Human Centered Design

ISO 9241-210

Learning Goals

- Understand …
  - The terms user centered design (UCD) and human centered design (HCD)
  - The general structure of the ISO 9241 Ergonomics of human–system interaction
  - The ISO 9241-210 Human-centered design for interactive systems
  - The problems of user centered design
- Be able to explain
  - Rationale for adopting human-centered design according to ISO 9241-210
  - Principles and activities of human-centered design according to ISO 9241-210
  - The separation between interaction design and technical realization

User Centered Design vs. Human Centered Design

- The terms are used interchangeable
- Human centered is the more modern term
- With the term “human centered” the focus should be on the person as a whole not only the user

ISO Standards and DIN Norms

ISO 9241
Ergonomics of human–system interaction

Many parts with specific focus

- Part 1: General introduction
- Part 2: Guidance on task requirements
- Part 3: Visual display requirements
- Part 4: Keyboard requirements
- …
- Part 110: Dialogue principles
- Part 151: Guidance on World Wide Web user interfaces
- Part 171: Guidance on software accessibility
- Part 210: Human-centered design for interactive systems
- …
- Part 420: Selection procedures for physical input devices
- Part 910: Framework for tactile and haptic interaction
- Part 920: Guidance on tactile and haptic interactions


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Ergonomics of human–system interaction —

Part 210:
Human-centred design for interactive systems

Ergonomie de l'interaction homme–système —

Partie 210: Conception centrée sur l'opérateur humain pour les systèmes interactifs

Reference number
ISO 9241-210:2010(E)

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ISO 9241 Ergonomics of human–system interaction

ISO 9241
Ergonomics of human–system interaction
Part 210: Human-centered design for interactive systems

Table of Contents


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ISO 9241-210

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2010-03-15

Ergonomics of human–system interaction —

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ISO 9241-210:2019(EN) Human-centered design for interactive systems

ISO 9241-210
Human-centered design for interactive systems
3. Rationale for adopting human-centered design

- “Using a human-centered approach to design and development has substantial **economic and social benefits for users, employers and suppliers**. Highly usable systems and products tend to be more **successful both technically and commercially**.“
- “Systems designed using human-centred methods improve quality, for example, by:
  - a) increasing the **productivity** of users and the operational efficiency of organizations;
  - b) being **easier to understand and use**, thus reducing training […] costs;
  - c) increasing usability for **people with a wider range of capabilities** […]
  - d) improving user experience;
  - e) **reducing** discomfort and **stress**;
  - f) providing a **competitive advantage** […]
  - g) contributing towards sustainability objectives.”


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Human-centered design for interactive systems

4. Principles of human-centered design

- a) the design is based upon an explicit **understanding of users, tasks and environments** […]
- b) **users are involved** throughout design and development […]
- c) the design is **driven and refined by** user-centered **evaluation** […]
- d) the process is **iterative** […]
- e) the design addresses the **whole user experience** […]
- f) the design team includes **multidisciplinary skills** and perspectives”


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Human-centered design for interactive systems
6. Human-centered design activities

"a) understanding and specifying the **context of use**"

- *What are the tasks or objectives associated with the design?*

"b) specifying the **user requirements**"

- *What expectations or requirements must the design accommodate?*

"c) producing **design solutions**"

- *prototyping, rendering, mockup building, implementation*

"d) **evaluating** the design"

