Crash-Course CPUX-F

Certified Professional for
Usability and User Experience – Foundation Level
in 3 hours

Introduction

Programme

16.15 to 17.00: Basic concepts; Human-centered design

17.00 to 17.05: Break

17.05 to 17.45: Understanding and Specifying the Context of Use;
Specifying the User Requirements

17.45 to 18.15: Break

18.15 to 18.55: Producing design solutions: Usability principles & guidelines;
Specifying the interaction

18.55 to 19.00: Break

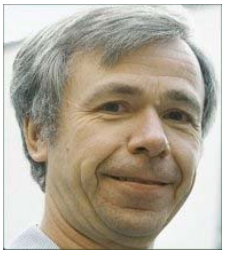
19.00 to 19.35: Evaluating the design: Usability test; Usability inspection

19.35 to 19.45: Break

19.45 to 20.05: Test exam, 18 exam questions in 20 minutes

20.05 to 20.15: Answers to test questions; Your questions to the answers.

Rolf Molich, DialogDesign



- Independent usability consultant, DialogDesign
  www.DialogDesign.dk
  Since 1993
- Also teaches HCI at the University of Copenhagen
- Education: Software Engineer, 1974, from the Technical University of Denmark.
- Has worked with usability since 1984.
- Invented the heuristic evaluation method in 1990 with Jakob Nielsen
- Comparative Usability Evaluation (CUE) studies 1998 - ...
- Strongly believes in the value of certification

Certification Test Questions and Certification Test

- A certification test always consists of **40 certification test questions**.
- Certification test questions are **in English**.
- You have **75 Minutes** to answer the questions.
  You have **90 minutes** if you are not a native English speaker.
  You may leave earlier but you can‘t return.
- Each test question is **multiple-choice** with **six options** to choose from. The number of correct answers – one, two or three – is clearly indicated for each question.
- Check the options that are correct or match the curriculum more closely than the other options.

Assessment of Answers to Test Questions

- You must score at least **28 points out of a possible 40 (70%)**, to obtain the CPUX-F certificate.
- If a question has one correct answer, you score one point if you have marked solely the correct answer.
- If a question has two correct answers, you score ½ point for each correctly marked answer; ½ point is subtracted for each incorrectly marked answer.
- If a question has three correct answers, you score ⅓ point for each correctly marked answer; ⅓ point is subtracted for each incorrectly marked answer.
- The total score for a single question can never be negative.
- You will receive your result at most seven working days after the test via email.
- You will receive your certificate at most 4 weeks after the test.

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Certification Test

- You may use a **printed English-Norwegian** or an **English-English dictionary** during the test. You must provide this dictionary yourself.
- Please bring an **official photo-id** for the test.

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Re-sitting the certification test

If you are unlucky enough to fail the test, you can retake the test:

- in connection with any other CPUX- or iSQI-certification event;
- in a Pearson Vue test center;
- in a Prometric test center.

For detailed information about how to re-sit the certification test in a Pearson Vue or Prometric test center, please see

http://uxqb.org/en/certification/taking-the-certification-test/

Section “Computer based certification test (without training)”

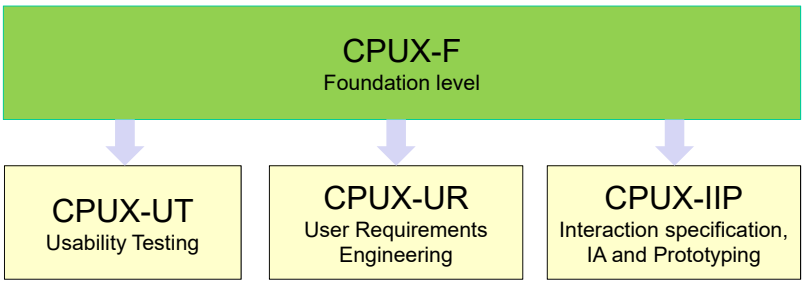
CPUX-F Documentation

The website www.UXQB.org provides:

- CPUX-F – Curriculum and Glossary
- CPUX-F – Public Test Questions (for training purposes)
- Information regarding advanced level certification such as CPUX-UT (Usability Testing), and CPUX-UR (User Requirements Engineering)
- Most information is available in English and German

Advanced Level Certifications

- The CPUX-F certificate qualifies you for taking any advanced level certification like CPUX-UT and CPUX-UR.



- The CPUX-F certificate qualifies you to train CPUX-F students. Certification requires a Recognized Training Provider (RTP) license, which costs 1.500€ per year.

Meta-Test Question – 1 Correct Answer

A test question has two correct answers. You check one answer. You are in doubt as to which other answers are correct. You decide not to check further answers. It turns out that the one answer that you checked is correct. How many points do you receive for this test question?

- ☐ 1 point
- ☐ 1/2 point
- ☐ 1/3 point
- ☐ 0 points
- ☐ 1/2 negative point
- ☐ 1 negative point

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2. Basic Concepts

Usability

The extent to which an **interactive system** can be used by specified **users** to achieve specified **goals** with **effectiveness**, **efficiency** and **satisfaction**
in a specified **context of use**.

Effectiveness

The accuracy and completeness with which users achieve specified **goals**.

Efficiency

The **resources** used in relation to the results achieved.

Satisfaction

The extent to which the **user's** physical, cognitive and emotional responses that result from the use of an **interactive system** meet the user's needs and expectations.

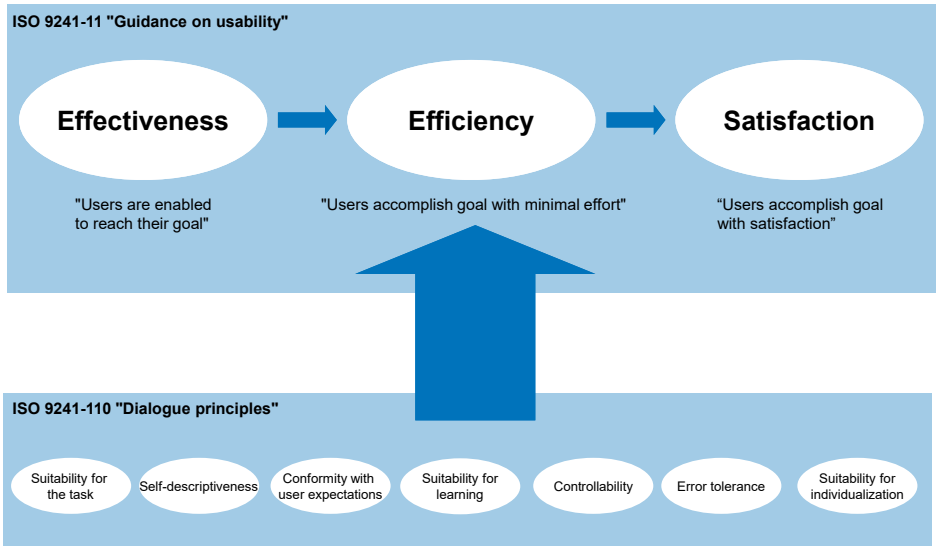
Notes:

- Satisfaction is measured using a questionnaire.

Examples of dissatisfaction and satisfaction:

- Prolonged periods of use of a notebook without an external mouse causes muscular discomfort.
- Users say that it "takes forever" to reserve a car on a car rental website.
- Users spontaneously say that they like the appearance of the home page of a car rental website.

Usability



Test question – 1 correct answer

The key components of usability according to ISO 9241 are effectiveness, efficiency and satisfaction.

Which one of the following statements best describe “effectiveness”?

- ☐ Can it do what I want?
- ☐ Can a disabled person do what he or she wants?
- ☐ Can the interactive system carry out my tasks quickly?
- ☐ Can the interactive system carry out my tasks effectively?
- ☐ Can the interactive system carry out my tasks reliably?
- ☐ Do I feel safe and well while I use the system?

Usability

Notes:

- Usability = Effectiveness – Can it do what I want?
  + Efficiency – Can it solve my tasks quickly?
  + Satisfaction – Do I feel safe and well while using the product?
- Usability is always relative to the context of use. The context of use is the basis for judging the usability of a product.
- Example: An air-traffic control system can be highly usable for an experienced air-traffic controller but totally incomprehensible for a layman.

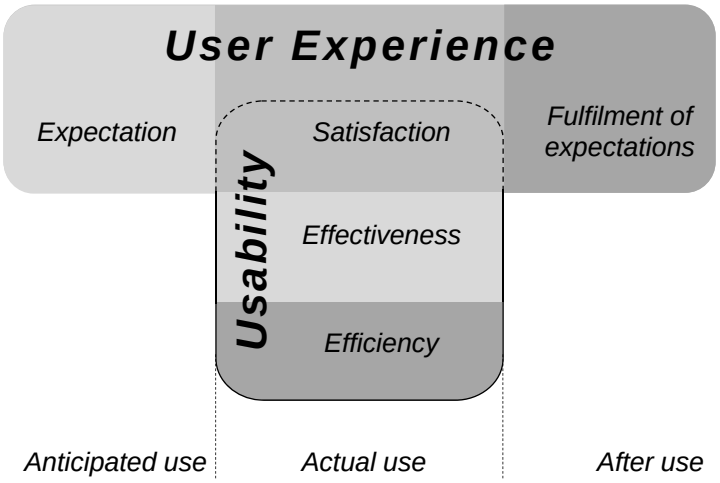
User Experience, UX

A **user's** perceptions and responses that result from the use or anticipated use of an **interactive system**.

Note:

- User experience is mainly about **satisfaction** and fulfilment of expectations.

Difference between Usability and User Experience



User Experience, UX

- Users' perceptions and responses include the users' emotions, beliefs, and accomplishments that occur before, during and after use.
- Examples of "Responses" are
  - excitement,
  - fatigue,
  - uncertainty about the achieved result, and
  - negative attitudes towards the interactive system.
- User experience is a consequence of brand image, presentation, functionality, system performance, interactive behaviour, and assistive capabilities of the interactive system.

Interactive System

A combination of hardware, software and services that **users** interact with in order to achieve specific **goals**.

This includes, where appropriate,

- Packaging,
- User documentation,
- On-line help,
- Support,
- Training.

Even systems that do not accept input from users are covered by this definition, for example destination boards in an airport or signs in a train station.

User Interface

All components of an **interactive system** (software or hardware) that provide information and controls for the **user**, to allow them to accomplish specific **tasks** with the **interactive system**.

Test question – 1 correct answer

More than 75% of users of a website spontaneously say that they consider the home page quite attractive. Which one of the properties of usability according to ISO 9241 is honored particularly well by this website?

- ☐ Accessibility
- ☐ Completeness
- ☐ Efficiency
- ☐ Effectiveness
- ☐ Satisfaction
- ☐ Speed

Test question – 1 correct answer

Which one of the following best describes “user experience”?

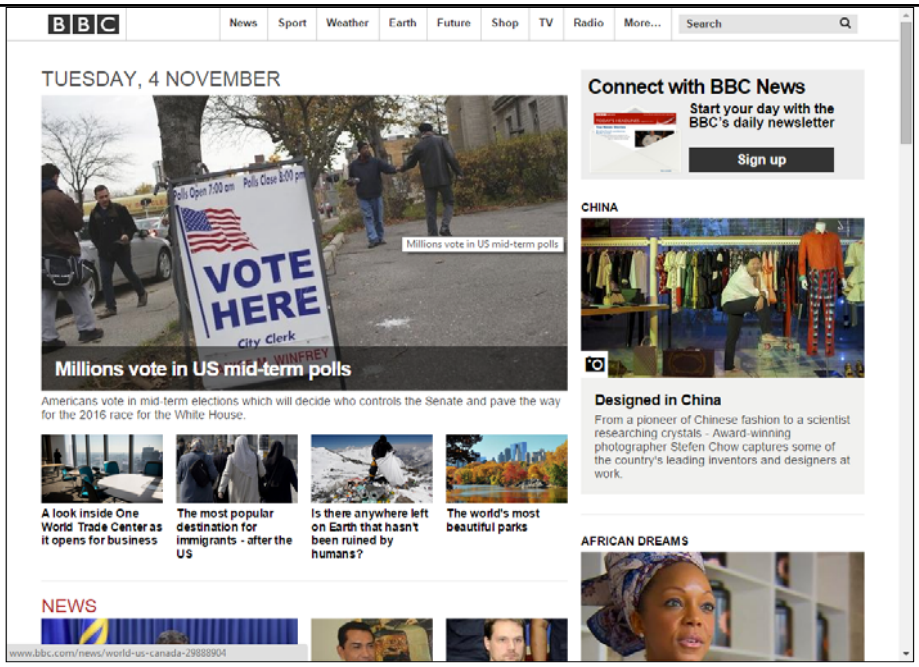
- ☐ Extent to which an interactive system can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use.
- ☐ Extent to which an interactive system achieves satisfaction from its appearance and attractiveness
- ☐ The first impression of an interactive system
- ☐ Users’ impressions of an interactive system after using it frequently for at least 6 months
- ☐ Usability with particular emphasis on helpfulness of the support for the interactive system, for example documentation, help and telephone support
- ☐ A user's perceptions and responses that result from the use or anticipated use of an interactive system.

