EE4717/IM4717 Web Application Design
Web Application Design Principles

Lecturer :

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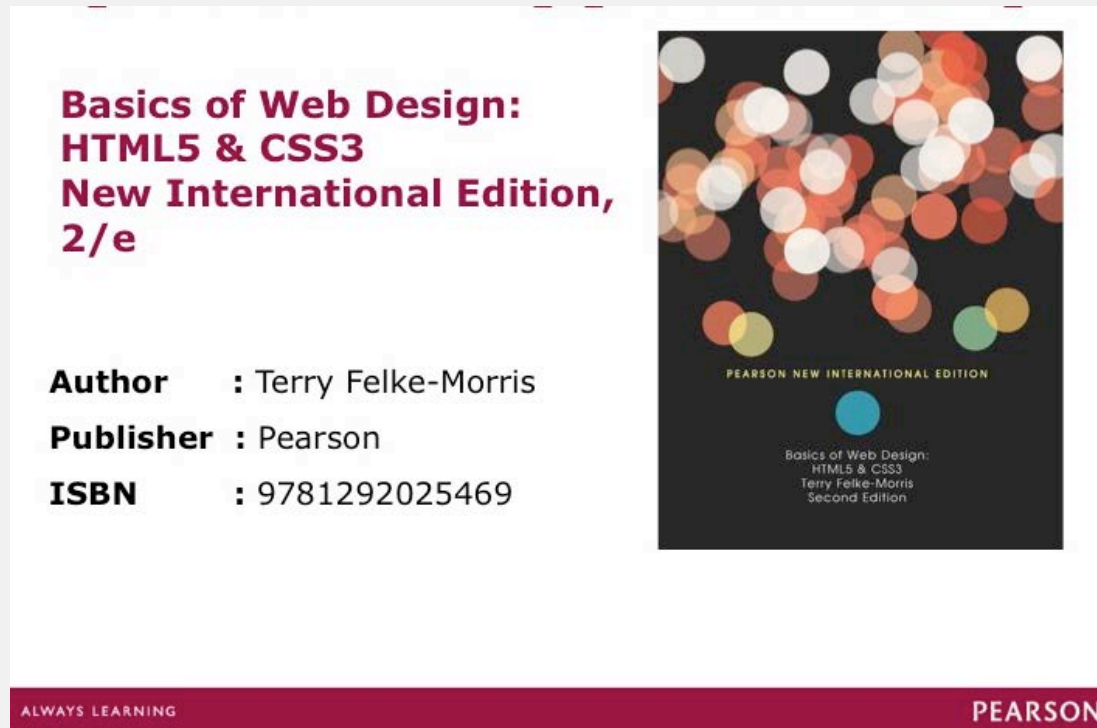E-mail: eykchong@ntu.edu.sg
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➢ The teaching are mostly adopted from the slides provided by the author and publisher of the following textbook:

Basics of Web Design: HTML5 & CSS3 New International Edition, 2/e

Author : Terry Felke-Morris

Publisher : Pearson

ISBN : 9781292025469

PEARSON NEW INTERNATIONAL EDITION

Basics of Web Design:
HTML5 & CSS3
Terry Felke-Morris
Second Edition

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Design of web application

- It is more than just web-programming.
- Recommended text:
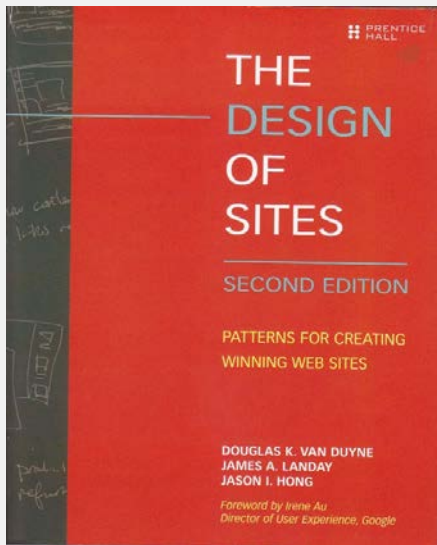
  ❑ Title: The Design of Sites
  Authors: Douglas K. Van Duyne;
  James A. Landay;
  Jason I. Hong
  ISBN: 978-0-13-134555-3
  Publisher: Prentice Hall PTR

- Emphasis : Customer-centered web design.
- Some slides are based on the chapters in this book

Applying Customer-Centered Design

➢ Principles

– high-level concepts that guide the entire design process and help you stay focused.

– must acquire a deep understanding of your customers' needs.

– design your Web site iteratively, moving from rough cuts to refined prototypes, before creating the production Web site.
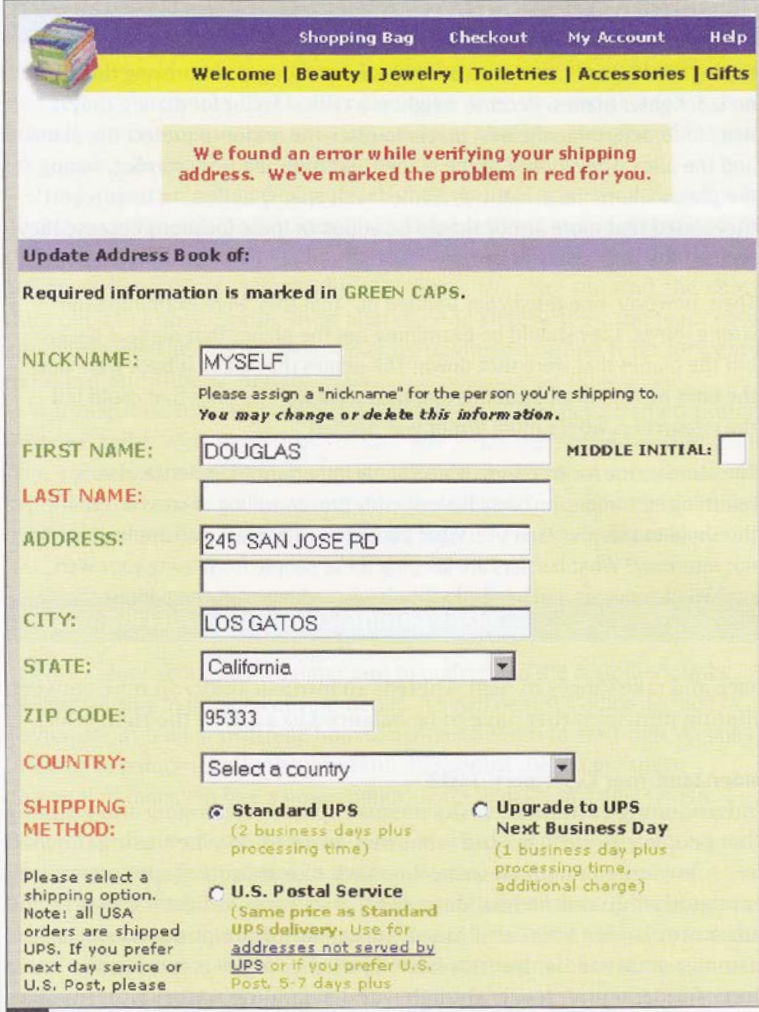
➢ Design is about making informed trade-offs between competing constraints.

Understand Your Customers' Tasks

Example:

➢ A small dentist 's office decided to automate its billing, switching from paper-based forms to electronic versions. Hoping to reduce costs in the long term, the dentist spent a nontrivial amount of money to hire a programming team to develop a new system. After it was finished and deployed, however, all of the dentist's assistants were extremely dissatisfied with the new system

➢ What happened?

  – The programmers did not pay attention to how the paper forms were used, and many of them had handwritten notes in the margin, such as, "this patient's insurance takes longer than most".

  – But the new system simply did not support this kind of flexibility.

➢ A careful analysis of the existing tasks could have revealed this use of notes, and the appropriate flexibility could have been designed into the system.

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Choose the right combination of colors

How to start: Build Scenarios

➢ Create scenarios illustrating why people would use your Web site.

➢ Use photographs or sketched storyboards.

➢ Storyboard is a sequence of Web pages that you create to give a rough idea of how someone might accomplish a given task.

