Software testing methods

Introduction to usability testing

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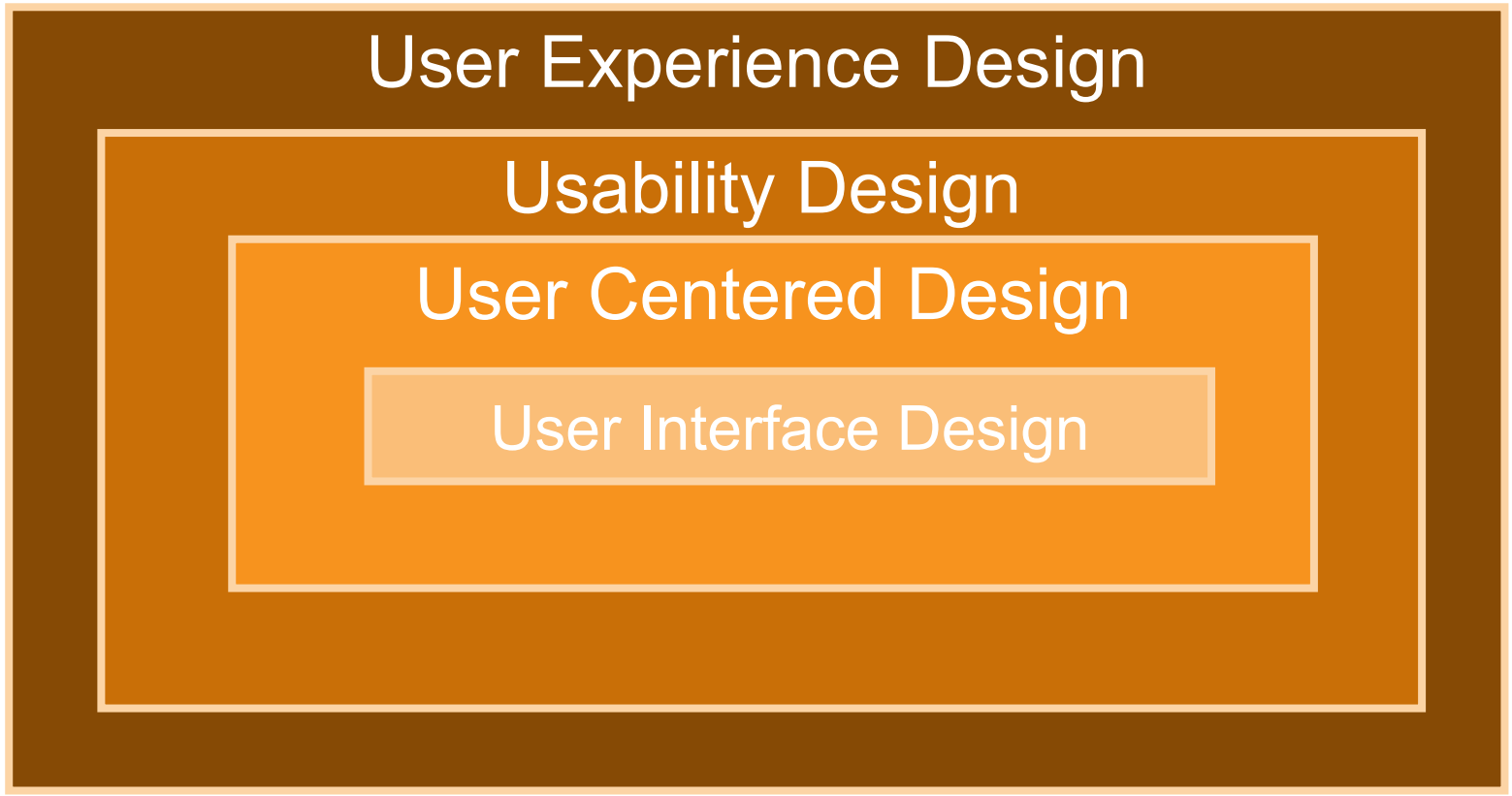
Concepts of UX/UI design

