DEGGENDORF INSTITUTE OF TECHNOLOGY

# Human Factors and Human-Machine Interaction

## Usability Engineering –Analysis and Design

FACULTY

OF COMPUTER SCIENCE

# PERSONAS

A persona is a **specific user**

- Originally: Personas are based on **typical behavioral patterns**
- Personas are based on **empirically collected data** as much as possible
- Personas represent **user groups** and their **typical characteristics** (goals, roles, abilities, attitudes, environment)
- Personas have **goals**: "*if it has no goal, it is not a persona*" (Cooper)

Alan Cooper: Personas are "*fictitious, specific, concrete representations of target users*"

Jared Spool: "*Personas are model users that the team creates to help understand the goals, motivations, and behaviors of the people who will use the interface*."

# PERSONAS

- Personas are **not** user roles or user profiles or market segments.
- Personas can represent **relevant non-users**.
- A persona can represent a **desired target audience** that is not currently addressed by the existing product.

# PERSONAS: GOALS

- "**Goals**" have multiple facets or **dimensions**.
- **Main goal**: The user should not feel stupid (Hassenzahl: need for competence).
- Hassenzahl's needs:
  - Competence
  - Autonomy
  - Relatedness
  - Stimulation
  - Security
  - Popularity

# PERSONAS: ADVANTAGES

- **Specify** abstract information.
- Facilitate **shared understanding** of users.
- Create **empathy** with users.
- Facilitate **communication** among all **stakeholders** involved: developers, marketing, design.
- Serve as a template for **selecting users** for testing.

# PERSONAS: ADVANTAGES

- Using personas avoids...
  - the **elastic user**
  - **self-referential** design
  - edge cases (=rare special cases)

- It **prevents** design *by* engineers/computer scientists *for* engineers/computer scientists.

# PERSONAS: TYPES

- **Primary** Persona: Each interface addresses a primary persona.
- **Secondary** Persona: Minor additions to the primary persona.
- **Anti-Persona**: Should not be addressed.
- **Buyer** Persona.

# PERSONAS: CREATION

- **Length**: One to two pages.
- Information about the **person**: Name, age, ...
- Definitely include a **photo**; possibly a **collage** of multiple photos in different situations.
- Use **fiction** only where necessary; keep it minimal.
- Do **not include solutions** in the description.

# PERSONAS: STRUCTURAL ELEMENTS

- **Name, age, gender**
- Strong character traits
- **Image**
- Relevant quotes
- **Goals**
- Occupation, role, responsibilities, tasks
- Professional education, knowledge, and skills
- Behavioral patterns and approaches
- Needs, values, fears, desires, preferences
- General (computer/product) knowledge
- Knowledge about related products, previous systems, competing products

# Isaac Rice

## Freelancer

29, In a relationship, Video Producer, California, USA

### BIO

Isaac Rice is a freelance Video Producer working remotely from home. He Works during production and post-production phases in film, TV and video projects. He has a home internet connection with an average speed.

### TECHNOLOGY

IT & Internet

Software

Mobile Apps

### GOALS

Collect material effectively from customers.
Deliver dailies and output to customers effectively, reliably and fast showcase portfolio online.

### PAIN POINTS

Travel to customers' location to collect material.
Use regular mail to receive and deliver content.
Limited file size uploads.
Long time to upload huge files Restarting interrupted uploads from scratch

### WANTS & NEEDS

Secure, fast and affordable way to collect and deliver huge media files Easy way to showcase portfolio securely online

### BRANDS

Dropbox Google Drive vimeo we YouTube

# PERSONAS: EXAMPLES

# Bridget DAY

**AGE** 26
**OCCUPATION** Marketing Director
**STATUS** Single
**LOCATION** New York, NY

**TIER** Enthusiast
**ARCHETYPE** The Marketer

Ambitious | Admired | Focused

*"I would like to find and learn skills that would help me grow my business footsprint online."*

## MOTIVATIONS

- Incentive
- Fear
- Acheivement
- Growth
- Power
- Social

## GOALS

- To grow a strong industry reputation
- To build her own Blog
- To expand and learn new skills

## FRUSTRATIONS

- Slow download times
- Data crashes
- Poor communication

## BIO

Bridget's business has been slowing lately and she could really use a set of skills that would help her undertsand evolution of her work.

