment is not attractive from the landlord's point of view, as the expected return is low.

The real estate market has been targeted by private and public investment. Broadly speaking, the second has a smaller interference and a significant one in some market segments: rehabilitation of the historical and ancient areas, social housing and support to co-operative construction. Public investment is not profit oriented and, consequently, provides housing on a budget. It is not, however, easily accessible and only a small part of the population benefits from it. The majority of families satisfy their housing needs in the private investment sector, at higher prices.

The weight of mortgages in familiar budget is noteworthy and financial institutions extend the period of loans to up to 50 years. This situation works like an anchor preventing location changes when needed; this also influences the general trend to buy small houses where the need to accommodate a relative for a period of time or permanently is impossible without the privacy of individuals being interfered. In the most populated areas the prevailing type of construction is the one where each floor is accessed through several steps, frequently without a lift. Buildings are common property and each modification, despite its inclusion result, requires the agreement through majority (unless there is municipal or governmental obligation). This agreement depends on the budget, but mainly on the humanity, consciousness and open mindfulness of each inhabitant. Particularly, metropolitan areas present buildings with more than three floors, with stairs and (sometimes) lifts. This model is widely spread from the city centre to the near and far periphery. The most frequent typology consists of two bedrooms, one living/dining room, one kitchen and one bathroom. Real Estate prices are determined by room dimension, finishing but mainly by the location value. This implies the choice of peripheral areas, more or less close to the city centre, and dwelled mainly by night time population. The more distant from the city centre, the less it costs but also it also has fewer transports and equipment, which means less quality of life (Gomes, 1999). Built environment becomes an un-balanced and un-humanised place where the
individual hardly lives with some dignity and quality of life, especially those with special requirements, such as seniors.

2.3. Settlement and built environment considerations

Real Estate speculation and wrong urban planning make the immediate profit appear as the main purpose to draft the city plan. During the last century, the cities' growth followed an unsustainable model, both to their identity and the quality of life provided to their inhabitants. The car use in daily life has expanded the distance between residence and workplace, families and individuals, like no other means of transportation. Traditional methods of planning metropolitan areas are uncharacterised, creating unsustainable communities, through the spoilt energetic management as the addition of physical and psychological human stress. New considerations towards individuals and their life styles will demand new ways of planning the city, periphery and house (GOMES & AUAD, 2005).

![Fig. I. The community planned for the car: path ways and roundabout. Special attention to the lady with a baby trolley. (GOMES, 2007)](image)

Built environment has different causes of obsolescence, as human beings have several ways of diminishing its performance. The important issue is to define the bridge that supports and balances both life cycles, in public and private spaces. If new life styles require inclusive design, the most critical question is the need of people who are not able to live all alone, within exclusive environments anymore (KEATES & CLARKSON, 2004). In view of the character of contemporaneous life, it is important to define the population, its anthropometric and ergonomic description and life style. If the percentage of people with physical or sensorial diseases/impairments is not considered significant (when compared with the whole population), the proportion of the elderly is so, as so are the temporal impairments caused not by individuals requirements but by environment, activities, functions, products or communication systems.
Human beings have been spectators of these changes with the flexibility required to live within inhuman environs, luxury houses which, by their exclusivity, limit the independence of the human condition and consequently the quality of life. This is true for public buildings and is more effective within residential areas. Urban environment should take individuals considerations (Adaptive Environments, 2006). Public spaces should introduce safe equipment, dimensions and finishing, promoting activities and interaction among individuals. Gardens or exterior spaces are not suitable if they do not offer seats, shadows, equipment, such as cafe shops or a vending machine, local fairs, reading seats (on a quiet area), thematic workshops, musical or theatre scenarios, appealing to the human sensitive perception to attract and maintain people. Accessibility is important to promote the mobility of individuals, despite physical requirements for the elderly or the young couples with children. Considerations should be taken to pavement dimensions, sloping, finishing, colours, and textures. Pedestrian ways, commercial and leisure spaces, spaces and equipment to outdoor activities can be crucial towards the promotion of a stronger commitment with the community and the interaction between individuals within the same area. Public buildings, despite their age or historical interest, should provide solutions for including individuals, appealing to different ages, desires and needs. Indoors scenario is not different.
Inside the house considerations must be made to doors and corridors width; kitchens should be more ergonomic to individual reach; secure to the use of gas and electricity equipment to both children and elderly (GREENSTEIN, 1997). Toilets should guaranty the accessibility and the security provided by good illumination, water drainage and textured finishing avoiding falls.

Inclusive design is a recent area of knowledge even though it results from the awareness of each professional and intervenient in daily life activities. The complexity of the built environment elected it as one of the major areas which need the data and knowledge of the inclusion concept. Efforts are being made to include the training and practice of these issues in architectural conception but always with a strong opposition from professionals, owners and, frequently also, users. Inclusive is considered expensive and useless.

Municipalities have been blind to this reality. Despite the fact that the law of 123/97 (Decreto-Lei, 1997) established a seven years term for public spaces and buildings to comply with its requirements, the reality is that when this statute was replaced in 2006 by the Decreto-lei 163/06 (extending the requirements to residential buildings) the vast majority of the consequences of the first regulation was still not enforced and aimed buildings and spaces were and still are, not inclusive and non-complying with legal requirements. Until recently, the Portuguese legislation respecting public buildings accessibility requirements excluded people whose requirements were not a wheel chair and applied only to public buildings. Presently, the legislation applies also to dwellings but it is still a document where the “should” prevails instead of the “have to”. Municipal (or governmental) authorities have a crucial responsibility to prevent unacceptable attitudes, decisions and practices while promoting and encouraging good practices. Legal support can be of extreme importance because of legislation application and implications.

