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Developing a Model of Factors Influencing the Quality of Service for Disabled Customers in the Condition s of Sustainable Development, Illustrated by an Example of the Silesian Voivodeship Public Administration

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Abstract: The article discusses the issue of disabled persons in the perspective of sustainable development and presents barriers that persons with disabilities encounter while being served in local government offices such as town halls. The research was done on the example of 33 Silesian towns. Random selection was applied to choose disabled people who use services of particular municipal cities. The paper is based on the 2846 correctly completed questionnaires. The research has been done in 2014. To data analysis we use qualitative methods and statistical methods. In statistical methods we used particularly: Significance testing and confirmation factor analysis. In the research process we formulated four research questions: What is the impact of the degree of disability on the evaluation level of quality with regard to architectonical barriers? What is the impact of the types of disability on the evaluation level of quality with regard to architectonical barriers? What is the impact of the age of disabled on the evaluation level of quality with regard to architectonical barriers? What hidden factors we can identify in the case of architectural barriers in municipal offices services for peoples with disability? In addition, we formulated two hypotheses as following: H1. The type of disability has a significant impact on the evaluation of architectural barriers in municipal offices by the disabled client. H2. The age of a disabled person influences the evaluation of architectural barriers in municipal offices by the disabled client. We found in the paper statistically significant impact of degree of disability, type of disability and the age of disable person on their assessment of quality level of services in the municipal offices. We found that persons with higher level of disability assess problems with architectural barriers worse comparing person with low level of disability. Problems with architectural barriers also have impact particularly on the persons with motor impediments. From the age point of view the problems with architectural barriers an important for disables persons at the age 40 or higher. Another very important finding of the present paper is the identification of hidden factors affecting persons with disability needs in the case of municipal offices service.

Keywords: disability; sustainable development; sustainable urban development; architectural barriers; accessibility

1. Introduction

Problems of sustainable development consist of many factors and issues important in today's world. One of the interesting factors influencing sustainable development is the issue of equal opportunity for people with regards to the access to public services. Especially people with disabilities

may face problems in this regard. One of the goals of sustainable development on the local level is to ensure equal opportunity for all people regardless to their health status. In order to do this we should strive to eliminate or reduce architectural barriers in the public space, especially in municipal offices and their surroundings. To this end we should carefully analyze the level of those barriers and their factors.

The main aim of the paper is the identification of the hidden factors of architectural barriers. Based on those, the authors want to determine the level of service quality from the perspective of a disabled client to investigate what barriers are the most significant and to reduce them to ensure equal opportunity. This approach is consistent with the sustainable development concept and the European Union's policy to implement it on the local level.

In the subject literature, sustainable development is most often defined as development which fulfills the needs of the current generation without diminishing the chances of future generations [1–6]. According to this definition, one of the most important factors in the concept of sustainable development is fulfilling the needs of all people regardless of their status, social standing, country of residence or type of disability [7–10]. The term was first created and adopted at a United Nations Conference on Environment and Development (UNCED) held by the United Nations in Rio de Janeiro in 1992 [11,12]. The conference resulted in the creation of a program for the 21st century called Agenda 21. The most important information contained in the program pertains to balancing the economic and social development with protection of the natural environment [13–15].

In Poland, the Polish UNESCO Committee was founded. According to this committee, sustainable development is a process aiming to fulfill the developmental aspirations of the current generation in a way that allows for the fulfillment of those same aspirations by the following generations [16].

Sustainable development is legally sanctioned in Polish legislation. In 2003, the Polish government adopted a document entitled "Poland's obligations resulting from the provisions contained in the "Action Plan" of the Earth Summit in Johannesburg." Earlier, in 1997, the concept of sustainable development was introduced into the constitution of the Republic of Poland as one of its principles.

According to art. 5 of the Constitution of the Republic of Poland dated 04 February 1997, the Republic of Poland safeguards the independence and inviolability of its territory, guarantees freedom and human and civil rights and the safety of citizens, protects national heritage and ensures environmental protection, guided by the principles of sustainable development.

Adjusting to the principles of the European Union, Poland, within the framework of cooperation on sustainable global development, developed the Strategy for Sustainable Development of Poland until 2025. This strategy adopted some of the principles set out in the Rio Declaration. The principles contained in the Strategy [17,18]:

- Principle 1, stating the right of a person to health and productive life in harmony with nature and defining a person as the subject of sustainable development.
- Principle 2, defining the sovereign rights of nations to use their natural resources, without causing damage to other countries.
- Principle 3, stating equal rights to the development of present and future generations.
- Principle 4, defining the role of environmental protection as an integral component of the sustainable development process.
- Principle 5, defining the necessity to include counteracting poverty in all its forms and pathologies in the sustainable development processes.
- Principle 7, specifying the obligation to national activities and cooperation for the balance of ecosystems.
- Principle 8, specifying the need for changes in consumption and production trends.
- Principle 10, defining the necessity of public participation in the management of environmental resources and decision-making processes in sustainable development.

