Session 1

Introduction to User Interface Design

Learning Objectives

- In this session, you will learn to:
- Define User Interface (UI) and User Interface design
- List and explain the different elements of User Interface Design
- Describe the principles of User Interface Design
- Describe the types of User Interface Design
- Explain the User Interface Design process
- Describe the models in User Interface Design

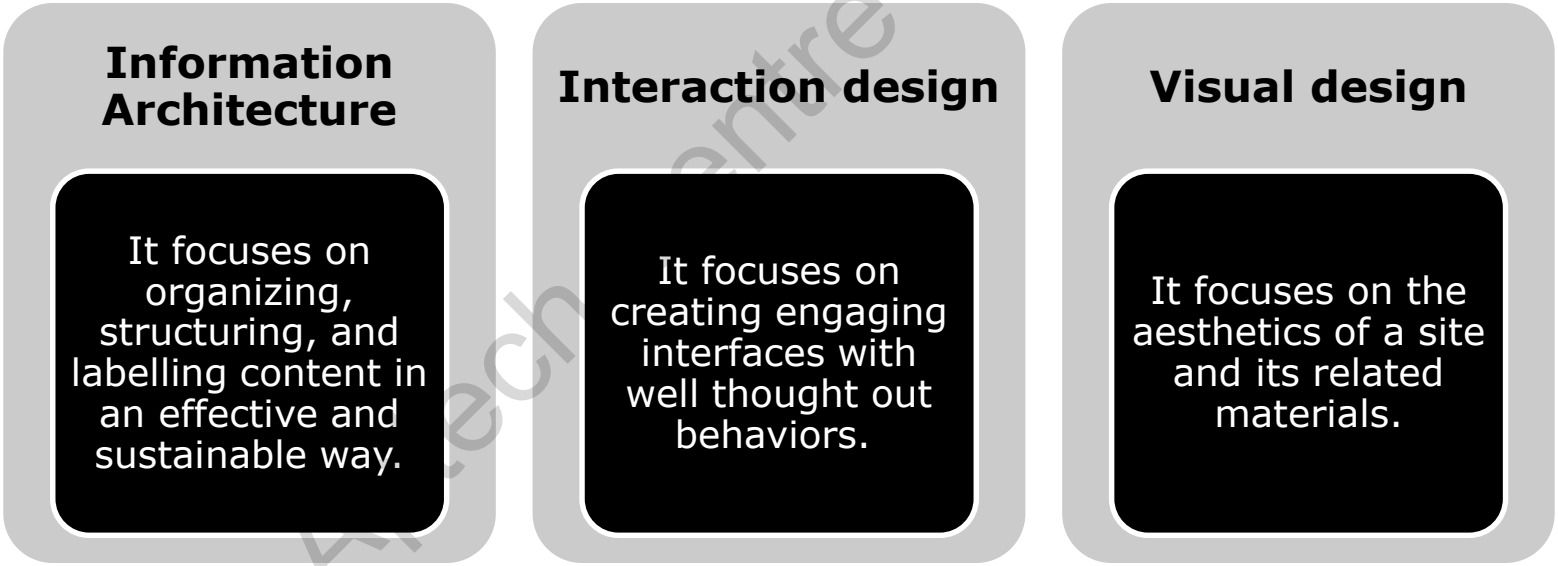
What is User Interface (UI)?

- User Interface is the means by which a user and a computer system interacts. It comprises both software and hardware components.
- Typically, the UI comprises:
  - The textual, graphical, and auditory information the program presents to the user.
  - The control sequences that user employs to control the program.

Example of a most common UI: Automatic Teller Machine (ATM)

What is User Interface Design (UXD)?

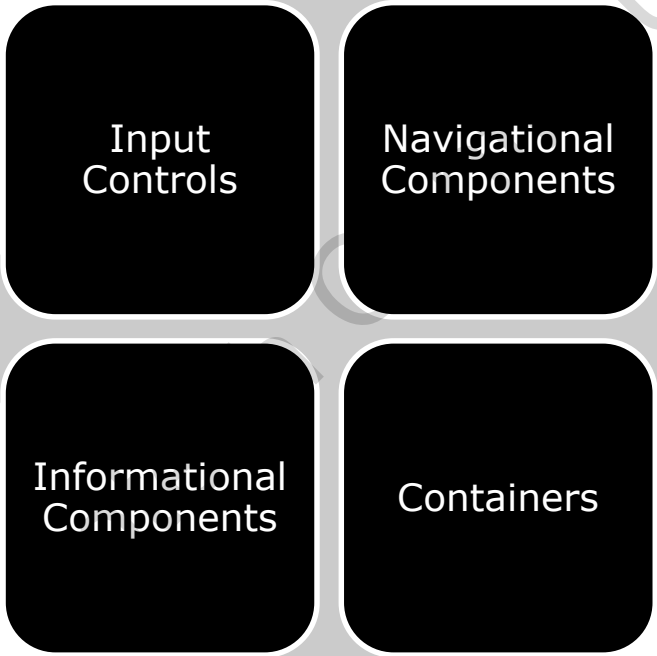
- User Interface Design is the design of Websites, appliances, computers, and software applications.
- UI design brings together the concept from:



- The overall goal of the UXD is to make the user's experience and interaction as simple and efficient as possible.

