Micro-survey top topics we’ll review today:
Tasks, scenarios, personas, and Part 2 presentations

THIS WEEK:
Today:
• Design principles

Wednesday:
• Sketching, applying design principles

NEXT WEEK:
Monday: Presentations for Project Part 2
Wednesday: Evaluating your designs
DUE SUNDAY: Project Part 2
Micro-survey - 1

How do you identify tasks to re-design as scenarios? *Pick tasks that fit with your vision of how the work will be improved. Tasks come from your consolidated field observations – they should be abstract steps (see example from Mon, March 26.)*

How much detail/how abstract should scenarios be? *You are designing the INTERACTION so details like a user submitting credentials for authentication so that a user can view a report are needed. Details like using the login screen to enter a user name and password are not appropriate. These details are part of an interface design. For your storyboard you would include even more details. See [http://pallavi05g.github.io/storeefy.html](http://pallavi05g.github.io/storeefy.html) for examples.*
Does a persona need multiple scenarios?

*Usually a persona has multiple tasks that are related to your vision. You will be re-designing the work in those tasks into scenarios in your new system. The re-design can result in multiple scenarios or not. Most likely other personas or stakeholders will be using the results of this work, so what your scenario “produces” must be usable, hopefully as-is, by downstream personas or stakeholders.*
Part 2 Presentations - only 5 min!

What’s on your slide:
• Remind us of your users
• Your team vision
• Your personas and their respective scenarios
• The problems your proposed system addresses, and those it doesn’t address
• Resistance your proposed solution might meet, and where it might not fit cultural needs.

Your presentation should contain:
• Remind us who your users are, and tell us your vision
• Tell us your most interesting persona and 1 task you re-designed as a scenario
• Tell us about any resistance/cultural issues you think you might see
Other Questions?
Making Design Concrete

Learning objectives:
1. Understand the different aspects of your project’s design space.
2. Understand the benefits and different types of prototyping
3. Understand UI design principles, including Gestalt principles
4. Understand how to achieve Organization and Structure in your designs

Materials originally created by Prof. Jamie Ruiz
Impact

- Good visual design can significantly reduce processing time by user
- Tullis (1981) redesigned screen for telephone line testing
  - 40% reduction in time to interpret display
  - 79 person years saved for every year of use
- Tullis (1984)
  - 5.5 sec vs. 3.2 sec average search times for lodging info screens
Design Space

• Design space is both conceptual:
  – full range of possibilities for addressing identified problem; infinite in scope

• And real:
  – mapping of one or two dimensions of the design
  – e.g. tangible representations

• Mapping helps organize and suggest possibilities
Making Design Concrete

• Design process requires lots of cognitive resources
• Make *tangible representations* of every design idea to cope with this complexity
  – Write everything down!
  – Sketch!
  – Create example prototypes!
Benefits of Tangible Representations

• Offload cognition into environment
• Reflect on and evaluate the design
• Gather feedback from stakeholders
• Discover unintended side effects (positive/negative) of the design idea
Design Tools

• Scenarios & Storyboards
• Low-fidelity prototypes (paper-based)
• High-fidelity prototypes (functional mock-ups)

• Sketches – We’ll do an exercise from the Sketching User Experiences book (available on Canvas in the Files section) on Wednesday, using the 10 plus 10 method. Today your team needs to do part of the pre-work for this exercise; see the pre-work info on the Progress page
Why prototype?

• Faster, cheaper than building functional system
  – One bug in implementation can wreck evaluation
  – Broader design palette than computer-based tools

• Evaluation
  – Roughness of system encourages “right” level of evaluation
  – Can iterate on-the-fly
  – Palm Pilot, Laser Printer, Dynabook evaluated this way

• Communication
  – More clearly communicate intents
Types of Prototypes

Horizontal vs. Vertical:

• Horizontal
  – Broad overview of system, little detail
  – Example: Website’s overall site design

• Vertical
  – Detailed rendition of one small part of system
  – Example: Detailed page design for one web page

Low Fidelity vs High Fidelity

• Low fidelity
  – Extremely coarse approximation of system using common physical materials
  – Intent is to get primary ideas across

• High fidelity
  – Systems nearly identical to proposed production version
Horizontal or Vertical? 
Low or High Fidelity?