- Principle 11, defining the directions of development of national legislation, integrating ecological and developmental aspects.
- Principle 13, on the liability and obligation to repair damages caused to the environment and to victims of a degraded environment
- Principle 16, on the obligation to bear the costs of counteracting pollution by the producer of the pollutants and on the internalization of external environmental costs in the prices of products, which translates into fees paid by the users of the environment
- Principle 17, on environmental impact assessment as a management instrument on a national and international scale.
- Principle 27, on the obligation of States and societies to cooperate in good faith and in a spirit of partnership in order to implement the principles of sustainable development.

Due to the subject matter discussed in this article, namely sustainable development in relation to people with disabilities, the below section presents actions for sustainable development in the social dimension.

In Polish conditions, the social dimension of sustainable development must include [19]:

- Guarantee to satisfy the basic needs of societies, in particular to a safe shelter, to ensure an appropriate biological minimum, including drinking water and sanitary needs in appropriate quantity and of appropriate quality and healthy food in the amount ensuring coverage of the body's needs
- Guarantee of protection against the harmful effects on health and life of, first and foremost, pollution caused by economic activity, noise and vibration, ionizing and non-ionizing radiation, the effects of applications of genetically modified organisms, but also crime.
- Guarantee of the availability of education, at least in the basic scope and help in acquiring knowledge for the most talented individuals at higher levels of education.
- Guarantee of active health protection through prophylaxis, appropriate treatment conditions and prevention of diseases recognized as social.
- Guarantee of social care for the elderly, infirm and disabled persons, ensuring a certain social minimum and possibilities of functioning in the society.
- Guarantees of just distribution of income and social security measures that help to eliminate social differences, prevent the creation of large areas of poverty and marginalization of individuals and social groups.
- Guarantee of access to employment primarily by generating new jobs, supporting small and medium enterprises, access to training and courses raising qualifications and changing qualifications, access to cheap loans.
- Equitable access to the environment and its resources, to recreation in a healthy and uncontaminated environment.
- Inviolability and protection of private property, state property and social goods.

All of the aforementioned guarantees also apply to the social group of people with disabilities. The implementation of those guarantees is included in ministerial sectorial programs, primarily in social policy, fiscal policy, health policy, environmental policy, education policy and labor and wage policy, science and technology development policy, rural and agricultural area development policy, urban and urbanized area development policy, cultural development policy, anti-crime policy, immigration policy, inter-sectorial plans and programs. The guarantee of maintaining social equality means that disabled people should be given the same opportunities for development and subsistence as abled persons, only by additionally taking into account the limitations resulting from their various types of disabilities [20–26].

One of the many elements of the concept of sustainable development in the aspect of social issues, is the maintenance of social equality and equal opportunities for disabled people. People with

disabilities using public facilities encounter various obstacles such as architectural barriers that limit their daily functioning.

The word barrier comes from French (barrière) and means an obstacle. To the disabled, barriers are all obstacles or restrictions that they face in their daily lives. They are all the limitations that lower the independence of persons with disabilities [27–29]. People with disabilities are a group in society that is very diverse in terms of the type and degree of disability, therefore different barriers limit people with disabilities to varying degrees. Among the barriers—limitations affecting the functioning of people with disabilities—we distinguish natural, economic, physical, educational, employment, infrastructural, material as well as mental and psychological barriers [26–28].

Natural barriers are connected with being unable to acquire certain skills and knowledge—this is associated with intellectual and developmental disabilities. Diagnostic barriers occur when it is difficult to determine clearly what kind of dysfunction affects an individual, or in cases when the wrong diagnosis was made. The first case is associated with diseases with a genetic basis, and the second with cases of severe paralysis, where there is additional deep impairment that prevents contact with the environment making it difficult to make an accurate diagnosis.

Educational barriers—this problem applies in particular to children and youth, and is associated with the obligation to attend school. Children and adolescents with reduced intellectual efficiency are directed to the appropriate educational institution and in cases where the disability allows for learning at a school, such persons are directed to integrated classes [30,31].

Economic barriers belong to the group of social barriers for disabled people, also called financial barriers. Due to their specificity, they are the most common obstacle in the lives of people with disabilities and are associated with social exclusion. People with disabilities very often face financial problem many times associated with the costs of rehabilitation and treatment. It is very difficult for a disabled person with a varying degree of disability to find a job. This is another factor affecting their difficult financial situation and the feeling of a certain stigma associated with their condition [32].

Mental and psychological barriers are related to the lack of acceptance of their own disability by the disabled and with lowered self-esteem. Among these barriers, we distinguish endogenous barriers associated with very strong emotions that prevent proper functioning and cause certain problems. In this case, people with disabilities have a very strong sense of helplessness and lack self-confidence. The second type of mental barriers is related to the lack of acceptance of the environment and encountering negative reactions. These types of barriers cause isolation from the surroundings and disturb the process of inclusion and integration with the society [33].