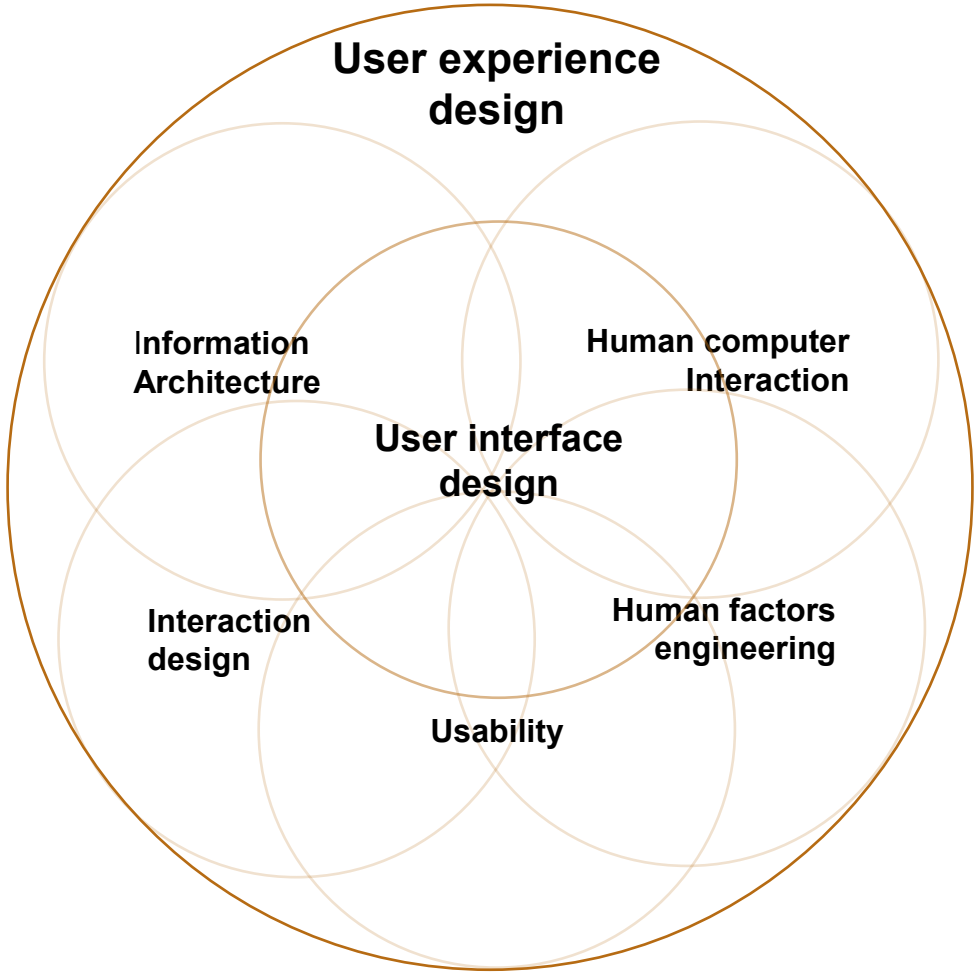


Concepts related to UX/UI testing

- User testing
  - Do users need my app?
  - Will users use my app?
- Usability testing
  - Can users use my app?
- Depending on the resource these terms might be used ambiguously

User Experience (UX) Design

- User experience is a term used to describe the overall experience and satisfaction as use has for a product or service
- User experience design is a process aiming to design a system that offers great experience to its users
- All (UI) interfaces, interacitivity and physical surroundings are taken into account



*”**Usability** is a quality attribute that assesses how easy user interfaces are to use. The word "usability" also refers to methods for improving ease-of-use during the design process.”*

