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**Information  
Architecture  
for the Web**

**Module 4:** **Enable Visual  
Thinking**



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# 4

## Module 4: Enable Visual Thinking

Information is easier to remember when it is in an orderly state, rich in pattern and structure, and highly interconnected. Disordered information that lacks structure is easy to forget.

**Jeremy Campbell, *Grammatical Man*, 1982**

### Objectives:

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- 4.1** → **Understand ways people organize information into categories**
- 4.2** → **Design visual structures to help users**
- 4.3** → **Incorporate techniques for reducing visual overload**

## Introduction

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**In this module, we'll look at the way human beings classify and structure content. We'll discover how inherent structures and visual patterns support us in making the choices and acting.**

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As human beings, we depend on classifying and categorizing information to make sense of the world. Our minds gather information and then make sense of it. The way we gather information often depends on how information is grouped and visually structured.

In this module, we'll look at the way human beings classify and structure content. We'll discover how inherent structures and visual patterns support us in making choices and acting.

4.1 

# Understand ways people organize information into categories

**Our understanding of the world is largely determined by our ability to organize information.**

**Louis Rosenfeld and Peter Morville**  
*Information Architecture for the World Wide Web,*  
1998

Many scholars agree our understanding of the world is determined by our ability to organize information. As human beings, we categorize information to understand, explain, and control. During the 20th century, scholars such as Emile Durkheim explored the underlying structures that human beings rely on as they process information. In a 1912 text, Durkheim wrote, “If humankind did not agree upon essential categories at every moment—if they did not have the same conception of time, space, cause, and number, all contact between their minds would be impossible.”

Information architects must rely on fundamental understanding and look at categories as structures for helping people find the answers they seek. Unfortunately—as many of us know—we’re often thwarted when we enter websites. We’re burdened by labels that make no sense to us.

Different scholars list the challenges with categorizing information. We find it comes down to two challenges: people and language.

➤ **People**

- View information from different perspectives
- Have egos and political agendas

➤ **Language**

- Is ambiguous
- Varies in granularity



Question

**What different ways do people organize information?**

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## Structures and schemes

In their book, *Information Architecture for the World Wide Web*, Rosenfeld and Morville provide a foundation for tackling organization challenges. They define organizational systems as organizational schemes and organization structures.

### Structures

We relate to organization structures every day—linear structures (beginning, middle, and end), special structures (physical proximity). The hierarchical structure is most familiar. Rosenfeld and Morville comment that hierarchy is “ubiquitous...it informs our understanding, and provides an easy-to-see mental model of a site’s structure.”

### Schemes

Organizational schemes, according to Rosenfeld and Morville, can be considered both exact and ambiguous. Exact schemes include alphabet, chronology, or geography. The ambiguous schemes (which the authors call “the tough ones”) have more difficulties for users.

Ambiguous schemes “divide information into categories that defy exact definition...” They can be difficult to design and maintain. They can be difficult to use. In an ambiguous scheme, someone other than the user has made a decision on how to group items together. Success depends on the classification system (or structured container) the Web developer chooses to use. Ambiguous schemes organize information in the following ways:

- By topic
- By task
- By audience
- Based on metaphor
- In a hybrid manner (which is often difficult for users to follow)

**While information may be infinite, the ways of structuring it are not.... Your choice will depend on the story you want to tell.**

**Richard Saul Wurman,  
*Information Anxiety 2*,  
2000**

## Inherent structures

Richard Saul Wurman identified five patterns that humans rely on to understand information: location, alphabet, time, category, and hierarchy.

Location, alphabet, and time can be considered externalized—we learn specific structures for explaining them. Categories and hierarchies often are self-generated. We create these structures based on our own experience.

Understanding the underlying structure and organization of information permits us to extract value and significance from it.

- **Location.** Location is a natural form to choose when you are trying to examine and compare information that comes from diverse locales.
  - Medical information showing regions of the body
  - Regions of the country
  - Location labels: North, South, East, West
- **Alphabet.** This method lends itself to organizing extraordinarily large bodies of information, such as words in a dictionary or names in a telephone directory.
  - Directions to find people or numbers
  - Code numbers when people know form by number
- **Time.** Time works best as an organizing principle for events that happen over fixed durations. It is an easily understandable framework from which changes can be observed and comparisons made.
  - Process (Narrative visually displayed)
  - Procedure (How-to steps)
  - Timeline (Visual ... often horizontal visualization)
- **Category.** Category pertains to the organization of goods. It lends itself well to organizing similar items.
  - Subordinate/Coordinate
  - Granularity
  - Parallelism
- **Hierarchy.** Hierarchy organizes items by magnitude such as small to large, least expensive to most expensive, and order of importance.
  - Biggest to smallest
  - Most important to least important

Thinking about inherent structures can be especially useful when architecting websites where we put information into different categories. The user might, for example, click onto a map to find information organized by location. Or click into an alphabetical list to view the same information.