Parts of User Interface Design

The fundamental parts of most user interfaces are as follows:



Parts of User Interface Design

Input Controls:

- Input controls define the way the system captures the information.
- These are the interactive components of the user interface.

Element	Description
Button	Can be pressed, or clicked, by the user to perform an action
Radio button	Allows the user to select one item from a set
Checkbox	Allows the user to select one or more options from a set

Parts of User Interface Design

Elements	Description
Drop-down list	Allows users to select one item at a time, similar to radio buttons, but is more compact allowing the user to save space
Drop-down button	When clicked displays a drop-down list of mutually exclusive items
List box	A box on the screen that contains a list of options. It allows the user to select one or more items from a list
Text field	A basic text control that allows the user to enter a small amount of text

Parts of User Interface Design

Navigational Components:

- Navigational components provide the way for the users to tell the system what to do.

Element	Description
Search Field	Allows users to enter a keyword or phrase and submit it to search the index with the intention of getting back the most relevant results.
Breadcrumb	A navigation aid that allows the user to keep track of the location within programs.
Pagination	Divides content into discrete pages. It allows the user to skip between pages or go in order through the content.

Parts of User Interface Design

Element	Description
Tags	Allow users to find content in the same category
Icons	A simplified image serving as an intuitive symbol that is used to help users to navigate the system
Image Carousel	Allows the user to browse through a set of items and make a selection of one if they so choose.

Parts of User Interface Design

Informational Components:

- Informational components include tooltips, notifications, progress bars, message boxes, and modal window.

Elements	Description
Tooltip	A common user interface element used in conjunction with a cursor, usually a pointer
Notification	An update message that announces something new for the user to see
Progress Bar	Indicates where a user is as they advance through a series of steps in a process

Parts of User Interface Design

Element	Description
Message Box	A small window that provides information to users and requires them to take an action before they can move forward
Modal Window (pop-up)	A child window that requires users to interact with it before it can return to operating the parent application

Parts of User Interface Design

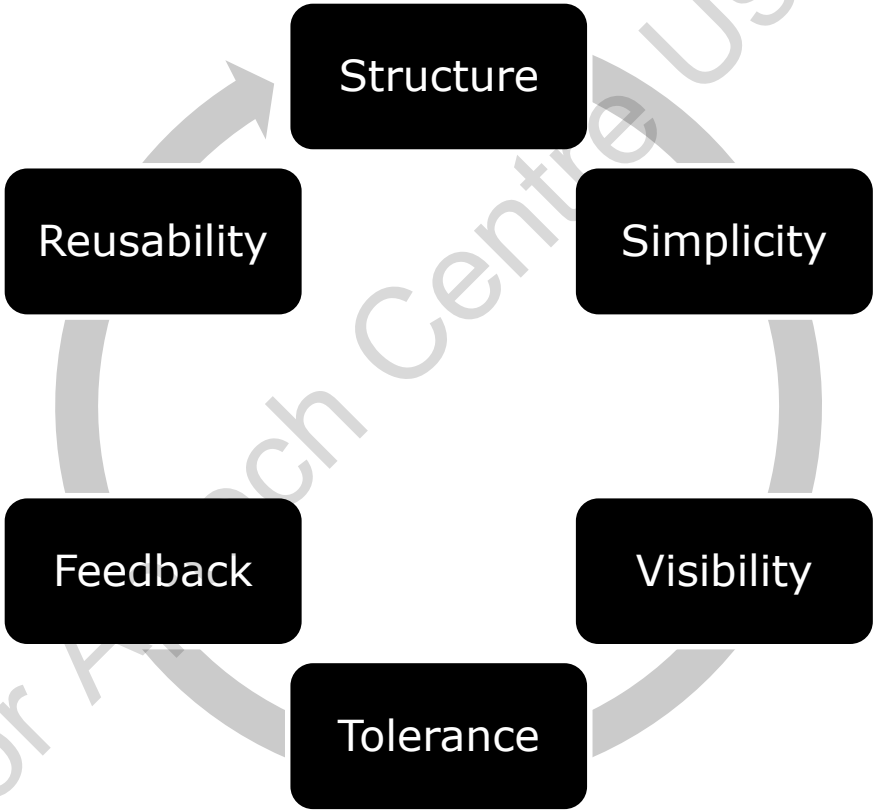
Containers:

- Containers are designed to contain page elements to a reasonable maximum width based on the size of a user's screen.

