

# Human Factors and Human-Machine Interaction

## Usability Engineering –Introduction

**FACULTY**  
OF COMPUTER SCIENCE



# OVERVIEW

- What is usability?
  - Definition
  - Framework
  - Process
- What is User Experience (UX)?







# USABILITY: DEFINITION

“The extent to which a **product** can be used by specified **users** to achieve specified **goals** with **effectiveness**, **efficiency** and **satisfaction** in a specified **context of use**.” (Usability – ISO 9241-11)

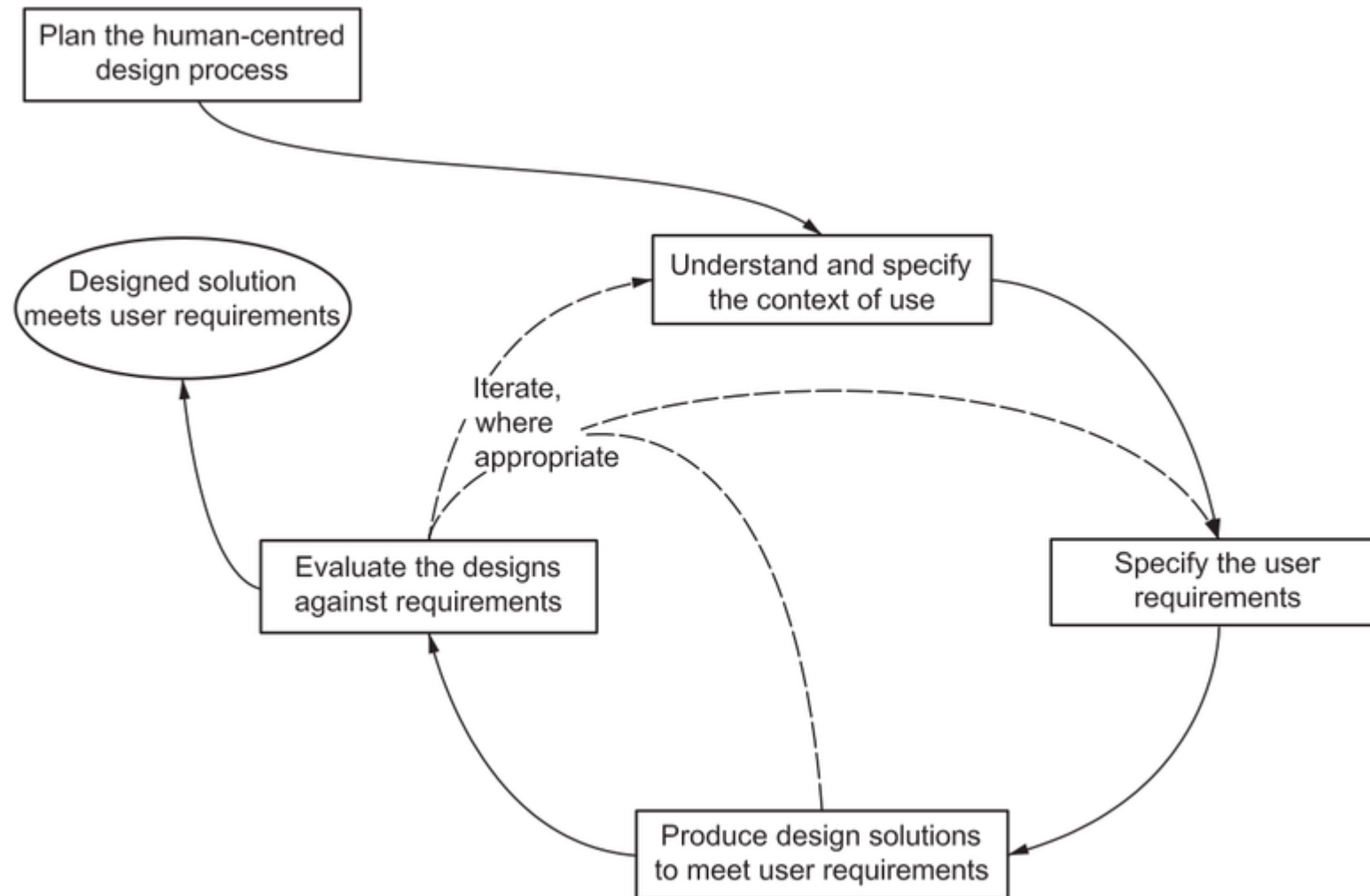
**effectiveness**: the accuracy and completeness with which specified users can achieve specified goals in particular environments

