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*from the notebooks of John Artim*

# Usability and User Interface

## Usability

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# Acknowledgements

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- A Microsoft® PowerPoint file of this notebook is available by request. Send an email to John Artim ([jartim@uistyle.com](mailto:jartim@uistyle.com)) requesting the Use Case Basics Notebook PowerPoint file in the Use Cases and Software Requirements Specification series. Please include your name, affiliation, and your intended use of the material.

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# Goals of this Notebook

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- Define usability
- Discuss techniques for assessing the usability of a design or implementation

**Browsing Time for this notebook is about 1 hour**

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# Background for this Notebook

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- No special background is required but some exposure to software development will be a help

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# Major Topics in this Notebook

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- What is usability?
- How is usability assessed?

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# Usability

- Usability—the user’s ease of task completion
  - Applies to hammers, business processes, and GUIs
- Usability can be judged by positive criteria:
  - Which design works better?
  - Is a design built on good/appropriate design patterns?
- Or by negative criteria:
  - Does this design exhibit usability flaws?
    - Known poor design practice
  - Does this design exhibit usability problems?
    - Observed user difficulties

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# What is Usability?

- Basis of Usability: how well suited is a tool for the task it supports?
- Based on cognitive psychology
  - Human problem solving research
    - Problem Space
    - Optimal Problem Space Representation

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# Usability Concerns for Specification

- Usability is all about what it takes to successfully complete a task
  - With or without a computer system's help
- To assure usable designs, each task must be completely described:
  - What must the user see and manipulate?
  - What is the *shape* of what the user sees?
    - The forest is more important than the trees!
    - But make sure you list what kind of trees you see

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# Usability Concerns for UI Design

- For each use case, what must be presented?
  - Domain entities and attributes
  - Domain relationships
- Relationship of each use case to other use cases:
  - Can a use case be interrupted by another use case?
  - Does a use case include (exclusively) other use cases?
    - If yes, then recursively apply UI design principles!
  - Does the use case use other use cases?
    - Commonly reused pieces
    - Typically *Finder* dialogs
      - For example, *Locate a Customer*

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# Testing UI Designs

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- Relevant once you have a UI design
- There are four main ways to test the usability of UI designs:
  - Usability Heuristic Review
  - Usability Walkthrough
  - Usability Test
  - Comparative Usability Test

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# What's a Usability Test Do?

- A usability test identifies and helps classify the severity of usability problems
- Severity is one of:
  - **Severe:** leads to the unrecoverable loss of data or an unacceptable loss of staff time
  - **Moderate:** leads to the loss of recoverable data or an acceptable loss of staff time
  - **Minor:** inconveniences the end-user

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# Goal of Usability Practice

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- Eliminate all severe usability problems before a product is used for real work!
- Reduce or eliminate moderate usability problems as quickly as possible
- Reduce minor usability problems over time
- But most problems should be caught in design!

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# Usability Heuristic Review

- A usability expert works with the application in review under guidance of designers
  - Or works with prototype or reviews “paper” designs
- Expert writes up a report listing likely problems
- *Heuristic Review* because expert uses principles of usability as a mental checklist against a design
- Can be done at any time but the earlier the better!

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# Usability Heuristic Review

(cont'd)

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- Advantages
  - Cheap
    - Especially compared to severe problems!
  - Little staff time needed
  - Gets most preventable problems
- Disadvantages
  - May miss domain-specific issues
  - Requires usability expert

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# Usability Walkthrough

- Usability Expert moderates a scenario-based use of a UI design with a mixed panel of participants
  - The scenarios are based on critical user-task use cases
  - Panel includes designers, implementers, users, subject matter experts, customers
    - Best if all stakeholders present!
  - UI can be real application, prototype, or storyboards
- Moderator classifies and records all usability problems
  - And often provides a written report summarizing the meeting results

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# Usability Walkthrough (cont'd)

- Advantages
  - Efficient use of usability expert time
  - Done in days
- Disadvantages
  - Higher cost of staff time; typically two hours for each participant in the walkthrough
    - But much more efficient than each reviewing on their own!

**Note:** this is a really effective way of very quickly and efficiently getting concrete feedback from end-users and subject matter experts on a storyboarded design!

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# Usability Test

- Scenario-based use of an application or functional prototype by users
  - The scenarios are based on critical user-task use cases
  - The users can be actual users or surrogates
- Best if conducted by usability expert but can be done by others
  - The more experience the tester has, the more concrete your conclusions will be
- The tester does not interfere with the user (the subject in the test)

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# Usability Test (cont'd)

- Advantages
  - When done properly, high degree of certainty that all problems have been uncovered
    - This point is well-documented in usability literature
  - Especially good for severe problems
  - Can compare problems between user groups
- Disadvantages
  - High cost of usability expert time, subject time
  - Takes longer to prepare, execute (typically weeks)

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# Comparative Usability Test

- Just like a regular *Usability Test* except that two or more alternative designs are tested
- By using the same scenarios and test conditions you get
  - A reliable judgment of which design is better
  - Often an understanding of why

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# Comparative Usability Test

## (cont'd)

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- Advantages
  - Very reliable
  - Detailed view of what works, what doesn't, and some idea as to why
- Disadvantages
  - You must have two (or more!) working designs
  - Costly in staff time and usability expert time

**Note:** this form of test is rarely needed nor cost-justified. But when it is, it is a really critical tool to have!

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# But Before You Test

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- Get Good UI Requirements
- Create a good high-level UI design
- Then work out enough detail to try to test it!

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