**Alphabet:** Users find alpha structure under "services"

**Location:** Users click into county image

**Hierarchy:** Site lists county leaders from executive to county sheriff.


**Time:** Users learn about news in "what we're doing"

**Category:** Features offer users access into category topics.

**Website Content:**

- King County, Washington
- HOME NEWS SERVICES
- www.metrokc.gov
- SEARCH
- King County Works!
- Metro buses • Job openings • Public health • Land use
- What we're doing...
  - Addressing state's inaction on traffic issues
  - Porting rise in drug-related emergencies
  - Asking for help finding Burien woman
  - Seeking Salmon Program volunteers
  - Announcing energy, dollar savings
  - Effecting King County burn ban
  - Decrying RTC transit service deep-freeze
  - ...more County news
  - ...breaking regional news
- Picture This!
  - Metro productivity keeps buses full but not too full
- Puget Sound Fresh
  - Good for all of us!
- Take the Metro Shuttle to WOMAD.
- Enjoy world music and more at WOMAD (120K external)
- Take the Metro Shuttle to the Bellevue Arts & C
- See streaming video (IE browsers) added to your co
- Meet Executive Sims in your community.
- Features
  - Volunteer; Restaurant closures;
  - Kids Web; Nutrition; CTV;
  - Picture This!;
  - » more
- Public safety, courts
  - Juror information; In
  - instructions; Sex d
  - Women's resource
  - » more
- Community health
  - Public health; Mental health;
- Recreation, arts
  - Parks & recreation (87K); Lakes;
- Special services
- Weekly Poll
- Red Light Cameras
- PHONE NUMBERS
- Emergencies
- General Information
  - (206) 296-0100
  - Toll-free:
  - (800) 325-6165
  - TTY:
  - (206) 296-0100
- LEADERS
- Executive Council

www.metrokc.gov offers different routes for users at their site. Using LATCH (Location, Alphabet, Time, Category and Hierarchy) as a framework, Web creators can base routes on underlying patterns of information.

4.2 

## Design visual structures to help users

People actively organize what they see. They resolve ambiguities, impose structure, and make connections.

As a matter of discipline, we document designers aim to constrain the meanings readers create. We cannot control the process of interpretation, only guide it through careful design of words and pictures.

**Karen A. Schriver, *Dynamics of Document Design*, 1994**



Question

**Identify several ways the design of a document helps the reader see the text and understand its meaning?**

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To design visual structures to help users, we must understand how they view information cognitively, and how they respond to spatial arrangement.

- **Cognitively**—We view information and in four seconds derive meaning about the structure.
- **Visually**—We construct meaning based on how we perceive visual “gestalt” cues.

## We look at information cognitively (we look for structure)

In four seconds...

1. **Viewer sees the whole page** as a construction of elements having varied visual characteristics.
2. **Viewer chunks** the page into individual elements, using the visual cues—white space and page design.
3. **Viewer cues** these chunks into sequence and hierarchy via typographic elements—such as bigger text.
4. **Viewer filters** these elements—looks for similarities and differences.
5. **Viewer abstracts** the identity and function of each element (figures out number and purpose of different elements on page).
6. **Viewer acts** on information.

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### Viewer sees whole page

Viewer **sees the whole page** as a construction of elements having varied visual characteristics.

#### What we can do:

- Use established graphic structures/mental models
  - Example: newspaper looks different than shopping site
- Keep a visual (conceptual and mechanical) consistency



Question

Are there sites that you have seen that you wonder, “What is the purpose of this site?” because of how it was visually presented?

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## 2 Reader chunks page into elements

Viewer **chunks** the page into individual elements, using the visual cues—white space and page design.

### What we can do:

- Use white space to separate chunks of information.
- Place similar items together (**proximity**).
- Alert users to the organization of information via grouping of information and maps.

## 3 Viewer cues the information

Viewer **cues** the information, trying to identify a hierarchy of importance. Through basic cue processing we recognize simple shapes in a complex design. In addition, even at a distance (or on a low resolution monitor), we will locate objects of similar shape or color.

### What we can do:

- Help users find sequence and hierarchy via typography, placement, and graphic treatment.
  - Use color to cue.
  - Use size to cue.
  - Use text weight to cue.

## 4 Viewer filters elements

Viewer **filters** information by looking for similarities and differences.

### What we can do:

- Maintain consistency!!!
- Create layers of depth and importance by associating and categorizing information.
- Repeat elements or the visual “look” of elements (**repetition**).
- Simplify the graphic choices within the visual space.

**5****Viewer abstracts elements**

Viewer **abstracts** the identity and function of each element.

**What we can do:**

- Enable differentiation
- Visually highlight differences
- Use white space to separate

**6****Viewer acts**

Viewer **acts** on information.