Storyboard
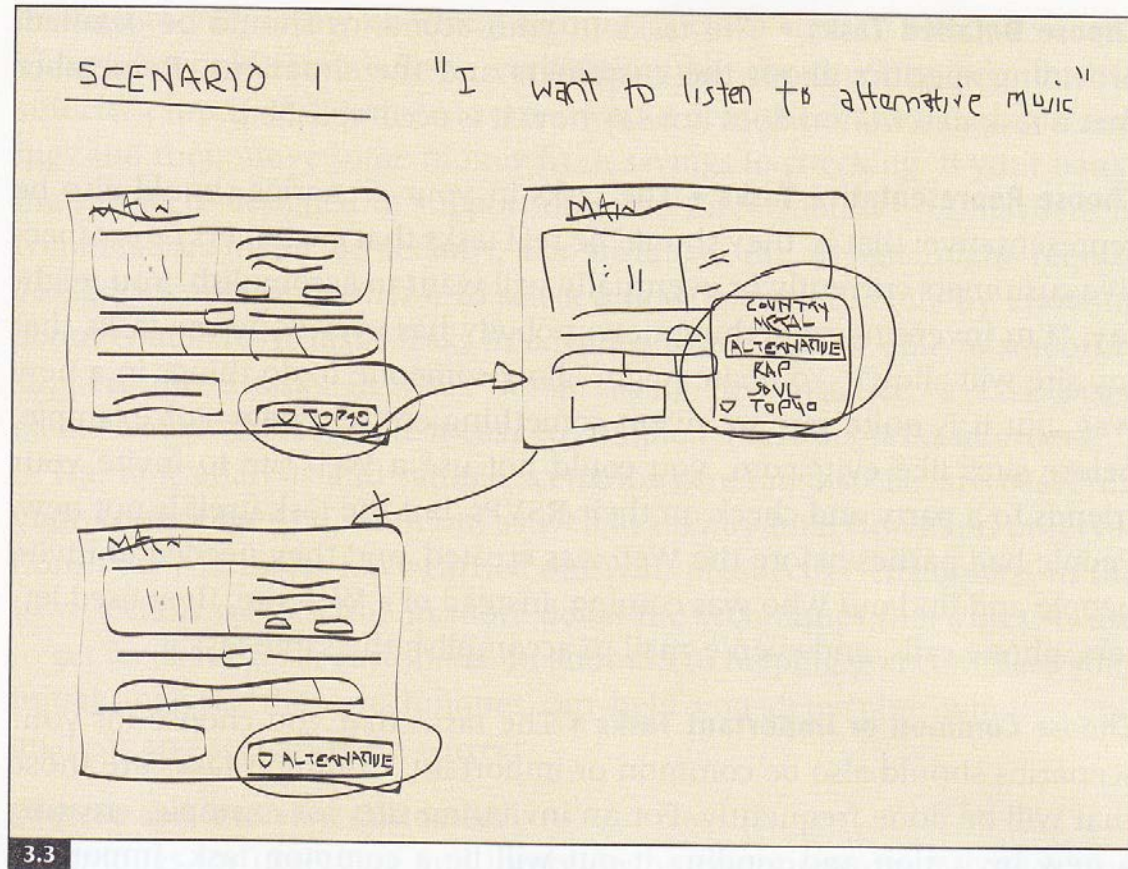
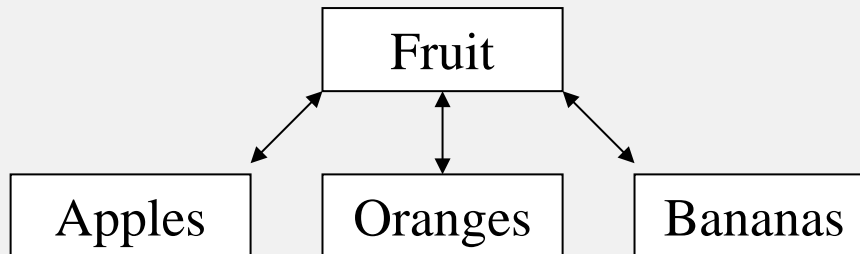This sketcher storyboard shows how a customer would accomplish one task using the design of a music site targeted at mobile device users.

Card Sorting

➢ It helps to determine the best site structure.

➢ Example

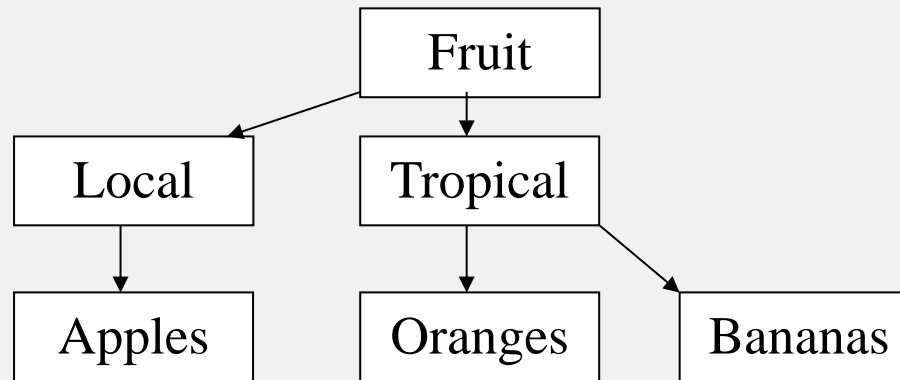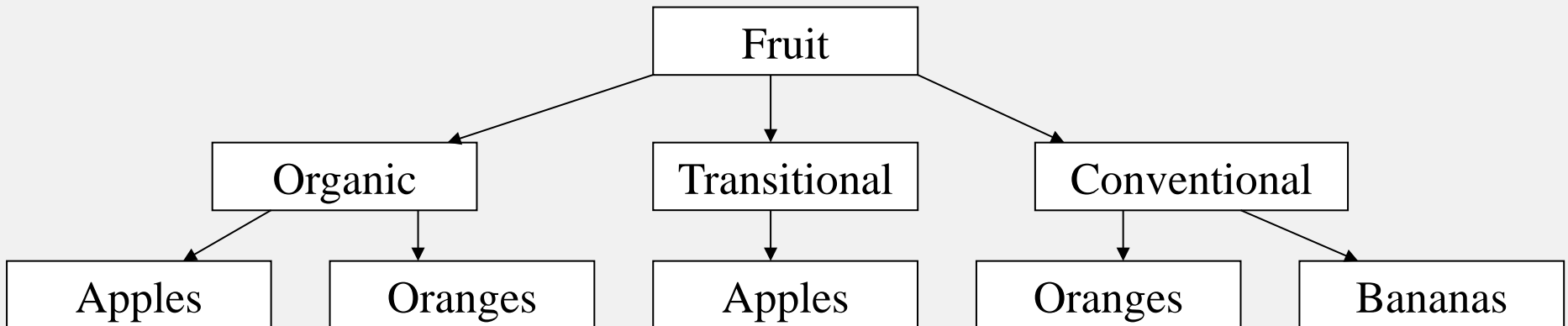suppose your site starts with the following content:

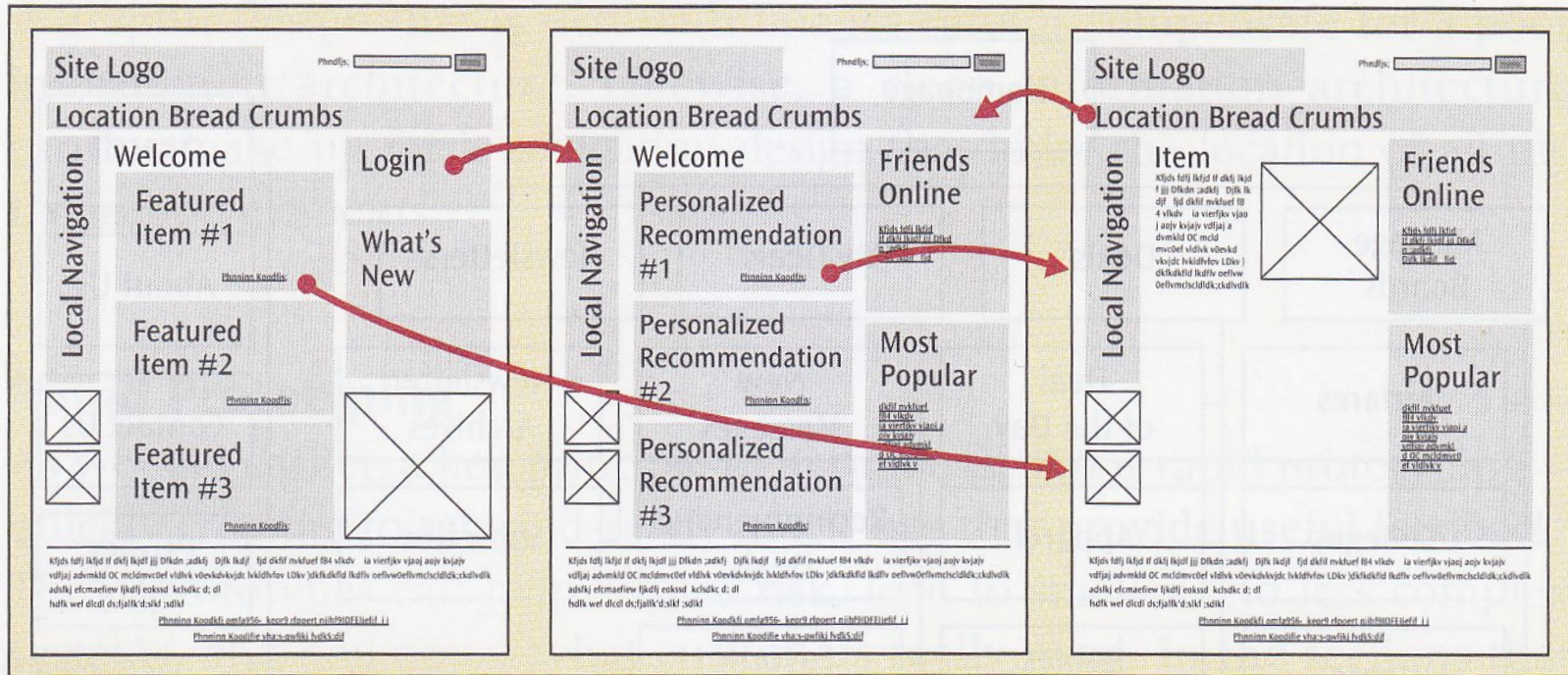| Apples	Oranges	Bananas

– for a grocery site:

```
              Fruit
          ↙    ↕    ↘
    Apples  Oranges  Bananas
```

Card Sorting

- If customers were particularly concerned about freshly picked, locally grown fruit,

```
                    ┌───────┐
                    │ Fruit │
                    └───┬─┬─┘
              ┌─────────┘ └──────┐
          ┌───────┐         ┌──────────┐
          │ Local │         │ Tropical │
          └───┬───┘         └──┬────┬──┘
         ┌────────┐      ┌─────────┐    ┌─────────┐
         │ Apples │      │ Oranges │    │ Bananas │
         └────────┘      └─────────┘    └─────────┘
```

- If customers were concerned about pesticide use,

```
                         ┌───────┐
                         │ Fruit │
                         └─┬──┬──┬┘
          ┌────────────────┘  │  └────────────────┐
     ┌─────────┐      ┌──────────────┐      ┌──────────────┐
     │ Organic │      │ Transitional │      │ Conventional │
     └──┬───┬──┘      └──────┬───────┘      └──────┬────┬──┘
  ┌────────┐ ┌─────────┐ ┌────────┐      ┌─────────┐  ┌─────────┐
  │ Apples │ │ Oranges │ │ Apples │      │ Oranges │  │ Bananas │
  └────────┘ └─────────┘ └────────┘      └─────────┘  └─────────┘
```
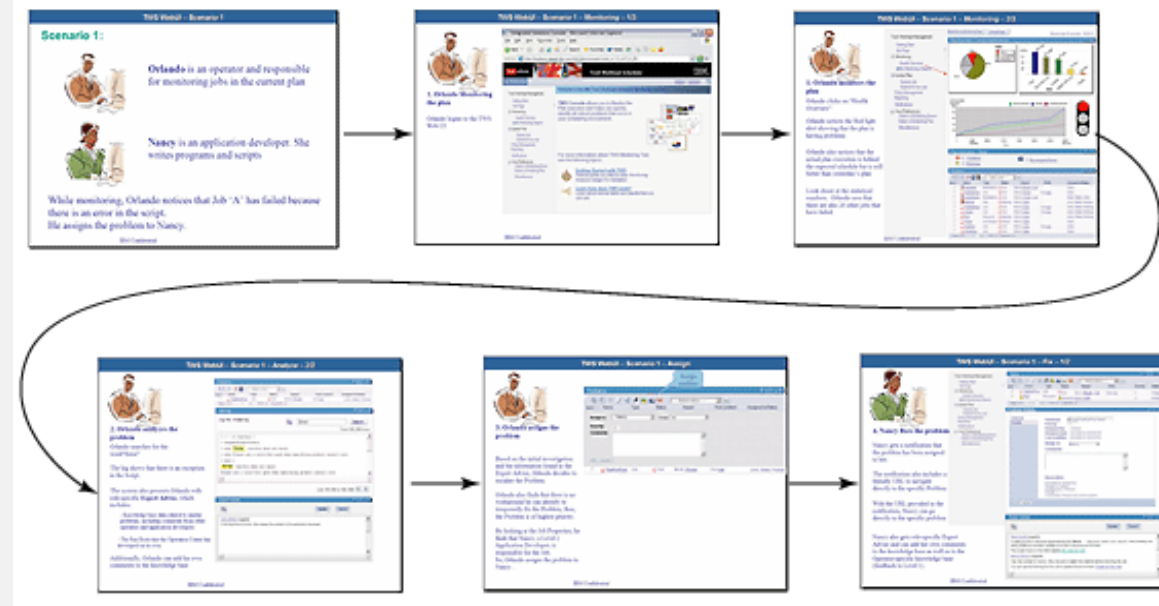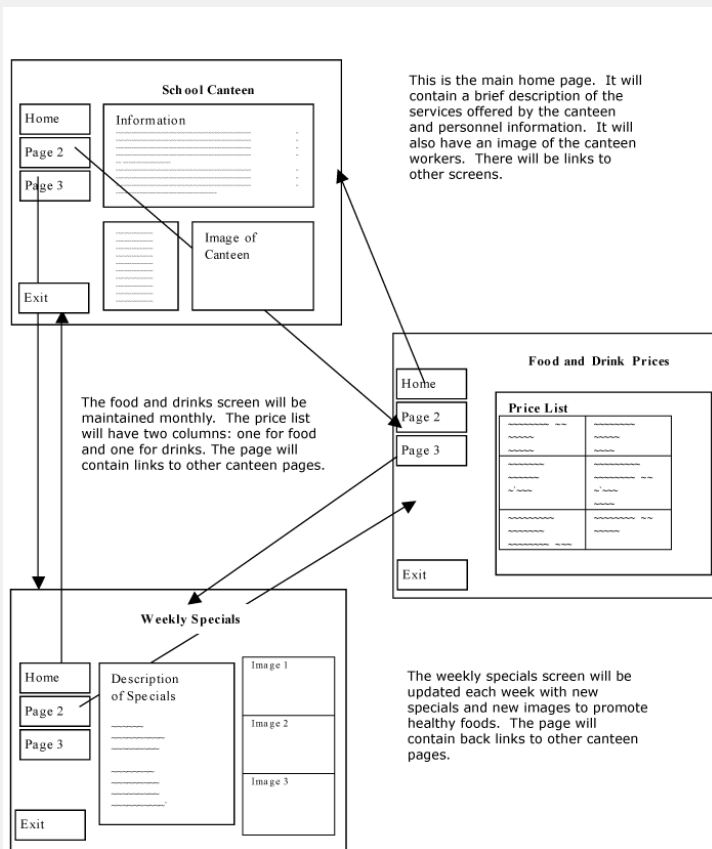
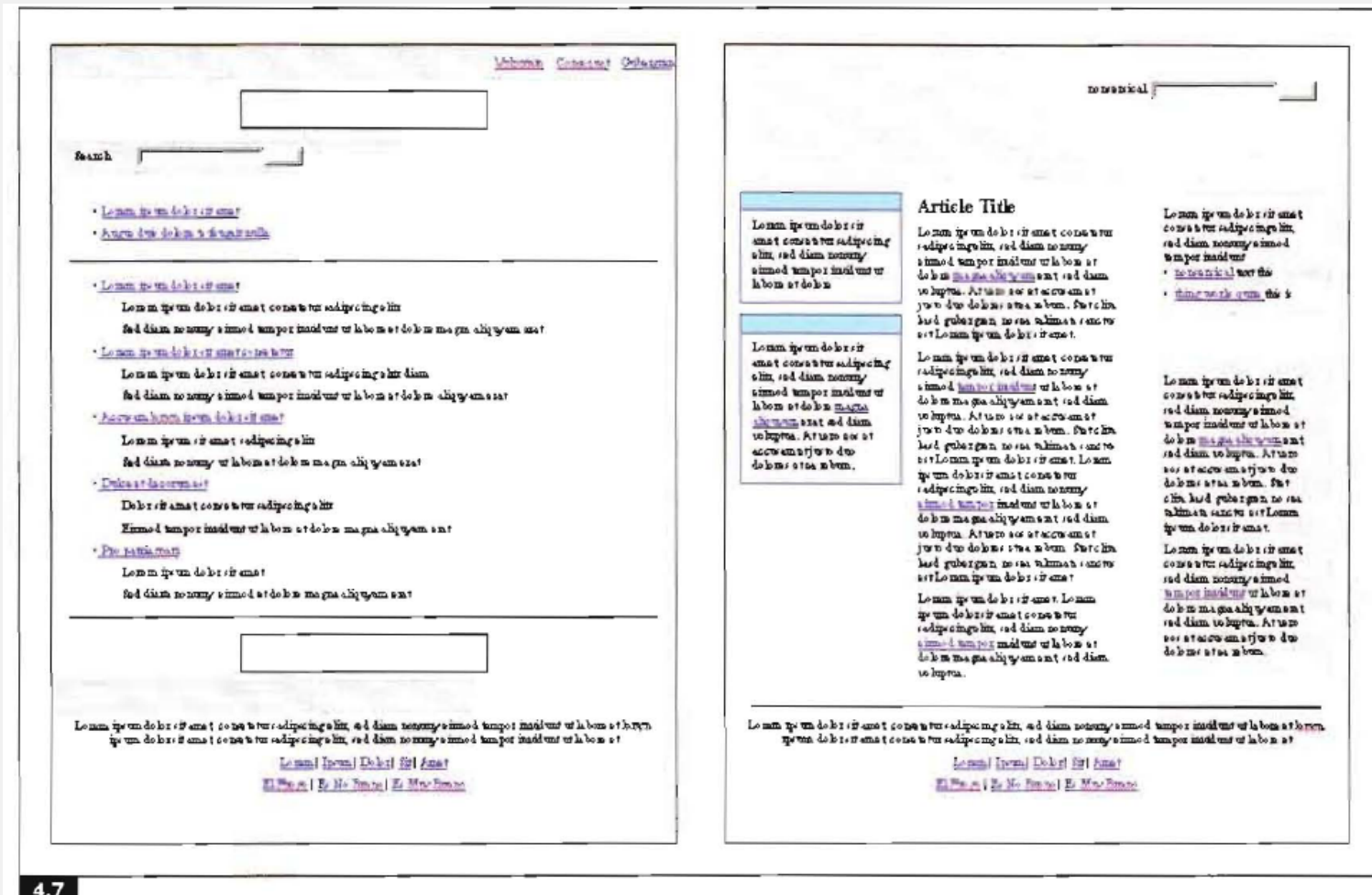NANYANG TECHNOLOGICAL UNIVERSITY

