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Universal design

– introduction to a design principle that challenges the idea of being human

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Universal Design – introduction to a design principle that challenges the idea of being human

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The fact that we are different and the fact that all people experience one or more impairments during their lifetime is at the heart of universal design. The concept was developed by American architect and wheelchair user Ron Mace in the 1990s, and despite different theoretical approaches and interpretations, the essence is to develop inclusive solutions by integrating human differences.

Everyone will experience changing needs and demands of their surroundings at some point in their life.

Universal design breaks with the notion that users with special needs must have separate solutions. Instead, the value-based design concept aims to create solutions that, as a starting point, works for all people despite different abilities. The goal is for everyone to be able to participate and for no one to be left behind. A goal that is also reflected in the UN's Sustainable Development Goals in the recurring pledge to "Leave No One Behind".

The aim of universal design is to avoid dividing people into groups with and without impairment. Instead, the idea is to make the notion that people are different the starting point, and by embracing diversity create solutions that consider everyone's needs.

The thesis is that, a solution that is necessary for some, can add value for everyone at the same time; sometimes we need to bring a stroller or a suitcase with us, or we break a leg or a foot and experience changes in our abilities for a period of time. And if it does not apply to us personally, it could apply to someone we know and would like to accompany us to a concert, a birthday party, on holiday or in an educational setting.

The man behind the concept

The concept was originally defined by the American architect Ron Mace. Mace had his own design studio and lectured at the School of Design at North Carolina State University (NCSU), and he was a wheelchair user himself. In his practice, Mace found that solutions defined as "accessible" or "barrier-free" in the American context often ended up stigmatising and exposing users, despite having the opposite intention.

By focusing on the special needs of a particular user group, the solutions were not integrated into the design process. "Accessible" or "barrier-free" solutions were practiced and interpreted as so-called "add-on solutions" added to the final design at the end of construction, or after it had been completed and which, contrary to the intentions, exhibited and exposed people rather than include them.

Such solutions are often neither equal nor integrated, and in response to this, Mace developed and defined the concept of universal design.

The original definition of universal design reads:

"Universal design is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design"

- Ostroff 2001

Mace defined and developed the concept as a design concept aimed at architects and designers. In 1997, he appointed an interdisciplinary American expert committee who developed a set of seven design principles that served as an operationalisation tool. Each of the seven principles is accompanied by 3-5 guidelines.

The 7 Principles of Universal Design

Principle 1: Equitable Use.

Principle 2: Flexibility in Use.

Principle 3: Simple and Intuitive Use.

Principle 4: Perceptible Information.

Principle 5: Tolerance for Error.

Principle 6: Low Physical Effort.

Principle 7: Size and Space for Approach and Use.

(Story M.F 2001)

Interpretations and approaches

Initially, Mace was focused on universal design being more than just a design solution. Over time, other researchers have further developed his concept.

American researcher Edward Steinfeld, who also helped to formulate the seven design principles, has continued to work on the application and interpretation of the concept with his colleague Jordana Maisel.

Steinfeld and Maisel have formulated a new definition that emphasises process and inclusion as objectives. They say that:

"Universal design is a process that enables and empowers a diverse population by improving human performance, health and wellness and social participation"

- Steinfeld and Maisel, 2012

Steinfeld and Maisel have in their development of the definition also designed an implementation tool titled 'The 8 Goals of Universal Design'. In their development of the concept, the interpretation is emphasised as a process rather than just a solution.

The 8 Universal Design Goals

- Body Fit
- Comfort
- Awareness
- Understanding
- Wellness
- Social Integration
- Personalization
- Cultural Appropriateness

(Steinfeld, E. and Maisel, J. 2012)

Over time, the concept has spread and branched out and is now used in many professional and interdisciplinary contexts. Universal design is, both in its intention and in its value-based starting point, closely related to "inclusive design", "universal design" and "design for all". The differences in the four concepts primarily come down to tradition, geographical or professional preferences.

Since Mace defined universal design, the concept has become widespread and developed internationally and is practiced and interpreted differently in different countries. The definition and intention of the concept remains in its original form, but the development in places such as Japan is supported by the private sector, while in the UK it is primarily used in industrial design, and in Australia in both legislation and various professional networks. This underscores the potential of universal design being used in many contexts across disciplines, traditions, and geographical boundaries.

In 2006, universal design was adopted by the UN Convention on the Rights of Persons with Disabilities, which meant that it was introduced in a Danish context. In the Convention, universal design is adopted as a general obligation. All countries that acceded to the Convention have committed themselves to integrating and developing universal design into research, teaching and regulations. Denmark ratified the Convention in August 2009.

