1. **User Interface Design**

**Design Principles**

* The goal of a good design is to make the artifact seem like the obvious solution to the problem, in spite of these compromises
* To mirror the physical environment of the real world. So it could avoid the burden of learning and remembering a whole new set of rules.
* The artifacts should be designed around the users and their needs: that is around human beings.

**Metaphor (A figure of speech in which an expression is used to refer to something) and Mimesis (imitative representation of human behavior)**

* Everything inside the compute is invisible
* Everything the user sees is visible
* The task of use interface design is to link the visible and the invisible in an appropriate manner
* Over time, we have accumulated many different ideas about what is “appropriate”
* Today, we believe the most appropriate interface is graphical (a GUI)
* A GUI relies on 2 key concepts metaphor and mimesis

**Design Components**

* Navigation
  + The main way humans interact with the built environment is by moving through it either physically or virtually
* Cues
  + A cue is a static feature of an object that sends a small, simple message to user
  + It alerts the user an important property of the object
  + E.g. visible hinges on the side of a door, the red button starts the video camcorder recording
* Affordance
  + An affordance is a feature of an object that you manipulate in order to change the state of the object
  + E.g. a weblink can be clicked and will take you to that page
  + A key principle of good design is that affordances should be obvious, easy to manipulate and with clear, unambiguous effects
* Feedback
  + When you try to operate on an object, how do you know you have succeeded? This is the issue of feedback
  + Feedback can be indicated by tge effect itself-click on the link and you go there OR a special signal –button changes color when pressed
  + Best design has the feedback provided by the effect itself, not by an extra feature
  + In all cases, feedback must be immediate, persist as long as needed, convey no other message and be appropriate for operation
  + Feedback must also be designed for failed operations

**Design Rules**

* Keep to a human scale
  + The size and shape of designed objects should match the size and shape of their human users
    - Height and width
    - Distance and “step size”
    - Symmetrical division of large areas and spaces
    - Contour and feel of parts you touch
    - Pitch and traverse of moving parts
  + Decoration or ornament should never interfere with functional shape
* Respect human senses
  + The information conveyed by an object should use the right medium, the right signal and the right symbol
    - Sight, hearing, touch
    - Color, brightness and contrast
    - Sound pitch and loudness
    - Texture, roughness and softness
  + Important objects or feature should be sensually more emphatic
  + Unimportant things should be less emphatic
* Provide subtle cues
  + Ideally cues should be perceived but not “noticed”
    - Ridged (protruding) keys on key board
    - Faint sound when operation is performed
    - Slight darker color at pressure point
  + Cues must never mislead or contradict
* Provide clear affordances
  + Affordance should be obvious inform of meaning
    - Push plate on door
    - Turn handle for water tap
    - Mouse over for pop-up help
* Provide appropriate feedback
  + Whenever a designed objects does something, it should emit a sensible signal
  + Good design links the feedback directly to the affordance
    - E.g. button moves inward when clicked on and licks into a “depressed” position
  + A separate, unrelated feedback loop is another sign of poor design

