

ITEC 101: HUMAN-COMPUTER INTERACTION

WEEK 4 - USABILITY PRINCIPLES & HEURISTIC EVALUATION

1. Introduction to Usability Principles

- **Definition:** Usability refers to the ease with which users can interact with a system effectively and efficiently.
- **Why It Matters:** A well-designed system improves user satisfaction, reduces errors, and increases productivity.
- **Key Goals:**
 - **Efficiency:** Users can complete tasks quickly.
 - **Effectiveness:** Users achieve their goals with accuracy.
 - **Satisfaction:** Users have a positive experience.

2. Nielsen's 10 Usability Heuristics

Jakob Nielsen, a renowned usability expert, introduced usability heuristics as general principles for designing user-friendly interfaces. They help identify usability issues early in the design process.

1. **Visibility of System Status:** The system should always keep users informed about what is happening.
 - Example: A loading spinner when an action is being processed.
 - Bad Example: No response when clicking a button.
2. **Match Between System & Real World:** The interface should use language and concepts familiar to users.
 - Example: A trash bin icon for deleting files.
 - Bad Example: Complex technical jargon in a UI.
3. **User Control & Freedom:** Users should be able to undo/redone actions easily.
 - Example: A "Back" button or confirmation dialog before deletion.
 - Bad Example: No way to recover accidentally deleted files.
4. **Consistency & Standards:** Users should not have to wonder if different words, actions, or situations mean the same thing.
 - Example: Standard placement of navigation bars.
 - Bad Example: A "Save" button placed inconsistently in different screens.
5. **Error Prevention:** Design should prevent errors before they occur.
 - Example: Disabling a submit button until all fields are filled.

- Bad Example: Allowing users to proceed without required information.
- 6. **Recognition Rather Than Recall:** Users should recognize information rather than having to recall it.
 - Example: Displaying search history.
 - Bad Example: Forcing users to memorize complex commands.
- 7. **Flexibility & Efficiency of Use:** The system should cater to both novice and experienced users.
 - Example: Keyboard shortcuts for advanced users.
 - Bad Example: No way to speed up common tasks.
- 8. **Aesthetic & Minimalist Design:** Interfaces should avoid unnecessary elements and focus on essentials.
 - Example: Clean, uncluttered UI with relevant information.
 - Bad Example: Overloaded screens with excessive text and images.
- 9. **Help Users Recognize, Diagnose, & Recover from Errors:** Error messages should be clear and provide a solution.
 - Example: “Invalid password” with suggestions to reset it.
 - Bad Example: “Error 404” with no further explanation.
- 10. **Help & Documentation:** Users should have access to easy-to-find help resources.
 - Example: Context-sensitive help links.
 - Bad Example: No support documentation available.

3. UX Metrics & Evaluation Methods

- **Definition:** UX metrics are quantitative and qualitative methods to measure usability.
- **Why They Matter:** They help in assessing and improving user experience.
- **Types of UX Metrics:**
 - **Effectiveness:** Task success rate, error rates.
 - **Efficiency:** Time taken to complete a task.
 - **Satisfaction:** Net Promoter Score (NPS), user feedback.
 - **Learnability:** How quickly users adapt to a new system.
 - **Error Rate:** Number of user errors in a task.

4. Evaluation Methods

- **Usability Testing Types:**

- User Testing
- A/B Testing
- Heatmaps
- Cognitive Walkthroughs
- Heuristic Evaluation
- **Cognitive Walkthrough:**
 - Definition: A step-by-step review of a user's journey to identify usability issues.
 - Steps:
 1. Identify tasks users need to complete.
 2. Predict challenges users may face.
 3. Identify solutions to improve usability.
 - Example: Analyzing a sign-up process for usability barriers.
- **Heuristic Evaluation:**
 - Definition: A method where usability experts assess a system based on predefined heuristics.
 - Steps:
 1. Select usability experts.
 2. Evaluate interface using Nielsen's heuristics.
 3. Identify usability issues.
 4. Provide recommendations for improvement.
 - Example: Evaluating an e-commerce checkout process.

5. Conclusion

Understanding usability principles and heuristic evaluation methods helps in designing intuitive, efficient, and user-friendly systems. Implementing these best practices improves user satisfaction, reduces errors, and enhances overall digital experiences.

References

- Shneiderman, B. (Designing the User Interface, Chapter 4)
- Nielsen, J. (Usability Heuristics)
- Additional sources (if applicable)