The Convention uses Mace's original definition, albeit with the addition of services and programmes: "Under the Convention, States parties recognize the importance of universal design, defined in article 2 as:

"Under the Convention, States parties recognize the importance of universal design, defined in article 2 as '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', not excluding 'assistive devices for particular groups of persons with disabilities where this is needed'. The Convention also establishes the obligation of States parties to undertake or promote research into and the development of universally designed goods, services, equipment and facilities, in line with the provisions of article, as well as to promote universal design in the development of standards and guidelines".

- UN Convention on the Rights of Persons with Disabilities 2007

No one has ownership of the concept. It has become a dynamic concept which is understood and interpreted a little differently depending on the geographical, professional, or sectoral framework. Therefore, it can also be understood and applied as a vision, a principle, a strategic approach, and a concrete design solution.

This extension of the framework from dealing with design and architecture to also dealing with services and programmes means that universal design is no longer just a concept that is relevant to a few individual professional groups. When services and programmes are included in the framework understanding of the concept, the usage is extended to include all the frameworks for the lives we live. This applies to work life, education, legislation, subsidy schemes, technology and the digital life, sports, leisure and culture. And everything in between. It therefore becomes relevant to apply the concept in other sectors and contexts than construction and design.

The interaction between universal design and accessibility

The concept of accessibility is closely related to universal design. In a Danish context, however, there is a fundamental difference in how the user group is considered when using the two concepts.

In Denmark, accessibility is primarily used to describe special solutions for special users. Therefore, accessibility often becomes *accessibility for persons with disabilities* in everyday language. In the construction sector, accessibility is often interpreted as the minimum requirements for accessibility for persons with disabilities in building regulations. (Grangaard, Frandsen og Ryhl, 2017).

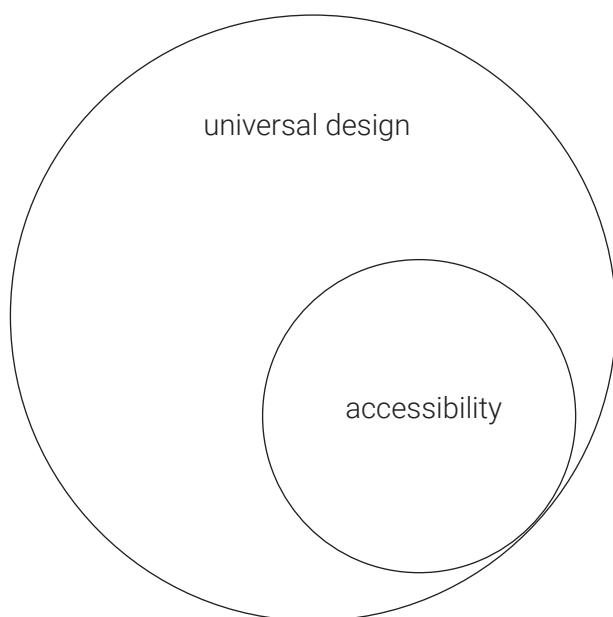


Illustration C. Ryhl 2016

Universal design, on the other hand, aims for solutions that includes all users. However, this does not mean that the two concepts of universal design and accessibility are mutually exclusive; in reality, they can complement each other.

In some contexts, the relationship between the two concepts is defined based on their effect. For example, one could say that universal design is a means of increasing accessibility, or if reversed that increased accessibility is the first step towards universal design. Working with one concept often strengthens the implementation of the other.

One of the crucial differences between the two concepts lies in the way the user is defined. But even in this case, they are not mutually exclusive – on the contrary. In a Danish context, the users of accessibility are primarily people living with a disability, while the users of universal design include everyone.

A new understanding of the user

If we are to ensure that all users are included and that we create solutions that, in Mace's words, are 'usable by all', then the very idea is that we cannot just focus on physical aspects of ability, but must equally incorporate sensory, cognitive, and psycho-emotional aspects.

For example, universal design provides a framework for focusing on the development of better solutions for people with hearing or visual impairment.

Hearing impairment often leads to difficulty following a conversation in a room with poor acoustics, resulting in exclusion. Poor acoustics can thus be as exclusive for the deaf and hard-of-hearing as a staircase can be for a wheelchair user. Even though a human being has physical access to a room, it does not mean that they have access to what is happening in the room (Ryhl, 2009).

Another example might be at the train station where a voice announces on a crackling loudspeaker that the train will be arriving on different track. That information can be difficult to capture for a person with impaired hearing who would benefit more from being able to read the information on a board, while the person with impaired vision needs the voice on the speaker.

Access to the information therefore depends on being able to hear what is being said on the loudspeaker (good sound/good acoustics) and the information can be read somewhere (good lighting/good board).

It is worth noting that both also benefit people with normal hearing and good eyesight. This also serves as an example of how we can interpret universal design in practice. Diversity in user needs requires diversity in solutions. Often it is the combination of different solutions that together become a universal design solution.

