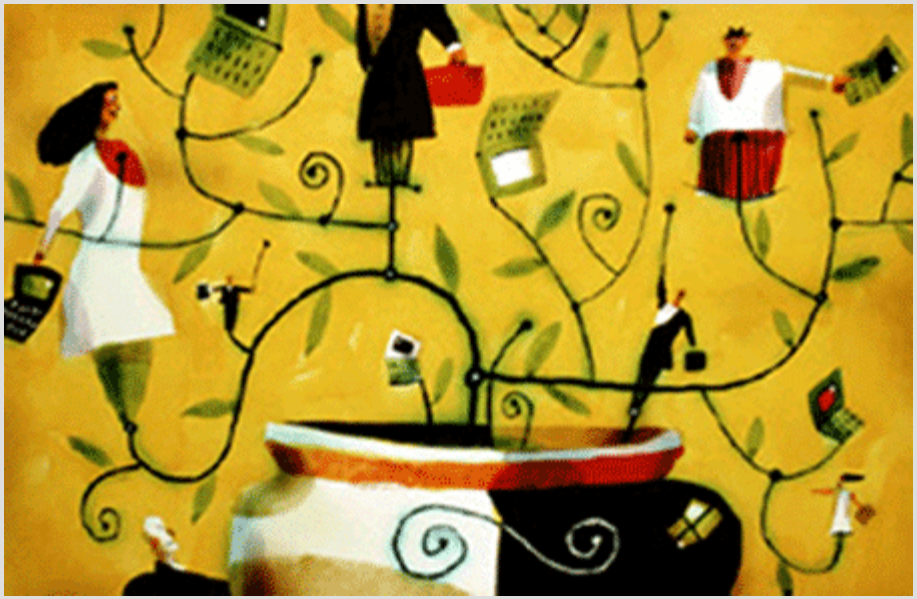
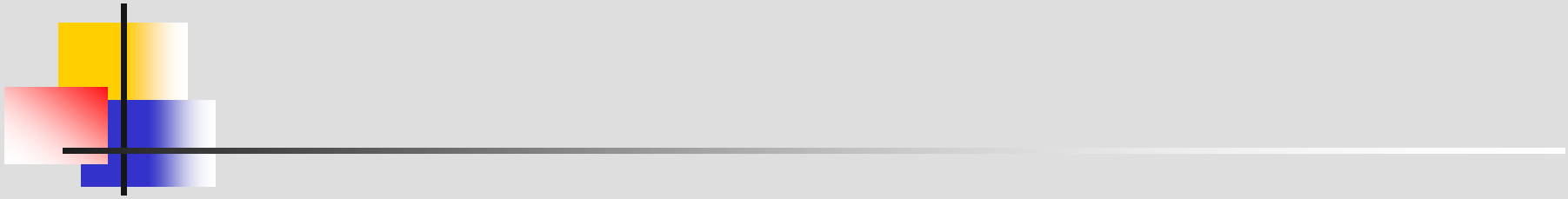
User-Centered Website Development: A Human-Computer Interaction Approach





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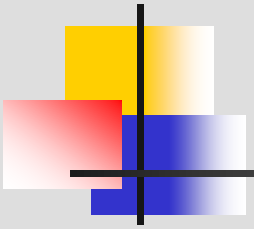
PowerPoint slides by Dan McCracken, with thanks to Rosalee Wolfe and S. Jane Fritz, St. Joseph's College

1. Human-Computer Interaction: An Overview

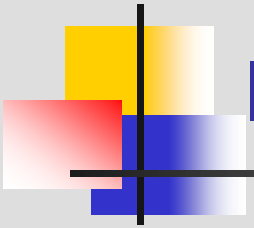


In this chapter you will learn about:

- The benefits of making a website more usable
- The history and goals of Human-Computer Interaction
- The methodology of User-Centered Development

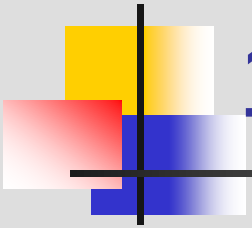
1.1 Introduction

- Have you ever been unable to find something in a website that you *know* is there?
- Have you ever been enraged by a useless or misleading error message?
- Have you ever wondered why a website needs to know your e-mail address, and left the site for fear it might be misused?



