

# Conceptual Design

SWEN-444

Selected material from *The UX Book*, Hartson & Pyla

Analyze

Understand user work and needs

Design

Create interaction design concepts

Prototype

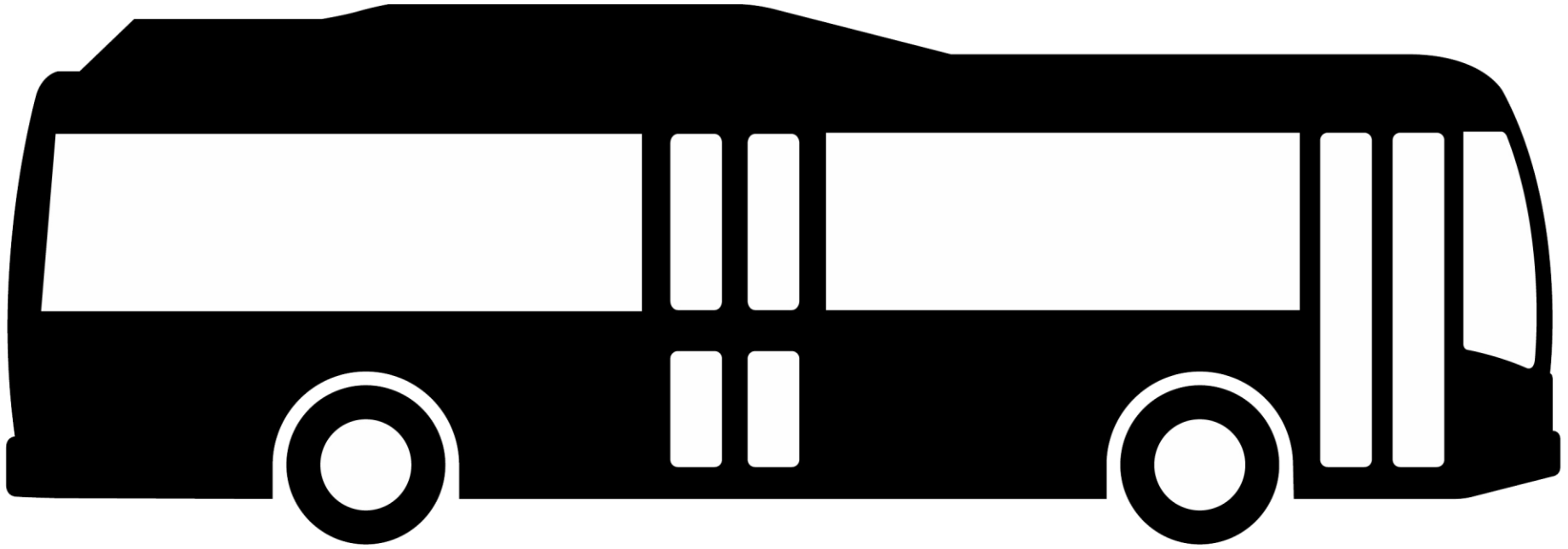
Realize design alternatives

Verify and refine interaction design

Design thinking

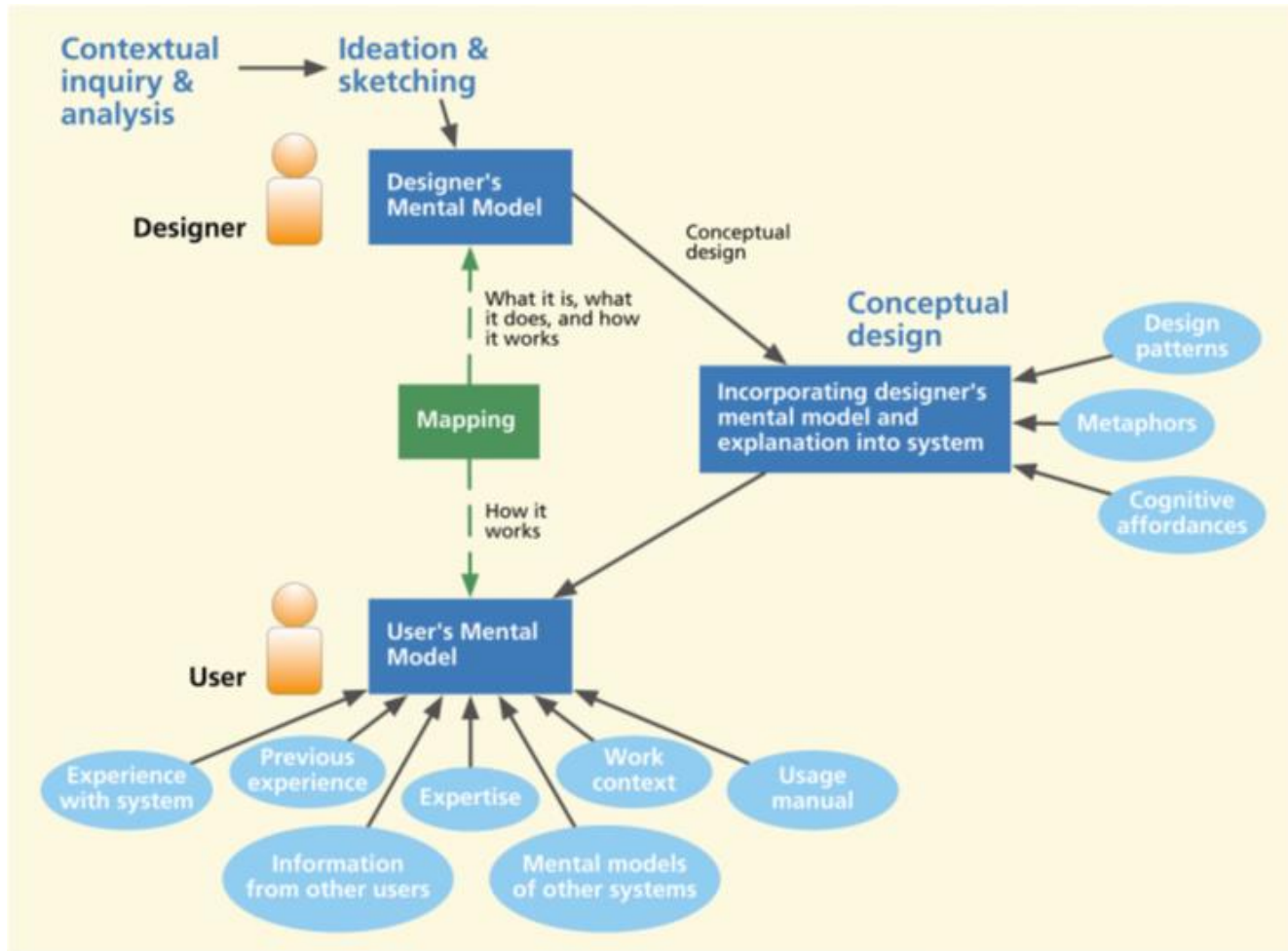
Conceptual design

Design production



# Conceptual Design

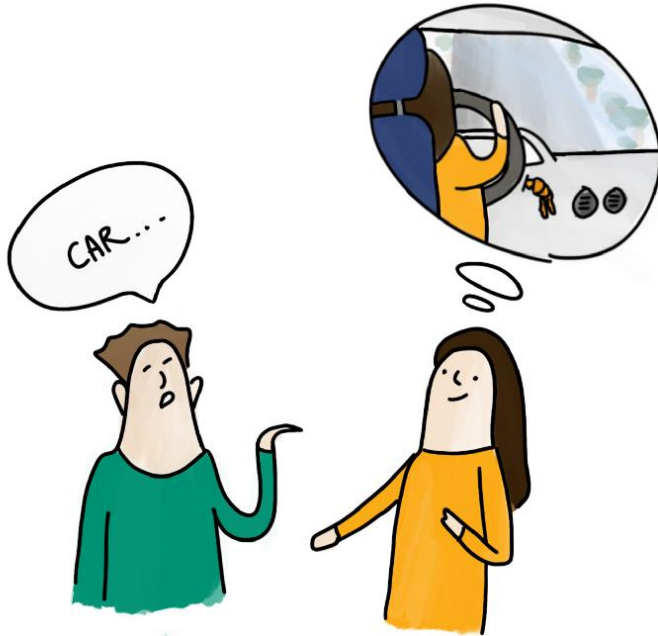
- Establish a **conceptual design** for the system, the system **metaphor** or **theme**
  - Innovate and brainstorm
- Derived from the **designer's mental model**
- Must map to the perceived **user's mental model**
- Critique and compare multiple design concepts
- Choose metaphors ... ecological (starting point), then interactive and emotional perspectives



# 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 provide a better UX
  - Transparent objects expose their functions; e.g., bicycles
  - Opaque objects hide their functions; e.g., computers

“Mental models help you understand life.”