**efficiency**: the resources expended in relation to the accuracy and completeness of goals achieved

**satisfaction**: the comfort and acceptability of the work system to its users and other people affected by its use



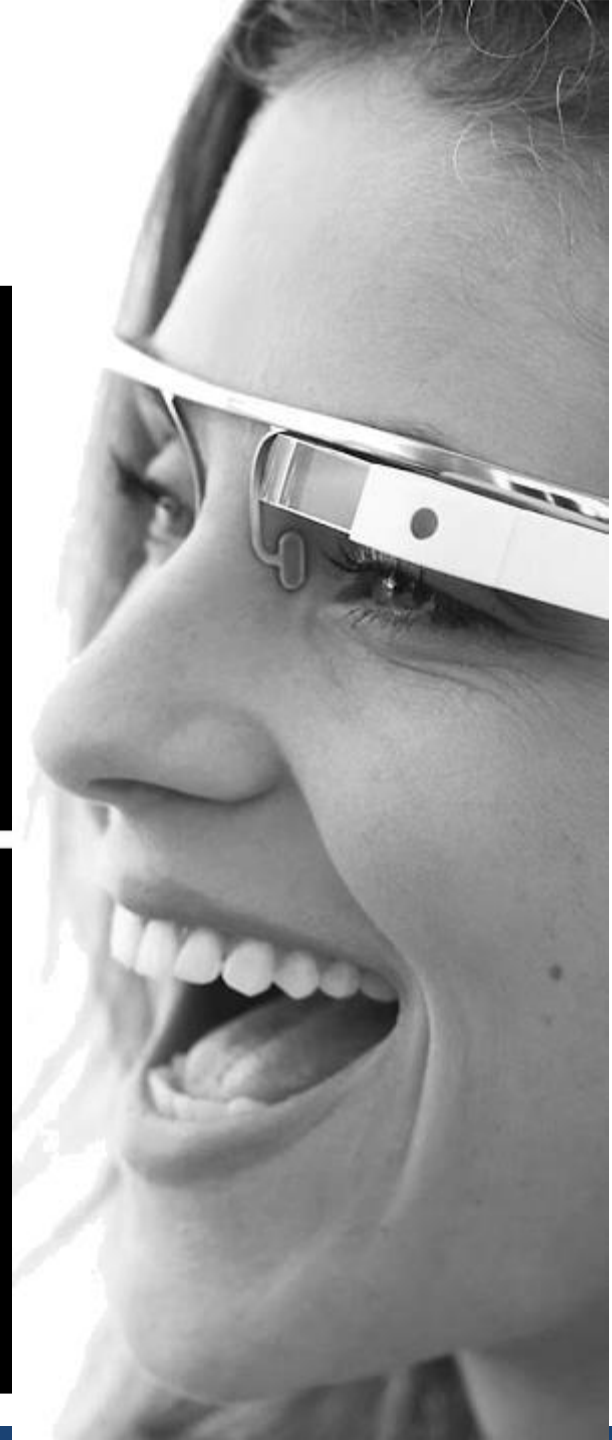
