



# USER INTERFACE DESIGN

# INTERFACES

- For a successful navigation design, it's important to consider the interface as well.
- The interface is the intermediary between users and content, an interpreter and guide to the complexities of a site.
- In the graphical environment of the Web, interface design has to do with constructing visual meaning.

# VISUAL MESSAGES

- When visual messages are used, it's relatively easy to figure out where you need to go.
- Architecture (the system's logical structure) and interface (visual cues and guidance) work together to help the users make decisions.

# HIERARCHIES CAN BE VISUAL

- Visual hierarchies show relationships between elements on a page.
- This is done by paying attention to factors such as:
  - The relative size of elements on a page
  - Their placement or position
  - Color and contrast
  - Movement

# RELATIVE SIZE

- Information about the importance of one item over another.
- Large items will generally draw attention first and will be seen as the more important elements on screen.
  - e.g. Headers are almost always larger than text, which communicates that they have weight and importance.
- When these clues are not available, sorting through information can be an overwhelming experience for users.

# PLACEMENT OR POSITION OF ELEMENTS

- In Turkish, we're accustomed to reading and writing from left to right and from top to bottom. The way we approach the screen is the same.
  - Items to the left and top of center tend to be noticed first, and are usually considered more important than other items.
  - The famous left-hand navigation panel took off partially because of its natural, comfortable location.
- Grouping or placing elements in proximity also provides information about their logical relationships.

# COLOR AND CONTRAST

- Show relationships between items, establish importance, and most importantly draw attention.
  - A highlight color on a page, such as yellow or red, draws the eye because of its difference from the other elements.
  - A high-contrast black element used on a light-colored page has a similar effect.
- Color is also an excellent way to show a continuing path, since we can interpret color information rapidly and with a high degree of precision.
- Using the full rainbow of colors without meaning or association—a common occurrence on the Web—makes for poor visual hierarchies.

# MOVEMENT

- Draws our attention
- If everything on screen is vying for attention in a Las Vegas-style glitter of color and lights, it becomes difficult to make decisions about information paths or judge relationships among content elements.
- Used judiciously and with purpose, animation can be an exciting and effective way to communicate information.

## KEEP IN MIND

- Good communication design has little to do with decoration, though it can be a thing of beauty.
- It's as important to a site's success as quality content, architecture planning, technical wizardry, and usability testing.
  - When these areas come together,
    - each presenting solutions in a unified way,
    - each understanding the strengths of the others,
    - the result is a well-crafted user experience.

# MEANING THROUGH METAPHOR

- Visual hierarchies are the basic building blocks, but there are other tools available for our use. Metaphor is one of the most powerful—and most misused—of these.
- In the literary world, authors use metaphor to explain a concept by associating it in the reader's mind with another, more familiar concept.
  - For example, *traffic slowed to a crawl* explains that traffic was moving very slowly. The cars weren't actually crawling, but they may as well have been.

# MEANING THROUGH METAPHOR

- Metaphor can be as restrictive as it is helpful, however.
- Selecting the wrong metaphor for a concept, failing to carry it through, or even taking it too far can result in awkwardness or confusion
  - e.g., Yahoo-style lists of subject categories are often called "channels" but these channels have nothing to do with broadcasting. They don't relate to TV either.
  - They're misleading and misnamed, and despite having useful content, are likely to be overlooked by some visitors.

# CLARITY VS. CHAOS

- On the Web, it can be especially troublesome to play with chaos in design.
- For many users, the Web already represents chaos. Adding a veneer of confusion is sometimes the last straw.
- If scripts and animation are battling for attention, adding unreadable type and bad color contrast is probably not going to help.

# CLARITY VS. CHAOS

- In navigation design, it's cruel and unusual punishment to offer chaos instead of guidance, self-expression instead of shared communication.
- Interface design, like many areas of design, is service-oriented
  - That makes the work of an interface designer a serious challenge, since it is much harder to understand others' needs than it is to know your own tastes.
  - There may not always be glory in it, but service is the hallmark of good design.

# VISUAL EXPLANATIONS

- Could better design have prevented the space shuttle Challenger's disastrous explosion? Edward Tufte thinks so, and he's not even talking about the shuttle's design.
- The engineers put together multiple charts to explain the danger, none of which convinced the decision-makers to halt the launch.
- What went wrong?
  - The direct cause was that the O-rings (a seal) were not designed to withstand extreme cold.
  - But Tufte shows a more tragic design flaw: the sadly unpersuasive charts used to explain the O-ring problem.