It doesn't have to be that way

- You can design websites that
  - Are pleasant and convenient for your users
  - Let them accomplish their goals
- The key: think about your users
  - Learn about them
  - Watch them work, in their workplace
  - Interview them, also in their workplace



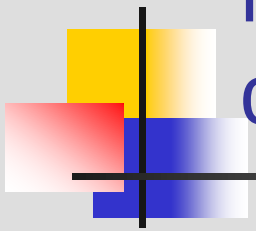
1.2 Benefits of Usable Web sites

- Gaining a competitive edge
- Reducing development and maintenance costs
- Improving productivity
- Lowering support costs

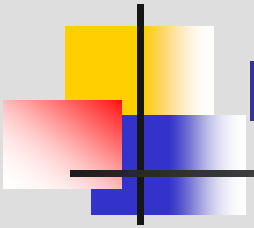
Gaining a competitive edge, continued

- *Conversion rate* is the percentage of visitors who take an action you want them to take, such a making a purchase
- Increasing the conversion rate lowers the cost of individual sales
- Ease of use is the most important driver of high conversion rates
- And there is gold in improving the conversion rate, which was 3.2% in May, 2003

Reducing development and maintenance costs

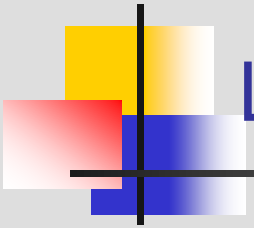


- Learn about users first, and you will avoid
  - Implementing features users don’t want
  - Creating features that are annoying or inefficient
  - High cost of making changes late in the development cycle



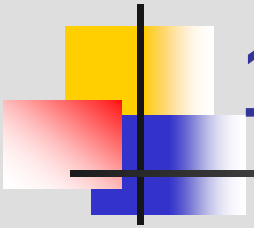
Improving productivity

- For e-commerce, productivity means that users find what they want—and succeed in buying it
- For a company intranet, productivity means employees become more efficient



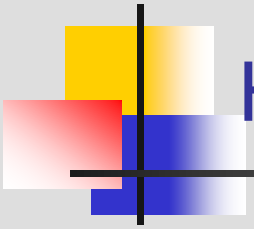
Lower support costs

- Calls to customer support are very expensive for the vendor: estimates range from $12 to $250 *per call*
- A website that reduces support calls can save major dollars



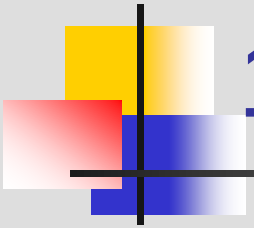
1.3 What is HCI?

- “Human Computer Interaction is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of the major phenomena surrounding them.”
  - As defined by the Special Interest Group on Human-Computer Interaction (SIGCHI) of the Association for Computing Machinery (ACM)



How do we make computers easy to use?

- By applying the principles of Human-Computer Interaction
- By being, as an HCI practitioner, the advocate for the user

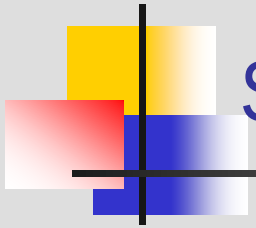


1.4 Goals of HCI

To develop or improve the

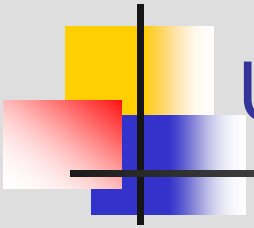
- Safety
- Utility
- Effectiveness
- Efficiency
- Usability
- Appeal

. . . of systems that include computers



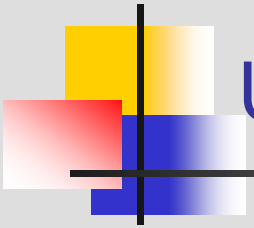
Safety

- Safety of Users—think of
  - Air traffic control
  - Hospital intensive care
- Safety of Data—think of
  - Protection of files from tampering
  - Privacy and security



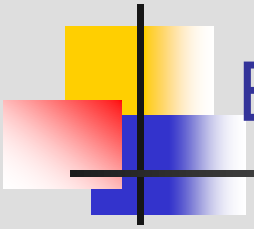
Utility and effectiveness

- Utility: what services a system provides; examples:
  - Information
  - Instruction
  - Purchases
- Effectiveness: user's ability to achieve goals; examples:
  - Find desired information
  - Enter credit card data