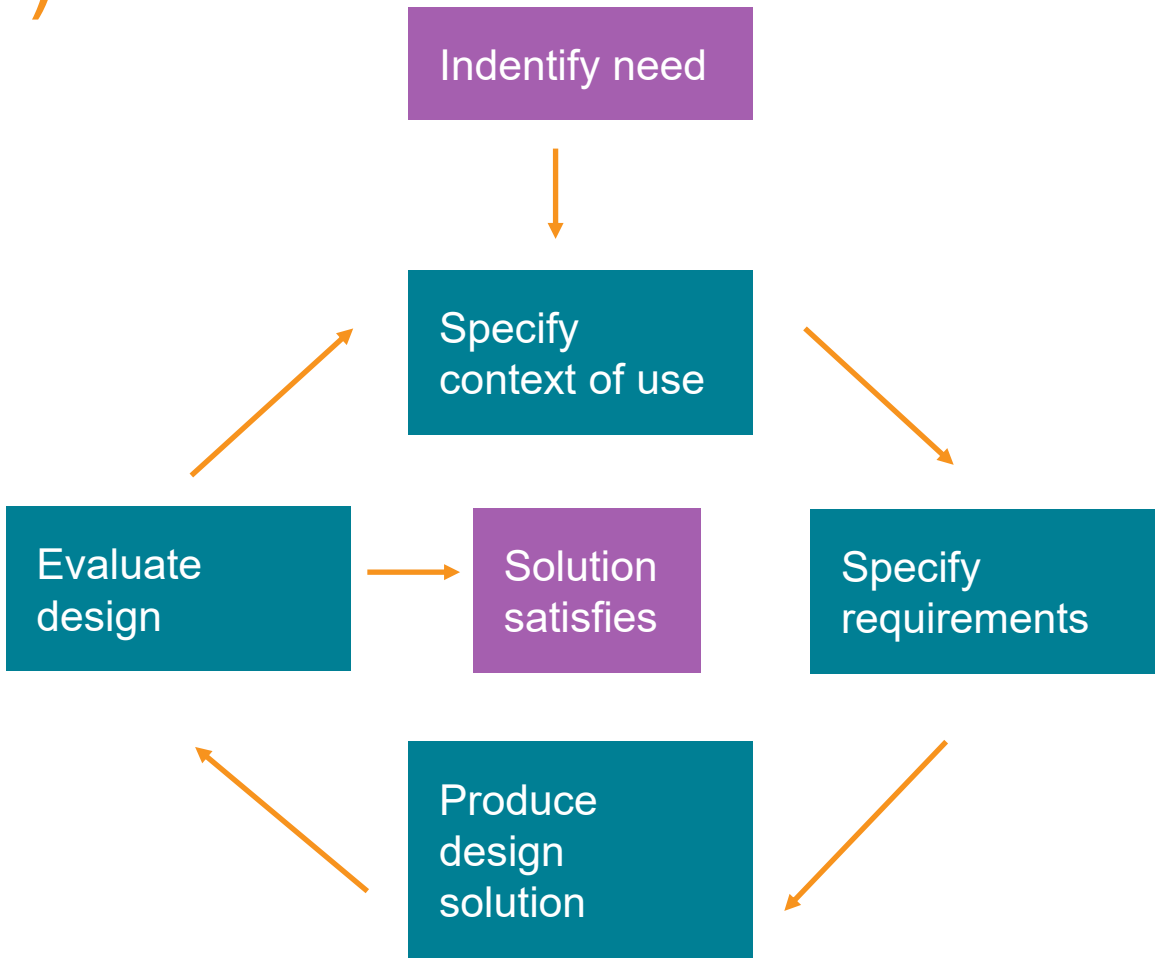
- Jacob Nielsen

Usability Design

- Usability is a quality assessing how easy user interface is to use
- Usability design is a process to improve the usability of a product or service
- Usability factors (which should be also tested)
  - Learnability
  - Efficiency
  - Memorability
  - Correctness/errors
  - Satisfaction

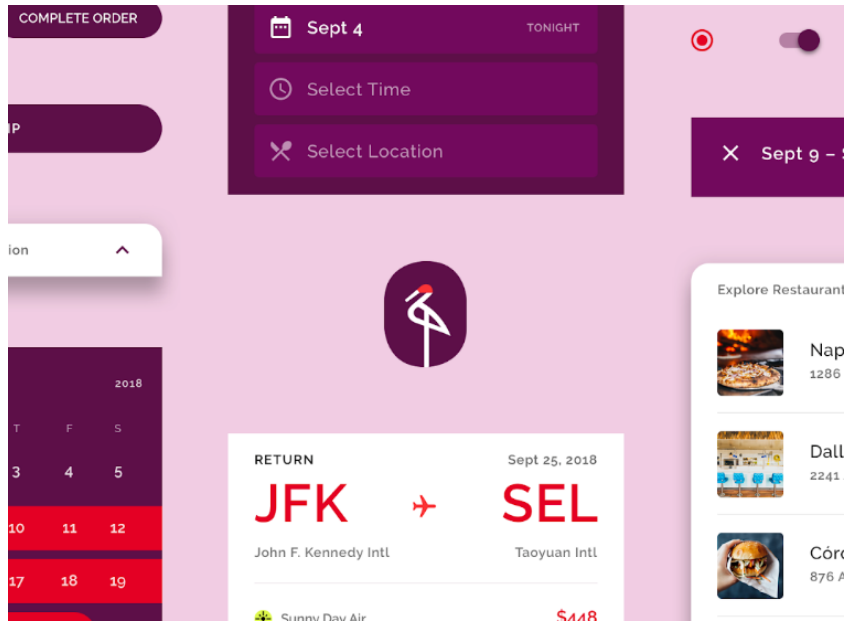
User Centered Design (UCD)

