

# ART 260

## User Experience Design

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### Instructor

- Rich Rowan
- rrowan@digipen.edu
- Cell: 206-898-2955

### Office Hours

- Thursday 1pm-4:30pm



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## Heuristic Evaluation & User Testing

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- ☐ Usability Inspection & Heuristic Evaluation
- ☐ Usability Testing
- ☐ Playtesting

**PLEASE SILENCE  
ALL ELECTRONIC DEVICES**

**THANK YOU**



# Types of Testing

## Usability Inspection

- Cognitive Walkthrough
- Heuristic Evaluation

## Usability Prototypes

- Paper Prototyping
- Functional Prototyping

## Usability Testing

- Usability Testing
- Playtesting



# USABILITY INSPECTION & HEURISTIC EVALUATIONS

## *Early Stage Usability Evaluation*

# Cognitive Walkthroughs

- A cognitive walkthrough method is a usability inspection method used to identify usability issues in interactive systems, focusing on how easy it is for new users to accomplish tasks with the system.
- Cognitive walkthrough is task-specific, whereas heuristic evaluation takes a holistic view to catch problems not caught by this and other usability inspection methods.
- **Guess what – you’ve already started doing this as part of your User Scenario Flows!**

# Conducting a Cognitive Walkthrough

Participants perform the walkthrough by asking themselves a set of questions for each subtask in a scenario. Typically four questions are asked:

1. Will the user try to achieve the effect that the subtask has?
  - Does the user understand that this subtask is needed to reach the user's goal?
2. Will the user notice that the correct action is available?
  - For example, is the button visible?
3. Will the user understand that the wanted subtask can be achieved by the action?
  - For example, the right button is visible but the user does not understand the text and will therefore not click on it.
4. Does the user get feedback?
  - Will the user know that they have done the right thing after performing the action?

By answering the questions for each subtask usability problems will be noticed.

# Heuristic Evaluations

- A heuristic evaluation is a holistic usability inspection method that helps to identify usability problems in the user interface (UI) design. Proposed by Jakob Nielsen and Rolf Mulich in 1990.
- Evaluator examines the interface and judges its compliance with recognized usability principles (the "heuristics").
- Heuristic evaluation is now widely used where UIs are often designed in a short space of time on a budget that may restrict the amount of money available to provide for other types of interface testing.



# Nielsen's Heuristics (1 of 3)

## **Visibility of System Status**

- The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.

## **Match Between System and the Real World**

- The system should speak the user's language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order.

## **User Control and Freedom**

- Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.

## **Consistency and Standards**

- Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.



# Nielsen's Heuristics (2 of 3)

## Error Prevention

- Even better than good error messages is a careful design which prevents a problem from occurring in the first place. Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action.

## Recognition Rather than Recall

- Minimize the user's memory load by making objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.

## Flexibility and Efficiency of Use

- Accelerators—unseen by the novice user—may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.

# Nielsen's Heuristics (3 of 3)

## **Aesthetic and Minimalist Design**

- Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.

## **Help Users Recognize, Diagnose, and Recover from Errors**

- Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.

## **Help and Documentation**

- Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.

# Gerhardt-Powals Cognitive Principles

- **Automate unwanted workload** – eliminate mental calculations, estimations, comparisons, and unnecessary thinking
- **Reduce uncertainty** – display data in a manner that is clear and obvious
- **Fuse data** – reduce cognitive load by bringing together lower level data into a higher-level summation
- **Present new information with meaningful aids to interpretation** – use everyday terms, metaphors, etc.
- **Use names that are conceptually related to function** – Context-dependent; attempt to improve recall and recognition; group data in consistently meaningful ways to decrease search time
- **Limit data-driven tasks** – Reduce the time spent assimilating raw data; make appropriate use of color and graphics
- **Include in the displays only that information needed by the user at a given time**
- **Provide multiple coding of data when appropriate**
- **Practice judicious redundancy**



# USABILITY TESTING

# Paper Prototyping

- Paper prototyping is a method of usability testing where representative users perform realistic tasks by interacting with a paper version of the interface that is manipulated by a person “playing computer” who doesn’t explain how the interface is supposed to work.
- Your wireframes, filled with content, can act as your paper prototype for a usability test.