- Conduct initial evaluations, usability testing, and ergonomic assessment


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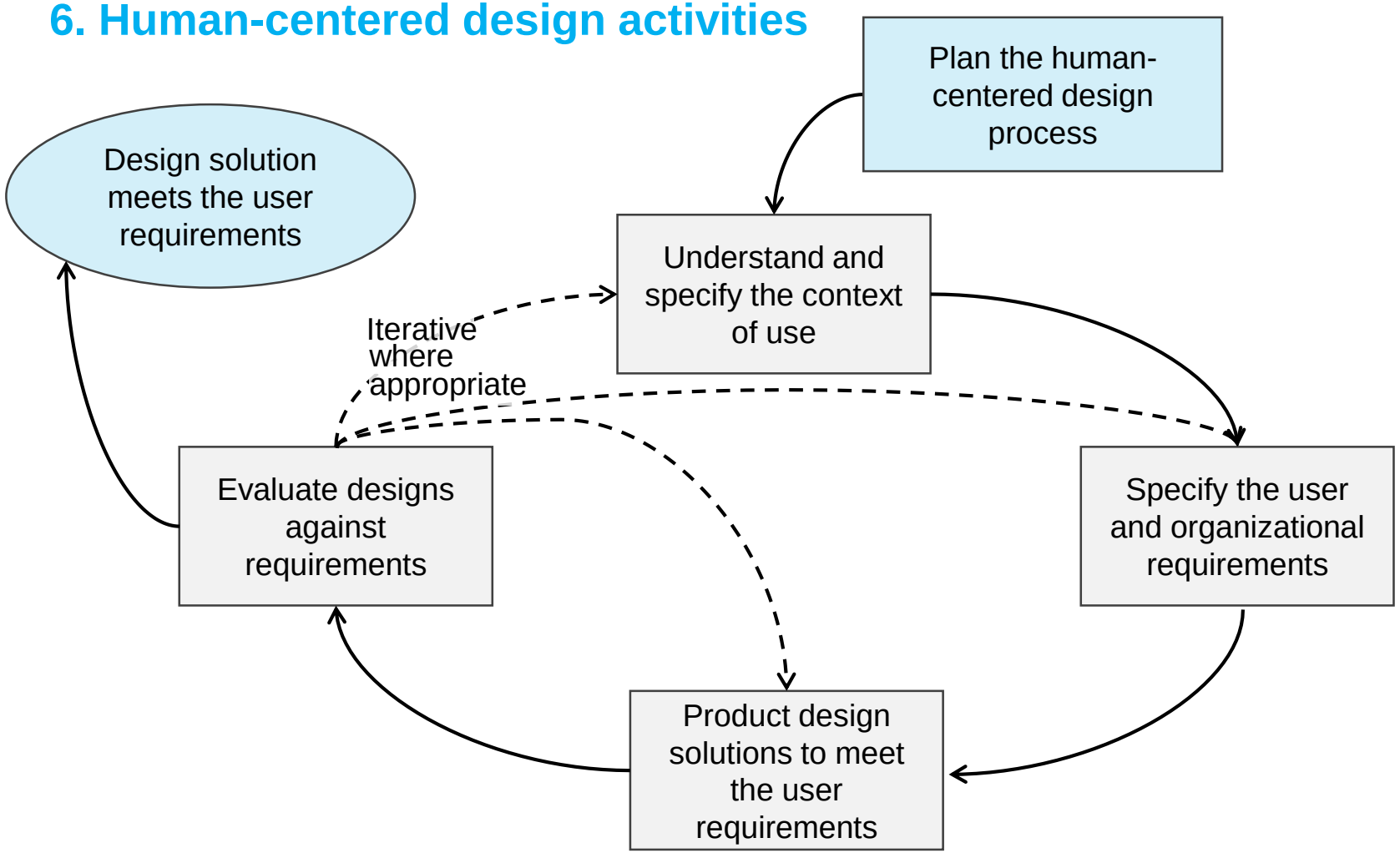
Human-centered design for interactive systems
6. Human-centered design activities

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First edition
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Part 210:
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Ergonomie de l'interaction homme–système —