Employment barriers are closely related to the previously discussed economic barriers, i.e., the bad economic situation of people with disabilities. The first factor affecting the employment problems of people with disabilities is the reluctance of employers to hire them. Another factor is the small number of protected workplaces and a lower pay in comparison with the able-bodied employees in the same job position.

Infrastructural barriers are those that directly affect the life and functioning of people with disabilities. People with disabilities with low and medium level of disability must handle certain official matters, which is why it is important that all public facilities be adapted to the needs of persons with disabilities.

Lack of facilities for the disabled may be related to the distribution of social and technical infrastructure in the surroundings [34,35]. Most disabled people need to use municipal offices, so it is important that those offices have adequate facilities in the form of parking spaces for people with disabilities directly in front of their entrance or toilets adjusted to the needs of disabled people. Similar facilities should also be found in other places: Theaters, museums, cinemas, hospitals, outpatient clinics, shops, etc.

Balanced architecture should meet human requirements in terms of physical and mental comfort, safety of shelter, identification and esthetics. It should provide a sense of comfort, intimacy and isolation, bioclimatic comfort, safety and hygiene, and conditions for mental and physical rest. In the

case of people with disabilities, the sustainable development architecture should also take into account different types of disability and, therefore, the existing limitations. Based on the analysis, it can be concluded that for the disabled the biggest architectural problems are: Appropriate number of parking places; parking places located near the office entrance; surfaces and curbs in the office of the disabled, anti-slip floor; lifts; system of ramps for the disabled. In the case of designing public buildings, it is important to take into account the needs of people with disabilities, then you can talk about sustainable architecture in a social aspect.

We can distinguish three types of sustainable building issues: Economic sustainability, environmental sustainability and social sustainability [36,37]. In this publication we are interested mainly in social sustainability related topics. The social sustainability is connected with nurturing social cohesion and providing a safe and healthy environment to all persons using particular site [38].

The balanced architecture is an indispensable part of sustainability. A sustainable community should provide leisure activities for all groups of society: Elderly people, young peoples, people with disabilities, etc. The planning of the space should enhance people's lives and can help to enhance their feeling of belonging to a community worth living in. Addressing user requirements in the process of architecture planning is very important for individuals with disability. Basic accessibility for all members of society through the provision of appropriate space planning standard, access configuration and services should be a part of standard building regulation requirements. The careful design of the public space and technical improvements can be helpful [39]. The sustainable building approach is considered a way for the building industry to move towards achieving sustainable development goals for example for adjusting the public buildings to the peoples with disability needs. It is also an important proof that municipal office treats disabled people's requirements as important [40,41]. With increasing emphasis on sustainable building design, various countries have developed respective rating systems in the last two decades [42]. A holistic approach to sustainability can reach beyond buildings to encompass sustainable communities and lifestyles [43–47].

2. Materials and Methods

This publication presents the results of studies on disabled persons' evaluation of architectural barriers in municipal offices in the Silesian Province. The Province of Silesia is the second voivodeship in Poland it terms of population, and, at the same time, the province with the largest number of towns in Poland.

Towns for studies were chosen by the stratified sampling method, whereas disabled persons in particular towns were randomly selected. In the first stage, 33 from among 71 towns in the Silesian Province were chosen.

Next, random selection was applied to choose disabled people who use services of particular municipal offices. Survey studies were conducted in 2014. They resulted in obtaining 2846 correctly completed questionnaires.

Table 1 presents detailed characteristics of respondents participating in the studies. The surveyed population consisted of an almost even number of women and men; 1421 women and 1425 men took part in the study. The majority of the surveyed disabled persons had secondary education (1591 people—56%), followed by higher education (651 people—23%). The smallest number of the surveyed disabled had merely basic education (570 people—20%). Among those surveyed 34 persons did not complete the box concerning education. The largest group of the surveyed disabled were people aged 30–39 years (758 persons) and 20–29 years (763 persons). A large group among the surveyed were people aged 40–49 years (641). The group aged 50 and above consisted of 459 people, whereas the smallest group was that composed of the disabled below 20 years of age—only 225 people.

The participants of the study were: 1384 persons with mild disability (49%), 1057 people with moderate disability (37%) and 400 people with severe disability (14%). Five of the surveyed persons did not provide their degree of disability.

In the investigations conducted five types of disability have been distinguished:

- Sensory impairment—a lack, damage to or disorder of sensory analyzers' function (this category includes the blind, the visually impaired, the deaf, hard of hearing and people with visual and auditory perception disorders)—644 surveyed persons;
- intellectual impairment—intellectual and developmental disabilities—182 surveyed persons;
- social functioning impairment—disorders of neural and emotional balance—399 surveyed persons;
- communication impairment—hindered verbal contact (speech impediments, autism, stammering)—444 surveyed persons;
- motor impairment—people with motor organ dysfunction—1153 surveyed persons.

Table 1. Characteristics of the surveyed respondents.