Rapid Prototyping – Storyboard

Storyboards show the steps that a customer would take to accomplish a task. This storyboard shows how a customer interacts with a site that lets groups of friends find, recommend, and share things with each other.
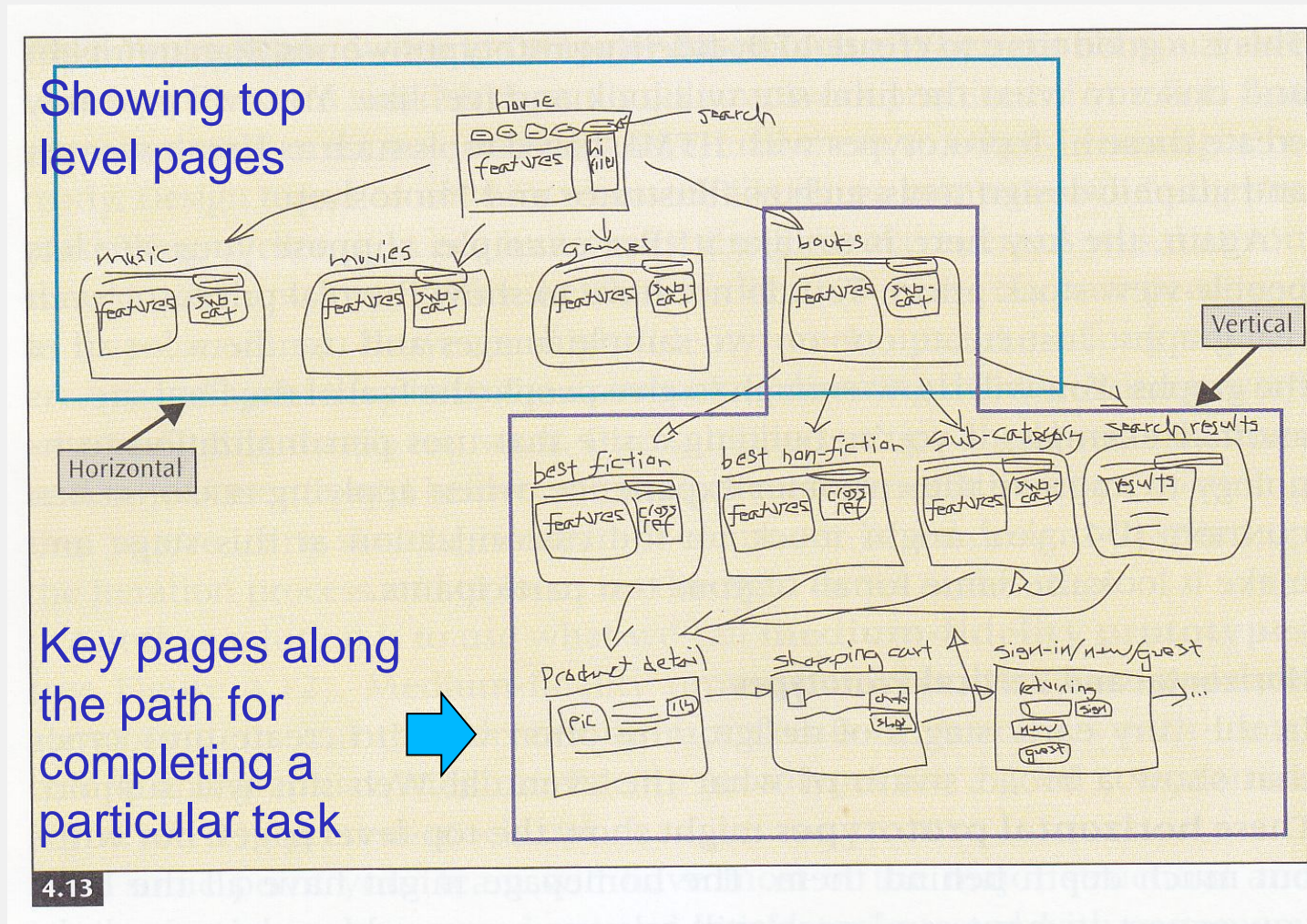
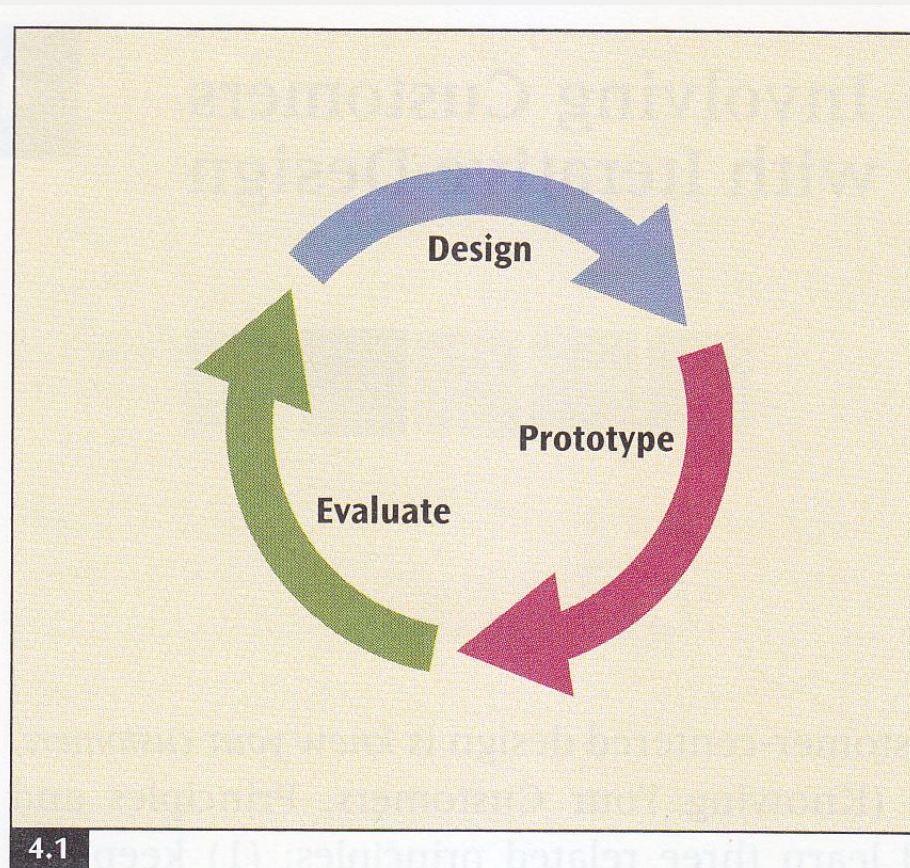# Sample Storyboard

