MODULE 3

AGE-FRIENDLY BUILT ENVIRONMENT – ARCHITECTURE

UNIT

1

INTRODUCTORY UNIT – HUMAN-CENTRED DESIGN

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DESIRE

DESIGN FOR ALL METHODS TO CREATE AGE-FRIENDLY HOUSING

STU FAD
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DESIRE will provide professionals in the building industry and home furnishings sector with the tools and skills to apply Design4All methods as an integral part of the design process, with the aim to create or adapt age friendly housing as a solution for the wellbeing, comfort and autonomy of the older adults or dependents at home.

The DESIRE training platform consists of six modules and 21 units.

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UNIT 1 – INTRODUCTORY UNIT – HUMAN-CENTRED DESIGN

This unit provides an overview of the basic principles, methods, and legislation focused on human-centred design methods (people at the heart of the design process) related to the built environment, such as the principles of Universal Design/Design for All, legislative frameworks, and European initiatives. This unit aims at the acknowledgment of human diversity and various needs and requirements of people in the built environment, including older people and persons with disabilities. Empathic and simulation exercises within this unit provide a deeper understanding of the requirements and needs of different users and understanding of the importance of participatory planning.

1.1 DIVERSITY OF PEOPLE IN THE BUILT ENVIRONMENT

IN A NUTSHELL

Every person is unique and has the right to be welcome in the built environment. To ensure inclusion of all people, we consider different areas of life, environments, as well as various needs of people in macro, meso and micro levels. The importance of this issue is emphasized by international conventions and documents, such as the Convention on the Rights of Persons with Disabilities, and we find more details regarding the built environment in ISO standards. Neuro-architecture offers an innovative research approach to this topic.

Accepting the diversity of people and the individuality of each person is a basic prerequisite for creating an **inclusive environment**, in which all people would have the opportunity to use the physical environment, products, services, means of communication and information on an equal basis, while actively participating in society. The environment must support the right of every individual to an **independent and full personal life**, so systemic solutions (from the micro to the macro level) should ensure the creation of a non-discriminatory environment.
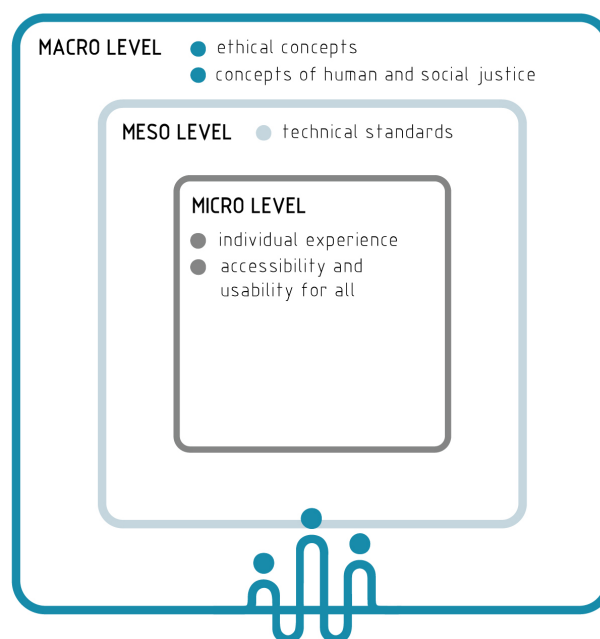

Figure 3.1.1   Systemic solution of inclusive environment (Suláková according to Samová, 2008)

1.1.1 The International Classification of Functioning, Disability and Health

To understand the diversity of people, it is essential to know the basic requirements and needs of a wide range of users of the built environment. **The International Classification of Functioning, Disability and Health** (ICF, WHO 2001) provides a terminological basis, including components and factors, that are important for the creation of an inclusive environment, products, services and information and communication technologies. The ICF is based on a description of situations regarding human abilities in the context of the environment and society in which one lives. It conceptualises functioning as a "dynamic **interaction between a person's health condition, environmental factors and personal factors**." The ICF covers the **entire lifespan** of people.

The ICF defines the following **components** that create comprehensive information about a person's condition:
- **Functioning and Disability:**
  - Body Functions and Body Structures
  - Activities and Participation
- **Contextual Factors:**
  - **Environmental Factors** (e.g. physical, social, cultural environment)
  - **Personal Factors** (characteristics of the individual – gender, race, age, lifestyle, education, experience, behaviour, etc.)

The ICF classification further classifies **environmental factors** into the following categories:
- built environment, products and technologies (personal consumption items, information and communication technologies, assistive technologies, means of transport, public buildings, public spaces, etc.)
- natural environment and human-made changes to the environment (climate, air quality, etc.)
- support and relationships (family, friends, neighbours, etc.)
- attitudes (social, individual)
- services, systems and policies (e.g. social security, health, education, etc.)

According to the ICF, a person's functional ability is understood as a **holistic concept** that includes all body functions, activities and participation in the environment and society. The term disability serves as an umbrella term for disorders, limitations in activity and participation. Disability is understood as a multidimensional phenomenon resulting from the interaction between people and their physical and social environment.

The importance of environmental factors and their impact on human activity and participation in society is also emphasized by the **Convention on the Rights of Persons with Disabilities** (hereinafter referred to as the CRPD Convention), which was approved by the United Nations in 2006: "Recognizing that disability is an evolving concept and that disability results from the interaction between persons with impairments and attitudinal and environmental barriers that hinders their full and effective participation in society on an equal basis with others." The importance of this interaction in creating the environment and its individual elements is emphasised by **Human-centred Design**, which focuses its attention on the people and reflects their diverse needs and abilities.

1.1.2 ISO Guide for addressing accessibility in standards

In connection with the creation of the built environment and the more rigorous expression of the relationship between the individual and the environment, it is recommended to use the ISO/IEC GUIDE 71: 2014 (E) **Guide for addressing accessibility in standards**. This ISO guide provides terminology relating to the accessibility and usability of the environment, products, information and communication technologies and services. This ISO guide utilises the term accessibility from an **inclusive perspective**, recognizing that accessibility generally **benefits everyone**.

The ISO GUIDE 71: 2014 uses terminology describing human abilities and characteristics according to the ICF classification (WHO,2001), so it does not use the term "disability" but the terms – body structure, bodily functions, disorders and consequences in relation to activity limits and restrictions in participation. The ISO guide emphasises the **diversity of human abilities and characteristics, which change over a person's life** and can be very diverse even among individuals of the same age group. It also draws attention to the fact that all people may experience certain limitations in activities and participation during their lives. The ISO guide points out that **sensory, physical and cognitive limitations** can be very diverse – from mild disorders to severe disorders. Although some disorders can be mild, the combination of several disorders can cause severe limitations, most often in the **ageing process**.