- Iterative design process in which designers focus on the user needs in each phase of the design process
- Users are involved throughout the design process and project (e.g. product owner in Scrum)



User Interface (UI) Design

- Process to build interfaces for products and services, focusing on looks and style (but other aspects of UX are taken into account)
- Desing easy to use and pleasurable interfaces
  - Layout, navigation
  - Colors
  - Typography
  - Graphics
  - Sounds
  - …



Usability testing

- Evaluating a product or service by testing it with representative users
- Test participants will try to complete tasks (test cases/scenarios) while observers watch, listen and take notes
- Execute usability testing iteratively (e.g. in every sprint if using Scrum) during the whole lifecycle of the software
  - Start testing as early as possible (e.g. with wireframes), this will prevent having serious usability issues
  - Continue testing and getting feedback after release to improve user experience
- Analyze results and apply then into the product or or service

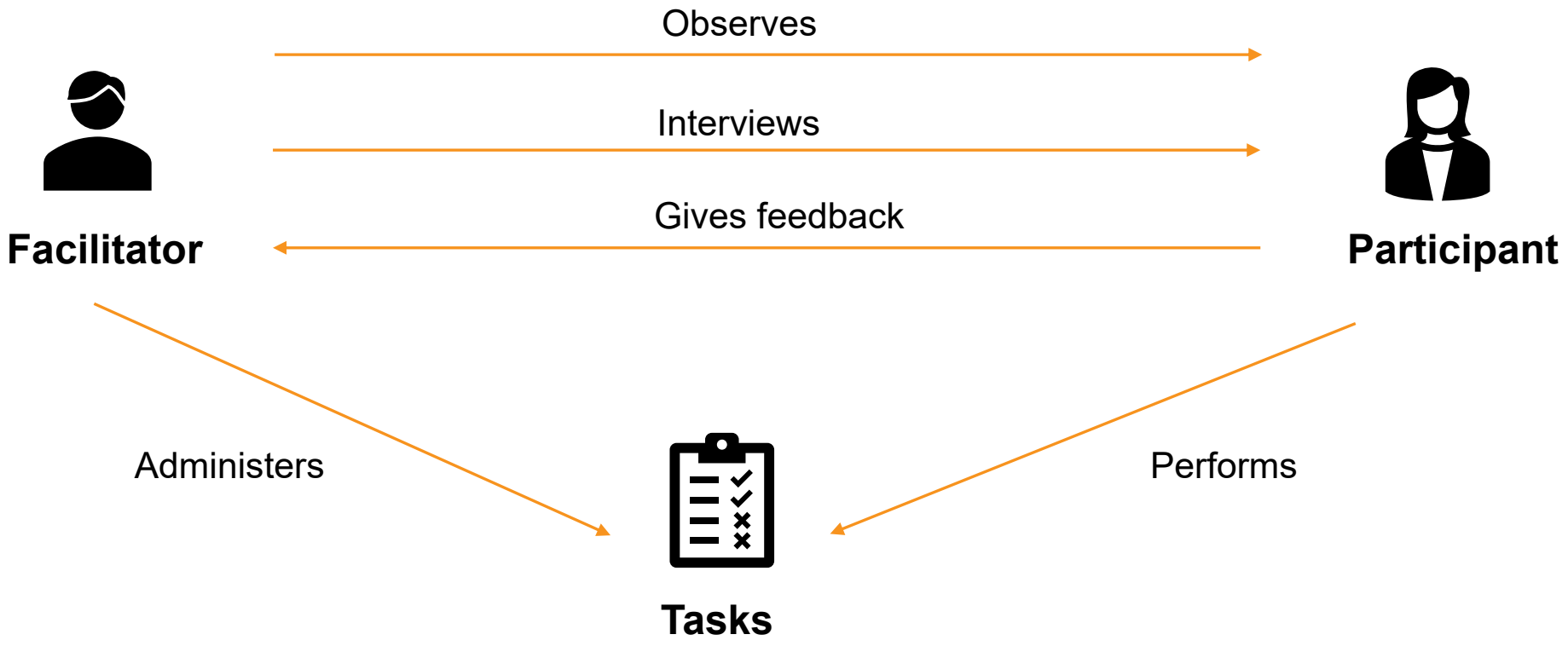
Why usability testing?