Rapid Prototyping – Schematics

Have a feel of complete individual webpages.

Horizontal and Vertical Prototypes

Showing top level pages

Vertical

Horizontal

Key pages along the path for completing a particular task
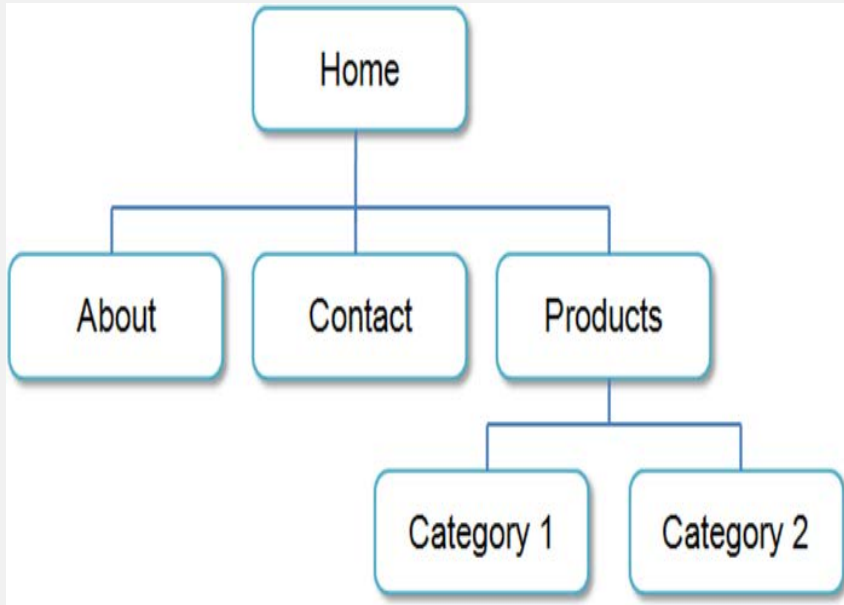
The Iterative Design Process

Detect problems while they're still inexpensive and easy to fix, building site with the features that your customers need, in a way that your customers can use.

Website Organization

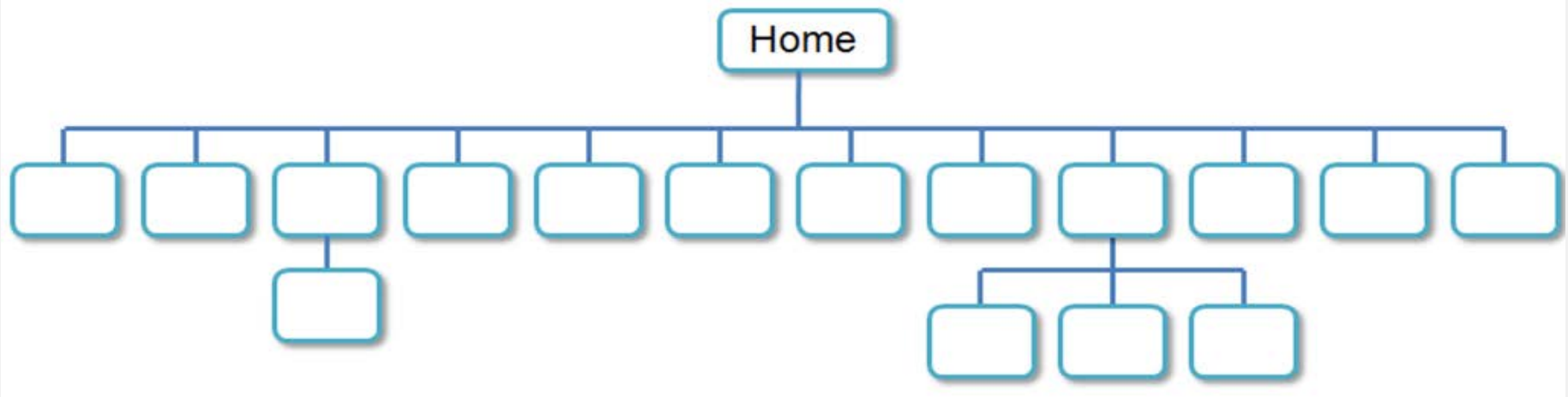➢ **Hierarchical**

➢ **Linear**

➢ **Random**

Hierarchical Organization

Site Map

- ➢ A clearly defined home page
- ➢ Navigation links to major site sections
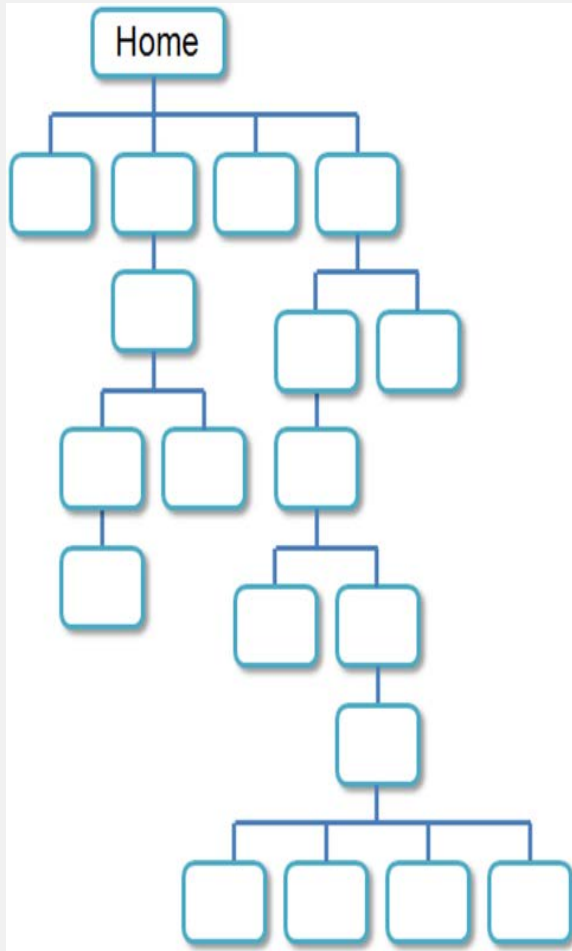- ➢ Often used for commercial and corporate websites

