Collaborative housing for elderly – clever co-living concepts

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Key words: collaborative housing, elderly, co-living,

Introduction
The number of senior citizens is rapidly increasing in many parts of the world, which consequently signifies an increase in the number of people having hampered mobility, sight, hearing, or memory difficulties, and the number of people who find increased difficulties processing information. These challenges and additional requirements have to be addressed by designers of living quarters for the elderly and disabled. In particular, how to facilitate movement for people with disabilities and how to improve their quality of life in general. The majority of flats are designed for young, fit, and active people. Many senior inhabitants do not possess the same attributes, meaning that even performing the simplest home tasks is more challenging for them. Furthermore, inappropriately designed housing space can lead to health issues, such as backache, injuries or accidents.

Research has shown that adapting living space to the needs of elderly can reduce the risk of injury by 30 - 50%. The age of the furniture and equipment in their homes also plays an important part in determining functionality. According to the research, 60% of the senior population lives in homes that have not been remodelled or refurnished for over 20 years, which is contributing to lower safety and comfort level. Comfort is crucial for the elderly, as they spend most of their time at home. Over 14% of English elderly citizens live in unfit conditions, in homes that are in dire need of renovation and adaptation (Boyo, 2001). Yet, only 10% of them decide to modify their existing furniture and equipment to reflect their special needs (Gilderbloom et al, 1996). They often refrain from renovating due to financial concerns, lessening mobility and fear of the upheaval of renovation work. Furthermore, research also shows that the elderly suffer from inappropriate room dimensions, including rooms that are too big for them (West and Emmitt, 2004).

Practical example
A case study project, Smart Home IRIS (Independent Residing enabled by Intelligent Solutions), will be presented as a clever co-living concept. Smart Home IRIS is equipped with state-of-the-art communication technology adapted to different types and levels of disability. The purpose of Smart Home IRIS is to demonstrate adaptations of an elderly apartment and the use of contemporary technology and equipment in the elderly’s home environment, as well as to demonstrate and enable testing of various assistive technologies and solutions that would
enables the elderly to have maximum functional independence and safety in their home environment (Figure 1). The CoLIVING ICT-based services address the three main areas of the elderly social interaction context: 1) care and wellness, 2) guidance as a daily tasks assistance and 3) mobility monitoring.

As the development of assistive technologies and smart home technologies is spreading, and rehabilitation professionals all over the world are becoming aware of the benefits of assistive technologies, continued research in this area is essential.

**The objectivities of Smart Home IRIS are:**

- To present a Smart Home as a future clever co-living concept,
- To facilitate public access in Slovenia the demonstration of contemporary technology that assist people with diverse disabilities and the elderly,
- To provide an opportunity for people with disabilities and the elderly to try out and select technical solutions in the demonstration apartment for their respective disabilities in order to maximize functional independence in their home environment;
- To advise elderly, along with their care givers, on the most rational and economic adaptation of their current living quarters with regard to their particular needs;
- To provide equipment manufacturers and service providers, in the field of rehabilitation technology, the opportunity to promote and test their solutions in the integrated environment of the demonstration department;
- To create new opportunities for researchers and developers in the fields of e-accessibility and e-inclusion in Slovenia and elsewhere (Figure 2);
- To facilitate activities for the promotion of a e-accessibility policy in Slovenia and elsewhere.

The goals of Smart home Iris are described in Table 1.
Workshop 5. Collaborative housing and cities

The users of Smart home IRIS are: people with different disabilities and elderly; professional organizations will use the demonstration facility for training and planning of diverse activities for the users; the general public interested in familiarizing themselves with the requirements of patients and elderly and the technical solutions for their needs; designers of similar facilities, especially architects, interior designers and suppliers of equipment, responsible for the technical documentation of new housing or adaptation of existing housing, to meet needs and demands of IRIS users; students of medicine, social services and supportive technology.

Table 1: Immediate goals Smart Home

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<th>Immediate goals Smart Home as a clever co-living concept.</th>
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<td>Facilitate greater independence among all user groups</td>
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<td>Reduce the cost of home-care (health care, nursing and other forms of assistance)</td>
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<tr>
<td>Improve the user safety</td>
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<td>Reduce the need for re-location to retirement homes and other suitable institutions</td>
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<td>Create modular solutions that can be applied in diverse user environments (private living quarters, social institutions, retirement homes, etc.)</td>
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Wood and Human Health in the Built Indoor Environment

The built environment directly affects user health in many ways. Perception of the environment impact emotional and mental states and could have direct physiological impact on the user. Physical aspects of the built environment, such as ergonomic function, safety, and accessibility, also affects individual wellbeing. Targeted design interventions, especially with natural materials like wood, can impart many benefits to users. Benefits that may be imparted by ones built environment include:

- reduced psychophysiological stress, the ability to cope better with stressful events and situations, and increased recovery from stress
- reduced time away from work due to illness
- increased connection with and care for the natural environment
- support for increased social cohesion
- support for more activity in typically sedentary lifestyles

Wood as an element of restorative environment and ergonomic design (REED)

Wood is an ideal material for REED because it satisfies both general tenets of the design paradigm: sustainability and a connection to the nature. Wood from healthy, well-managed forests is a sustainable material, and provides carbon storage in form of durable products. When used in appearance applications, wood also provides a connection to nature.

Wood addresses many aspects of health environment creation:

1. Resource efficiency – sustainably managed forests can supply us with material as a source of fully renewable resource.
2. Material naturalness – wood is a natural material that connects users to nature and provides restorative benefits for their occupants.
3. Nature Connections – the social benefits of natural material used in buildings include increasing users concern for the environment and creating a desire to protect it.
4. Adaptability and safety – wood can be used to create an adaptable environment, furniture, and other products that helps to address safety and accessibility needs for all generations.

5. Diverse functionality – wood has the appearance, physical, mechanical and structural properties, and product applications that provide benefits beyond their primary purposes.

6. Innovation – there are many ongoing research activities to improve the functionality, service life, and suitability of wood and wood products for the variety of uses.

There are many indoor environments in which occupants would benefit from REED. Recent research has focused on offices, hospital recovery rooms, schools, and homes.

Conclusions

Smart home as a clever co-living concept could be the future solution for the ageing population, while promoting healthy and safe ageing. It includes the latest equipment, technical aids and rehabilitation technology, which improves the elderly with enriched quality of life and assure their optimal occupational, educational and social integration in society. Improving accessibility, functionality, and safety at home, at work and in society in general requires combining many disciplines together to develop solutions that integrate ICT, ergonomics, healthcare (psychological and physical), building, and community design. The work of the Smart home involves new expenditures: the employment of new professionals, maintenance of the demonstration apartment with its equipment, renewal and continual improvement at the same. In spite of the initial high costs for technology, in the long run investment will reduce public expenditures for the social and medical care of elderly. Smart home is one possible example of future co-living concept for elderly. Since the built environment directly affects user health in many ways, wood is an ideal material for restorative environment and ergonomic design.

References


