

Interactive Design Basics

Four Approaches to Interactive Design

Elements of Interactive Design

Laws of Interactive Design

Characteristics of Good Interactive Design

Four Approaches to Interactive Design

User-Centered Design

Activity-Centered Design

Systems Design

Genius Design

User-Centered Design

Focuses on user needs and goals

Users guide the design

Designer translates user needs and goals

Caveat: User goals can be difficult to define.

Activity-Centered Design

Focuses on the tasks and activities that need to be accomplished

Users perform the activities

Designer creates tools for actions

Caveat: fixating on tasks designers might not look for solutions for the problem as a whole.

(design a vase, design something to hold flowers)

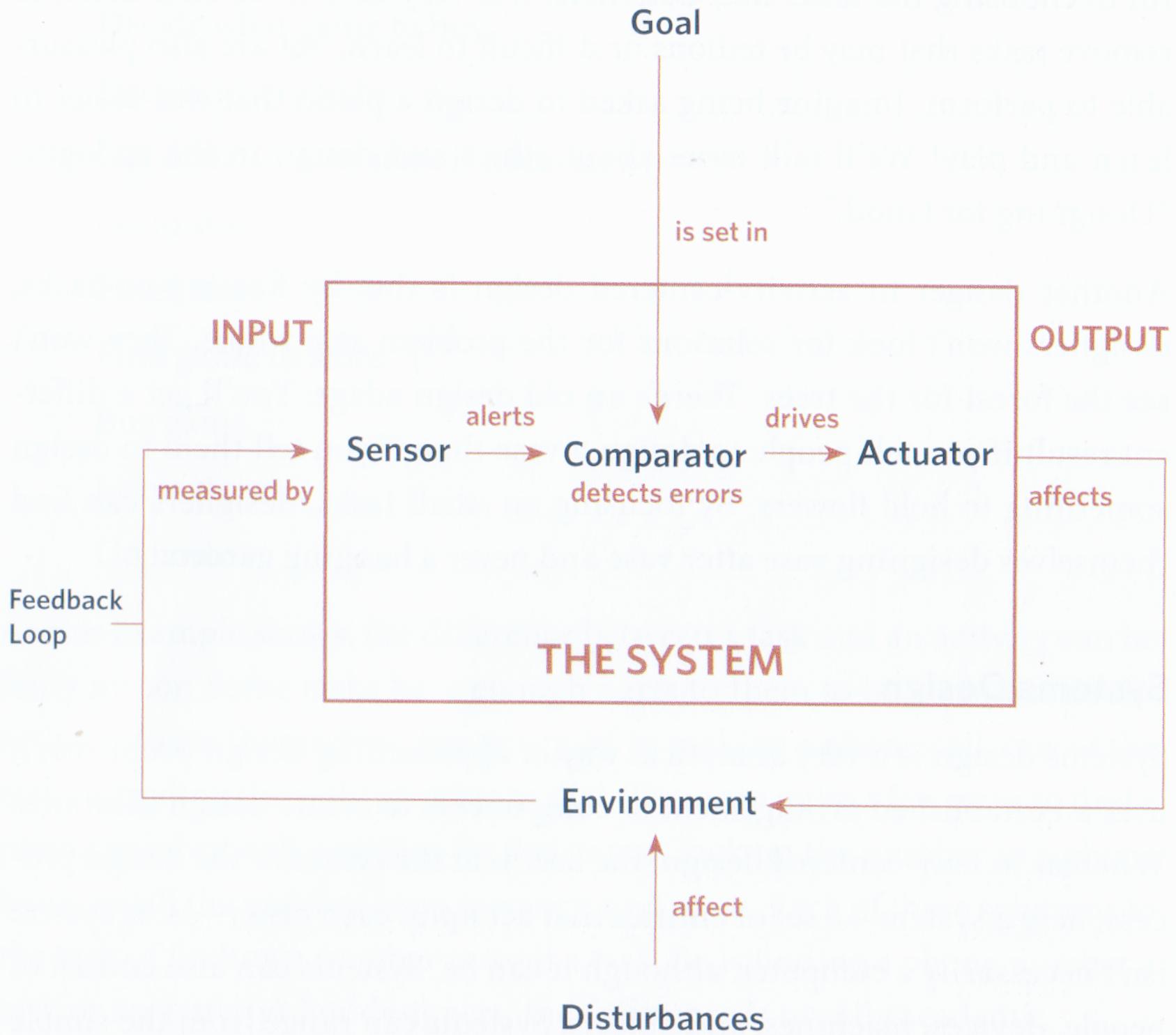
Systems Design

Focuses on the components of a system

Users set the goals of the system

Designer makes sure all the parts of the system are in place

Caveat: Users are deemphasized in favor of context. Focused on the big picture.



Genius Design

Relies on the skill and wisdom of designers used to make products

Users are the source of validations

Designer is the source of inspiration

Caveat: Best practiced by experienced designers.
But it is a fast and personal way to work which reflects the designers' sensibilities.

Elements of Interactive Design

- Motion
- Space
- Time
- Appearance
- Texture
- Sound

(elements of art: line; shape; value; texture; color)

Motion

To be Interactive is to communicate.

To communicate generates a behavior which is motion.

Motion is colored by attitude, culture, personality, and context.

Without motion, there can be no Interaction.

Space

Movement happens in some sort of space.

2D and 3D space, whether that space is a digital screen or analog physical space.

Space provides a context for motion.

All interactivity takes place in space.

Time

Some tasks take time and are complicated.

Digital time is measured in milliseconds.

Time creates rhythm.

Interactions happen over time.

Appearance

How something looks gives clues as to how it behaves.

Appearance is a major source of "affordance."

