CPUX-F
Curriculum and Glossary

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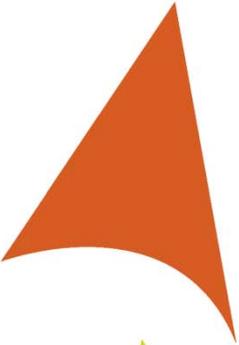
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CPUX-F – Curriculum and Glossary – Version 3.15

Contents

Introduction

This document defines what you need to know in order to pass the certification test for Certified Professional for Usability and User Experience - Foundation Level (CPUX-F). The certification test will only cover concepts and knowledge that are described in this document.

Terms that are defined in the curriculum always appear in **bold**.

Overview of CPUX-F resources

All relevant information about the CPUX-F certification and other types of CPUX certifications is freely available from UXQB.org – the website of the International Usability and User Experience Qualification Board.

The information on UXQB.org includes:

- A complete list of recognised CPUX-F training providers and available courses. Note that training is recommended but not required in order to take the CPUX-F certification test.
- CPUX-F Curriculum and Glossary (this document) for download.
- A complete sample set of 40 CPUX-F certification questions with answers for training purposes.

The Curriculum and Glossary document is available in several languages. For currently available language versions, please check UXQB.org

> We strongly recommend that you study the complete, publicly available sample set of CPUX-F certification questions carefully before you take the certification test.

Learning Objectives

Learning objectives (LO) are brief statements at the start of each section that describe what you are expected to know after studying that section.

The table at the beginning of each section shows that section's learning objectives.

LO #	Learning Objective

Learning Objectives are characterised by the keywords

Know – that is, recite, recognise

Understand – that is, compare, distinguish, explain, substantiate, summarise

Master – that is, analyse, communicate, document, execute, plan.

In other curricula, these 3 levels are designated "K1", "K2" and "K3", respectively.
The CPUX-F curriculum contains no learning objectives at the *Mastering* level.

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1. The human-centred design process

LO #	Learning Objective
1.1	Understand the basic elements of **human-centred design**: involving **users**; **iteration** based on frequent **usability evaluation**; addressing the whole **user experience**
1.2	Understand the **human-centred design** activities and their interdependency
1.3	Understand the purpose of each deliverable of the **human-centred design** activities
1.4	Know what **agile development** and **lean UX** are
1.5	Know what **usability maturity** is
1.6	Know the **usability maturity** levels incomplete, performed, managed and innovating

Human-centred design is an approach to design that aims to make **interactive systems** more usable by focusing on the use of the **interactive system** and applying usability knowledge and methods.

Human-centred design is 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).

Lean UX is an approach to **human-centred design** that focuses on a fast, **iterative** approach through early usability evaluation and lightweight deliverables. **Lean UX** informs and supports **Agile development**, where working but incomplete software is delivered early and frequently, to enable quick feedback.

An organisation's receptiveness to **usability** activities and findings may be influenced by its **usability maturity**.

PLAN THE HUMAN-CENTRED DESIGN PROCESS

UX DELIVERABLES:
· User experience project plan

ANALYSIS: UNDERSTAND AND SPECIFY THE CONTEXT OF USE

UX DELIVERABLES:
· Context of use description
  · User group profiles
  · Task models
  · As-is scenarios
  · Personas
  · User journey maps

EVALUATE THE DESIGNS AGAINST USER REQUIREMENTS

UX DELIVERABLES:
· Evaluation reports

SPECIFY THE USER REQUIREMENTS

UX DELIVERABLES:
· User needs
· User requirements

PRODUCE DESIGN SOLUTIONS TO MEET USER REQUIREMENTS

UX DELIVERABLES:
· Use scenarios
· Storyboards
· Task models
· Information architecture
  · Navigation structure
· Style guide
· Wireframes
· Low-fidelity prototypes
· High-fidelity prototypes

DESIGN SOLUTION MEETS USER REQUIREMENTS

Figure 1. The interdependence of **human-centred design** activities according to the ISO 9241-210 standard.

The black rectangles show the 5 key activities in an **iterative**, **human-centred design** process. "UX deliverables" are common outputs from the corresponding activity. The grey hatched arrows show iteration.

If a project has insufficient resources to produce all the UX deliverables specified in Figure 1, some of the deliverables may be skipped, for example **task models**, **user needs**, **storyboards** and **user journey maps**.

Human-centred design means planning for iterations, getting **user** feedback as early and as often as possible. It is perfectly acceptable to run through the iterations often with lightweight UX deliverables, for example in **agile development**.

All UX deliverables in Figure 1 are defined in the curriculum.

Term	Definition
Human-centred design	An approach to design that aims to make **interactive systems** more usable by focusing on the use of the **interactive system** and applying human factors, ergonomics and usability knowledge and methods. Notes: 1. The concept "human-centred design" is used instead of "user-centred design" to emphasise the need to consider additional **stakeholders** who may not be **users**. 2. Feedback from **users** through **usability evaluation** is a critical source of information in human-centred design.
Iterative	Repetitive. An iterative process repeats steps in the **human-centred design** process until a **usability evaluation** of the **user interface** shows that the **user requirements** have been adequately met.
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: 1. 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**. 2. Usability methods that work well with agile development: a. 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. b. **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. Notes: 1. **Agile development** processes are the basis for lean UX, as the **iterative** approach in teams and the realisation of small, well defined packages enables regular, small and fast **usability tests**. The results from **usability tests** are then directly used in the next iteration for the development. 2. Lean UX assumes that at first everything is a hypothesis and consequently needs to be validated. The team learns through experiments with **users** in the **context of use**. Failure is part of the learning process – not every hypothesis is validated, not every experiment provides the desired results. 3. Instead of carrying out extensive user research upfront, lean UX derives the hypotheses to be validated from known **context of use** information, e.g. from **stakeholder interviews**. These hypotheses are then validated or questioned in subsequent **contextual interviews** or **usability test sessions**.

Term	Definition

Usability maturity	The level of understanding and implementation of a systematic **human-centred design** process within an organisation.
	
	Notes:
	1. Usability maturity can be expressed in a model with 4 levels:
	    a. *Incomplete*: The **human-centred design** process is not implemented, or fails to achieve its process purpose.
	    Note: At this level 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.
	    b. *Performed:* The **human-centred design** process achieves its process purpose.
	    Note: **Usability** is achieved by enthusiastic individuals using ad-hoc processes.
	    c. *Managed*: The **human-centred design** process is implemented in a managed fashion, and its work products are appropriately established, controlled and maintained.
	    Note: The process is planned, monitored and adjusted.
	    d. *Innovating*: The **human-centred design** process is continuously improved to respond to change aligned with organisational **goals**.
	    Note: Process innovation objectives are defined that support the relevant business **goals**.
	2. 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:
	    a. 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**.
	    b. Ask management and **stakeholders** to leave the office and put themselves in the context of their users.
	    c. Ask management and staff to use their own products and services, like a customer. They may never have used their company's products.
	    d. Conduct **usability tests** of **prototypes** with project management as observers or **test participants**.
	3. The usability maturity model is based on the process measurement framework for process capability in ISO 33020.

2. Basic concepts

LO #	Learning Objective
2.1	Understand **usability** and its three main criteria
2.2	Understand **user experience** (UX)
2.3	Understand the difference between **usability** and **user experience**
2.4	Know what a **goal** is
2.5	Understand **user interface**, **dialogue** and **interactive system**
2.6	Know what **accessibility** is
2.7	Know about important **accessibility** aids
2.8	Know the purpose and most basic contents of **ISO 9241**
2.9	Know the responsibilities that a **user experience professional** can have

Usability is the extent to which an **interactive system** is **effective, efficient** and **satisfying** to use in a specified **context of use**.

An **interactive system** is **effective** if it supports what **users** need to do to reach their **goals**, and if **users** can figure out how to do it.

An **interactive system** is **efficient** if it supports **users** in carrying out their **tasks** using as few **resources** as possible. In most cases, this means that **users** must be able to complete their **tasks** quickly.

An **interactive system** is **satisfying** if it is pleasant to use.

User experience (UX) considers **satisfaction** before, during and after use (whereas **usability** considers **satisfaction** only during use). **User experience** before use may be influenced by company branding, customer reviews, previous interactions, etc. **User experience** after use may be influenced by product delivery, post-sales support, recent interactions, etc.

Accessibility is the extent to which an **interactive system** enables **users** to interact with it, regardless of their level of vision, hearing, dexterity, cognition, physical mobility, etc.

A **user experience professional** is a person who has specific responsibilities associated with the **human-centred quality** of an **interactive system**. Their responsibilities include analysis of the **context of use**, specifying **user requirements**, producing design solutions – in particular **prototypes** – and carrying out **usability evaluations**.

Term	Definition
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**.
	Notes:
	1. Usability depends on users, goals and tasks, and other aspects of the **context of use**.
	2. Technical defects may lead to **usability problems** if they prevent **users** from solving their **tasks effectively** or **efficiently**.
Effectiveness	The accuracy and completeness with which users achieve specified **goals**.
	Notes:
	1. Accuracy is the extent to which an actual outcome matches an intended outcome.
	2. Completeness is the extent to which the use of the system, product, or service produces all intended outcomes.
	3. Completeness can be measured as the success rate: (Number of users who achieve a specified goal) / (Number of users who attempt to reach the specified goal).
	4. Effectiveness is the attribute of **usability** that focuses on being able to accomplish **tasks**.
	Example:
	1. A car rental website does not offer **users** any opportunity to cancel a reservation. An analysis of the **context of use** shows that **users** need this function. There is a problem with the effectiveness of the website.
	2. A car rental website enables users to cancel a reservation. A **usability test** shows that only 5 out of 100 **users** are able to figure out how to cancel their reservation. Those who are able to figure out how to do it, do so quickly. There is a problem with the effectiveness but not with the **efficiency** of the website.
Efficiency	The **resources** used in relation to the results achieved.
	Notes:
	1. **Resources** include time, human effort, financial and material **resources**.
	2. Efficiency is the attribute of **usability** that focuses on being able to accomplish a **task** using acceptable amounts of **resources**.
	Example:
	1. A car rental website enables **users** to cancel a reservation. A **usability test** shows that the cancellation procedure is needlessly complicated even though all **usability test participants** finally manage to cancel their reservations. The **effectiveness** of the website is OK, since all **users** manage to achieve their **goal**. There is a problem with the efficiency of the website.
	2. Sluggish response caused for example by an overloaded **interactive system** is a **usability problem**.

