Lecture 5: Human-Computer Interaction in Website Design

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Definition of HCI

• Human Computer Interaction, or HCI, is the study, planning, and design of what happens when you and a computer work together.
Human Computer Interaction

• While people often think of Interface Design in terms of computers, it also refers to many products where the user interacts with controls or displays. Military aircraft, vehicles, airports, audio equipment, and computer peripherals, are a few products that extensively apply HCI.
Human Computer Interaction

• What makes some Websites easier to use than others?

• Why users get lost in electronic space such as website?
Importance of HCI Study

• HCI study win user acceptance and subsequent marketability.
• While website developer focus on the technology, usability specialists focus on the user interface.
• Studies have shown that, by estimating all the costs associated with HCI study, the benefits can amount to 5000 times the project's cost. HCI is a Web imperative now, and it'll continue to be so in future.
Human Computer Interaction

• As its name implies, HCI consists of three parts:
  – The User
  – The Computer
  – The Interaction
HCI in Website Development

• User comes first!!!
Basic Principles of HCI

1. Requirements Analysis
   – Establish the goals for the Website from the standpoint of the user and the business.
   – Agree on the users' needs and aim for usability requirements.
   – Complete discussions with potential users and questionnaires.
Basic Principles of HCI

2. Conceptual Proposal
   – Outline site design and architecture at an abstract level.
   – Perform a task analysis to identify essential features.
Basic Principles of HCI

3. Prototyping
   – Create visual representations (mock ups) or interactive representations (prototypes) of the Website.
   – Evaluate usability
   – Using the results, create more mock ups or improve the prototypes.
   – Repeat this process until the design and usability goals are met.
Basic Principles of HCI

4. Development

- Create the final product.
- Evaluate functionality through testing, quality assurance, usability testing, and field testing.
- Use the evaluation results to improve the product.
- Repeat this process until the business goals are met.
Basic Principles of HCI

5. Launch and Housekeeping
   – Launch the Website.
   – Maintain and tweak with user feedback (housekeeping).
   – Use the feedback to create new requirements, and begin major design improvements (system iteration).
Topology

• Think of the topology of
  – a site as a skeleton,
  – the programming as the muscles on the skeleton,
  – the Style as the skin and hair.
Navigational Topologies

• **Topology**: A collection of Nodes, joined by Paths.

• **Node**: A unique point.

• **Path**: One of four possible relationships between Node. (None, A to B, B to A, A to B and B and A.)
Topology

• The Simplest Topology

Two Linear Topologies: Unidirectional and Bidirectional.
Topology

- **Trees:** The simplest example of this is a binary tree where each Node has exactly two Paths.

A Tree Topology: One Root, many Leaves.
Topology

• **Graphs and Cycles**: A graph may contain cycles (loops) within the topology.

*Image of a graph topology with no root and possibly cycles.*

*A Graph Topology: No Root, possibly cycles.*
Topology Comparisons

• A simple comparison can be made between topologies and road design:
  – A single road is equivalent to a linear topology
  – Cul-de-sacs are equivalent to tree topologies.
  – A city block system is equivalent to a graph topology
Combination of Topology

• **Mixed type Topology:** In most practical situations, a website will employ a mixture of the topologies
Navigation

• A rich set of graphic navigation and interactivity links within your Web pages will pull users' attention down the page.

• By providing your own consistent and predictable set of navigation buttons you also give the user a sense of your site's organization.
Navigation

• Example: rich graphics and many links immediately draw the reader into the site:

![Image of Salon.com website](image_url)
Navigation

• Clear navigation aids
  – The main interface problem in Web sites is the lack of a sense of where you are within the local organization of information.
  – Clear, consistent icons, graphic identity schemes, and graphic or text-based overview and summary screens can give the user confidence that they can find what they are looking for without wasting time.
Navigation

• No dead-end pages

“Dead-end documents”

Readers can link directly into pages deep within your site. If there are no links on a page, that page is a dead end.
Wrong Display of Fonts

• Where does that come from?
• Each font has a subtle effect on the User.
• You have the fonts doesn’t mean you should use them.
Too much use of Colour

• You have 16.7 million colours to choose from, and it doesn’t mean you should use them all.
Aspect Ratio Ignorance

• Another design element that screams “I don’t understand graphical design!” is aligning aspect ratios.

| Correct Aspect Ratio | Too Tall | Too Squat |
Button bars

• This is particularly useful when users need to be able to follow an ordered sequence of documents, e.g., “Next Page” and “Previous Page”.

• Paging buttons
Curator's Tour

Cosmetic Jar

This cosmetic jar is carved from a piece of rock crystal.

This tiny object measures only one and a half inches (3.8 cm.) in height and is typical of the Byzantine love of exquisitely crafted luxury objects. The use of rock crystal (a variety of quartz) can be dated back as far as 3000 B.C. Because it was virtually colorless and assembled glass, rock crystal was a favorite material for small vessels such as this. The jar's protruding lip is covered with delicate gold filigree in a plant motif with tiny rows of granulation. The lid repeats this decoration and a round sapphire forms its knob. This cosmetic jar was likely the property of a wealthy woman for use on her dressing table. It may have held powdered make-up or ointment.

Byzantine luxury objects such as jewelry, enamels, ivories, and silks were highly portable and became the envy of the Latin West to which they were frequently exported. There they were often imitated by European craftsmen.

Cosmetic Jar, 6th c. AD

Enlarge image

Cosmetic Jar

Byzantium, 500s AD

Gold filigree, sapphire, and rock crystal
Grace Rainey Rogers Fund 1946.427
Bandwidth and interaction

- Research has shown that for most computing tasks the threshold of frustration is about ten seconds.
- Dial-up v.s. university or corporate intranet site
- Industry observers expect that it will be at least another five years before Web designers can count on most home users having access to high-speed Web connections.
- In general, be conservative with Web graphics.
Simplicity and consistency

- The user interface for your Web site should follow the general navigation and layout conventions of major Web sites because your users will already be used to those conventions.
- Should be simple, familiar, and logical.
- Highly unusual, "creative" navigation and home page metaphors always fail because they impose an unfamiliar, unpredictable interface burden on the user.
Simplicity and consistency

- An excellent model of interface design is the Adobe Corporation Web site.

http://www.adobe.com/education/
Design integrity and stability

• To convince your users that what you have to offer is accurate and reliable.
• Frequently check the links
Feedback and dialog

• Planning for ongoing relationship with users of your site is vital to the long-term success of the enterprise.