## ACTION

Read How To articles
Looking for expert analysis

## PERSONALITY

Extrovert — Introvert
Sensing — Intuition
Thinking — Feeling
Judging — Perceiving

## TECHNOLOGY

- IT and Internet
- Software
- Mobile Apps
- Social Networks

JLeclainche.wordpress.com

# SCENARIOS

- Bring **personas** to life
- Based on the principle of **storytelling**
- In the context of personas, a scenario is a description of an **activity** in which the **persona** achieves one of their **goals** by using the **system** being developed.
- Scenarios are based on user **needs** and describe the **emotional state** of users during the **interaction**.

Alan Cooper: "*A scenario is a concise description of a persona using a software-based product to achieve a goal.*"

# SCENARIOS: 3 TYPES

- At different stages in the **development process**
- **Context** scenarios:
  - Broad and shallow: A-Day-in-a-Life
  - High-level
  - Ideal interaction flow (WHAT before HOW)
  - Possible before the first design of an interface
  - How goals are addressed/achieved
  - "High-level interactions in a particular setting, used to envision the potential use of a product, focusing on a persona's needs, goals, and motivation."
- **Key-Path** scenarios
  - Details of the interaction
  - Introduction of the design vocabulary
- **Validation** scenarios
  - Different situations
  - What if...

# CONTEXT SCENARIOS: ELEMENTS

Address the following questions:

- In what setting(s) will the product be used?
- Will it be used for extended amounts of time?
- Is the persona frequently interrupted?
- Are there multiple users on a single workstation or device?
- With what other products will it be used?
- What primary activities does the persona need to perform to meet her goals?
- What is the expected end result of using the product?
- How much complexity is permissible, based on persona skill and frequency of use?

Cf. Cooper (2014); copied from http://www.hci.otago.ac.nz/info410/Readings/Scenarios.pdf

# (CONTEXT) SCENARIOS

- Described from the **user's perspective** (the **persona**) (but not in first-person narration)
- Include **social, emotional** context, **motivations**, etc.
- Document the current or future **usage context** in a narrative form
- **Reused** in the design process
- Can be **broad** or detailed; not exhaustive in terms of details

# SCENARIOS: ELEMENTS

- Application **situation** with a **focused theme**
- **Persona** at the center of attention
- One or more **actors** with **goals**
- **Tools** and objects required
- **Sequence** of actions and events: problem state → obstacles → result
- Varying levels of **abstraction** and detail
- **Length**: no more than 1 page A4

# SCENARIOS: STRENGTHS

- Proximity to the user and their **needs**
- Facilitated **communication** and communicability in the project
- Reduced **complexity** through concretization
- **Verifiability** and **flexible** adaptability: data-driven
- **Memorability**: scenario is stored as a whole; episodic memory

