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## THE USE OF ICT, DEVELOPMENT OF THE OFFER AND SPATIAL CHANGES IN THE BUILDING OF THE DAY CARE HOME FOR ELDERLY AND SICK IN TARNOWSKIE GÓRY (POLAND), CASE STUDY

#### Sylwia WIDZISZ-PRONOBIS \*

\* MSc; The Silesian University of Technology, Faculty of Architecture, Akademicka, 44-100 Gliwice, Poland ORCID: 0000-0002-1086-3294

E-mail address: sylwia.widzisz-pronobis@polsl.pl

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#### Abstract

New Internet technologies allow building relationships via social networks and lessening social exclusion. While researching the needs of the residents of the building of the Day Care Home for Elderly and Sick People in Tarnowskie Góry, the author analyzed the possibilities of using information and communication technologies (ICT) to expand the institution's offer and increase the number of residents. The essence of the study was to determine the social needs of seniors and to check what forms of Internet activities are possible. The interaction with the Day Care Home participants via the Internet requires appropriate space organization. Therefore, it was important to check whether seniors are ready for new forms of social interactions and if they are willing to acquire new knowledge and to further expand their skills. The subject discussed in the article was part of a broader study on the analysis of the needs of seniors to reorganize the space in the building and its surroundings. The research tools used have shown how important it is for seniors to establish analog contacts and build friendships during joint meetings and games. Research shows the degree of use of basic digital tools and the limitations of learning new digital tools. At the same time, the dynamics of changes within this age group is visible. There is also a noticeable need for a flexible approach to urban and architectural solutions, allowing for changes in the near future without large investment expenditures. The results of this research were confronted with the results of the study on the use of technology during COVID-19.

Keywords: Social inclusion; Digital tools in the building; COVID-19.

#### **1. INTRODUCTION**

#### 1.1. Design problem

A research project was carried out on the space of the Day Care Home for Elderly and Sick in Tarnowskie Góry in Silesia (hereafter referred to as the Day Care Home). The project was a part of the semester classes at the Silesian University of Technology. The Day Care Home is an institution valued by its residents. However, the admission level is low and applicants are often forced to wait too long before being accepted as residents. For a long time, management has been struggling with organizational problems, including too little space for physical activities, rest, and relaxation for members. In addition, there are needs to make the institution's offer more attractive, giving new opportunities for development and social interaction. The participants in the center are elderly people, but also lonely people and people with various diseases. Many users are educated and have their passions.

The building in which the Day Care Home is located is a historic building (Fig. 1) and the past of the former owners is known to many residents. Those are important factors contributing largely to the popularity of the place among local community. The building is situated in the center of Tarnowskie Góry, next to the main road that leads to the Railway Station, near the most important shops. Also the public transport stop is located right in front of the building. The localization of the building among strategic infrastructure is definitely a big advantage, however, it may also pose a significant safety challenges for caregivers of elderly with dementia.



View of the building from the entrance from Bytomska Street, author: S. Widzisz-Pronobis

The research was carried out together with students on the subject of Methods of testing the quality of buildings and urban spaces 2019/2020. They were to develop architectural concepts of changes in the attic of the building and in the garden (Fig. 2) next to the facility. The spaces were chosen by the management of the institution. The proposed arrangements within those two spaces are expected to facilitate implementation of new, extended offer for current and future participants. As for today the selected spaces are posing a great challenge due to their difficult access and limited financial possibilities of the Day Care Home.



Figure 2. View of the garden from the building's terrace, author: K. Hendel

The spatial aspects are important to address because the access to the attic (Fig. 3) is only possible via the stairs (Fig. 4). The stairs are narrow and the reconstruction of the staircase is not possible for technical and conservation reasons. This means that the functions designed in the attic will be used only by physically fit people. This limitation excludes a large proportion of participants. Therefore, there is a problem in organizing the facility in such a way that it fully serves all participants. This can be remedied by technology that allows participants to interact in different parts of the building and participants who are not in the Day Care Home at the same time.



The attic space of the building, author: K. Hendel



Figure 4. The staircase in the building, author: K. Hendel

The first research meetings revealed a great need for building and maintaining social relations of the participants inside the building and of the participants with the environment of the institution. Seniors express their willingness to be included in proposed changes and readily shared their knowledge of the institution. Therefore, preparation of the user needs research process required analysis of research related to the role of social media in building mutual relationships and supporting community building [1, 2, 3, 3]4]. It was also important to see if increasing digital interactivity was relevant to the development of the Day Care Home offer in the context of research related to building an environment around an institution's (e.g. library's) product or service based on a strategy of community engagement and increasing online interactivity [2].