1. **User Centered Design**

**Development Process Overview-Building form bottom to top**

1. The Surface Phase: Images, texts
   1. Purpose
      1. It deals with the visual presentation of logical arrangements
         1. Communicating a brand identity
         2. Directing the eye movement, 2 important qualities
            1. It follows a smooth flow
            2. It gives a sort of “guided tour” of the possibilities available to them
   2. Visual Design
      1. **Contrast** is vital to drawing the user’s attention to essential aspects of the interface
      2. **Uniformity** is an important part of ensuring the design communicates effectively without confusing or overwhelming users
      3. **Internal consistency**: consistent design approach throughout different parts of the site
      4. **External consistency**: site design approach also used in other products from the same organization
      5. **Color palettes**
         1. The colors in a company’s standard pallet are selected specifically for how well they work together, complementing each other without competing
         2. Brighter or bolder colors can be used for foreground elements to draw attention. More muted colors are better used for background elements
      6. **Typography**: the use of fonts or typefaces to create a particular visual style
         1. Typefaces designed should be highly readable on screen such as Georgia and Verdana fonts
         2. For larger text elements or short labels, typefaces with a little more personality are perfectly appropriate.
      7. **Design comp**: a visualization of the finished product built up from component that have been chosen
      8. **Style guide:** defining every aspects of the visual design, from the largest scale to the smallest
   3. **Deliverables**
      1. Design style guide
         1. Color palettes, typography standards, navigation elements, logo/icon treatment
      2. Design comp
         1. Homepage, second, third level pages, content page, search page
2. The skeleton Phase: page layouts
   1. Purpose
      1. It defines what form that functionality will take and how it will be presented
         1. Interface design
         2. Navigation design
         3. Information design
   2. Interface Design
      1. Successful interfaces are those in which users immediately notice the important stuff
      2. Employing a variety of tricks to ease users along the way to their goal
   3. Navigation Design
      1. 3 simultaneous goals
         1. It must provide users with a means for getting from one point to another on the site
         2. It must communicate the relationship between the elements it contains
         3. It must communicate the relationship between the overall contents and the page the user is currently viewing
      2. Type of navigation
         1. Global navigation: providing access to the broad sweep of the entire site
         2. Local navigation: providing users with access to what’s nearby in the architecture
         3. Supplementary navigation: providing shortcut to related content that might not be readily accessible through the global or local navigation
         4. Contextual navigation: embedding the content of the page itself
         5. Courtesy navigation: providing access to items that users don’t need on a regular basis but as a convenience
   4. Information Design
      1. The key is to group and arrange the information elements in ways that reflect how users think and support their tasks and goals
      2. Good wayfinding enables users to quickly get a mental picture of where they are, where they can go and which choices will get them to closer to their objectives
      3. Icons, labeling systems and typography are other information design systems used to help reinforce a sense of “you are here” for users
      4. Wireframes
         1. It is a bare-bone depiction of all the components of a page and how they fit together
         2. To captures all the skeleton decisions in a single document that serves as a reference for visual design work and site implementation.
         3. For smaller sites, a single wireframe is sufficient, but the most sites, multiple wireframes are needed to convey the complexity of the intended results
   5. Deliverables
      1. Wireframe
         1. A set of templates showing the allocation of content components and navigation
3. The structure Phase: site maps
   1. Purpose
      1. How the system respond to user behavior – interaction diagram
      2. How will users go through content efficiently and effectively – information architect
      3. Focus on understanding both people and the way they work and think
   2. Interaction Diagram
      1. Conceptual models: user’s impression of how the interactive components you create will behave
      2. Status convention: using conceptual models people are familiar with, makes it easier for them to adapt to an unfamiliar site
      3. Error handling: proper handling of error at each layer of error handling in your interaction design help to ensures that a higher percentage of users will have positive experiences

Prevention -> Correction -> Recovery

* 1. Information Architecture
     1. Approaches
        1. Hierarchical
        2. Matrix
        3. Organic
        4. Sequential
     2. Organizing principles
        1. The criteria that determine which nodes are grouped together and which are kept separate
        2. Highest levels are closely tied to site objective and user needs
        3. Lower levels are specific to content and functional requirements
        4. Facets can provide a simple, flexible set of organizing principles for contents
     3. Language
        1. Controlled vocabulary: a set of standard terms for use on the site to create consistency across the content
        2. Thesaurus: documenting alternative terms that are commonly used but not approved for use on the site
     4. Metadata: a standard approach to describing a given piece information which provides:
        1. More flexibility in structuring the contens
        2. A faster and more reliable way of finding information
     5. Deliverables
        1. Interaction design brief – description of the conceptual models used
        2. Site architecture diagram – graphical presentation of the site structure
        3. Vocabulary list-list of a set of standard terms for use on the site
        4. Metadata
           1. List of a set of information describging the content
           2. Naming convention