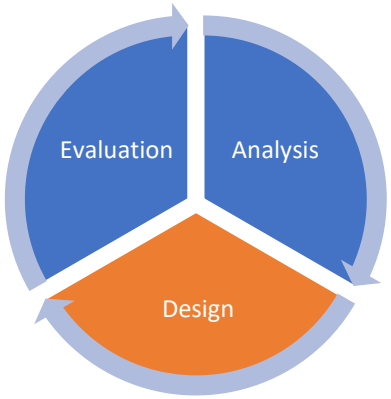
# SCENARIOS: EXAMPLES

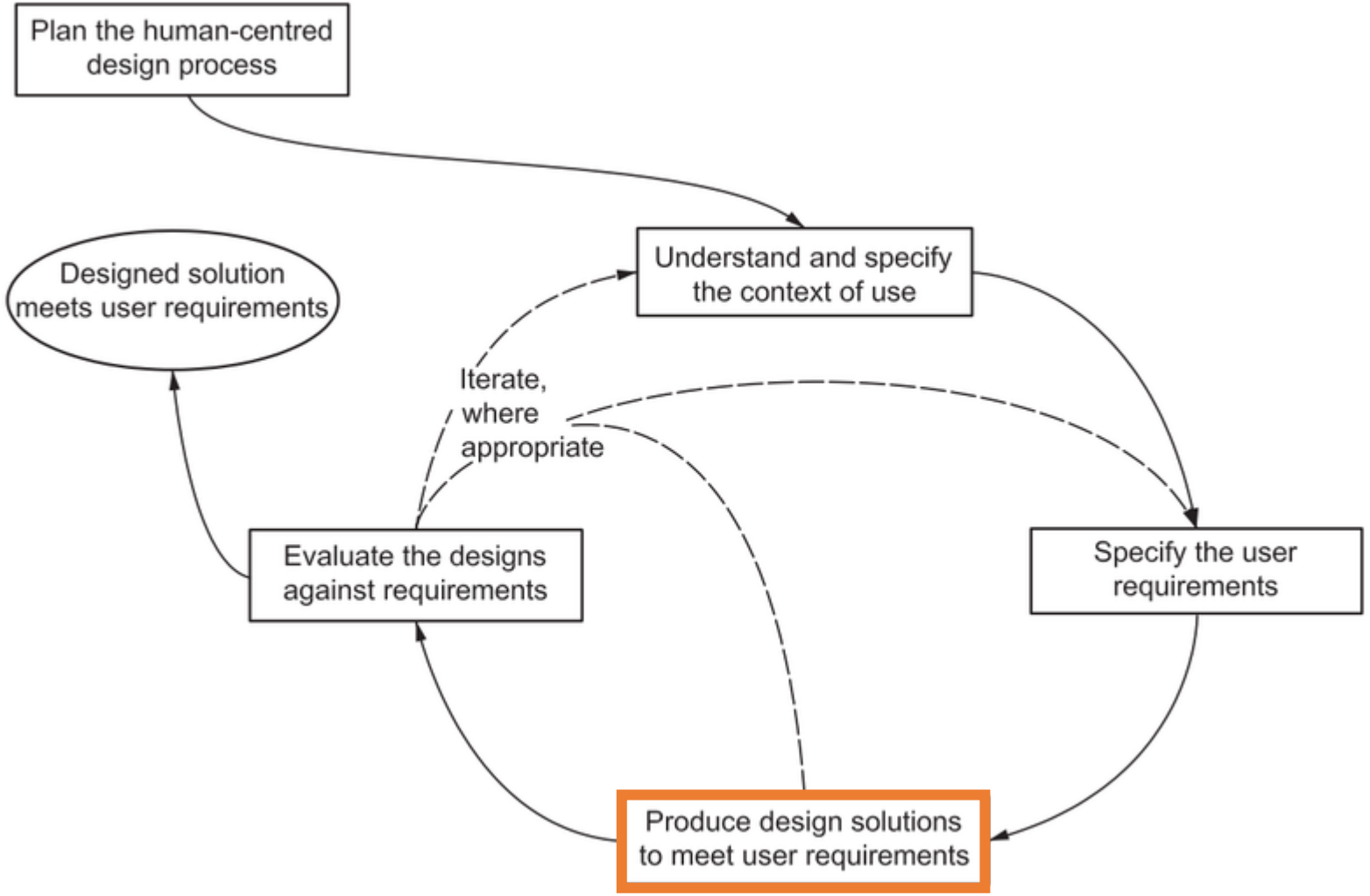
- Peter wants to drive to his friends' soccer game in the neighboring town. Since his tank is almost empty, he needs to stop at a gas station on the way.
- In the car, he first takes out his phone and checks where the cheapest gas station is located, then places his phone in the center console.
- Afterwards, he drives to the gas station and fills up his tank but not completely due to the high prices.
- Peter has to drive about 7 km on a country road to reach the next town. He knows the route like the back of his hand. His smartphone warns him with a beep and an additional display of a construction sign one kilometer before a construction site in a blind curve.
- Peter reduces his speed and approaches the spot cautiously.
- Upon arriving at the game, he takes his phone with him and checks his driving data (estimated fuel consumption, appropriate driving behavior) on his way to the edge of the playing field.
- Additionally, he marks the construction site on the highway to notify other drivers, so that his friends will also be informed about the construction site.