Accessibility

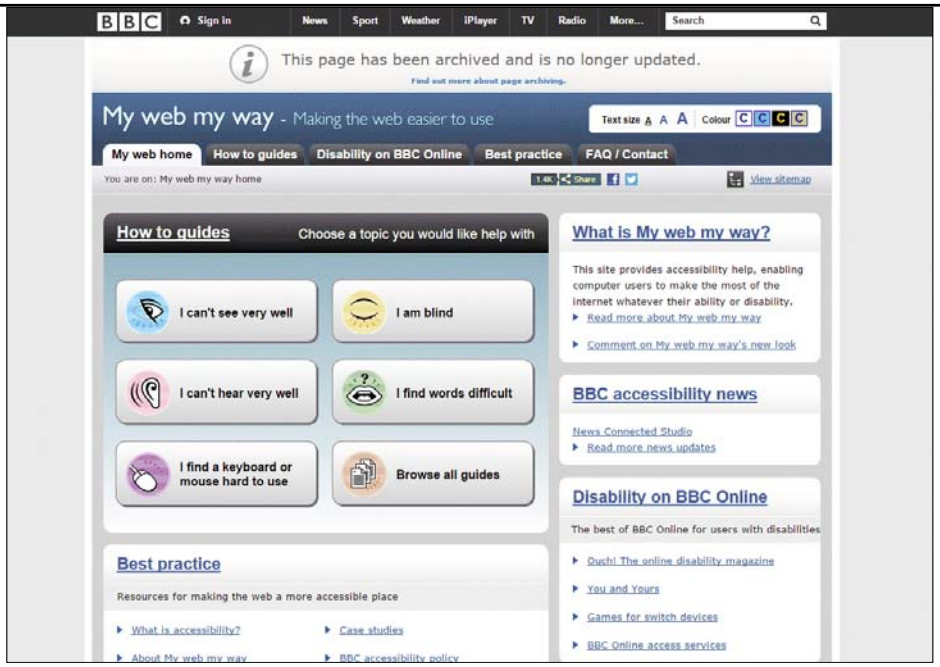
The extent to which an **interactive system** enables **users** to interact with it **effectively**, **efficiently** and with **satisfaction**, regardless of their level of vision, hearing, dexterity, cognition, physical mobility, etc.

Notes:

- Standards and guidelines for accessibility are available; standards may be legally enforced in some markets. Relevant guidelines include W3C’s Web Content Accessibility Guidelines (WCAG) 2.0 and ISO 9241-171, Guidance on software accessibility.
- Assistive technologies, such as screen readers, may be used by people with visual impairments to help them interact with an interactive system. Additional descriptions, for example alt tags, can be added to the code of non-textual elements, such as pictures and diagrams, to convey their meaning.



Accessibility – ALT tags for people who use a screen reader



Accessibility – Zoom, change size of text and colors

Test question – 1 correct answer

Which one of the following findings is related to the user experience of the website of an airline, but not to its usability?

- ☐ The graphics on the website are attractive
- ☐ Surcharges for baggage appear only after users have entered their names
- ☐ It is possible to cancel a ticket and get part of the fare refunded, but all users struggled hard to find out how to get a refund on the website
- ☐ Users consider the fares quite high
- ☐ The search for airports is not error tolerant. For example, a search for Pittsburg does not suggest Pittsburgh
- ☐ During the flight, staff announcements are difficult to understand

Summary

- Usability = Effectiveness + Efficiency + Satisfaction

- Effectiveness – Can it do what I want?
- Efficiency – Can it solve my tasks quickly?
- Satisfaction – Do I feel safe and well while using the product?

- User Experience
  - Before use
  - During use (Usability)
  - After use

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1. The Human-Centred Design Process

Human-centred design: Users + Evaluation + Iteration

- Based upon an explicit understanding of **users**, **goals, tasks, resources** and **environments**.
- **Users** are involved throughout the design.
- The design is driven and refined by **usability evaluation**.
- The process is **iterative** – that is, it continues until the **user requirements** are met.
- The design addresses the whole **user experience** (UX).

A popular simplification of the HCD-process

- **Discover**
  Get Out Of The Building to talk with people and discover "what is the problem?"
- **Make**
  Prototype what you assume is a solution.
- **Evaluate**
  Watch people use it and find how wrong you were.
- **Repeat the above**
  Solution designers often assume they're done after evaluation. It never ends.

Credit: Archie Miller, quoted with permission

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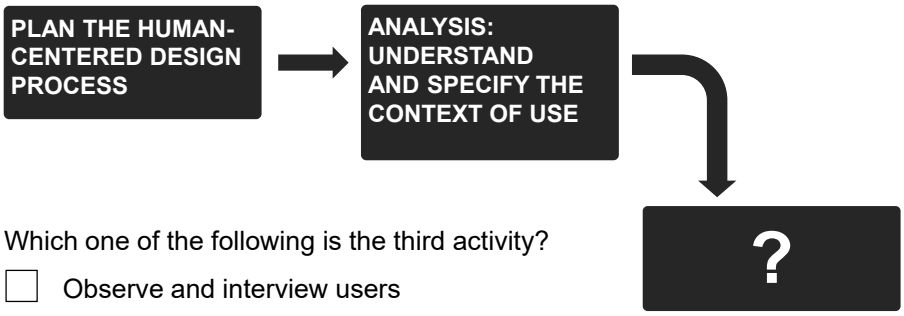
Process for Developing Human-Centered Systems



Which one of the following is the third activity?

- ☐ Observe and interview users
- ☐ Create the first prototype
- ☐ Specify the user requirements
- ☐ Create design solutions that match the context of use
- ☐ Carry out the first usability test
- ☐ Create personas and scenarios

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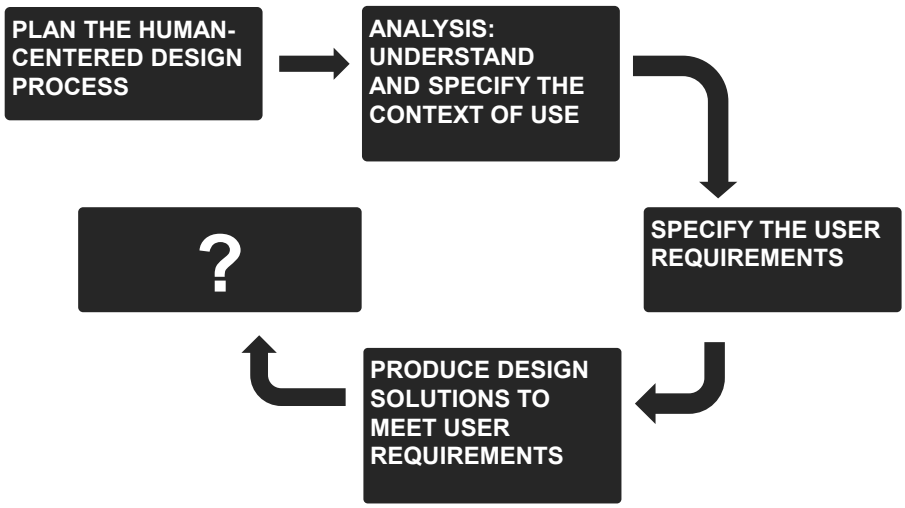
Process for Developing Human-Centered Systems



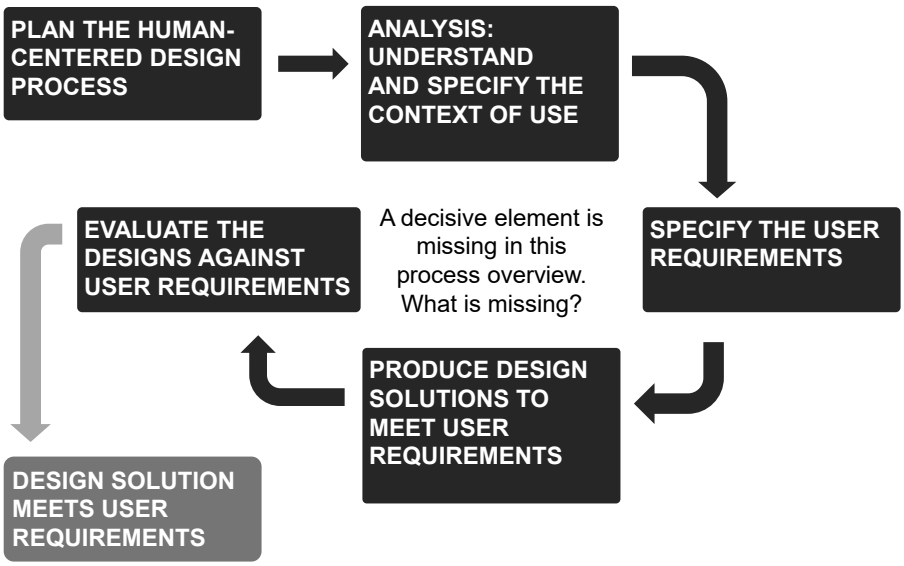
Test question – 1 correct answer

The first 4 activities in the process for developing human-centered systems are
1. Plan the human-centered design process
2. Understand and specify the context of use
3. Specify the user requirements
4. Produce design solutions to meet user requirements

Which one of the following is the fifth activity?

- ☐ Release the system
- ☐ Ask users for their opinion about the system
- ☐ Present the system to management for approval
- ☐ Adapt the user requirements to the design
- ☐ Create personas and scenarios
- ☐ Evaluate the design against user requirements

Process for Developing Human-Centered Systems



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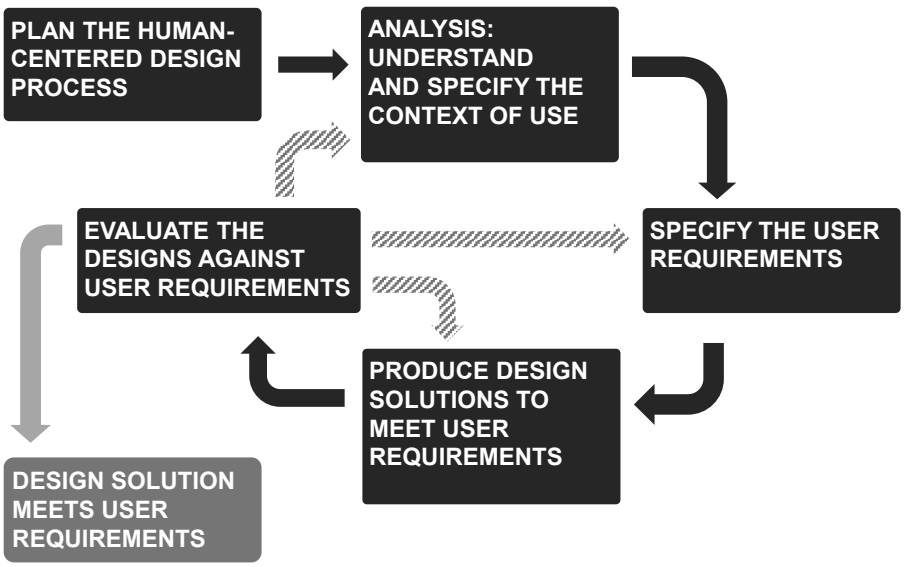
Process for Developing Human-Centered Systems



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Agile development

A set of principles, methods and approaches for improving productivity by reducing documentation and unnecessary formalism, and focusing on **iterative** development in short cycles, collaboration and communication, incremental improvement and adaptation to changes.

Notes:

- In an agile environment, design teams usually work in **short development cycles**, often called sprints or iterations, of one week to one month.
- In each cycle, the goal is to design, code and evaluate a feature or a group of features. Evaluation is carried out with users and other stakeholders.