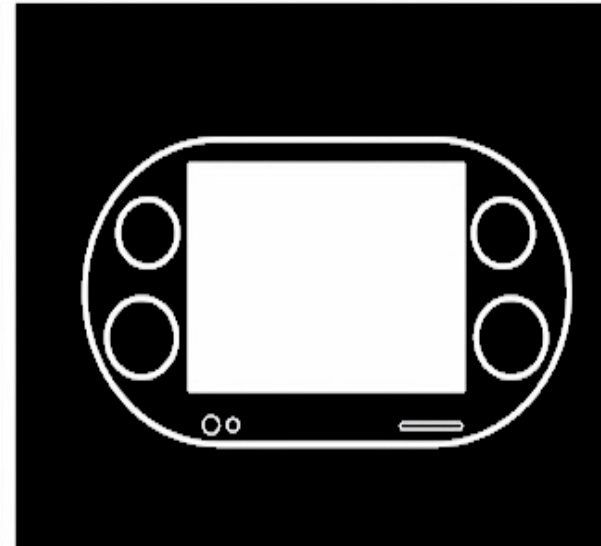
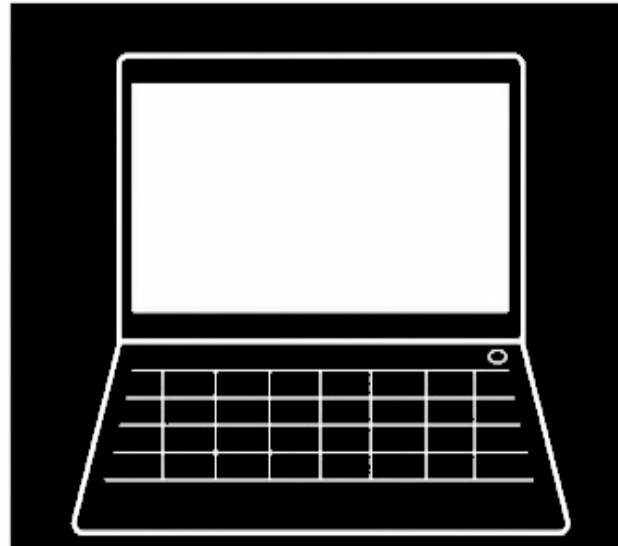
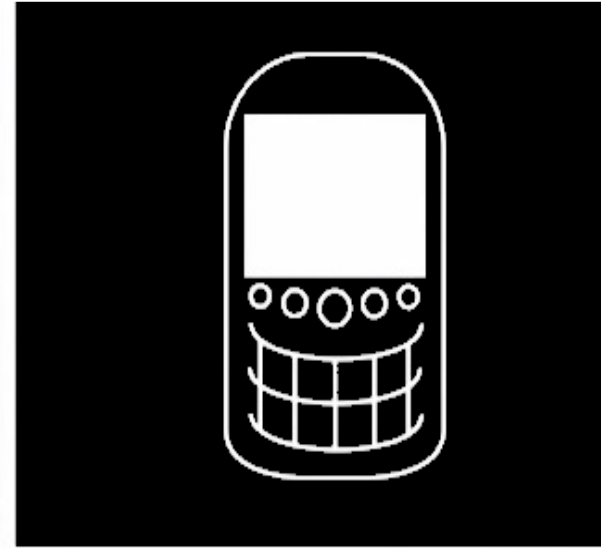
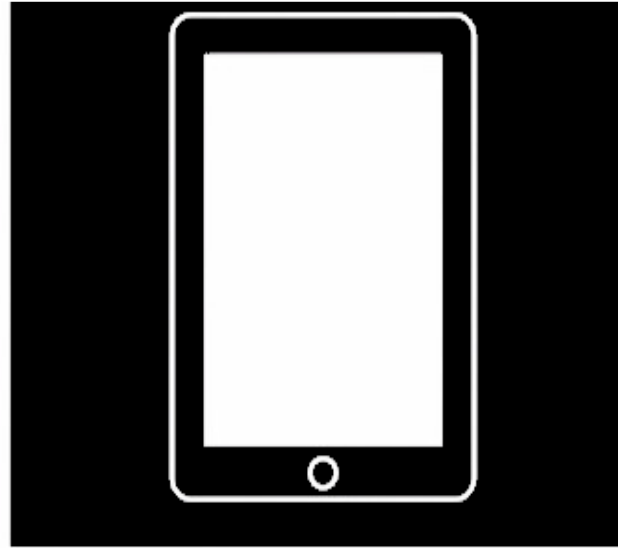
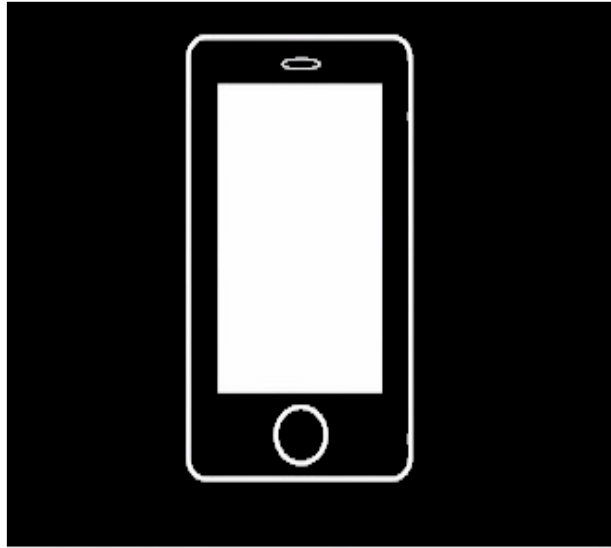
# USABILITY: PROCESS