Keys, steering wheel, EV,  
ride share, autonomy, ...

## Thermostat

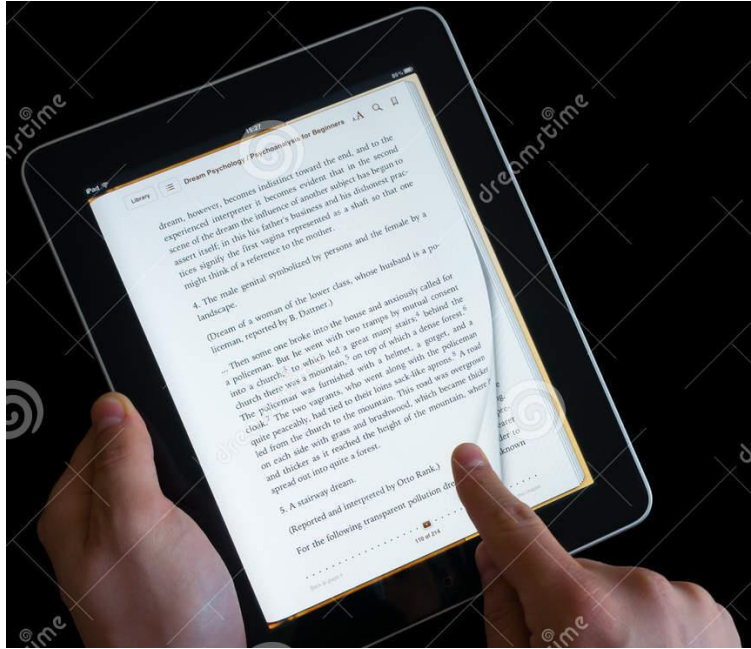


# Designer's Mental Model Perspectives

- **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



# Mental Model Perspectives



Designer



User

# Metaphors

- **Visual/linguistic** 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

## Famous metaphors

“The Big Bang.” Fred Hoyle

“All the world’s a stage, and all the men and women merely players. They have their exits and their entrances.” William Shakespeare