If these examples are harmful to individuals in general, they have a strong impact in individuals with special requirements in particular. The legislation of the past decade reveals practices which comprehend no more than the one ordered by law, with no other (anthropometric, ergonomic or cognitive) concern. In fact, they could be more or less accessible but they are not inclusive (GOMES, 2006).

3. Telemedicine

3.1. The ICT as a tool to communicate

During the last century, telecommunications enabled communication between communities and individuals. More than reaching people by road, maritime or air transportation, the possibilities granted by the telephone, fax,
telegram, telex offered not only the relationship between organisations and individuals but also shortened distance in time. Geographical barriers and the isolation of the people living in remote areas diminished. Inducing the economic existence of regions and individuals, they could also establish a multisided link between the hypothesis that telecommunications and transportation bring together individuals but simultaneously promote the insertion of individuals, houses, and facilities in peripheral and/or remote areas.

Telecommunications advances allow new methods of work and innovative production. The works result is no longer "goods"; that is the time of information. This product requires quality production, incompatible with mass production and unskilled, irresponsible and unhealthy workers.

The media, as communication tools, determines the ability to reach transmission. If there are no technological aids, geographic proximity is essential to social insertion. If the way to establish communication is gesture, then the transmitter must be within the field of vision of the receiver. The same happens with oral communication. If there is some sort of technology available, the distance may increase and the number of individuals available to socialise increases. Transmission is amplified. This amplification may be reached by any technological means. Writing is one way, smoke signs is another, Internet yet another. The only significant difference among them is range and efficiency (GOMES, 2003).

People use the ICT and the Internet for different reasons that range from work, research activity to public bureaucratic and humanitarian services. Some people use this new communication tool and feel integrated in a virtual group with similar interests; some people aim that the introduction of the ICT at workplaces diminishes face-to-face contact, allow more working hours and this, increased by the inclusion of the ICT in the dwelling, enhance the possibility to develop a workaholic and isolated personality. The ICT can both minimise the feeling of social isolation or emphasise the same feeling. Email or a home page can be a process of contact as so the traditional telephone, mail or smoke signs used to be.

The modern lifestyle is characterised by a constant dynamic and a dispersion of the family elements throughout the workplace, the kindergarten, the school, the nursery and home. This dispersion is deemed to be necessary for a better quality of life, measured in education, health, elderly care and professional achievement. The big question should be, however, how the ICT can improve or stress our daily life. The majority of the surveys gathered can present some biased conclusions provided by fancy or unfocused questions. The fact that the number of physical contacts diminishes does not mean that communication between individuals or between individuals and groups or organisations is reduced. In fact, social integration is not determined by the number of contacts, but by the quality of these contacts. The statement "alone in the crowd" is a very well known "cliché".

The ICT cannot provoke social isolation as it was conceived to be a communication tool to overcome geographical and time constraints. Social isolation
is a consequence of the lack of interaction between individuals and groups. The way people interact with each other is an essential characteristic of the individual personality, influenced by education, culture, social and economic realities where the individual's placement is inherited. Apart from this, social isolation is always described in association with age, living alone in elderly, reform and distance from the daily habits, physical disability, and illness. This is not new. Everyone can speak about experiences of colleagues, neighbourhoods, and relatives who, in a certain moment of their lives, became lonelier because of a specific reality. Social isolation is related with the human being as an individual and how he/she interacts with the social environment he/she is inherent to.

Once the features and requirements of human behaviour are identified, the impact of the ICT on focused issues like personal and professional contacts, daily habits, the family life, on other ways of gathering information and communication, such as TV, newspapers, telephone, mail, etc may be assessed. Another item which is worthy of analysis is the role of the ICT, particularly the Internet, as a tool of the humanitarian or human care helpdesk (GOMES, 2002). The Internet's purpose, as other forms of remote communication, such as mail, telephone, TV, newspapers and magazines, is the communication between individuals, groups, organisations and ideas. Both the process and the result will certainly demonstrate the strength of a network connection between individuals and organisations, show the advantages which can be brought and minimise the disadvantages that were identified in a structurally undefined manner.

That young people are the cluster more interested in the ICT is neither new nor surprising; this reality includes mobile phones, email, messenger or features as Internet phone. In fact, the last decade switched spectacularly the way people exchange information and the need to be online (available) emerged.

Each of these items has already some observance from senior cluster for daily life communications; from the neighbours’ conversation, to distant relatives’ piece of news, to order bread from the supermarket, to appoint a visit to a doctor. Mobile phones can be the easiest tools to use, which is why they have a stronger presence in this group. As regards the Internet, seniors present more difficulty, and some hesitation to use it explains the percentage of the Internet use within this group, 25% (INE, 2007a).

Some political decisions can benefit the increase of the ICT implementation and usage. Telecommunications coverage, telecommunications costs, the permission of more activities online, considerations to the perception of information and a more inclusive virtual world can be the key to a challenge between individuals and regions. New technologies allow the "physical as perceptual” presence of individual in a more than ever remote distance.