Usability methods that work well with agile development

- **Frequent usability tests**
  Usability test participants are recruited well in advance and scheduled each week, so whatever is ready can be usability tested. Appropriate usability test tasks are prepared shortly before the usability test based on what is available.
- **Low-fidelity prototyping** with early mock-ups to prepare next iterations.

Lean UX

An approach to **human-centred design** that integrates principles and methods for **usability** and **user experience** into **agile development**, thereby achieving economic advantages.

Usability maturity

The level of understanding and implementation of a systematic **human-centred design** process within an organisation.

Note:

- Usability maturity can be expressed in a model with 4 levels:
  - Innovating (best)
  - Managed
  - Performed
  - Incomplete (worst)

Usability maturity

Innovating	The human-centred design process is continuously improved to respond to change aligned with organisational goals.
Managed	The process is planned, monitored and adjusted.
Performed	Usability is achieved by enthusiastic individuals using ad-hoc processes.
Incomplete	There is little evidence of any systematic achievement of the process purpose. Product managers may say that they care about usability, but when it comes to spending budgets or making otherwise inconvenient decisions to achieve usability, nothing happens. Usability is fine if it comes for free, but no one is committed to delivering it.

Boosting the usability maturity

To boost usability maturity in an organisation that is at level incomplete or performed, carry out activities that clearly demonstrate the benefits of usability, for example:

- Run **usability tests**. Invite stakeholders to **participate in the planning** of the usability test. Ask stakeholders to observe usability test sessions and participate in writing the usability test report.
- Ask management and stakeholders to leave the office and **put themselves in the context of their users**.
- Ask management and staff to **use their own products and services**, like a customer. They may never have used their company's products.
- **Conduct usability tests of prototypes** with project management as observers or test participants.

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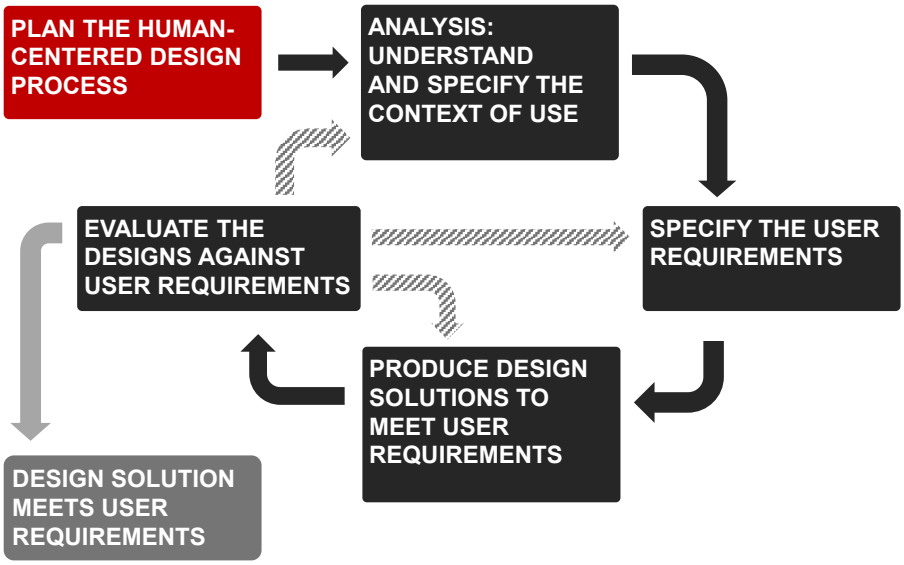
3. Plan the Human-Centred Design Process

Process for Developing Human-Centered Systems



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Plan the human-centered design process

In the planning activity, the user experience manager plans the human-centred part of the design activities for an **interactive system**.

Planning activities include

- Appointing the manager of **human-centred design** activities,
- Appointing other **user experience professionals** who will participate in the project.
- Writing the **user experience project plan** or including **human-centred design** activities in the project plan.

  The **user experience project plan** includes **human-centred quality objectives**.

User experience project plan

A description of the **human-centred design** activities and deliverables for an **interactive system**.

Notes:

- The description can be an independent document or a part of the overall project plan.
- The user experience project plan contains:
  - The **human-centred quality objectives** specific to the project;
  - The planned human-centred deliverables and the activities needed to produce those deliverables as part of the project;
  - The time plan;
  - The cost estimate for the **human-centred design** activities.

Human-centred quality objectives

The **goals** that are to be achieved for the **user** of an **interactive system** when developing the **interactive system**.

Note:

- Human-centred quality objectives relate to one or more of the following components of human-centred quality: **usability**, **accessibility**, **user experience** and avoidance of harm from use.

Examples of human-centred quality objectives:

- Travelers to the US must be able to pass through immigration twice as quickly as before (**usability, efficiency**).
- Blind **users** must be able to recognise and understand the content of the website (**accessibility**).
- **Users** must have a feeling of complete privacy when using the electronic voting booth (**user experience**).
- When using a system for creating prescriptions, the **user** must not be able to prescribe drugs that are incompatible with each other (avoidance of harm from use).

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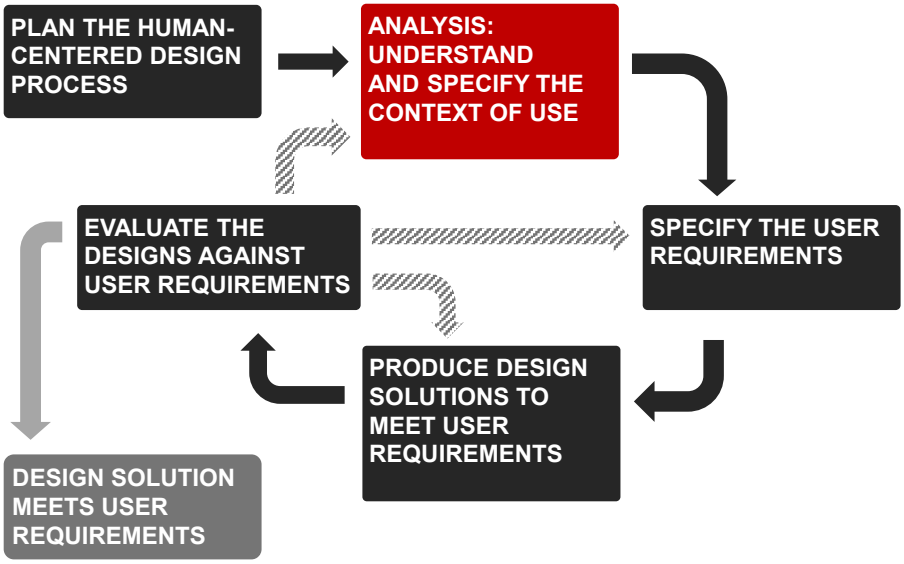
4. Analysis: understand and specify the context of use

Process for Developing Human-Centered Systems



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Context of use

A combination of **users**, **goals**, **tasks**, **resources**, and **environments**.

Context of use

Examples:

- Teenagers — *Users*
  on a bus — *Physical environment*
  use their phones — *Resources*
  to send messages — *Task*
  to their friends — *Social environment*
  to make them laugh — *Goal*

User

A person who interacts with an **interactive system**, or who uses the output of the system.

Users

A user is one of the following:

- **Primary user**: a user who uses the interactive system for its intended purpose.
- **Secondary user**: a user who carries out support tasks with the interactive system, for example to maintain it or to train primary users.
- **Indirect user**: a user who uses the output of the interactive system, but who does not interact directly with it.

Stakeholder

An individual or organisation with an active interest in an **interactive system**.

Notes:

- All users are stakeholders, but not all stakeholders are users.
- Market requirements and organisational requirements are examples of requirements from stakeholders who are not users.

Examples:

- Stakeholders might include: users, technical support, trainers, documentation writers and developers.
- Stakeholders who may not be users might include: designers, developers, managers of development teams, shareholders, board members and marketing professionals.

Task

A set of activities undertaken in order to achieve a specific **goal**.

Tasks and subtasks

- Most tasks can be subdivided into subtasks – that is, activities.
- A subtask does not in itself achieve a goal from the user's point of view but is a necessary decision or action to reach the user's goals.
- Some subtasks can be subdivided into smaller subtasks.
- Subtasks are unsuitable as usability test tasks, because they are very specific.

Task and subtasks examples

- "Rent a car" is a task.
- "Cancel a car rental reservation" is a task.
- "Register on a car rental website" is a subtask.

Task Model

A description of the **subtasks** that have to be carried out in order to reach the **user's goals**.

Note:

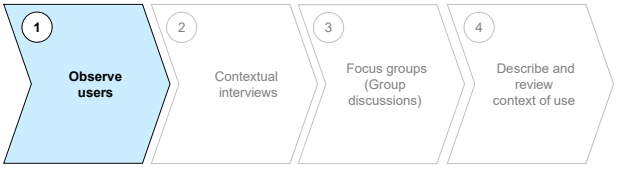
- A task model describes the logic of the task itself, while a scenario describes the completion of one or more tasks by a persona.

Test question – 1 correct answer

The following statements describe reasons for distinguishing between primary, secondary and indirect users. Which one is NOT a valid reason?

- ☐ If limited resources are available for usability testing, the focus should be on primary users as usability test participants
- ☐ It's important to recruit both primary, secondary and indirect users as usability test participants for a thorough usability test; most often they will have different usability test tasks
- ☐ Primary, secondary and indirect users often require different user interfaces, which must all be considered during design
- ☐ Primary, secondary and indirect users often have different contexts of use, which must be described separately
- ☐ A prototype can't serve both primary and secondary users
- ☐ Primary, secondary and indirect users often have different user needs

Determine Context of Use



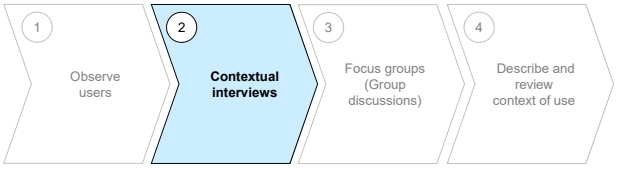
Observation

A method for gathering contextual information relating to **user needs** in which an **observer** watches **users** who carry out **tasks** that are related to the **interactive system**.

Notes:

- The observer behaves unobtrusively except that they may ask an occasional clarifying question.
- If no interactive system is available, existing procedures can be observed.
- Observation should take place in a context that is as natural as possible, for example at the user's workplace, their home or in a shop.

Determine Context of Use



Contextual Interview

A data-gathering method that questions a few carefully selected individuals in depth to arrive at a fuller understanding of the **context of use** for an existing or planned **interactive system**.

In an interview, the interviewer (a **user experience professional**) typically conducts a **briefing** and then asks questions to a **user** about the current **context of use** and, if applicable, about the planned **interactive system**. The interviewer uses an **interview checklist** to ensure that all relevant topics are covered.

Interviews should be "contextual" – that is, they should take place at the location where the user's interaction with the interactive system usually takes place, for example the user's workplace.

Contextual Interview

- Why should an interview be conducted contextually, if possible?
  - Because users are not always aware of what they do
  - "Not worth mentioning"
  - "Everybody knows that"

- What are the alternatives to a contextual interview?
  - Interview in a neutral meeting room
  - Interview over the phone
  - E-mail interview

  These alternatives, while often used, are not optimal

Master-Apprentice Model

A principle for a successful **interview**: The interviewer treats the **user** as the master while the interviewer is the apprentice. The goal of the master-apprentice model is to understand users' **goals** and **tasks** in detail by learning them as an apprentice would.

The interviewer asks because they sincerely want to learn – not to demonstrate their knowledge.

Note:

- Everything the master says is correct. Sometimes the apprentice must ask several questions in order to fully understand the Master.
  Doubt is inappropriate.

Interview Questions

Interview questions for a restaurant review system:

- "Did you take a look at the list of restaurants?"
- "Are you ready to submit your review?"
- "Are you going to cancel your reservation?"
- "Do you ever use help?"

Your comments?

Closed Question

An interview question that requires an answer from a predetermined set of alternatives, for example yes and no.

Notes:

- Avoid several closed questions in sequence. They stop users talking because they sound like a police interrogation.

Example:

- "Have you ever rented a car?“
- A corresponding open question might be: "Please tell me about the last time you rented a car."

Open Question

A question in an **interview** that does not give any indication of the expected format or content of the answer.

Notes:

- Open questions are desirable in interviews because they invite users to start talking and provide extensive answers to questions.