Seven restrooms – one universal design solution

The Disabled People's Organisation of Denmark's office building in the city of Høje Taastrup is one example of a building, where an incredibly wide range of user needs must be met every day. The architects therefore chose to design seven different restrooms, thereby following the mantra that 'diversity in user needs requires diversity in solutions.'

In addition to a regular restroom, there are toilets for wheelchair users with armrests placed on the right side or the left, respectively, as there is a difference as to which side is better for a wheelchair user for getting from the wheelchair to the toilet.

In addition, there is a smaller restroom which meets the needs of people with impaired vision, as this group can most easily navigate by being able to feel both walls at the same time, for instance.

This solution is an example of how seven restrooms together form a universal design solution.

(Ryhl, og Frandsen, 2016).

Good acoustics are thus an important factor in relation to inclusion for people with hearing impairments because they are extra sensitive to poor acoustics. Yet acoustics are also important for people with visual impairments because they often use hearing as their primary sense.

With universal design, Mace wanted to define a new design concept which in its basic starting point and value entailed a completely new understanding of ability in relation to a human life. It is a break with what we call 'normal' and a realisation that there is no such thing as a standard human being. On the other hand, we must take as our starting point the fact that we all experience some form of functional limitation once or several times in our lives – if not sooner, then when we get older.

Must be incorporated into the process

Universal design is also a new methodological approach that requires knowledge and skills to apply.

For example, it is important that universal design is incorporated as an element in the early stages of any project. Both in relation to the above understanding of the users, which requires knowledge of user needs, and in relation to knowledge involvement, including the involvement of resource persons and users.



The café at Tate Modern : Photo by C. Ryhl

Equal access, but unequal user experience

The café at Tate Modern in London is a good example of how equal access doesn't necessarily offer an equal user experience. Located on the top floor of the large museum, the café overlooks the Thames and the London Skyline and is definitely worth a visit. As a wheelchair user, you can easily get all the way up to the café without assistance.

However, the layout itself excludes wheelchair users. Although the café has floor to ceiling windows to allow for a view for both sitting and standing visitors, the bar tables along the window mean that a wheelchair user cannot reach the table nor be at the same level as the café's other guests.

The café is accessible but does not offer its visitors equal use. A process where the principles of universal design had been applied and where all users' experiences had been weighted as equally important would have offered a different solution.

By considering the complex breadth of user needs, the stimulating solution approach, and the holistic understanding of quality in experience and use, universal design can offer a different method than the widespread accessibility checklist approach, which often does not come into play until late in the process.

In a construction process, for example, it is important to incorporate the human aspects into the project early in the process. Diversity must be incorporated into the project description, so that it is already in the mindset of the architect and the client at that point.

It is not necessarily about creating one solution that benefits everyone. It can also be a collection of different options that together constitute a universal design solution. We all need to get through a door, but we do not all need to go through one door. Not if the result becomes the lowest common denominator. In principle, one door could have a step if the other door is fully automatic, as long as, the total solution, provide dignified access for all. It is important to emphasise that in the recognition that we are different, there is also a recognition that we do not always have to be the same. In some cases, an equal solution involves different solutions that meet different needs.

This is the case with the social enterprise and microbrewery People Like Us. With 36 employees, of which 75 percent have one or more diagnoses, e.g. autism spectrum disorder, cerebral palsy or ADHD. The goal at People Like Us is to work with employees' abilities rather than their limitations. In collaboration with the City of Copenhagen, People Like Us have developed both a special training course (STU) and a special workplace for an employee with autism spectrum disorder and a special talent for drawing. The brewery arranged a spot for him that was based on his needs for the workplace, with its own exit for example. The employee felt safe there and was fully capable of carrying out his work of designing and drawing beer labels.

When possible and meaningful, the equal solution is the same for everyone. This applies to construction as well as to other sectors, where processes and solutions are also designed to ensure that everyone can be included in all contexts of life.

Universal design is a concept that can be interpreted in several ways, depending on context, function, and possibilities in general. Whether we live with an impairment or not, we all still have abilities that we use and depend on, and these abilities need to be stimulated, challenged, and used.

This is what universal design can help to support, so that, ultimately, we achieve a broader and more tolerant notion of what a human being is, and not least what we can achieve.

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Bevica Fonden is a foundation that through partnerships works to strengthen the conditions for Self-governance and independent life of people with mobility impairments. This is based on research and knowledge of universal design as an interdisciplinary and value-based concept.

The Bevica Fonden Universal Design Hub works to strengthen the interdisciplinary research field universal design as a lever for Leave No One Behind in the Danish work with the implementation of the UN's The Sustainable Development Goals and 2030 agenda.

UN Convention on the Rights of Persons with Disabilities, recognizes the importance of universal design, defined in article 2 as: *'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'*.