# OVERVIEW

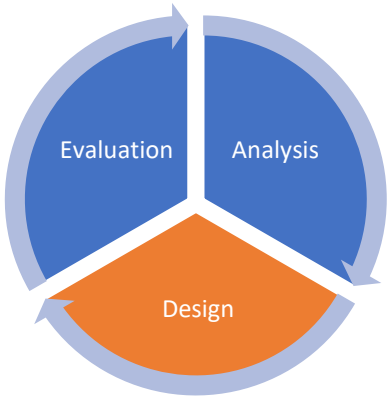
- Analysis
  - Observation
  - Contextual analysis
  - Personas
  - Scenarios
- Design
  - Methods
  - Principles of dialogue design

# OVERVIEW

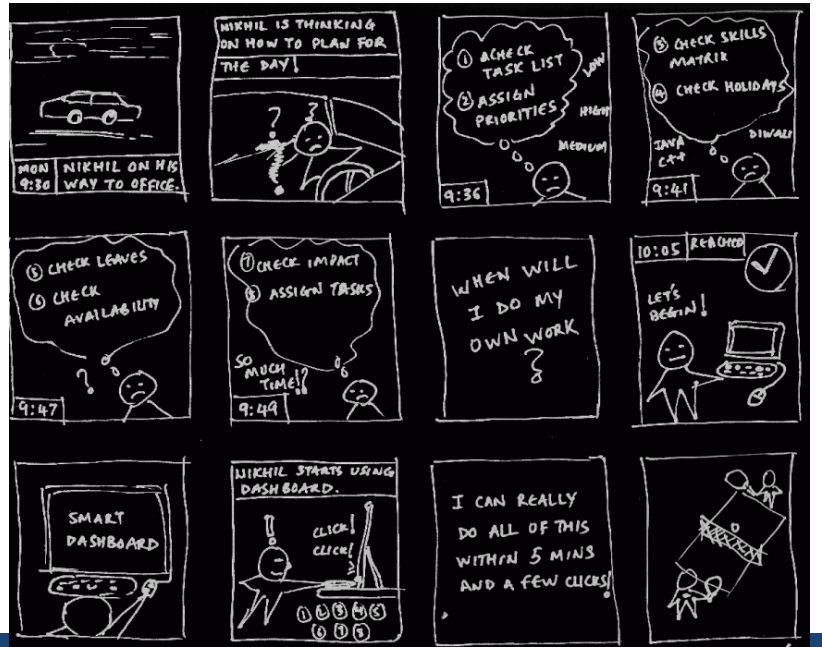

Evaluation
Analysis
Design

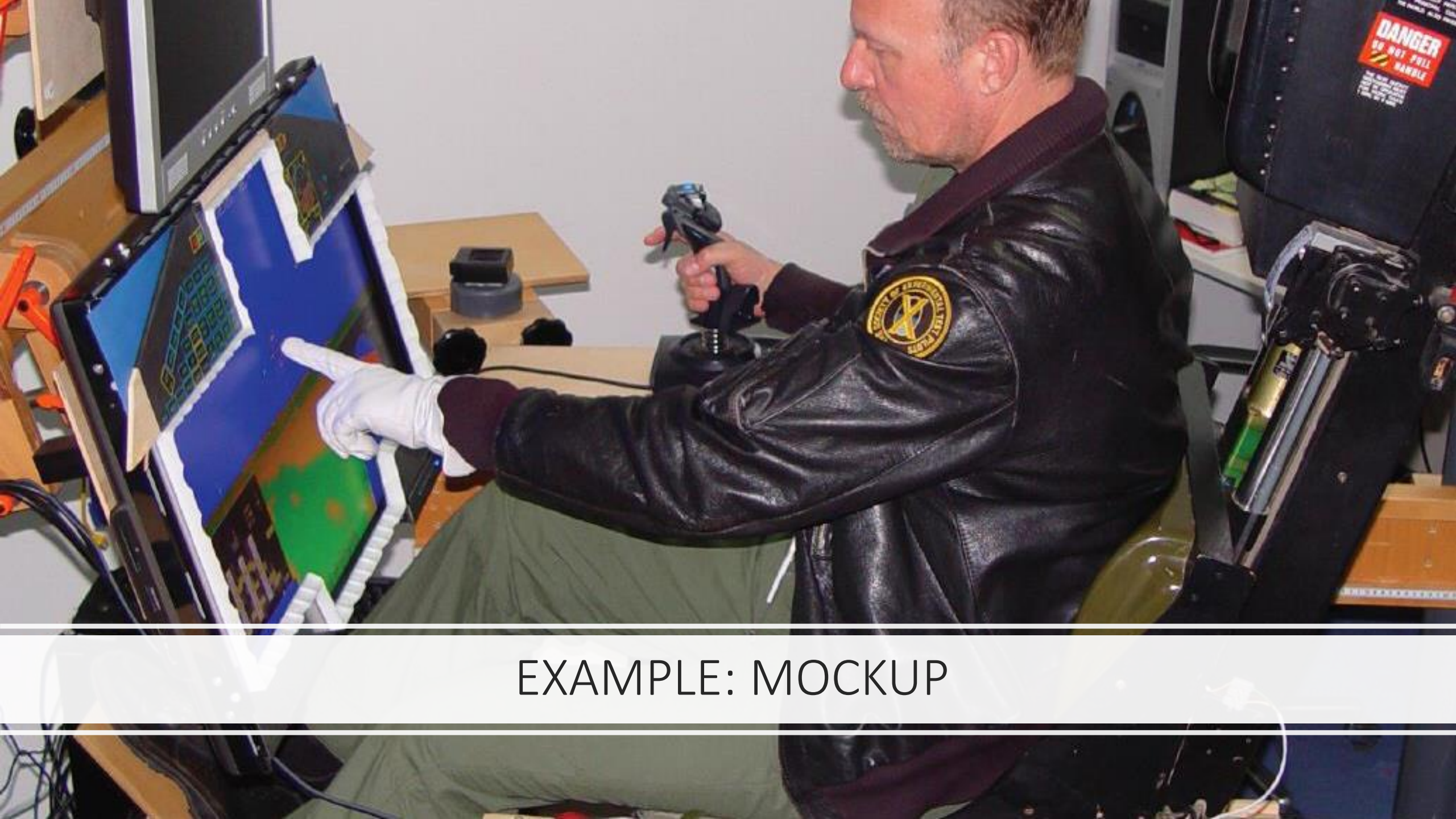

Plan the human-centred design process
Understand and specify the context of use
Specify the user requirements
Produce design solutions to meet user requirements
Evaluate the designs against requirements
Designed solution meets user requirements
Iterate, where appropriate

# DESIGN METHODS




- **Drawings/Sketches**
- **Wireframes** (schematic representation, often of a single page template)
- **Storyboards** (sequential, visually illustrative representation; similar to comics)
- **Mockups** (often physical models or representations)
- **Prototypes**
  - Static
  - Animated/interactive
  - High fidelity
  - Vertical vs. horizontal






# EXAMPLE: MOCKUP

# DIALOGUE PRINCIPLES

1. Suitability for the user‘s tasks
2. Self-descriptiveness
3. Conformity with user expectations
4. Learnability
5. Controllability
6. Use error robustness
7. User engagement

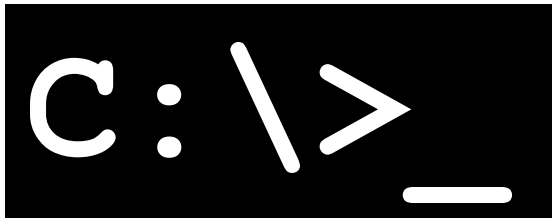

ISO 9241 Part 110 (2020)

# SUITABILITY FOR THE USER‘S TASKS

An interactive system is suitable for the user’s tasks when it supports the users in the completion of their tasks, i.e. when the operating functions and the user-system interactions are based on the task characteristics (rather than the technology chosen to perform the task).