A good illustration of these statements is the result of an experiment promoted by Capinha, a remote village in the interior municipality, which offered the free access to the Internet. This village, usually populated by senior citizens
has begun a new way of attracting population: through the possibility to inter­
act for free. At the beginning, there was a boundary between the two sets of
individuals but this boundary has tended to disappearing. At the same time, the
municipality has provided training sessions and Internet rooms for whoever
may be interested. More than work or commercial applications, curiously these
individuals generally use this tool to contact relatives emigrated in other Euro­
pean countries and even to communicate between neighbours within the same
village through the Messenger. In fact, the way of communication is challenging
the distance between regions shortening the proximity between individuals
(FONSECA, 2008).

3.2. Tele concept – a new way of living

The ICT inclusion in daily life has enabled technical performance of se­
curity, especially in the healthiest areas of the house, favouring the inclusion of
individuals with severe and complex needs. Moreover, it has also been the most
frequently used technical device of communication, leisure and work activities
for people in general (GOMES, et al., 2000). Considering that the ICT was concei­
ved and developed as a tool to minimise geographical and time constraints
(among other constraints), it has become very difficult to identify it as a cause
or the reason to design or tackle any kind of isolation, particularly social kind.
Along with these statements, characterising the citizen of the 21st century,
the citizen of the information society, is crucial. Besides, we should pinpoint
his/her physical, educational, social, cultural and economic identity and verify
the impact of the ICT in his/her natural and daily behaviours.

The latter years of the previous century witnessed a complete revolution of
the way people developed its professional and social/personal activities. This
revolution was granted by the computers increased performance and portabi­

ty and by its introduction in our homes and in our everyday life. Nowadays,
the computer is an interactive tool expanded by Internet connection.

The availability of the resources in expansion on the Internet provides us
with information that can be a precious help in:

  - Work: enhanced performance and information level;
  - Research: quantity and accuracy of the information make it a perfect
tool to gather and manage information;
  - Leisure times: games, travel, cultural and other sites can provide
entertainment;
  - Public service: can be divided into two categories – the bureaucratic
one and the social/humanitarian one.

The ICT is essential in the modern lifestyle. It has got out of the office and
invaded our houses, leisure facilities and transport.
This sense of “attaining” allows new ways of doing the type of activity independently as long it deals with information. These phenomena challenge standards of individual behaviour and they draft new ways of living. Both the metropolitan areas, and the coastal areas are hubs of employment, training, graduation, health and social facilities; nevertheless these areas are also characterised by violence, poverty, environmental pollution, urban chaos and exclusion (Fidalgo, 1999). Individuals have some difficulties to identify themselves with any place: they spend more time in the workplace but they act as a visitor; in the dwelling area they are closed at home, resting, managing or enjoying family life. The mono functionality of these areas is also an added value to this feeling (Gomes, 1999). This reality, together with the development of land communication, moves individuals to rural areas with a rapid and comfortable access (by private transport), in the past as a seasonal occupation, is tending to become permanent. Yet, this reality is not too clear in number when compared with the preference for the urban centres. Nevertheless, it constitutes a very interesting paradigm. Reasons for these movements include the number of retired individuals who decide to return to their place of birth as liberal professionals and entrepreneurs searching for new values associated to comfort and luxury. These two sets are the extremes of a line which explains the lack of representativeness of the sample within the whole population; the first is characterised by low education levels, poor incomes depending on welfare, but identified with the place by birth or antecedents; the second is characterised by higher incomes, good education levels, regardless of their economic and social condition. Even though they are not identified with the place, they are open to accept and live with the local habits. They work with the “tele concept” where travel distance has been replaced by mobiles, emails, wireless, confidence in remote transactions, etc. Whereas the lack of social and cultural facilities is a reality, their economic status and their time management enable different alternatives. Information society aims and demands an informed community; therefore, those regions and individuals must be informed by the ICT potential of large coverage and of providing individuals with the capability of “doing”. Technical and economic capacity of each region of promoting the use of the ICT can grant neglected regions a valuable contribution to the promotion of a new way of populating and managing. The opportunities raised by new technical performances of individuals, the opportunities offered by tele-work, e commerce and telemedicine can be crucial to the idea of shortening the distances in a global village.

3.3. Telemedicine a new paradigm to be present

It is widely accepted that Telemedicine concerns the ability to promote interactive healthcare using the ICT. This new paradigm endorses/increases the speed up of diagnosis and therapeutic care delivery for special mobile con-
ditions, emergencies, virtual care centres/hospitals, assisted living, patient’s homes, etc... (ETHEL, 2008). In fact, telemedicine explores the communication potential of the ICT despite geographical or individual barriers. Albeit it seems a different way of doing medicine, Telemedicine does not change nor should change anything in the ethical procedures taken by a professional within this cluster: just the means. Informally, Telemedicine starts with the telephone, once this technology provides the effective communication to call the doctor, to describe symptoms, to prescribe treatment and to tackle a considerable set of situations (TELEMEDICINE RESEARCH CENTRE, 2007). The expansion of communication provided by computers and the Internet, the introduction of digital technology in complex and everyday equipment allows to expand their applications. Nowadays, Telemedicine enables the exchange of emails, individual information integration, video technology for diagnosis, prescription, treatment, and surgical intervention, among other types of communication. The exchange of information can be done between hospitals, services, doctors and patients.