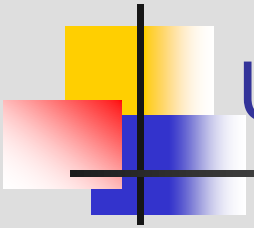
Utility and effectiveness are distinct

- A web site might provide all necessary services, but if users can’t find the items they want to buy, the site lacks effectiveness



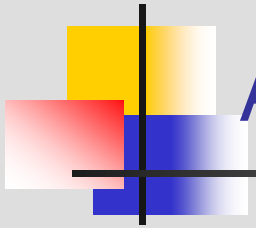
Efficiency

- A measure of how quickly users can accomplish their goals or finish their work using the system



Usability

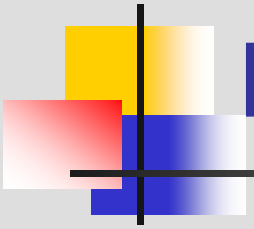
- Ease of learning
- Ease of use
- Can be an entire graduate course!



Appeal

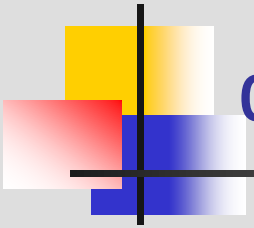
- How well users like the system
  - First impressions
  - Long-term satisfaction

1.5 User-Centered Development Methodology

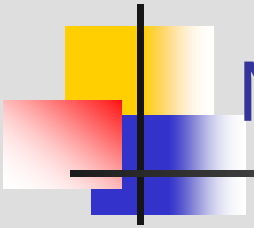


- User-centric, not data-centric
  - Involves users in the design process
  - Usability can be quantified and measured
- Highly Iterative
  - Involves testing and revision
- Interdisciplinary and eclectic, building on a dozen different disciplines

The stages of user-centered development

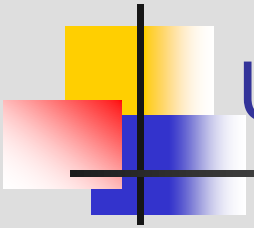


- Needs analysis
- User and task analysis
- Functional analysis
- Requirements analysis
- Setting usability specifications
- Design
- Prototyping
- Evaluation



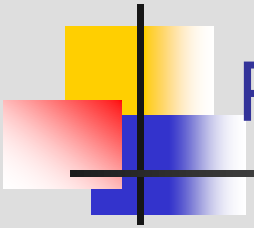
Needs analysis

- Summarizes the nature and purpose of the system
  - Type of system (website, video game, spreadsheet)
  - People it will serve
  - Benefits it will provide



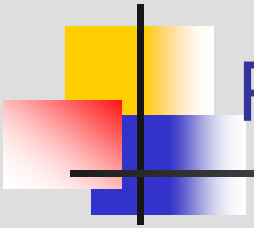
User and task analysis

- User analysis - characterizes the people who will use the site:
  - General considerations (age, education, experience with computers)
- Task analysis - what users will do
  - User's goals - what they want to accomplish
  - Tasks or activities carried out to achieve the goals
- See Chapter 3



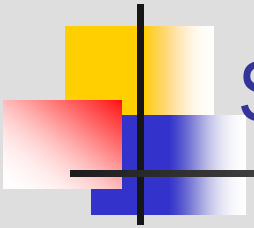
Functional analysis

- Functionality or computer services that users will need and what will be automated
  - Close correspondence between functions and tasks
- Examples: travel site task: “find all flights to xyz, ordered by price”
  - Needs search function and sorting capability
- Music CD site: task “buy a CD”
  - Needs secure on-line transaction functionality



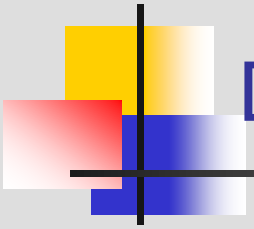
Requirements analysis

- Describes the formal specifications required to implement the system:
  - Data dictionaries
  - Entity-relationship diagrams
  - Object oriented modeling
- Similar to software engineering



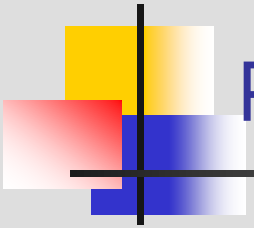
Setting usability specifications

- Answers question “How good is your site?”
- Performance measures (such as number of tasks completed, number of errors, etc.)
- Preference measures (such as first impression, overall satisfaction)



