The **system adapts to the user** and not the opposite
(as systems-centered or engineering-driven design)

from **system-centered** design to **user-centered** design
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**Topic 7 User Centred Design**

**T7.1 UCD**

**Essential Idea:**
The fundamental principle of UCD is understanding the needs of the users is the key to designing the best products and services.

A designer must consider the needs, wants and limitations of the end user within every element of the design cycle. The ability to identify how users will interact with a product, service or system is vital for its success. To achieve this, designers must be able to acquire and analyse valid data without making assumptions about how the product may be used.

**Concepts and principles:**

- The designer needs to have a deep understanding of the user, task and the environment.
- The process is iterative, led by the user and developed through user-centred evaluation.
- The product must address the whole user experience.
- UCD design teams are multidisciplinary.
- The five stages of UCD: research, concept, design, implementation, launch

- Inclusive design

**Essential Understanding:**

- UCD design teams may include anthropologists, ethnographers and psychologists.

- Inclusive design requires designing universally accessible products for all users including those with physical, sensory, perceptual and other challenges and impairments.

**Nature of design:**

As a designer you must consider the needs, wants and limitations of the end user within every element of the design cycle. The ability to identify how users will interact with a product, service or system is vital for its success. To achieve this, designers must be able to acquire and analyse valid data without making assumptions about how the product may be used.
User Centred Design

Products should not only be useful, they should be usable and desirable. Usefulness, usability and desirability have been described as the three-legged stool of design—take one leg away and the whole thing falls over! User-centred design (UCD) is particularly useful when a new product is to be introduced. User-centred designers engage actively with users to gather insights that drive design from the earliest stages of product development right through the design process, setting the agenda for projects and feeding directly into the product brief. Designers/companies have shifted from conventional market research techniques to greater emphasis on the user experience. UCD involves smaller numbers of people than conventional market research and it can lead to unexpected insights that stimulate innovation. Conventional market research may be flawed as users often do not tell researchers the true facts about a product or they cannot identify how and why they use products—particularly for radical designs. Awareness of the experience of end-users can lead designers to question established practices and assumptions. UCD enables user feedback to inform product redevelopment even after launch, sometimes in quite a radical way.

UCD is a design process paying particular attention to the needs of potential users of a product through involvement of users at all stages of the design process. It considers how users are likely to use the product and tests products with actual users. Sometimes called "empathic design", the user-centred approach puts the design team in direct contact with the people they are designing for, that is, to empathize...
with potential users and so gain a better understanding of users’ thoughts, needs, values and beliefs. The design team often includes anthropologists, ethnographers and psychologists to advise the creative designers.

**Fundamental Principles**

- A design is based upon an explicit understanding of users, tasks and environments.
- Users are involved throughout design and development.
- The design is driven and refined by user-centred evaluation.
- The process is iterative.
- The design addresses the whole user experience.
- The design team includes multidisciplinary skills and perspectives

**User, task and the environment**
User centred design is based upon an explicit understanding of users, tasks and environments and involves designers understanding the principle of your users' 'context of use'.

Think of the context of use as **the user experience trinity**: you need to understand your **users**, understand what the **task** is in relation to the product or system and understand the **environment** in which the product or system is used.
User-centred design has a focus on **inclusive design**. You need to consider how designers try to create products that are suitable for users with disabilities and other users. This ensures that there is a sufficient market for their products and increases their feasibility as an innovation.

**Users are involved throughout design and development.** The purpose of this principle is to ensure design teams involve users in all design phases: not just by running a focus group at the start of design or by administering a survey at the end of design. Moreover, the standard emphasises that user involvement needs to be 'active': in other words, you don't simply demonstrate your design to users, you engage them in the design. You can achieve this through field studies early in design and usability testing once you have an artefact that people can use. Again, this principle is a shoo-in for anyone who works in the field of user experience.

**The UCD process is iterative**
Iteration is the act of repeating a process with the aim of approaching a desired goal, target or result. Each repetition of the process is also called an "iteration", and the results of one iteration are used as the starting point for the next iteration. Iterative design is designing but more specifically, understanding what one is designing through actually creating it. Alistair Cockburn describes it as “learning by completing”. Perhaps most importantly, an underlying principle of the iterative method is that until you have actually built what you are designing, you are not going to be able to fully understand it.

**The UCD process is led by the user**
When presenting sketches and ideas to users for their feedback, you are effectively asking them to imagine how the product will work, to prototype it in their mind as it were, and then provide feedback on what they are imagining. However, with ID you are prototyping at every stage and therefore you get more reliable user/client feedback. The overall experience of a user of a product or system is very much dependant on the designers understanding of user, task and environment.