Term	Definition
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: 1. **Effectiveness** and **efficiency** may influence satisfaction. For example, low **effectiveness** or low **efficiency** may lead to low satisfaction. Satisfaction may influence **effectiveness** and **efficiency**. For example, frustration may cause **users** to quit a **task**, which influences **effectiveness**. 2. Satisfaction is often measured using a **questionnaire.** See the examples in the definition of **questionnaire**. 3. The difference between satisfaction and **user experience** is that satisfaction results from use, while **user experience** results from discovering, adopting and using the **interactive system**, through to final use and recollections of use. In addition, **user experience** can be influenced by more than just use, for example brand image, price and opinion of others, but it is still related to actual or imagined use. Examples of dissatisfaction and satisfaction: 1. Prolonged periods of use of a notebook without an external mouse causes muscular discomfort. 2. Users say that it "takes forever" to reserve a car on a car rental website. 3. Users spontaneously say that they like the appearance of the home page of a car rental website. 4. High prices or unacceptable terms of service in a web shop are not part of satisfaction because satisfaction is about the usage of an **interactive system**. They may influence the **user experience**.

Term	Definition
User experience	A **user's** perceptions and responses that result from the use and/or anticipated use of an **interactive system**. Notes: 1. **Users'** perceptions and responses include the **users'** emotions, beliefs, preferences, comfort, behaviours, and accomplishments that occur before, during and after use. 2. User experience is a consequence of brand image, presentation, functionality, system performance, interactive behaviour, and assistive capabilities of the **interactive system**. It also results from the **user's** internal and physical state resulting from prior experiences, attitudes, skills, abilities and personality; and from the **context of use**. 3. **Usability** criteria can be used to evaluate aspects of user experience. 4. **Usability** is mainly about the interaction with the **interactive system**. User experience also takes into account what happens before and after the interaction through to final use and recollections of use. See the examples below. 5. User experience is mainly about **satisfaction** and fulfilment of expectations. 6. User experience is often referred to as UX. 7. The following figure shows the relationship between user experience and **usability**. **Usability** is **effectiveness**, **efficiency** and **satisfaction** during actual use, while user experience is the **satisfaction** or dissatisfaction during anticipated use, actual use and after use. Examples that illustrate the difference between **usability** and user experience: When ordering flowers for delivery from a flower store's website: 1. **Usability problems** encountered during checkout affect both the user experience and **usability**. 2. The quality of the physical flowers delivered affects only the user experience. It does not affect **usability** of the flower store's website. 3. The experience of visiting the physical store affects the user experience of subsequent visits to the website. It does not affect the **usability** of the flower store's website.
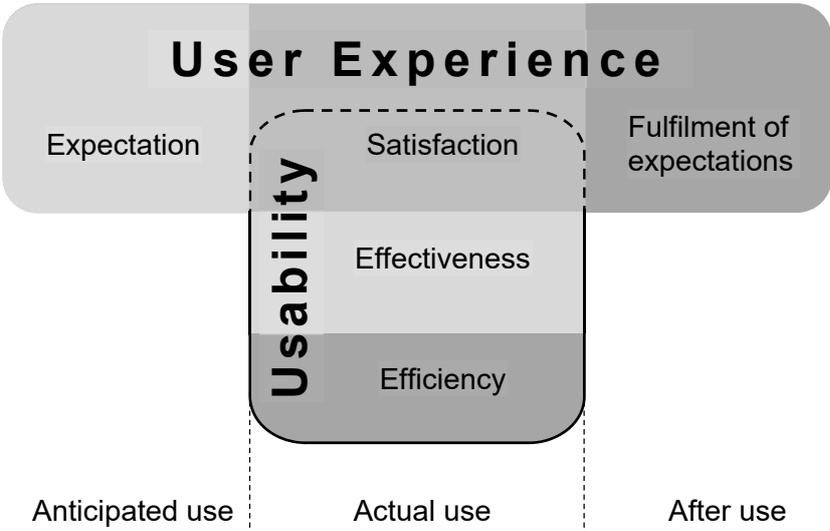
Term	Definition
Goal	The intended outcome. Notes: 1. Goals are used in **human-centred design** to express the intention of **users** on a high level without foreclosing technical solutions. The concepts "goal" and "**user need**" are related. 2. A goal is typically expressed in the form of a condition or state. In contrast, a **task** is typically expressed in the form of an activity. Examples: 1. Goal: Change the colour of my hair from brown to red. **Task**: Book an appointment with my hairdresser using their website. 2. Goal: Visit a friend in a small city, 100 km away. **Task**: Rent a car using the car rental website. Renting a car is not a user goal.
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**.
Dialogue	An interaction between a **user** and an **interactive system** that consists of **user** actions (input) and responses from the **interactive system** (output) in order to achieve a **goal**.
Interactive system	A combination of hardware, software and services that **users** interact with in order to achieve specific **goals**. Notes: 1. This includes, where appropriate, packaging, user documentation, on-line help, support and training. 2. 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.
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: 1. 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. 2. 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.
ISO 9241	A family of standards covering **human-centred design**. Note: 1. ISO 9241 includes standards related to a. Software ergonomics; b. The human-centred design process; c. Displays and display related hardware; d. Physical input devices; e. Workplace ergonomics; f. Environment ergonomics; g. Control centres.

Term	Definition
User experience professional	A professional who has one or more of the following responsibilities in a project: 1. Planning and managing the **human-centred design** process; 2. Identifying and describing the **context of use**; 3. Deriving the **user requirements**; 4. Creating the **information architecture** and the **navigation structure**; 5. Defining and conceiving the interaction between humans and the **interactive system** based on the **context of use** and the **user requirements**; 6. Designing the graphic part of the **user interface**; 7. Carrying out **usability evaluations** of **user interfaces** in various stages of realisation.

3. Plan the human-centred design process

LO #	Learning Objective
3.1	Know what the planning activities for a **human-centred design** project are
3.2	Understand what **human-centred quality objectives** are

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, and either 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**. Planning includes the appointment of other **user experience professionals** who will participate in the project.

Term	Definition
User experience project plan	A description of the **human-centred design** activities and deliverables for an **interactive system**. Notes: 1. The description can be an independent document or a part of the overall project plan. 2. The user experience project plan contains: a. The **human-centred quality objectives** specific to the project; b. The planned human-centred deliverables and the activities needed to produce those deliverables as part of the project; c. The time plan; d. 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**. Notes: 1. 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: 1. Travelers to the US must be able to pass through immigration twice as quickly as before (**usability, efficiency**). 2. Blind **users** must be able to recognise and understand the content of the website (**accessibility**). 3. **Users** must have a feeling of complete privacy when using the electronic voting booth (**user experience**). 4. 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).

4. Analysis: understand and specify the context of use

LO #	Learning Objective
4.1	Understand the **context of use**
4.2	Understand the concept: **user**
4.3	Understand the differences between **primary, secondary** and **indirect users**
4.4	Understand the concept: **stakeholder**
4.5	Know what a **user group** and a **user group profile** are
4.6	Understand the concept: **task**
4.7	Understand the difference between a **task** and a subtask
4.8	Know what **environment** means
4.9	Know what a **resource** is
4.10	Know what a **task model** is
4.11	Know what a **focus group** is
4.12	Know what **observation** is
4.13	Understand what a **contextual interview** is
4.14	Understand the difference between an **interview** and a **contextual interview**
4.15	Understand the **master-apprentice model**
4.16	Understand the **interview checklist**
4.17	Understand the differences between **open**, **closed**, **neutral** and **leading questions**
4.18	Understand what an **as-is scenario** is
4.19	Understand what a **persona** is
4.20	Understand what a **user journey map** is and what touchpoints are

The purpose of "Analysis: understand and specify the context of use" is to understand and describe who the **users** are, what they do, what problems they have, and what their **needs** are, with respect to the planned **interactive system**.

To understand **users** and their **needs**, we can **observe users** performing tasks, **interview users** and conduct **focus groups.**

In a **focus group,** a **moderator** leads a group of participants through a focused discussion around a set of questions on specific topics.

Interviews should focus on gathering information about the current **context of use** rather than the **interactive system** itself. They should be done contextually. A **contextual interview** takes place at the location where the **user**'s interaction with the **interactive system** usually takes place, for example the **user**'s workplace, their home or in a shop. An ordinary **interview** takes place in a neutral environment, for example in a meeting room.

During a contextual **interview**, the interviewer treats the interviewee as the master while the interviewer is the humble apprentice (**master-apprentice model)**. The interviewer asks because they sincerely want to learn – not because they want to demonstrate their knowledge. The interviewer should use **open** and **neutral** interview questions rather than **closed** and **leading questions** to avoid biasing the interviewee. The interviewer should rely on an **interview checklist** to ensure that all relevant topics are addressed, rather than using it to control or steer the **interview**.

The outcome of this activity is a description of the **context of use**. The **context of use** has five components: **Users** (people who interact with the **interactive system**), **Goals** (what **users** want to achieve), **Tasks** (what **users** do to achieve their **goals**), **Environment** (where the interaction takes place), and **Resources** (the means required to perform the **task**).

The **context of use** is described in **user group profiles** and **personas** (who are the **users**), **as-is scenarios** (how do **users** currently do **tasks**), **task models** (details about what the **tasks** are) and **user journey maps** (how **users** interact with the **interactive system** and the organisation providing it).

