To Err is Human
THE DESIGN OF EVERYDAY THINGS: Ch 5

This chapter of the book focuses on the types of errors people tend to make and how, as interface designers, we can prepare for and deal with them once they take place. Human errors may be separated into two main categories: Slips and Mistakes. Slips occur when there is a valid goal but an error is made along the way while Mistakes happen when the goal itself is wrong.

The author talks about six different types of slips: Capture, Description, Data-driven, Associative-activation, Loss-of-activation, and Mode.

Capture slips happen when a familiar activity takes charge over an unfamiliar one and both activities have common stages in the beginning of their action sequences.

Description slips are when a correct action sequence is applied to the wrong object. This happens when an internal action is similar to some other task and the users intention is not sufficiently precise.

Data-driven errors are the result of an automatic action that was triggered by the arrival of sensory data. This could easily happen while dialing a phone number if, in the middle of the action sequence, you were to read some unrelated numbers.

Associative-activation slips, also known as Freudian Slips, happen when internal thoughts and associations cross with an external trigger and form a new, unplanned, action sequence.
A Loss-of-activation happens when, during an action sequence, the person forgets the original goal that triggered the sequence, but remembers the stages leading up to the completion of the goal. For instance walking to the refrigerator, opening the door, but not remembering what you originally wanted to retrieve from it.

Mode errors are very closely coupled with the interface design and occur when a device has more possible actions then its physical constraints allow. This requires multiple modes of operation on the same interface. Errors are most likely to occur when the current mode is not clearly visible, allowing the user to mistake the current mode for another.

Given these common Slips and Mistakes, how do we design an interface to minimize the occurrence of errors and deal with them when they do happen? Several rules of thumb can make a big difference in usability:

- Use strong physical constraints to stop an action sequence when an error is detected.
- Make erroneous behavior easy to discover before an error can happen.
- When an error does occur, make it very visible and allow corrections to be made.

The most powerful being the use of strong physical constraints, also called Forcing Functions, and can be summarized by the following three types: Interlocks, Lockin, and Lockout.

Interlocks force a specific sequence of operations to be completed before the user can move on to another task. This is the case when using a “wizard” to complete some setup process and is related to tunneling.
Lockin forcing functions keep a specific operation active to prevent the user from ending the task prematurely.

A Lockout forcing function does not allow the user to enter an erroneous state. The author uses the example of fire escape stairway. Once the bottom floor is reached, a barrier prevents you from continuing into the basement.

Questions:

1) What general rules of thumb should be used when designing an interface in order to both prevent and prepare for user errors?

2) Name and describe three types of Slips that a person could make while logging into and checking their email on CS.

3) List the three types of Forcing Functions talked about by the author.