Examples:

- “What would you want to do on the website of a car rental company?”
- “How do you select a suitable car for a vacation rental?”

Interview Questions

Interview questions for a restaurant review system:

- "What advantages does the restaurant review system offer for your choice of restaurant?"

Your comments?

Leading Question

A question in an **interview** that signals a preference for certain possibilities, or attempts to direct the reply in a certain direction.

Neutral Question

A question in an **interview** that has no built-in assumptions, and no frame that excludes anything or directs the reply in a certain direction.

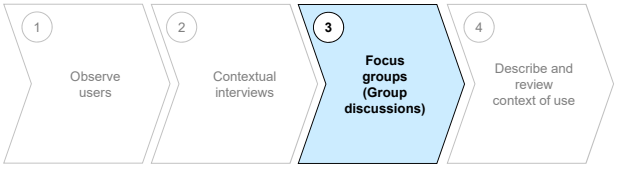
Examples of neutral (and open) interview questions:

- What happened?
- What do you mean by that?
- What possibilities do you have now?
- What should the home page of the new car rental website look like?

Interview Checklist

A written list of suitable questions and cues used by an interviewer during an **interview** to make sure that all relevant topics are addressed.

Determine Context of Use



Focus Group (Group Discussion)

A focused discussion where a **moderator** leads a group of participants through a set of questions on a particular topic.

Note:

- Do not use focus groups for usability evaluation.
  Focus groups are about attitude and opinion. In comparison, usability tests are about observing actual user behaviour.

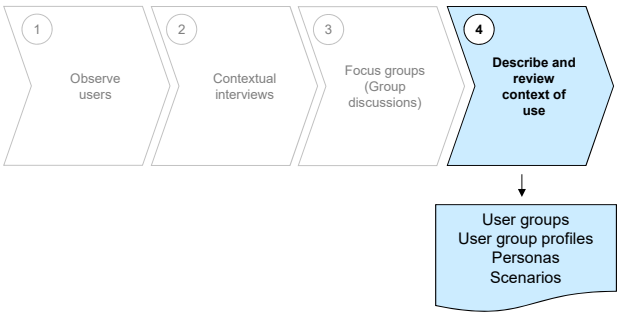
Test question – 2 correct answers

Let‘s assume that a colleague of yours is planning to conduct interviews with users of a document management system. One of the questions in the interview checklist is:
Don‘t you agree that the status of the documents should be displayed to the administrators?

Which two of the following expressions best characterize this interview question?

- ☐ Closed
- ☐ Formative
- ☐ Leading
- ☐ Neutral
- ☐ Open
- ☐ Summative

Determine Context of Use



User Group

A collection of **users** with the same or similar personal characteristics and context of use related to the **interactive system**.

User Group Profile

A generalized description of a **user group**.

Example: Customers – Private people who want to move house

- Private people rent a cargo van, for example because they want to move house. Most rentals are booked in advance and last 2-3 days. Most customers are one-time only customers.
- Customers have no particular experience with cargo vans – they are used to smaller cars. They are unfamiliar with business terms and conventions in cargo van rental.
- Customers are reasonably familiar with the internet and are reluctant to provide their email address unless there is an explicit guarantee that they won't receive spam emails as a result.

Persona

A description of a fictitious but realistic **user** and what they intend to do when using an **interactive system**.

Notes:

- Personas are not real people; they are realistic representations of users, constructed from empirically determined data, for example from observations or interviews.
- Personas typically have a name, age, some background, goals and aspirations. A persona description should include information about the persona's knowledge about and interest in the subject matter of the interactive system.
- Including a photo in a persona description helps to create the illusion of a real person.

Persona for the Digital Bunch of Keys, DigiKey

Carol Becker, 55, Stoke-on-Trent (UK): *"It must be simple and trouble free"*

Education	Primary school
Occupation	Helps out at the local library
Family status	Widowed. Two children (son and daughter), both are married and live elsewhere with their families.
Hobbies and interests	Cooking, gardening

Carol Becker lives in a large, old house several miles outside Stoke-on-Trent, which is south of Manchester.

Mrs. Becker has an old Windows computer. She uses it for her extensive collection of cooking recipes and has recently been using it to keep in touch with the family via e-mail. She refers to the computer as “the beast” because it sometimes issues scary messages, which require a lot of time and help from others to resolve.

Her children gave her a smartphone for Christmas. She currently uses it just to make calls.

Mrs. Becker maintains her house well. Because her house is old, she often has craftsmen visiting. Mrs. Becker is often away from home and she has problems letting the craftsmen in when she’s not present.

Personas – Tips

- A persona must contain adequate information about knowledge of the subject matter area – not just information about knowledge of technology
- 3-5 personas per user group are sufficient.
  One persona is not sufficient
- Make sure there is sufficient contrast between similar personas
- One-half of an A4-page is sufficient
- Key elements:
  - Name,
  - Age,
  - Photo,
  - Occupation,
  - Knowledge of subject area,
  - Knowledge of and attitude towards technology

As-is scenario

A narrative text description of the procedure a specific **user** currently follows to complete one or more **tasks**.

Notes:

- The “specific user“ in a scenario is often a persona.
- As-is scenarios describe how tasks are currently accomplished (“The current, miserable state of affairs”)
- As-is scenarios describe the current context of use in a popular way for stakeholders.
- As-is scenarios serve as a basis for identifying user needs and deriving user requirements.

As-is scenario

Example:

> *Helen Rourke wants to rent a car for the weekend. The whole family – two adults and three children (3, 6, 8) – must have ample space in the car.*
>
> *She compares prices and sizes of the available cars.*
> *She decides that the rental price is fair and rents the car.*

A scenario should avoid placing unnecessary constraints on the design by referencing specific objects, such as buttons, in the **user interface**.

For example, the following text is too specific:

> *Helen Rourke looks at the "Total price" field and decides that the rental price is fair. Then she clicks the button "Confirm rental".*

The following alternative is much better

> *Helen Rourke decides that the rental price is fair and rents the car.*

User journey map

A graphical or tabular description of all encounters **users** have with the **interactive system** covering all touchpoints that influence the **user experience**, making the overall **user experience** tangible for others.

Notes:

- User journey maps can be used as a general communications medium to exemplify scenarios for stakeholders that extend beyond the pure interaction, for example from the discovery of the product to the purchase situation to the usage of the product.
- User journey maps are graphs or tables that show the full user experience for users in general.
- User journey maps are created during analysis to describe current encounters. They are updated during design to describe intended encounters.

User journey map – Examples of touchpoints

Tabular user journey map for the task “Make a trip using a rented car”:

User task	Touchpoint
Looks for a car rental company	Google, ad in magazine or newspaper, billboard.
Calls to ask questions	Customer support, local station.
Rents a car	Website, customer support.
Picks up the car at the airport	Signs showing directions to the rental desk; Staff at the rental desk; Transfer by shuttle to the pick-up location; Staff at pick-up; Condition of the car and equipment; Adjusting and starting car.
Drives the car	Operating the car and equipment; Instruction manual; Customer support, roadside service.
Returns the car	Signs showing direction to return location; Staff at the return location.
Receives and pays the bill	Bill, debit transaction, customer support.
Reads emails	Post-rental emails; Solicited or unsolicited marketing emails.

Context of use description

A description of the **users**, **goals**, **tasks**, **resources**, and **environments** derived from **observations, contextual interviews** and **focus groups**.

Creating a context of use description

- Results from interviews, observation and focus groups are analysed and summarized in a context of use description
- The context of use description is the basis for identifying user needs and tracing them back to their source.
- A context of use description describes:
  - **Users**, in the form of **user group profiles** and **personas**;
  - **Goals** in the form of **as-is scenarios**;
  - **Tasks**, in the form of **task models**, **as-is scenarios** or **user journey maps**;
  - **Resources**, in the form of lists or **as-is scenarios**;
  - **Environments,** in the form of **as-is scenarios.**

Test question – 3 correct answers

Which 3 components are missing in the following description of a persona?

The human resources coordinator at Amino Pharmaceuticals has no children and is single. For the past 4 years she has had a boyfriend. Her favorite pastimes are dancing tango and preparing wonderful tapas. She speaks Spanish passably.

She spends most of her day processing forms that are needed to hire, transfer, or discharge employees in the R&D (Research and Development) department. If something is incomplete or unclear, she takes the necessary time to find the answer. She's an expert in all necessary forms and procedures.

Her goals: Advance in HR, excellence through accuracy; helpfulness; do not fall behind.

- ☐ Occupation
- ☐ Education
- ☐ Age
- ☐ Knowledge of subject area
- ☐ Name
- ☐ Photo

Test question – 1 correct answer

Which one of the following activities is NOT part of the analysis of the context of use?

- ☐ Analysis of similar existing manual interactive systems
- ☐ Prototyping the dialogue
- ☐ Questioning people who know users well
- ☐ Questioning representative users
- ☐ Observing representative users
- ☐ Conducting a focus group with users of similar existing interactive systems

Summary

- Context of use =
  Users + Goals + Tasks + Environments + Resources
- Determine context of use:
  Observation + Interview + Focus group
- Interview: A professional conversation
  Interview checklist, Master-Apprentice model, open/closed questions
- A context of use description describes:
  - Users, in the form of user group profiles and personas;
  - Goals in the form of as-is scenarios;
  - Tasks, in the form of task models, as-is scenarios or user journey maps;
  - Resources, in the form of lists or as-is scenarios;
  - Environments, in the form of as-is scenarios.

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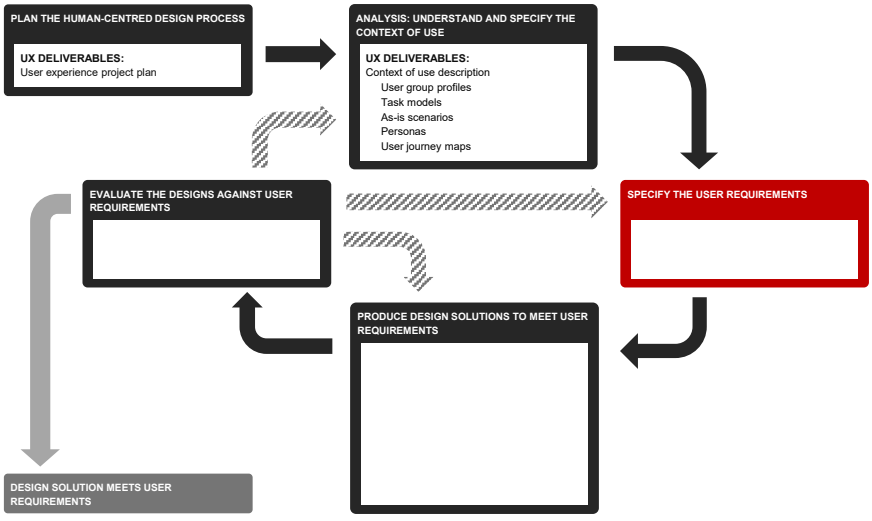
5. Specify the user requirements

Process for Developing Human-Centered Systems



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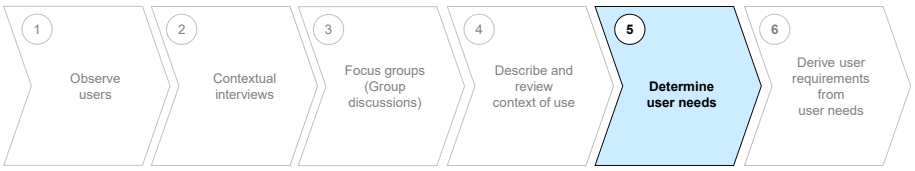
Derive User Requirements



User Need

A prerequisite identified as necessary for a **user**, or a **user group**,
to achieve a **goal**, implied or stated within a specific **context of use**.

Notes:

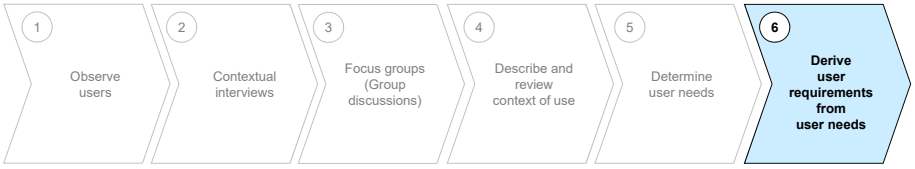
- A user need is independent of any proposed solution for that need.
  In other words: A user need must not reference for example "the system" or "the website".
- User needs are identified based on various approaches including interviews with users, observations, user surveys, usability evaluations, expert analysis, etc.
- User needs often represent gaps (or discrepancies) between what should be and what is.
- User needs are transformed into user requirements considering the context of use, user priorities, tradeoffs with other system requirements and constraints.