Low Fidelity Prototyping
From the HKT website

Horizontal? Vertical?
Fidelity?
Horizontal? Vertical? Fidelity?

From the HKT website
Horizontal? Vertical?

From the Storeefy website

1. Playing with interactive toys which reads stories & shows videos.
2. UPLOAD TO CONTINUE
   OR
   Upload pic to app
   PICTURE BOOK
   PARTICIPATING IN ACTIVITIES ON AN ENGAGED APP PLATFORM

3. Roleplaying / adopting character personas in an interactive game setting
   GRANDMA = QUEEN
   GRANDSON = PRINCE
   SWIPE LEFT
   SWIPE RIGHT
   CLICK

4. Reading comic books/ graphic novels with family

5. Listening to radio talk shows and podcasts about culture

6. Learning at cultural movie screenings

7. Engaging in storytelling sessions in a community setting

8. Understanding critical content by exploring at a library
Horizontal? Vertical? Fidelity?

From the HKT website
Horizontal? Vertical? Fidelity?

From the HKT website
Paper Prototyping

• Start with blank sheets of paper
• As design starts to solidify, sketch unvarying system states on piece of paper / cardboard
• Use Post-Its to represent dynamic content
  – Drop-down menus
  – Views (e.g., graphs) that change
  – Drag-n-drop items
• Can also use tracing paper, transparencies for dynamic content
Wizard-of-Oz

- Low-fidelity prototypes can be brought to life
- Person fills in for computation
- Have different system states already built
  - Or build on-the-fly based on user demands
Designing interactive systems

- What Constitutes a Good Design?
- What Constitutes a Bad Design?

In reality, it is very difficult to describe why designs are good, but very easy to say what makes a bad design.

Conceptual Models and Design: Mismatches cause “gulfs of execution and evaluation” for the user.
Moving Towards Good Design: UI Design Principles

• **Affordances**
  – Perceived and actual properties of a thing that determine how it can be used (e.g. turn knobs, push buttons)

• **Mapping** (take advantage of physical analogies/cultural standards)

• **Constraints**
  – Physical (e.g. only one way to connect, disabled buttons/menus)
  – Semantic Constraints (rely on knowledge of the situation and world)
  – Logical (e.g. My Documents, My Pictures, etc.)
  – Cultural (e.g. Next ➔, Prev ◀)

• **Visibility/Feedback**
  – Provide some mechanism to show:
    • Input is received
    • When system is doing something
    • The outcome of an action
  – Minimizes Gulf of Evaluation

• **Consistency** (allows users to leverage control from familiar onto new)

• **Metaphors**
Gestalt Principles

“In anything at all, perfection is finally attained not when there is no longer anything to add, but when there is no longer anything to take away”

Antoine de Saint Exupery
Simplicity

• Simple designs present the *minimum* amount of information to achieve *maximum* effect

• Simplicity leads to quickly recognized and understood functionality
  – Less information == less time to process

• Simplicity can also aid recall
  – Less to remember
Achieving Simplicity

- Reduce, reduce, reduce
- Reduce some more
- Reduce until it hurts
- Regularize
Reduce!

• For every visual element (or interactive element)...

• ...Ask yourself if you can remove the element and still have a functional, understandable system/design

• Good candidates for removal
  – Lines used to segment areas
  – Bounding boxes
  – Gratuitous graphics

• Consider how many people will need the visual information over the long-term
Regularize

• Regularization and repetition can produce simplicity
• We see patterns and chunk them into a single unit
• Makes things more predictable
• Increases ability to scan

Regularize across:

– Size
– Color
– Line weight
– Alignment
– Shape
– Texture
– Orientation
– Spacing

Example: Keyboard
Irregularity

• With regularity, irregularity becomes meaningful

  • Irregularities draw attention!!!