A **user group profile** is a generalised description of a collection of **users** with the same or similar personal characteristics and **context of use** related to the **interactive system**.

A **persona** is a description of a fictitious but realistic **user** and what he or she intends to do when using the **interactive system**.

An **as-is scenario** is a narrative text description of the procedure a specific **user** currently follows to complete one or more **tasks**,

A **task model** is a list of subtasks for each **task** which the **user** has to complete to reach their **goals**. **Task models** help the design team to design the right solution for each **task**.

User journey maps provide an overview of the touchpoints where **users** interact with the **interactive system** and the organisation providing the **interactive system**. They help **stakeholders** and **user experience professionals** understand and optimise the **user experience**.

The main purpose of **personas** and **as-is scenarios** is to identify user needs and make it easier for designers, developers and other **stakeholders** to understand who the **users** are, what they do, what their obstacles are, and to facilitate discussions within the design team.

Term	Definition
Context of use	A combination of **users**, **goals**, **tasks**, **resources**, and **environments**. Notes: 1. The context of use is determined by **interviewing users** or by **observing** them carry out tasks. 2. The results from **focus groups**, **observation** and **contextual interviews** are described in the **context of use description**. Examples of contexts of use, users, goals and tasks, environments and resources: 1. Consider the **interactive system** "messaging app": Teenagers on a bus use their phones to send messages to their friends to make them laugh. a. Users: Teenagers; b. Goal: Make friends laugh; c. Task: Send message; d. Social environment: Friends: e. Physical environment: Bus; f. Resource: Phone. 2. Consider the **interactive system** "text processor": Secretaries in a school office create certificates for students in time for graduation; they validate the certificates with stamps. a. Users: Secretaries; b. Goal: Have the certificates ready in time for graduation; c. Task: Create certificates; d. Social environment: School staff and students; e. Physical environment: School and school office; f. Resource: Stamp.
Context of use description	A description of the **users**, **goals**, **tasks**, **resources**, and **environments** derived from **observations, contextual interviews** and **focus groups**. Notes: 1. The context of use description is the basis for identifying **user needs** and tracing them back to their source. 2. A context of use description describes: a. **Users**, in the form of **user group profiles** and **personas**; b. **Goals** in the form of **as-is scenarios**; c. **Tasks**, in the form of **task models**, **as-is scenarios** or **user journey maps**; d. **Resources**, in the form of lists or **as-is scenarios**; e. **Environments,** in the form of **as-is scenarios.** 3. Examples of components within a context of use description are **user group profiles**, **personas**, **as-is scenarios**, **task models** and **user journey maps**.

Term	Definition
User	A person who interacts with an **interactive system**, or who uses the output of the system. Notes: 1. A user is one of the following: a. **Primary user**: a user who uses the **interactive system** for its intended purpose. b. **Secondary user**: a user who carries out support **tasks** with the **interactive system**, for example to maintain it or to train **primary users**. c. **Indirect user**: a user who uses the output of the **interactive system,** but who does not interact directly with it. 2. **Stakeholders** may or may not be users. **Stakeholders** are not considered to be users if they are affected by an **interactive system** but don't interact with it or use its output. Examples of **stakeholders** who are not users: 1. The non-technical managers of a team of technical users. 2. People affected by the noise produced by an **interactive system**. 3. Marketers affected by the impact of the use of the **interactive system** on the brand. Examples: 1. A customer (user) uses a car reservation website to make a reservation – The customer is a **primary user** of the system. 2. A customer (user) calls the reservation centre where a customer service representative uses the same system to make the reservation for them – The customer is an **indirect user** of the system.
Primary user	A **user** who uses the **interactive system** for its intended purpose. Examples of primary users: 1. A bank customer who uses a cash dispenser to withdraw money is a primary user of the cash dispenser. 2. A call centre operative who uses a reservation system to reserve cars for customers is a primary user of the reservation system.
Secondary user	A **user** who carries out support **tasks** with the **interactive system**, for example to maintain it or to train **primary users**. Note: 1. Secondary users – in particular maintenance staff – typically interact with a different **user interface** than **primary users**. This **user interface** also requires context analysis and specification of **user requirements** to be usable. Examples of secondary users: 1. A user who prints a document on a printer is a primary user of the printer. When the same user a moment later changes the ink on the printer, he or she is a secondary user of the printer. 2. A bank employee who restocks a cash dispenser with cash is a secondary user of the cash dispenser. 3. A trainer who teaches a call centre operative how to use a car reservation system is a secondary user of the reservation system.
Indirect user	A **user** who uses the output of the **interactive system**, but who does not interact directly with the **interactive system**. Examples of indirect users: 1. A bank customer who receives a paper or electronic statement is an indirect user of the bank's computer system. 2. A customer who contacts the call centre to reserve a car is an indirect user of the computer system used by the call centre operative to make the reservation.

Term	Definition
Stakeholder	An individual or organisation with an active interest in an **interactive system**. Notes: 1. All **users** are stakeholders, but not all stakeholders are users. To highlight the distinction, you can use the phrase "users and other stakeholders". 2. **Market requirements** and **organisational requirements** are examples of **requirements** from stakeholders who are not users. Examples: 1. Stakeholders might include: **users**, technical support, trainers, documentation writers and developers. 2. Stakeholders who may not be **users** might include: designers, developers, managers of development teams, shareholders, board members and marketing professionals.
User group	A collection of **users** with the same or similar personal characteristics and contexts of use related to the **interactive system**.
User group profile	A generalised description of a **user group**. Example of a user group profile for the website of a van rental company: 1. 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.
Task	A set of activities undertaken in order to achieve a specific **goal**. Notes: 1. Most tasks can be subdivided into subtasks – that is, activities. 2. 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**. 3. Most subtasks lead to choices or inputs by the **user** when using the **interactive system**. 4. Some subtasks can be subdivided into smaller subtasks. 5. Subtasks are unsuitable as **usability test tasks**, because they are very specific. Examples of tasks and subtasks: 1. "Rent a car" is a task. 2. "Cancel a car rental reservation" is a task. 3. "Register on a car rental website" is a subtask. 4. "Log in to a car rental website" is a subtask. 5. The subtask, "Log in to a car rental website", can be broken down into smaller subtasks, such as: a. Enter the username; b. Enter the password; c. Tick the 'Remember me' checkbox.
Environment	The physical, social and technical conditions in which a **user** interacts with an **interactive system**. Note: 1. The social conditions include the organisational conditions.

Term	Definition
Resource	All means required to use an **interactive system**. Note: 1. Resources can be a. Reusable – for example: equipment, information and available human-based and system-based support; or b. Exhaustible – for example: time, human effort, financial resources and materials.
Task model	A description of the subtasks within a **task** that have to be carried out in order to reach the **user's goals**. Notes: 1. The purpose of a task model is to provide a precise description of a **task**. 2. Task models should be written so **users** can understand and validate them. 3. A task model describes a task's contextual preconditions, the steps needed to carry out the task, and its intended outcomes, whereas **as-is scenarios** and **use scenarios** describe how one or more tasks are carried out by a person. 4. Task models are created during analysis to describe current **tasks**. They are also created or updated during design to describe intended **tasks**. Example of task model: Setting: 1. **Interactive system**: Ticket machine for public transport; 2. **User**: Person using public transport; 3. **Task**: Purchase a ticket to allow travel from the user's current location to a specific destination using public transport; 4. Precondition: The **user** has decided they need to be at a specific location at a specific time and will use public transport to get there; 5. **Goal** (intended outcome): The **user** has purchased a suitable ticket. Subtasks: 1. Identify the available modes of transport to the destination, for example bus or underground. 2. Establish the departure time for each mode of transport, factoring in any transfers. 3. Establish the costs for each mode of transport. 4. Select the preferred mode of transport (based on departure time; duration; cost; any preferences for specific modes of transport). 5. Pay for the ticket. 6. Take the ticket.
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: 1. The **observer** behaves unobtrusively except that they may ask an occasional clarifying question. 2. If no **interactive system** is available, existing procedures can be observed. 3. 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.

Term	Definition

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**. Through inquiry and interpretation, it reveals commonalities and differences across the **user** base.
	
	Notes:
	1. 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.
	2. Interview questions should be
	   a. **Open** rather than **closed**;
	   b. **Neutral** rather than **leading**.
	3. The main purpose of an interview is to gather information about **users**, **goals**, **tasks**, **resources** and **environments** – that is, how things are currently done.
	   In an **iterative** cycle, a **low-fidelity prototype** based on data collected from **users** through **observation** and **interviews** may be subsequently evaluated with **users** to clarify the understanding of the **context of use**, **user needs**, **user requirements** and the **use scenario** for the **interactive system**.
	4. Interview participants may make valuable suggestions regarding the expected future system – these can be documented separately and should be probed in subsequent interviews to check their validity. They can also be communicated through **as-is scenarios** as shown in example 2 in the definition of **as-is scenario**.
	5. Where possible, interviews should be done contextually, however any interview is better than no interview at all.
	6. Successful interviewers
	   a. Use **open questions** and avoid **closed questions**;
	   b. Use **neutral questions** and avoid **leading questions**;
	   c. Don't talk too much;
	   d. Use an **interview checklist** but remain flexible;
	   e. Prepare for the interview;
	   f. Remain curious;
	   g. Check their notes before the interview participant leaves so they never leave unsure about what happened.
	7. Compare this definition to **contextual interview**, **pre-session interview** and **post-session interview**.

Contextual interview	An **interview** that takes place at the location where the **user's** interaction with the **interactive system** usually takes place and focuses on the **context of use** of the **user**.
Interview checklist	A written list of suitable questions and cues used by the interviewer during an **interview** to make sure that all relevant topics are covered.

