

1. What aspects constitute the context of interaction design? What does that mean for the development work?

There are four different aspects in the context of interaction design, which are Roles, Tasks, Contents, and Visual & Interaction Design.

Roles: such as User Roles and Persona, define diverse persona or categories of users, including different users' responsibility, permission, functionality, need, and basic information.

Tasks: such as User Cases and Scenario-Based Design, outline specific interactions or scenarios between users and a system, providing a detailed interaction for developers and designers to refer.

Contents: such as Contents Model, organizes and structures the content, It defines the types of content, their relationships, and how they are presented to users. It also provides a outline of the interaction design or interface and help developers identify what should they keep in the interfaces.

Visual and Interaction Design: It focuses on the aesthetics and visual elements in the interfaces, also including user flows, feedbacks in order to improve the user experiences and iteratively refinements.

How they influence development work?

User roles and user cases provide a clear roadmap for developers and designers to align the design with real user needs.

Having a well-defined content model and design elements, developers have a clear understanding of what needs to be built.

Build the collaboration between designers, developers, and stakeholders to ensure a cohesive development process.

The iterative process allows for continuous improvement of system.

## 2. Answer briefly:

What model can be used to describe user's interaction with a user interface? Describe the model briefly and illustrate how it can be used to inform user interface design.

The model is "The interaction cycle: Seven stages of action"(Norman). It describes how the user interact with the system, dividing into seven stages about how they understand during the interaction period.

1. Goal forming
2. Intent to act
3. Specifying actions
4. Executing actions

Gulf of execution

-----external world / surroundings-----

Gulf of evaluation

5. Perceiving system state
6. Interpreting system state
7. Evaluation the outcome

We could use this model to inform user interface design, such as mapping to user flows, reducing cognitive level, getting significant feedback and understand its affordances, error handling and prevention, usability testing.

3. User interfaces can be created using imperative and declarative means. Describe briefly how these approaches and technologies appear in user interface design and assess their pros and cons in the UI development work.

Imperative language: Describe how things should be done.

pros: Imperative languages allow precise control.

provides flexibility and customization.

cons: More complex and challenging for developers to maintain the system.

Learning curve is higher than declarative languages

Lack of modularity and reusability.

declarative language: Describe what things should be done.

pros: UI developers are not programmers, It is a simple way to implement

Speeding up adoptions and deployments of user interface.

More robust and predictable user interface performance, no need to spend lot of time to find coding bugs.

More security due to bounded syntax.

Less code for developers to maintain.

cons: Functionality restricted by the language they use.

Non-programmers sometimes need to learn sophisticated language syntax.

4. According to course material, how can you analyse (and design for) the visual perception of a user interface?

We could analyze the visual perception of a user interface via user research ,and follow the principles, guidelines and style guides to design for the visual perception of a user interface.

User Research:

Conducting some user surveys, interviews, and usability tests to understand how users perceive visual elements and give some feedback for iteratively improvement.

Explore and understand user preferences, user needs, habits, and cultural influences affecting their perception.

UI principles and guidelines:

Simplicity and Clarity: Keep the interface simple and intuitive, reducing unnecessary elements.

Consistency: Maintain consistent design elements, such as colors, icons, terminology, across the pages of interface.

Accessibility: Ensure the interface is accessible to all users, considering diverse needs. (color blind)

Visibility of system status: User should know the current content and state of the system that they interact with.

**5. Answer briefly**

What are the main elements that need to be modelled when defining and designing a user interface?

The main elements that need to be modeled.

1. **Persona:** user models that are represented as specific, individual human beings.
2. **User Roles:** It define diverse categories of users, including different users' responsibility, permission, functionality, need, and basic information.
3. **Task Analysis:** It outlines specific interactions between users and a system, providing a detailed interaction for developers and designers to refer.
4. **Scenario Based Design:** It focuses on understanding user needs and behaviors within particular contexts.
5. **Essential Use Cases:** They are used primarily to capture the high level user- functional requirements of a system and define the fundamental structure of our application.
6. **Usability Testing:** Conducting test to evaluate the interface's usability with real users.
7. **Feedback:** after usability testing, user provides feedback for iteratively and continuous improvement.

## 6. Long essay (6p)

You have been asked to design a mobile application for visitors of the city museum. Based on the contents and approaches of the course, describe in a nutshell, what kind of process would be appropriate for the user interface development work? Furthermore, consider what kind of methods would ascertain a high-quality outcome from the viewpoint of future users? Illustrate the challenges that you might face during the development work and describe how you would overcome them. At the end of your answer, explore how the resulting user interface would appear. Do not forget to include references to your answer.

Modelling Methods:

1. **User Persona:** Creating personas representing different and diverse user groups.(artists customer, family, student)
2. **Scenario-Based Design:** Scenarios and use cases describe the user's interaction with the mobile application.(booking museum tickets, checking exhibition schedule)

3. Wireframes and prototypes: Creating wireframes to outline the overall app's structure, navigation, and layout. Developing interactive prototypes to visualize the user logic flow and functionality.