- Knows purpose
- Keeps reading
- Leaves page
- Clicks elsewhere
- Goes round and round
- Moves purposefully



Group Exercise

### Exercise: Visual preprocessing

**Show your site to your partner.** Take turns reading the following questions and responding:

- What kind of site is it?
- What are the big chunks of information in the site?
- Can you name these chunks of information?
- Can you see the relationship between the chunks of information?

**Trade places.**

**Record your partner's findings about your site.**

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Human vision is the true creator of virtual reality.

Donald Hoffman, *Visual Intelligence*, 1998

## Identify what happens when we encounter visual information

For the mind to cope with the world, it performs two functions: It gathers information and it processes it. When we perceive, we gather information that can be used for thought.

Gestalt psychologists describe this human activity by identifying characteristics about how people perceive:

- People perceive actively
- People view information within surroundings
- People organize what they see into figure and ground
- People group information depending on the relationship of elements in the field
- People anticipate continuation

### People perceive actively

- People want to know what to focus on.
- People try to separate different graphic symbols and cues and give them all meaning.
- People tend to believe the problem is with them rather than in the structure of information.



Online Exercise

### Exercise: Reacting to pages online

Go to the class website, <http://www.infodotdesign.com/class/ia>.

Write down several words describing the physical/mental reaction you have to the pages displayed.

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**People view information within surroundings**

- Parts of the visual field will always interact with each other.
- Figures that work well in isolation may not work well with other information.

**When you described your reaction to the visual, did you use words like “cluttered?” Were you viewing information within the screen space?**

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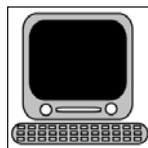
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**People organize what they see into “figure and ground”**

- We look at information trying to figure out foreground and background.
- When constructing a site:
  - Both blank space and text can act as ground
  - Use contrast



Online Exercise

**Exercise: Locating important information**

Go to the class website, <http://www.infodotdesign.com/class/ia>.

**What jumps out at you from the page? Do you perceive it as important? Is it the most important information on the page?**

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### People group information

- When people perceive a visual field, patterns emerge.

### People anticipate continuation

- People will look for “good continuation” when looking at information. When we don't see continuation we tend to become uneasy.
- Designers can use this perceptual quality when considering the effect they want to create (based on the purpose of the information).
- When an object “steps out” of the grid, people tend to focus on it.

### What we can do:

- When we present information, we must think about how people group information and anticipate continuation. As a result, we need to build in many opportunities for **alignment**.
- We need to establish formal or informal **grid** structures on which to place text and graphics.



Individual Exercise

### Exercise: Using gestalt language to explain how users see

Answer these questions for your site:

Do you feel there is a “connectedness” in the example?

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Do you see some figures “jumping” to the foreground?

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Do you see any similarity in pattern? Does the information seem to align for you or do you feel it is scattered?

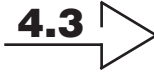
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**4.3**

## Incorporate techniques for reducing visual overload

What happens when we assess choices, select options, simplify content, abstract information, analyze and synthesize data, complete missing information, separate similar items or put information together? Visual perception, according to seminal thinker Rudolf Arnheim, “is not a passive recording of stimulus material but an active concern of the mind.” Perception, he says, involves problem solving. “To see means to see in relationship to other things.” The challenge for us is to understand the context in which our graphics lie and strategies for manipulating our “visual writing” to support our users.

**Most people can look at a poorly designed page and state that they don't like it, but they don't know what to do to fix it.**

**Robin Williams,  
Non-Designer's Design  
Book, 1994**

Robin Williams addresses that question in her book, *The Non-Designer's Design Book*. Williams offers four principles to help readers build documents that are more professional, organized, unified, and interesting. She lists these four principles as Proximity, Alignment, Repetition, and Contrast. (She lists them as PARC...but we find that it's easier to remember them as CRAP.)

### Contrast

- Contrast captures attention.
- Gestalt theory says users will immediately try to make meaning out of any visual contrast.
- The user will assign importance based on contrast to determine if the information is worthy.

### Repetition

- Repetition imposes structure.
- Cognitive theory says people actively organize what they see.
- The user will chunk information based on repetitive visual cues.

### Alignment

- Alignment creates patterns.
- Gestalt theory says everything in the perceptual field influences everything else.
- The user will create a hierarchy based on alignment.

### Proximity

- Proximity of elements affects how the user perceives the information.
- Cognitive theory says people actively try to connect what they perceive.
- The user will expect related information to be together and may connect unrelated information as a result of proximity.

**Try this CRAP test.** We believe you can reduce visual overload by applying the CRAP test on your current site: Did you use contrast where it was worthy? Did you use same structure when repeating page elements? Did you align text and graphics into grids? Did you put information together that belonged together and separate dissimilar information with space?