Some design principles for HCI
COMP3900_6390 Second Semester 2016

Large-scale: Designing for the real world:

Mental models (conceptual models) of the tasks being performed

The designer should understand the user's mental model of the task to be performed and try to design a system that matches this mental model of the task.

The designer should also provide the user with a clear understanding of how the computer system implements that task because the designer may not be able to exactly follow the user's mental model.

If there are different categories of users then the designers should consider the mental model of each category of user.

Novice and Expert users. Interface designers should understand the level(s) of expertise of the intended users and should design the interactions so that they are appropriate for that level (or those levels) of expertise.

Knowledge in the "head" and knowledge in the "world". Interface designers should be aware of the things that a user would be expected to know (knowledge in the user's head) and of the things that the user may not know and should therefore be provided by the interface.

Mappings between interface items and items or interactions in the real world. Interface designers should pay attention to the mappings between the abstract items in an interface and the real items and actions in the world so that these mappings are intuitive for the intended set of users.

Following existing conventions. Interface designers should make themselves aware of any existing interaction conventions that are relevant to the system they are designing and follow those conventions wherever it is appropriate to do so.

Medium-scale: Controlling and influencing what the user does:

Constraints on the user's choice of actions. An interface should constrain the choices offered to the user so that those choices are appropriate for the particular situation.

Forcing functions. If a user's action is likely to generate an error then the user should be forced to first perform a confirming or completion action to avoid that error.

Error management. Interface designers should understand the types of errors that users are likely to make with the system that is being designed and the designers should make design decisions to reduce the impact of those errors.

Small-scale: Implementation details:

Interaction feedback. An interactive interface should give the user immediate and appropriate feedback whenever the user performs an action. Remember that feedback can happen at the level of the screen interaction (button darkens to show that the system "got" your button click) and at the level of the task (you asked the system to do something and it tells you that it is doing/has done what you asked).

Visibility of the status of the system. An interface should display the status of any system variables, including status information on the progress of any task that the user is performing. When the user interacts with the system the state of the system will change and it should be possible for the user to discover the new state of the system.

Discoverability. It should be possible to discover what actions are possible at each stage of using an interface

Affordances and Signifiers

These two concepts are described Donald Norman in his book "The Design of Everyday Things".

Affordance. This is a made-up word to describe the concept that a "resource" (perhaps a feature in the software) is designed for a particular group of users and may not be usable by other groups of users. An extreme example would be using non-annotated images in a web page which would not be accessible by blind users.

The designer should focus on matching the resource that an interface provides with the needs and abilities of the target group of intended users.

Signifiers. Donald Norman used this word in the latest edition of his book. A "signifier" is a sign or label (could be a picture, words, sounds, mouse-over event …) that tell the user where the interaction should happen. An example is the "tap" feature of modern credit cards. For some tap systems (the Commonwealth Bank handsets for example) it is easy to see where to tap. For others it is hard to tell from the labels where you should tap your credit card.

The designer should make sure that each interactive element of the interface has appropriate signifiers so that users can easily find and use that element.