4. Usability Testing: Conducting usability test with lo-fidelity and high-fidelity prototypes, helping gathering direct feedback form users to know what they really need.

Ensuring high-quality outcome:

User Research and Analysis: User persona, Scenario-Based Design highlight the key pain point.

Wireframe and Prototype: Interactive prototypes illustrate the app flow and basic functionalities.

Usability Testing: Feedback reports, iteratively refines prototype to address the issues and problems they found.

Accessibility Testing: Ensure the designed application is accessible to all users, including those with disabilities such as color blinds.

Challenges and how I overcome:

Limited Visitor Data: Overcome by conducting surveys in both quantitative and qualitative research, observations, interviews, or questionnaires to gather user insights.

Balancing Features: Focus on features through user feedback and focus on core functionalities to align with real user needs.

Reference:

- Lectures pdf
- Norman, D. A. (2013). The Design of Everyday Things.
- Nielsen, J., & Molich, R. (1990). Heuristic evaluation of user interfaces.
- Jeff Sauro and James R. Lewis.(2016) Quantifying the User Experience: Practical Statistics for User Research.

7. Describe three most important dialog design principles and explain briefly why they are the most important ones.

The three most important dialog design principles:

1. Task suitability:

The dialog helps the users to perform their task effectively and efficiently. This principle ensures that the dialogue design aligns with the user's task and goals. It focuses on providing the correct information for users to accomplish their goals. If the interface doesn't support the user's task effectively, it can lead to confusion or frustration

2. Conformity and expectation:

The dialog is consistent and corresponds to the user's characteristics, for example, the knowledge gained from the user's work area, training and experience, as well as the generally accepted conventions. This principle ensures that the dialogue design follows these established conventions, reducing cognitive workload and enhancing predictability. It helps users navigate interfaces more easily, as they can anticipate how elements will be interacted with.

3. Fault tolerance:

The user can achieve the intended work result despite clearly faulty input with either no or minimal corrections. Despite the faulty input, the application or interface allows the user to achieve the intended objective with minimal corrections. Fault tolerance in usability is a seamless continuation of the fault tolerance principle in accessibility. This principle focuses on how well the interface handles user errors or unexpected inputs. Designing the interface aligned with fault tolerance involves providing clear error messages, offering suggestions for correction, or allowing easy actions reversal.

**8. Answer briefly:**

What kind of interaction styles can be used in computer user interfaces? What are their key benefits and challenges?

(resource come from lectures pdf: Dialogue Types / Sequence Control: Smith & Mosier 1986; Shneiderman & Plaisant 2010)

The interaction styles:

1. Question and Answer

benefits: Strict guidance, doesn't require lots of user training.

challenges: too slow for sophisticated and powered user.

## 2. Form Fill-in

benefits: Simple data entry, modest user training, convenient assistance, form-management tools

challenges: Consumes lots of screen space.

## 3. Menu Selection

benefits: Short learning, less keystrokes, structures decision making, dialog-management tools, easy error handling, doesn't require lots of user training.

challenges: It slows frequent users, consumes screen space, requires rapid display rate.

## 4. Command Language

benefits: flexible, it favors sophisticated and power users.

challenges: It requires high user training, lack of presenting error handling.

## 5. Natural Language

benefits: No syntax learning, modest user training.

challenges: it is unpredictable, no context, more keystrokes, clarity is also an issue.

## 6. GUI / Graphic Interaction / Direct manipulation

benefits: It is visual, easy to learn, easy retention, error prevention is better, allows exploration, satisfaction for user experience.

challenges: It's harder to program, It requires high user training, using graphics display

## 9. What is an essential use case? Why is it relevant in user interface design?

Essential use case:

What our system will do at a high-level and with a user focus for the purpose of scoping the project and giving the application some structure, they are used primarily to capture the high level user- functional requirements of a system and to define the fundamental structure of our application.

They cannot usefully be used to capture non-functional requirements and internal functional requirements. They are not a functional decomposition model and not intended to capture all of the system requirements. In additions, They don't capture how the system will do anything.

Relevance in user interface design:

Essential use cases help in identifying and clarifying the primary functionalities and user goals that the interface must support.

Designer could focus on the most critical functionalities in the interface.

Designing UI around core interactions ensures the system align with users' primary goals and needs.

Communication essential use cases helps stakeholders, designers, developers understand the core functionalities and user requirements, improving collaboration throughout the design process.

**10. Answer briefly:**

What is the role of command line user interfaces in contemporary interactive systems? What needs to be taken into account in the design of textual / command line user interfaces?

The role of command line user interface in contemporary interactive systems is the next generation user interface, replacing the Graphic UI. Search engines have migrated to becoming answer engines to improve overall search experiences, such as ChatGPT, which arose one year ago.

What needs to be taken into account in the design of CLI ?

1. User must recall notion and initiate action.
2. Typical form is a verb followed by a noun with qualifiers or arguments for the verb or noun.
3. Abbreviations may be permitted.
4. Feedback may be generated for acceptable commands.
5. Error messages may result from unacceptable forms and types (Designers often make some errors by choosing a metaphor closer to machine domain than to the user's task domain)