# VISUAL EXPLANATIONS

- Navigating the Web could hardly be called a matter of life and death (though cases of fatal misinformation exist).
- But if misinterpreting information could cause a group of intelligent people to proceed with a doomed launch, imagine how it could confuse and mislead Web users!
- Visual displays, whether charts, books, or interfaces, have the power to be expository—a power far beyond decoration.

# DESIGNING FOR ACTION

- There are lessons from industrial design that we can borrow for use in Web design, many of which are based on solid cognitive science.
- They help explain how we think, react, interpret, and learn.
  - They explain why we sometimes push handles that are meant to be pulled, and why a large segment of the population doesn't have a clue how to program a VCR.

# THE DESIGN OF EVERYDAY THINGS

- Sheds some light on how design can be brought more into line with human needs.
- It's an appealing thought—a world in which we don't struggle to understand objects; instead, they are designed to "understand" us.
- Norman's survey of poorly designed objects can be damn funny.
  - He tells stories of people walking into glass doors, rigging up cabinets with string, and standing helpless before bathroom faucets whose use was a mystery.
  - Other stories—of "human error" at a nuclear power plant or "pilot error" related to a crash—are less humorous, and make the importance of human-centered design very clear.

# 7 STAGES OF ACTION

- Norman highlighted seven stages of completing a task:
  1. Forming the goal
  2. Forming the intention
  3. Specifying an action
  4. Executing the action
  5. Perceiving the state of the world
  6. Interpreting the state of the world
  7. Evaluating the outcome

## Seven stages of action

## Relevant design questions

Forming the goal

How easily can one determine the function of the device?

Forming the intention

How easily can one tell what actions are possible?

Specifying an action

How easily can one determine mapping from intention to physical movement?

Executing the action

How easily can one perform the action?

Perceiving the state of the world

How easily can one tell if the system is in desired state?

Interpreting the state of the world

How easily can one determine mapping from system state to interpretation?

Evaluating the outcome

How easily can one tell what state the system is in?

# GULFS: EXECUTION & EVALUATION

*Gulf of execution:* Mismatch between the users's intentions and the allowable actions

*Gulf of evaluation:* Mismatch between the system's representation and the users' expectations

## 4 PRINCIPLES OF GOOD DESIGN

- *Visibility.* By looking, the user can tell the state of the device and the alternatives for action.
- *A good conceptual model.* The designer provides a good conceptual model for the user, with consistency in the presentation of operations and results and coherent, consistent system image.
- *Good mappings.* It is possible to determine the relationships between actions and results, between the controls and their effects, and between the system state and what is visible.
- *Feedback.* The user receives full and continuous feedback about the results of actions.

## 4 PRINCIPLES OF GOOD DESIGN

- Paying attention to these user-centered design principles—visibility, conceptual models, mapping, and feedback—is not just for designing phones and transistor radios.
- Think of how many times you've clicked on something believing it to be a link, or gone to a page that offered no feedback about location.
- These are important design principles, whether it's industrial design or navigation design.
- Keeping them in mind could save your users a lot of trouble since, as Norman puts it, "If an error is possible, someone will make it."

# DESIGNING FOR INTERACTION

- Interaction, in a nutshell, is two or more people having an exchange—of ideas, of emotions, of physical objects, of words.
- On the computer, interaction is still two or more people having an exchange, with the exception that the interaction is mediated by technology.
- Interactions on the computer are often as complex as interactions off the computer, and it's helpful to understand both.
  - e.g., what makes an interaction positive instead of negative? Politeness is one essential ingredient of a positive interaction. We know this is true in daily life, but surprisingly, it seems to be true in computing situations as well.

# CREATING "POLITE" COMPUTERS

- Quality (saying true things)
- Quantity (saying neither too much nor too little)
- Relevance (saying things that relate to the topic at hand)
- Clarity (saying things clearly and well)

# USE THE EIGHT GOLDEN RULES OF INTERFACE DESIGN

## 1 Strive for consistency.

- Terminology
- Prompts
- Menus
- Help screens
- Color
- Layout
- Capitalization
- Fonts
- Most frequently violated

# USE THE EIGHT GOLDEN RULES OF INTERFACE DESIGN (CONT)

## 2 Enable frequent users to use shortcuts

- Abbreviations
- Special keys
- Hidden commands
- Macro facilities

## 3 Offer informative feedback

# USE THE EIGHT GOLDEN RULES OF INTERFACE DESIGN (CONT)

- 4 Design dialogs to yield closure
  - Sequences of actions should be organized into groups
  - Beginning, middle, and an end
- 5 Offer error prevention and simple error handling
- 6 Permit easy reversal of actions
- 7 Support internal locus of control
- 8 Reduce short-term memory load