What is design?

Goodwin’s definition:

“Design is the craft of visualizing concrete solutions that serve human needs and goals within certain constraints.”
Goal-Directed Design

Set of tools to direct design:

**Principles** – guidelines for good design within a context.

**Patterns** – abstract solutions to common design problems.

**Process** – the steps to follow in planning your design.
The User’s Thought Process

Develop a plan:
- Define a goal
- Identify available options

Gulf of Execution:
- How does this operate?

Execute plan

Evaluate Feedback:
- What happened?
- What does it mean?
- Did I achieve my goal?

Gulf of Evaluation:
- How do I know it worked?
Conceptual Model

Does the system provide the *information* needed for the user to develop an *understanding* of how the system works?

A good design provides the correct level of detail so a user can *conceptualize* how the system works at an *abstract level*.

It is vital for a user to understand the *conceptual design* to correctly use the system.
Example from Norman

Two controls:
  Temperature of refrigerator
  Temperature of freezer
The user’s conceptual model

The “freezer” knob controls the temperature in the freezer.

The “refrigerator” knob controls the temperature in the refrigerator.
The actual Design Model

One knob controls the thermostat, the other controls the valve distributing the cold air.
Getting to the right conceptual model

Discoverability

The user should be able determine the current state of the system, and identify possible actions.

Feedback

The system should provide continuous information about the results of an action, and easily determine the new state.
Techniques to convey the model

Affordances – clearly demonstrates what actions are possible.

Constraints – physical or logical limits guide actions and conveys information.

Mappings – relationships between controls and their actions.

Signifiers – readily communicates the proper feedback.
Affordances

Actual and perceived properties of an object that determine how it could possibly be used

A chair affords sitting
A button affords pushing
A knob affords turning

Scissors:

Holes for fingers
Blades for cutting
Constraints

Limit the range of possible actions.

Scissors:

*Big hole for fingers*
*Small hole for thumb*

*Pivot point only allows to open and close*
Mappings

Mappings are used to determine relationships between actions and results controller and controlled.

Can be physical or semantic.

Car seat adjuster

*Maps to seat back*
Signifiers

All actions should have effects
  Can be visual or audial

Provide meaningful messages

Elevator
  *Button lights up when pressed.*
More examples

What do you notice about these?
Faucets
Car Windshield Wipers
Washing Machine