The basic structure of the ISO guide is divided into:
- a set of **goals to achieve universal accessibility** (based on the identification of peoples' needs and requirements)
- description of **human abilities and characteristics**
- description of **strategies/recommendations** to address peoples' needs in relation to human capabilities/functions and limitations

The ISO guide divides **human abilities/ functions and characteristics** as follows:
- **sensory abilities and characteristics**
  - seeing/vision function
  - hearing function
  - touch/haptic function
  - taste and smell functions
- **immunological system functions** (immune reactions, allergies and hypersensitivity, etc.)
- **physical abilities and characteristics**
  - height and body size
  - body movement (upper/lower limbs)
  - strength and endurance
  - voice and speech functions
- **cognitive abilities** (perception, attention, learning, memory, orientation, problem solving, decision making, emotional functions, etc.)

To know more about the human abilities, functions and characteristics read the Module 2, Unit 1 on Ageing process and changes to bodily systems.

950

A person moving with
the help of French crutches

550
w.500

A person moving with
walker

800

1700
w.700/900

A person with
a stroller
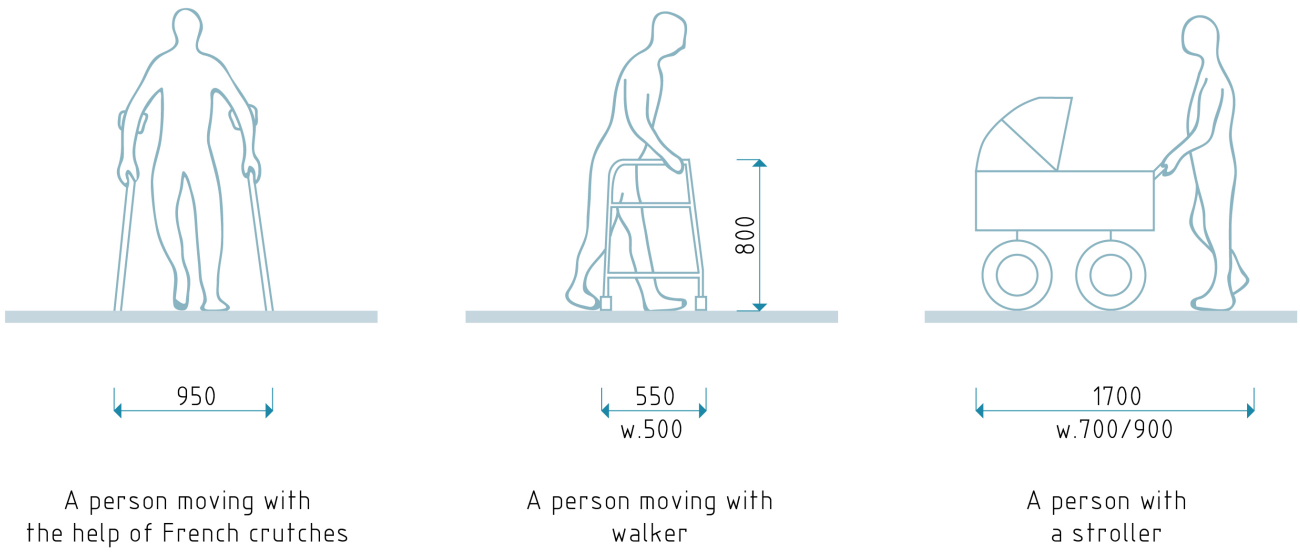
Figure 3.1.2 Spatial demands of people with diverse mobility (Suláková)

950

A person moving with
a stick

650   550
w.500

800

A person moving with
rollator

1100

A person with
luggage
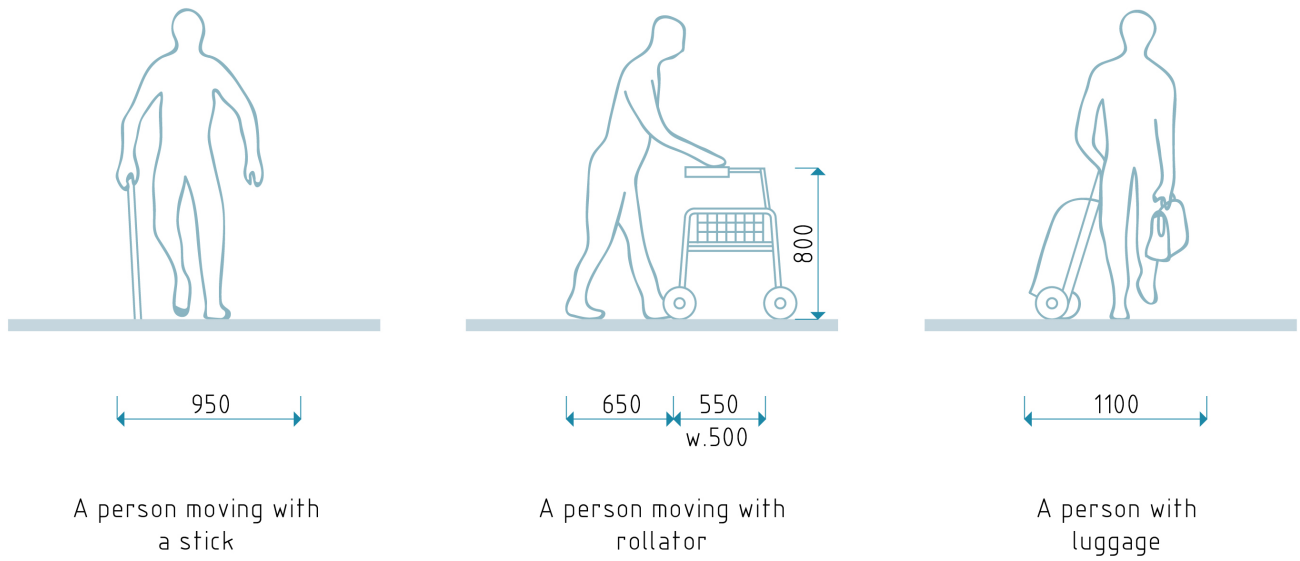
Figure 3.1.3 Spatial demands of people with diverse mobility (Suláková)