Term	Definition
Master-apprentice model	A principle for a successful **contextual 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. Notes: 1. The interviewer asks because they sincerely want to learn – not because they want to demonstrate their knowledge. 2. Everything the master says is correct. Sometimes the apprentice must ask several questions in order to fully understand the master – the interviewer must never leave unsure about what happened. 3. Typical mistakes include: a. Interrupting the master; b. Attempting to influence the master; c. Doubting or even trying to correct the master; d. Using the **interview checklist** to steer the **interview** rather than letting the master address issues in the way they prefer.
Open question	A question in an **interview** that does not give any indication of the expected format or content of the answer. Notes: 1. Open questions are desirable in **interviews** because they invite **users** to start talking and provide extensive answers to questions. 2. Compare this to a **closed question**. Examples: 1. For examples of open (and **neutral**) **interview** questions see **Neutral question**.
Closed question	An interview question that requires an answer from a predetermined set of alternatives, for example yes and no. Notes: 1. Avoid several closed questions in sequence. They stop users talking because they sound like a police interrogation. 2. Compare this to an **open question**. Example: 1. Closed question: "Have you ever rented a car?" A corresponding **open question** might be: "Please tell me about the last time you rented a car."
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. Note: 1. Compare this to a **leading question**. Examples of neutral (and **open**) **interview** questions: 1. "What happened?" 2. "What do you mean by that?" 3. "What possibilities do you have now?" 4. "What should the home page of the new car rental website look like?"

Term	Definition
Leading question	A question in an **interview** that signals a preference for certain possibilities, or attempts to direct the reply in a certain direction. Note: 1. Compare this to a **neutral question**. Examples of leading questions: 1. "Would you like to have the ability to categorise clients by their annual spend with your company?" 2. "What advantages does the current car rental website offer for your choice of rental car?"
Focus group	A focused discussion where a **moderator** leads a group of participants through a set of questions on specific topics. Note: 1. 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.
As-is scenario	A narrative text description of the procedure a specific **user** currently follows to complete one or more **tasks**. Notes: 1. The specific **user** in the scenario is often a **persona**. 2. As-is scenarios are created by a **user experience professional** based on results from **observation** and **contextual interviews**. 3. As-is scenarios are a suitable basis for developing **personas** as thinking about **users** in their current **context of use** involves thinking about what they want to do, and thinking about activities involves thinking about who will be undertaking them. 4. As-is scenarios are reviewed by **users** to detect misunderstandings that may have occurred during **contextual interview**. Examples: 1. As-is scenario "John Miller is a business traveller who often takes flights in the course of a week. He prefers to take his car to the airport. But every now and then he misses a flight and then regrets not having taken a taxi or tram to the airport. He simply underestimates the queues at the front of the car park and the walking time to the gate." Compare this example to the corresponding example in **use scenario**. 2. Suggestions from interview participants may be added to the as-is scenario: John Miller suggests: "It would be wonderful if I could just pre-order a parking spot and skip the queues. If I find out that no parking spots are available, I could simply call a taxi. This would allow me to plan my time better. They could also offer an express valet service, where I would simply leave my car and my keys and they would park the car for me – for a fee, of course."

Term	Definition
Persona	A description of a fictitious but realistic **user** and what they intend to do when using an **interactive system**. Notes: 1. Personas are not real people; they are realistic representations of **users**, constructed from empirically determined data, for example from **observations** or **interviews**. 2. 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. Example of a persona for an app to remotely control locks in private homes: **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 and 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.

Term	Definition
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: 1. Besides depicting **as-is scenarios** or **use scenarios**, 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. 2. User journey maps do not replace **as-is scenarios** or **use scenarios**. 3. User journey maps are graphs or tables that show the full **user experience** for **users** in general. User journey maps can also show the user experience for a **persona**. 4. User journey maps are created during analysis to describe current encounters. They are also created or updated during design to describe intended encounters. Examples: 1. Examples of touchpoints: a. The first contact with the **interactive system**: "How I heard about that new service." Also: Ads, quotes and sales staff that answer **users**' pre-sales questions; b. The direct task-oriented interaction, including support staff, bills, instruction manuals and people who deliver products; c. Telling others about my **user experience**, for example, writing a report to colleagues about my experience with the new **interactive system**. 2. Example of 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.

5. Specify the user requirements

LO #	Learning Objective
5.1	Know what **user needs** are
5.2	Know the relationship and difference between a **user need** and a **user requirement**
5.3	Understand **user requirement**
5.4	Understand the difference between **market**, **organisational** and **user requirements**
5.5	Understand the difference between **qualitative** and **quantitative user requirements**

The purpose of "Specify the user requirements" is to define precise, determinable **user requirements** that must be met by the **interactive system** before it is released. **User requirements** are based on the **user needs** identified based on the results of the previous activity, "Understand and specify the context of use". **User needs** may not have been explicitly formulated.

User profiles, personas, as-is scenarios and **task models** from the analysis of the **context of use** are used to identify solution-independent **user needs**.

Qualitative or **quantitative user requirements** are derived from **user needs**. **User requirements** must be verifiable so it is possible to determine in a **usability evaluation** whether a **prototype** fulfils them or not.

The **user requirements** are also used to guide the design in order to ensure that the **interactive system** meets **user**'s expectations as closely as possible.

Term	Definition
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**. The purpose of user needs is to serve as a helpful intermediate step in the transformation of the **context of use** information into comprehensive **user requirements**. Notes: 1. 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". 2. User needs are identified based on various approaches including **interviews** with users, **observations**, **user surveys**, **usability evaluations**, expert analysis, etc. 3. User needs often represent gaps (or discrepancies) between what is and what should be. 4. User needs are transformed into **user requirements**. **User requirements** are then prioritised for implementation, taking the **context of use**, user priorities, trade-offs with other **requirements** and constraints into consideration. Examples of user needs: 1. 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**). 2. 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**). See also the examples in **User requirement**.
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 Notes: 1. A requirement should have a determinable condition that makes it possible to validate it. 2. This curriculum defines the following types of requirements: a. **Market requirement**; b. **Organisational requirement**; c. **User requirement**. 3. This curriculum further distinguishes between the following types of **user requirements**: a. **Qualitative user requirement**; b. **Quantitative user requirement**.
Market requirement	A **requirement** for an **interactive system** based on marketing policy aimed at maximizing business opportunities, purchase and use. Examples: 1. The website must be at least as usable as that of the two top competitors. 2. The colours used on the website must conform to the **style guide**.

| Term	Definition
Organisational requirement	An organisational rule that **users** have to follow when conducting their **tasks**. Note: 1. Organisational requirements are **requirements** on the **users** that lead to **requirements** on the **interactive system**. 2. Organisational requirement may be based on regulatory requirements. Examples: 1. A salesperson must have a written approval from the director for offers that exceed 100.000 Euros. 2. A support staff member must send a **user** of the **interactive system** a gift card with a value of up to 50€ if the **user** has a reasonable complaint. 3. Organisational requirements based on regulatory requirements: a. Users must confirm that they have read the terms and conditions before continuing. b. Minors are explicitly told that they are not allowed to proceed past the front page of a sports betting website.
User requirement	A **requirement** for use that provides the basis for design and **evaluation** of an **interactive system** to meet identified **user needs**. Notes: 1. User requirements are derived from **user needs**. 2. A user requirement can be a **qualitative user requirement** or a **quantitative user requirement**. 3. Both **qualitative** and **quantitative user requirements** provide a basis for the design of the **interactive system** and can be verified by evaluating the **interactive system**. While **qualitative user requirements** address the way in which the **interactive system** is used to arrive at a user **goal**, **quantitative user requirements** set measurable **goals** for **usability** and **user experience**. Examples of relationships between **user need** and user requirement: 1. **User need**: Users who frequently rent cars from a car rental company need to know what options they chose for previous reservations so they can apply them to future reservations. Corresponding **user requirements**: a. Users must be able to select the types of cars they chose in previous reservations; b. Users must be able to select the payment methods they used for previous reservations. 2. **User need**: During a disaster in a motorway tunnel, car drivers in the tunnel need to avoid breathing poisonous gases in order to survive the disaster. Corresponding user requirements: a. Users must be able to recognise immediately that poisonous gases are present around them as soon as they have been technically detected. b. At any location in the tunnel, users must be able to detect how to get to the next rescue room. Corresponding **organisational requirements**: c. The organisation operating the tunnel must ensure that rescue rooms are available at regular intervals throughout the tunnel. d. The air pressure in the rescue rooms must exceed the air pressure of the surroundings. 3. **User need**: During heart surgery, the anaesthetist needs to be aware of the patient's vital signs in order to keep them stable. Corresponding user requirements: a. Users must be able to monitor changes in the blood pressure during the operation. b. At any time, users must see the heart activity of the patient.

Term	Definition

Qualitative user requirement	A statement of what **users** must be able to locate, recognise, understand, select or input as part of conducting a **task** with the **interactive system** to meet identified **user needs** in a specified **context of use.**
	
	Note:
	1. Qualitative user requirements are not features. They provide the basis for features.
	
	Examples:
	1. Reasonable qualitative user requirements:
	   a. "The user must be able to see the number of people and suitcases that can fit into the cars available within a specific price range at the car rental website."
	   b. "The user must be able to select a car with automatic transmission on the car rental website."
	   c. "The user must be able to see the opening hours of a specific car rental location."
	2. Incorrect qualitative user requirements:
	   a. "The user interface must be usable and support all user tasks" (too general).
	   b. "The user interface must have a big, red 'Rent this car' button" (too detailed, and there is no user requirement, only a solution).

Quantitative user requirement	A required level of **usability** to meet identified **user needs** expressed in terms of measures of **effectiveness**, **efficiency**, **satisfaction, accessibility, user experience** and avoidance of harm from use in a specified **context of use**.
	
	Notes:
	1. 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.
	2. When defining suitable quantitative user requirements:
	   a. Look for guidance from existing systems – **users** will expect the new **interactive system** to perform better than or at least as well as the existing system.
	   b. Consider quantitative user requirements set by **stakeholders** who have an interest in a specific minimum performance of the **interactive system**.
	   c. Verify quantitative user requirements with **users** to determine whether or not they are appropriate from their perspective.
	
