1. INTRODUCTION AND SUBSTANTIATION OF THE CHOICE OF TOPIC

Due to extending life span of our society, the issues involving problems in the seniors’ environment are undertaken in architectural design more and more frequently. These issues are also a part of the teaching syllabus at the Faculty of Architecture, Silesian University of Technology. Students understand the necessity of facing such problems, therefore, they participate willingly in projects concerning this field of architecture, and often chose designs of senior homes for their BSc and MSc theses, using architectural and urban solutions consistent with the needs of the elderly living nowadays. Accordingly, a question arises whether these needs are long-term and whether they will be the same or similar in 30-50 years’ time. Such question is relevant for two reasons:

- First and foremost – in accordance with the life cycle of buildings – there is a chance that the facilities (senior homes, care facilities) that are built nowadays will still be used in the future, so, after repairs and adjustments they should fulfil the needs and requirements of future seniors.
- Secondly – will the seniors of the future be similar to the seniors of today? Will they follow the same behaviour, interests and hobbies? Will they suffer
from similar ailments? Will the present representatives of the so-called Y and Z generation, i.e., young people brought up in the world of new technologies, the Internet, Facebook and other amenities that have radically changed hobbies, leisure activities and ways of communicating with others, and who will be seniors in 30-40 years’ time, still be interested in cultivating the garden and reading traditional books?

Surely, although it is impossible to give firm answers to the above questions that concern the future, they are pertinent enough to be pondered upon. Thus, the authors of the paper have made an attempt at addressing these questions to students at the Faculty of Architecture within the framework of the subject: “Design Strategies”. As this subject is taught in the form of design classes, the authors have decided to adopt the approach of Design Thinking (acronym: DT), as it offers the opportunity of abandoning schematic thinking and replicating usual patterns, leading to innovative solutions that are especially applicable to the architecture of the future. It should be emphasized that this approach consists of stages that are very important in architectural design: definition of users’ needs and brainstorming, thanks to which, in the authors’ opinion, it can result in new attitudes towards the issue of future seniors. Moreover, DT requires team work, which is nowadays highly recommended. Unlike individual work, team projects tend to lead to innovative solutions and give better chances of addressing present and future users’ needs. The method has some disadvantages, but much more benefits, because, according to Lindsey Pollak – the generation of 20-30 year adults “for who it is natural to use applications facilitating cooperation, such as: Skype, Google Docs or Wikis”, although not very keen on group work, likes to contribute to the accomplishment of a common goal.

The opportunity of realizing how their individual work influences the final result, is a source of tremendous job satisfaction” [16].

The undertaken topic was divided into two parts, i.e. two separate papers. The first one is a presentation of theoretical foundations for the subsequent conceptual work based on Design Thinking, whereas the second paper is focused on the results and final conclusions.

2. STATE OF RESEARCH

As the undertaken topic combines two themes: application of Design Thinking in teaching at the Faculty of Architecture, and facing the problem of senior homes in the future, the chapter on the state of research was divided, congruously, into two sub-sections, one focused on DT method and the other on the design of the environment for seniors.

2.1. State of knowledge concerning Design Thinking method

Design Thinking is a method of creative solving a problem and looking for innovative solutions. According to definition of Willemien Visser: “Design Thinking refers to design-specific cognitive activities that designers apply during the process of designing” [11]. For DT method the following procedural steps are characteristic:

• formulation of the problem to be solve,
• survey of user needs,
• brainstorm,
• prototyping,
• implementation of the best ideas into practice and testing.

A detailed history of the development of DT method and presentation of the most important publications can be found on web site: “Human-Centered Design Thinking. A collection of articles and thoughts written and/or curated by Max Yakin Bozek” [12]. In terms of the objectives of this work – as far as DT method is concerned, first and foremost, Tim Brown’s book should be mentioned, also available in Polish [5], which is the most important publication devoted to the application of DT method, its procedures and substance. There are also some supplementary publications available on the Polish market: Bochinska B. (and others) [4], Best K. [1], discussing the management of the architectural design process from a comprehensive perspective. Apart from well-known publications, DT has rich and easily available theoretical and practical foundations in the Internet sources, for example: www. pages of Stanford University [13], where the method is being developed in research and teaching, and, among Polish sources: www. pages of the Technical University in Gdansk [14], which is one of the co-organizers of Design Thinking Week. There are also numerous trainings and practical examples of the application of DT on the Internet.