“Chaos is a friend of mine.” Bob Dylan

“A hospital bed is a parked taxi with the meter running.” Groucho Marx

“America has tossed its cap over the wall of space.” John F. Kennedy

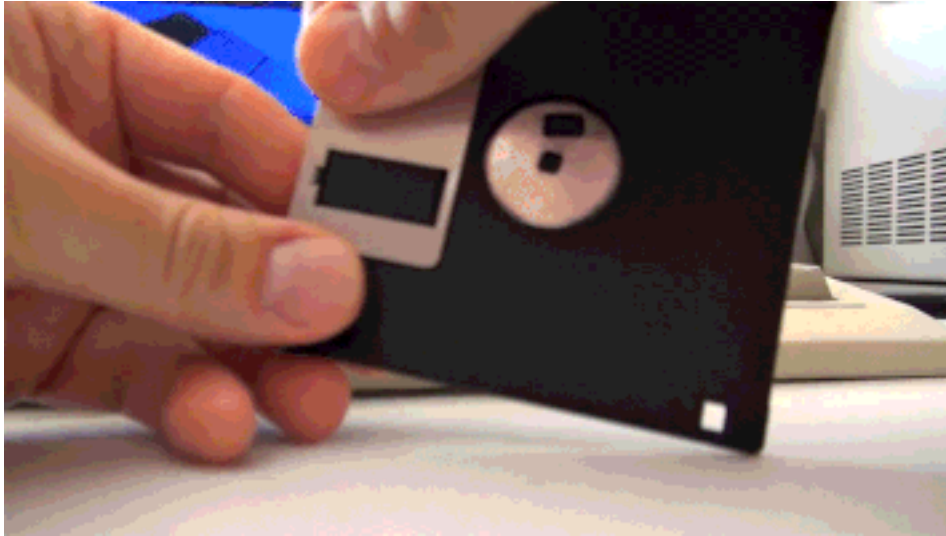
# Metaphors



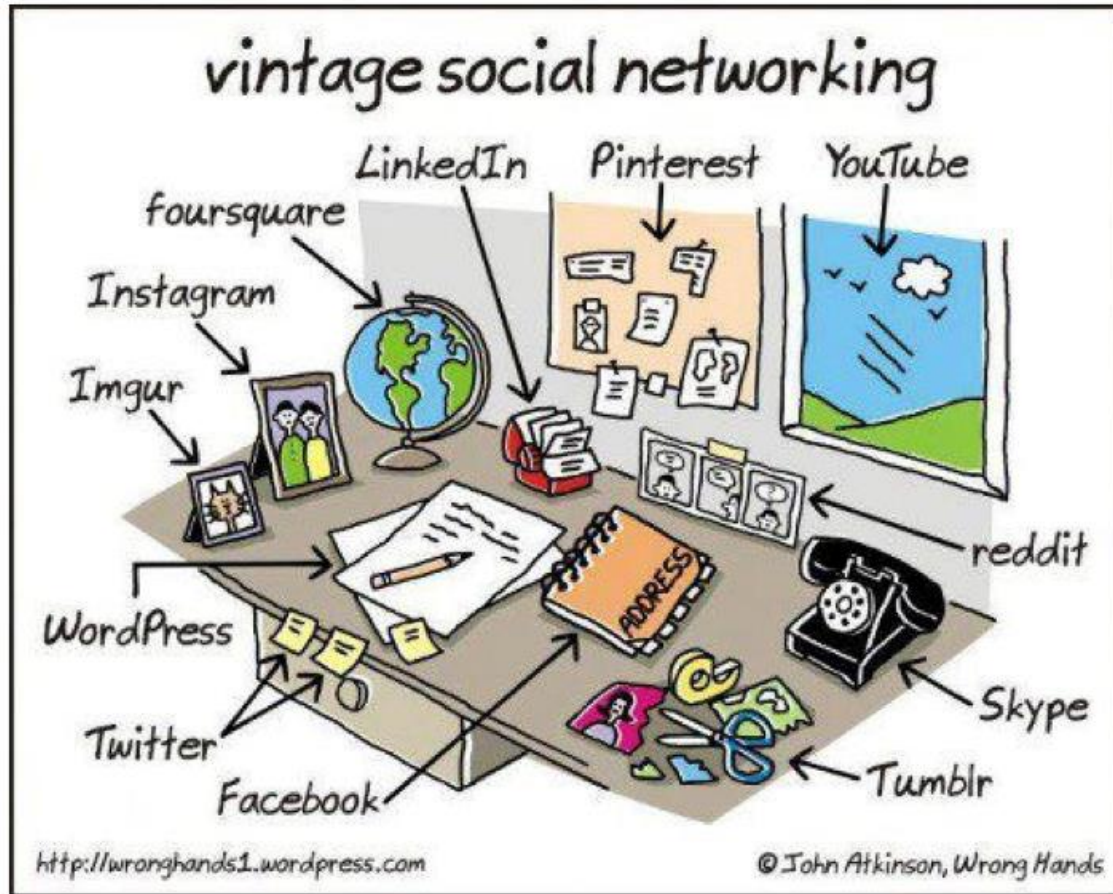
# Metaphors



# Metaphors



# Mental Models and Metaphors



# Mental Models and Metaphors in Design

- Establish a **conceptual metaphor theme** that will provide an overall design guide (e.g., desktop)
- Detailed **design level metaphors** should **support** the **thematic metaphor** (e.g., file folder)
  - Follow visual representation conventions (e.g., house as a home button)
- Are existing virtual objects (e.g., social network) valid metaphors?
  - Virtual objects in turn are based on real world objects
  - Will all of your users get it?