#### 1.2. The role of seniors in society

Due to the dynamic development of smart investment planning and smart cities [5, 6], research identifying the readiness and skills of older people to use new and engaging technologies was conducted. Referring to the design experience of the author of the article [7], it can be stated that every proposal on the use of a building has an impact on the design of the interior and the security of the space for dynamic functional changes in the building. Therefore, the selection of technological solutions has an impact on the architecture of the building and the organization of the surrounding space.

The offer of institutions is aimed mostly at people who are in need of care due to their age related mobility problems, but who otherwise are mentally relatively healthy and therefore can actively participate in rearranging or implementing the changes within their surroundings. Therefore, involving seniors in participatory processes could increase data on their specific needs and at the same time recognize physical and psychological limitations that exclude them from urban life. Many participatory processes lack stakeholders with their potential [8]. An interesting example of that is the participatory process organised in Dąbrowa Górnicza (Poland). The organisers of the consultation meetings were looking for communication channels that would help them involve older people. Participatory activities were necessary to integrate them into the social plans of a group of senior citizens of Dabrowa Górnicza. It is necessary to reach the right places or the right people to help include this age group. Observations from the author's experience in participatory processes conducted during the Covid-19 pandemic revealed problems with organising meetings with seniors who required support in using communicators. Meanwhile, the offers of support centres have the human and organizational capacity to allow seniors to participate in participatory processes or share their knowledge in other settings.

The tools that allow participants to contribute in the virtual world may have different sizes and different spatial and technological requirements, including the following:

- To prepare a webinar, a large and open space is needed;
- Connecting with users outside the building requires well-organized telecommunication networks, but also space to place a large TV screen with a group of users operating inside the building or in the garden;
- In order to use social media each participant should have access to equipment e.g. tablet, computer etc. and to a place where they can use this equipment;
- It is necessary to organize intimate spaces with Internet access and a person who can help the senior with technical problems,
- It is necessary to design a spatial and technological system that allows interaction of users staying in different parts of the building and in the garden,
- There is a need to provide space for people who do not use technology.

#### 1.3. Research assumptions

Preliminary analysis of historical materials and first interviews with the Day Care Home management helped define the following research questions.

- Do seniors use digital tools for communication and knowledge sharing?
- Do seniors notice the need for space organization to include technology in the offer?
- Is there a space to launch activities based on new technologies that increase the Daily Home offer and the number of people using the offer? Is there a need to organize space for activities based on technology?
- Is it possible to use digital tools to engage seniors in the discussion about the city and use their knowledge and experience, thus increasing the contribution of this social group in inclusive processes?

## 2. METHODOLOGY

#### 2.1. Research tools

The entire research project dealt with spatial changes in the building. Therefore, the research tools contained mainly issues related to the study of the needs and preferences of the facility users. The analysis of digital tools and the possibilities of using technology in the facility were accompanying threads. Technological threads were added to the research tools in such a way as to prepare the research participants, equip them with knowledge about the technical and functional capabilities of the object. At the same time, it was necessary to design research tools and explain the technological nomenclature. It was important to explain to seniors the words: webinar, tutorial, internet tools, social networks, internet applications, computer hardware.

For the effect of the study, it was important to obtain verbal and nonverbal information, as well as associative images:

- Collected verbal information: seniors claim that the use of phones is solely limited to calling, only rarely texting and the use of applications would have to be demonstrated to them.
- Non-verbal: Reserchers observed evident signs of curiosity about the topic, such as listening with bated breath; and showing each other phones between participants
- Associative: The seniors involved in the study emphasized that the maintaining relationships with other participants is important, and that the elements of interior design should be maintained. They also share the conviction that the phone is not for entertainment; the use of computer, however, is linked with leisure time and sometimes with the use of webcam

The research tools were designed by the author of the paper with the support of the sociologist Phd Barbara Rożałowska and Prof. Joanna Tymkiewicz.

The individual interview survey and the focus interview questionnaire consisted of seven main parts:

- Discussion of the goal of the study,
- Imprint,
- History of the building,
- Assessment of the current state,
- Analysis of the current needs,
- Assessment of potential changes in the building and the garden,
- Analysis of technological solutions.