150 | 600 | 150

1100

1200

Blind person moving
with a white stick

Person with guide dog

Person with a guide
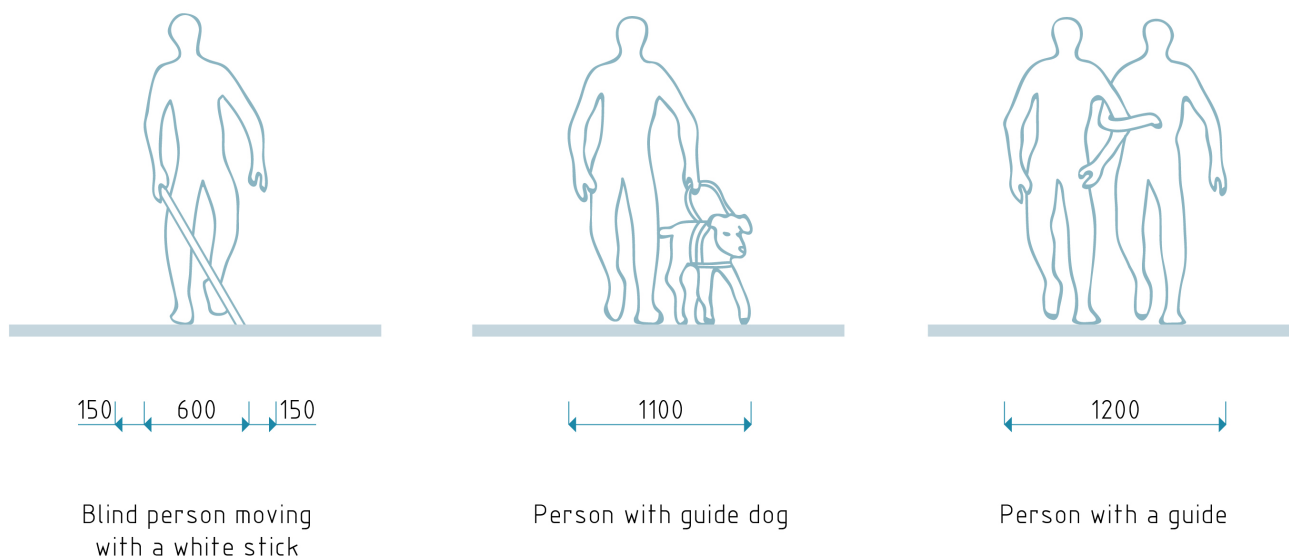
Figure 3.1.4 Spatial demands of people with visual impairments (Suláková)

Maneuvering space affects the
design of the minimum spaces
(elevator, toilet,...)

min. 1500
(electric wheelchair 1800)

(el. wheelchair 1800)

1100–1200

Min. passage affects
the width of the spaces
(corridors) and width of
the door openings

650–700

800

Figure 3.1.5 Spatial requirements of person in a wheelchair (Suláková)

1.1.3 Environmental psychology and neuroscience in architecture

The **challenge in architectural design** is to create such an environment that is **not only** responding to the **functional needs of the people**, but also reflecting their **psychosocial, cultural, and other needs**. Therefore, architectural design is linked with environmental psychology and neuroscience, which draws attention to the psycho-social aspects of the environment and examines the imp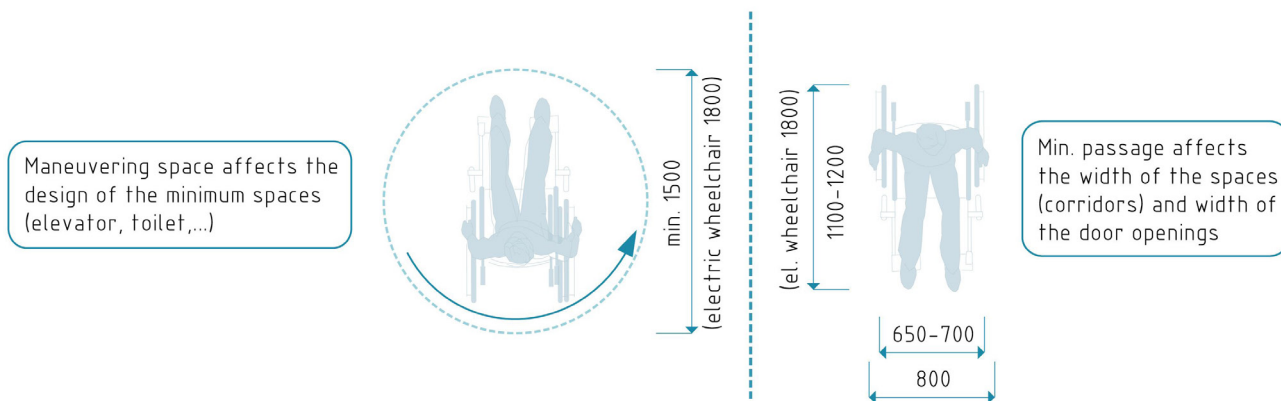act of the environment on people and their health and well-being. In the context of human-centred design, there is also an extended understanding of the attributes of a universally accessible environment, which includes, for example, physical, sensory and information accessibility, visitability, adaptability and flexibility of the environment for a wide range of people.

Architect and environmental psychologist Dak Kopec (2012) in his book "Environmental Psychology for Design" presents three basic **levels of human-environment interactions**:
- physical (e.g. the effect of lighting, temperature, colour and humidity on humans),
- social (e.g. the impact of the family environment, labour relations, etc.),
- biological (e.g. the effect of allergens, harmful substances, etc.).

It is also important to consider the impact of the **cultural background**, which affects people's interactions and attitudes towards the built environment.

Edelstein (2016) uses the term "**neuro-architecture**" as a new field of study that seeks to expand our understanding of the influence of the built environment on the brain, body and behaviour. Edelstein also introduces the new term "**neuro-universal approach**", as a response to the diversity of human abilities in the cognitive area (sensory perception, memory, orientation skills, emotions, etc.). **Neuroscience in architecture** is helping to design such an environment that minimises negative physiological, cognitive, and emotional effects. Advances in neuroscience are now able to explain the ways in which we perceive the world around us and navigate in space and the way our physical environment can affect our cognition, problem-solving ability, and mood. (Sternberg and Matthew, 2006).

An inclusive environment is not just about the physical accessibility of the built environment, but considers several factors, such as the psychological, social and cultural needs of a person. These factors are related to how a person perceives and feels (safe, tolerant, friendly) in the environment and society.

1.2 EMPATHIC AND SIMULATION EXERCISES

IN A NUTSHELL

The empathic and simulation exercises provide students or the general public with experience the situations and requirements of different people, e.g. a person in a wheelchair, person with visual impairment using a white cane, person with a broken leg or with a baby carriage, etc. Various aids, such as a wheelchair, glasses simulating various visual impairments, etc. can be used in these exercises.