Many advantages can be considered by the use of Telemedicine. The major one is the possibility to offer care and reliance to people who due to regional or individual qualities have been excluded from the traditional system (BUTTERFIELD, 2008). Yet, different studies have demonstrated also its benefit for individuals, who, due to health specification, ethnical rituals or just diffidence, understand the benefits of some privacy. This privacy, together with promptness can be a crucial reason for a more effective and fast assistance to users. Telemedicine can and should be a crucial issue towards a better local, regional and national health care system. Yet, its positive forwarding will only be made possible if there is a strong awareness and commitment by competent political authorities, professional clusters and individuals for a more effective, efficient and convenient service (ETHEL, 2008).

The implementation of this new method of looking after people can be started by an easy and informal solution such as emailing questions and answers on the Internet messenger with webcam, whenever direct contact is demanded (although image is fairly good). In a more institutional appliance, this remote exchange of information can be helped by a portal with suggestions for users, remote access to administrative procedures, contacts to specialised professionals or in more specified cases to promote permanent contact to individuals with chronic features.

The expansion of equipment capacities as communication technologies has made the video technology as the preferable one to see, study and interact with patient in real time giving the confidence needed to implement and invest in this new approach to health care (TELEMEDICINE DEPARTMENT, 2008). Technology improves to unexpected levels and many studies are undertaken to understand and develop the impact of this model of quality of care and satisfaction (AMERICAN TELEMEDICINE ASSOCIATION, 2008).
People have reacted harmfully to this change and maybe this is the main reason for this exchange being blocked. This reaction results from negative experiences of remote actions and activities, pessimistic opinions on the health care system in general, and also due to the lack of knowledge of legal, practical, privacy and interoperability related issues (ETHEL, 2008). But the seed was already dropped in institutions and gradually some information integration has been made possible, such as the invitation to appoint services by phone or on the Internet, and the fact that some doctors have started to give their professional emails to patients promoting a more effective communication between them. This reality is more effective at private health care institutions located in the metropolitan areas. This pattern illustrates the sense of global connection between individuals, equipment, competences, information towards the reduction of commute movements and a more care and intelligent assistance.

It is worth of mention the fact that telemedicine, as any other activity helped by the ICT, does not and should not replace face-to-face professional contact and human affection. Telemedicine does not and should not be implemented by economic reason, once this answer can be a source of failure of the process and the reason to increase the suspicion towards new technologies as new methods of doing.

In Portugal it is possible to identify three “virtual” public services, operating within a domestic framework, different in methods although their objectives aim prompt assistance to individuals as a choice beyond hospitals and health centres; yet all are very well classified by their users. The National Health Service – health line – (MINISTÉRIO DA SAÚDE, 2007) provides a phone line number which people can call to 24 hours a day, and express their anxieties and ask for assistance. On the other side of the line, qualified professionals suggest different approaches to medical recommendations, including the contact to other public services. This service deals with the whole population once there are specialised services directed to children and to the elderly. The service focused on children, “trim, trim, doi, doi” (CAEIRO, 2008) works also 24 hours a day, and is the one that has received more positive feedback from its users; all the observations written on various online documents, reveal the professionalism, the attention and the knowledge demonstrated by players. Several cited opinions pinpoint the quality and suggest the extension of this model to other medical areas. The third service is the “linha do cidadão idoso” – line for the elderly – (PROVEDOR DE JUSTIÇA, 1999), intends to be a phone communication where senior individuals can learn their individual rights; in practice this service works from 9 to 5 (although a recording system covers the period from 5 to 9), and the seniors individuals who use it describe their anxieties, their need of help and often declare how they have been abused of. According to statistics of this service, the victims are mostly individuals aged between 71 and 90 years old, and have experienced violence and negligent acts. Most experiences of vio-
In a country with so many asymmetries, as Portugal, Telemedicine, as a new approach, can be a significant help to the reality lived by so many areas. The experience related by users of those media, demonstrates that several areas, remote and peripheral ones, have deficient number of qualified staff to respond to the requirements of the population. Some municipalities present a poor number of “médico de família” (doctor of the family) whereas others present a typical picture of health centres. This is the case of Aveiro’s district, although its coastal geographical location and the existence of some industry, 30851 users (4%) do not have their “médico de família”; 1813 decided not to have it; and the ones who prefer to have it, represent a ratio between doctor and patient from 1/1450 to 1/1750 depending on the parish (COSTA, 2008). Although this implies a personal contact between players and users, this traditional model is inefficient once the imbalance between the parties do not allow the time and concern required; yet its design results from economic options.

Telemedicine should not be enforced by economic criteria: users must feel comfortable with the model, and for that a multidiscipline’s team is essential, with well qualified professionals (in the academic and practical levels). In consequence of the reasons mentioned above, Telemedicine can be a model to implement within areas with special requirements, ranging from desertification to non-existence of social facilities. The example of Capinha village and the success of some “virtual” social services, give the impetus to define some areas as pilot studies for implementation and evaluation. By observing these examples, it is possible to state that remote areas can be helped throughout net communication, fading the gap between city centres and remote areas, where people can feel attracted by geographical or thematic interest, return to family origin, cost reduction (like dwelling, commuting, net communications, etc.…) without being economic, social or culturally segregated.

4. CoHousing

Everywhere, people talk about feeling isolated, or about not feeling safe at home. In today’s fast-paced world of competition and lonely individualism, we need a place to belong to, a place where we feel safe and supported. And yet, when we need to get away, we need a place to be ourselves - quiet, separate and safe.