At the Faculty of Architecture, Silesian University of
Technology, the first publications on Design Thinking have also already come out:

- in the field of urban planning – two papers describing the workshops conducted on the bases of DT, published in ACEE-Journal: Stangel M., Szóstak A. [7] and Stangel M., Witeczek A. [8],

In view of DT used for design of the future, there are several actions organized world-wide, for example: IKEA’s initiative, which, together with students of Lund University and Eindhoven University, has undertaken the task of designing “the Kitchen of 2015” in consideration of forecasting users’ future needs [17].

2.2. State of research on the design of the environment for seniors

To get a proper insight into the issues concerning the elderly and their built environment, as well as the relations between the two, it is necessary to examine publications devoted to seniors (their problems, needs and expectations), to the architectural environment dedicated to elder users and describe the principles of Universal Design, ergonomics and design guidelines and standards. Thus, literature concerning the general problems of the elderly and the disabled was analyzed, in consideration of medical, sociological, psychological and pedagogical issues of gerontology, sociology and environmental psychology. A comprehensive presentation of important publications in these fields and full reference data are contained in M. Bielak’s monographs [2], [3].

3. OBJECTIVE OF THE RESEARCH

The main objective of the research undertaken by the authors was to find out students’ opinion, as seniors of the future, on their predicted future needs in view of the place of occupancy in “Senior architects’ home”. Apart from the research objective, there were also didactic objectives to be accomplished, i.e. to extend students’ knowledge of the design of care facilities for the elderly and acquisition of the skills involved in DT, including the recognition of users’ needs, as well as improvement of competence in team projects. The particular stages of DT method, apart from the above-mentioned analyses of the state of research, was preceded by the stage of substantial preparation, including the recapitulation of the knowledge on modern trends in the design of senior homes, as well as architectural and technical solutions targeted at the elderly, in the form of multimedia presentations prepared by students and supplemented by an introductory lecture.

4. CURRENT TRENDS AND REQUIREMENTS CONCERNING THE DESIGN OF THE ENVIRONMENT FOR SENIORS

As far as the architectural form and aesthetics are concerned, among the care facilities for seniors there is an increasing number of original and aesthetically challenging buildings, for example [15]:

- WoZoCo in Amsterdam, Holland, designed by MVRDV (1998) – a visionary multi-floor building with facades containing dynamically extended balconies and freely “scattered” widows of various size, situated in the quarter designed as garden-city;
- Santa Rita Geriatrics Centre, Ciutadella, Illes Balears, Spain, designed by Manuel Ocaña (2004-2009) – a vast compact one-floor body of the building in the form of a polygon, with internal atrium composed of soft lines;
- Old People’s Home in Alcácer do Sal, Portugal, designed by Aires Mateus Arquitectos (2010) – minimalist form composed of white cuboids arranged as a chess-board in three rows of floors, twined around hilly landscape;
- Care Facility in Hainburg, Austria, designed by Christian Kronaus + Erhard An-He Kinzelbach, 2009, situated among green sites, with dynamic, unusual, zigzag-like bent facades;
- Seniors’ Centre Home in Hodoš, Slovenia, designed by Ravnikar Potokar Arhitekturni, 2010 – an elegant, visually light pavilion which combines the functions for seniors with zones and functions accessible to outsiders;
- Retirement Home in Riedisheim, France, designed by Atelier Zündel & Cristea (A/ZC), 2009 – simple in form, overlaid with patinated wood, with timber terraces, balconies and roofing – evoking a sense of comfort, warmth and safety;
- Retirement Home in Plussenburgh, Rotterdam, Holland, designed by Arons en Gelauff Architecten, 2006 – a luxurious tower – apartment block, with modernly expressed facades, dedicated
to the retiring “hippie generation”.

The analysis of the above examples indicates that foreign architects emphasize the wish to abandon the stereotypes and “hospital-like” architecture of care facilities. They propose explicit, modern forms, use materials and colour – lines that create a positive mood (serenity, optimism) and people-friendly scale, although one of the described examples is a tower block. The architectural solutions and means of expression support a sense of safety and good orientation (way-finding) in the facility and in the external surroundings. Also, it is an ambition of foreign design offices to satisfy more refined tastes and requirements of more demanding users (often well-to-do).