Design

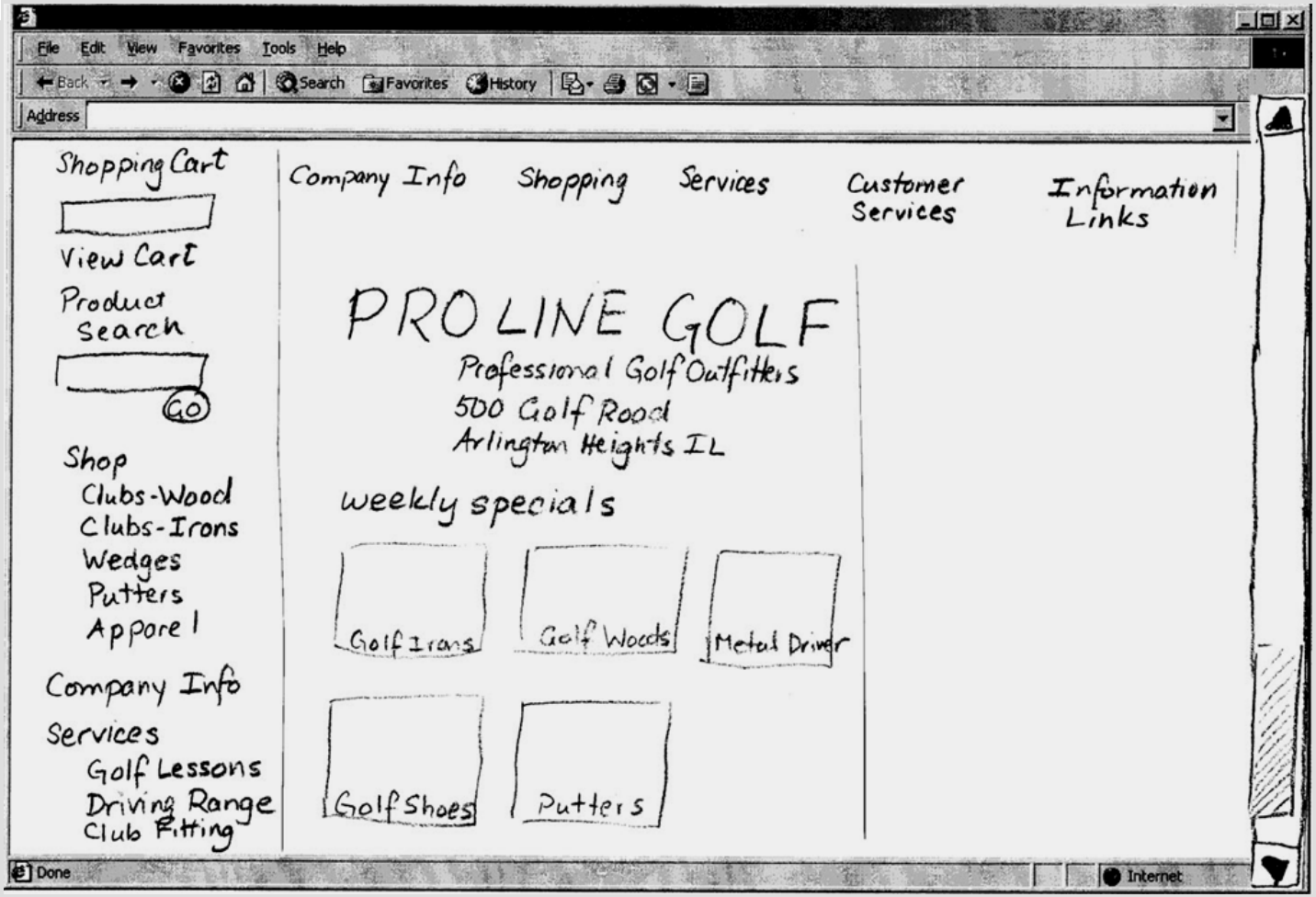
- Organization
  - Visual organization to create clarity and consistency
  - Layout
- Appearance
  - “Look and feel”
- Now you can begin to sketch layout of pages—because you know your users and what they want to do
- See Chapters 4, 5, and 6