- Getting feedback
- Find usability issues
- Discover use cases in order to understand user needs
- Learn what users like and do not like in a product or service
- Learn now interface is being used
- Faciliate discussion about product or service to improve it
- Explore impact of changes in design

Why usability testing?

- False-concensus effect
- Lower support costs
- Lower customer acquisition costs
- Higher customer satisfaction and retention rate
- People won’t use your product or service if usability in not up to standard

Usability testing – flow of information



Objectives of usability testing

- The goal is to identify **usability problems**, determine user **satisfaction**, and collect **qualitative and quantitative data**
- **Uncovering** opportunities to **improve**
- **Learn** about the target user's behaviour and preferences

Usability testing

- Wireframes, designs, prototypes and working software (in various development phases) can be used for testing and getting feedback iteratively
- **Explorative** usability testing is executed on the early stages of the development to achieve more understanding about processes and user activities
- Usability **assessment/evaluation** can be used in every stage of development process to find out problems in usability

Test persons in usability testing

- Test person focus on what he/she is able to see and experience through UI
- Test users should represent the actual (real) users of the developed software (age, gender, experience,…)
- In case testers do have previous knowledge or experience about the tested software, that might affect on the test results negatively
- On the other hand, you can test existing product or service with users, that may have a lot of experience using the software to discover usability issues

Usability testing

- Blackbox testing
  - Test person(s) do not have any knowledge about technical details
- Usability testing is **not**
  - Functional testing
  - Acceptance testing
- Non-functional (quality) testing
- Static (e.g. paper prototype) or dynamic (e.g. working software) testing

Types of usability testing

- Qualitative
  - Focuses on collecting insights, findings
  - Discovering problems
  - 5 participants is usually enough
- Quantitative
  - Collecting metrics describing user experixence
  - e.g. task success (ratio) and timing
  - Benchmarking
  - A larger number of participants is needed to increase to reliability of the study

Concideration for usability testing

- Resources (e.g. money, time, people, facilities, …) has to be taken into account
- Competition (similar products or servicers) might affect on testing
- Sometimes usability might be confilicting with other requirements (e.g. security requirements), what is the importance of usability for the product

Usability testing process

- Process depends on the selected method, but if not ad-hoc (no preplanning), process includes following steps
  - Defining objectives
  - Selecting methods and tools
  - Defining and recruiting representative users for testing
  - Defining test cases/scenarios
  - Executing tests
  - Analysing and reporting the results
  - Reporting and applying necessary changes to the product or service
  - Regression testing

(Usability) testing Methods

- Ad-hoc
- Moderated in-person usability testing (in lab environment)
- Moderated/unmoderated remote testing (by capturing screen)
- Hallway/Guerilla testing
- Evaluation/review by experts (e.g. heuristic evaluation)
- Contextual inquiry
- Session recording
- Card sorting
- Automated usability testing
- Benchmarking, comparative usability testing
- Interview and surveys
- A/B testing
- Alpha/Beta testing
- …

Resources

- Usability testing 101. https://www.nngroup.com/articles/usability-testing-101/
- Usability 101: Introduction to Usability. https://www.nngroup.com/articles/usability-101-introduction-to-usability/
- Usability testing. https://www.usability.gov/how-to-and-tools/methods/usability-testing.html
- International Software Testing Qualifications Board. http://www.istqb.org/

Resources

- Evolve. How to analyze a usability test. https://evolveresearch.app/posts/2019/how_to_analyse_usability_test/
- User Testing v/s Usability Testing. https://medium.theuxblog.com/user-testing-v-s-usability-testing-c3a9edd04612
- How to easily find and fix usability problems. https://www.userbrain.com/blog/find-and-fix-usability-problems