Human-centred approach in the design process is based on a cooperation with the various people in participatory planning and to experience and understand different users' situations in empathic and simulation exercises.

Empathic exercises are based on three steps: (1) exploring people/users, (2) immersing into other people's lives through a simulation experience, and (3) connecting with people/users (Kouprieand, Sleeswijk Visser, 2009). To **cover heterogeneous groups of people**, empathic simulation exercises should consist of:

- simulation of a blind person's movement with a white cane;
- on-site survey from the position of person in a wheelchair;
- on-site survey using a baby carriage or using heavy luggage.

Simulation exercises can be conducted in an existing built environment (e.g. public spaces and buildings) or in a specially created environment, such as an exhibition with different types of spaces (e.g. Black Box – completely dark interior to show visitors how a blind person feels the space). These exercises can help students/visitors to test accessibility, safety, perceptibility and usability of different spaces, information and products.
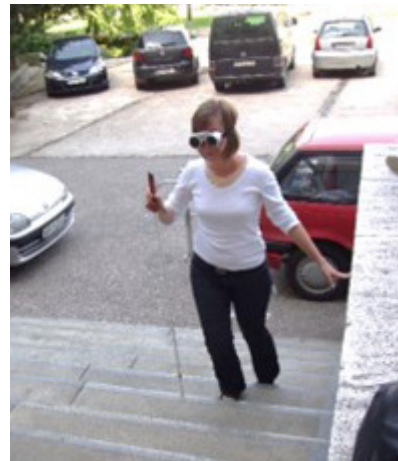
Figure 3.1.6 a,b Simulation exercises in public spaces – in cooperation with Slovak Blind and Partially Sighted Union (Čerešňová)

Figure 3.1.7 a,b,c Simulation exercises in public spaces – survey of the exterior of the building from the position of person with visual impairment and person in a wheelchair (Čerešňová)

Figure 3.1.8 a,b,c Simulation exercises in the building – survey of the interior from the position of person in a wheelchair (Čerešňová)

Figure 3.1.9 a,b,c Simulation exercises in a specially created environment – exhibition with different types of spaces (Čerešňová)

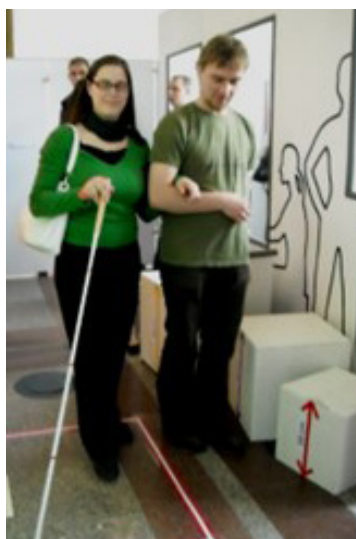Empathic exercises help to **understand the interaction between people and environment/society**, which may cause limitations to some groups of people due to incorrect design solutions. These exercises can help to better understand functional limitations of the built environment. Usually, some people do not realise the obstacles in the built environment but sitting in a wheelchair they discover how difficult it is to manage going up a steep ramp or to open a door and enter a room. By simulation exercises they understand how a good design can help to make the environment more accessible and usable for all people.

Another positive effect of simulation exercise is that attention is **shifted from visual perception of architecture to more multisensory experience** of all components of the environment, including hearing, touching and smelling. Multi-sensory perception and accessibility of the built environment, communication and information systems are often underestimated. Herssens and Heylingen (2007) point out that in the process of creating an environment without considering the user-friendliness, multi-sensoriality and functionality, this can result in physically and cognitively inaccessible spaces.

1.2.1   Instructions for emphatic/simulation exercises

- provide simulations of various types of limitations in the built environment (e.g. moving in a wheelchair, moving with white cane, moving with a baby carriage or using heavy luggage…)
- select different types of environments in exterior and interior spaces (with different surfaces, slopes, dimensions…)
- at the beginning provide basic information about the moving in a wheelchair, with white cane or other aids
- analyse and describe specific situations, for example:

- How to find the way with white cane (simulation of blind person) when the space is very spacious (such as square) without any orientation elements or guiding lines?
- How to move in a wheelchair when the slope of the ramp/terrain is very steep?
- How to move up the stairs when your legs are stiff (simulation with fixation of the legs)?
- How to open the door/window when sitting in a wheelchair or moving with white cane?
- How to reach the things (e.g. books in shelves) when sitting in a wheelchair?

1.3 HUMAN-CENTRED DESIGN METHODS AND PRINCIPLES

IN A NUTSHELL

Human-centred design is a broad term and contains many approaches and methods. However, all of them have one common aim, to create an accessible, usable and friendly built environment for all the diverse groups of people. Among them, we will study Universal Design (origin in the USA, 7 principles), Design for All (origin in Scandinavia) and Inclusive Design (origin in the UK, 5 principles) in more depth in this unit.

When creating the built environment, it is necessary to consider the diversity of people, so that a wide range of people have equal opportunities to use the physical environment, products, services and information. Therefore, it is necessary to use methods with a **human-centred approach** that focuses on people and their diverse needs, demands and abilities, such as methods:

- Human-Centred Design
- Design for All
- Universal Design
- Inclusive Design
- Design for all ages/Age-Friendly Design
- User-friendly Design/People-Friendly Design
- Body Conscious Design
- Participatory Design
- Barrier-free design/Accessible Design

Different terminology is related to the cultural-geographical and historical background in different parts of the world, for example, Universal Design has its roots in the USA and

Inclusive Design originated in the United Kingdom. The term Barrier-free Design was originally aimed at removing barriers in the built environment in the 1950s to make it accessible to people with disabilities. Later, this term was replaced by the term Accessible Design to emphasise the concept of environmental accessibility, and not just the removal of barriers as a result of unsatisfactory design solutions. There is currently an emphasis on the shift from environmental accessibility to social inclusion (full integration of all people into society), which emphasises the importance of everyone's active participation in society as one of the factors of social sustainability. Thus, human-centred design becomes part of the strategy and creation of sustainable development (Sustainable Design).

1.3.1 Human-Centred Design

At the end of the 20th century, **human-centred design** began to develop in the field of ergonomics and information and communication technologies, in which attention was focused on the interaction of humans and products/computers in order to ensure comfortable and intuitive user properties of these products (Zhang, Dong, 2009). Human-centred design is defined in this area as a technical term in the international ISO standard (ISO 9241-210:2010 Ergonomics of human-system interaction. Part 210: Human-centered design for interactive systems) as "…an approach to interactive systems development that aims to make systems **usable and useful** by focusing on the users, their needs and requirements, and by applying human factors/ergonomics, and usability knowledge and techniques. This approach enhances effectiveness and efficiency; **improves human well-being, user satisfaction, accessibility and sustainability**; and counteracts possible adverse effects of use on **human health, safety and performance**."