# Storyboards

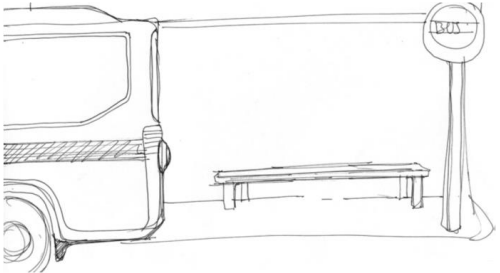
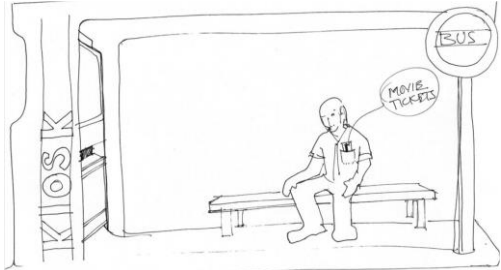
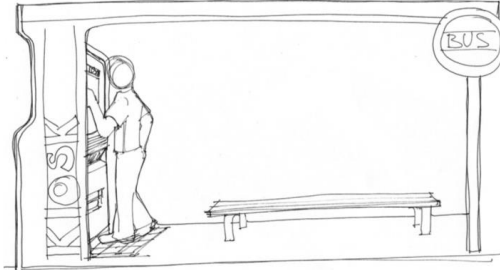
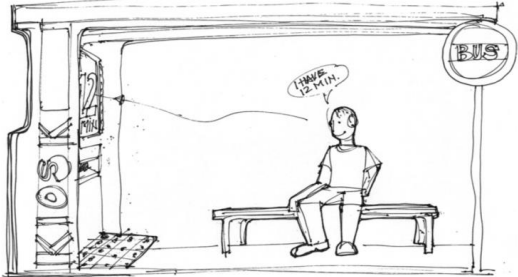
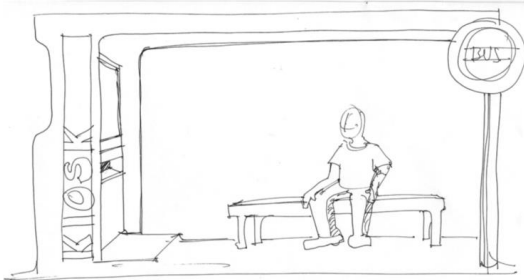
- **Sequence** of visual “freeze-frame” **sketches** to show expected **user interaction** with the system
  - Adapted from the movie/animation industry
- Visual, intuitive representation of written scenarios
- Show all perspectives
  - Actors
  - Screens
  - Interaction
  - Dialogue showing sequences of flow from frame to frame