	Examples:
	1. 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."
	2. 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."
	3. 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.' "
	4. Measure of accessibility: "80% of 25 people using screen readers must be able to rent a car as specified in example 2 within 10 minutes."
	5. Measure of user experience: "After using the interactive system for a month, 80% of 200 users must answer 'Agree' or 'Strongly agree' to the statement 'I would recommend this product to a friend.' ".
	6. Measure of avoidance of harm from use: "99% of 100 users who have booked a flight must be fully aware of the dates they have selected, and of any additional costs.
	7. Compare the above example to the examples in **qualitative user requirement**.

6. Design: produce design solutions to meet user requirements

LO #	Learning Objective
6.0.1	Understand what a **use scenario** is
6.0.2	Know what **information architecture** and **navigation structure** are
6.0.3	Know what **card sorting** is
6.0.4	Know what a **storyboard** is
6.0.5	Understand **prototypes** and **wireframes**
6.0.6	Know the difference between **low-fidelity** and **high-fidelity prototypes**
6.0.7	Know what **user assistance** is

The purpose of "Design: produce design solutions to meet user requirements" is to convert **user needs** and **user requirements** into a working **interactive system** – that is, a design solution. Deliverables from the analysis of the **context of use**, such as **user groups**, **as-is scenarios** and **personas** are also used. The conversion considers **dialogue principles**, **heuristics**, **style guides** and design concepts like **affordance** and **mental models** as described in section 6.1. **Design patterns** are existing design solutions that have been shown to work for **users** and can therefore be reused in the designs of new **interactive systems**.

The approach is iterative as indicated by the following diagram:
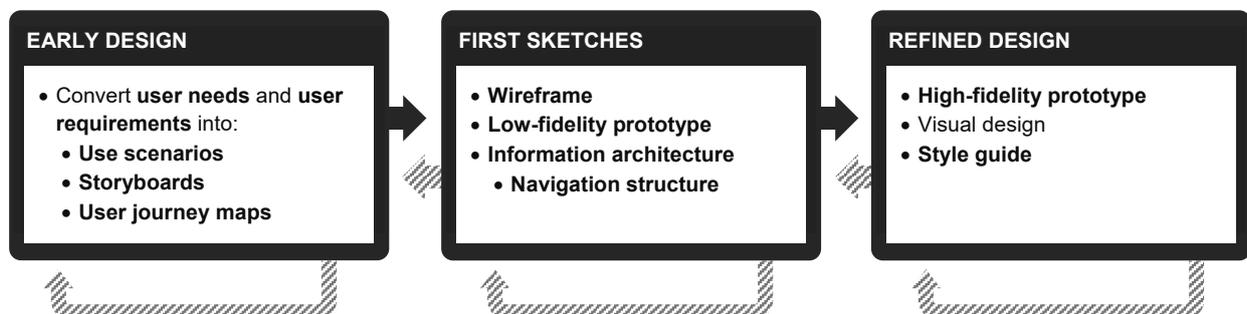
The approach is **iterative**. The hatched arrows indicate **iterative** cycles that are required when a **usability evaluation** shows that **user requirements** have not yet been fully met. Many iterations may be required before the **interactive system** meets the **user requirements**.

Use scenarios, storyboards and **user journey maps** are cheap and fast methods of describing how **tasks** could be accomplished with the intended **interactive system**. They tell **stakeholders** how **user needs** could be met. **Use scenarios** are text-based; **user journey maps** are graphic; **storyboards** are comic-book like depictions.

The primary purpose of a **prototype** is to serve as the basis for a **usability evaluation**, often a **usability test**. The results from the **usability evaluation** guide the redesign and refinement of the **prototype**. A secondary purpose of a **prototype** is to give **stakeholders** and **users** an early impression of the design of the **interactive system,** in order to promote constructive discussions.

Prototypes can be **low-fidelity prototypes** or **high-fidelity prototypes** containing varying amounts of detail and interaction.

Low-fidelity prototypes are based on **use scenarios** and **storyboards**. They may look sketchy. They are cheap to create and thus easy to discard if they don't work. They may include **wireframes**, which are screens that consist solely of straight lines, rectangles and text. They may also include screens drawn on paper. In a **usability evaluation** of a paper-based **low-fidelity prototype**, a human being replaces the computer.

The **iterative** process gradually refines **low-fidelity prototypes** into **high-fidelity prototypes**, which in turn inform and steer a working **interactive system** that can be released once it meets **user requirements.**

The **information architecture** and the **navigation structure** are developed in parallel with the **prototypes**. From a human-centred point of view, the **information architecture** is the naming and structuring of the information that is accessible to **users**. The **navigation structure** is the logical organisation of the screens, pages and windows that comprise the **user interface** – that is, the links and menus that enable **users** to get from one set of information to another.

Card sorting can be used to create a human-centred **navigation structure**.

Term	Definition
Use scenario	A narrative text description that describes an intended usage situation with the **interactive system** under development. Notes: 1. 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**. 2. The specific **user** in the use scenario is often a **persona**. 3. 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. 4. A use scenario should avoid placing unnecessary constraints on the design by referencing specific objects, such as command buttons, in the **user interface**. Example of a use scenario: 1. "Before leaving for the airport, John Miller checks the availability at the airport car park with his new application. If enough parking spaces are available, he reserves one with his new application and then calmly drives to the airport. He knows that since the application has been launched there is a separate entry for cars with reservations." Compare this example to the example in **as-is scenario**. 2. The following text is a bad example because it is too specific and violates note 5: "John Miller looks at the 'Overview of available parking spaces' screen and selects one by clicking the 'Select' button. He then clicks the 'Reserve'-button and reserves the parking space."

Information architecture	The naming and structuring of the information that must be accessible to the **user**.
	
	Note:
	1. Examples of UX-related deliverables in the information architecture:
	  a. Data model from the user perspective; content and content hierarchy;
	  b. The words used in the **user interface**, for navigation and content;
	  c. **Navigation structure**, for example menu structure and site map.

Navigation structure	The logical organisation of the units of displayed information that comprise the **user interface**.
	
	Notes:
	1. In practice, the "units of displayed information" are often screens, pages or windows.
	2. The navigation structure comprises:
	  a. The logical structure, for example hierarchy, the order and grouping of elements of the user interface and navigation items.
	  b. The navigation elements that are used to navigate the structure, for example menus and breadcrumbs.
	3. The navigation structure is part of the **information architecture**.

Term	Definition
Storyboard	A sequence of visual frames illustrating the interplay between a **user** and an envisioned **interactive system**. Notes: 1. The purpose of a storyboard is similar to the purpose of a **use scenario**. 2. A storyboard is a comic book style representation of a **use scenario**. 3. Storyboards can also be used to illustrate a current **user experience**. Example: Parking assistant, similar to example 1 in the definition of **Use scenario**

Before leaving for the airport, John Miller checks the availability at the airport car park with his new app. He sees that parking spaces are available, so he reserves a place to park...

… and then calmly drives to the airport with his car.

He knows that since the app has been launched, there is a separate entry for cars with reservations.
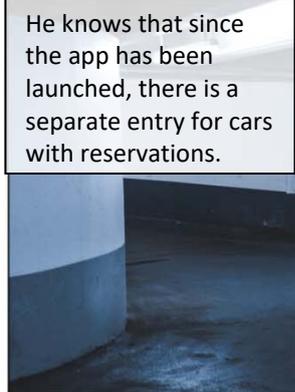
John parks his car…
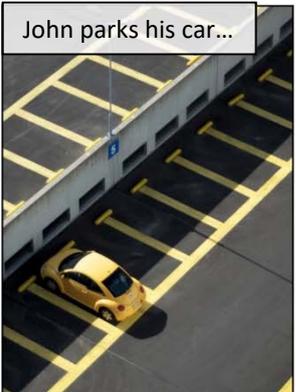
… and arrives with plenty of time to catch his flight.

Term	Definition
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. Notes: 1. There are two methods of card sorting – open and closed: a. During open card sorting, **users** are asked to sort the cards into groups that they feel represent distinct domains of information. b. 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. 2. After an open card sort, **users** are asked to name each group. If a majority of **users** suggest the same name, use that name as the group title. 3. The groups provide important clues as to how human-centred menus could be structured and named. The group titles may be used as menu titles. 4. If **users** ask about the meaning of a concept, explain it to them and ask, "what do you call this concept?" 5. Encourage **users** to add additional concepts that are important to them during the card sort. Have blank cards ready for this purpose. 6. If several **users** consider a concept superfluous or irrelevant, consider dropping it from the menu. 7. Various tools are available to help you prepare, execute and analyse card sorting sessions.
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**. Notes: 1. The key purposes of a prototype are a. 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. b. 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?". c. To show **stakeholders** and colleagues a concrete example of what it is that you are planning. d. To serve as a specification for the implementation of the **interactive system**. This particularly applies to **high-fidelity prototypes**. 2. This curriculum distinguishes between **low-fidelity prototype** and **high-fidelity prototype**.
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: 1. Wireframes typically do not address visual design and precise layout.
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: 1. A low-fidelity prototype is often created using paper, pens, sticky notes and so on. Screen mock-ups are often made using a prototyping tool. 2. A low-fidelity prototype may be operated by a human being instead of a computer. 3. A low-fidelity prototype should be capable of being updated in moments.

Term	Definition
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**.

User assistance	Information to help a **user** to interact with an **interactive system**.
	
	Notes:
	1. User assistance can include describing the **user interface**, but it also focuses on how to help the **user** to best apply the capabilities of the **interactive system** to their needs.
	2. User assistance incorporates all forms of help available to a **user**, for example
	   a. User documentation: Written or other information for **users** about an **interactive system**, how it works, and how to use it;
	   b. Online help: Assistance delivered through computer software that can be topic-oriented, procedural or reference information;
	   c. System-initiated guidance: Unsolicited, explicit information about an event or a condition from an **interactive system** to a **user**.
	