Specification		Number of People Surveyed	Percentage of Respondents
Criterion of Division	**Range**		
Sex	Woman	1421	50%
	Man	1425	50%
Education	Basic	570	20%
	Secondary	1591	56%
	Higher	651	23%
	No answer	34	1%
Degree of disability	Severe	400	14%
	Moderate	1057	37%
	Mild	1384	49%
	No answer	5	-
Type of disability	Sensory impairment	644	23%
	Intellectual impairment	182	6%
	Social functioning impairment	399	14%
	Communication impairment	444	16%
	Motor impairment	1153	40%
	No answer	24	1%
Age	Below 20 years of age	225	8%
	20–29 years	763	27%
	30–39 years	758	27%
	40–49 years	641	13%
	50 and more years	459	21%

Source: Author's own study.

Based on an analysis of the subject literature regarding architectural barriers, in the studies conducted, the following 18 variables related to the disabled client's perception of the quality of service were defined:

- B1—office localization (easiness of access),
- B2—appropriate number of parking places,
- B3—parking places for the disabled located near the office entrance,
- B4—clear marking of parking places for the disabled,
- B5—making sure that unauthorized persons do not occupy places for the disabled,
- B6—facilities for the disabled in the office,
- B7—lifts adapted to the needs of the disabled,
- B8—toilets adapted to the needs of the disabled,
- B9—handrails by the stairs,
- B10—system of ramps and driveways for the disabled,
- B11—doors with a width enabling entrance on a wheelchair,
- B12—anti-slip floor,
- B13—levelled thresholds and floors,

- B14—surface and curbs in the vicinity of the office adjusted to the needs of the disabled,
- B15—contains information for the disabled,
- B16—legible for the disabled with visual impairment,
- B17—municipal office does not have architectural barriers which would make it difficult for the disabled to get around,
- B18—general evaluation of architectural barriers in the office.

In the event of evaluation of perceived and expected quality, marking B_O—for expected quality, with a number of subsequent variables, and marking B_p—for perceived quality, with a number of subsequent variables, have been applied. The overall evaluation of a particular architectural barrier is calculated as perceived quality minus expected quality; for subsequent variables in this case the marking B has been applied.

All variables regarding architectural barriers and the level of quality were evaluated on 1–7 Likert scale, where in the case of expected quality 1 means that a given variable is completely irrelevant, whereas 7 means that it is very important; on the other hand, in the case of perceived quality 1 means that a particular variable is performed by the municipal office at a very low level, while 7 means that its level is very high.

The analysis of the research results was conducted using different quantitative methods for statistical data analysis. Calculations for the needs of the publications were made by means of Excel spreadsheet and Statistica 10.0 package, used on a license owned by the Silesian University of Technology [48].

The construction of the method, which consists in comparing the perceived quality with the expected one, indicates that the level of quality is positive very seldom, as most frequently the quality of the actually provided service does not meet the expectations. This phenomenon is psychologically determined and occurs in different kinds of organizations [48–52]. For this reason, the negative result should not be immediately treated as a bad one. A low level of quality occurs only when there is a considerable gap between the expectations and client's perception of the service. To interpret the results of studies discussed in this publication, the following linguistic scale has been applied:

- above 0—very good;
- <0; −1)—good;
- <−1; −1.5)—average;
- <−1.5; −2)—bad;
- below −2—very bad.

In the investigations, the following goals were set:

- Identification of hidden factors for architectural barriers.
- Determining the level of quality of the client service in municipal offices of the Silesian Province with regard to architectural barriers, as evaluated by the disabled.
- Analysis of the influence of the degree of disability, its type and the age of the disabled person on the perception of the quality of service in relation to architectural barriers.

All problems have a big impact on sustainable development especially in the area of promotion of equal opportunity in the public services. Equal opportunity for people with disabilities is impossible to achieve without the elimination of architectural barriers. To ensure equal opportunity for the disabled we should decrease the level of this phenomenon.

First we formulated four research questions:

- What is the impact of the degree of disability on the evaluation level of quality with regard to architectonical barriers?
- What is the impact of the types of disability on the evaluation level of quality with regard to architectonical barriers?

- What is the impact of the age of the disabled on the evaluation level of quality with regard to architectonical barriers?
- What hidden factors can we identify in the case of architectural barriers in municipal offices services for peoples with disability?

Before the studies two hypotheses were formulated:

Hypothesis 1 (H1). *The type of disability has a significant impact on the evaluation of architectural barriers in municipal offices by the disabled client.*

Hypothesis 2 (H2). *The age of a disabled person influences the evaluation of architectural barriers in municipal offices by the disabled client.*

3. Results

After calculating the values of variables regarding the disabled persons' evaluation of architectural barriers (Figure 1) it turns out that one variable was assessed on a very low level, namely making sure that parking places for the disabled are not occupied by unauthorized persons-score (−2.05). Other variables which were given a low rating include:

- Appropriate number of parking places (−1.98);
- legibility of the office's website for the disabled with visual impairment (−1.88);
- parking places located near the office entrance (−1.82);
- surfaces and curbs in the vicinity of the office adapter to the needs of the disabled (−1.82)
- anti-slip floor (−1.62);
- lifts adapted to the needs of the disabled (−1.52);
- system of ramps for the disabled (−1.52);
- the office's website contains information that is important for the disabled (−1.51).