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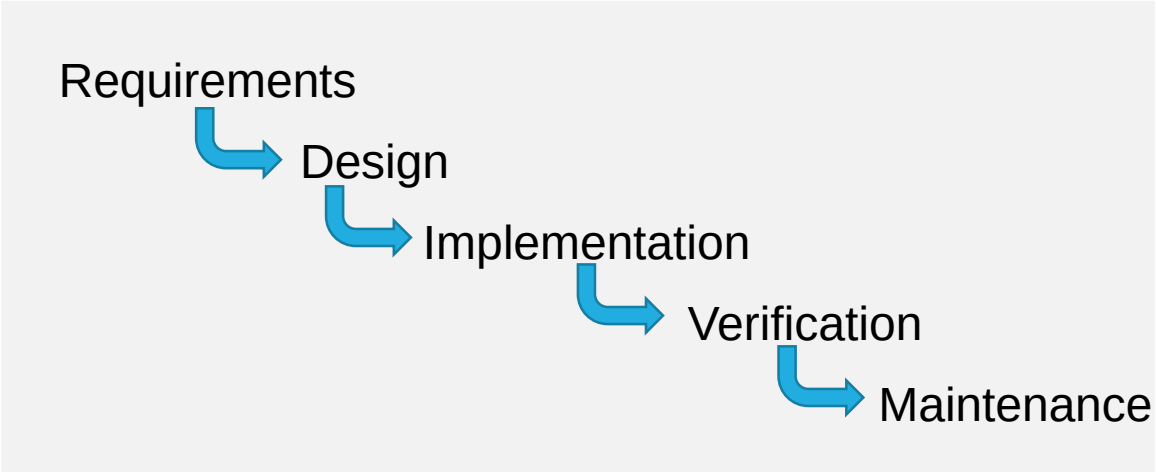
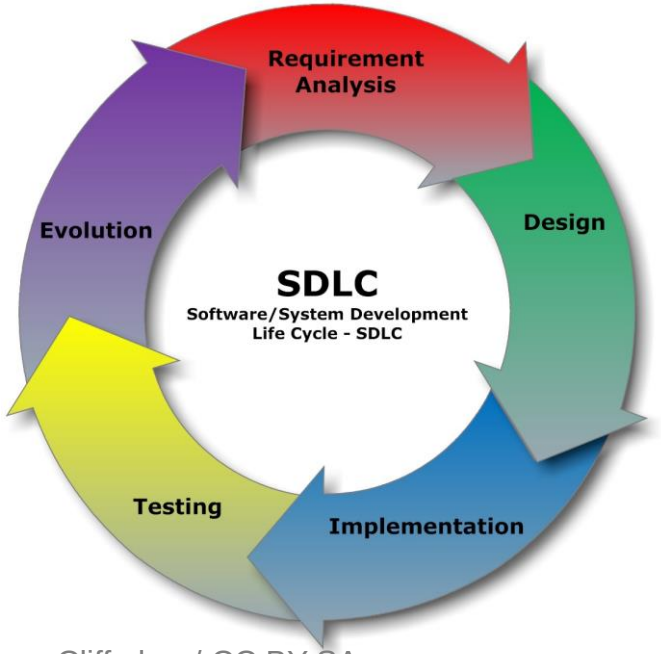
Software Process vs Human Centered Design Process

Mini-Exercise

- Will the human centered design process work well with the waterfall model?



- Does it fit agile software development methods?



Separation between interaction design and technical realization

Separation into a two stage process for interactive applications

- 1st – Concept development and Interaction design (quick iterations)
  - Application and interaction concept
  - Interaction design
  - Prototypes to evaluate the concept and interaction design
- 2nd – technical realization (slow iterations)
  - Technical analysis
  - Technical specification (e.g. architecture, platform)
  - Implementation
  - Evaluation and Quality management

Problems of User Centered Design

- Users may expect disadvantages (e.g. being replaced by software)
- Users may have conflicting views
- Users may be wrong
- Users may be resistant to change

- In a “business environment” you are expected to create a system with regards to the **goals specified** and this is unfortunately NOT necessarily the system users would like to have
- There is often a **trade-off between** the goals of **employers (customer) and employees (user)**

How easy is it to work in multidisciplinary teams?

- Many people are involved in the process of designing and implementing an interactive product
  - **Different background** (e.g. design, business, CS, marketing, administration)
  - Different and **conflicting** low level **objectives** objectives
- Communication can be very difficult!

- To be able to work in a team is essential!
  - Team work is a skill that can be learned

Did you understand this block?

Can you answer these questions?

- What is the ISO 9241-210 standard about?
- What are potential problems of user centered design
- What is the rationale for adopting human-centered design according to ISO 9241-210
- Name the Principles and activities of human-centered design according to ISO 9241-210
- How do the design activities according to ISO 9241-210 relate to each other? Make a sketch.
- Explain how interaction design and technical realization can be separated and why this may be useful.

References

- ISO 9241 Ergonomics of human–system interaction
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