Hierarchical: Too Shallow

- ➢ Be careful that the organization is not too shallow.
- ➢ Too many immediate choices → a confusing and less usable website.
- ➢ Group, or "chunk", related areas
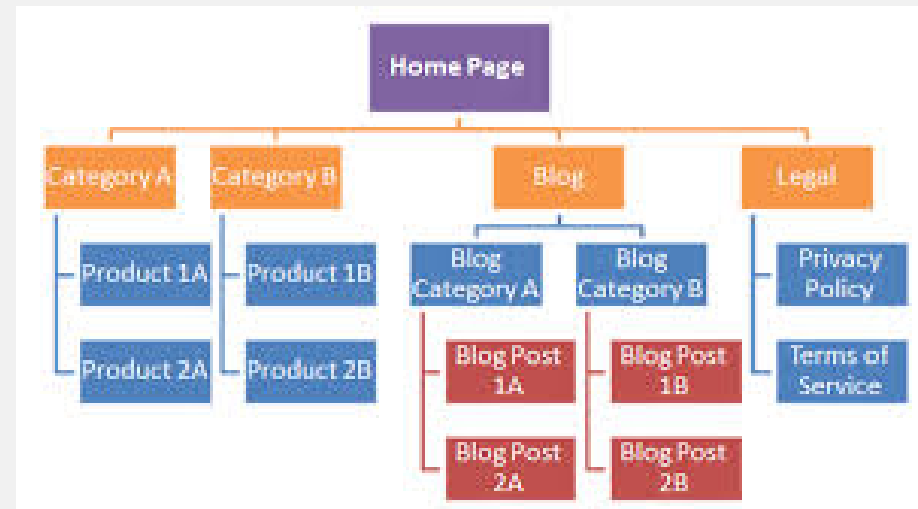
Hierarchical: Too Deep

- Be careful that the organization is not too deep.

  ◦ This results in many "clicks" needed to drill down to the needed page.

  ◦ User Interface "Three Click Rule"
    - A web page visitor should be able to get from any page on your site to any other page on your site with a maximum of three hyperlinks.

Linear Organization

Home Page → Lesson 1 → Lesson 2 → Lesson 3 → Summary

➤ A series of pages that provide a tutorial, tour, or presentation.
➤ Sequential viewing

Random Organization

- Sometimes called "Web" Organization

- Usually there is no clear path through the site

- May be used with artistic or concept sites

- Not typically used for commercial sites

Sample Site Map
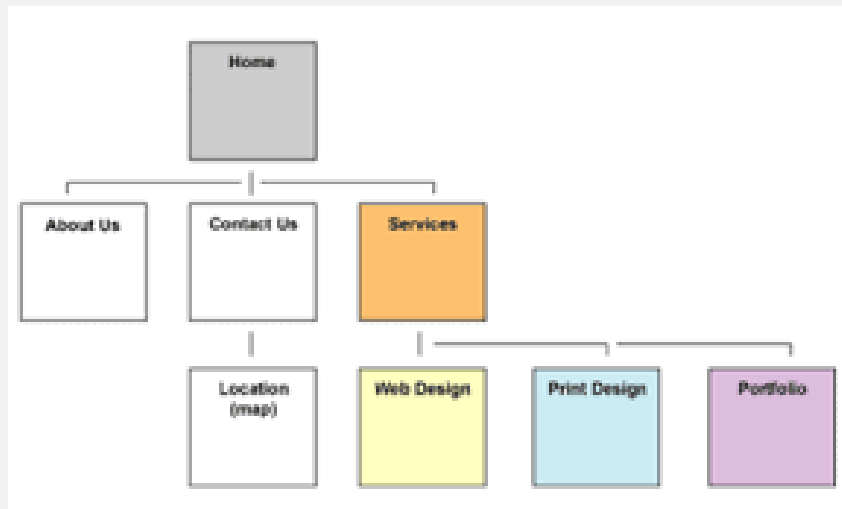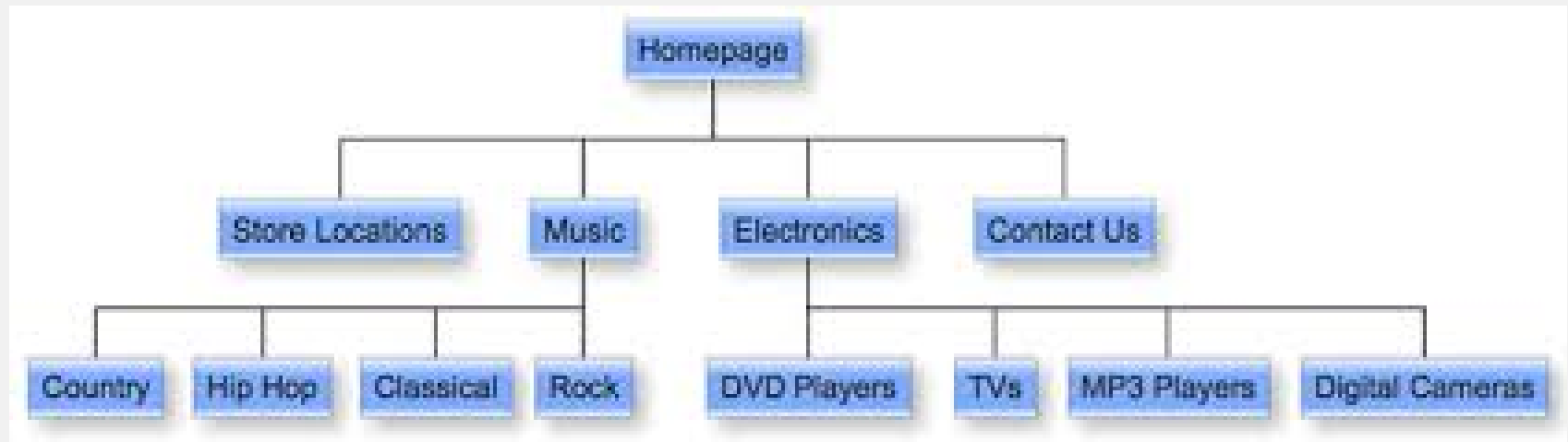
Visual Design Principles

➢ **Repetition**

- – **Repeat visual elements throughout design**

➢ **Contrast**

- – **Add visual excitement and draw attention**

➢ **Proximity**

- – **Group related items**

➢ **Alignment**

- – **Align elements to create visual unity**

Writing for the Web

- ➢ **Avoid long blocks of text**
- ➢ **Use bullet points**
- ➢ **Use headings and subheadings**
- ➢ **Use short paragraphs**
- ➢ **Use common fonts:**
  - – **Arial, Helvetica, Verdana, Times New Roman**

- ➢ **Use appropriate text size:**
  - – **medium, 1em, 100%**
- ➢ **Use appropriate line length**
  - – **Between 50-75 characters is recommended**
- ➢ **Use strong contrast between text & background**

- ➢ **Use columns instead of wide areas of horizontal text**

More Text Design Considerations

- **Carefully choose text in hyperlinks**

  - **Avoid "click here"**
  - **Hyperlink key words or phrases**
  - **Do not hyperlink not entire sentences**

- **Chek yur spellin (Check your spelling !!)**

Using Color on Web Pages

➢ Computer monitors display color as intensities of red, green, and blue light

➢ RGB Color

➢ The values of red, green, and blue vary from 0 to 255.

➢ Hexadecimal numbers (base 16) represent these color values.