**The UCD process is developed through user-centred evaluation.**
The difference between UCD and other approaches is that UCD methods are used to develop simple models, mock-ups or prototypes on parts or all of the designs (graphical designs, information architecture, interaction design, information visualisation)

Prototypes are used as touch-points with users to keep checking that design concepts and solutions are on course from a user perspective. The risk of developing a solution that doesn't work is thus minimised.
The most valuable form of feedback is through evaluating design solutions with typical users.

As design solutions are assessed, feedback of results should be fed back to the designers quickly. The objective is to improve the design based on user feedback. Iterative design implies a process of design, evaluation, redesign.

Evaluation activities should begin early in development and continue in frequently throughout.

- Early in development, users can be asked to step through their tasks following a sequence of screen sketches or paper prototypes.
- If it is impossible to involve user, usability experts may be able to evaluate designs by “walking through” designs based on user and task goals.
- Working prototypes can be tested more formally by users carrying out typical tasks. Task completion and task completion rates are key factors.
- A usability lab is not always essential but it does have the advantage that developer may watch and discuss the tests without disturbing the user.
- When a complete prototype is available, usability requirements for user performance and satisfaction can be tested.

Evaluation methods can include:

- Personas and scenarios
- Usability testing
- Observation: Interviews and focus groups
- Questionnaires
- Participatory design

These methods are described in more detail in sections 7.3 and 7.4

The product must address the whole user experience
User experience includes usability, but also encompasses a more emotional dimension: for example, the desire, joy, meaning, reflection, value or frustration that a user experiences
Peter Morville's user experience honeycomb describes a structured way to understand the components of user experience. Successful products or services are 'valuable', which is positioned at the centre of the honeycomb. The other elements of desire, usefulness, usability, findability, credibility and accessibility all contribute to this overall value.

Experience innovation isn’t driven by specific product features or design, but by reimagining the broader experience of how customers might use the product or service. By looking beyond the product to take a broader view of customer issues and activities around the product, companies can find new ways to address unmet needs, create talk-worthiness, and fuel differentiation.

Take Uber, the car service. Uber didn’t change the vehicle or retrain drivers, but fundamentally changed how you order, meet, and pay for a car. By taking a broader view of what a car service could be, Uber was able to reimagine the entire experience—offering “relentless reliability,” and a seamless system that addresses many hassles such as long wait time, not having cash, losing recipients, etc. The company is growing like wildfire—adding almost 80,000 new customers a week and is able to charge a lot more than the typical cab. Looking beyond the product to the broader experiences surrounding it also creates new horizons for growth.

At Nike, for instance, shifting from sneakers to enabling fitness has spurred clothing sales, the Fuel band, and other integrated digital solutions, and fitness-oriented social media sharing and gamification.

**UCD design teams are multidisciplinary.**
Designing a simple and enjoyable experience for users is not a simple task, though. It requires a multidisciplinary approach. UCD design teams may include anthropologists, ethnographers and psychologists.

Click the link below to watch the video. In it David Kelley, head of IDEO, an award-winning global design firm that takes a human-centered, design-based approach to helping organizations in the public and private sectors innovate and grow, explains how his team works.

**UCD Task 1:** Identify the different team members and their roles within IDEO.

**UCD Task 2:** Why is the team multidisciplinary?
Anthropologists treat human society as a field of science and want to know why things happen. For example, we know how AIDS is spreading but do we know why? They tackle big human problems, such as overpopulation, warfare, and poverty. Anthropology considers how people's behaviors changes over time, and how people and seemingly dissimilar cultures are different and the same.

An ethnographer has direct interaction with people to gather and record data about human culture and societies. There are various research methods that can be applied to the different sub-categories of this social study, such as field, design or visual ethnography. An ethnographer often needs to be able to find patterns in and understand issues faced by a wide sample of people with diverse backgrounds.

Psychologists are concerned with the assessment, diagnosis, treatment, and prevention of mental disorders. They often work in medical settings, clinical psychologists are not medical doctors and do not prescribe medications in most states.

**UCD Task 3: Define anthropology and ethnography, how do they complement each other?**

**The five stages of UCD: research, concept, design, implementation, launch**

**Research**
Learning about the people who use or are going to use your product, and the context in which they’ll use it. It can include ethnographic techniques such as shadowing, diary studies and interviews, as well as focus groups, benchmarking, usability testing and online tracking (for web projects).

**Concept**
Examining the needs of your users and of your business, and coming up with innovative solutions to address those needs. During this stage, the visual design team work on concepts for brand
interpretation. The visual and interaction ideas come together for concept testing sessions with target users.

