Lecture 8
Design Principles #2

Design principles
- **Efficiency/usability**
- **Grouping**

Heim, Chapters 6.5-6.6

Efficiency/Usability

MAXIM

Efficiency describes the usability of a design

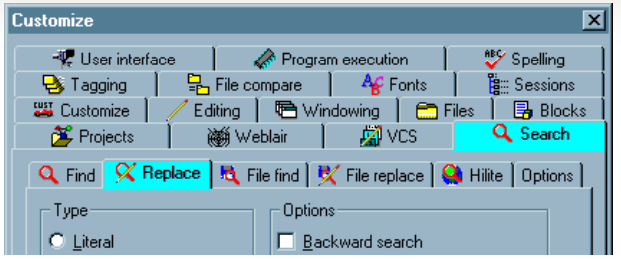
- The efficiency goal stipulates that a design should enable a user to accomplish tasks in the easiest and quickest way possible without having to do overly complex or extraneous procedures.

A computer shall not waste your time or require you to do more work than is strictly necessary. *(Raskin, 2000)*

Efficiency/Usability

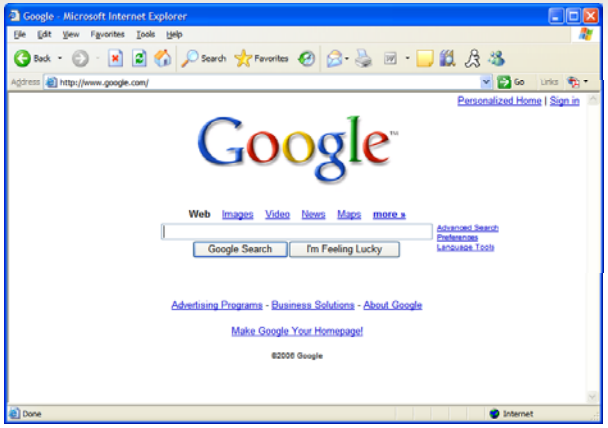
- **Simplicity** - If things are simple they will be easy to understand and, therefore, easy to learn and remember.
  - **Ockham's Razor** - Pluralitas non est ponenda sine necessitate - pluralities should not be posited without necessity
  - **80/20 Rule** - The 80/20 rule implies that 80% of an application's usage involves 20% of its functionality
  - **Satisficing** - Combines the conflicting needs of finding the optimal solution that satisfies all the requirements and the need to settle on a solution that will be sufficient to proceed with the design

Interface Hall of Shame



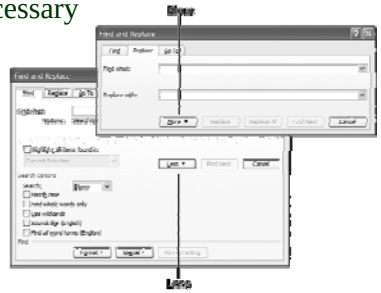
MultiEdit tabs

Simplicity!



Efficiency/Usability

- **Simplicity**
  - **Progressive Disclosure -** Show the user only what is necessary



Efficiency/Usability

- **Simplicity**
  - **Constraints -** Involves limiting the actions that can be performed in a particular design

Controls the design's simplicity

Physical

  - **Paths** - constrain movement to a designated location and direction
  - **Axes** - constrain the user's movement to rotation around an axis
  - **Barriers** -provide spatial constraints that can confine the user's movement to the appropriate areas of the interface

Efficiency/Usability

- **Simplicity**
  - **Constraints**
    - Psychological
      - **Conventions** - exploit learned behavior to influence a user's actions
      - **Mapping** - can influence the way in which people perceive relationships between controls and effects
      - **Symbols** - can influence the way in which we interact with an interface by defining meaning and constraining our possible interpretations of interface elements

Efficiency/Usability

- **Memorability** - Interfaces that have high memorability will be easier to learn and use
  - Many different parameters affect memorability:
    - Location
    - Logical Grouping
    - Conventions
    - Redundancy

Efficiency/Usability



- **Predictability** - Predictability involves a person's expectations and his ability to determine the results of his actions ahead of time.
  - **Consistency-Correctness**
    - Consistency reinforces our associations and, therefore, increases our ability to remember and predict outcomes and processes.
    - Before we strive to be consistent, we must make sure we are correct