#FFFFFF	#FFFFCC	#FFFF99	#FFFF66	#FFFF33	#FFFF00
#FFCCFF	#FFCCCC	#FFCC99	#FFCC66	#FFCC33	#FFCC00
#FF99FF	#FF99CC	#FF9999	#FF9966	#FF9933	#FF9900

Hexadecimal Color Values

Red: #FF0000

Green: #00FF00

Blue: #0000FF

Black: #000000

White: #FFFFFF

Grey: #CCCCCC
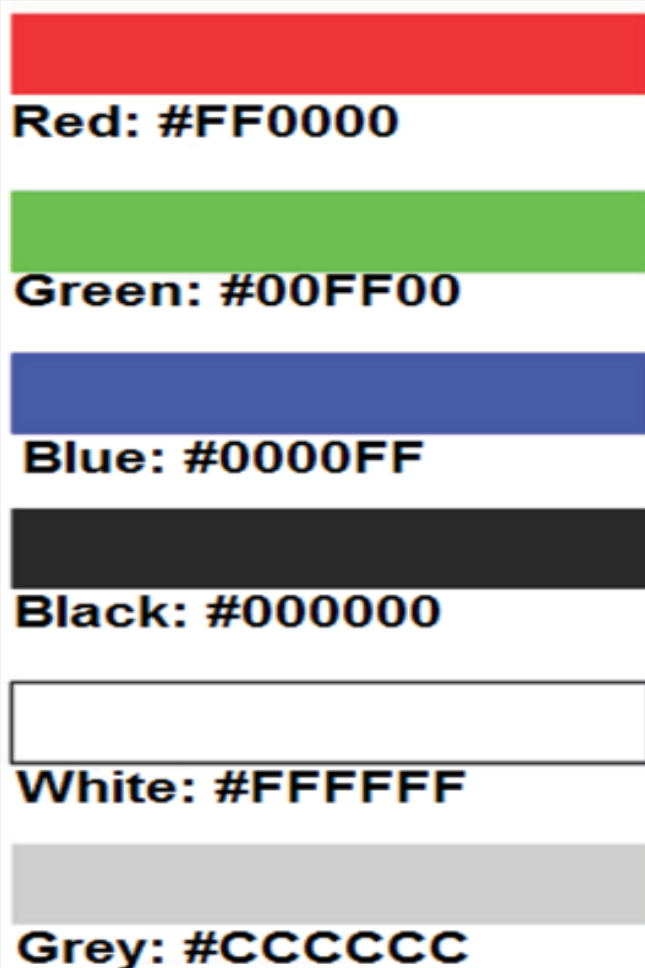
- **# indicates a hexadecimal value**

- **Hex value pairs range from 00 to FF**

- **Three hex value pairs describe an RGB color**

Web Color Palette

#FFFFFF	#FFFFCC	#FFFF99	#FFFF66	#FFFF33	#FFFF00
#FFCCFF	#FFCCCC	#FFCC99	#FFCC66	#FFCC33	#FFCC00
#FF99FF	#FF99CC	#FF9999	#FF9966	#FF9933	#FF9900
#FF66FF	#FF66CC	#FF6699	#FF6666	#FF6633	#FF6600
#FF33FF	#FF33CC	#FF3399	#FF3366	#FF3333	#FF3300
#FF00FF	#FF00CC	#FF0099	#FF0066	#FF0033	#FF0000

- **A collection of 216 colors**

- **Display the most similar on the Mac and PC platforms**

- **Hex values:**
  00, 33, 66, 99, CC, FF

- **Color Chart : http://webdevbasics.net/color**

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Making Color Choices

➢ How to choose a color scheme?

– Monochromatic
- http://meyerweb.com/eric/tools/color-blend
- http://www.0to255.com

– Choose from a photograph or other image
- http://www.colr.org

– Begin with a favorite color
- Use one of the sites below to choose other colors
  - http://www.colorschemedesigner.com
  - http://www.colorsontheweb.com/colorwizard.asp

Use of Color

Appealing to Kids & Preteens

Appealing to Everyone

Appealing to Young Adults

Appealing to Older Adults

# Use of Graphics & Multimedia

- File size and dimension matter
- Provide for robust navigation
- Anti-aliased/aliased text considerations
- Provide alternate text
- Use only necessary multimedia

Navigation Design

➢ **Make your site easy to navigate**
  – **Provide clearly labeled navigation in the same location on each page**
  – **Most common – across top or down left side**

➢ **Consider:**
  – **Navigation Bars**
  – **Breadcrumb Navigation**
  – **Using Graphics for Navigation**
  – **Dynamic Navigation**
  – **Site Map**
  – **Site Search Feature**

Wireframe

➢ **A sketch of blueprint of a web page**

➢ **Shows the structure of the basic page elements, including:**

   – **Logo**

   – **Navigation**

   – **Content**

   – **Footer**
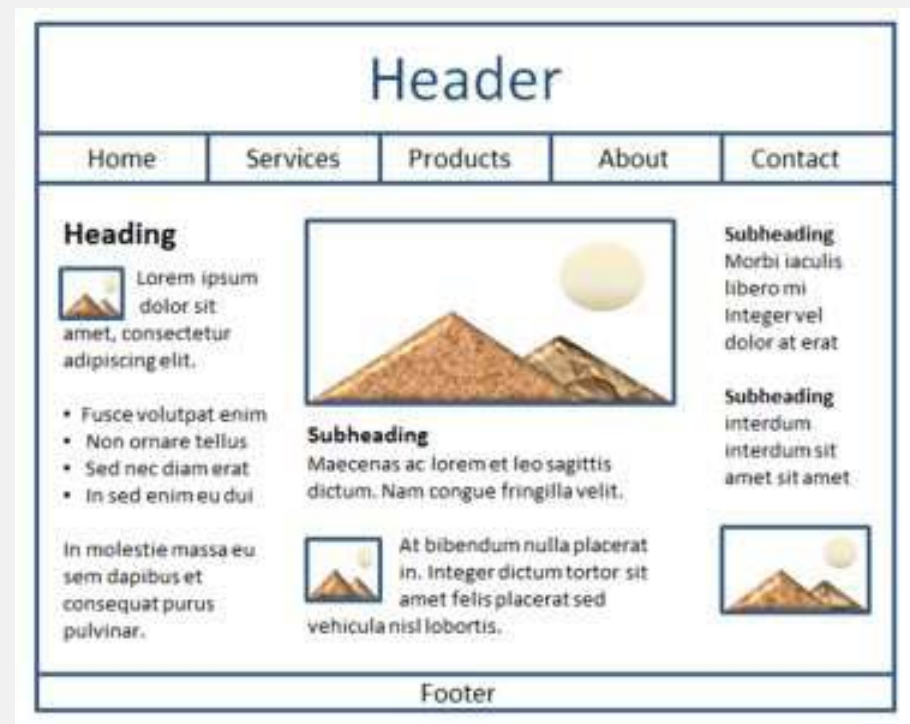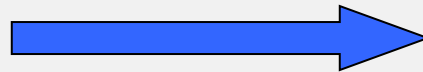
Sample Wireframe
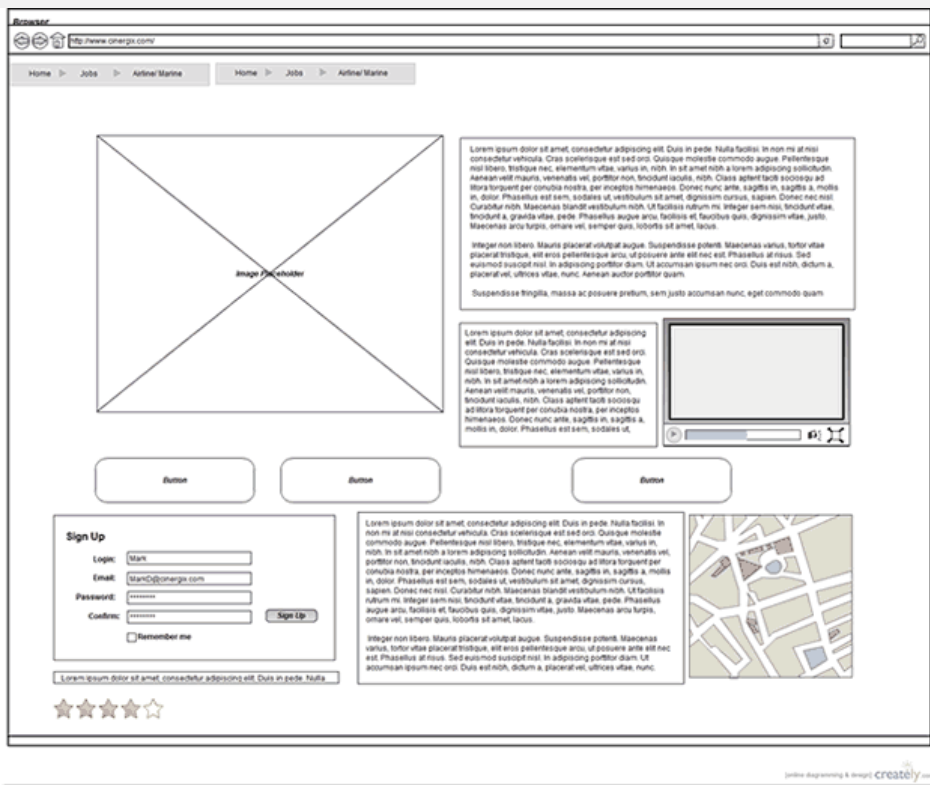
Web Page Design Page Layout (1)