• People will ascribe meaning to irregularity, even if you did not intend there to be any
  – Avoid accidental irregularities!
Organization and Structure

• Structure doesn’t happen naturally
  – Explicitly planned, designed

• People naturally try to find order and structure, even if none was intentionally designed

• Use Gestalt principles to create structure...
Achieving Organization and Structure

• Grouping
  – Apply Gestalt principles to create groups of similar or related items instead of explicit structure

• Hierarchy
  – guide viewer, to allow scanning of information
  – according to intended reading/viewing sequence
  – adjust properties such as size, position, spacing, **white space**...

• Relationship
  – Establish relationships between elements by using position, size, value (color, shape, etc.)
  – Alignment is very effective tool at creating relationships
  – Similarity of form also effective

• Balance
  – Want to create visually stable composition, similar to physical balance
  – Stability achieved by manipulating properties such as position, size, hue, form
  – Symmetric layouts achieve balance naturally
Common Errors

• Haphazard layout

• Proximity not taken into account when laying out components in interface

• Unclear hierarchy

• Bounding boxes creating visual clutter, competing for attention
  – Use negative space (white space) instead

**Testing it out...**
  – Use the squint test...
  – Mimics early portion of visual recognition system
Wireframes

- Wireframes allow you to explore basic layout and visual composition of interface at high level

- Focus on functional areas and user’s flow through the visual interface
  - What functionality, where? What tools?
  - What information will user need?

- Draw and label boxes indicating different portions of interface
  - Don’t need to provide actual contents of boxes
  - Can use “squiggly” lines for text if want to add weight
What structuring principles are used? From the inVision website

Grouping

Hierarchy
guide viewer: properties such as size, position, spacing, white space...

Relationship
using position, size, value (color, shape)

Alignment

Similarity

Balance
visually stable composition:
properties such as position, size, hue, form

Symmetric layouts
Gestalt Grouping Principles

• Proximity (nearby elements associated)
• Similarity (elements with visual characteristics associated)
• Continuity (visual system prefers continuous, unbroken contours)
• Closure (visual system will create a complete picture)
• Area (smaller of 2 overlapping elements becomes object of interest)
• Symmetry (the greater the symmetry, the more we ascribe meaning)
Proximity

- Individual elements associated more strongly with nearby elements than with those further away
Similarity

• Elements associated more strongly when they share basic visual characteristics
  – Shape
  – Size
  – Color
  – Texture
  – Orientation
Continuity

- Visual system prefers continuous, unbroken contours

- Will seek out simplest possible explanation for abstract drawings
  - Even if several, plausible combinations exist
Closure

• Visual system will “fill in holes” to create a complete picture

• Will close figures when information absent
Principle of Area

- *Figure* is element that is interpreted as object of interest
- *Ground* is area on which figure rests
- Principle of *area* suggests that smaller of two overlapping elements seen as the *figure* while larger element is seen as ground
  - Also, darker objects appear more often as figure with lighter areas seen as ground
Figure/Ground
Symmetry

• We prefer symmetry

• The greater the symmetry, the more we ascribe meaning, relationships in the composition

• Symmetrical, unconnected elements are integrated into one coherent object
We’ll look at this site and how a specific NP website is laid out.

Look for these **UI design principles**: affordances, mappings, constraints, visibility/feedback, consistency, metaphors

Look for **simplifications**: reduce, regularize

Look for **structure**: grouping, hierarchy, relationship, balance

Look for **Gestalt grouping techniques**: proximity, similarity, continuity, closure, area, symmetry
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Image Credits

Storeefy website: http://pallavi05g.github.io/storeefy.html
HKT website: http://uxding.com/case-study-HKT.html
Invision Wireframing: https://www.invisionapp.com/blog/wireframe-examples/