Later, human-centred design spread to other areas of creating environments and services, and even began to be enforced as a **way of design-thinking**, promoted mainly by the American company IDEO, which created the Human-Centered Design Toolkit in 2011 and The Field Guide to Human-Centered Design in 2015. Human-centred design is moving the focus from the user to the person, it means considering the recipient not only as a user, but as a carrier of needs, desires, emotions that go beyond the most functional aspects.

Human-centred design is characterised as an **innovation inspired by people**, involving people in the creative process itself in the form of **participatory planning**, in which they can actively make decisions about the creation of the environment or products. The **basic features of human-centred design** (IDEO, 2011) are:
- empathy (as a deep understanding of different human needs)
- collaboration (as a benefit of multiple user experiences and perspectives)
- optimism (as a belief that we can all improve the environment/products)
- experiment (as a driving force leading to more radical changes)

THE BASIC FEATURES OF HUMAN-CENTRED DESIGN

EMPATHY · COLLABORATION · OPTIMISM · EXPERIMENT

Figure 3.1.10 Basic features of human-centred design (Suláková according to IDEO, 2011)

The Design for All method was initiated by the European Institute for Design and Disability (EIDD) – Design for All Europe, which was established in 1993. According to the EIDD Stockholm Declaration, adopted on 9 May 2004 at the EIDD General Assembly in Stockholm, the Design for All method has its roots in Scandinavian functionalism and ergonomic design. The social policies of the Nordic countries, especially in Sweden, supported the birth of the "**society for all**" concept in the 1960s, emphasising the importance of environmental accessibility. The concept of Design for All was introduced at the EIDD General Assembly in Barcelona in 1995.

The EIDD Stockholm Declaration (2004) defines Design for All as **design for human diversity, social inclusion and equality**. It provides a precise definition of Design for All and describes its purposes:
"This holistic and innovative approach constitutes a creative and ethical challenge for all planners, designers, entrepreneurs, administrators and political leaders. Design for All aims to enable all people to have **equal opportunities to participate in every aspect of society**. To achieve this, the built environment, everyday objects, services, culture and information – in short, everything that is designed and made by people to be used by people – must be accessible, convenient for everyone in society to use and **responsive to evolving human diversity**. The practice of Design for All makes conscious use of the analysis of human needs and aspirations and requires the involvement of end users at every stage in the design process." (EIDD Stockholm Declaration, 2004)

At present, the concept of Design for All needs to become an essential part of **sustainable development strategies**. For this reason, the EIDD, through the Stockholm Declaration, calls on the European institutions, national and public administrations in each European country, as well as the professions and organisations involved in planning and creating the environment and products, to implement the principles of Design for All into legislation and national strategies.

Design for All method is a **holistic and innovative approach** in making the built environment and products accessible and usable to a wide range of people. Design for All uses a human-centred approach for creating a people-friendly built environment, products and services. This method is a key driver of change towards an inclusive society.
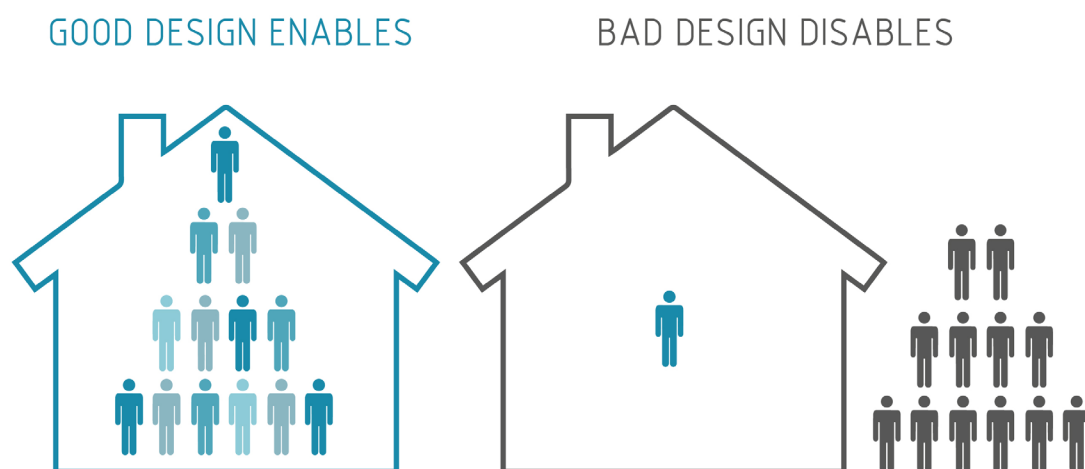
GOOD DESIGN ENABLES   BAD DESIGN DISABLES

Figure 3.1.11   Scheme illustrating quotation „Good design enables, bad design disables" by Paul Hogan, founding member of the EIDD (author of the scheme Lenka Suláková)

1.3.3 Universal Design

Universal design does not provide the same solution for all people ("one size fits all") but emphasises the need for flexibility and adaptability of the environment so that it can reflect the individual needs of a wide range of people with diverse abilities and limitations.

A major milestone in the development of Universal Design was the formulation of **Seven principles of Universal Design** (NCSU, 1997) developed within the research centre at the North Carolina State University, coordinated by architect, designer and educator Ronald L. Mace. Each principle can be associated with a group of **design guidelines**:

- **Principle 1 – Equitable Use**: the design is useful and marketable to people with diverse abilities:
  a) Allows the same use to all users: identical, when possible, otherwise equivalent;
  b) Avoid segregating or stigmatising any users;
  c) The conditions of privacy, security and safety should be equivalent for all users;
  d) Makes the project attractive to all users.
- **Principle 2 – Flexibility in Use**: the design accommodates a wide range of individual preferences and abilities:
  a) Allows the choice of the method of use;
  b) Allows access and use with left hand and right hand;
  c) Facilitates accuracy and precision of the user;
  d) Provides adaptability to the characteristics of the user.
- **Principle 3 – Simple and Intuitive Use**: use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level:
  a) Eliminates unnecessary complexities;
  b) Corresponds to the expectations and intuition of the user;
  c) Provides a great variety of reading and comprehension alternatives;
  d) Structures the information consistently with their importance;
  e) Provides suggestions and signals during and after user actions.
- **Principle 4 – Perceptible Information**: the design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities:
  a) Uses different methods (visual, verbal, tactile) for a redundant presentation of the essential information;
  b) Provides adequate differentiation between essential and secondary information;
  c) Maximises the readability of essential information;
  d) Differentiates the elements so that they can be described (facilitating the issuance of instructions and directives);
  e) Provides compatibility with a variety of techniques and devices used by people with sensory limitations.
- **Principle 5 – Tolerance for Error**: the design minimises hazards and the adverse consequences of accidental or unintended actions:
  a) Places the elements to minimise risks and errors: the most used elements are more accessible; the risky elements are eliminated;
  b) Provides warnings on risks and errors;
  c) Provides elements of protection;
  d) Discourages unintentional actions or requires alertness.
- **Principle 6 – Low Physical Effort**: the design can be used efficiently and comfortably and with a minimum of fatigue:
  a) Allows to maintain a neutral position of the body;
  b) Requires a reasonable activation effort;
  c) Minimises repetitive actions;
  d) Minimises the physical effort supported.

- **Principle 7 – Size and Space for Approach and Use**: appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility:
  a) Provides a clear view of the important elements for any seated or standing user;
  b) Makes comfortable achieving all the components for any user sitting or standing;
  c) Allows variations in the size of the hands and the handle;
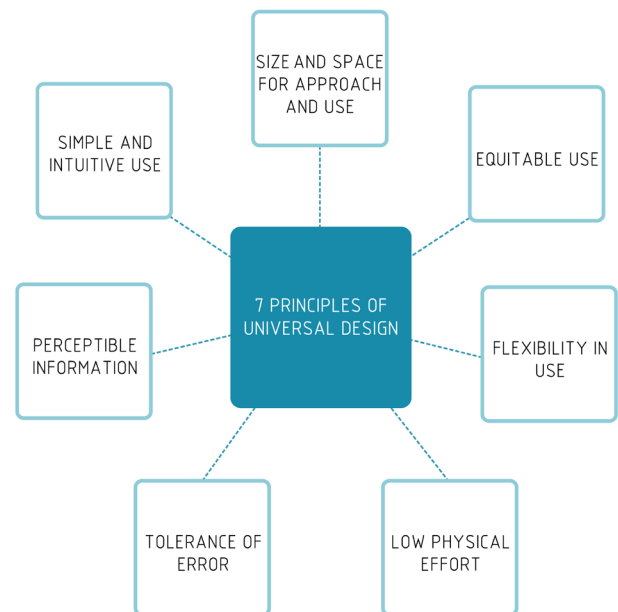 d) Provides adequate space for the use of assistive devices or personal assistance.

Steinfeld (2014), together with his colleagues, believes that a stronger acceptance of Universal Design in practice can be achieved by placing greater emphasis on social participation, focusing on **health and well-being**, recognizing the role of the context of the environment, and conceptualising **Universal Design as a process** rather than as a set of rules. Therefore, they propose the following definition: "Universal Design is the process that empowers diverse people by improving their performance, health, well-being and social participation in the environment." (Steinfeld and Maisel, 2012)

That was the incentive for the development of eight **Goals of Universal Design** (Steinfeld and Maisel, 2012):
1. Body Fit – Accommodating a wide range of body sizes and abilities.
2. Comfort – Keeping demands within desirable limits of body function.
3. Awareness – Ensuring that critical information for use is easily perceived.
4. Understanding – Making methods of operation and use intuitive, clear, and unambiguous.
5. Wellness – Contributing to health promotion, avoidance of disease, and prevention of injury.
6. Social Integration – Treating all groups with dignity and respect.
7. Personalization – Incorporating opportunities for choice and the expression of individual preferences.
8. Cultural Appropriateness – Respecting and reinforcing cultural values, and the social and environmental contexts of any design project.

1.3.4   Inclusive Design

The term "inclusive design" was used in the United Kingdom (UK) in the early 1990s, initially in connection with the "DesignAge" research project, which aimed to ensure an independent and quality life for an ageing population. Later, based on this project, the Research Centre for Inclusive Design the Helen Hamlyn Centre for Design, which is part of the Royal College of Art, was established in London. Currently, the centre also uses the term "people-centred design," that is, human-centred design.

In British standards, inclusive design is defined as "the design of common products and services that are accessible and usable to the widest possible range of people without the need for special modifications or special designs".

The Commission for Architecture and the Built Environment (CABE, now the Design Council) in the United Kingdom **defines inclusive design** as "the process by which an environment is planned, designed, managed, implemented and used with respect to the human being".

This definition emphasises the importance of applying the principles of inclusive design at all stages of the environment process. CABE is the creator of **five principles and key concepts of inclusive design** (CABE, 2006):

1. **People** – inclusive design places people at the centre/heart of the design process from its inception, through the active participation of users to project implementation;
2. **Diversity** – inclusive design acknowledges diversity and difference of individuals in terms of age, abilities and limitations;
3. **The right to choose** – inclusive design offers choice where a single design solution cannot accommodate all users;
4. **Flexibility** – inclusive design provides flexible environment and product solutions that are adaptable to the needs of a diverse range of users;
5. **Convenience** – inclusive design creates solutions that are comfortable and enjoyable for all users.

FIVE PRINCIPLES AND KEY CONCEPTS OF INCLUSIVE DESIGN

1	2	3	4	5
PEOPLE	DIVERSITY	CHOICE	FLEXIBILITY	CONVENIENCE

Figure 3.1.13   Diagram with 5 principles of Inclusive Design (Suláková according to CABE, 2006)

The Engineering Design Centre at the University of Cambridge developed an online Inclusive Design Toolkit in 2017 (www.inclusivedesigntoolkit.com). This centre provides training workshops and consultancy services on inclusive design.

1.3.5　Main characteristics of human-centred spaces

The basic characteristics of architectural and urban spaces, which are designed by the human-centred approach, are defined by Lori Gee (2006) using four areas, which can be specified in more detail as:

1. **Healthy space**
   - creating a sense of **physical and mental well-being** and respecting ergonomic aspects and the human diversity;
2. **Stimulating space**
   - offering a variety of **multisensory experiences** (visual, tactile, auditory and kinaesthetic) that have a positive impact on memory and information processing for different people, including people with sensory disabilities,
   - enabling **visual accessibility** and perceptibility of the space, as well as contact with the outdoor environment (especially the natural one);
3. **Space that balances community and solitude**
   - accepting person's need to be alone or in society/community,
   - combining a wide range of private spaces (sense of privacy), but also interactive spaces for group activities and socialisation;
4. **Adaptable and flexible space**
   - supporting the diversity of people and the diversity of activities,
   - providing flexibility and sufficient space for various groups (individual space, spaces for small or larger groups),
   - providing adaptable (e.g. height-adjustable) and mobile furniture, but also technologies that can be easily adapted to various needs of people,
   - using various information and communication methods, thus supporting several styles, or even different sensory abilities of individual persons.