Modern trends in the design of facilities for seniors are also noticeable in diploma works of students at the Faculty of Architecture (Fig. 1, 2). Their designs emerge on the grounds of modern standards, guidelines and norms in accordance with the Universal Design principles. The starting point for such projects are literature studies and quality evaluations of existing facilities, leading to the determination of seniors’ needs and the requirements concerning their place of occupancy and life.

To recapitulate – the fundamental requirement that currently functioning care facilities have to fulfill is a total elimination of all architectural barriers. This entails technical, construction and organizational activities providing users with opportunities for independent fulfillment of their needs in their own environment. Buildings and their surroundings should be easily accessible in all their parts, both from the interiors and from the exteriors. They should be equipped with amenities for the disabled, for example: lifts in multi-floor facilities. Spaces “free from any barriers” should enable inmates to move around on their own, both inside the building and in its surroundings, as this reduces the sense of co-dependence and gives them opportunities for making choices. Buildings should also be equipped with paging and alarm systems, fire alarms, which could be used to call the staff in case of any difficulties. They should guarantee comfort, provide orientation and information signs to facilitate way-finding and awareness of being in a specific space. They should be legible, accessible and safe; moreover, their arrangement should be flexible to enable unhindered formation of space (zones devoid of partitions, accessible and easy for inmates to move around). They should also meet the basic requirement of our times – functional flexibility, involving the need to adjust spaces to individual, different needs.

5. TECHNICAL AMENITIES FOR SENIORS

Another issue related to better insight into the design for seniors, before commencing DT procedures, were currently functioning, modern amenities for the elderly and the disabled. At this stage students were acquainted with innovative technical solutions that are already in use, or will be commonly used in the nearest future and that have a significant influence on the way seniors and the handicapped move around and communicate with other people. These technical novelties may also have an impact on the architectural and urban space for seniors, for example:

- exo-skeleton – enabling people with leg inertia to get up from a wheelchair and walk,
- bionic limbs prostheses controlled by brain impulses,
- bio-electronic eye retina, or portable GPS devices, enabling the blind to move around the city by cre-
ating a touch-screen map supported by satellite signals or voice commands,
• improved hearing prostheses – cochlear implants, brainstem implants,
• speech prostheses – brainstem implants connected to voice synthesizers.

The inventions mentioned above are now prototypes, or unavailable (unaffordable, yet, in future they may become standard devices that will change the functioning and life comfort of seniors.

6. IN SITU ANALYSES

It should be mentioned that apart from theoretical knowledge, students had the opportunity of facing the problems regarding in senior homes in practice during quality analyses and participative studies in the functioning care facilities for the elderly within the framework of the faculty subject: “Adjustment of the environment for seniors”.

The conducted quality analyses with the participation of students entailed quality evaluation of existing senior homes, in view of the fulfilment of specific needs of the elderly. Before the evaluation, students prepared input materials, including drawing materials (plans) and, in consequence, gradually evaluated the consistence of the design with the reality, studied and assessed the advantages and disadvantages revealed in the course of observations and interviews with the users. In the next step, in accordance with POE (Post Occupancy Evaluation – for more information on the method see [6]), they conducted the quality analyses of the facilities during the stage of occupancy. The analyses were focused on the criteria of functionality and efficiency of the buildings, users, essential spaces, selected elements, technical, functional and behavioural quality (in this case: mainly aesthetic quality).

The investigated buildings were analyzed in accordance with the following general list of the criteria-quality categories elaborated by M. Bielak (for more information see [2], [3]).

• Location:
  – Surroundings and neighbourhood of the site;
  – Spatial management of the site;
  – Image and attractiveness of the building as perceived by users and visitors;
• The building:
  – Technical issues;
  – Maintenance

  – Safety;
  – Internal environment, micro-climate:
    – Air quality inside the building;
    – Ambient temperature;
    – Natural and artificial lighting;
    – Acoustic conditions (noise);
  – Spatial efficiency, way-finding;
  – Functional quality of space:
    – Internal zones and specific types of space.

The issues and activities described in the first part of the paper provided substantive grounds for conceptual work in accordance with Design Thinking. The next stage and final conclusions are presented in Part II of the paper.

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