Usability

Web Engineering

Chapter 11

“Programming is a race between software engineers trying to build bigger and better idiot-proof programs and the Universe trying to produce bigger and better idiots - So far, the Universe is winning.”

Introduction

- Usability is one of the most important quality factors for a Web application
    - Users will quickly reject it if they don't like using it or don't know how to use it
        - Unlike regular software, most Web applications are free, so switching to a competitor is without cost
    - Many usability guidelines are available, but developers just following guidelines is often not enough
        - Feedback from usability evaluations/tests used in an iterative usability engineering process
            - Test will often consist of both user tests, and expert reviews

Usability engineering methods

- Like the rest of Web engineering, usability engineering should consist of a number of phases
  - Requirements analysis, design, implementation and operation
  - Test performed during all phases
- The tasks during usability engineering can often be allocated to four different roles
  - System analyst, interface designer, usability expert and implementer

Usability roles

- System analyst
  - In charge of the requirements analysis and conceptual design
  - Analyses the target group, and determine which tasks they would want to perform
- Interface designer
  - Responsible for the interface design, and the Web application’s look and feel

Usability roles

- Usability expert
  - Checks and evaluates models, guidelines and standards
  - Conducts usability tests, analyze their results, and request the necessary design changes
- Implementer
  - Will implement the system (or perhaps just the interface)
  - Should have knowledge of interface design too, to be able to follow the directions from the usability expert

Requirements analysis

- The system analyst will often start out creating a competitive analysis (benchmarking)
    - Study other Web applications to learn best practices and find examples of what not to do
- Then the system analyst or usability expert will define “qualitative/quantitative usability goals”
    - Concrete and testable goals
        - i.e. number of unsuccessful searches must be less than 5%
- Also important to define what the aim of the usability should be - ease of learning or ease of use?
    - Web application used every day => ease of use
    - Web application used rarely => ease of learning

Design

- Interface designer develops a conceptual model of the user interface, based on the requirements analysis
- Preferable to get lots of feedback from potential users
  - Maybe not financially possible for small Web apps
- Besides user feedback the usability expert should evaluate the model as well
  - Preferable before the user tests to removed any obvious errors

Design

- Next the designer and the implementer can create a more detailed design of the user interface
- A detailed design can lead to additional user testing:
    - Prototypes
        - Early implementations with basic functionality
    - Usability tests
        - User performing actual tasks in real context
        - If users are unavailable, then remote usability test can be used

Implementation

- Both implementer and usability expert play the most important roles in this phase
  - Usability expert takes the role of “quality assurance”
    - Checks if guidelines and standards are being followed
  - More feedback from users, preferable the same users that was involved in the earlier phases
    - Does the real-world system correspond to what they expect?

Operation

- Gather usability requirements for future versions
  - Long-term usage is the best way of collecting information about the Web applications usability
  - Offline methods
    - Direct user contact, surveys, focus groups, etc.
  - Online methods
    - Log file analysis, etc.

Design guidelines

- Simple “best practice” usability guidelines to keep in mind when developing interfaces
  - Special guidelines are usually available for specific user groups
    - Older users, young users, users with disabilities
- Some general and widely accepted guidelines is always worth considering

Response times

- A system's response time is very important for users - as response times increase, user satisfaction decreases
  - 0.1s is perceived as instantaneous
  - Less than 3s, the users don't really start to feel they are waiting
    - Is considered normal for Web applications
  - 3-10s is noticed, but usually tolerated by most users
    - Preferable if we can indicate that the wait will be rewarded
  - >10s, The users will start doing other things, or find a new Web site

Decreasing response times

- Reduce the size of graphics, or minimize the use of graphics
- Consider breaking up large pages into several smaller pages
- For images use “width” and “height” attributes
  - Allows a browser to properly render rest of page, while waiting for graphics to be downloaded
- Some insist that the home page should be less than 50 kB

Interaction efficiency

- Apart from response times, time spent on navigation and input is important for overall efficiency
  - Minimize distance between clickable elements
  - Clickable elements should not be too small
  - If keyboard input is needed, avoid frequent changes between mouse and keyboard
  - Interesting items should be reachable is as few clicks as possible
    - Preferable no more than 4 clicks

Colors

- Don’t make excessive use of colors
  - Some guidelines say no more than 4-5 different colors on a page, and no more than 7 different colors on a web site
  - Avoid extreme hues, flashy or highly saturated colors
- Make sure all information conveyed by colors is also available without color
  - E.g. links should perhaps be underlined, not just another color
- Different colors have different meanings
  - i.e. blue = stability, trust, loyalty
  - Cultural differences

Text layout

- Reading text on screen is less efficient than on paper
- Text must be arranged to make reading as easy as possible
  - Avoid multi-column text, works well in newspapers, not on screen
  - Avoid fixed width layouts
  - Use sans-serif fonts on screen (serif fonts are for print)
  - Use simple backgrounds with high contrast to the content
  - Arrange text in short paragraphs
  - Speak the “user’s language”, not too technically, not too simple

Page structure

- Important elements must always be visible
  - Menus/navigation should be positioned on left side or at top of pages
- Pages should never be overloaded with content
- Horizontal scrolling should always be avoided
  - Vertical scrolling is acceptable
- Pages should be easily printable
  - Or a printable version should be available (print button)

Navigation structure

- Navigation is one of the most important parts of a Web site
  - If the user can’t find it, then the function is not there!”
- Navigation consists of:
  - Where am I? (current position in site structure)
  - What can I do or find here? (content on current page)
  - Where can I go? (other available parts of the web site)
  - Where have I been? (history/back button)

Navigation structure

- Provide users with a “mental model” of the site
  - Intuitive navigation elements (simple menus, etc)
  - Breadcrumbs (navigation path)
  - Site map
- For navigation a simple tree view menu might be better than a dropdown menu
  - Dropdown menus take up less space on page, but important information (i.e. where am I?) is hidden

Multiculturality

- Web = global availability
  - Colors
    - Colors have vastly different meanings in different cultures
  - Languages
    - Important to speak the languages of our users
    - English is always a good choice, but not enough for all users and in all countries
  - Representation of information
    - Users from different countries use different date formats and measurements, might need to leave some fields empty when registering at our page, etc.
    - Is 01/03/2022 = March 1st 2022 **or** January 3rd 2022?
      - Make the format clear, or e.g. select date with a calendar

Confidence-generating measures

- If we want users to spend money on our site, register with personal data, etc. then they need to feel they can trust us
  - “About us” pages
    - Introduce the company, list business terms and conditions
    - Present “impressive figures” like number of employees, age of company, etc.
  - Contact information
    - Preferable a real-world address, but also e-mail address and a phone number
  - FAQ lists, online support chat, message boards, etc.
  - Privacy policies

Consistency

- Always strive for consistency throughout an entire Web site/application
  - Keeps the learning effort to a minimum
- If possible use same header, footer, navigation, etc. on all pages
- Consistency might go beyond our own Web site
  - Use roughly the same layout, metaphors, etc. as comparable Web sites/applications

Information processing

- Memory
  - Web sites rely more on short-term memory than regular software, since users use them less regularly
    - Maximum memory load should be 7±2 items
- Attention
  - Movement might attract, but also distract users

Other design criteria

- Icons and metaphors can be a good idea, if we use standard well-known ones
  - i.e. shopping cart on an e-commerce site
  - When using icons, always add a textual description too
- Accessibility
  - Up to 20% of the world’s population suffer from some kind of disability – that’s a lot of potential users to lose
    - Especially navigation must be available to everyone
      - If images are used as links, add “alt-attributes”