While community living is not a new phenomenon, one must acknowledge that with the success of cohousing, the idea is being spread for the first time on a global scale. If globalization tends to destroy cultural variation, the flexibility
of cohousing has allowed it to resist that trend and to adapt to people’s needs in different cultural contexts.

Cohousing communities combine the autonomy of private homes with advantages of shared resources and more sustainable living where people know and interact with each other. Yet cohousing offers an ideal balance of privacy and community, with members choosing to interact within neighbourhood activities at the level they prefer. The basic traits include a common house, shared facilities, self-governance by consensus and design input by community.

Residents usually own their homes, which are clustered around a “common house” with shared amenities. The amenities may include a kitchen and dining room, children’s playroom, workshops, guest rooms, home office support, arts and crafts area, laundry and more. Each home is self-sufficient with a complete kitchen, but resident-cooked dinners are often available (Canadian Cohousing Network, 2004).

Cohousing residents involve themselves in the planning, design ongoing management and maintenance of their community, meeting frequently to address each of these processes. Cohousing neighbourhoods propose environmentally sensitive design with a pedestrian orientation. The optimal community size contains between 12 and 36 households emphasizing a multi-generation mix singles, couples, families with children, and elders. In addition, several new communities are designed especially for elders (The Cohousing Association of the United States, 2008).

The majority of these built communes have a relationship with the ICT. A detailed search on the internet makes us understand that this relationship has different goals, such as the presentation of the community, the interaction with people in and outside community, and the assistance to inhabitants. Several cohousing communities have websites where it is possible to establish contact with the community. They state the concepts and principles beyond the construction site, illustrate it with technical and artistic drawings, photographs, observations of inhabitants and visitors. These portals can also be very interesting to introduce inhabitants; to promote events calendars, and is also possible to find email addresses as blogs to encourage the virtual communication between inhabitants and between them and others. Yet, it is noteworthy the fact that the existence of each community portal does not restrict any personal website, personal or professional email address, or virtual contacts of each individual or family.

The six defining characteristics of cohousing:

- Participatory process – the future residents organise and participate in the planning and design process of their communities so that it meets their needs, and are responsible as a group for final decisions;
- Deliberate neighbourhood design – the physical layout and building orientation encourage a strong sense of community. The private residen-
ces are clustered on the site, leaving more shared open spaces. The dwellings typically face each others across a pedestrian and courtyard, with cars parked in the periphery, and sometimes with underground parking structures. Often, the front doorway of every house affords a view of the common house;

- Private homes and common facilities – Communities are generally designed to include significant common facilities for daily uses, to supplement private living areas.
- Complete resident management – Unlike a typical condominium homeowner’s association, residents in cohousing usually manage the development, and also perform much of the work required to maintain the property. They take part in the preparation of common meals, and meet regularly to solve problems and develop policies for the community.
- Non-hierarchical structure – There are not real leadership roles. Decisions are made together, as a community, often using a decision-making models such as consensus;
- No shared community economy – The community is not a source of income for its members. Typically the maintenance work of the village is considered as a task to be developed also by cohousers, a contribution to shared responsibilities. This is a significant change to the dynamics between neighbours and defines another level of community beyond the scope of cohousing.

4.1. A brief history

The cohousing idea originated in Denmark, in the late 1960’s, as a group of families designed a neighbourhood to reflect their desire for friendship and trust among neighbours of all ages, safety for children and the elderly, a spirit of cooperation and caring for each other, opportunities to share time and resources and a design and development process that respected the environment. The Danish concept of “living community” has spread quickly. Worldwide, there are now hundreds of cohousing communities, expanding from Denmark in the U.S., Canada, Australia, Sweden, New Zealand, The Netherlands, Germany, France, Belgium, Austria, among other countries.

Cohousing residents broadly aspire to “improve the world, one neighbourhood at a time” and the goal is “to explore and model innovative approaches to ecological and social sustainability”.

In Europe, countries can be divided into two groups: the Scandinavian countries, including Denmark, Sweden, and also Holland, which pioneered cohousing more than 30 years ago; and the Mediterranean countries, including
France, Spain and Italy, which are only now beginning to realise the advantages of cohousing.

One interesting observation that can be extrapolated from the European experience is that across the different countries’ approaches to cohousing, cohousing for the elderly is booming across Europe. This is a positive sign, as the biggest challenge for cohousers in the years to come will be to ensure that elder are integrated into the larger society as fully as possible. As the European experiences show, the highly nature of cohousing can offer a more sustainable alternative to society (MATTHIEU, 2007).

4.2. Senior Cohousing

Traditional forms of housing no longer address the needs of many older people. Dramatic demographic, economic, and technological changes in our society have created a population that lives longer, ages healthier and is looking for alternatives to their current housing situation as they age (DURRETT, 2006).

Senior cohousing takes the original concept and modifies it according to the specific needs of senior, as usually limited to those 55 years of age or over. The result is a welcoming little village that invites involvement, cooperation and friendship – a recreation of earlier times when community participation was viewed as an essential part of social, mental and physical health (DE LA GRANGE, 2006).