Efficiency/Usability

- **Predictability**
  - **Generalizabilty:** can help us use the knowledge we gathered from previous experience and apply it to similar situations
  - **Conventions:** allow us to use our intuitions
  - **Familiarity:** familiar menu names and options help users locate objects and functions more easily
  - **Location, Location, Location:** Not all areas on the screen are created equal

Efficiency/Usability

- **Predictability**
  - **Modes:** Modes create instability in mental models because they change the way objects function

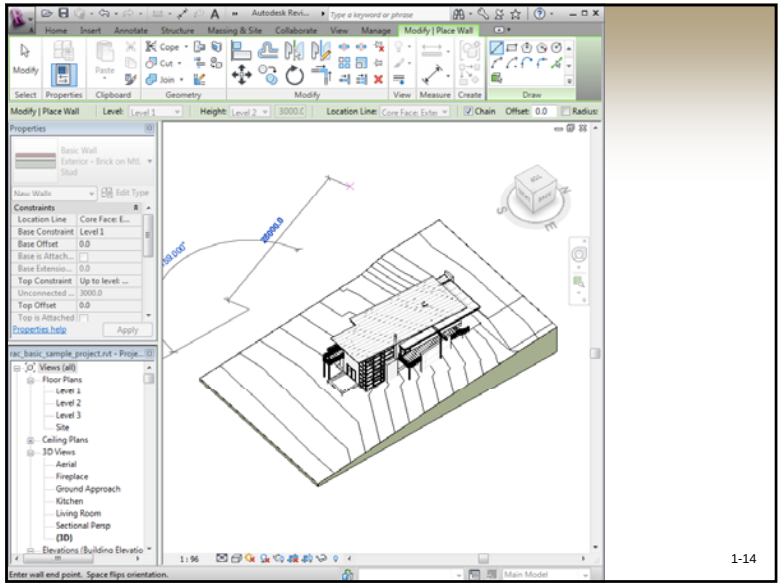
Efficiency/Usability

- **Visibility** - The principle of visibility involves making the user aware of the system's components and processes, including all possible functionality and feedback from user actions.

Show everything at once, and the result is chaos.

Don't show everything, and then stuff gets lost.

(Norman, 1998, 74)



Efficiency/Usability

MAXIM

The principles of progressive disclosure and simplicity should be used in conjunction with the principle of visibility to avoid overload

- **Visibility**
  - **Overload:** Following the principle of visibility without also applying progressive disclosure can lead to visual overload
  - **Feedback:** Direct Manipulation interfaces provide immediate visual feedback about user actions. It is the task of the interaction designer to decide what form that feedback takes

Efficiency/Usability

- **Visibility**
  - **Recognition/Recall:** The principle of visibility is based on the fact that we are better at recognition than we are at recall
  - **Orientation:** People need to be able to orient themselves, especially in complex information spaces

Grouping

- **Low-level principles** - used to make decisions about specific screen controls, menus and layouts

MAXIM

Use visual cues to support the logical structure of the interface

- **Gestalt Principles of Perception**
  - Gestalt psychology strives to explain the factors involved in the way we group things
  - At the heart of Gestalt psychology is the idea that we strive to find the simplest solutions to incomplete visual information

by R.C. James

Gestalt Principles of Perception

- **Figure-Ground: Basic premise**
  - We perceive our environment by differentiating between objects and their backgrounds

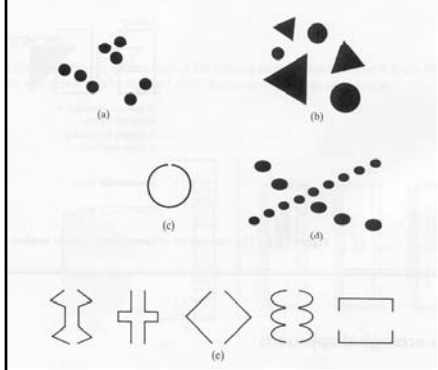
The Rubin Face/Vase Illusion

Mac Logo

Gestalt Principles of Perception

- The Gestalt Principles of Perception:
  - Proximity
  - Similarity
  - Common Fate
  - Closure
  - Good Continuity
  - Area
  - Symmetry
  - Surroundedness
  - Prägnanz

Gestalt Principles of Perception



- Proximity
- Similarity
- Closure
- Continuity
- Symmetry

Gestalt Principles of Perception

- **Proximity Principle –** Objects that are close to each other will be seen as belonging together