1. The scope Phase: features
   1. What are you going to build
      1. Functional specifications
         1. Describe what the system will do
         2. Be specific
         3. Avoid subjective lingo
      2. Content requirements
         1. Focus on purpose not format
         2. Provide rough estimates of the size of each feature
         3. Identify responsible party for each content element
   2. Gathering requirements
      1. 3 General categories of requirements
         1. Things people say they want
         2. Things people actually want
         3. Things people don’t know they want
      2. Ways of gathering requirements
         1. **Brainstorming sessions-**used for generating lots of new ideas and solutions and must be targeted to a specific topic
         2. **Competitor analysis-**not onlyproduces usability metrics but also aids decision makers in their strategic goal-setting and planning
         3. **Scenario-**a simple narrative describing how a persona might go about trying to fulfill one of those user needs
   3. Prioritizing requirements
      1. Fulfilling strategic goals
      2. Working under technical and time constraints
      3. If conflicts occur between features, revisit strategic objectives
      4. If the strategy document identifies a clear hierarchy of priorities among strategic objectives, use them as primary factor
   4. Deliverables
      1. Functional documents
         1. List of tasks and scenarios
         2. Comprehensive list of proposed features
      2. Content document
         1. Content delivery plan
         2. Comprehensive list of required contents and their estimate
2. The strategy Phase: what people want to achieve
   1. **Site Objective**
      1. **Why of the website creation**
         1. Why will this site exist
         2. Why will people visit? And return ?
         3. How will you measure the success of this website
         4. How will this site create revenue
      2. **Success Metric**
         1. **Traffic**: The number of visitors that are coming to your site
         2. **Stickiness**: the amount of time users spend on the site and the number of pages they view
         3. **Conversion**: The percent of visitors who become customers and the size of the average sales ticket
         4. **Customer** **retention**: The number of customers who return to you site and the frequency of their purchases
      3. **Survey**
         1. Client survey might be a good tool of finding site objective
         2. Feedback from varying sources gives a broader feel for the project
         3. Straightforward distribute/collect/analyze process
   2. **User Needs**
      1. The value of User Profiles and Personas
         1. Clarify assumptions about users and their tasks
         2. Communicate those assumptions
         3. Highlights aspects of user groups that influence the design
         4. Highlight variation among user groups
         5. Provide a basis for prioritizing user groups
         6. Provide a means to document rational for early design decision
      2. User Research
         1. Survey, interviews of focus groups: gathering information about the general attitudes and perceptions of the users
         2. User tests or field studies: understanding specific aspects of user behaviors and interaction
      3. Market Research
         1. Task analysis: a method of closely examining the precise steps users go through in accomplishing their tasks, e.g. interview or observation
         2. User testing: a method of getting users to test what you’ve prodcuced
   3. **Deliverables**
      1. Site objectives and success matrices
      2. User analysis
         1. User profile: target users, their characteristics, needs, tasks, technologies they use and their social and organizational issues
         2. Personas
3. UCD – Summary
   1. User centered design increases the value of the site through better desifn and evaluation and creates positive experiences for the users
   2. UCD is about how you empathize with users, understanding their needs and the tools and technology they use and their social and organizational context.
   3. Its about how you use this understanding to shape up your design
4. **Web Usability**
   1. **Page Design – cluttered or complex designs make people less likely to find what they want.**

* **Introduction**
  + It’s the most immediately visible part of web design
* **Consistency**
  + Web designers need to accommodate and support user-controlled navigation
  + Maintaining consistency in patterns and alignment across different types of pages
* **Rich Content**
  + Reduce clutter and visual noise
  + Use strong alignment and underlying grid
  + Group based on similarity, proximity, common region and connectedness
* **White Space**
  + Without an adequate amount of white space, text would be unreadable, graphics would lose their emphasis, and there would be no balance between the elements on page
  + Passive space – outside the main content area. E.g. margins on the piece of paper
  + Active space- inside the main content area. The space between paragraphs
* **Colors**
  + Color is the most powerful cue to coherence and connection and is used effectively to indicate highlighting or selection
  + Providing natural grouping cues
  + Showing relationships
  + Reinforcing a theme
* **Response times**
  + The most important design criterion for web pages
  + Basic advice
    - 0.1s: allowing users to move, zoom or manipulate any screen element
    - 1 sec: getting to new page
    - 10 sec, staying focused on navigating the site
* **Linking**
  + Keep it short (not more than 2 to 4 words long)
  + Provide a short summary
  + Link color: blue (unvisited), purple(visited).
  + Outbound links, good to provide warning clues about leaving the site. E.g. pop-up
  + Incoming links: most valuable means of generating traffic. Use permanent URLs for each of your pages
  + Advertising links: linking directly to payoff pages that follow up on the message in your ad instead of linking directly to your homepage
* **Credibility**
  + One of the main goals of great web design is to establish your creditability as a professional run operation
* **Printing**
  + 2 versions. One optimized for online viewing, the other should keep the entired document in one file with a layout that is optimized for printing
  1. **Content Design**
* Writing for the web
  + People come to website for content. They want information that
    - Answers a question or helps them to complete a task
    - Is easy to find and easy to understand
    - Is accurate , up to date and credible
  + Web users scan web pages at average 27 secs on each web page
  + Give people only what they want
  + Write in inverted pyramid style. Main point -> supporting info ->history
  + 4 main guidelines for writing for the web
    - Be precise
      * use plain language, present the most impt material upfront
    - Write for scannability-
      * Use meaningful headings
      * Bulleted list
      * Use highlighting and emphasis to make import words catch the user’s eye
    - Use hypertext to split up long information into multiple pages
      * Page chunking
      * Spilt the info into coherent chunks that each focus on a certain topic
  + Guidelines for writing meaningful links
    - Don’t make new program/product names into links by themselves
    - Rethink document titles and headings that turn into links
    - Think ahead. Match links and pages titles
    - Use single nouns sparingly, longer, more descriptive
    - Add a short description of people need it
    - Make the link meangingful
* Page title
  + Good pages titles as the main references to the pages
  + Act as micro-content. Get 40 to 60 characters to explain
  + Optimize title for a quick scanning
* Writing headlines - guidelines
  + Cleary explanation
  + Write in plain language
  + Skip learning articles
  + Make the first word an important, information-carrying one
  + Don’t start page titles with the same word
* Legibility (readability ?)
  + Use colors with high contrast between the text and the background
  + Use either plain-color backgrounds or extremely subtle background patterns
  + Use big enough fonts that people can read the text, even if they don’t have perfect vision
  + Make the text stand still
  + Al;most all text should be left –justified
  + Use readable font – verdna, arial
  + Avoid caps
* Online documentation
  + Make documentation pages searchable
  + Have abundance of examples
  + Instruction should be task-oriented and emphasize how to do things step by step
  + Good idea to provide a short conceptual model of the system
* Multimedia
  + Don’t overload page with multi-media
  + General guide for using multimedia effectively
    - Don’t make people wonder what or why
    - Choose an appropriate size
    - Use illustrations to support content
    - Don’t make content look like ads
    - Don’t annoy people with blinking, rolling waving or wandering text or pictured
    - Use animation where it helps
    - Don’t make people wait through splah or flash
  + Animation is good for 7 purposes
    - Showing continuity in transition
    - Indicating dimensionality in transition
    - Illustrating changes over time
    - Multiplexing the display
    - Enriching graphical representations
    - Visualizing three dimensional structure
    - Attracting attention
  1. **Site Design**