The goal of the study (also presented to seniors) was exploring the possibility of extending the offer of activities that would stimulate the elderly. During the research meeting, we wanted to obtain information on:

- The needs of the Day Care Home participants in the context of the use of the building and its surroundings,
- User preferences regarding the functional as well as aesthetic solutions of the current building spaces,
- User preferences regarding the functional and aesthetic solutions of new building spaces, including the attic,
- The technological habits of the participants of the Day Care Home.

In the imprint, we needed to define the degree of various limitations of participants and their reasons for using the Day Care Home offer. This information allows us to respond to certain statements and is of great importance in the context of research on the possibilities of using technology in the institution's new offer.

During first conversations with the management and residents of Tarnowskie Góry, we heard how important the history of the building is, especially for the older residents of the city. Therefore, it was necessary to find out in the questionnaire what meaning the history has for the participants of the Day Care Home. The prepared questions were to help the seniors to talk about their memories connected with the building.

The assessment of the current state continued throughout the survey and the main focus was on:

- aesthetics of the building,
- interior aesthetics,
- aesthetics of the garden,
- assessment of space,
- assessment of accessibility in the building,
- assessment of accessibility to the building,
- assessment of the possibility of using the Internet.

A 5-point rating scale was used for the evaluation, inspired by the Likert scale [9].

In the context of the use of new technologies, it was important to check how the residents of the Day Care Home evaluate access to the Internet and whether they use it.

Need analysis was carried out by associations and visualization [10]. At this point, it was important to

bring out more profound needs and capture memories and visions of the Day Care Home's participants. The key question was "What do you associate the name Daily House with?". Visualizations were applied by using unfinished sentences that led the subjects to an association images we wanted to get from the interview. Guiding questions have also been added to the sentences provided to help seniors direct their thoughts.

Here are the examples:

A statement concerning the use of the building space ("When I am in the Day Care Home, I spend the day on ..."),

A sentence about the new attic space ("I wonder if there could be an attic ..."),

The vision of the new garden space ("Almost every day I wonder if the garden could be...").

The above sentences were used in the questionnaire for the individual interview; in the case of the focus interview, the subject was followed up by discussion with all participants..

To investigate the aesthetic preferences of the users and to relax the atmosphere during the study, we first proposed the evaluation of potential changes in the interior of the building and in the garden. As in the case of the analysis of the current state of the building and its surroundings, a 5-point rating scale was used here, ranging from strong disapproval (1) to the strongest approval (5). The prepared eight photos show the diverse nature of the space, as well as the aesthetic and functional solutions that could be implemented in the Day Care Home.

The analysis of technological solutions was based on questions that allow one to determine whether resi-

dents of the Day Care Home use technology in their daily activities. Both in the individual and focus interview, it was necessary to check what skills the seniors have and if they are interested in learning new technological tools. We discuss one of the many ways to live on the Internet. At the beginning of the conversation, it was important to describe what a webinar is. In the focus study, we used a video on how to do a webinar, and in the individual study, the students showed webinars on the phone. The questions in the survey were to check whether the online form of presentation is possible for the participants of the Day Care Home. Visualization was also used in this part of the study. The participants heard two potential stories to help them get into potential situations. The first one was about a situation in which the members of the Day Care Home, use the offer of the Day Care Home from their own home by means of technology. The second story represented a situation where users participate in city life by talking about their needs in urban spaces. Both stories are real and took place on a smaller scale during social research organized by the author of the paper in Bytom, which is the another city in Silesian region.

#### 2.2. Research process

The main consideration during the research process design was the proactive involvement of students in the research project. The students could actively participate in the research and gain important knowledge for their projects. In addition to field study, literature research was carried out to precisely identify research questions and develop appropriate research tools (Fig. 5).



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Analysis of materials on the history of the building and part of the city of Tarnowskie Góry

Prior to the project date, it was possible for students to get acquainted with the materials prepared by prof. A. Szewczenko. The information package included historical and current photos, historical technical drawings, and technical documentation of the building.

#### First visit to the Day Care Home building

The purpose of the visit was to get to know the building and feel the atmosphere inside.