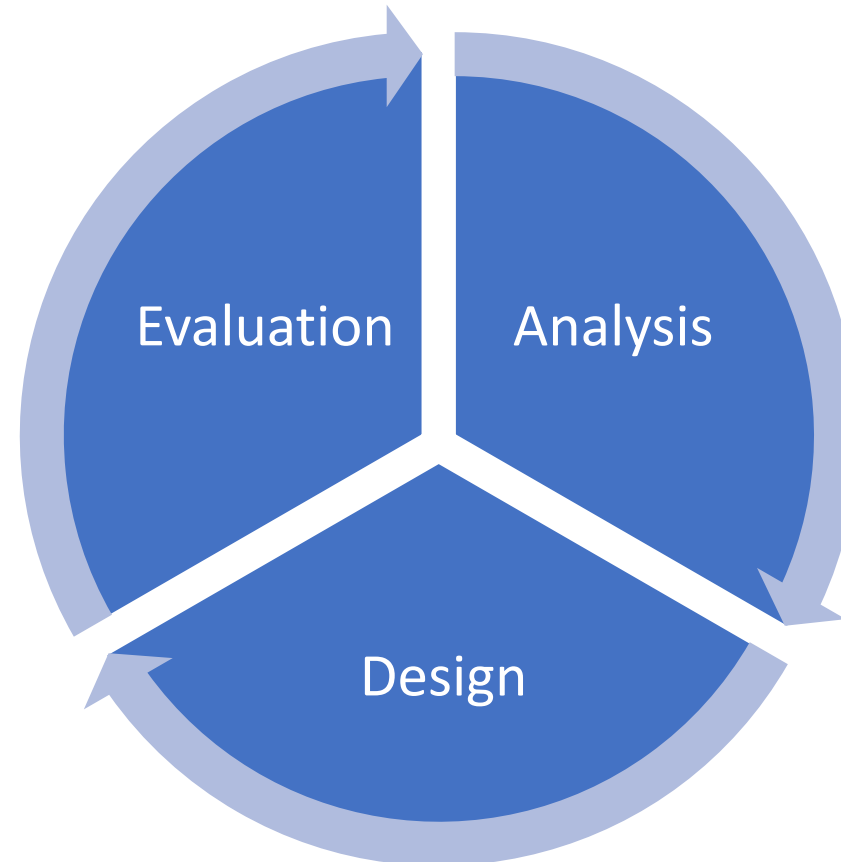
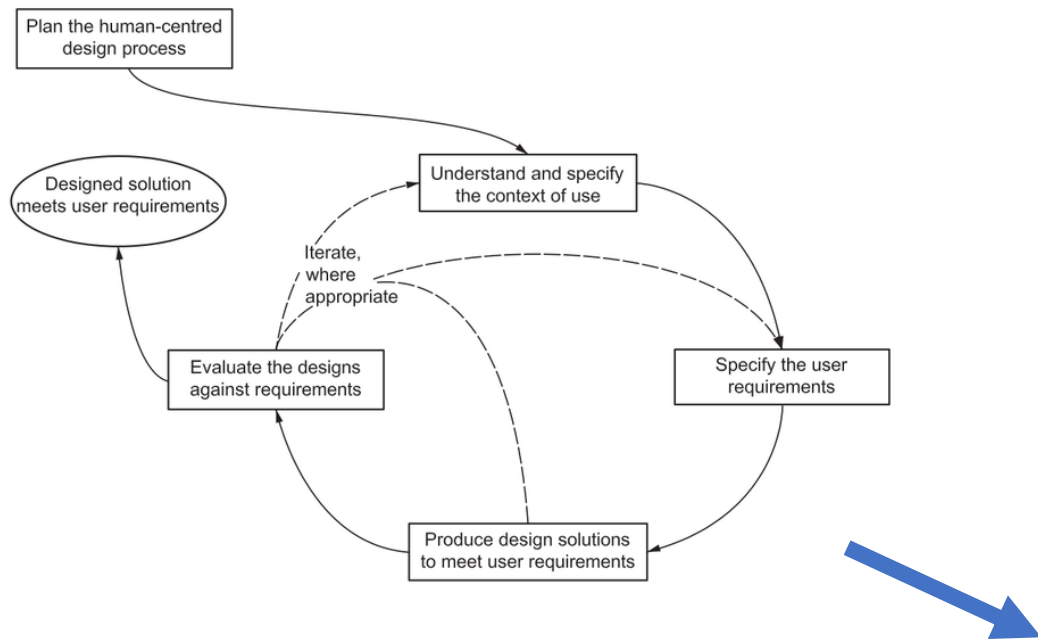