According to the principles of Inclusive Design set out by CABE (2006), the human-centred space should have following characteristics:
- **Inclusive** so everyone can use them safely, easily and with dignity.
- **Responsive** taking account of what people say they need and want.
- **Flexible** so different people can use them in different ways.
- **Convenient** so everyone can use them 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.

1.4 LEGISLATIVE FRAMEWORKS AND EUROPEAN INITIATIVES

IN A NUTSHELL

The goal of many legislative documents, standards, initiatives and organisations is to promote universal accessibility and usability of the built environment.

Binding legislative documents:
- Convention on the Rights of Persons with Disabilities (CRPD)
- Union of Equality: Strategy for the Rights of Persons with Disabilities

Standards:
- Building construction — Accessibility and usability of the built environment
- Accessibility and usability of the built environment – Functional requirements

European organisations:
- EIDD – Design for All Europe
- EuCAN – The European Concept for Accessibility Network

Nowadays, the topic of human-centred approach and universal design is of a great importance for society all over the world. As inclusion and accessibility for all people with various needs and of different ages develops, these ideas become increasingly incorporated into various conventions, declarations, standards, and networks.

Many countries and cities are proclaiming to take steps to create an **inclusive and friendly living environment for all**. These intentions are reflected in their **legislative frameworks** and in various initiatives (unions, networks).

This unit provides information about the most important **documents and organisations** dealing with the issue of accessibility and universal design in the **European Union**.

1.4.1   Convention on the Rights of Persons with Disabilities

The **Convention on the Rights of Persons with Disabilities (CRPD)** is a fundamental international human rights treaty of the **United Nations** intended to protect the rights and dignity of persons with disabilities. This convention emerged from several previous declarations and became widely accepted throughout the world. It started an evolution of views from seeing persons with disabilities as objects of charity, medical care and social protection towards seeing them as full and equal members of society with human rights. (Pyaneandee, 2019, pp. 19–21).

The CRPD was created in 2006 and entered into force in 2008, was signed by 184 parties up to present (2022) and ratified by most of them. **The European Union** signed the CRPD in 2007 and **ratified** it in **2010**. (United Nations, 2006) Figure 20 shows the map exemplifying the participative countries.

The CRPD consists of the preamble and 50 articles. **Article 2** deals with **definitions** including universal design (United Nations, 2007, p. 4): "**Universal design**" means the design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. "Universal design" shall not exclude assistive devices for particular groups of persons with disabilities where this is needed.

Article 3 mentions **general principles** such as respect, non-discrimination, participation and inclusion in society, equality, accessibility, and other (United Nations, 2007, p. 5). Article 4 states General obligations and further articles deepen and widen the ideas briefly named in Article 3.

Article 9 characterises **Accessibility** (United Nations, 2007, p. 9): "To enable persons with disabilities to live independently and participate fully in all aspects of life, States Parties shall take appropriate measures to ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to information and communications […]" This article explains the areas which need to be accessible. Public buildings, spaces and components of the physical environment (for example, public transport) must be barrier-free. Moreover, crucial information should be accessible, presented in several ways, for example, using Braille and in easy-to-read and understand forms or also in sign language. The following articles deal with other important areas of life, for instance, situations of risks, access to justice, liberty, freedom from torture, exploitation, etc., living independently and being included in the community, personal mobility, freedom of opinion, respect for privacy, right to education, health, work, participation in all kinds of public life, and others.
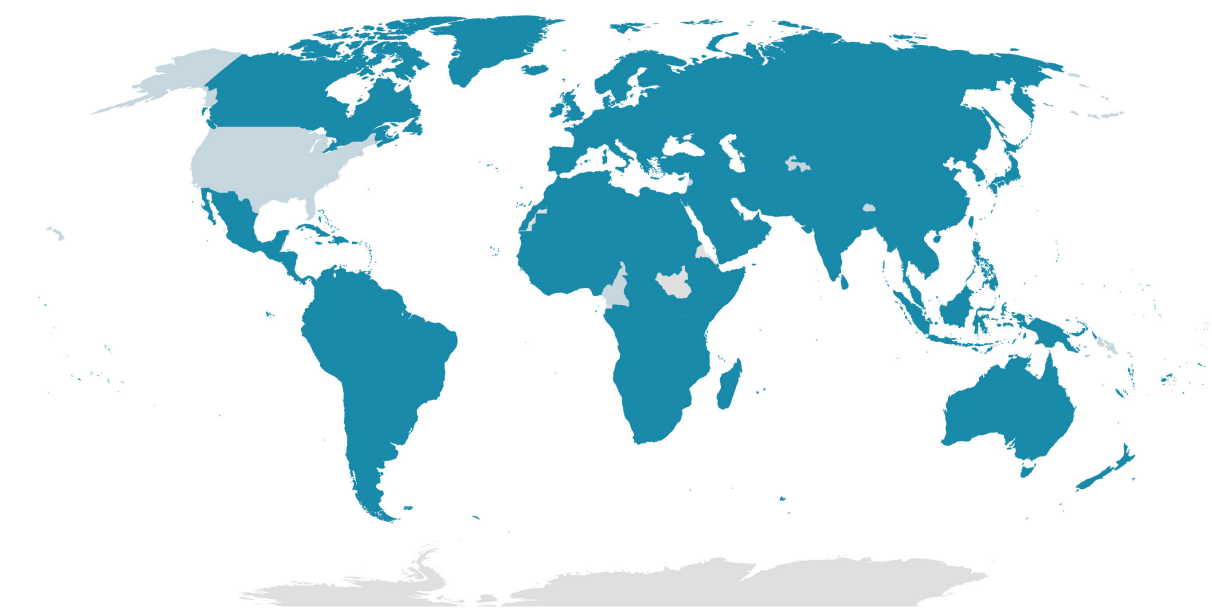

Figure 3.1.14 The map exemplifies the participative countries (light: signed the CRPD, dark: signed and ratified the CRPD, Suláková).

