Conceptual Design

Selected material from *The UX Book*, Hartson & Pyla
Analyzing user work and needs

Creating interaction design concepts

Realizing design alternatives

Verifying and refining interaction design

Design thinking

Conceptual design

Design production

Diagram:
- Analyze
  - Understand user work and needs
- Design
  - Create interaction design concepts
- Prototype
  - Realize design alternatives
- Verify and refine interaction design
Conceptual Design

- Establish a **design vision** for the system, the system **metaphor or theme**
  - Innovate and brainstorm
- Derived from the **designer’s mental model**
- Must **map** to the **perceived user’s mental model**
- **Critique** and **compare** multiple design concepts
- Choose **metaphors** … **ecological** (starting point), then **interactive** and **emotional** perspectives
  - App “store”
  - “desktop”
  - “coolness” or “hipster”
Mental Models

- A mental model is a cognitive representation of something that defines a logical and believable estimation as to how a thing is constructed or how it functions; i.e., how we think of things

- Designs that align with a user’s mental model will be easier for him or her to use
  - **Transparent** objects expose their functions
    - Bicycles
  - **Opaque** objects hide their functions
    - Computers
Mental Models
Mental Models (cont)

- Mental models are:
  - **Unscientific** often based on best **guesswork and approximations**
  - **Partial** – do not necessarily **describe** the **whole system**
  - **Unstable** - they can **evolve and adapt** to the context
  - **Inconsistent** as some parts may be **incompatible** with other parts of the same model.
  - **Personal** – individual’s **minds eye**, therefore are **not universal concepts**
Designer’s Mental Model Perspectives

- **Ecological** – the system in its environment
  - Thermostat – role in the context of the heating system

- **Interaction** – user operation
  - Thermostat – current temperature, target temperature, control to change the target, plus understanding of its behavior

- **Emotional** – expected user emotional response
  - Thermostat – reliability, aesthetics in home decor
What Mental Models Come to Mind?

- Camera
- MP3 player
- Microwave
- Integrated development environment (IDE)
- Remote control
- On-line retail shopping site
- Kiosk
Metaphors

- Visual representation of real world objects to create a mental model
- Analogies for communication and explanations
  - Explain unfamiliar using familiar conventional knowledge
  - Use what users already know about existing system or phenomena
  - Adapt to help users learn how to use new system
- Bad metaphors contradict user expectations or real world behavior

Examples of good and bad metaphors?
Metaphors
Choosing a Metaphor

- Real world **analog** objects
  - Ultimately the **basis of all metaphors**
- Established **digital** world design patterns and conventions; e.g.,
  - Social networking
  - Hamburger menu icon
Mapping

- Mapping describes how we **make connections between things**; patterns

Proper mapping can increase the usability of an interface

What is the best mapping of the controls?
Mapping

- Mapping describes how we make connections between things; patterns

Proper mapping can increase the usability of an interface

Arbitrary mapping

Arbitrary mapping improved

Natural

Use natural mapping whenever possible
Storyboards

- **Sequence** of visual “freeze-frame” sketches to show how people will interact with the system
  - Adapted from the movie/animation industry
- **Visual, intuitive representation of written scenarios**
- Show all perspectives
  - Actors
  - Screens
  - Interaction
  - Dialogue showing sequences of flow from frame to frame
Storyboard – Environmental Perspective

“Every interface is a story”
https://trends.uxdesign.cc/
Storyboard – Interactive Perspective
Importance of Frame Transitions

- Storyboard **frames** – **static** states
- Frame-to-frame **progression** (transition) **shows interaction** over time
- **Transitions** are where user experience lives, where users think about what to do next
- Source of most **problems for users**, **challenges for designers**
- So make **actions between frames part of what is sketched**
  - Add frames that show circumstances that lead to transitions
  - User thought bubbles, gestures, reactions