User Need

Examples of user needs:

- During a presentation with a fixed time limit (context of use), a presenter (user) needs to know how much time is left (prerequisite) in order to complete the presentation in time (goal).
- As part of monitoring the cash flow (context of use), an account manager (user) needs to know the number of invoices received and their amounts (prerequisite), in order to complete the daily accounting log (goal).

Derive User Requirements



Requirement

A condition or capability that must be met or possessed by
an **interactive system** to satisfy an agreement, standard, specification or other formally imposed documents

Requirement

Quality criteria for requirements:

- Distinct
- Verifiable
- Based on one or more user needs and satisfy these

Ultimately, requirements must leave no doubt in a court of law
when facing an uncooperative supplier and a skeptical judge.

Types of Requirements

The curriculum defines the following types of requirements:

- Market requirement;
- Organizational requirement;
- Qualitative user requirement;
- Quantitative user requirement.

Market Requirement

A **requirement** for an **interactive system** based on marketing policy aimed at maximizing business opportunities, purchase and use.

Example:

- The website must be at least as usable as that of the two top competitors
- The colours used on the website must conform to the style guide.

Organizational Requirement

An organizational rule that **users** have to follow when conducting their **tasks**.

Example:

- A salesperson must have a written approval from the director for offers that exceed 100.000 Euros.

Example of organisational requirement based on regulatory requirements:

- Minors are explicitly told that they are not allowed to proceed past the front page of a sports betting website.

Qualitative User Requirement

A statement of what **users** must be able to locate, recognize, understand, select or input as part of conducting a **task** with the **interactive system.**

Qualitative User Requirement

Examples of reasonable qualitative user requirements:

- The user must be able to compare the differences between cars that are available for a specific price range at the car rental website.
- The user must be able to select a car with automatic transmission at the car rental website.
- The user must be able to see the opening hours of a specific car rental location.

Qualitative User Requirement

What do you think of this qualitative requirement:

- The user interface must be usable and support all user tasks

Qualitative User Requirement

What do you think of this qualitative requirement:

- The user interface must have a big, red 'Rent this car' button

Quantative User Requirement

A required level of **usability** to meet identified **user needs** expressed in terms of measures of **effectiveness**, **efficiency** or **satisfaction** in a specified **context of use**.

Note:

- Quantitative user requirements are acceptance criteria for usability and user experience, for example whether users can solve particular tasks with the interactive system in an acceptable time or with a specified maximum number of use errors.

Quantative User Requirement

Examples of reasonable quantitative user requirements:

- Measure of **effectiveness**:
  95% of 25 users who have used the car rental website at least twice within the past 6 months must be able to rent an economy size car at Frankfurt Airport (Germany) for two days starting tomorrow at 09.00.
- Measure of **efficiency**:
  80% of 25 users who have used the car rental website at least twice within the past 6 months must be able to rent an economy size car at Frankfurt Airport (Germany) for two days starting tomorrow at 09.00, within 5 minutes.
- Measure of **satisfaction**:
  80% of 25 users who have used the car rental website at least twice within the past 2 months must answer 'Agree' or 'Strongly agree' to the statement 'I would recommend this website to a friend.'

Test question – 1 correct answer

Which one of the following expressions best describe the statement

"Error messages from the system that sells theatre tickets must be comprehensible, constructive and precise"

- ☐ Market requirement
- ☐ Use scenario
- ☐ Organisational requirement
- ☐ User need
- ☐ Quantitative user requirement
- ☐ Qualitative user requirement

Test question – 2 correct answers

Which two of the following statements are correct?

- ☐ User needs are derived from user requirements
- ☐ User needs must be verifiable
- ☐ A user need is independent of any proposed solution for that need
- ☐ User needs can be qualitative or quantitative
- ☐ User requirements can refer to a solution
- ☐ User requirements are derived from as-is scenarios

Summary

- User needs → Requirements
- Requirements =
  Market requirements
  + Organisational requirements
  + User requirements
- User requirements are used to evaluate interactive systems. They serve as yardsticks to measure whether the system lives up to reasonable user expectations.

  Prior to the evaluation they serve as lighthouses that guide the development, for example by evaluating prototypes.
- User requirements: Distinct and verifiable, if necessary in a court of law

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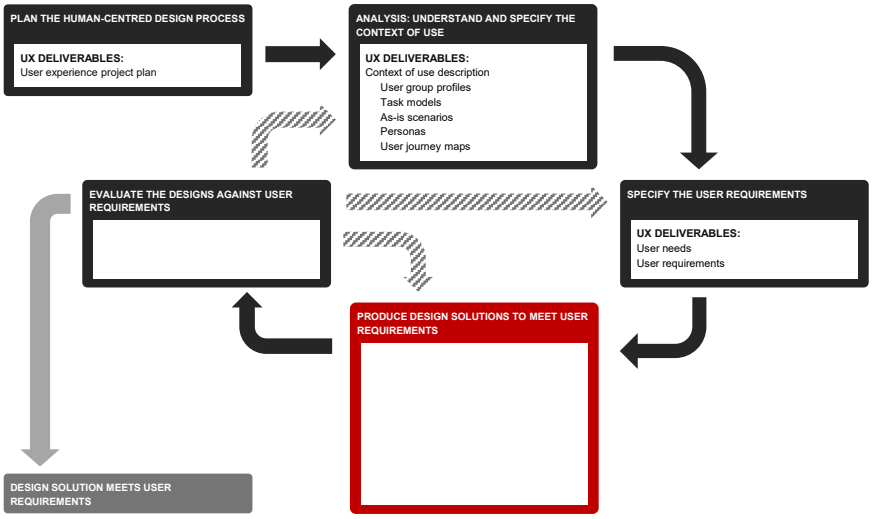
6. Design: Produce design solutions to meet user requirements

Process for Developing Human-Centered Systems



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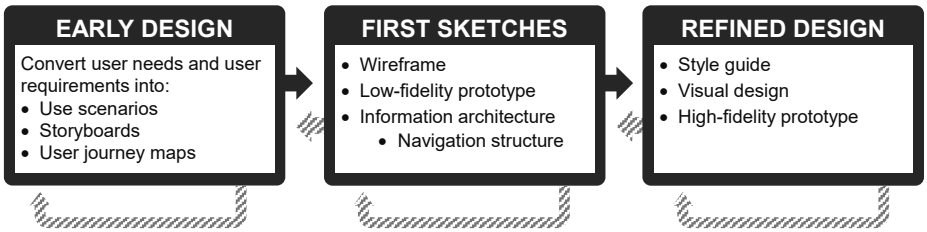
The design process



Information Architecture

The naming and structuring of the information that must be accessible to the **user**.

Examples of UX-related deliverables in the information architecture:

- Data model from the user perspective; content and content hierarchy;
- The words used in the user interface, for navigation and content;
- Navigation structure, for example menu structure and site map.

The information architecture does not include for example the graphic design of the interactive system

Navigation Structure

The logical organization of the units of displayed information that comprise the **user interface**.

Notes:

- In practice, the "units of displayed information" are often screens, pages or windows.
- The navigation structure comprises:
  - The logical structure, for example hierarchy, the order and grouping of elements of the user interface and navigation items.
  - The navigation elements that are used to navigate the structure, for example menus and breadcrumbs.
- The navigation structure is one of several possible realizations of the information architecture in the user interface

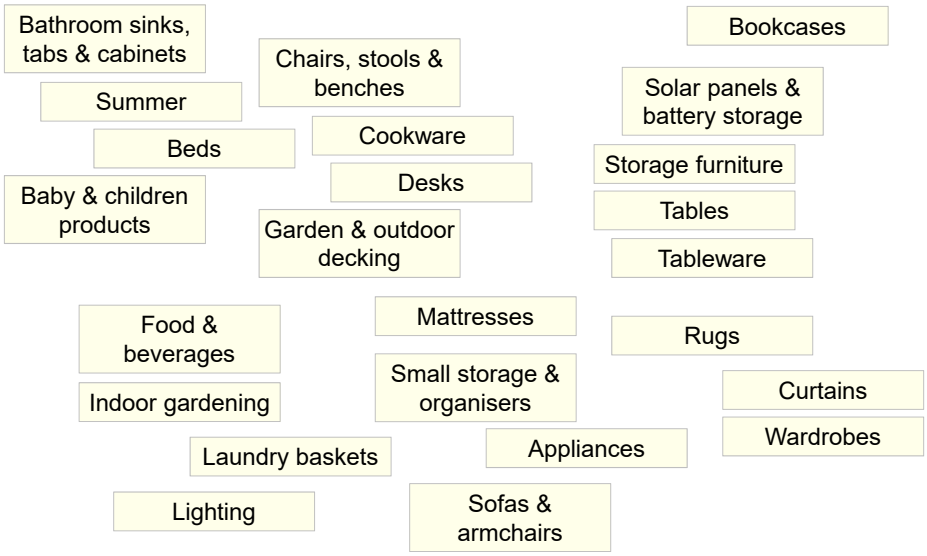
Card sorting

A method for structuring information – such as menus in a **navigation structure –** that involves writing key concepts onto different cards and asking **users** to sort these cards into groups.

Note:

- There are two methods of card sorting – open and closed:
  - During **open card sorting**, users are asked to sort the cards into groups that they feel represent distinct domains of information.
  - With **closed card sorting**, the group names are pre-defined, usually by a prior round of open card sorting, and users are asked to populate those groups with the cards.

Card sorting – Examples of concepts



Card sorting – Example of a partly finished card sort

Bedroom	Living room	Kitchen	Dining room	Outdoor
Beds			Storage furniture	
Mattresses			Tables	
Laundry baskets			Tableware	

Children's room	Bathroom	Home office	Hallway	Laundry
		Desks		

User Assistance

Information to help a user to interact with an **interactive system**.

Notes:

- User assistance can include describing the user interface, but also focuses on how to help the user to best apply the capabilities of the interactive system to their needs.
- User assistance incorporates all forms of help available to a user, for example
  - **User documentation**: Written or other information for users about an interactive system, how it works, and how to use it;
  - **Online help**: Assistance delivered through computer software that can be topic-oriented, procedural or reference information;
  - **System-initiated guidance**: Unsolicited, explicit information about an event or a condition from an interactive system to a user.

Use scenario

A narrative text description that describes an intended usage situation with the **interactive system** under development.

Notes:

- The purpose of use scenarios is to provide a **very early, tangible basis for discussions** about what the future interactive system could be like for the user, before prototypes are constructed. Use scenarios are based on a deep understanding of the context of use, user needs, user requirements as well as discussions with users and stakeholders.
- The specific user in the use scenario is often a **persona**.
- Use scenarios illustrate use of the interactive system in a real context. They can be viewed as textual representations of the initial prototypes of a new interactive system. They enable developers to understand processes and context.

Use scenario

A use scenario should avoid placing unnecessary constraints on the design by referencing specific objects, such as buttons, in the **user interface**.

Example:

- The following text is too specific:

  Helen Rourke looks at the "Total price" field and decides that the rental price is fair. Then she clicks the button "Confirm rental".

- The following alternative is much better

  Helen Rourke decides that the rental price is fair and rents the car.

Two types of scenarios

There are two types of scenarios:

- As-is scenarios
  describe how tasks are done so far.
  As-is scenarios describe the current context of use.
  They are used to derive user needs and user requirements.

- Use scenarios
  describe how to do tasks with the new interactive system.
  Use scenarios serve as the basis for the development of low-fidelity prototypes

  Use scenarios are created very early in the design activity.

Storyboard

A sequence of visual frames illustrating the interplay between a **user** and an envisioned **interactive system**.

Notes:

- The purpose of a storyboard is similar to the purpose of a **use scenario**.
- A storyboard is a comic book style representation of a **use scenario**.
- Storyboards can also be used to illustrate a current **user experience**.

Storyboard Example

Example: Storyboard for parking assistant
(example 1 in the definition of Use scenario)

Wireframe

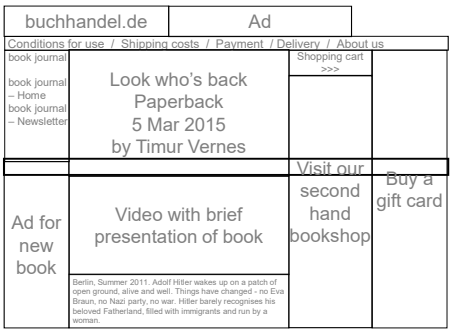
A screen or page in a **low-fidelity prototype** for a graphical **user interface** comprised of lines, rectangular boxes and text that represent the intended interaction design.