Cohousing offers the social and practical advantages of closely knit neighbourhood consistent with the realities offered by the twenty-first century life, as assistive technology and the ICT. In senior cohousing residents can choose to grow older meaningfully, consciously and independently in a self-manage, close-knit community; it is similar to the mixed-generation cohousing model, with the following modifications:

- Careful agreements among residents about co-care and its limits;
- Use of inclusive design appropriate for seniors: each living space should support the transition from a house with an active lifestyle to one that supports progressing needs accessibility;
- Size limitations – a maximum of 30 living units, usually 15-25;
- Common areas, indoors and out, are designed to provide easy access and recreation for all levels of physical and sensorial ability;
- Studio residences can be included in community’s common house to provide living quarters to home health aides whose services may be shared by several residents, allowing to remain at home for all but major medical emergencies;
- Senior-specific method for creating the community.
Senior co-housing technology can be a precious help to the safe, comfortable and healthy use of the built environment. From the simple sensor to water, gas or electrical control, to assistive equipment to improve posture, mobility, strength, or more sophisticated features, the existence as the performance of technology can be vital to reach the objectives of the community in general and the individual in particular (Scotthanson, C. & Scotthanson, K. 2005).

Contemporaneous seniors are familiar with the use of mobile-phones, and sometimes computers, and the Internet. Each of these items can be a tool to improve communication between relatives, neighbours, professionals from different areas, individuals with common interests, special requirements, etc.; if it is not the case, professional staff from the common house as any neighbour can help in this communication management. Physical, sensorial as mental conditions can be resultants from chronological or biological features, emerging the need to have a medical centre or privileged access to the most near one. The ICT can be the tool to step up the contact, to permit virtual assistance through simple equipment, such as mobile-phone (by oral description), computer, internet and webcam to video equipment to support more complex requirements.

Cohousers tend to be people who are seeking to improve their quality of life, people who are interested in a large community around them and who like to think globally and act locally. To the best of their ability, they take responsibility for themselves, for the world they experience, and for their children will inherit.

Cohousing offers the environmental solutions and sense of community that our society needs for such a long time.

5. Case studies

The inclusion of two case studies aims to illustrate the implementation of the concept within different geographical regions, with different types of individuals but the same desire to provide comfort, interaction between individuals as generations in a sustainable way to promote a more participative life for people in general and seniors in particular.

The two cases selected aims to determine some visible indices which can and should be consider within the planning of built human environment.

5.1. La Querencia, California

The first case to study is located in Fresno, California, United States, within an area of 1.1 hectare nearby an elementary school and retail areas.
La Querencia is a project of cohousing headed for an intergenerational community characterized by twenty-eight homes and common facilities like children's playground areas, pool, spa and exercise facilities, and also a common house to commune activities, such as dinner and living areas. The built complex is targeted to active adults who wish to live in community in accordance with the rules determined for this venture. The resident population is characterized by different backgrounds: single, married, with and without children, working and retired individuals and families.

This complex has no leader, as cohousing principles suggest, and all decisions are taken under group discussion. It is a multi-generational friendly environment within easy walking distance between various facilities. The main goal is the balance between this new life style and energetic efficient design within a natural environment. There are no prototypes towards religious and political beliefs only the aspiration of living within an interactive and sustainable neighbourhood. The values proclaimed by the group concern the share and care concepts, personal growth, privacy and communication, teamwork and fun, and sense of family.

La Querencia does not differ from a condominium as so many others under the target of a population with income. Legally it will have the same requirements and demands like monthly fees; but cohousing communities in general and La Querencia in particular are targeted to the sense of community. This sense is illustrated by the location of the built complex, geographical orientation of each building, facilities offered, urban design, a common house and the communication between the different home units, backyards and walkways.

Usually, the common house is the core of these community condominiums; this condition is made possible by the activities, functional areas and support offered. This is the case of la Querencia. The common house is featured by a kitchen, a great room and a sitting room, children area, laundry facilities, guest apartment and terrace. The freedom to use if wished the services provided by the common house allows people to have different daily schedules, interact with inhabitants or visitants of the complex, according to their aims and needs.

There are four different typologies of private houses, ranging from two to five bedrooms; despite the disparity of rooms number as available area, all units include: kitchen, living room, laundry, covered entrance, and yard (with the exception of upstairs flats). The houses intend to materialize the sustainability of the complex, using natural and qualified materials to ensure a more comfortable thermal and acoustic environment, low maintenance as energy efficiency and management. Although sustainability is a very interesting issue on its own, in fact helps also within the quality of life of individuals with some requirements as senior ones. The use of equipment for energy efficiency and maintenance improves the functionalities of the community, and reduces the
dependence on electricity and gas equipment, as private gardens. Walking distances develop the outdoor living and neighbourhood interactions. The houses have different typologies, usually split in two levels though the first level guarantees all the facilities needed in case of mobile condition. The purpose to have a familiar and human environment, allows temporary residence of visitors, in private units and, if required, within common house. Understanding the importance of domestic animals for some individuals and families, La Querencia allows the existence of domestic pets within private dwellings although is from their owners the responsibility to take care, and to manage their daily life.

The cohousing inhabitant arrives from different or similar backgrounds according to the objectives of the particular complex. In the case of La Querencia, inhabitants come from different professional, economic and cultural backgrounds. Most are active adults who feel affection for living in community. Although this reality, every inhabitant has his or her own dwelling, the exclusive use of its backyard, allowing privacy if desired. Nevertheless, common areas as facilities available increase the contact between individuals; nevertheless this does not requires or compel the communication and resembling to everyone. Ethical and respectful rules must be defined and obliged. The individual is free to choose who wants to private with as it is morally obliged to behave with respect for the whole community. This is very important for the accomplishment of common activities, such as exercise room, cleaning and cocking within main house, garden and pool maintenance, etc.