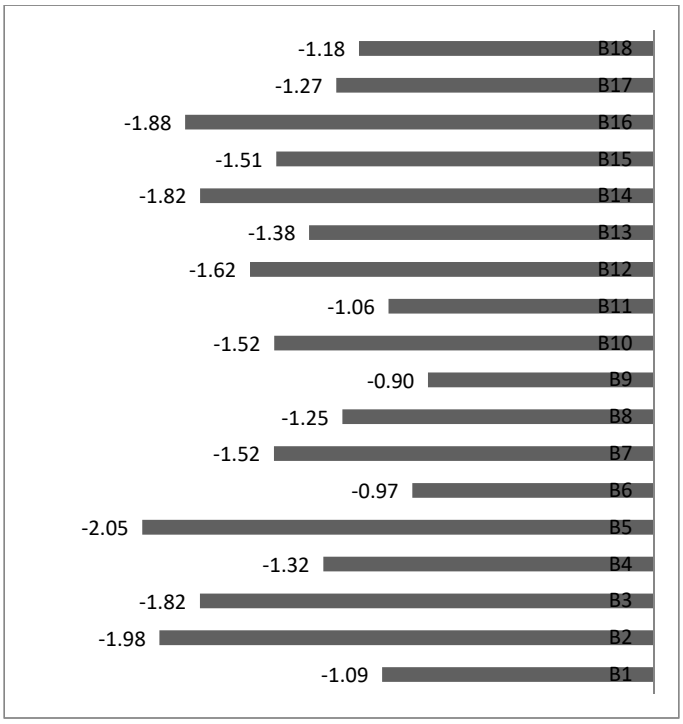

Figure 1. Level of quality with regard to architectural barriers in the investigated municipal offices.

A division of the results according to the type of disability has been presented in Table 2. To achieve the significance of the results we used of non-parametric Kruskall–Wallis test allowed for finding statistically significant differences at the significance level of $\alpha = 0.05$ between two variables: B14—adapting the curbs and surfaces in the vicinity of the office to the needs of the disabled and B17—architectural barriers which make it difficult for the disabled with motor impairment to get around the office.

Table 2. Evaluation of the level of quality with regard to architectural barriers according to the degree of disability.

Variables	Degree of Disability		
	Severe (N = 400)	**Moderate (N = 1057)**	**Mild (N = 1384)**
B1	−1.23	−1.11	−1.03
B2	−1.91	−2.06	−1.93
B3	−1.82	−1.87	−1.77
B4	−1.16	−1.36	−1.34
B5	−2.09	−2.13	−1.97
B6	−1.03	−0.96	−0.95
B7	−1.72	−1.54	−1.45
B8	−1.33	−1.23	−1.23
B9	−0.96	−0.93	−0.87
B10	−1.67	−1.61	−1.41
B11	−1.24	−1.04	−1.03
B12	−1.63	−1.62	−1.61
B13	−1.49	−1.32	−1.40
B14	**−1.81**	**−1.95**	**−1.71**
B15	−1.46	−1.49	−1.54
B16	−1.87	−1.92	−1.85
B17	**−1.42**	**−1.27**	**−1.23**
B18	−1.28	−1.25	−1.10
Average	**−1.51**	**−1.48**	**−1.41**

Source: Author's own study.

Table 3 presents a list of results of the conducted studies regarding architectural barriers divided into particular types of disability. To achieve the meaningfulness of the results we used significance testing. On the basis of statistical significance $\alpha = 0.01$ using an ANOVA Kruskall–Wallis test, statistically significant differences were found between the following five variables: B1, B6, B11, B14, B15. The results concerning the division into types of disability suggest that in many cases the issues are evaluated the worst by people with intellectual impairment (average—1.550. However, this is not always the case, as sometimes this barrier is rated the worst by persons with social functioning impairment (−1.49) or motor impairment (−1.47).

The variable which highly differentiates the client's evaluation of architectural barriers is the one related to the age of the respondent using the services provided by municipal offices. In this case to achieve the significance of the results we use of ANOVA Kruskall–Wallis test allows for stating that statistically significant differences at the level of significance $\alpha = 0.01$ appear in the case of such variables as: B1, B4, B5, B8, B13, B14, B15 (Table 4).

Table 3. Evaluation of architectural barriers with a division into types of disability.