-210 (2010)



# MOBILE SYSTEMS

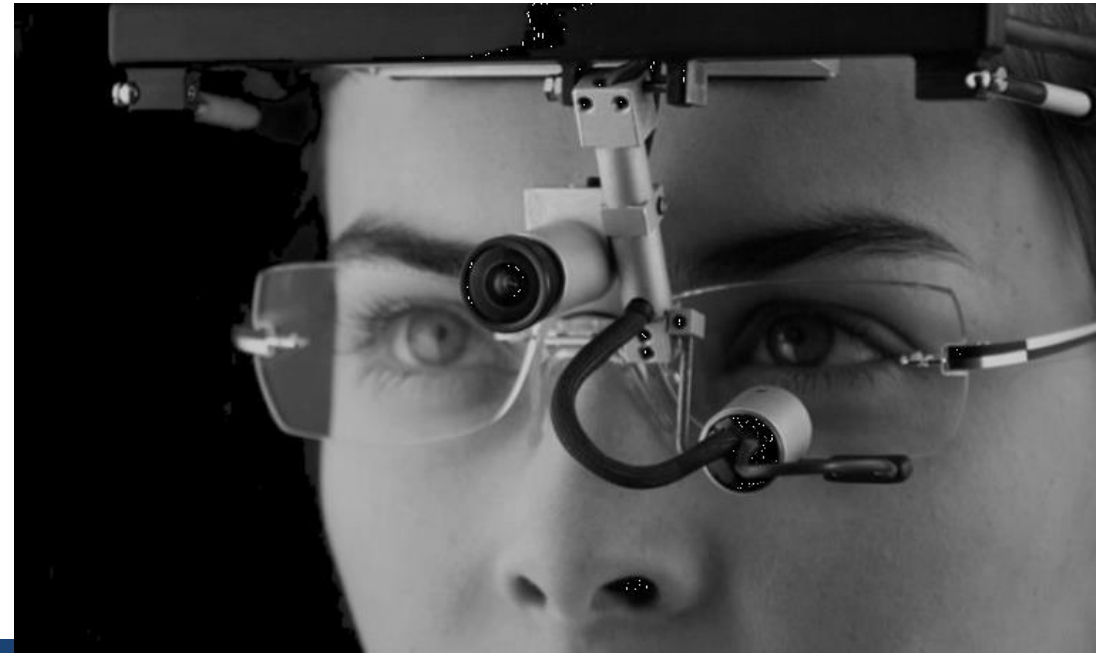






# METHODS: ANALYSIS

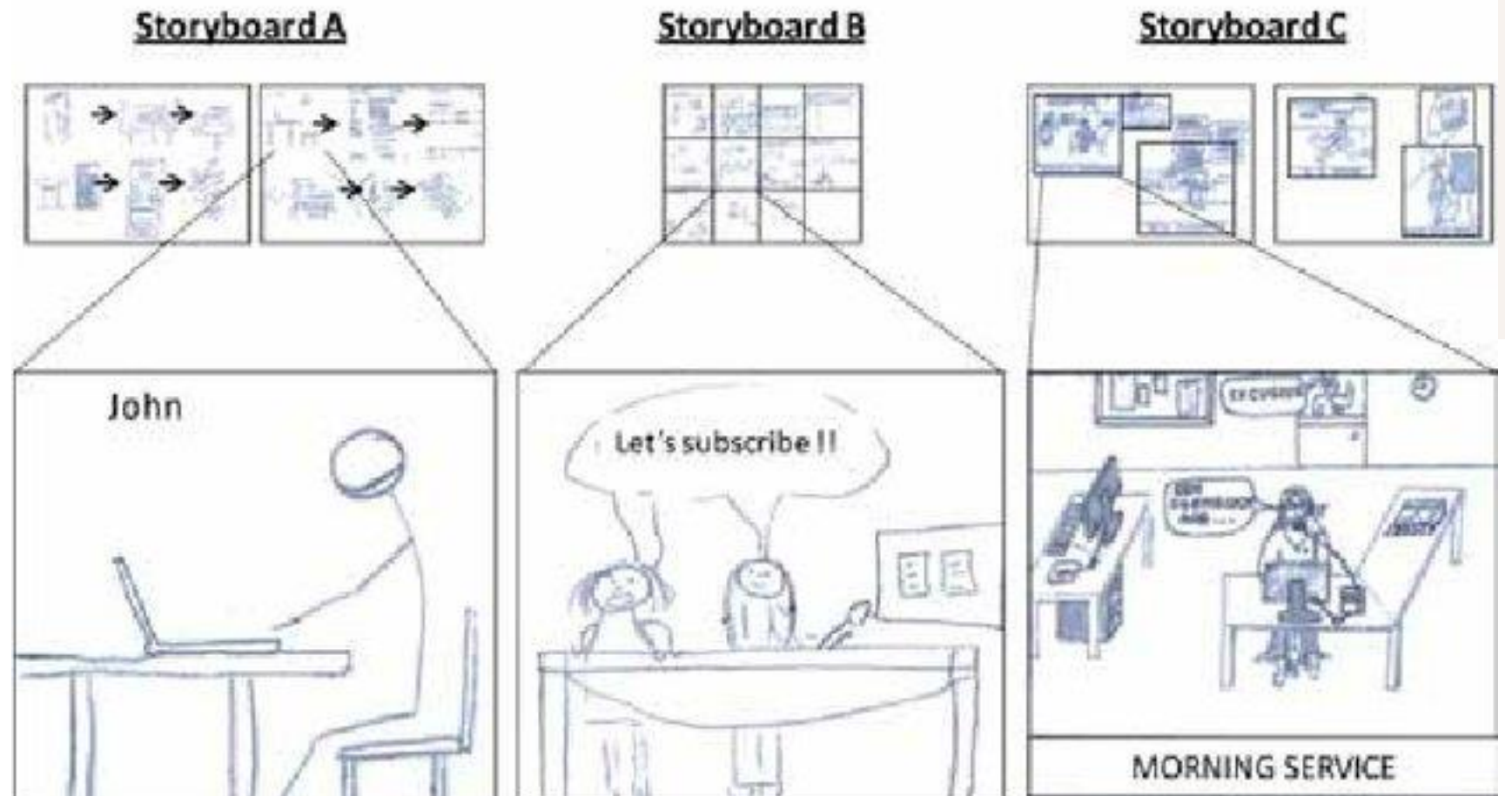
- Personas & Scenarios
- Interviews, Focus Groups
- Field Studies, Ethnographic Studies
- Eye Tracking
- Lab Experiments
- User Modelling





# METHODS: DESIGN

- Wireframes
- Storyboards
- Agile Methods
- Rapid Prototyping
- ...



# METHODS: EVALUATION

- **Discount Usability:** Usability Inspection (Heuristic Evaluation, Cognitive Walkthrough)
- Questionnaires
- DIY Usability Tests
- Context-oriented methods
- (Classic) User tests
- User Modelling



USABILITY++ = USER EXPERIENCE (UX)



# USER EXPERIENCE

„A person's perceptions and responses that result from the use and/or anticipated use of a product, system or service.”

(User Experience – ISO 9241-210)

User Experience encompasses all **emotions**, perceptions, preferences, physiological and psychological responses, behaviors, and performances that arise **before, during, and after** the use.