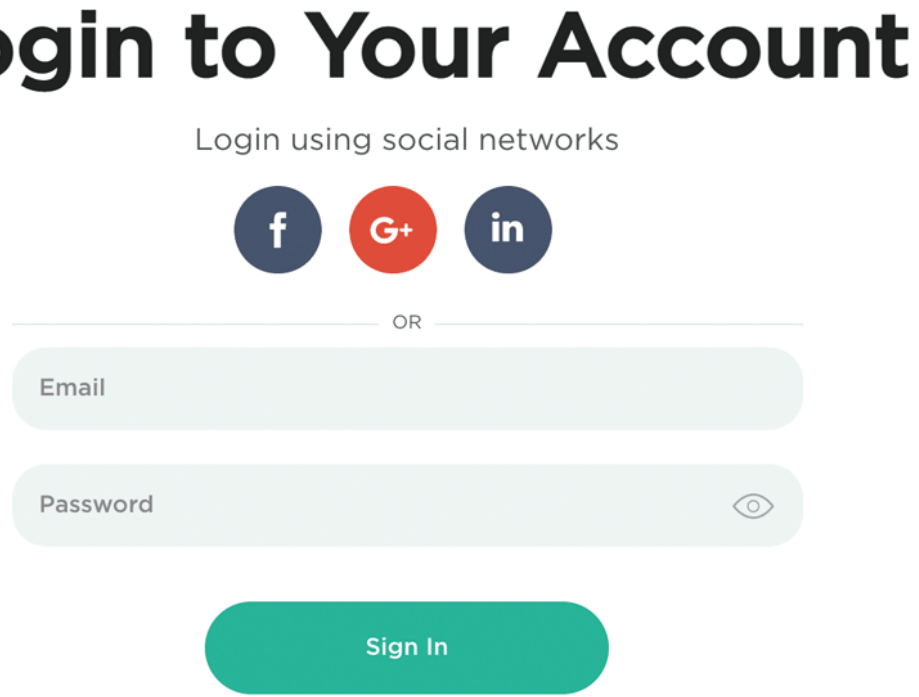
# SELF-DESCRIPTIVENESS

The interactive system presents appropriate information, where needed by the user, to make its capabilities and use immediately obvious to the user without unnecessary user-system interactions.



# CONFORMITY WITH USER EXPECTATIONS

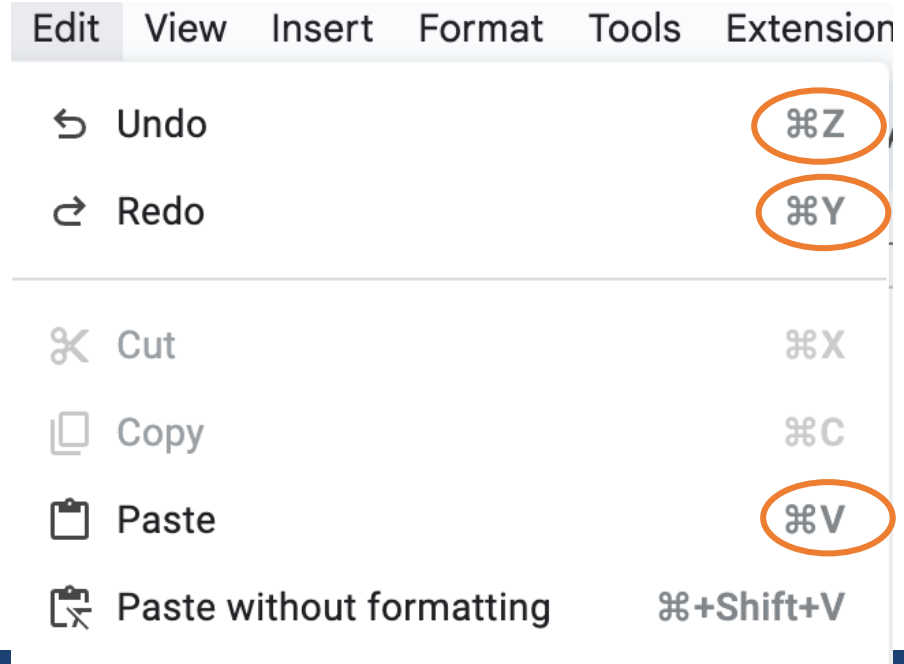
The interactive system’s behavior is predictable based on the context of use and commonly accepted conventions in this context.