Variables	Type of Disability				
	Sensory Impairment (N = 644)	**Intellectual Impairment (N = 182)**	**Social Functioning Impairment (N = 399)**	**Communication Impairment (N = 444)**	**Motor Impairment (N = 1153)**
B1	**−0.99**	**−1.34**	**−1.14**	**−1.26**	**−1.02**
B2	−1.78	−1.95	−2.08	−1.94	−2.06
B3	−1.73	−2.05	−1.94	−1.77	−1.78
B4	−1.21	−1.47	−1.39	−1.36	−1.32
B5	−1.96	−1.91	−2.07	−2.25	−2.01
B6	**−0.88**	**−1.18**	**−0.98**	**−1.03**	**−0.94**
B7	−1.52	−1.62	−1.49	−1.39	−1.57
B8	−1.26	−1.49	−1.23	−1.31	−1.18
B9	−0.77	−1.09	−0.95	−0.89	−0.92
B10	−1.36	−1.51	−1.51	−1.40	−1.64
B11	**−0.96**	**−1.39**	**−1.12**	**−1.22**	**−0.98**
B12	−1.57	−1.87	−1.72	−1.47	−1.61
B13	−1.35	−1.63	−1.56	−1.39	−1.29
B14	**−1.70**	**−1.56**	**−1.73**	**−1.63**	**−2.03**
B15	**−1.40**	**−1.15**	**−1.48**	**−1.36**	**−1.69**
B16	−1.76	−1.72	−1.86	−1.66	−2.05
B17	−1.22	−1.73	−1.29	−1.25	−1.22
B18	−1.07	−1.22	−1.19	−1.21	−1.20
Average	**−1.36**	**−1.55**	**−1.49**	**−1.43**	**−1.47**

Source: Author's own study.

Table 4. Evaluation of architectural barriers according to the age of the disabled.

Variables	Age Range				
	Below 20 Years (N = 225)	**20—29 Years (N = 763)**	**30—39 Years (N = 758)**	**40—49 Years (N = 641)**	**50 and More Years (N = 459)**
B1	**−0.83**	**−0.94**	**−1.01**	**−1.27**	**−1.33**
B2	−1.78	−1.89	−1.94	−2.16	−2.03
B3	−1.57	−1.79	−1.75	−2.01	−1.82
B4	**−1.17**	**−1.34**	**−1.27**	**−1.53**	**−1.18**
B5	**−1.65**	**−2.03**	**−2.11**	**−2.21**	**−1.93**
B6	−1.02	−0.99	−0.94	−0.96	−0.95
B7	−1.44	−1.40	−1.49	−1.68	−1.57
B8	**−1.09**	**−1.10**	**−1.17**	**−1.43**	**−1.42**
B9	−0.71	−0.85	−0.85	−1.01	−1.03
B10	−1.39	−1.48	−1.46	−1.62	−1.59
B11	−1.09	−1.01	−1.07	−1.04	−1.16
B12	−1.35	−1.50	−1.70	−1.71	−1.68
B13	**−1.06**	**−1.25**	**−1.39**	**−1.50**	**−1.57**
B14	**−1.51**	**−1.65**	**−1.85**	**−1.96**	**−1.98**
B15	−1.25	−1.35	−1.51	−1.59	−1.79
B16	−1.74	−1.94	−1.78	−1.85	−2.03
B17	−1.11	−1.15	−1.23	−1.38	−1.46
B18	−1.08	−1.11	−1.16	−1.29	−1.20
Average	**−1.27**	**−1.38**	**−1.43**	**−1.57**	**−1.54**

Source: Author's own study.

Hidden Factors for Architectural Barriers

Taking into consideration the classic assumptions [23] for conducting a factorial analysis, the first criterion is fulfilled, as the number of variables is 18, therefore the number of cases should be at least 180. As there are 2846 cases, this criterion is fulfilled. The data also fulfills Bartlett's sphericity test,

Kaiser–Meyer–Olkin criterion and Cronbach's alpha test. Fulfillment of the tests provides a basis for applying a factorial analysis. For this purpose, Kaiser's criterion and Cattell's scree test have been used. Application of both of the aforementioned criteria suggests that four factors at most are left. The identified hidden factors explain the total variability of 58%. Table 5 presents the matrix of factor loadings (factors were subjected to rotation by harmonized Varimax method). Factor loadings assigned to a particular factor have been bolded.

The identified factors can be useful to measure the level of implementation of the sustainable development policy in the aspect of ensuring equal opportunity in access to public administration services. By identifying these factors we can determine what is important from the point of view of clients with disability.

The first identified factor accounts for 20% of variability and contains eight variables. The factor was named disabled person moving freely around the office. This factor includes issues related to the location of a municipal office, facilities for the disabled in toilets, handrails by the stairs, a system of ramps in the office, an adequate width of doors enabling persons in wheelchairs to get around, anti-slip floor, levelled thresholds and floors as well as the existence of barriers which make it difficult for the disabled to move around the office.

The second identified factor accounts for 17% of variability and consists of four variables. The factor was named—parking spots for the disabled. It includes variables related to the number of parking spots in the vicinity of the office, the location of parking spaces near the office entrance, clear marking of parking spots for the disabled and making sure that parking spots for the disabled are not occupied by unauthorized persons.

Table 5. Identification of hidden factor loadings for architectural barriers.