	Examples of system-initiated guidance are:
	a. Messages (informative, warning, error), for example "Your battery is almost empty. Please connect your notebook to a charger";
	b. Status information, for example "You have 7 new messages";
	c. Instructions, for example "Separate e-mail addresses by a space, comma, semicolon or line break."

6.1. Dialogue principles and user interface guidelines

LO #	Learning Objective
6.1.1	Understand the concept: **dialogue principle**
6.1.2	Know each of the seven **dialogue principles**
6.1.3	Know what a **heuristic** is
6.1.4	Understand the concept: **affordance**
6.1.5	Know what a **mental model** is
6.1.6	Understand the purpose of **user interface guidelines** and **style guides**
6.1.7	Understand the differences between **dialogue principles** and **user interface guidelines**
6.1.8	Know what a **user interface element** is
6.1.9	Know what a **design pattern** is

Dialogue principles and **user interface guidelines** are rules, of varying levels of specificity, used to guide the design of the interaction (see section 6). They are intended to make the interaction effective, efficient and satisfying, to avoid common **usability problems** and to ensure a **consistent user interface**.

Dialogue principles and **heuristics** are general guidance for the design of usable **dialogues**. There are seven **dialogue principles**; examples of **dialogue principles** are **conformity with user expectations** and **error tolerance**. **Dialogue principles** are not bound to any specific technology or method.

The concepts of **affordance** and **mental model** supplement the **dialogue principles**. **Affordance** is an aspect of an object that makes it obvious how the object could be used. A **mental model** is the perception people have of themselves and of the things with which they interact.

User interface guidelines are low-level, specific rules or recommendations for **user interface** design that leave little room for interpretation, allowing designers to implement them consistently.

Style guides are collections of **user interface guidelines**; they are used to ensure consistency in the appearance and behaviour of **user interfaces** across **interactive systems** produced by the same organisation.

A **user interface element** is a discreet component of the **user interface. User interface elements** include text, hyperlinks and command buttons.

A **design pattern** is a general solution to a commonly occurring problem within a given context in software design. Examples of **design patterns** are log-in dialogues and check-out process in a web shop.

Term	Definition

Dialogue principles	General goals for the design of useful and usable dialogues.
	
	Notes:
	1. Dialogue principles are not bound to any specific technology or method.
	2. ISO 9241-110 lists the following seven dialogue principles:
	  a. **Suitability for the task**;
	  b. **Self-descriptiveness**;
	  c. **Conformity with user expectations**;
	  d. **Suitability for learning**;
	  e. **Controllability**;
	  f. **Error tolerance**;
	  g. **Suitability for individualisation**.
	3. Comparison of **dialogue principle**, **heuristic** and **user interface guideline**:
	
	<table><tr><td>**Concept**</td><td>**Applicability**</td></tr><tr><td>Dialogue principle</td><td>General</td></tr><tr><td>Heuristic</td><td>General, but more specific than a dialogue principle</td></tr><tr><td>User interface guideline</td><td>Specific to a user interface platform, technology, application domain or organisation</td></tr></table>

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**).
	
	Notes:
	1. Examples of recommendations from ISO 9241-110 for observing the **dialogue principle**:
	  a. The **dialogue** should present the **user** with information related to the successful completion of the **task**.
	  b. The **dialogue** should avoid presenting the **user** with information not needed for the successful completion of relevant **tasks**.
	  c. The format of input and output should be appropriate to the **task**. If typical input values are required for a **task**, these values should be available to the **user** automatically as defaults.
	  d. The steps required by the **dialogue** should be appropriate to the completion of the **task** – that is, necessary steps should be included and unnecessary steps should be avoided.
	2. Suitability for the task is a **dialogue principle**.

Self-descriptive-ness	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. Notes: 1. Clear and descriptive titles, breadcrumbs, appropriate feedback and progress indicators, and **affordances**, including clear instructions, are means to make an **interactive system** self-descriptive. 2. Self-descriptiveness is a **dialogue principle**.
Conformity with user expectations	Correspondence to predictable contextual needs of the user and to commonly accepted conventions. Notes: 1. **Consistency** is an aspect of Conformity with user expectations. 2. Compliance with **style guides** is a means to establish **consistency**. 3. Conformity with user expectations is a **dialogue principle**.

Term	Definition
Suitability for learning	A dialogue is suitable for learning when it supports and guides the **user** in learning to use the **interactive system**. Notes: 1. Examples of recommendations from ISO 9241-110 for observing the **dialogue principle**: a. The **dialogue** should provide sufficient feedback about the intermediary and final results of an activity so that the **user** learns from successfully accomplished activities. b. If appropriate to the **tasks** and learning goals, the **interactive system** should allow the **user** to explore ("try out") dialogue steps without negative consequences. 2. Suitability for learning is a **dialogue principle**. Example of suitability for learning: 1. When a **user** downloads a new app, very often it will have a step-by-step guide on how to use some of the key features. Initially, the guide will display a short explanation of a feature. On pressing 'next' it will explain the next feature, and so on.
Control-lability	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. Notes: 1. Properly placed and labelled exit-buttons ("Cancel", "Skip" or "Stop"), undo and redo are means to make an **interactive system** controllable. 2. Controllability is a **dialogue principle**.
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. Note: 1. Error tolerance is a **dialogue principle**. Examples of error tolerance: 1. 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. 2. If severe consequences could result from a user action, the **interactive system** should provide explanation and request confirmation from the **user** before carrying out the action.
Suitability for individualisation	The property of a dialogue that allows **users** to modify interactions and the presentation of information to suit their individual capabilities and needs. Note: 1. Suitability for individualisation is a **dialogue principle**. Example: 1. A news app lets **users** individualise which news topics or content they want to see, for example, they can choose to see technology news but not sports or entertainment news. It also lets **users** adjust certain characteristics of the **user interface**, for example, text size and contrast.

Term	Definition

Consistency	The same information is presented in the same way throughout the interactive system, in accordance with the user's expectation.
	
	Notes:
	1. Consistency is an aspect of **Conformity with user expectations**.
	2. Consistency is relevant on several levels, for example;
	  a. Within a screen;
	  b. Across screens in the same **interactive system**;
	  c. Across **interactive systems** from the same manufacturer;
	  d. Across similar **interactive systems** from different manufacturers.

Heuristic	A generally recognised rule of thumb that helps to achieve usability. Note: 1. For a comparison of **dialogue principle**, **heuristic** and **user interface guideline**, see **dialogue principle**, note 3. Examples of generally recognised heuristics: 1. Speak the users' language (related to the **dialogue principle**, **conformity with user expectations**). 2. Follow platform conventions (related to the **dialogue principle**, **conformity with user expectations**. 3. Minimise the user's memory load by making objects, actions, and options visible (related to the **dialogue principle**, **suitability for the task**). 4. Visibility of system status (related to the **dialogue principle**, **self-descriptiveness**). 5. Help users recognise, diagnose, and recover from errors (related to the **dialogue principle**, **error tolerance**).
Affordance	An aspect of an object that makes it obvious how the object could be used. Examples of affordances: 1. A handle on a teapot or teacup provides an obvious affordance for holding. 2. A command button on a web page provides an affordance for clicking. 3. 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: 1. Alternative, popular definition: A person's thought process about how something works in the real world. 2. People form mental models through experience, training and instruction. The mental model of an **interactive system** is formed largely by interpreting its perceived actions and its visible structure. Expectations resulting from the use of other or similar systems are also of importance. 3. If a user's mental model of an **interactive system** is incomplete or contradictory, then the user cannot easily use the **interactive system**. Example: 1. 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.

Term	Definition
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. Notes: 1. Collections of user interface guidelines are called **style guides**. 2. For a comparison of **dialogue principle**, **heuristic** and **user interface guideline**, see **dialogue principle**, note 3. Examples of user interface guidelines: 1. For all controls, such as radio buttons, select the safest, most secure value by default to prevent loss of data or system access. If safety and security aren't factors, select the most likely or convenient value. 2. The company logo must appear in the upper left corner of each page. Its position must be exactly the same as on the home page. Clicking the logo must cause the home page to be displayed. 3. The height of a command button must be 23 pixels.
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 Note: 1. Many organisations have a style guide to ensure the **consistency** of their corporate design, for example how to use and how not to use the logo, corporate colours and standard layouts for print and advertising. Examples of style guides: 1. Windows User Experience Interaction Guidelines for Windows Desktop apps ("UX Guide") 2. IOS Human Interface Guidelines
User interface element	A basic component of a **user interface** that is presented to the **user** by the **interactive system**. Note: 1. User interface elements are the basis for creating the functions that **users** need in order to complete **tasks** with **the interactive system**. 2. User interface elements may or may not be interactive Examples: 1. Common examples of user interface elements include paragraphs of text, hyperlinks, push buttons, radio buttons, check boxes and tool tips. 2. A single word in a paragraph of text or the words on a push button are not user interface elements. 3. 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.

Term	Definition
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. Notes; 1. A single **user interface element** to solve a certain design problem can be considered a design pattern, for example a tab. 2. Design patterns must comply with relevant **user interface guidelines**. Examples: 1. Accordions, tabs Solve the design problem "The interactive system has more data to display than can fit in the available screen area." 2. Wizards Solve the design problem "Novice users need a complicated procedure explained in small, easy-to-digest steps." 3. Frequently asked questions (FAQ) Solve the design problem "Users may have one of many questions concerning an interactive system."