There were: conversations with staff, observations of the behaviour of the residents, conversations with the building's residents, observations of the building's space, construction and spatial assumptions necessary to analyze the possibilities of arranging the garden. In order to become familiar with the building and to touch on its atmosphere we conducted talks with the residents of the building along with observations of the available space and assessment of construction details. We also evaluated the possibilities of rearranging the garden space and made the first assessment of activities favored by residents. What is worth noticing is that despite the limited space or due to limited space for physical activities residents are often engaged in digital tool (their own smartphones or computers available in the Day Care Home). This allows us to assume that some of the IT solution proposed for this project would be welcomed by residents. However, we also need to point that there is a need for more private space for resident preferably free of internet connection. This is due to the fact that some of the residents may need an extra time for rest and regeneration.

### Preparation of Research with Students

As a part of preparation for the visit, the students conducted analysis of investments that serve the elderly, including the investments in the spirit of a smart city. The students presented ideas for projects for elderly people. Among the proposals were spatial solutions for gardens and interiors, as well as technological solutions to support seniors. Innovative projects were to open them up to looking for nonstandard proposals for the elderly.

### Preparation of a Research Tool

The purpose of the study was to identify the development needs of Day Care Home and the possibility of supplementing the offer with solutions related to the development of the world of technology and the Internet. It was important to check the possibility of using the information and communication technologies (ICT) to increase the activity of seniors and affect functional changes in the building.

The development of the research tool made it possible to examine the technological potentials, suggest solutions for the future, and demonstrate the links between the questions and the design task.

It was important to adapt the research tool to seniors' current knowledge of digital tools that can be used for social engagement. Here I would like to explain what factors were most limiting for seniors, what exactly needed to be simplified and what was most challenging in learning and adapting digital tools.

For the development of the concept designs by the students it was necessary to explore the needs of the elderly with respect to potential changes to the attic and garden.

An important goal for the author of the paper was to investigate the possibility of using Internet tools to study the needs of seniors and to motivate and socialize seniors.

#### Interview with the management of the institution

The management described the situation of the Day Care Home related to the high interest in the current offer of the institution. Due to limited human and space resources, the management has to refuse new seniors. New applicants are waiting in line to become participants in the activities of the Day Care Home. During the interview, we asked about the readiness of the management to launch a digital form of communication to increase the number of recipients of the offer and to support people who temporarily cannot attend the activities carried out in the Day Care Home.

Creating webinars is an opportunity to increase the attractiveness of the Day Care Home offer and to develop materials that could be shared with the elderly also outside the Day Care Home. Opening the institution to other residents, making the community aware of the oportunities awaiting seniors possibilities of seniors, including seniors in social life, using the knowledge of seniors in participatory activities in the cities processes, in cultural and industrial activities, etc.

#### Conducting research

Research visit:

- Conducting individual interviews with the use of questionnaires,
- Moderating discussions in a focus interview, including educational elements on digital tools,
- Conducting observations in the atmosphere of a "student raid" in the institution,



Figure 6. Starting a meeting with users of the Daily House building, author: K. Hendel

The Day Care Home for the Elderly and Sick accommodates about 40 people a day. Some of resindents usualy are in their own homes and carers only provide them with meals. Participants are people to various mental and physical health. Several people struggle with neurological diseases, including dementia. The management selected people who are mentally fit and able to define their needs for the research. Importantly, people who are communicative and willing to talk participated in the study. It was of great importance for the final results (Fig. 6). During the observation of the building and its use, the students engaged in conversations and often heard conflicting expectations. This may be due to the mental state of other the Day Care Home users, but may also be due to other factors that have not been further analysed.

Ten people participated in the individual survey. A room with tables was prepared for the individual talks. Two researchers (students) talked to one respondent (senior) at a table (Fig. 7). The students kept order to ensure that every participant has an opportunity to address the question without being interrupted by others. In the first interviews, it was apparent that the seniors suggested each other's answers. Therefore, it was essential to introduce the



Figure 7. Individual interview, author: K. Hendel



Figure 8. Focus interview, author: K. Hendel

routine among all involved parties to reach the final conclusions. A prepared questionnaire for an individual interview was used, as well as photos showing interior and garden solutions for evaluation.

12 people (9 women, 3 men) participated in the focus interview, which took place in the library room. It was the only room where researchers and residents could sit together at a large table (Fig. 8). The researchers were mainly students who were to initiate a conversation and write down statements on a flipchart and in a notebook. Taking note of the statements was to be a signal to seniors that they were well understood. Additionally, the test was taped so that it was possible to listen to the excerpts when there was a heated discussion. The author of the paper had an additional role in the part related to technology. Her task was to discuss the purpose of the technology and explain the concepts of webinar to the subjects. Pictures with inspiration and videos showing how to organize online meetings were presented on a laptop with a large screen. Internet topics required the introduction and explanation of the phenomenon that is visible on portals such as Facebook and YouTube. The concept of a webinar was also unknown to students. Therefore, a video with bloggers, who prepare for an Internet presentation, was presented to show what a webinar is.