1.4.2 The Strategy for the Rights of Persons with Disabilities 2021–2030

The document **Union of Equality: The Strategy for the Rights of Persons with Disabilities 2021–2030** (European Commission, 2021) is also a very important source of information. It follows the CRPD and other previous policies, The European Pillar of Social Rights and The European Disability Strategy 2010–2020. Despite these several prior documents, the European Commission sees a need for improvement in this area because there are still many barriers and risks. In addition to these shortcomings, the Strategy for the Rights of Persons with Disabilities 2021–2030 also examines consequences of the Covid-19 pandemic.

Similarly, to the CRPD, it discusses visions for accessibility, rights, autonomy, and equality. It also focuses on supporting **independent living**: accessible, inclusive housing in the community. The document promotes appropriate **community-based services** instead of institutional services, which show many obstacles, thus they support **deinstitutionalization** (European Commission, 2021, pp. 10–12). This topic includes older people, who should also not live in institutions, but rather in community-based homes.

The document further deals with inclusion in work, social protection, access to justice, education, healthcare, and other important areas of life such as culture and leisure activities.

1.4.3 Standards for accessibility and universal design

Standards elaborated according to principles of accessibility and universal design are very important sources of information. Standards consist of texts accompanied with illustrations detailing requirements for an inclusive built environment. They are essential, namely, for architects and designers.

One of the important standards is **Building construction — Accessibility and usability of the built environment** (ISO 21542:2021). It is an international standard, which is however not binding for the European Union, but further standards emerge from it. It also had a previous version from 2011 and followed by an earlier standard from 1994, Building construction — Needs of disabled people in buildings — Design guidelines. The current standard (ISO 21542:2021) replaces previous versions and specifies a range of **requirements**

and recommendations for designing safe, inclusive, age-friendly and sustainable built environments that are accessible and usable by all people. The authors of the standard explain its objective in the following way: "The purpose of this document is to describe how a building should be designed, constructed, managed and maintained in order to enable people to approach and enter the building; use the facilities, services and information networks; egress from the building under normal conditions; and evacuate the building during an emergency." (ISO 21542:2021, Introduction)

The scope of this standard includes the elements of construction, building assemblies, etc., and products that relate to usability and accessibility of buildings, i.e., access to buildings, circulation within buildings, evacuation, etc.

It also deals with common spaces in units on residential buildings. Recommendations regarding **residential units** are given in Annex A of the document. Furthermore, the reader can also find information about outdoor features directly concerned with access to a building; however, not about separate public open spaces not related to the use of a building.

Another essential standard for creating an inclusive built environment is **Accessibility and usability of the built environment – Functional requirements** (EN 17210:2021). It is based on a previous document, ISO 21542:2011 Building construction – Accessibility and usability of the built environment. This standard is the most important one for countries of the European Union because it has binding character; thus, the standard must be transferred to the national legislations of the member states. The current standard (EN 17210:2021) specifies functional requirements and recommendations for an accessible and usable built environment, following Design for All/Universal design principles applicable across the full spectrum of the built environment. In addition to building

and interior environments, the standard also addresses urban settings. The requirements are elaborated based on the widest range of user needs and target groups, among others, older persons. Thus, it is a remarkably complex document in terms of varying physical environments and regarding multiple points of view of people with different needs.

The chapter on housing defines **adaptable housing**, which means "dwellings for all people throughout the lifecycle or in response to changing needs of the residents" (EN 17210:2021, p. 214). In addition to temporary situations such as injuries, it also considers ageing. Due to flexibility in basic design, easy and cost-effective adaptations can be made to housings. "This is especially important in an ageing society to make it possible for people to "**age in place**" or remain living in their own home as they get older." (EN 17210:2021, p. 214) The adaptability needs to be considered from the beginning, then it proposes affordable and easy changes when it is needed. The term "Lifetime Homes" can be used to address this topic.

1.4.4 Networks

Organisational networks dealing with issues of inclusion, accessibility, and universal design have a very important position in spreading a human-centred approach in design of the built environment.

EIDD – Design for All Europe, established in 1993, has one of its goals „to promote, communicate and disseminate the theory and practice of Design for All as a tool for social and economic inclusion "(EIDD, 1993, updated 2010). This platform spreads information about Design for All, promotes diversity, inclusion, and equality, and organises events (seminars, conferences, webinars, etc.) supporting these ideas. They formulated the **EIDD Stockholm Declaration (2004) with the quote**: "Good

design enables, bad design disables". Concerning older people, one can mention an online event from 2021 "Design Age Institute: Age, Agency & Joy" by Royal College of Art dealing with designing products and services to experience joy at every age. Among the members is CEDA (Centre of Design for All) at Faculty of Architecture and Design, Slovak University of Technology in Bratislava, where the co-authors of this publication participate.

Another organisation is **EuCAN – The European Concept for Accessibility Network**. It states similar values as accessibility, inclusion, and human-centred philosophy. Its beginnings go back to 1985 and the document European Concept for Accessibility (ECA) was formed

in 1996. The network publishes documents that promote the mentioned ideas in multiple languages. The document European Concept for Accessibility (Wijk, 1996) contains information about principles and criteria for accessibility including housings' adaptability and visitability. Another document from EuCAN is ECA European Concept for Accessibility: Technical Assistance Manual (Aragall, 2003). It also deals with theoretical background, as well as practical recommendations. Part of the focus areas of the document is also housing, and it briefly mentions, for example, an accessible kitchen for all.

SUMMARY

To conclude, this unit has shown basic information and background sources for the concepts of inclusion, accessibility, and human-centred design methods based on the **diversity of people, their needs and requirements**.

E**mpathic/simulation exercises** can help to understand different requirements and needs of people in the built environment, including identification of the limits and barriers.

Basic p**rinciples, characteristics and goals of human-centred design methods, such as Universal Design, Inclusive Design, Design for All** provides holistic solutions for creation of people-friendly (as well as age-friendly) environment.

Important and **binding documents** are the legislative ones, especially the United Nations' **Convention on the Rights of Persons with Disabilities** (CRPD) and the **Union of Equality: Strategy for the Rights of Persons with Disabilities** of the European Commission.

Then there are standards that are more technical and deepen the knowledge in detail. Among the important standards are **Building construction — Accessibility and usability of the built environment** (ISO 21542:2021) and **Accessibility and usability of the built environment – Functional requirements** (EN 17210:2021). They are essential for architects and designers who form the living environment.

Finally, there are several European organisations dealing with this issue. We have mentioned **EIDD – Design for All Europe and EuCAN – The European Concept for Accessibility Network**. These organisations promote, support, and spread awareness about inclusive design and inclusive society.

All these components are important pillars to create and better understand the design and notions of inclusive, accessible environments.

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