# Usability Testing Process

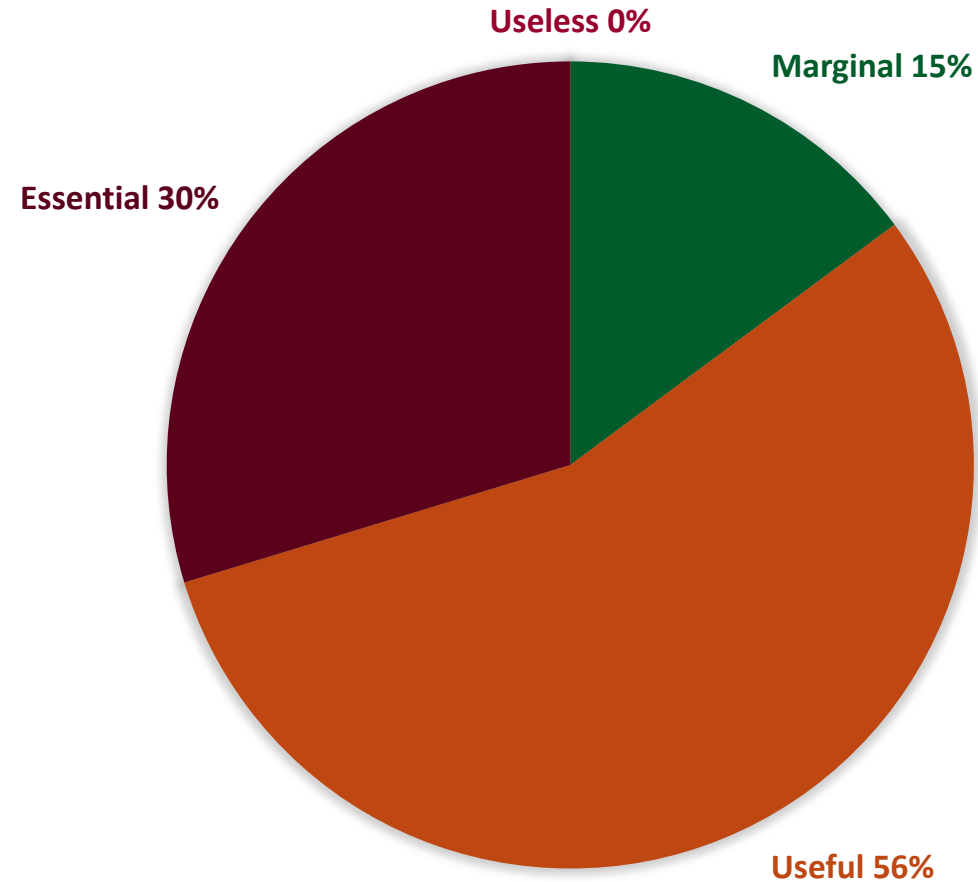
- Identify your users – try to find users that match your personas.
- Determine some typical tasks that you expect these users to perform.
- Create the paper versions of all UI states (wireframes filled with actual content are great for this).
- Conduct your usability test – roles are as follows:
  - **User**: Representative user that will interact directly with the prototype, by “clicking” or “typing” directly on the prototype
  - **Computer**: Assistant that manipulates the pieces of paper to simulate how the interface behaves but does not explain how it is supposed to work.
  - **Facilitator**: Person who guides the User through the tasks to complete and responds to the user with questions, not answers, to direct the user to attempt to accomplish the task through interaction.
  - **Observers**: Team members that observe behaviors and take notes but do not interact.

# Benefits of Paper Prototyping

- Provides substantive user feedback early in the development process—before you've invested effort in implementation.
- Promotes rapid iterative development. You can experiment with many ideas rather than betting the farm on just one.
- Facilitates communication within the development team and between the development team and customers.
- Does not require any technical skills, so a multidisciplinary team can work together.
- Encourages creativity in the product development process.