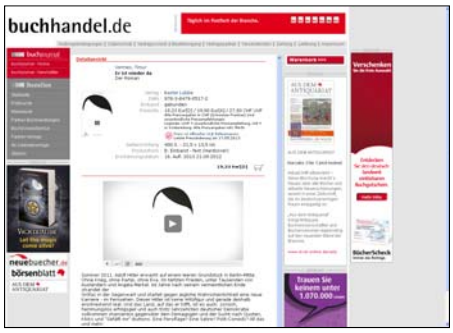
Note:

- Wireframes typically do not address visual design and precise layout.

Wireframe

A page in a wireframe and a corresponding derived web page.





Prototype

A representation of all or part of an **interactive system** that, although limited in some way, can be used for analysis, design and **usability evaluation**.

Note:

- The curriculum distinguishes between
  - **Low-fidelity prototype**
  - **High-fidelity prototype**

DK, NO: Fidelity = nøjagtighed, gengivelseskvalitet

Prototype – Why?

The key purposes of a prototype are

- To facilitate **early evaluation** of the effectiveness and efficiency of an interactive system at a time when it is still reasonably cheap to make fundamental changes to information architecture and design.
- To **increase the interest** of prospective users in the new interactive system based on a concrete example. Users often find it easier to criticise something than to answer the open question “What do you want?”.
- To show stakeholders and colleagues a **concrete example** of what it is that you are planning.
- To **serve as a specification** for the implementation of the interactive system. This particularly applies to high-fidelity prototypes.

Low-Fidelity Prototype

A low-cost, simple illustration of a design or concept used to gather feedback from **users** and other **stakeholders** during the early stages of design.

Notes:

- A low-fidelity prototype is often created using paper, pens, sticky notes and so on. Screen mockups are often made using a prototyping tool.
- A low-fidelity prototype may be operated by a human instead of a computer.
- A low-fidelity prototype should be capable of being updated in moments.

Evaluation of a Low-Fidelity Prototype

Evaluation of a prototype:
User (left), notetaker (centre), moderator and "interactive system" (right)

From the book "Usable Web Design" by Rolf Molich

Low-Fidelity Prototype – Popular Definition

A low-fidelity prototype is an

- Early,
- Incomplete,
- Cheap

draft of a product.

High-Fidelity Prototype

A software **prototype** of the **user interface** to the **interactive system** that is being designed. A high-fidelity prototype more closely resembles the finished **interactive system**.

Test question – 1 correct answer

For an internal demonstration one of your colleagues has simulated a new ordering system with the software tool Axure. The system closely resembles the final system and apparently works perfectly, but it is not connected to the database.

Which one of the following terms best describes this system?

- ☐ Use scenario
- ☐ Low-fidelity prototype
- ☐ High-fidelity prototype
- ☐ Wireframe
- ☐ User journey map
- ☐ Storyboard

Summary

- General design structure:
  - Information architecture
  - Navigation structure
  - User assistance
- Tools
  - Use scenario
  - Storyboard
  - User journey map
  - Card sorting
  - Wireframe
  - Prototype
- Low-fidelity prototype
  - Early, incomplete, cheap
- High-fidelity prototype
  - Resembles the finished system

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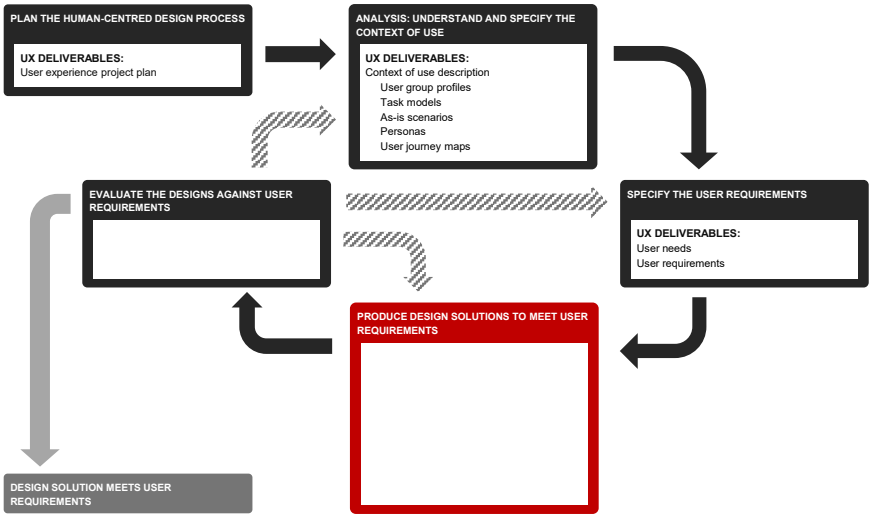
6.1. Design: Dialogue principles and user interface guidelines

Process for Developing Human-Centered Systems



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Important, Basic Design Concepts

- Affordance
- Mental Model

Affordance – dansk: brugssignal

An aspect of an object that makes it obvious how the object could be used.

Examples of affordances:

- A button on a web page provides an affordance for clicking.
- A company logo in the upper left corner of a web page provides limited affordance for clicking.
- The “swipe to delete” design pattern has no affordance at all.

Mental Model

The perception people have of themselves, others, the environment, and the things with which they interact.

Notes:

- Alternative, popular definition: A person's thought process about how something works in the real world.
- If a user's mental model of an interactive system is incomplete or contradictory, then the user cannot easily use the interactive system.

Mental Model – Example

For a word processing system, a user's mental model may be that all changes to a document are saved instantly.

An alternative mental model is that changes are saved only when the user selects "Save".

The two mental models make a difference for the user's actions if the word processing system crashes.

Dialogue Principles

General **goals** for the design of **useful** and **usable dialogues**.

Notes:

- Dialogue principles are not bound to any specific technology or technique.
- Dialogue principles may be difficult to apply because of their generality.

Dialogue Principles

ISO 9241-110 lists the following seven dialogue principles:

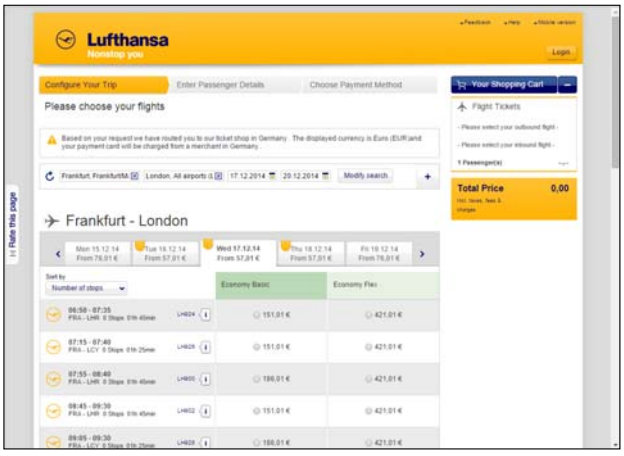
- **Suitability for the task;**
- **Self-descriptiveness;**
- **Conformity with user expectations;**
- **Suitability for learning;**
- **Controllability;**
- **Error tolerance;**
- **Suitability for individualization.**

Dialogue Principle 1: Suitability for the Task

The property of an **interactive system** to support the **user** in the completion of the **task** – that is, to base the functionality and the dialogue on the **task** characteristics (rather than the technology chosen to perform the **task**).

Dialogue Principle 2: Self-Descriptiveness

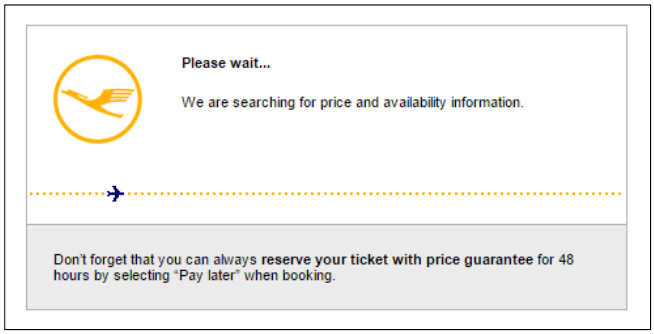
The property of a **dialogue** to, at any time, make it obvious to the **users** which dialogue they are in, where they are within the **dialogue**, which actions can be taken, and how they can be performed.



Self-Descriptiveness – Feedback

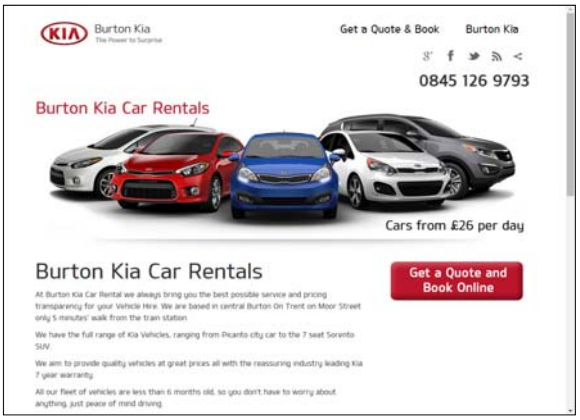
Feedback is typically used when

- Processing the request takes time
- A request that users consider critical has been completed
- A user request may have potentially dangerous consequences



Dialogue Principle 3: Conformity with User Expectations

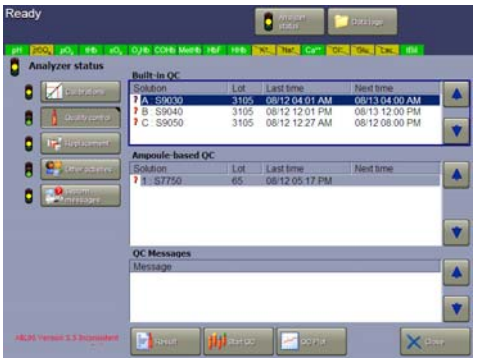
Correspondence to predictable contextual needs of the user and to commonly accepted conventions.



Users' expectations for a car rental website:
It must be possible to enter rental information immediately

Conformity with User Expectations – Consistency

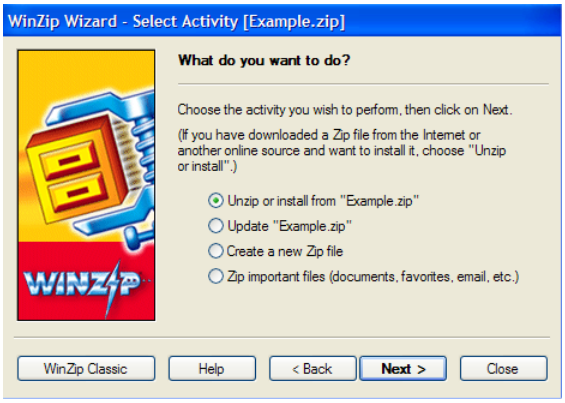
- Similar information must be represented similarly within applications and across applications.
- Speak the users‘ language (consistency with real world)



Users' expectations for the user interface of this analyser:
It must look like Windows

Dialogue Principle 4: Suitability for Learning

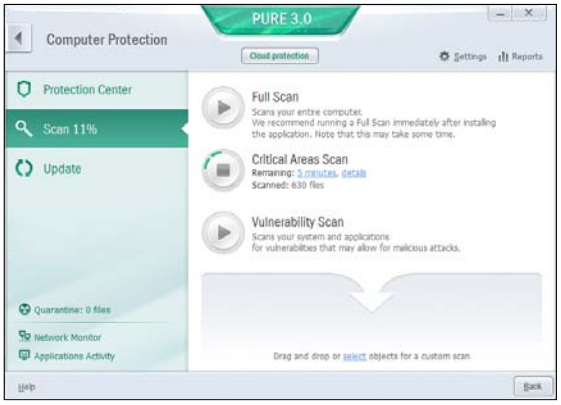
A dialogue is suitable for learning when it supports and guides the **user** in learning to use the **interactive system**.



Assistant for learning to use WinZip: Task-centered user guidance

Dialogue Principle 5: Controllability

The ability of a **user** to initiate and control the direction and pace of the interaction until the point at which the **goal** has been met.