5.2. São José de Alcalar, Algarve

The second case study is located within Freguesia Meixolheira Grande, Portimão, Portugal, a parish with 88 square kilometres and 3,598 inhabitants (COSTA, 2001).

The building complex within an area around 20,000 m², was constructed aiming to answer to a very aged population cluster in interior desertification. This model was designed for the gentrification of the inland rural areas where there is a large number of ageing population and few work opportunities for the youth.

Aldeia Lar São José de Alcalar was created for a very poor and ageing population, the big majority is aged over 75 years, couples, singles or widow/er, without any possibility to live all alone at home. To deal with this sense of incapacity and loneliness, several individuals tried to commit suicide, and that was a main issue to deal with and a crucial one to sustain and promote this project (COSTA, 2000).
The Project of Aldeia lar São José de Alcalar was created for the elderly people living in Meixolheira Grande community. The physical layout and geographic orientation encourage a strong sense of neighbourhood. The 52 private residences are clustered on the site, allowing different open spaces used as small gardens supporting different activities to interaction relationship. Residences were planned in two round blocks opened to a garden and pedestrian ways. The layout invites an involvement, cooperation and friendship.

The big “S” (solidarity) shaped building at the starting point of the complex is the common house. This place is where elderly people share amenities. There are a kitchen and a dining room, guest’s room, arts and crafts area, laundry, beauty, chapel, home office support and medical care. In the outside, there are amphitheatre and a coffee shop. A visit to the site made us realise that individuals interact and are deeply involved with these areas.
The medical care support is like a resting room, where a nurse takes care of the residents' medication. A doctor visits the site on a weekly basis, assisting individuals and redirecting to different types of assistance in case of need. Medical technology is not available but a freezer, to store some prescriptions and the equipment to measure blood pressure is present. Computers are used to perform administrative tasks and internet is a dream for the youth space. Although the example, reveals that a significant inadequacy of prompt support to this fragile population is similar to the experience lived by the majority of interior areas, and results from different policies adopted along the decades by every local and national government.

Most individual who dwell the complex, were farmers, increasing the importance of horticulture, which can be seen on different parts of the site and this activity is promoted between individuals as the vegetables consumed by residents are cropped there.
Fig. VIII. Horticulture and the hang out are important spaces to interact as the pavement at the front door. (GOMES & DARE, 2008)

Residences present a typology taking inclusive design principles into account that respond to the elderly's needs. Dwellings are composed of a living room, kitchen, bathroom and one or two rooms depending on the residents. The house itself has the flexibility enough to transit from the active lifestyle feature to an accessible one. For that, the dimensions of corridors and bathrooms are important to support all the details needed for a more inclusive environment.

In the first block, there are 26 units with one bedroom for the couples, and in the second block, there are 26 units with 3 bedrooms for groups of male and female seniors. Each house is self-sufficient with complete kitchen, but residents can chose the common house as the place to take the meals, not needing to cook and, thus, increasing the interaction between them. The complex also presents a building used as a kindergarten and a space to receive the youngsters after school; both spaces aim to help families with children during the working hours. Both worlds, young and senior, live within the same space and interact along different indoor and outdoor activities.

Fig. IX. Dwelling environment, an inclusive approach. (GOMES & DARE, 2008)

Aldeia lar São José de Alcalar neighbourhoods propose environmentally sensitive design with a pedestrian orientation and cars should be parked in the outskirts.
Traditional forms of senior cohousing do not present any leader; due to the characteristics of *Aldeia Lar*, there is a leader, Father Domingos Costa, who aims to manage the complex, giving answer to its financial, social, and cultural as spiritual needs. Financially, the institution depends on the contribution of residents, through their pension and with the contribution of the parish. In Portugal, most senior individuals survive with a pension. It is the major earning for these people and it is often lower than the domestic minimum salary. This social benefit is a heritage from the presidential regime before the 25 April of 1974, which qualify individuals to a pension whenever they did not receive any contribution to a pension fund or when the time of contribution was not sufficient to guaranty the pension.

*Aldeia Lar* São José de Alcalar started to work in 1995 and nowadays it shelters 105 senior individuals; the suicide rate has dropped to zero.

6. Future Trends

The ageing of population and poor job opportunities in the inland of Portugal are vital reasons for the desertification process. Elderly people need to stay at their home for much longer without losing mobility for social relationships. Nowadays, the traditional houses do not contribute for the inclusion of senior cluster. Elderly in particular and individuals in general requires a flexible and human built environment to support the individual and family life cycle.

The scientific and technical evolution in the world opens a large range of solutions challenging traditional society patterns towards a more inclusive and sustainable one.

Cohousing concept is a case of success in different continents and is spreading across Europe. The innovation proposed by this paper is to link cohousing concept, with the evolution and deployment of the ICT (with special incidence within Telemedicine). The benefits from this match will influence the quality of seniors’ life and youngsters’ settlement of population in the interior areas. The idea is the revitalization of urban areas as dwellings, promoting a more inclusive and sustainable built environment as a balance between metropolitan and rural areas.

