

INCLUSIVE DESIGN

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Nowadays, most designers try to create the most comfortable and affordable customer - oriented space. This design is characterized by the following principles:

- the expansion of human capabilities;
- the overcoming human limitations;
- taking into account preferences and individual differences of people, who will act in a projected residential environment in the design process.

Analyzing all mentioned facts, it becomes clear that the main task of the designer is to adapt created space for more people. Problems of adaptability is topical for people who need the additional capabilities of environment. Disabled and aged people are the category of the population that especially needs thought-out organization of residential environment. Generally, they are unable to orientate freely in the environment, to take an active part in cultural, sporting and entertaining actions, to use the common services in full measure and feel comfortably in their own home. These people lose the entitlement to the possibility of combining the individual interests with the public. In this connection there is the problem of functional and structural adaptation of the environment to prevent the limitations of contact and possibilities of movement the disabled and aged people, and also other people with limited mobility (parents with small children and children's prams, pregnant women, people with injuries of the musculoskeletal system, physically infirm people).

In spite of the fact that the necessity in the flexibility of space existed for a long time, special concepts for this problems has developed since the middle of the twentieth century. As today's this problem does not lose its topicality, new concepts and new courses are created. One of which is the concept of Inclusive Design.

What is Inclusive Design? Inclusive Design (also known as Design for All and as Universal Design in the USA) is neither a new genre of design, nor a separate scope of activity. It is a general approach in designing where designers ensure that their products and services address the needs of the widest possible audience, irrespective of age or ability. Two major problems become reasons of creating Inclusive Design:

- population ageing;
- constantly growing requirements to integrate disabled people into society.

Let's consider the history of creation Inclusive Design. The term Universal Design was introduced by an architect Ronald Mace. He described the concept of designing all products and environment adaptable to everyone, regardless of their age, ability, or status in life. However, it was the work of Selwyn Goldsmith, the author of *Designing for the Disabled* (1963), who really pioneered the concept of free access for disabled people. His most significant achievement was the creation of the splayed kerb at sidewalks. They were initially designed for people who use wheelchairs, but they are now also used by pedestrians with strollers or rolling luggage. Splayed kerbs have added functionality to sidewalks that we can all benefit from.

In 1997 a working group of architects, product designers, engineers and environmental design researchers developed seven principles of Universal Design, the leader was Ronald Mace from the North Carolina State University. The purpose of the principles was to guide the design of environments, products and communications. According to the Center for Universal Design in NCSU, the principles «may be applied to evaluate existing designs, guide the design process and educate both designers and consumers about the characteristics of more usable products and environments». The principles of Universal Design and its guidelines are shown in table 1.

Table 1 - Seven principles of Universal Design.

№	Principle	Guidelines	Examples
1.	<p>Equitable Use The design is useful and marketable for people with diverse abilities.</p>	<p>1a. Provide the same means of use for all users: identical whenever possible. 1b. Avoid segregating or stigmatizing any users. 1c. Provisions for privacy, security, and safety should be equally available to all users. 1d. Make the design appealing to all users.</p>	<p>Power doors with sensors at entrances that are convenient for all users. Integrated, dispersed, and adaptable seating in assembly areas such as sports arenas and theaters.</p>
2.	<p>Flexibility in Use The design accommodates a wide range of individual preferences and abilities.</p>	<p>2a. Provide choice in methods of use. 2b. Accommodate right- or left-handed access and use. 2c. Facilitate the user's accuracy and precision. 2d. Provide adaptability to the user's pace.</p>	<p>Scissors designed for right – or left – handed users. An automated teller machine (ATM) that has visual, tactile, and audible feedback, a tapered card opening, and a palm rest.</p>
3.	<p>Simple and Intuitive Use The use of design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.</p>	<p>3a. Eliminate unnecessary complexity. 3b. Be consistent with user's expectations and intuition. 3c. Accommodate a wide range of literacy and language skills. 3d. Arrange information consistent with its importance. 3e. Provide effective prompting and feedback during and after task completion.</p>	<p>A moving sidewalk or escalator in a public space. An instruction manual with drawings and no text.</p>
4.	<p>Perceptible Information The design provides necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.</p>	<p>4a. Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information. 4b. Provide adequate contrast between essential information and its surroundings. 4c. Maximize "legibility" of essential information. 4d. Differentiate elements in ways that can be described (i.e. make it easy to give instructions or directions). 4e. Provide compatibility with a variety of techniques or devices used by people with sensory limitations.</p>	<p>Tactile, visual, and audible cues and instructions on a thermostat. Redundant cueing (e.g., voice communications and signage) in airports, train stations, and subway cars.</p>
5.	<p>Tolerance for Error The design minimizes hazards and the adverse consequences of accidental or unintended actions.</p>	<p>5a. Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded. 5b. Provide warnings of hazards and errors. 5c. Provide fail safe features. 5d. Discourage unconscious action in tasks that require vigilance.</p>	<p>A double-cut car key easily inserted into a recessed keyhole in either of two ways. An «undo» feature in computer software that allows the user to correct mistakes without penalty.</p>
6.	<p>Low Physical Effort The design can be used efficiently and comfortably and with a minimum of fatigue.</p>	<p>6a. Allow a user to maintain a neutral body position. 6b. Use reasonable operating forces. 6c. Minimize repetitive actions. 6d. Minimize sustained physical effort.</p>	<p>Lever or loop handles on doors and faucets. Touch lamps operated without a switch.</p>
7.	<p>Size and Space for Approach and Use An appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.</p>	<p>7a. Provide a clear line of sight to important elements for any seated or standing user. 7b. Make reach to all components comfortable for any seated or standing user. 7c. Accommodate variations in hand and grip size. 7d. Provide adequate space for the use of assistive devices or personal assistance.</p>	<p>Controls on the front and clear floor space around appliances, mailboxes, dumpsters, and other elements. Wide gates at subway stations that accommodate all users.</p>

To sum up, we can enumerate the benefits of Inclusive Design:

- Inclusive - so that everyone can use the environments created safely, easily and with dignity.
- Responsive - taking into account of what people say they need and want.
- Flexible - so that different people can use the built environment in different ways.
- Convenient - so that everyone can use the built environment without too much effort or separation.
- Accommodating - for all people, regardless of their age, gender, mobility, ethnicity or circumstances.
- Welcoming - with no disabling barriers that might exclude some people.
- Realistic - offering more than one solution to help balance everyone's needs and recognising that one solution may not work for all.