7. Evaluate the design against user requirements

7.1. Usability tests

7.1.1	Understand **usability evaluation**
7.1.2	Understand the role of **usability evaluation** in **human-centred design**
7.1.3	Understand the key differences between **usability tests**, **usability inspections** and **user surveys**
7.1.4	Understand why **interviews** and **focus groups** are unsuitable for **usability evaluation**
7.1.5	Understand **usability test** and the main activities in a **usability test**
7.1.6	Know what a **remote usability test** and an **unmoderated usability test** are
7.1.7	Know how a **usability test** is prepared
7.1.8	Know what a **usability test plan** and a **usability test script** are
7.1.9	Understand **usability test task**
7.1.10	Know how **usability test participants** are **recruited**
7.1.11	Understand the activities in a **usability test session**: **Briefing, pre-session interview, moderation** and **post-session interview**
7.1.12	Know what a **usability lab** is
7.1.13	Know what **usability evaluation reports** and **usability test reports** are
7.1.14	Understand **usability findings**
7.1.15	Know the importance of positive **usability findings**
7.1.16	Know the **ratings** used for **usability findings**
7.1.17	Understand the responsibilities in a **usability test**: **Moderator, note-taker, observer** and **usability test participant**

The purpose of a **usability evaluation** is to determine whether or not an **interactive system**, or a **prototype** of an **interactive system**, meets the **user requirements** and applicable **dialogue principles**, **heuristics** and **user interface guidelines**.

This curriculum addresses three forms of **usability evaluation**: **usability test**, **usability inspection** and **user survey**. In **usability tests** and **user surveys**, users are involved in the **usability evaluation**, while **usability inspections** are carried out solely by **user experience professionals**.

A **usability test** shows what representative **users** are able to accomplish with the **interactive system** when they carry out representative **tasks**. Eliciting personal opinions from **users**, or discussing them, is not part of a **usability test**.

The main activities in a **usability test** are shown in the diagram below:

PREPARE FOR THE USABILITY TEST		CONDUCT THE USABILITY TEST SESSIONS		REPORT THE RESULTS
• Write a **usability test plan** • Write the **usability test script** • Include **usability test tasks** • **Recruit test participants**	→	• **Briefing** • **Pre-session interview** • Solve **usability test tasks** • **Post-session interview**	→	• Write the **usability test report** • Communicate the **usability findings**
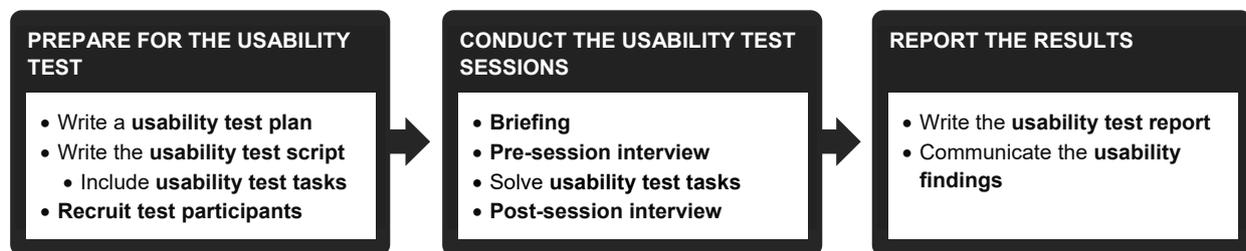
The first activity in a **usability test** is to write the **usability test plan**. This describes the purpose of the **usability test** and provides cost and time estimates.

The **usability test script** contains the **usability test tasks** and checklists for the **briefing** and interviews that are part of each **usability test session**.

The preparation of the **usability test** also includes **recruiting usability test participants** – these are representative **users** of the **interactive system**.

A **usability test** typically consists of 4 to 25 **usability test sessions**. In each **usability test session**, a **usability test participant** carries out specific, representative **usability test tasks** with the **interactive system**.

The **moderator** starts the **usability test session** by **briefing** the **usability test participant** about what will happen during the session. The **moderator** then conducts a pre-session interview with the **usability test participant** to learn about their background and knowledge of the **interactive system** they will be testing. The **moderator** quietly observes the **usability test participant**, who is encouraged to think aloud as they solve **usability test tasks**. A **note-taker** documents successes and failures. **Stakeholders** often observe **usability test sessions** to see for themselves how the **interactive system** is performing. Finally, the **moderator** conducts a brief post-session interview with the **usability test participant** to understand their overall impressions of the **interactive system**.

After all **usability test sessions** have been completed, the results are analysed and documented. A **usability test report** is written which describes the **usability findings** from the **usability test**. The **usability test report** contains both **usability problems** and positive **usability findings**.

Term	Definition
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: 1. Usability evaluation is a common term for a. **Usability test**; b. **User survey;** c. **Usability inspection**.
Usability test	A **usability evaluation** that involves representative **users** performing specific **tasks** with the **interactive system** to enable identification and analysis of **usability problems**, or the measurement of **effectiveness**, **efficiency**, and user **satisfaction**. Notes: 1. A usability test usually has three phases: a. Planning – this includes writing the **usability test plan**, writing the **usability test script** and **recruiting** suitable **usability test participants**; b. Conducting **usability test sessions** as described in note 2; c. Communicating **usability findings** – this includes writing the **usability test report**. 2. 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**. 3. **Moderators** often encourage **usability test participants** to think aloud during a **usability test session**, because they need to understand the thought processes of the **usability test participants**. Such qualitative usability tests are sometimes referred to as "think aloud tests". 4. The **usability test participant** and the **moderator** are usually in the same physical location during a usability test. During a **remote usability test** the **usability test participant** and the **moderator** are in different locations. During an **unmoderated usability test** there is no **moderator**. 5. **Usability tests** may occur at any time during the **human-centred design** process, from early analysis through **interactive system** delivery and beyond. **Usability tests** may be based on paper sketches or display mock-ups, as well as on **interactive systems** under design and completed **interactive systems**. 6. **Usability test sessions** are conducted by a **moderator** and viewed by a number of **observers** – these are often **stakeholders**. A **note-taker** records important **usability findings**.
Remote usability test	A usability test where the **usability test participant** and the **moderator** are in different physical locations. Notes: 1. The **moderator** observes the **usability test participant** using an internet connection. 2. The **moderator** communicates with the **usability test participant** over the telephone or via an internet connection.

Term	Definition
Unmoderated usability test	A **usability test** where **usability test participants** solve **usability test tasks** without a **moderator**. Notes: 1. The **usability test participant's** actions are usually video recorded for later analysis. 2. Unmoderated usability tests are usually conducted on the **usability test participant's** computer. The **usability test session** is recorded using specialist software installed on the computer. After each **usability test session**, the software sends the video recording to the client for analysis. 3. An unmoderated usability test is sometimes called an unmoderated remote usability test.

Usability test plan	A brief description of the purpose and extent of a **usability test**.
	
	 Notes:
	 1. The usability test plan is intended for management to decide whether the **usability test** should be conducted or not. It is deliberately brief and focuses on the resources required for the **usability test**.
	 2. The usability test plan includes:
	    a. The **goal** of the **usability test**;
	    b. The number of planned **usability test participants**;
	    c. The approximate length of each **usability test session**;
	    d. The name of the **moderator**;
	    e. A time plan.
	 3. The usability test plan may also include a cost estimate for the **usability test** including person hours.
	 4. Further details about the **usability test** such as **usability test tasks**, test method and required software and hardware are provided in the **usability test script**.

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.
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 usability test tasks for a car rental website: 1. What would you do if you needed to speak to someone about renting a car? 2. Please rent a car that suits your needs and is in a price range that you'd normally consider. You can choose the location you pick it up from and the amount of time you hire it for. 3. Please rent a small car from London Heathrow Airport, from 9.00 tomorrow morning. You'll need to return the car 4 days later, to the same location, at midday. 4. Please could you cancel the reservation that you made earlier. Examples of invalid usability test tasks: 1. Tell me what you think of the home page (opinion). 2. Stroll around on the website for 5 minutes and tell me what you think (hazy, opinion). 3. Are the rental conditions agreeable? (does not address usability).
Recruiting	A process for selecting candidates that have the appropriate characteristics to participate in a human-centred activity such as a **focus group, contextual interview**, or **usability test**. Notes: 1. A recruitment screener is often used to determine whether candidates have the appropriate characteristics to participate in the human-centred activity. It consists of a series of questions for prospective participants to identify whether they represent the intended **users** 2. Relevant characteristics might include: Personal and professional background, knowledge of the subject matter, attitudes and interests.

Term	Definition

Usability test session	A part of a **usability test** where one **usability test participant** carries out representative **usability test tasks** using the **interactive system** or a **prototype** of the **interactive system**.
	
	Note:
	1. In a usability test session, the **moderator** typically:
	   a. Greets the **usability test participant**;
	   b. Conducts the **briefing** and **pre-session interview**;
	   c. Hands out **usability test tasks** to the **usability test participant**;
	   d. Quietly observes the **usability test participant** while they carry out **usability test tasks**;
	   e. Conducts the **post-session interview**.

Usability test participant	A representative **user** who carries out **usability test tasks** in a **usability test session**.
Briefing	The first activity in an **interview** or a **usability test session** where the **usability test participant** is informed about the purpose of the **interview** or **usability test** and what their role and contribution will be.
Pre-session interview	An activity in a **usability test session** where the **usability test participant** answers questions about their background and previous experience with the **interactive system** and related **interactive systems**. Note: 1. The pre-session interview takes place after the **briefing** but before the **usability test participant** starts carrying out **usability test tasks**.
Post-session interview	An activity in a **usability test session** where the **usability test participant** answers questions about their **user experience** and general impression of the **interactive system**. Notes: 1. The post-session interview takes place after the **usability test participant** has carried out as many **usability test tasks** as time allows. 2. The opinions that surface during the post-session interview can help the **moderator** in understanding causes for **usability problems**, rating **usability problems** and understanding what the **usability test participant** liked.

Usability lab	Two or more rooms that are specially equipped for **usability tests** or **focus groups**.
	
	Note:
	1. A usability lab often consists of
	   a. a test room where the **usability test participant** sits;
	   b. 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 evaluation report	A document reporting the results of a **usability test**, a **usability inspection** or a **user survey**. Note: 1. The usability evaluation report for a **usability test** is usually referred to as a **usability test report**.

