Human-Computer Interaction
Human Centered Design

Goals of this Video

After watching this video you will be able to explain…

- The terms user centered design (UCD) and human centered design (HCD)
- Human-centered design principles and approaches for interactive systems
- The problems of human centered design

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

HUMAN-CENTERED DESIGN FOR INTERACTIVE SYSTEMS

ISO 9241-210 – PRINCIPLES

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”

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

ISO 9241-210 – ACTIVITIES

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

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

"2) specifying the **user requirements**"

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

"3) producing **design solutions**"

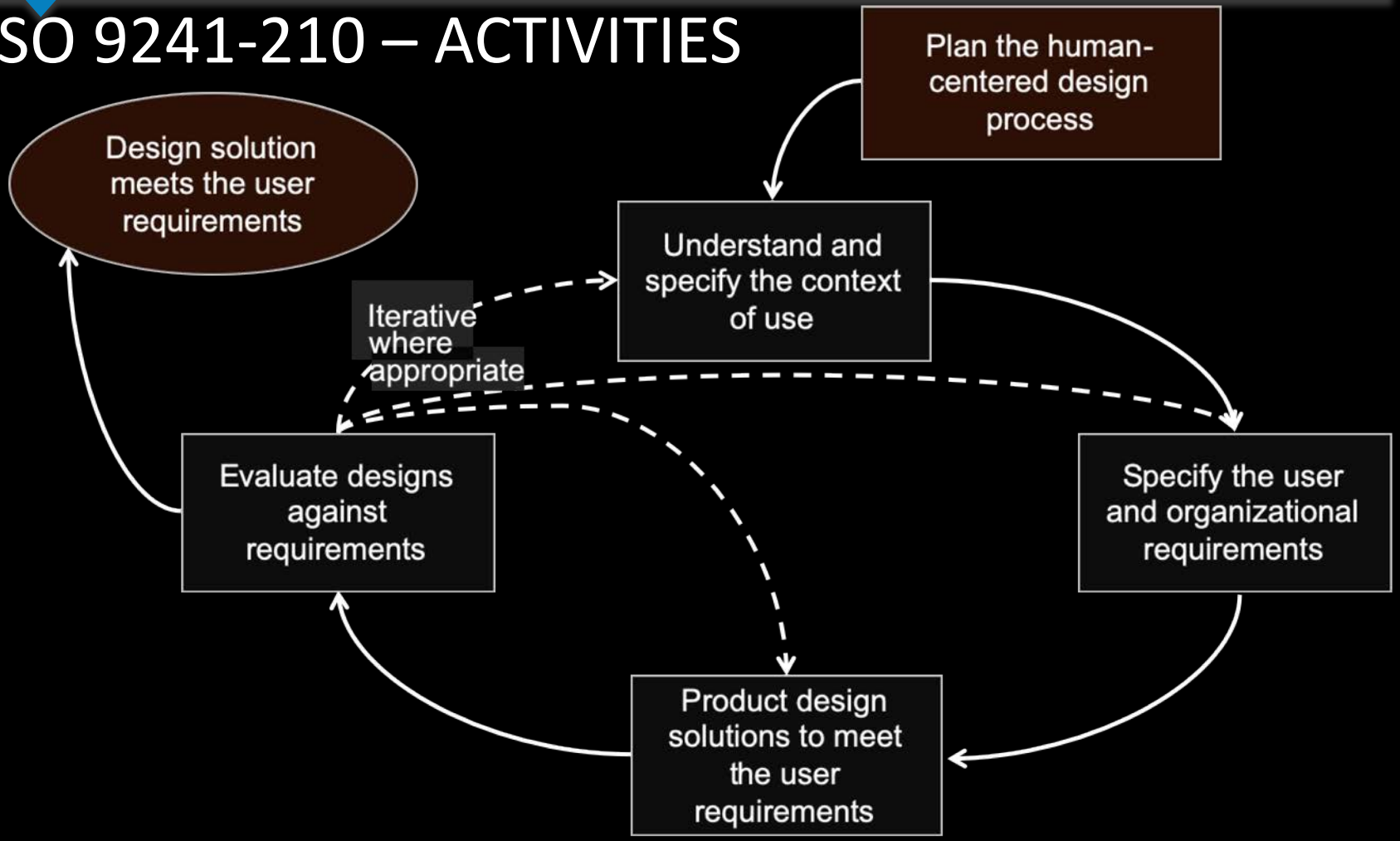
- *prototyping, rendering, mockup building, implementation*