Variables	Factor 1	Factor 2	Factor 3	Factor 4
B1	**0.39**	0.37	0.03	0.30
B2	0.21	**0.75**	0.14	0.06
B3	0.22	**0.79**	0.14	0.15
B4	0.07	**0.57**	0.18	0.43
B5	0.14	**0.73**	0.19	0.11
B6	0.12	0.17	0.18	**0.75**
B7	0.38	0.44	−0.07	**0.45**
B8	**0.59**	0.39	−0.09	0.37
B9	**0.57**	0.03	0.22	0.39
B10	**0.67**	0.07	0.17	0.25
B11	**0.68**	0.13	0.10	0.30
B12	**0.68**	0.26	0.29	−0.11
B13	**0.72**	0.27	0.21	0.02
B14	0.44	0.39	**0.45**	0.03
B15	0.31	0.27	**0.61**	0.21
B16	0.09	0.12	**0.81**	0.17
B17	0.22	0.10	0.17	**0.67**
B18	**0.55**	0.31	−0.08	0.40
Variance explained	3.65	3.07	1.64	2.20
Percentage share	**0.20**	**0.17**	**0.09**	**0.12**

Author's own study.

The third identified factor explains 9% of variability and consists of three variables. It includes variables related to the surfaces and curbs near the municipal office, the legibility of the website for the disabled with visual impairment and the website contents from the point of view of usability of information for handicapped persons. The variable was named—the website and surroundings of the office.

The last identified hidden factor accounts for 12% of variability and consists of three variables regarding facilities for the disabled in the office, lifts adapted to the needs of the disabled and the remaining architectural barriers. The factor was named other facilities for the disabled.

In the further stage the total value of the examined variables was calculated for particular hidden factors. According to the adopted scale, two factors were evaluated on an average level, whereas the other two on a bad level. Factors considered as average include the disabled being able to freely move around the office and other facilities for the disabled. Both of them were given a score of –1.25. Factors which were considered bad were the ones related to parking places for the disabled (–1.79) as well as the website and surroundings of the office (−1.73).

4. Discussion

A disabled person, encounters numerous architectural barriers in their daily existence, which hinder his/her functioning in society. The sustainable development according to literature should fulfill the needs of the current generation without diminishing the chances of future generations. We cannot fulfill all the society's needs without ensuring, that big and important part of the society—people with various kinds of disability can live in a sustainable and satisfying way. They should have an opportunity to participate in all public activities and they need to be in contact with municipal offices. This problem is very important from the perspective of ensuring equal opportunity. One of major tasks involved in creating a friendly public space for such people is to make sure that municipal offices are built and operate in a way that allows for reducing the arduousness of such barriers for the disabled to the greatest possible extent. This can be part of the implementation of sustainable policy on the local level.

A very low evaluation of office employees' care over the parking spots intended for the disabled is symptomatic and indicates that the investigated offices do not pay enough attention to the needs of handicapped people. Making sure that parking spots for the disabled are not occupied by unauthorized persons is an easy issue, which does not require large financial expenditure, as opposed to the elimination of other barriers. On the other hand, interviews with the disabled suggest that for many of them it is frequently a kind of a "test", informing them whether a particular institution cares for their needs or not. Many handicapped persons automatically perceive a given service outlet worse if from the very beginning they can see that parking spots are occupied by unauthorized people, who do not have adequate markings. In many cases disabled people are very sensitive about this problem. Planning with this issue in mind is an important element which shapes the image of the office as a place friendly to the disabled and should not be overlooked or neglected. The improvements in all mentioned problem is important from sustainable development point of view because according to literature very important factor of sustainable development is the issue of equal opportunity for people with regards to the access to public services. Fulfilling needs of persons with disability in those cases is according to the points mentioned in the Strategy for Sustainable Development of Poland until 2025 [49–52]. On the basis of the research we can say that infrastructural barriers are the most important and have biggest role in the person with disabilities perception of the quality of service in municipal offices by disabled. The others mentioned in literature barriers were not so important, according to obtained results.

Because infrastructural barriers are so important from persons' with disability point of view, municipal offices should use sustainable design in the process of planning of surroundings and interior of municipal offices. This philosophy is very important when we want to implement sustainable strategy on the municipal level. Sustainable architecture is very important part of implementing of equal opportunity for people with disability. In the case of municipal office in the sustainable architecture we should concentrate in the main founded in the paper problems: Curbs, parking spots, suffrages and the process of carefully planning of the surrounding of the office.

Taking into consideration the degree of disability—in the case of most variables a better score is given by persons with a mild degree of disability compared to the other two groups of handicapped

people. Persons with a severe degree of disability evaluate the examined variables on an average level of −1.51; in the case of moderate degree this evaluation reaches a level of −1.48, whereas for a mild degree of disability, the average score for the quality of architectural barriers is −1.41 (we use statistical testing of this results on the level of $\alpha = 0.05$).

In particular, in the case of variables where the differences are statistically significant:

- for variable B14 persons with severe disability evaluate architectural barriers on a level of −1.81; in the case of people with moderate disability this score is −1.95, whereas in the case of persons affected by mild disability the score reaches −1.71;
- for variable B17 the score given by persons with severe disability is −1.41; people with moderate disability evaluate it on a level of −1.27, whereas in the case of persons affected by mild disability the score is −1.23.