Chaotic design leads to dead ends and wasted effort. Hastily thrown-up websites without effective information schemes prevent user from getting to the information they seek, When this happens, they may give up or even worse go to a different site

* Introduction
  + From usability perspective, site design is more challenging and usually also more important than page design
  + Site design must be aimed at simplicity above all with as few distractions as possible and with very clear information architecture and matching navigation tools
* Homepage
  + The flagship of the site should therefore be designed differently from the remaining pages
  + Contain a larger logo and more prominent placement for the company name or site name
  + Serve as the entry point to the site navigation scheme
  + A useful home page make it instantly clear what the site is about
  + Homepage should have 3 features
    - Summary of the most important news or promotions
    - Directory of the site
    - A search feature
  + Better to create a page layouts that will work across a range of window sizes and different browser
  + Best to design this type of resolution-independent home page which can adopt to various screen size
  + Splash screens can be annoying and frequent users click off them as fast as they can
  + Metaphor
    - Facilitate learning by allowing users to draw upon the knowledge they already have about the reference system
    - Don’t overuse
* Navigation
  + Navigation interface need to help users answer the 3 fundamental questions of navigation
    - Where am i
    - Where I have been
    - Where can I go
* Site Structure
* Subsites
* Search Capabilities

1. **Mobile Usability**
2. **Usability Testing Basic**
   1. **Consequences of not testing**

* Inability to establish a real proof of concept
* Lack of informed decisions and prioritized project planning
* Dissatisfied users
* Cost of redesign
* Bad publicity
* Lost investment in time, money and effort
* Increased burden of support calls from confused users
  1. **Some eye-opening Statistics**
* 28% of users report difficulty locating products and services on websites
* 62% web shoppers gave up looking for the item they wanted to buy online
* 75% of shopping carts are abandoned before checkout/ 27% abandoned because they were confused by the checkout process
* 40% os users do not return to sites at which they have a negative experience
  1. **Definition of Usability Testing**

Usability testing encompasses a range of methods that examine how users in the target audience actually interact with a product/design

In typical approach, a user is asked to perform a variety of task relating to using the product/design, while an observer records notes on how successful the user is in performing each task:

* Whether users can determine how to accomplish the task
* How fast users go from one point to another
* What mistake they make
* Where they’re confused
* What alternate paths they take
* how much learning trail are involved
* Whether users derive satisfaction from the interaction
  1. **3 Principles of usability testing**
* Early focus on users and usability goals
* Empirical(verifiable by observation or experience rather than theory or logic) measurements of user behaviors
* Iterative design – keep redesigning till it’s perfect