The observation of the participants was supposed to be a hidden observation, but it took form of nonparticipant observation (Fig. 9). The visit of the students was planned and the users were prepared to meet the students. As a result, daily routine in the Day Care Home was disrupted. Seniors treated this day as a special occasion and welcomed student as their guests. Due to those changes in daily routine and behaviour of residents, it was difficult to determine if the conclusions from the observations are representative and valuable for assessing the real needs of the users. The students treated the observations as an introduction to deepening the discussion on the special needs of the elderly.



Figure 9. Observations, author: K. Hendel

#### Presentation of collected data

After the visit to the Day Care Home, the students presented the data collected in the Day Care Home. Presentations were needed to harmonize the knowledge in all participants of the classes and people taking part in the competition for the best proposal for the arrangement of the attic and garden for the Day Care Home.

#### Visit of the Seniors and the Management of the Daily House at the Faculty of Architecture of the Silesian University of Technology in Gliwice

The confrontation of the research results with the

student proposals took place at the Faculty of Architecture. The seniors were invited guests and had the opportunity to get to know the students' first ideas. During casual conversations, the students discussed their observations from the research visit and presented their visions of the attic and garden of the Day Care Home. This meeting was an opportunity for young designers to confront the research results with the opinions of the seniors. Most of the students took this opportunity. During the visit, changes in the expectations of seniors were observed related to the previously reported needs. Designers had a dilemma related to the direction of their design work because seniors suggested solutions that, according to previous research, should not be considered. Among the new suggestions, the idea of organizing an attic for social purposes for all participants appeared, which is impossible due to the existing stairs. Such a function in the attic would exclude participants who have trouble climbing the stairs.

At this stage, it was necessary to recall significant technical and physiological limitations from the design point of view.

#### A selection of the best concept projects

Representatives of the Day Care Home and the Municipal Social Welfare Center of Tarnowskie Góry and architects participated in the selection of the best student proposals.

#### 2.3. Literature Review Methodology

Other research was also conducted in terms of the use of technology to engage the elderly in social life. Key phrases that were used to search through the scientific literature:

- webinar as a form of social engagement,
- webinar as a form of social involvement,
- information technologies in social inclusion,
- promoting and facilitating social inclusion,
- smart buildings,
- social engagement and COVID-19,
- digital tools in COVID-19.

The selection of papers was based on the research topic. The focus was on research on the use of digital tools to build and maintain social relationships, as well as enabling the elderly to share their life and professional knowledge. Due to the COVID-19 pandemic, papers describing the use of digital tools for education and information were also included. The

Table 1

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conduct of classes for the elderly has educational and informative elements. It was important to refer research that analyzed the effects of social isolation and the use of technology to counteract it.

## **3. RESULTS**

### 3.1. Needs and possibilities of the elderly

The research carried out on the group of seniors and on the staff of the Day Care Home in Tarnowskie Góry showed mainly:

- Seniors have difficulty moving up the stairs (80% of respondents due to problems with the legs and spine, 20% of respondents due to poor eyesight) students faced the challenge of organizing the attic for the healthiest ones;
- The facility is associated with nice and friendly animals and colors (warm colors of 100% of respondents), which is consistent with the assessment of the aesthetics of the facility and the garden – the facility should retain its character and new elements should fit into the warm, friendly atmosphere of the interior;
- There is a lack of places for organized activity and intimate spaces in the garden; a new organization of the garden space is necessary, considering the different needs of active and less active seniors;
- Most of the respondents like to read necessary organization of intimate spaces where the seniors can read in peace;
- The respondents indicated the need for exercise, each user has a different favourite form of activity (dancing, gym, walking), - space organization needed for various physical activities;
- The respondents spend a lot of time talking and playing together (chess, cards); the space organization needed for joint activities in smaller groups.

Seniors want dedicated spaces for their activities and do not talk much about technology.