Controllability: The "Critical Areas Scan" is controllable.
A Stop button is available even though it is not instantly visible

Dialogue Principle 6: Error Tolerance

The property of a **dialogue** to achieve the intended result with either no, or minimal, corrective action by the **user** despite evident errors in input.

Examples of error tolerance:

- When an error occurs, the **interactive system** should provide a precise and comprehensible explanation. The explanation must also be constructive – that is, it must suggest a solution to the problem.
- If severe consequences could result from a user action, the **interactive system** should provide explanation and request confirmation before carrying out the action.

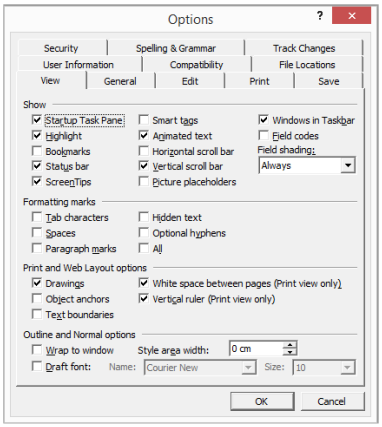
Error Tolerance

Guidelines for usable error messages:

- Constructive
  - ✹ Wrong file name
  - ✓ File names must start with a letter
- Comprehensible
  - ✹ Error 0a45
  - ✓ This file has been deleted since you last accessed it
- Precise
  - ✹ Something went wrong
  - ✓ The pick-up date (16-Dec-2014) must not be later than the return date (13-Dec-2014)
- Visible
  - ✹ Small font, easy to overlook
  - ✓ Message is clearly discernable
- Polite
  - ✹ ERROR! Illegal date!!
  - ✓ This system only accepts dates in the following format: 24-01-2015

Dialogue Principle 7: Suitability for Individualization

The property of a dialogue that allows users to modify interactions and the presentation of information to suit their individual capabilities and needs.



Some of the many options for individualizing Microsoft Word

Test question – 2 correct answers

A requirement for an interactive system is

“Users must have an option to undo at least the last dialogue step”

Which two of the following dialogue principles can NOT be used to justify this requirement?

- ☐ Conformity with user expectations
- ☐ Suitability for learning
- ☐ Controllability
- ☐ Self-descriptiveness
- ☐ Error tolerance
- ☐ Suitability for individualization

Heuristic

A generally recognized rule of thumb that helps to achieve **usability**.

Examples of Heuristics

Examples of generally recognised heuristics:

- Speak the users' language
  (related to the dialogue principle, conformity with user expectations).
- Follow platform conventions
  (related to the dialogue principle, conformity with user expectations).
- Visibility of system status
  (related to the dialogue principle, self-descriptiveness).
- Help users recognise, diagnose, and recover from errors
  (related to the dialogue principle, error tolerance).

User interface element

A basic component of a **user interface** that is presented to the **user** by the **interactive system**.

Note:

- User interface elements are the basis for creating the functions that users need in order to complete tasks with the interactive system.

Examples:

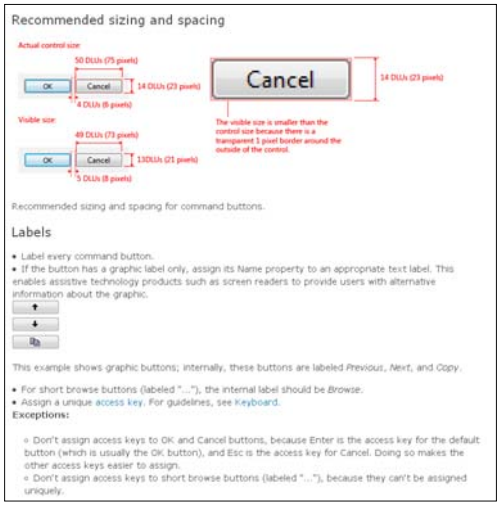
- Common examples of user interface elements include paragraphs of text, hyperlinks, push buttons, radio buttons, check boxes and tool tips.
- A single word in a paragraph of text or the words on a push button are not user interface elements.
- A log-in window, consisting of some text, two input boxes (for user name and password), and a log-in push button, is not a user interface element;
  it is composed of several user interface elements.

User interface guideline

A low-level, specific rule or recommendation for user interface design that leaves little room for interpretation, allowing designers to implement it consistently.

User interface guideline – Example

Example from "Windows User Experience Interaction Guidelines":



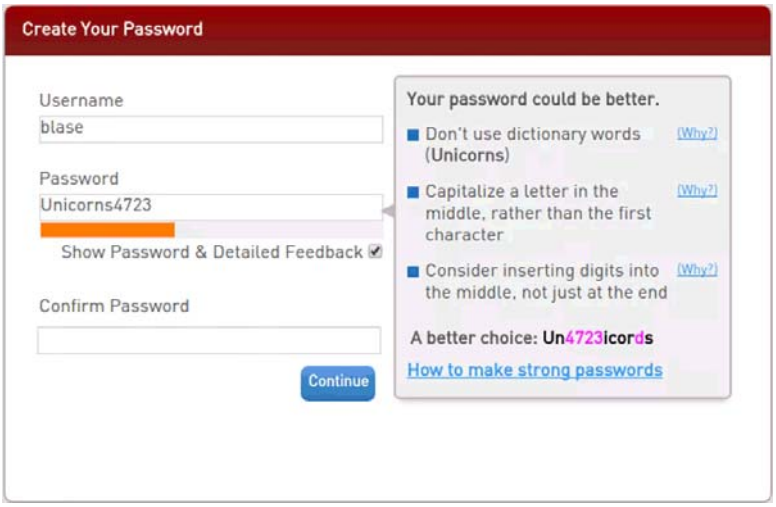
Style guide

A collection of **user interface guidelines** used to ensure **consistency** in the appearance and behaviour of **user interfaces** across **interactive system**s produced by the same organisation

Design Pattern

A solution to a commonly occurring design problem within a given **context of use**, that describes the design problem, a general solution, and examples of how to apply it.

Design Pattern



A state-of-the-art design pattern for “create safe password”

Summary

Concept	Validity	Practicability
Dialogue principle	General	Difficult in a specific context
Heuristic	General, but more limited than dialogue principle	Difficult but simpler than dialogue principle
User interface guideline	Only in a specific context	Simple
Design pattern	Only in a specific context	Very simple (copy pattern)
Style guide	Same as user interface guideline	Same as user interface guideline

Test question – 2 correct answers

Which two of the following are heuristics?

- ☐ Offer a great user experience
- ☐ The interactive system must be pleasant to use
- ☐ Follow platform conventions
- ☐ The height of a button must be 25 pixels
- ☐ The background color of pages must be light grey
- ☐ Help users recognize, understand and eliminate errors

Summary

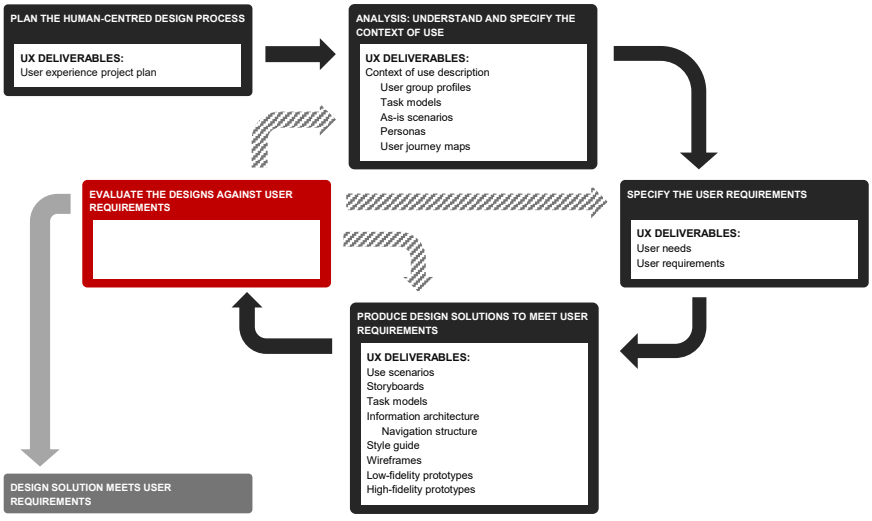
- Important, basic design concepts:
  - Affordance,
  - Mental Model
- The seven dialogue principles:
  - Suitability for the task;
  - Self-descriptiveness;
  - Conformity with user expectations;
  - Suitability for learning;
  - Controllability;
  - Error tolerance;
  - Suitability for individualization.
- Bases for design
  - Dialogue principles,
  - Heuristics,
  - User interface guidelines

Crash-Course CPUX-F

Certified Professional for
Usability and User Experience – Foundation Level
in 3 hours

7. Evaluate the design against user requirements

Process for Developing Human-Centered Systems



Usability evaluation

A process through which information about the **usability** of an **interactive system** is gathered in order to improve the **interactive system** (known as formative usability evaluation) or to assess the merit or worth of an **interactive system** (known as summative usability evaluation).

Note:

- Usability evaluation is a common term for
  - **Usability test**;
  - **User survey;**
  - **Usability inspection**.

Evaluation – Why?

- To find and eliminate usability problems
- To evaluate the interactive system from the user perspective
  - Does it meet the user requirements?
  - Does it fulfill the user interface guidelines (style guide)?
  - Are there additional, unexpected problems?
- To show stakeholders that even "their baby" has problems
  - There are usability problems
  - They can be serious
  - We have methods for discovering and eliminating them in a timely manner

Evaluation

- With users
  - Usability Test
    - Face-to-face
    - Remote
    - Unmoderated
  - User survey
- Without users (inspection based evaluation)
  - Heuristic evaluation

Usability Test – A Brief Introduction

Moderator and test participant during a "think-aloud" usability test session.
From the book "Usable Web Design" by Rolf Molich

Usability Test – A Brief Introduction

Moderator and test participant during a "think-aloud" usability test session.

Usability Test

A **usability evaluation** that involves representative **users** performing specific **tasks** with the **interactive system** to enable identification of **usability problems** or the measurement of **effectiveness**, **efficiency**, and user **satisfaction**.

Notes:

- A usability test consists of a number of **usability test sessions**.
  In each session, a usability test participant attempts to carry out representative usability test tasks using the interactive system or a prototype of the interactive system.

Types of Usability Tests – Overview

	Face-to-face	Remote	Unmoderated
Where is the moderator located?	Next to the test participant	Far from the test participant	No moderator
Communication test participant-moderator	Direct, face-to-face	Internet, telephone	Per email after the usability test session

Comparison: Formative and Summative Evaluation

	Formative	Summative
When during the development cycle?	As early as possible	Late
What is evaluated?	Prototype	Functional system
Evaluation method	Qualitative	Qualitative and/or quantitative

Main activities in a usability test

Roles in a Usability Test

- Moderator
- Note-taker
- Observer
- Usability test participant

Test question – 2 correct answers

Let's assume that you are planning a usability test of a website of a van rental company. Your budget allows you to conduct a test with 10 users.

Cargo Van

Which two of the following user groups would you recruit for this usability test?

- ☐ Experienced front-office workers who know customers and customer behaviour very well
- ☐ Management
- ☐ People looking for a job
- ☐ People who want to buy a used van
- ☐ Rental customers – Private individuals who are moving
- ☐ Rental customers from small enterprises

Test question – 1 correct answer

Which one of the following statements best characterize a usability test?

- ☐ A moderated, problem-oriented discussion between representative users
- ☐ An expert carefully evaluates the interactive system to uncover usability problems
- ☐ Representative users are asked to give their opinion about the interactive system.
- ☐ Representative users evaluate the interactive system using a questionnaire
- ☐ Representative users are observed while they solve representative, given tasks using the interactive system
- ☐ Representative users test the interactive system in order to find places where it does not compute results correctly

Usability Lab

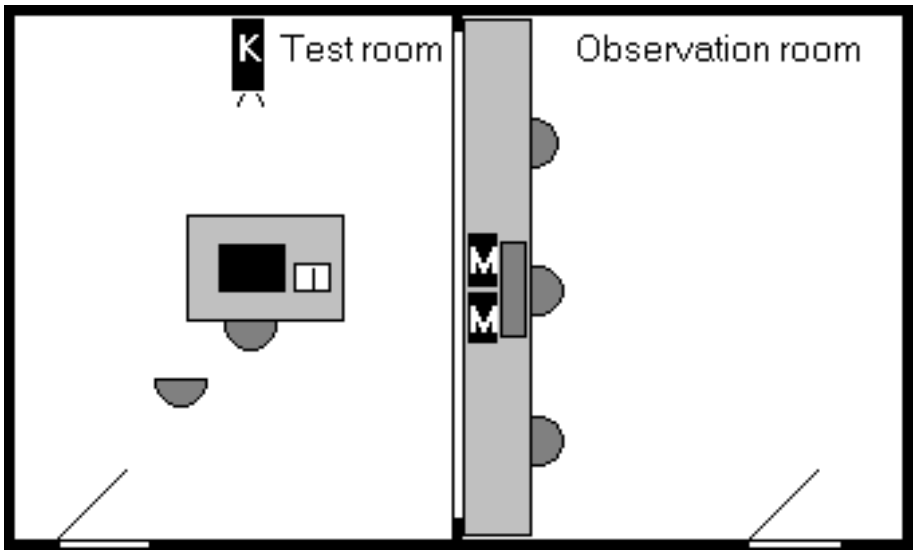
Two or more rooms that are specially equipped for **usability tests** or **focus groups**.