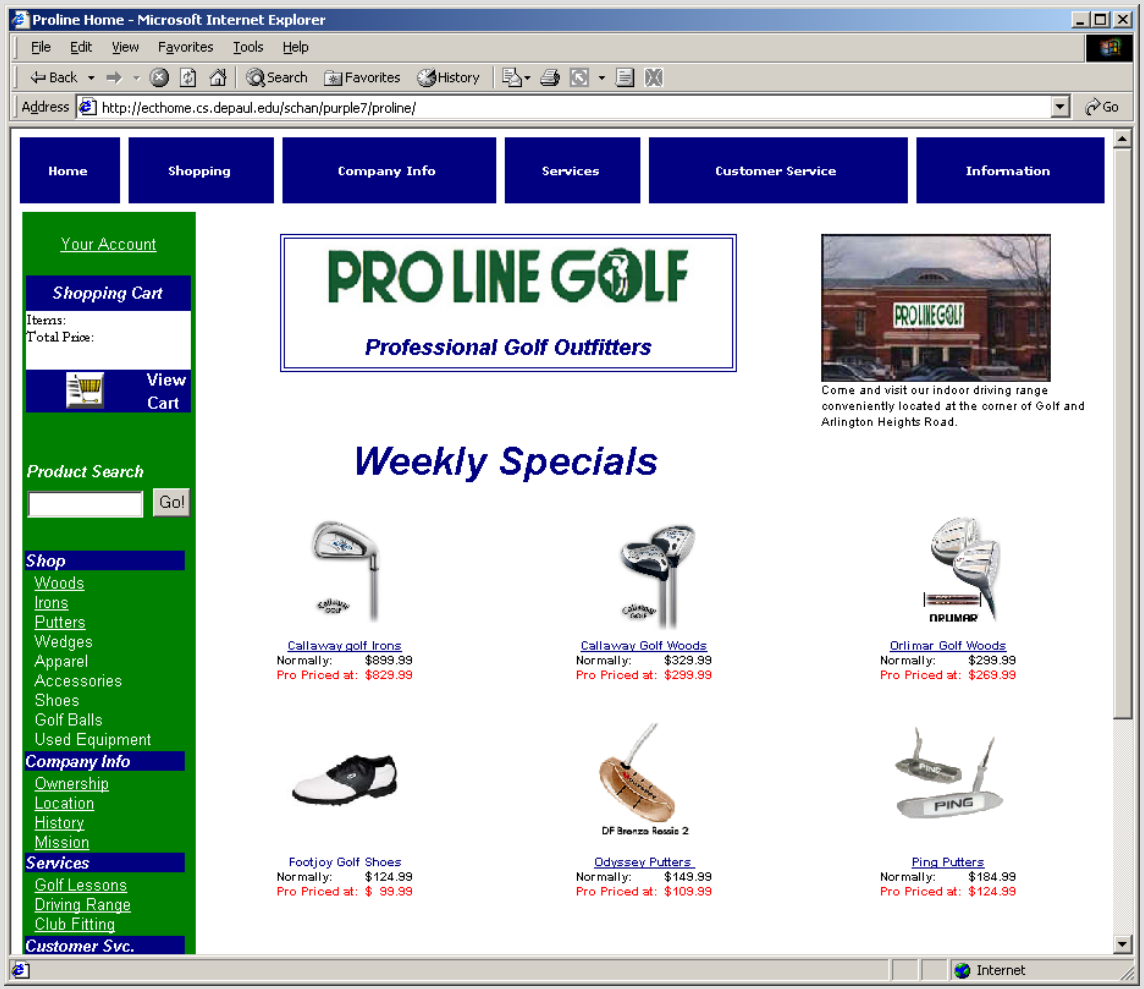
Prototyping

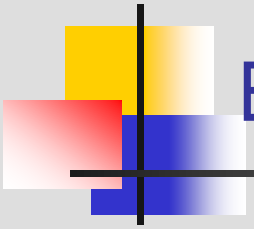
- Greek “proto” = first
- Prototype is an original model or pattern
  - Global: entire site
  - Local: selected parts of the site
- Prototypes
  - Evolutionary: becomes the final project
  - Throw-away: serves as a pattern
  - High fidelity: resembles final product
  - Low fidelity: just rough sketch - not close to final
- See Chapter 7

A low-fidelity prototype



A high-fidelity prototype





Evaluation

- Expert-based evaluation
  - Bring in a usability expert
- User-based evaluation
  - Test the website or other interface with users
- In this book we emphasize user-based evaluation
- See Chapter 8

1.6 Characteristics of User-Centered Development

- Highly iterative