The surveyed seniors assessed the aesthetics of the building and the garden very positively [Tab. 1]. In the interviews, they emphasized their sentiment toward the history of the building. The space of the building, which according to the respondents was too small and not comfortable, was rated lower. Often, there were suggestions to reorganize the building space in such a way that different groups of interests of the Day Care Home would not interfere with each other. It is interesting to assess the building space in terms of architectural barriers and the location of the facility. Many participants in Day Care Home come to classes by car and bus, hence the low rating of the location. However, positive assessments of the ability to enter and move around the facility contradict the information on the health and physical limitations of the Day Care Home seniors. Only four people answered the question regarding the assessment of Internet access, the remaining respondents said that they do not use the Internet. This shows that the internet is another barrier for seniors.

Assessment of existing status, author: S. Widzisz-Pronobis		
Lp.	Торіс	Rate (scale 1–5)
1.	Assessment of the building aesthetics	4.5
2.	Assessment of interior aesthetics	4.9
3.	Assessment of the aesthetics of the garden	4.75
4.	Assessment of the amount of space in the building	4.1
5.	Assessment of the building convenience	3.6
6.	Assessment of the building entrance / archi- tectural barrier	4.6
7.	Assessment of the ability to move around the building without barriers	4.9
8.	Assessment of the building location	3.1
9.	Assessment of the possibility of using the building	4.7

The assessment of the proposals presented in the questionnaire showed how important the use of natural materials, cozy spaces, and solutions conducive to building social relations is for the participants of the Day Care Home. Residents need space for various activities, but also a sense of intimacy. Modern solutions were assessed by respondents as too open and unfriendly. In the context of the use of smart solutions, it is necessary to blend them into traditional spatial forms. During interviews, the seniors indicated their fears of creating a space with too futuristic appearance.

Contradictions have arisen in the context of digital issues. Most of the time, seniors do not consider digital tools useful for everyday life. In individual interviews, 60% of the respondents do not use the Internet in the Day Care Home. Only a few people willingly use tools such as Skype, Facebook, You Tube, but mainly for communication with their loved ones and for fun.

During the focus interview, the seniors indicated that they have no knowledge of digital tools. They have the opportunity to participate in computer work-



Students' project, authors M. Grabowska, O. Matusik, K. Wrona, J. Swoboda Observations

shops and learn to use the computer and the Internet. However, seniors point out that they would need frequent contact with the equipment and constant support from someone who knows it. They often forget basic activities. On the Internet itself, they rarely navigate to unknown sites. They know, for example, YouTube, but they watch movies that someone recommends to them, rather than look for anything themselves.

The organization of such a webinar, in the opinion of the respondents, is too complicated and not worth the effort, especially if they themselves would be responsible for the entire technical side. It is worth noting that one of the men, a former camera operator, found the organization of the webinar easy to understand. When describing the possibilities offered by such a presentation, i.e., presenting their skills, several women became interested in this possibility. However, they declared that they were unable to organize such a thing on their own.

The seniors participating in the survey cannot imagine participating in the activities of the Day Care Centre in an online form. All respondents claimed that the only acceptable form for them is the analogue one. They look for information on the Internet but are no longer able to stay there.

In some student works, the authors showed solutions where the attic space is open and gives a lot of arrangement possibilities (Fig. 10). However, seniors were most appreciative of the projects in which students proposed places to relax and talk.

It is necessary to separate technological and Internet issues due to their function.

• Webinars may have a function for seniors related to sharing knowledge and a sense of usefulness for others.

Seniors couldn't relate to their experiences when asked about webinars. Sometimes they watch videos about how to do something e.g. how to cook something. However, they do not imagine that they would have to prepare such a thing themselves. During the interview, the seniors became interested in this form to do something new and interesting. However, they emphasized that it would be necessary to have support from someone who is more knowledgeable. It is worth highlighting here that among the seniors participating in the focus meeting there was a retired camera operator who declared his support in organizing such a webinar recording.

• Internet messengers (Skype, Facebook Messenger, Zoom, Hangouts) can be used by seniors to build and maintain long-distance relationships. The function is especially important in a situation where a participant in the Daily Home is sick and cannot participate in the life of friends in the building.

Seniors, when asked about the online form of maintaining relationships, turned out to be very skeptical. When we were describing the possibilities of such communication, we also indicated the possibility of participating in events organized for Daily Home residents, e.g. in remote art workshops.

The research tool was created in October 2019 and referred to the potential opportunities offered by technology to include socially excluded people in urban life. In the period March-June 2020, when we experienced limitations in social contacts due to COVID-19 announced in Poland, many participatory processes related to spatial planning moved to the Internet. However, in the project Space for Participation [11], it turned out that the online form of meetings is possible for selected stakeholder groups or if the participation process is already advanced and communication habits using technology and the Internet have been developed earlier. The lockdown situation resulted in many discussions on the inclusion of each stakeholder group in on-line cooperation.