Note:

- A usability lab often consists of
  - a test room where the usability test participant sits,
  - an observation room where stakeholders can watch usability test participants as they solve usability test tasks.

  The two rooms are usually separated by a one-way mirror which enables observers to watch usability test sessions without usability test participants being aware.

Usability Lab



Usability test script

A checklist used by a **moderator** in a **usability test** to keep track of **briefing** and **pre-session interview** questions, **usability test tasks**, and **post-session interview** questions.

Moderation

The activity carried out by a **moderator** in a **usability test** or **focus group**.

- Briefing: Information about the usability test procedure
- Pre-session interview: Initial questions to the test participant
- Task solution
  - Hand the task descriptions to the test participant, one by one,
  - Listen attentively while the test participant attempts to solve the test tasks,
  - Make notes,
  - Ask clarifying questions.
- Post-session interview: Final questioning of the test participant

Usability test task

A description of a **task** that a **moderator** asks a **usability test participant** to carry out during a **usability test**.

Examples of test tasks for a usability test of an airline website:

- Book the cheapest possible return flight from London to Frankfurt.
  Departure tomorrow, return 3 days later.
- Book a flight to a destination at a date and at a time that suits you.
  Select the options that suit you. Before you start, please tell me where and when you want to go.
- How much hand baggage are you allowed to take onboard a flight?

Usability test task

A description of a **task** that a **moderator** asks a **usability test participant** to carry out during a **usability test**.

Examples of INVALID usability test tasks:

- Tell me what you think of the home page (opinion).
- Stroll around on the website for 5 minutes and tell me what you think (hazy, opinion).
- Are the rental conditions agreeable? (does not address usability).

Usability test report

A document that describes the results of a **usability test**.

Notes:

- A usability test report typically contains
  - An executive summary;
  - 5-50 usability findings (including positive usability findings);
  - The usability test script used for the usability test;
  - Screenshots or pictures that supplement the description of important usability findings.
- Also referred to as “Test report”.

Basic usability test report

A usability test report is always required.

A basic usability test report may consist of 3-5 pages or slides:

- A one-page executive summary;
- 1-2 pages communicating the 5-6 most important usability findings
- 1-2 pages detailing the usability test tasks

Usability finding

A result from a **usability evaluation**.

Note:

- A usability finding can describe
  - A **usability problem**.
  - Something that **users** liked – that is, a positive usability finding.

Examples of usability problems for a car rental website

- Test participants did not understand expressions like “CDW” and “liability insurance” on the car rental website.
- Test participants did not understand that addional, expensive insurances were required to rent the car. The total that they saw on the website was substantially lower than what they would have to pay.
- About half of the test participants were unable to complete a search. They easily located the search box and entered the term they wanted to search for, but they were unable to start the search because the search icon was unobtrusive and placed in an unexpected location.

Rating

A measure given to a **usability finding** from a **usability test** to indicate the impact and criticality on the **user experience** and the consequences.

Notes:

- Usability findings are rated from the usability test participants' point of view. Sometimes, the ratings are done in cooperation with a domain expert.
- Typical ratings are:
  - Positive finding;
  - Minor problem;
  - Major problem;
  - Critical problem;
  - Catastrophic problem – existential threat (life-threatening problem).

Test question – 2 correct answers

Which two of the following are NOT appropriate tasks for a usability test of the website of the German Parliament (Bundestag)?

- ☐ What do you think of the design of the website?
- ☐ How much does it cost to visit the Parliament as a tourist?
- ☐ When was the Parliament building constructed?
- ☐ A friend of yours lost his camera when he visited the Parliament. Who should you contact in order to get it back?
- ☐ Are the opening hours of the German Parliament for tourists easy to find?
- ☐ Show me a video of the talk that Mr. Putin gave when he visited the German Parliament

Test question – 1 correct answer

Which one of the following is NOT a typical rating of a usability finding?

- Positive finding
- Minor problem
- Major problem
- Critical problem
- Essential problem (must be fixed regardless of cost)
- Catastrophic problem (life-threatening problem)

Evaluation

- With users
  - Usability Test
    - Face-to-face
    - Remote
    - Unmoderated
  - User survey
- Without users (inspection based evaluation)
  - Heuristic evaluation

User survey

A **usability evaluation** where **users** are asked to report subjective data into a **questionnaire** based on their experience in using an **interactive system**.

Notes:

- User surveys can be used to evaluate users' satisfaction with an interactive system and to gather information on the context of use.
- User surveys should be developed in accordance with the human-centred design process.

Questionnaire

A set of questions that is used collect data from **users**, often in a **user survey**.

Note:

- This definition applies to both digital and paper questionnaires.

Questionnaire – Notes

Questionnaires must be usable. They must adhere to dialogue principles, for example:

- Each question must contribute significantly to the purpose of the questionnaire;
- Questions must be easy to understand –
  For example, avoid double negations such as
  "The system is not difficult to use“;
- The questionnaire must keep users informed of their progress.

As with any product, testing the questionnaire for clarity with representative users before launch should be considered essential.

Questions for Evaluating Satisfaction

The new car rental website looks cool	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The new car rental website is easy to use	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The new car rental website lets me rent cars quickly	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Evaluation

- With users
  - Usability Test
    - Face-to-face
    - Remote
    - Unmoderated
  - User survey
- Without users (inspection based evaluation)
  - Heuristic evaluation

Usability inspection

A **usability evaluation** based on the judgment of one or more evaluators who examine or use an **interactive system** to identify potential **usability problems** and deviations from established **dialogue principles, heuristics**, **user interface guidelines** and **user requirements.**

Notes:

- Usability inspection is often performed by user experience professionals or subject matter experts, who base their judgement on prior experience of usability problems encountered by users and their own knowledge of user interface guidelines and style guides.
- Unlike usability tests, usability inspections do not involve users, except where a user adopts the role of evaluator.
- Heuristic evaluation is a usability inspection method.

Heuristic Evaluation

A **usability evaluation** method in which one or more evaluators compare an **interactive system** to a list of **heuristics** and identify where the **interactive system** does not follow those **heuristics**.

Notes:

- The list of heuristics must be manageable. Usually about 10 heuristics are used.
- Evaluators can be user experience professionals or subject matter experts (“single experts”), or both (“double experts”).

Test question – 1 correct answer

Which one of the following descriptions best characterize a user survey?

- ☐ A meeting where designers brainstorm ideas for a new interactive system
- ☐ An evaluation of a storyboard carried out by users
- ☐ An evaluation of an interactive system where reviewers identify potential usability problems
- ☐ An evaluation where representative users perform specific tasks with the interactive system to enable identification of usability problems.
- ☐ An evaluation where users are asked to report subjective data into a questionnaire based on their experience in using an interactive system.
- ☐ A focused discussion where an inspector leads a group of participants through a set of questions on a particular topic.

Test question – 1 correct answer

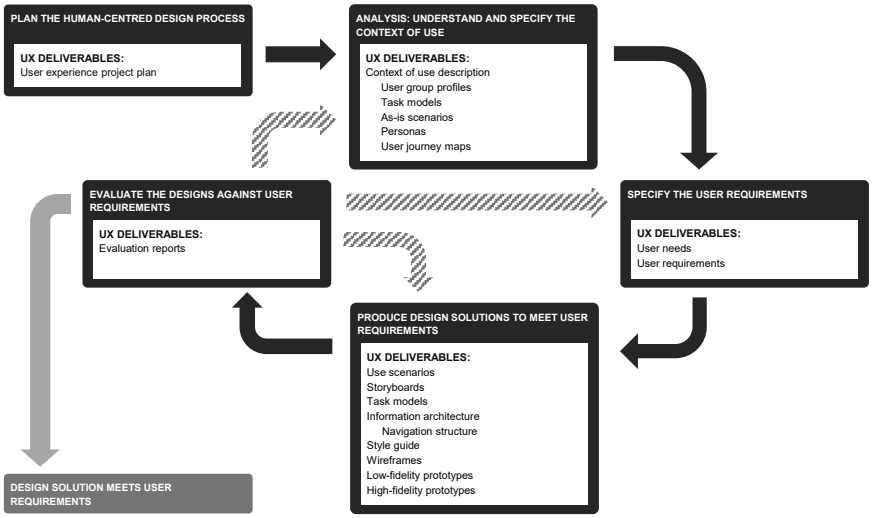
Your team is responsible for maintaining a car rental website. Management has asked you to carry out a user survey with 2,000 users in order to get an impression of how satisfied users are with the website. The questionnaire has been written.
Which one of the following activities is most important before you launch the user survey?

- Show the questionnaire to 8 users who have used the website at least five times and ask for honest feedback
- Commission an independent consultant to show the questionnaire to 8 users who have used the website at least 5 times and ask for feedback
- Conduct a focus group where 5 users evaluate the questionnaire
- Run a preliminary survey where you ask 25 representative users of the website to fill out the questionnaire. Afterwards, you evaluate the results.
- Conduct a heuristic inspection of the questionnaire
- Test the applicability of the questionnaire by asking 5 representative users to fill out the questionnaire one by one while they think aloud

Summary

- Usability tests are conducted in order to find usability problems, and to convince stakeholders that action is needed.
- Formative evaluation: Early; qualitative; prototype
  Summative evaluation: Late; qualitative or quantitative; functional system.
- Findings: Problems and positive findings.
- Usability test session:
  Briefing + Pre-session interview + Test tasks + Post-session interview
- Questionnaires must be short, comprehensible and usable.
  Testing a questionnaire for clarity with users can improve its usability decisively.
- Satisfaction can be measured with a questionnaire
- Usability test: With users
  Inspections: With usability professionals and subject matter experts
- Inspections are based on approximately 10 heuristics

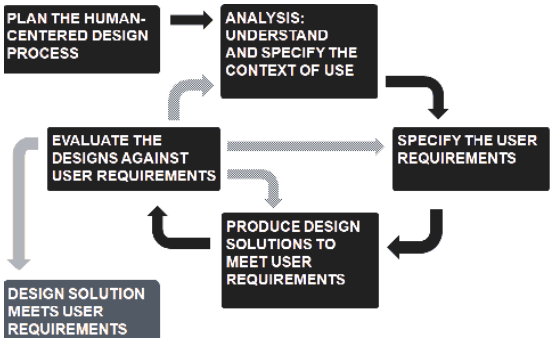
Process for Developing Human-Centered Systems



 Slide 237

Test question – 1 correct answer

During which activity in the process for developing human-centered systems is the **storyboard** developed?



- ☐ Plan the human-centered design process
- ☐ Observe users
- ☐ Understand and specify the context of use
- ☐ Specify the user requirements
- ☐ Produce design solutions to meet user requirements
- ☐ Evaluate the designs against user requirements

 Slide 238

Test question – 2 correct answers

Which two of the following provisions are NOT part of the human-centred design process?

- ☐ The design is driven and defined by usability evaluation
- ☐ In order to speed up the process, a usability expert makes all decisions in each activity
- ☐ If information is missing or errors have occurred, a previous process activity is resumed
- ☐ Users are in focus and are involved at various times
- ☐ The process provides for skipping activities after consultations with usability experts in case of time bottlenecks or personnel shortages
- ☐ The whole process is planned. During the process, resources and milestones are monitored and adjusted, if required

Summary

Basic principles for Human-Centered design in three words:

- Users
- Evaluation
- Iteration

HiPPO = Highest Paid Person's Opinion