Next, we analyze the impact of type of disability on evaluation of architectural barrier on respondents (we use statistical testing of this results on the level of $\alpha = 0.05$). As architectural barriers pose the greatest difficulty for people with motor impairment, these people evaluated the significance of the majority of variables on the highest level. In some cases the variables were also highly assessed by persons with communication and social functioning impairment.

The research results obtained confirm hypothesis H1, stating that the type of disability has a significant influence on the evaluation of architectural barriers in municipal offices by the disabled client.

In addition, we analyzed the impact of age on evaluation of architectural barriers in municipal offices by the peoples with disability (we use statistical testing of this results on the level of $\alpha = 0.05$). The studies clearly indicated that the older a disabled person, the worse he/she evaluates the quality of architectural barriers. Persons aged 40–49 assessed it on a level of −1.57 and people aged 50 or more gave a score of −1.54. Architectural barriers are assessed the most favorably by persons below 20 years of age. In their case the average score reaches −1.27.

The fact that the older the disabled, the worse they evaluate issues related to architectural barriers is confirmed by the results of an analysis of a correlation between the age and variables' results for particular barriers. V-Cramer correlations on a level of statistical significance $\alpha = 0.01$ are significant for some of the variables (variables B1, B2, B7, B8, B13, B14, B15, B18) and have a negative value, which means that the younger the respondent, the higher is the level of satisfaction. The correlations have low values (approximately 0.07 to 0.14), but they are statistically significant.

Young people, despite their disability, can cope with architectural barriers more easily due to the fact that their general fitness is better. On the other hand, in the case of handicapped persons aged 30 and above, especially the disabled over 40 years of age, these barriers are perceived as much worse, as they are much more difficult to handle due to the deteriorating general health condition of such people. In this case persons below 20 years of age evaluate arriving at the office as easy (−0.83); this variable is also assessed well by people in the age range of 20–29 years (−0.94). On the other hand, in the case of persons aged 30 and above, this variable is assessed on an average level—for 30–39-year-old people it is −1.01, for 40-.49-year-olds −1.27, whereas in the case of people aged 50 and above it reaches −1.33.

The results of the studies conducted confirm hypothesis H2, stating that the age of a disabled person influences the evaluation of architectural barriers in municipal offices.

Obtained results are according to others author's findings which say that disabled people with society are very diverse in terms of degree of disability, and types of disability.

5. Conclusions

Equal opportunity for people with disability is an important part of the implementation of a sustainable strategy. Without the reduction of architectural barriers in public administration offices we cannot realize this policy. It is an indispensable part of the social aspect of sustainable development.

We found in the paper statistically significant impact of degree of disability, type of disability and the age of disable person on their assessment of quality level of services in the municipal offices. We found that persons with higher level of disability assess problems with architectural barriers worse comparing person with low level of disability. Also problems with architectural barriers have impact particularly on the persons with motor impediments. From the age point of view the problems with architectural barriers an important for disables persons in the age 40 and more years.

On the basis of obtained results we can say, that authorities in municipal offices should carefully plan they architectural activity too meet the person with disability needs. Especially they should to concentrate on the needs of persons assessing the problem worth: Persons with a high level of disability, with motor impairments and having more than 40 years. They should to do careful research of the needs of those person to find they need and those kinds of disabled persons should participate in this process.

Another very important finding of the present paper is the identification of hidden factors affecting persons with disability needs in the case of municipal offices service. On the basis of the research the authors identify four main hidden factors for architectural barriers from the perspective of people with disability. We can distinguish four main hidden factors for architectural barriers: disabled person moving freely around the office, parking spots for disables, the website and surroundings of the office and other facilities. The analyses based on hither factor method conducted in the paper showed other factors that typical problems described in the literature (natural, economical, physical, etc.). Our factors concentrate on the main perceived by persons with disability problems and can be used by municipal offices to improving they services.

Those factors are: disabled persons moving freely around the office; parking spots for the disabled, the website and surroundings of the office, other facilities for the disabled. It is the authors' opinion that those factors can be useful not only locally, but also in other Polish provinces and others European countries. Local government authorities can use them for planning equal opportunity policies to increase the conformity of municipal office functioning to sustainable development principles.

On the basis of the analysis conducted, we have concluded that in the Silesian province, the main problems with architectural barriers from the perspective of disabled people are connected to: Parking spots; municipal office website and surfaces and curbs in the vicinity of the office. To fulfill the sustainable development goals and achieve a good level of satisfaction among the disabled customers, local authorities should resolve those problems. They are very important from the perspective of disabled clients and every municipal office should take them into consideration to ensure equal opportunity for all customers.

The result of the research can be used not only locally, but in other regions because the problems of disabled persons are similar and depends rather on the type and level of disability not on the particular municipal office. Especially, from the sustainable development point of view is important to include in the architectural planning process the persons with disability, from the identified in the paper group of persons which perception of the satisfaction of service level is worst. This can be beneficial in the improving of the problem and can lead to achieving equal opportunity and sustainable development strategy realization.

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