Since the beginning of the draft of this paper, media have reported news about the proliferation of Internet hotspots in different municipalities in this country (*Loureiro, 2008*) and its success attracting visitors. Technological changes are challenging the way people inhabit and use cities and villages.

The humanization of built environment is an objective to reach where the support to the individual is crucial to its economic, social and cultural survival. Cohousing and practical experiences, such as *São José de Alcalar*, can be important for the increase of demographic features of interior areas, its economic sur-
vival and the quality of life of senior citizens. The health care requirements can be accessible through telemedicine enabling a cost-effective solution.

São José de Alcalar employs 60 workers to support 105 seniors and manage the kindergarten. This means that 60 families have found work in a rural area; together with the fact that the parish has managed to settle more than 200 inhabitants, including senior citizens. This is not a figure to underestimate.

The underlying concept of this project is admirable and its success remarkable. The ICT can be a precious help to communicate with the health cluster, cutting commuting costs and thus freeing resources for investment if it is intended to go even further.

7. Conclusions

Population settlement nearby communication ways and big cities is an old issue with no solution while political, social and cultural policies do not create opportunities to link individuals to regions with different features. Desertification of the interior areas is not just a question of imbalanced employment and academic development opportunities; it deals with the lack and often with the non-existence of social facilities to promote the quality and dignity proper to individuals regardless of their sex, age, race or special needs.

Present-day society presents a new paradigm, with an aged but healthy and active population, who aim and need more inclusive environments. The planning of the cities in general and the planning of habitats in particular demonstrates the lack of human concerns within their conceptual process. Economic profits, doubtful management and political decisions reveal their influence on the built environment.

Technological equipment and performance increase, although too many individuals and institutions show a poor and inappropriate use of them. This reality emerges a suspicion about the ICT as all professional activities require these tools to develop tasks.

The quality and dignity of the various levels of human life cycle are crucial values towards the respect for human life and human being. Economic, technical and human resources are insufficient in number, qualifications and concentrated within metropolitan areas. Portugal known before condominiums constructed under different objectives, special attention to "villas operárias", which were habitats built near industries where it was possible to identify dwellings, social facilities, such as cafeterías and theatres, to establish relations among neighbourhoods. In view of this, it is possible to state that the model of cohousing is not original but the conceptual idea is so.

The senior cluster of Portuguese population is very well related with rural and interior areas, by origin or by the need to escape from the hectic life of the
city. The need for special care and medical assistance works as an anchor to city environment. Even though public assistance in city centre is not perfect, it shows more alternatives when it is compared with interior realities.

Tele concept in general and telemedicine in particular could be an answer towards these interior rural areas. Telemedicine applications could be qualified alternatives to the actual system, allowing less waiting time, access to specialised professionals, selection of priorities to specialised diagnosis, assistive care and living.

To implement both models, cohousing and telemedicine, is vital to inform and educate professionals and users on their direction. Living in the community is an interesting experience but rules must be defined, obliged and individuals should be penalised in case of disrespect. Special attention is needed to the application of the ICT in sensitive issues as medical assistance, towards the dissipation of a general opinion of suspicious and inefficiency.

A detailed observation to international experiences can be useful to analyse success as drawbacks factors. A detailed study of national behaviours and reality will establish the differences between national and international realities towards the successful achievement of any pilot study.

From the different experiences analysed during this research, it is possible to state that new models of settlement are needed and realistic. The aid provided by the ICT can be decisive to its success, specifically if implanted within interior areas towards the settlement of a heterogeneous population.

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Key terms and their definitions

**Assisted Living** – Intend to balance dwelling facilities and residents requirements. Aims to provide assistance and supervision, ranging from simple daily life activities to other more demanding situations; promotes the health, safe and well being of individual towards his or her independence and dignity.

**Built Environment** – All the man-made surroundings that support and increase human activities, ranging from large scale (as a metropolitan area or a village) to personal (balance between human and built environment life cycles).

**Cohousing** – Living in community. Composed by communitarian house with different facilities, including kitchen, living room, rooms and medical care, and private homes; the community is very influenced by residents’ opinions and decisions, and is managed and owned by residents who aim to live in a neighbourhood that privileges individuals interaction.

**Domotics** – Information Technology at home: promotes security control (including features as light and gas control, protection) but also the network devices which can contribute to challenges to remote opportunities towards individual comfort, social interaction and assisted living.

**Elderly** – Characteristic of the individual who has 65 and over. Nowadays, although age implications as retirement, elderly is a significant group of individuals, by number, but also by their affordability, social activities (as senior universities, or by opposition to complete loneliness) and aim to live as independent as they can.

**ICT** – Information Communication Technology is the study, conceptualization, implementation and management of information using computers and communication systems, such as the Internet.

**Inclusive Design** – Design of products, environments and communication systems to be used by the majority of individuals without adaptation and special design towards the social integration of all individuals in general and the ones with particular needs.

**Independent Living** – Arrangement that maximizes independence and self-determination, especially of disabled or elderly persons living in a community instead of in a medical facility.

**Real Estate** – In the built environment is the land and all the fixed, immovable or permanently attached to it, such as buildings, boundaries fixtures, structures, improvements, etc. This subject usually includes also the air and mineral rights, and surface rights which can be leased, sold, transferred together or separately. More than that is one of the best and favoured investments.

**Telemedicine** – Telemedicine is the ability to provide interactive healthcare, making use of modern technology and telecommunications.