# Usefulness of Paper Prototyping

## USEFULNESS OF PAPER PROTOTYPING



June 2002 survey of usability professionals, “What is the importance of paper prototyping to your work?”



# Paper Prototyping Supplies

What	Used For	Notes
White Poster Board (about 11x14")	A fixed background upon which other paper prototype elements are placed.	Paper prototypes are usually somewhat larger than life size.
Blank Paper	For drawing larger prototype pieces, jotting down notes, etc.	It's okay to use a lot of paper while creating a prototype, and keeping a stack of paper on hand reminds people of that.
Unlined Index Cards (5x8 and 4x6)	Useful for smaller prototype pieces: Dialog boxes, pop-up messages, drop-down menus, etc.	Card stock is sturdier than regular paper and holds up better under repeated use.
Markers, pens (black and/or colored)	Hand-drawing the prototype. Choose a thick enough point so that you'll draw a bit larger than life size—regular pens may be too fine, flip chart markers are too thick, Sharpie pens are about right.	Discount stores sell sets of art markers for much cheaper than you can find online.
Highlighter	Used with transparency and removeable tape to make a highlight element.	Light-colored translucent plastic can also work.

# Paper Prototyping Supplies

What	Used For	Notes
Scissors	Used to cut screen shots into pieces.	Don't run with them!
Transparent Tape	For attaching prototype pieces permanently, such as creating a dialog box out of two index cards. For a less permanent attachment, use removeable glue.	A matte finish reduces glare, although this isn't usually a problem unless you're videotaping.
Restickable glue	Like the glue on sticky notes, it keeps elements of the prototype in place until you're ready to move them. Useful in experimenting with different layouts or if your prototype has elements that change individually, such as a web site that uses frames.	Don't confuse it with glue marked "washable," which is not restickable. Difficult to find in stores.
Removable tape (Post-it is available in 2-line and 6-line widths)	It's opaque so you can write on it. Use the 2-line width for edit fields (especially if the data appears elsewhere in the interface), small amounts of text that change, status line messages, list elements.	A paper prototyping essential. Turning a corner under makes it easier to lift the tape off the paper when you want to move it elsewhere.

# Paper Prototyping Supplies

What	Used For	Notes
Transparency (overheads, acetate)	Placed over the prototype, it allows the user to “type” (handwrite) data without altering the prototype. Use transparency when there are more than a half dozen fields to complete, otherwise use removable tape.	Get write-on transparency rather than the stuff intended for laser printers, which is much more expensive. If testing with videotape, watch for glare.
Transparency pens, wet erase	For writing “typed” input on a piece of transparency laid on top of the prototype. Use damp paper towel or cotton swabs as an “eraser”.	Permanent transparency pens work too, but since you can’t erase them, you’ll use more sheets of transparency.
Correction fluid (Wite-Out)	For small changes to the prototype, such as a field label.	You have to let the correction fluid dry before writing on it. In a usability test, removable tape is better for quick fixes.
Fome-Cor board	For making 3D prototypes. It’s the polystyrene foam sandwiched between two sheets of thick paper.	You’ll sometimes see it spelled “foam core,” although Fome-Cor is actually a brand name.

# Number of Users

- As a general rule, testing with 5-8 users will provide enough data for you to see the main patterns, provided that you use roughly the same set of tasks and the users are from the same profile.
- Practically speaking, patterns begin emerging with 3-4 tests.

# Spacing of Tests

- Leave enough time between your tests to review what you've learned so far and make changes to the prototype if necessary.
- Generally speaking, you need at least 2 hours between tests.

# Task Design

- A good task has the following characteristics:
  - Based on a goal that matters to the user persona you've chosen.
  - Covers questions important to the success of your product and business.
  - Has appropriate scope – not too broad, not too specific.
  - Has a finite and predictable set of possible solutions.
  - Has a clear end point that the *user* can recognize.
  - Elicits action, not just opinion.

A background image of red stage curtains with a scalloped top edge. The curtains are closed and have a rich, deep red color with some vertical creases and folds.

See You Next Class