Equidistant | Horizontal Proximity | Vertical Proximity

Proximity

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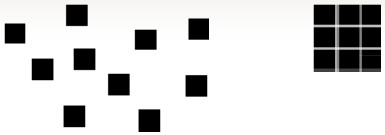
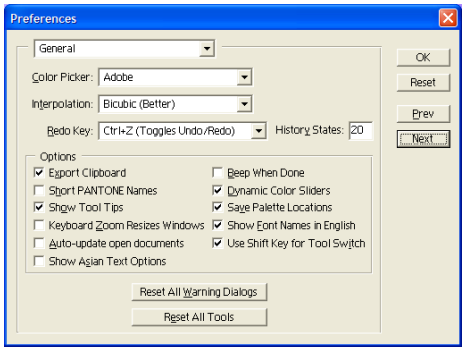


Gestalt Principles of Perception

- **Proximity** - Adobe PhotoShop Preferences Dialog



Gestalt Principles of Perception

- **Similarity Principle** – Objects that have similar visual characteristics, such as size, shape or color will be seen as a group and therefore related

Rows of Similar Objects | Columns of Similar Objects | Grouped Columns

Similarity

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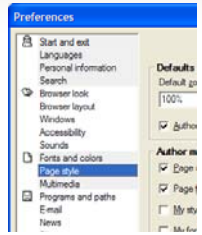
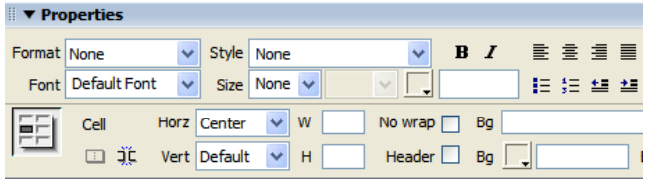


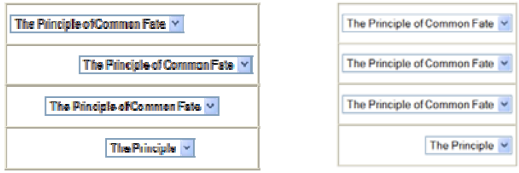
Gestalt Principles of Perception

- Property Pane from Macromedia's Dreamweaver
  - Our eyes pick up all of the text boxes because of the strong blue squares and the white areas that they have in common

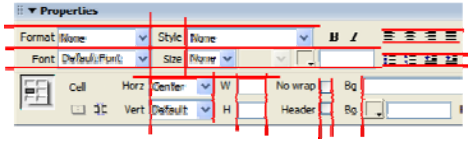


Gestalt Principles of Perception

- **Common Fate Principle** – Objects that move together are seen as related



Unaligned Drop-Down Menus | Aligned Drop-Down Menus



Gestalt Principles of Perception

- **Closure Principle** – We tend to see things as complete objects even though there may be gaps in the shape of the objects

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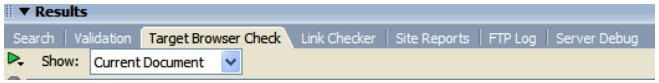

Closure

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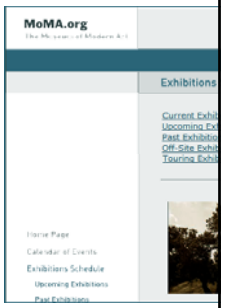
Gestalt Principles of Perception

- **Good Continuity Principle** – We tend to see things as smooth, continuous representations rather than abrupt changes



Continuation

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Gestalt Principles of Perception

- **The Area Principle** – Objects with small area tend to be seen as the figure, not the ground (also called the smallness principle)

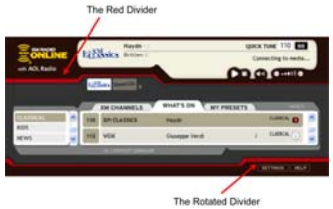
Gestalt Principles of Perception

- **Symmetry Principle** – Symmetrical areas tend to be seen as complete figures that form around their middle


Translation


Reflection


Rotation



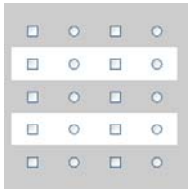
Gestalt Principles of Perception

- **Surroundedness Principle –** An area that is surrounded will be seen as the figure and the area that surrounds will be seen as the ground

Gestalt Principles of Perception

- **Prägnanz Principle –** We tend to perceive things based on the simplest and most stable or complete interpretation


Visual Conflict with Common Fate


Visual Conflict with Surroundedness

Prägnanz (figure-ground)

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1-37

Which Gestalt principles are being used? How can you tell?

1-38