"4) **evaluating** the design"

- Conduct initial evaluations, usability testing, and ergonomic assessment

HUMAN-CENTERED DESIGN FOR INTERACTIVE SYSTEMS

ISO 9241-210 – ACTIVITIES

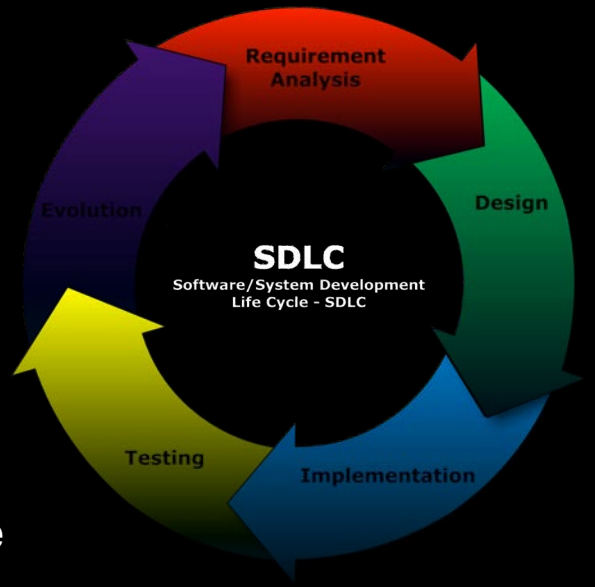


SOFTWARE PROCESS VS HUMAN CENTERED DESIGN PROCESS

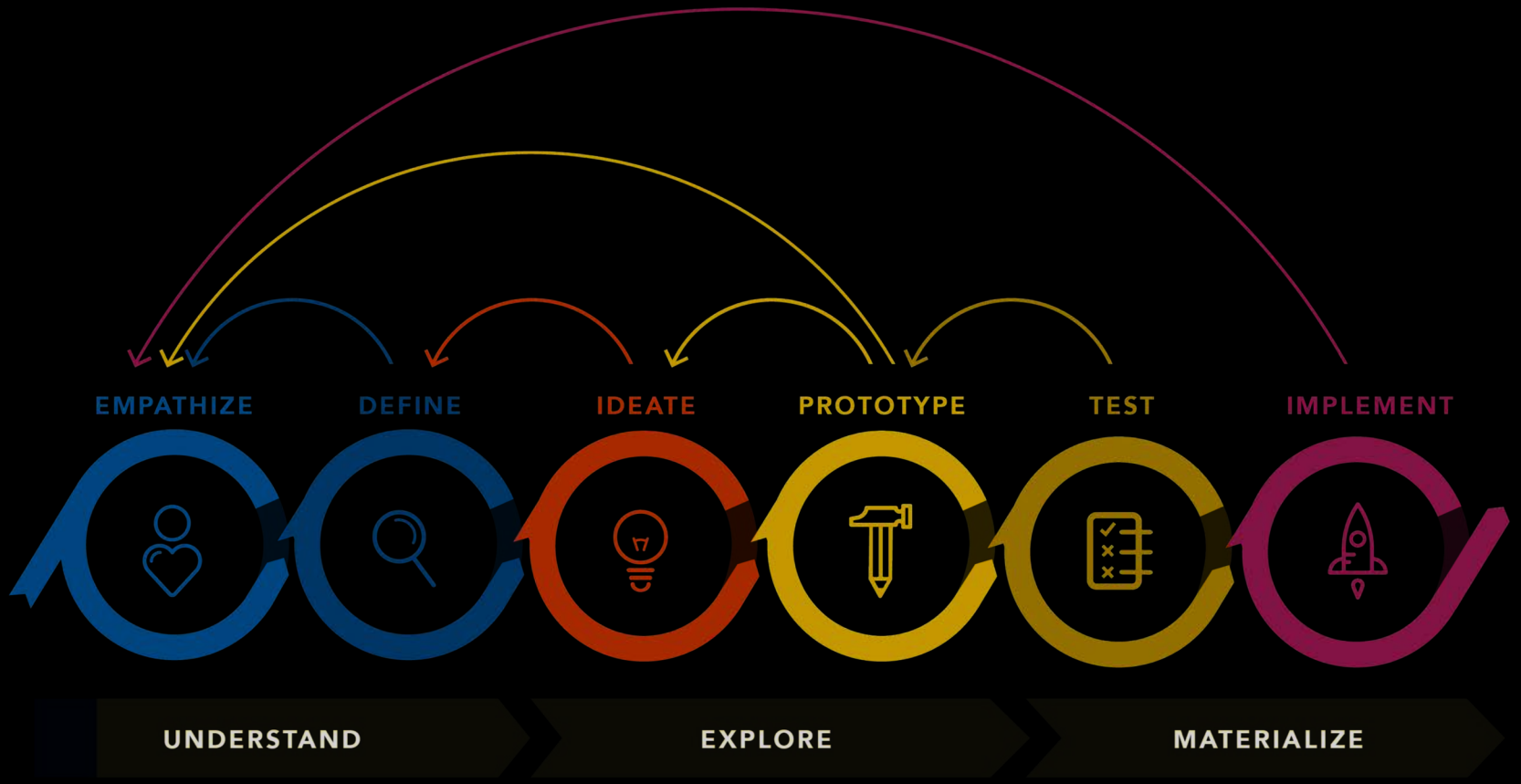
Waterfall model:

Requirements
- Design
  - Implementation
    - Verification
      - Maintenance

Agile software development



DESIGN THINKING



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SEPARATION BETWEEN INTERACTION DESIGN AND TECHNICAL REALIZATION

1st – Concept development and Interaction design (quick iterations)

- Application and interaction concept
- Interaction design
- Prototypes to evaluate the concept and interaction design

SEPARATION BETWEEN INTERACTION DESIGN AND TECHNICAL REALIZATION

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2nd – technical realization (slow iterations)

- Technical analysis
- Technical specification (e.g. architecture, platform)
- Implementation
- Evaluation and Quality management

CONTEXT OF USE ANALYSIS I/II

- Users and stakeholder groups
  - Who will use the system? (user / end-user)
  - Whose needs have to be considered (other stakeholders, such as managers, supervisors, family members, doctors, …)
  - How are these groups related?
- The characteristics of users or group of users
  - Knowledge, skills, experience, education, training
  - Physical attributes, habits, preferences and capabilities
- The goals and tasks of users
  - The way users typically carry out tasks
  - Frequency and duration, interdependencies
  - Risks, consequences for health and safety

CONTEXT OF USE ANALYSIS II/II

- The environments of the system
  - Technical environment: hardware, software, materials
  - Physical environment: e.g., thermal conditions, lighting, spatial layout and furniture.
  - Social environment: e.g., work practices, organizational structure and attitudes.

- Note: The context of use description is
  - a working document
  - usually part of the user requirements specification

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)**

REFERENCES

[1] Sarah Gibbons, Design Thinking 101
https://www.nngroup.com/articles/design-thinking/

[2] ISO 9241 Ergonomics of human–system interaction

[3] ISO 9241-210:2019(en) Human-centered design for interactive systems

ACKNOWLEDGEMENTS

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