# LEARNABILITY

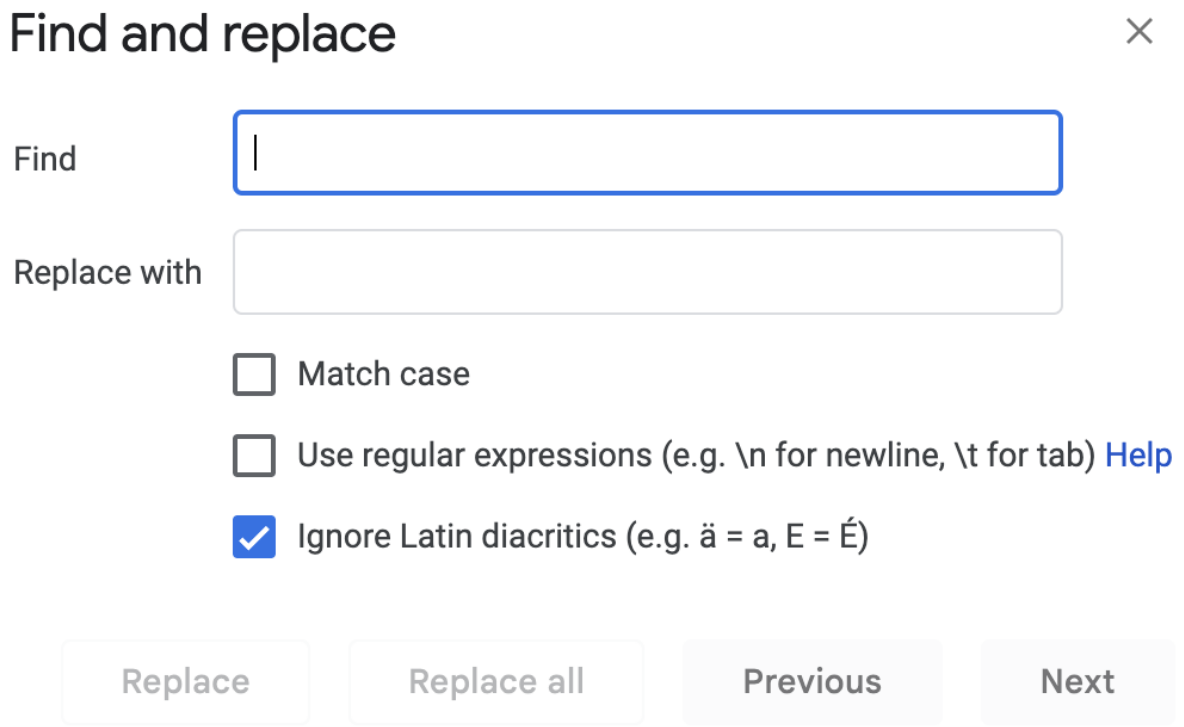
The interactive system supports discovery of its capabilities and how to use them, allows exploration of the interactive system, minimizes the need for learning and provides support when learning is needed.

Learnability involves guidance related to discovery of information and controls that users are looking for; exploration of information and controls that users have discovered; and retention of information about the system



# CONTROLLABILTY

The interactive system allows the user to maintain control of the user interface and the interactions, including the speed and sequence and individualization of the user-system interaction.



# USE ERROR ROBUSTNESS

The interactive system assists the user in avoiding errors and in case of identifiable errors treats them tolerantly and assists the user when recovering from errors. Use error robustness involves guidance related to use error avoidance; use error tolerance; use error recovery.


https://rstudio.github.io/shinyvalidate/reference/figures/demo.gif

# USER ENGAGEMENT

The interactive system presents functions and information in an inviting and motivating manner supporting continued interaction with the system.

# EXERCISE: USABILITY ENGINEERING – ANALYSIS & DESIGN

Following the exercise from last week:

1. Create Personas and Scenarios

2. Design an initial prototype. Choose a suitable method.