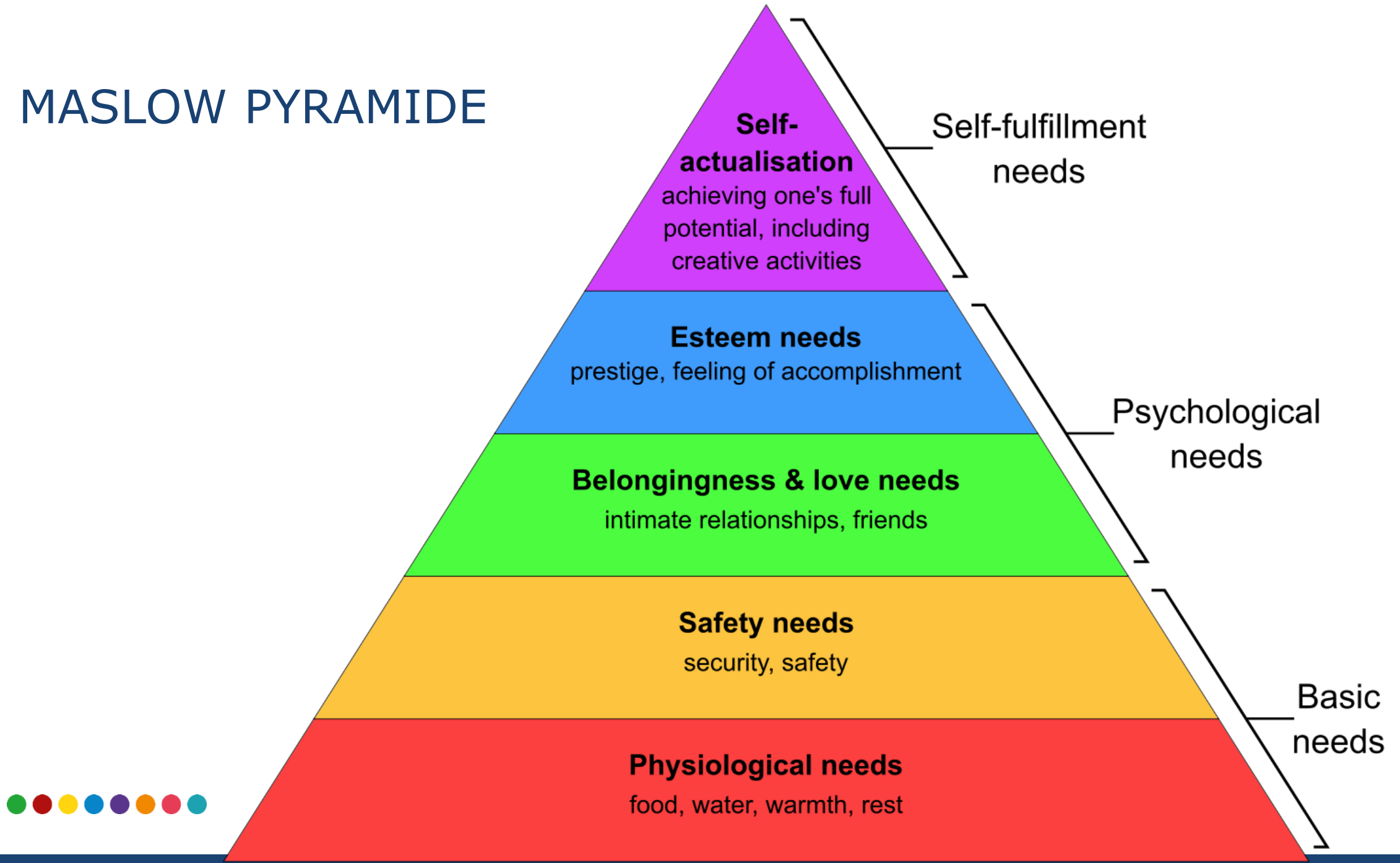


# METHODS: USER EXPERIENCE

- Holistic, temporal dynamics: Stories
  - Subjective:
    - Emotions: PANAS
    - Needs: Questionnaires
    - Hedonic AND pragmatic Quality: AttrakDiff
  - Objective performance measures:
    - Reaction times
    - Error rates
- ➔ **Not suitable for UX**



# MASLOW PYRAMIDE



# NEEDS AND USER EXPERIENCE

- Fulfillment of needs → positive emotions
- Experiences characterized by a **profile of needs**
- Positive experiences often characterized by a **single need**
- Needs as a **categorization system** for experiences
- Needs are not instrumentally serving a **goal or purpose**
- **Design** is instrumental in satisfying needs
- Design starting point (container): **Stories**



# USABILITY VS. UX