Term	Definition
Usability test report	A document that describes the results of a **usability test**. Notes: 1. A usability test report typically contains: a. An executive summary; b. 5-50 **usability findings** (including positive **usability findings**); c. The **usability test script** used for the **usability test**; d. Screenshots or pictures that supplement the description of important **usability findings**. 2. A usability test report is always required. A basic usability test report may consist of 3-5 pages or slides: a. A 1-page executive summary; b. 1-2 pages communicating the 5-6 most important usability findings; c. 1-2 pages detailing the usability test tasks.
Usability finding	A result from a **usability evaluation**. Note: 1. A usability finding can describe: a. A **usability problem**; b. Something that **users** liked – that is, a positive usability finding. 2. Reporting positive usability findings ensures that a. Teams are aware of aspects of the interactive system that currently work well, so that they are not unintentionally changed. b. Features that **usability test participants** liked are not removed simply because the development team was not aware that test participants appreciated them. c. A more positive attitude is adopted towards the **usability test report** and the **usability evaluation** in general.
Usability problem	A difficulty in using the **user interface** that affects the ability of the **user** to achieve their **goals effectively**, or **efficiently**, or with **satisfaction**. Note: 1. Usability problems can lead to confusion, error, delay, or outright failure to complete a **task**. Examples of usability problems are: 1. Search is not error tolerant. For example, a city search for "brigton" (instead of "brighton") provides no results. 2. A car rental website uses terms that users don't understand, for example CDW (Collision Damage Waiver), and the website provides no explanation of the terms. 3. A website has complicated rules for new passwords. 4. A loud video starts playing the moment a user lands on a web page. 5. A virus scan of a disc takes several hours. The anti-virus program offers no way of pausing or stopping the scan.

Term	Definition
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: 1. **Usability findings** are rated from the **usability test participants'** point of view. Sometimes, the ratings are done in cooperation with a domain expert. 2. Typical ratings are: a. Positive finding; b. Minor problem; c. Major problem; d. Critical problem; e. Catastrophic problem – existential threat (life-threatening problem). Examples: 1. Inability to book a flight, or booking a wrong, expensive, non-refundable flight due to poor **usability** are critical **usability problems**. 2. Renting a car with an inadequate liability insurance, or administering a lethal dose of medication due to poor **usability** are catastrophic **usability problems**.
Moderator	A neutral person who conducts a **usability test session** or a **focus group** session. Notes: 1. The moderator's tasks during a **usability test session** are described under **usability test session**. 2. Facilitator is a frequently used synonym for moderator.
Moderation	The activity carried out by a **moderator** in a **usability test** or **focus group**.
Note-taker	A **user experience professional** who makes notes of **usability findings** during a **usability test session**, **focus group** or **interview**. Notes: 1. Note-taking can be handled by the **moderator** in order to keep costs down. 2. The use of an additional note-taker allows the **moderator** to concentrate fully on the **usability test participant**.
Observer	A person who watches **users** in an **observation**, **usability test session** or **focus group**. Note: 1. Observers do not interfere with the usability activity. Observers may be actively involved in the analysis of the results.

7.2. Other evaluation methods

LO #	Learning Objective
7.2.1	Know what a **usability inspection** is
7.2.2	Know what a **heuristic evaluation** is
7.2.3	Know what a **user survey** is
7.2.4	Know what a **questionnaire** is, in particular its fields of application and the need for it to be usable

Usability inspection is a form of **usability evaluation**. It is 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**. The evaluators base their evaluation on their experience as **user experience professionals** or as **users** of the **interactive system** that is being evaluated.

A **heuristic evaluation** is a specific form of a **usability inspection** that is guided by a list of approximately 10 **heuristics**.

User surveys evaluate **users' satisfaction** with an **interactive system**. In a **user survey**, **users** report subjective data into a **questionnaire** based on their experience of using an **interactive system**. The **usability** of a **questionnaire** is important; for example, the questions in the **questionnaire** must be easy to understand and the **questionnaire** must keep **users** informed of their progress.

User surveys are also used to gather **context of use** information as part of understanding the **context of use**.

Term	Definition
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: 1. 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**. 2. Unlike **usability tests**, usability inspections do not involve **users**, except where a **user** adopts the role of evaluator. 3. **Heuristic evaluation** is a usability inspection method.
Heuristic evaluation	A **usability inspection** 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: 1. The list of **heuristics** must be manageable. Usually about 10 **heuristics** are used. 2. Evaluators can be **user experience professionals** or subject matter experts ("single experts"), or both ("double experts").
User survey	A **usability evaluation** where **users** are asked to report subjective data into a **questionnaire** based on their experience of using an **interactive system**. Notes: 1. User surveys can be used to evaluate **users' satisfaction** with an **interactive system** and to gather information on the **context of use**. 2. User surveys should be developed in accordance with the **human-centred design** process outlined in Figure 1.

Term	Definition

Questionnaire	A set of questions that is used to collect data from **users**, often in a **user survey**.
	
	Notes:
	1. Two important uses of questionnaires in **human-centred design** are:
	   a. To understand the **context of use**. Questions are about the **users**' experience with the current **interactive system** and their expectations for the intended **interactive system**. Questions are answered in text form.
	   b. To evaluate the **user experience** before, during and after the use of an **interactive system**.
	2. Questionnaires must be usable. They must adhere to **dialogue principles**, for example:
	   a. Each question must contribute significantly to the purpose of the questionnaire;
	   b. Questions must be easy to understand;
	   c. The questionnaire must keep **users** informed of their progress.
	3. As with any product, testing the questionnaire for clarity with representative **users** before launch should be considered essential.
	4. This definition applies to both digital and paper questionnaires.
	
	Examples of questions to understand **context of use**:
	1. "When did you last use the car rental website? What was your business? How did it go?"
	2. "What do you expect from a car rental website?"
	
	Examples of questions to evaluate **satisfaction**:
	1. On a scale from 1 to 5, where 1 means 'strongly disagree', 3 means 'neutral', and 5 means 'strongly agree', please rate the following statements:
	   a. The new car rental website looks cool.
	   b. The new car rental website is easy to use.
	   c. The new car rental website lets me rent cars quickly.

Informative Appendix A. Model course for preparatory training

This appendix describes a model course that teaches the entire curriculum in 2 days. The structure of the model course is not mandatory; trainers are free to organise their CPUX-F course in any way they consider optimal. The length of the course is not mandatory either; trainers may organise courses based on students' expectations and prior knowledge lasting for example 3 days, 1 day or even 3 hours.

A.1. Day 1

Basic concepts, section 2

- Show a few examples of certification questions so students have an idea of what they are studying for and how the test will be conducted. We recommend that examples of certification questions are presented throughout the course.

Exercise for *Basic concepts*:

- Simple examples of user interfaces that illustrate basic characteristics of usability
  - Effective and less effective
  - Efficient and less efficient
  - Satisfying and less satisfying
  - Accessible and less accessible

Plan the human-centred design process, section 3

Analysis: understand and specify the context of use, section 4

Exercises for *Understand and specify the context of use*:

- Interview
  - The trainer selects a suitable interactive system.
  - Students conduct an interview to understand the context of use for the chosen interactive system. One student is the interviewee, another student is the interviewer. The other students take notes.
  - Students discuss important insight gained from the interview.
  - Students discuss interview mistakes, for example missing questions and leading questions.

- Context of use description
  - Students brainstorm users, tasks, resources and environment for the system.
  - Students compare their suggestions to context of use information provided by the trainer for the system.

Specify the user requirements, section 5

Exercise for *Specify the user requirements*:

- Derive user requirements from user needs
  - The trainer provides a list of user needs for the interactive system.
  - Students derive user requirements from the user needs.
  - Students present and discuss the user requirements.

A.2. Day 2

Preparatory exercise for *Dialogue principles and user interface guidelines*:

- Evaluate a user interface
The purpose of the exercise is to establish a common understanding of the user interface of the website, which can be used as a source for specific examples of usability problems to illustrate the dialogue principles
  - Students walk through a given user interface, for example a car rental website, and use common sense to find usability problems

Dialogue principles and user interface guidelines, section 6.1

Design: produce design solutions to meet user requirements, section 6

Exercise for *Design: produce design solutions to meet user requirements:*

- Students create a low-fidelity-prototype of the interactive system which was analysed in the exercises on day 1.

Evaluation in general and usability test, section 7.1

Exercise for *Usability test*:

- Conduct a usability test session of a public website, for example ryanair.com or theguardian.com. The trainer moderates the test session. A student is the test participant.

Other evaluation methods, section 7.2

Exercises for *Other evaluation methods*:

- Students review a page from a website containing usability problems that can be found with heuristic evaluation.

- Students comment on a questionnaire provided by the trainer

Summary exercise:

- Example of certification test: Students have 20 minutes to answer 15 sample certification questions which they haven't seen before. Subsequently, the trainer reveals and discusses the answers. The goal is to familiarise students with the conditions for the certification test, and the style and concepts used in the test.

Informative Appendix B. Important changes to this document

Date, Version	Changes compared to version 2.10, 10-04-2014
23-03-2018, v3.15	Added learning objectives throughout the document. Added compact summaries of each activity at the start of each section. Removed the following definitions: 1. Intuitive; 2. Task object; 3. Usability engineer, user requirements engineer, information architect, interaction designer, user interface designer. Parts of these definitions have been moved to the definition of User experience professional; 4. Role; 5. Direct user; 6. Stakeholder requirement; 7. Recruitment screener (the screener is still mentioned in Recruiting); 8. Quality; 9. User documentation, online help, system-initiated guidance. Parts of these definitions have been moved to the definition of User assistance. Deleted the table "Responsibility of roles for key deliverables." Added the following definitions: 1. Agile development; 2. Lean UX; 3. Usability maturity; 4. User experience professional; 5. Plan the human-centred design process; 6. User experience project plan; 7. Human-centred quality objectives; 8. User interface element; 9. Card sorting; 10. User journey map. Major changes to the following definitions: - Scenario split into as-is scenario and use scenario. - Effectiveness, efficiency, satisfaction – updates reflect new ISO 9241-011 standard. Added index

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