**Iterative design**
Designing and usability testing mock-ups of your product through a series of repeated cycles. There’s interaction design, information architecture, visual design and content to be worked through in detail. The result of each cycle feeds into and refines the next, ensuring that the final user experience is simple and delightful.

**Implementation**
The development team often needs quick interaction solutions when they encounter unexpected technical constraints. There are also accessibility checks and testing to perform, and a final usability test of the working product.

**Launch**
Once the product is out, it’s important to gather feedback and can include further usability testing and ethnographic work.

**Inclusive Design**
User-centred design has a focus on **inclusive design**. Inclusive design requires designing universally accessible products for all users including those with **physical, sensory, perceptual** and other challenges and impairments.

Inclusive Design is important to the designers of tomorrow - and those who educate them. Future consumer markets will be more diverse than ever in terms of age and physical ability. In the past, design
education looked at special needs design for special needs group. That attitude is changing. Now the focus is on better mainstream solutions for everyone, supported by new design research techniques to make the development process more user-centred. This ensures that there is a sufficient market for their products and increases their feasibility as an innovation.

Inclusive Design approaches designing where designers ensure that products and services address the needs of the widest possible audience, irrespective of age or ability.

**Aging planet**

<table>
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<tr>
<th>World average</th>
<th>Japan</th>
<th>United Kingdom</th>
<th>USA</th>
<th>Russia</th>
<th>China</th>
<th>Turkey</th>
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<td>45.9%</td>
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<td>18.3%</td>
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<td>45.9%</td>
<td>28%</td>
<td>19.7%</td>
<td>37.4%</td>
<td>18.3%</td>
<td>13.9%</td>
<td>29.4%</td>
</tr>
</tbody>
</table>

The proportion of people over 60 years (of the total population)

Year average (median) age of the population

UN Department of Economic and Social Affairs Data

**Why is inclusive design important?** Demographic change is a major challenge to the design profession. There are already 130 million people over 50 in the European Union. By 2020, one in every two European adults will be over that age. The effects of rapidly ageing populations, and growing numbers of people with disabilities, are having a profound effect on new product and service development.

The British Standards Institute (2005) defines inclusive design as "The design of mainstream products and/or services that are accessible to, and usable by, as many people as reasonably possible ... without the need for special adaptation or specialised design."

By meeting the needs of those who are excluded from product use, inclusive design improves product experience across a broad range of users. Put simply **inclusive design is better design.**
**Inclusive Design Task:** Read through the case studies below and watch the video and discuss what you understand by the term ‘inclusive design’

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**OXO Good Grips Case Study**

OXO began with a few simple questions - Why do ordinary kitchen tools hurt your hands? Why can’t there be wonderfully comfortable tools that are easy to use?

In 1990, the first group of 15 OXO Good Grips kitchen tools was introduced to the US market. These ergonomically-designed, transgenerational tools set a new standard for the industry and raised the bar of consumer expectation for comfort and performance. The annual growth in sales was over 35% per year from 1991 to 2002, and the line now contains more than 500 innovative products covering many areas of the home. The OXO Good Grips line has been recognized by several national and international organizations for superior design. The company’s strategy is based on the primary goals of making products that are usable and desirable.

The handles on these products have innovative designs that make them comfortable to use, and the blades are functionally very effective.

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**Ferrari Enzo Case Study**

With only 400 produced and a price of $670,000, the Ferrari Enzo is probably the last place you would expect to find inclusive design. Surprisingly though, a 2004 press article from the Ferrari Owners' Club
indicates inclusive thinking within Ferrari’s design strategy for access and egress. The text below is paraphrased from the press article.

Climb into the latest Ferrari sports car and you are unlikely to notice the modifications designed with overweight, arthritic pensioners in mind. The Italian carmaker is just one of many companies grappling with a demographic shift that challenges the fundamental rules of marketing and design. The average buyer of a Ferrari road car is nearing 50 and set to get older. Car designers are responding by sparing the knees with changes to the door height. The trick is that no one must be able to tell.

‘The profile of our customers means we have to pay attention to practicality and functionality without compromising the sportiness,’ said Giuseppe Bonollo, strategic marketing director. ‘There are some engineering choices you can make which give you better accessibility and internal roominess. The way the doors open on the Ferrari Enzo, for example, allows part of the roof and part of the door undermoulding to come away as well, making it easier to enter the car.’

The press article credited the improved comfort of a modern Ferrari with doubling the average distance driven by its owner from 2,500 miles a year in 1990 to 5,000 miles in 2004.