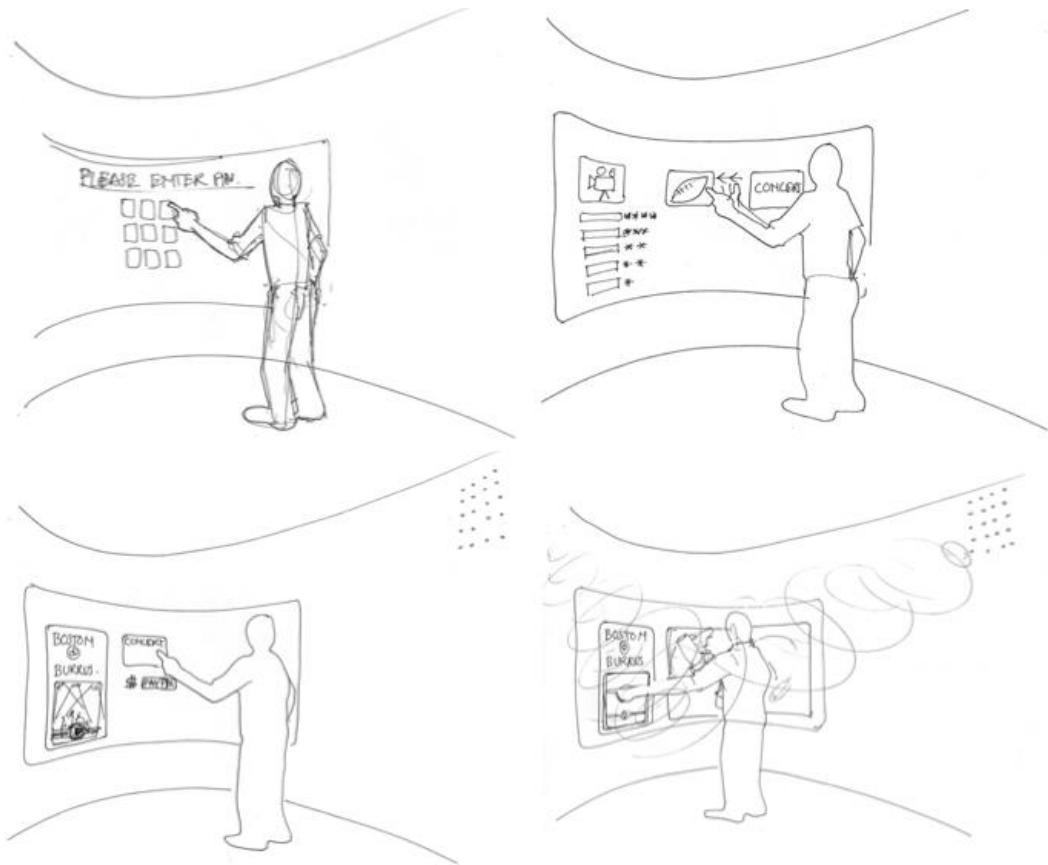
# Importance of Frame Transitions

- 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

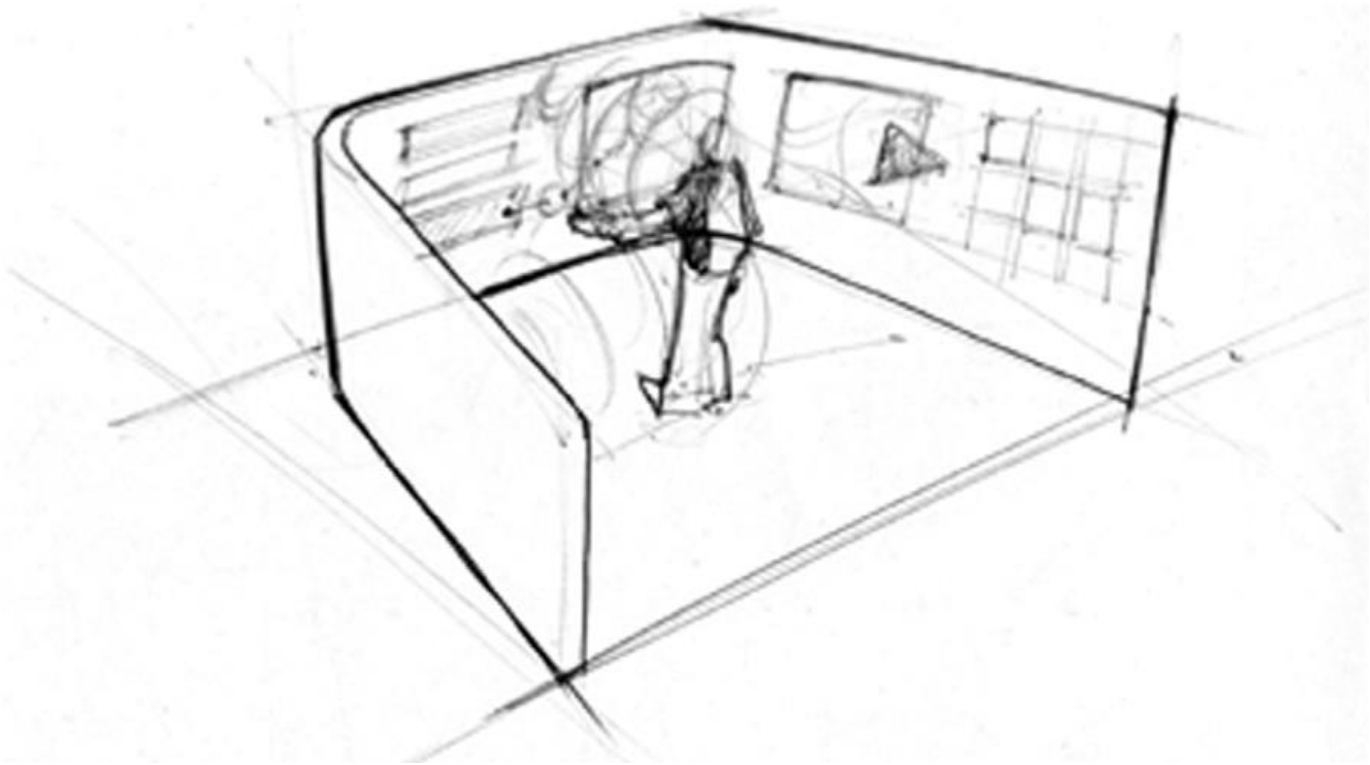
# Storyboard Example: Ecological Perspective



# Storyboard Example: Interaction Perspective



# Storyboard Example: Emotional Perspective



# Team Activity

- Create a storyboard for each design perspective (ecological, interaction, emotional) of at least one task for a work role in the work environment
  - Work practice that is part of the task, devices, screens
  - Physical user actions
- Cognitive user actions in “thought balloons”
  - \*Hint: see work flow model, social model, HTA, usage scenario
- What metaphors were considered?