# **3.2.** The effects of remote communication during COVID-19

The World Health Organization pointed to the need to adapt communication tools to recipients [12]. Observing the school and academic environment and the work environment, we can see a stimulus for too intensive participation in the internet life [13]. The blurring of the worlds hampers normal functioning [14]. Hence, it seems important to be careful about digitizing interpersonal relationships. The experience of limiting social contact to online relationships that we had during the COVID-19 pandemic shows how important it is to build and maintain the interpersonal relationships that Daily House users talk about. Social needs cannot be met by making older people dependent on digital solutions. It is significant to maintain the balance. Participants should be able to use the latest technological developments. At the same time, participation in the activities of institutions should not be conditioned by knowledge of digital tools.

## 4. DISCUSSION

#### **Digital Exclusion of Seniors**

The use of digital tools in the daily life of a senior is negligible. Seniors have very little knowledge of the opportunities that new technology and participation in digital life can offer them. Interviews with the residents of the Day Care Home have shown that the mere association with technology causes technological anxiety. As a result, seniors create problems that they have to overcome to use technology, not seeing the advantages of participating in social life thanks to digital messaging [15].

Social exclusion of seniors and the use of Internet messengers to engage seniors in society.

Some seniors have multiple disabilities. The limitations of the elderly (limited visual precision, memory difficulties and manual limitations) often affect the possibilities of using modern forms of communication and learning. Research on technological solutions for people with disabilities [16] shows how many technological possibilities there are. The research is largely based on the analysis of tools; however, they rarely refer to the limitations and often reluctance of older people to learn new, often unnecessary, skills. Building social relationships for seniors [17] in view of the research carried out by the author of the research involves, above all, live meetings. Increasing access to online social networks [18] was not a perceived need for respondents.

#### Use of senior knowledge for city development

Webinars are an innovative form of education that during Covid-19 became an essential form for teachers and lecturers. Current practices show how important a role they play in keeping learners engaged. They are also essential to the intellectual development of people on both sides of the screen [19]. Referring to the experience of COVID-19, it should be remembered that the people who prepare an online meeting physical and mental stresses. An online meeting requires not only knowledge of technological tools but also sensitivity to signals that come from the audience, including being alert to their possible overload with material and too long time spent on the Internet [13].

# Digital skills in building users and designing solutions in a smart building.

A study of the literature on the topic of the Internet of Things for Seniors showed the possibility of using technology mainly to monitor the elderly. They are used primarily to support the elderly, but these are solutions that do not solve the problem of social exclusion [20]. In the context of designing effective, cheap envelopes for institutions dealing with the care of weaker people, it seems important to use modern technical solutions. The creation of intelligent buildings should focus on the improvement of technical solutions to reduce operating costs [21].

The COVID-19 experience and its impact on the development of digital tools for seniors.

Research showing the impact of excessive workload and remote learning [13, 14] allows reflection on the idea of Smart Buildings for the elderly [22, 23], which can incapacitate users. Independence and social contacts are crucial for the elderly, as shown in the research conducted by participants in the Day Care Home. Creating self-thinking objects in which the senior is under constant control without human involvement is not beneficial to psychophysical health. Creating an institution's offer based on building and maintaining relationships using internet messengers can be incomprehensible and harmful. However, it is worth using the technological possibilities to develop the institution, but by selecting the tools to the current possibilities and needs of the participants.

## **5. CONCLUSIONS**

Analogue activities – seniors need to be in direct and personal contact with other people very much. Technology should support them, but it cannot trap them in four walls. They want to be able to leave the house. The possibility of online contact in an exceptional situation, especially valuable for senior with limited locomotory capacities, which allow them to participate in the classes live, is a significant value. However, a great risk for such proposals is to use them automatically without analyzing the mental state of the participants.

When designing spaces, we should anticipate dynamically developing technological possibilities. The structure of the senior group is changing. Among the elderly, there are people willing to explore technological possibilities. At the same time, there are concerns about maintaining security; hence, there are many apprehensions about installing the application, the need to log in using your own personal data. However, one should also consider the dynamically changing group of seniors, who more and more often have contact with new technologies and need space to use their skills or even develop in the virtual world.

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