The Design of Everyday Things

Chapters 4-5

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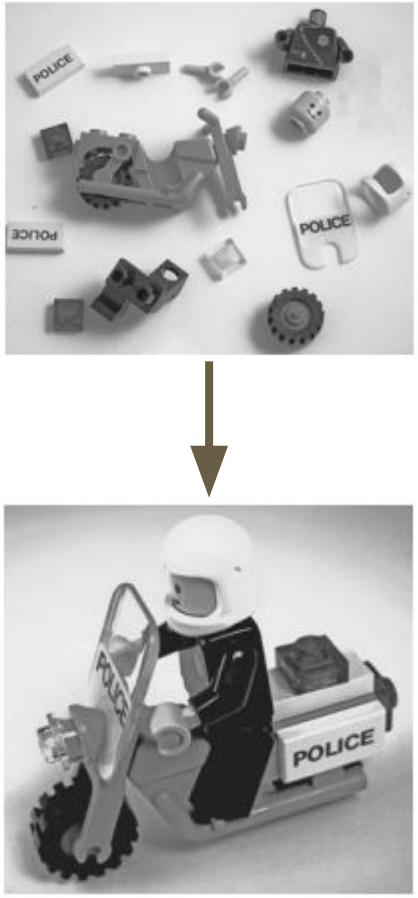
Design Constraints

Physical	Requires good visibility Suffers from legacy issues
Cultural + Semantic	Requires knowledge of cultures, situations, conventions & standards Changes with time
Logical	Requires good mapping



Enhancing Constraints

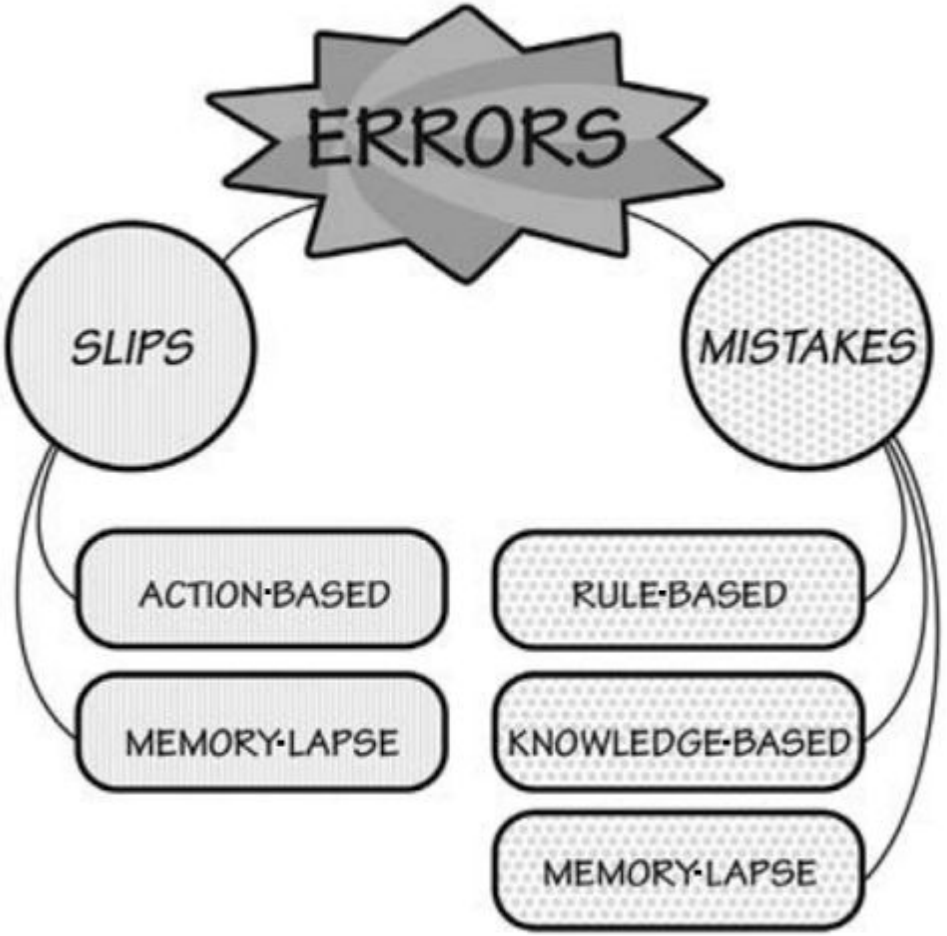
- Adding affordances and signifiers
- Improving mapping
- Creating activity-centred controls
- Creating forcing functions:
  - Interlocks
  - Lock-ins
  - Lock-outs
- Using sound as signifiers

Two Types of Error

Error: General term for all wrong actions

Slips: When a person intends one action and ends up doing another - *Slips are subconscious*

Mistakes: When the wrong goal is established or the wrong plan in formed - *Mistakes are conscious deliberations*



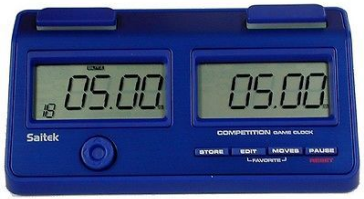
Classification of Slips

Capture slips: instead of the desired activity, a more frequently or recently performed one gets done instead - it captures the activity

Description similarity slips: performing a task correctly only at a high-level, normally acting upon an item similar to the target

Memory lapses: forgetting some part of a task after starting it

Mode-error slips: when a device has different states where controls have different meanings



Classification of Mistakes

Rule-based: applying a rule at the wrong time, applying a faulty rule, or applying a rule and evaluating the outcome incorrectly

Knowledge based: when a situation is so new that no skills or rules cover it

Memory lapse mistakes: a memory failure that leads to forgetting the goal or plan of action

Social and Institutional Pressures

- External pressures can encourage people to make bad decisions
- Good design can’t do enough
- Improve system design
- Checklists can prevent people from rushing
- Design systems not to punish people for reporting errors

Root Cause Analysis

Errors occur for many reasons - *the most common is design that forces people to behave in unnatural ways*

What should we do?

Root Cause Analysis - The Five Why’s

Detecting Errors

- Detection can only take place if there is *feedback*
- Action slips are easy to discover, but memory slips and mistakes are much more difficult

Designing for Error

*Machines are stupid: people look for the **meaning** of your actions, but machines simple execute based on your action...so what to do?*

1. Add constraints to block errors
2. Undo
3. Confirmation and error messages
4. Sensibility checks
5. Minimize slips by providing feedback
6. Consider the 'Swiss Cheese' model

Dealing with Errors

“We should deal with error by embracing it, by seeking to understand the causes and ensuring they do not happen again. We need to assist rather than punish or scold.”

Discussion - Using Sound as a Signifier

Can you think of a product where the addition of sound could encourage the desired behavior, without being an annoyance?

Discussion - Forcing Functions

Can you think of a good example of a forcing function?

Can you think of a bad example of a forcing function?

Discussion - Slips & Mistakes

Name some products that are poorly designed and frequently cause you to slip (*hint*: unconscious decision)?

How about products that caused you to make a mistake (*hint*: conscious decision)?

Discussion - Designing for Error

Given the slips and mistakes that we just discussed, how would you improve the product's design in order to avoid them?

***hint*:**

1. Add constraints to block errors
2. Undo
3. Confirmation and error messages
4. Sensibility Checks
5. Minimize slips by providing feedback
6. Consider the 'Swiss Cheese' model

Discussion - The Five Whys

Let’s go through our favorite classroom example of an error…