An affordance is a property, or multiple properties, of an object that provides some indication of how to interact with that object or with that `feature of that object.

Variables of Appearance

Proportion

Structure

Size

Shape

Weight

Color (hue, value, saturation)

Texture

Texture can also be part of appearance.

Texture can indicate how an object can be used as well as when and where.

Is it solid or flimsy? Is it fragile or durable?

Texture can convey emotion as well.

Sound

Sound is a small but important part of interactivity.

Sounds can convey information.

Three main components of sound:

1. Pitch: How high in range is a sound.
2. Volume: How loud is the sound.
3. Timbre or tone quality: What type of sound it is. Think of a middle C played on trumpet and on piano.

Laws of Interactive Design

- Moore's Law
- Fitt's Law
- Hick's Law
- The Magical Number Seven
- Tesler's Law of the Conservation of Complexity
- The Poka-Yoke Principle
- Direct and Indirect Manipulation
- Feedback and Feedforward

Moore's Law

Every two years computer processing power will double.

In 1965, Gordon Moore, a co-founder of microchip maker Intel, predicted that every two years, the number of transistors on integrated circuits (a rough measure of computer processing power) will double.

Implication of Moore's Law:

In two years our devices will be faster, smaller, and more powerful.

Fitt's Law

The time it takes to move from a starting position to a final target is determined by two factors: the distance to the target and the size of the target.

The larger the target, the faster it can be pointed to.

The closer the target, the faster it can be pointed to.

Implications of Fitt's Law

1. Clickable objects like buttons need to be reasonable sizes. The smaller the object, the harder it is to manipulate.
2. The edges and corners of screens are excellent places to position things like menu bars and buttons. Edges and corners are huge targets that you can not overshoot.
3. Contextual pop-up menus that appear when right-clicking can usually be opened more quickly than can pull-down menus at the top of the screen

Hick's Law

The time it takes users to make decisions is determined by the number of possible choices they have.

People do not consider a group of possible choices one by one. Instead, they subdivide the choices into categories, eliminating about half of the remaining choices with each step in the decision.

Implication of Hick's Law

A user will more quickly make choices from one menu of 10 items than from two menus of 5 items.

A controversial implication of this law is that it is better for products to give users many choices simultaneously instead of organizing the choices into hierarchical groups, as in drop-down menus.

Think Google vs. Yahoo homepage design.

The Magical Number Seven

The human mind is best able to remember information in chunks of seven items, "plus or minus two" according to George Miller, a psychology professor at Princeton University.

This refers to information a user needs to keep in short term memory.

Tesler's Law of the Conservation of Complexity

The law states that there is some complexity inherent in every process.

There is a point beyond which you can't simplify a process any further; you can only move the inherent complexity from one place to another.

Email ex: To and From required. Move complexity to the email client addressbook.

The Poka-Yoke Principle

In English it means mistake proofing: avoiding (*yokeru*) inadvertent errors (*poka*).

Designers use poka-yoke when they put constraints on products to prevent errors, forcing users to adjust their behavior to correctly execute an operation.

USB ex: The usb cord can only be inserted one particular way.

Direct and Indirect Manipulation

Direct Manipulation: Using a finger or mouse to do something to a digital object: move it, turn it, drag it to the trash.

Indirect Manipulation: Using a command or menu or other means that isn't directly a part of the digital object to alter that object: choosing the 'Select All' command in the application menu.

Feedback

Feedback is some indication that something has occurred. Every action by a person who engages with the product or service should be accompanied by some acknowledgement of the action: Moving the mouse should move the cursor

Designing the *appropriate* feedback is the designer's task.

Feedforward

Feedforward is knowing what will happen *before* you perform an action.

Feedforward can be a straightforward message: "Pushing this button will submit your order"

Feedforward can be a hyperlink with a descriptive name instead of "Click Here."

Characteristics of Good Interactive Design

- Trustworthy
- Appropriate
- Smart
- Responsive
- Clever
- Ludic (playful)
- Pleasurable

Trustworthy

Before we'll use a tool, we have to trust it can do the job.

Products and services need to display their trustworthiness quickly. They need to appear like they aren't going to rip us off, injure us, sell our personal data, break immediately or otherwise betray our trust.

Appropriate

The solutions that interactive designers come up with need to be appropriate to the culture, situation and context for which they are designed.

Ex: Airport check-in kiosks can't be complicated or require significant learning to use - - they are used infrequently by harried people.

Smart

The products and services we use need to be smarter than we are. They need to prevent us from making mistakes or from working harder than necessary.

They need to do things we have trouble doing: rapidly performing calculations, remembering things over both long and short term, and detecting complicated patterns.

Ex: Cellphone can hold more numbers than you can memorize.

Responsive

A product or service should respond to us, and not just show a spinning beach ball or hourglass.

Immediate: less than 0.1 second

Stammer 0.1 to 1 second, user notices a delay

Interruption: after 1 second task seems interrupted

Disruption: more than 10 seconds users consider the task at hand completely disrupted.

Clever

Clever implies intelligence without smugness or condescension.

Clever products and services predicts the needs of their users and then fulfills those needs in unexpectedly pleasing ways.

Ex: TiVo eight-second rewind button.

Ludic (playful)

Designing products and services that allow play doesn't mean designing everything to be a toy or a game.

Through serious play, we seek out new features and try them to see how they work.

Users need to be made comfortable, and making errors should be difficult instead of simply providing lots of warning messages, which make people nervous.

Pleasurable

Unless a product or service is pleasing to use, or we likely won't use it often.

Beautiful products work better.

Humans are more forgiving of mistakes in things that are aesthetically pleasing.

For a product to be appealing it must be visually and functionally pleasing.