- Place the most important information "above the fold"
- Use adequate "white" or blank space
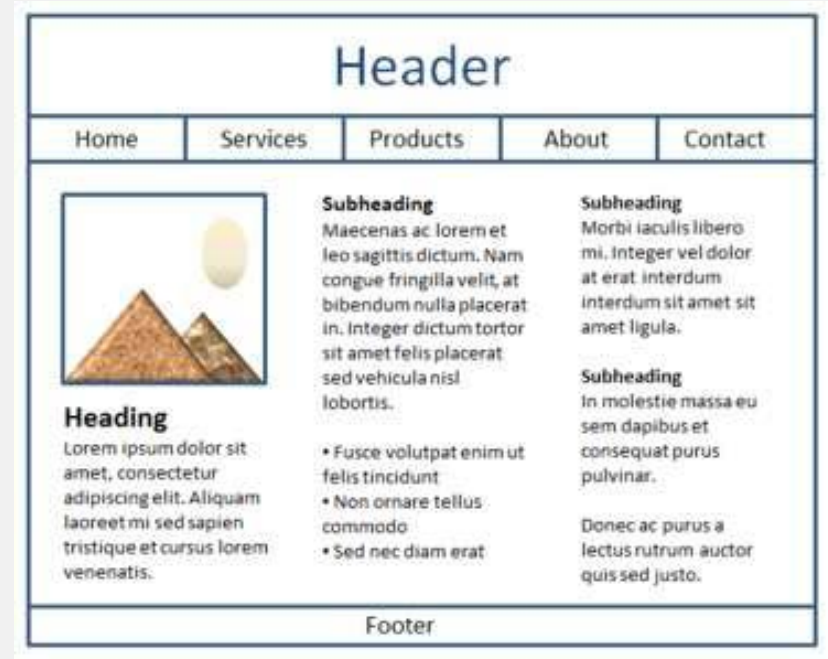- Use an interesting page layout

This is usable, but a little boring. See the next slide for improvements in page layout.

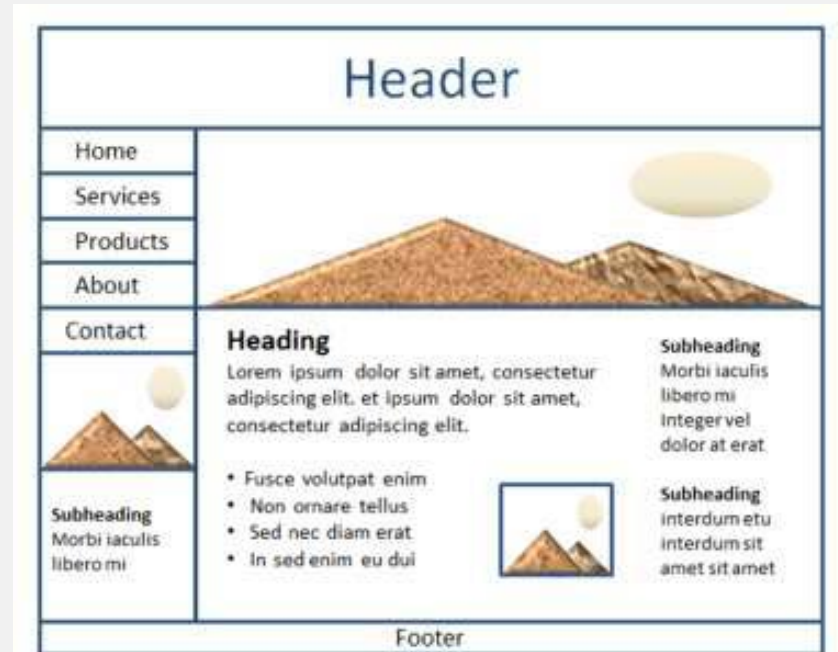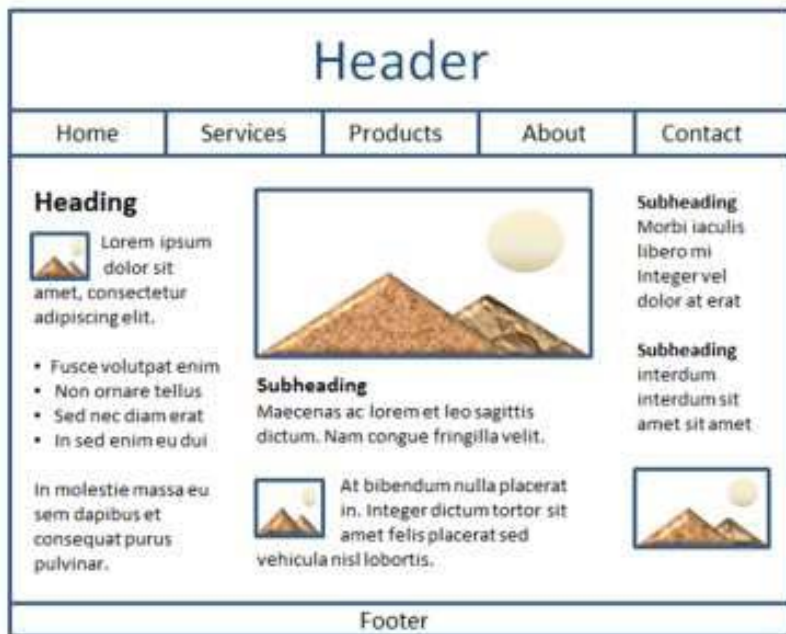# Web Page Design Page Layout (2)

Better

Columns make the page more interesting and it's easier to read this way.

Web Page Design Page Layout (3)

Best

Columns of different widths interspersed with graphics and headings create the most interesting, easy to read page.

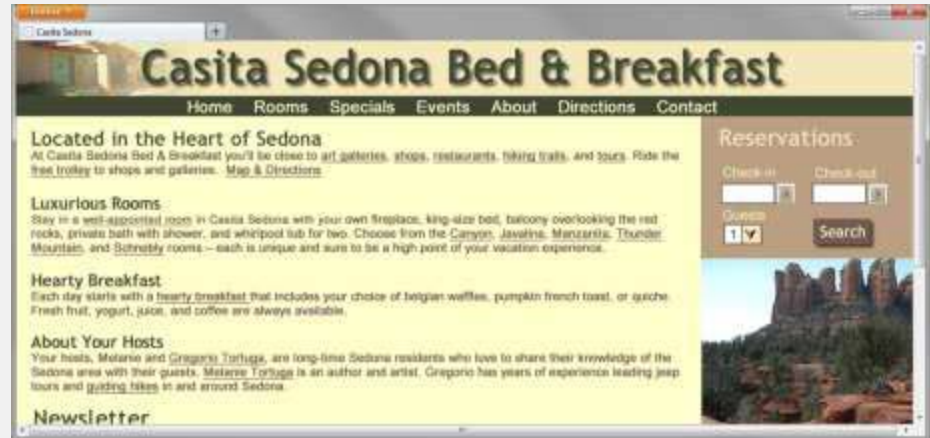# Page Layout Design Techniques

Fixed Layout

◦AKA rigid or "ice" design

◦Fixed-width often at left margin

◦More appealing if fixed with content centered

Page Layout Design Techniques

Fluid Layout
- AKA "liquid" design
- Expands to fill the browser at all resolutions.

Adaptation:
- Page content typically centered and often configured with a percentage width such as 80%

Web Design - Best Practices Checklist

http://terrymorris.net/bestpractices

- Page Layout
- Browser Compatibility
- Navigation
- Color and Graphics
- Multimedia
- Content Presentation
- Functionality
- Accessibility

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Final Words on design

- ➢ Avoid Computer-Based Tools in the Early Design Stages

- ➢ Designer who work out conceptual ideas on paper tend to iterate more and explore the design space more broadly, using computer-based tools tend to take only one idea and work it out in detail.

- ➢ When should you move to computer-base tools?

    when you absolutely must save designs and email them to others.