Element	Description
Accordion	A vertically stacked list of items that utilizes show/hide functionality

Dialogues/Principles and Attributes of User Interface Design

The UI design principles include:



Dialogues/Principles and Attributes of User Interface Design

Structure Principle

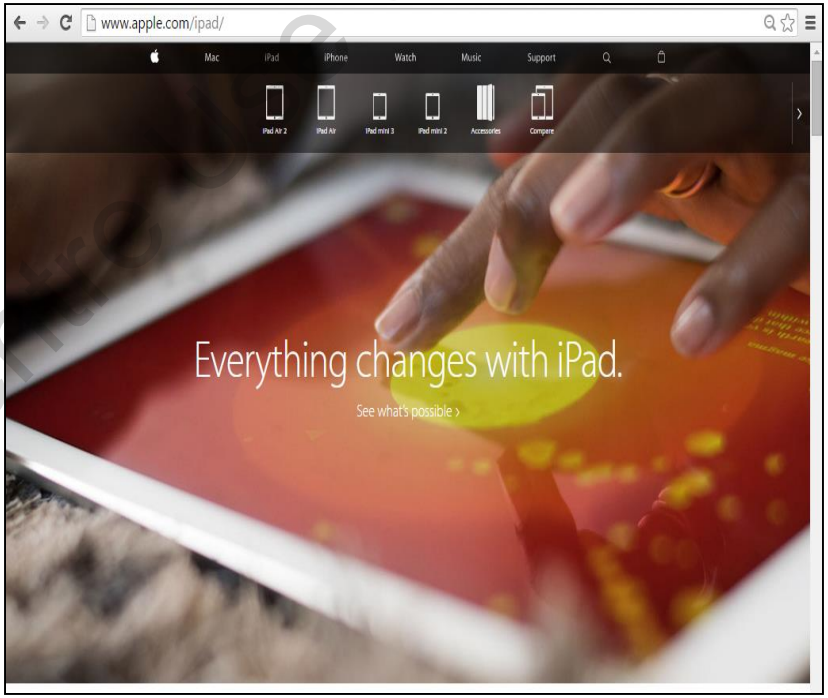
- It is concerned with overall user interface architecture.
- The design of the interface should be visually, theoretically, and linguistically clear.
- It should provide clear and user-specific paths to useful and relevant information.

Example of a clearly structured UI
Image Courtesy: https://www.amazon.com

Dialogues/Principles and Attributes of User Interface Design

Simplicity Principle

- The design should be simple to learn and simple to use.
- It should include only the important elements of communication.
- It should also make common tasks simple to do.
- It should provide good shortcuts that are meaningfully related to longer procedures.

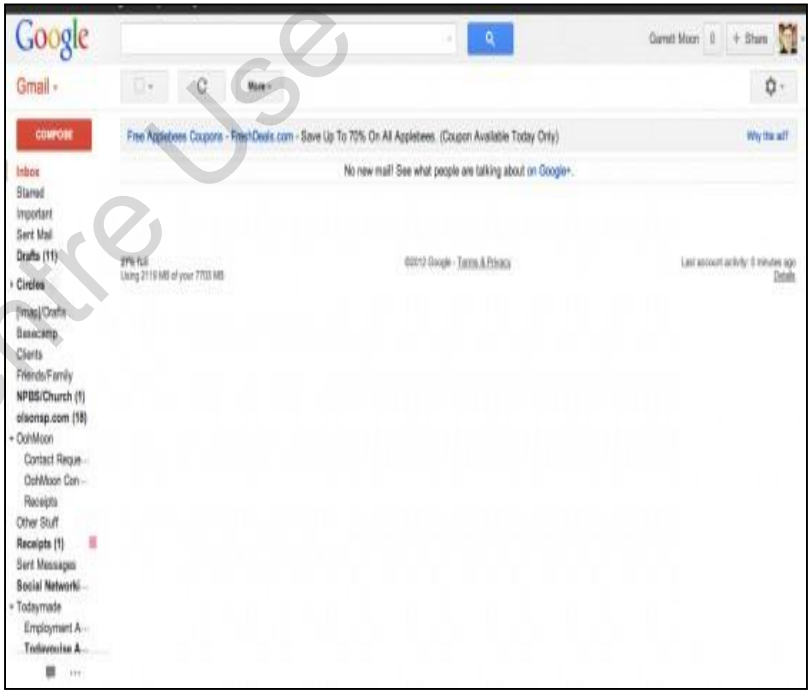


Example of a simple UI
Image Courtesy: http://www.apple.com/ipad/

Dialogues/Principles and Attributes of User Interface Design

Visibility Principle

- The UI design should make all required options for a given task visible without confusing the user with superfluous information.
- It needs to be very straight forward to let users easily comprehend the interface and navigate though it more efficiently.

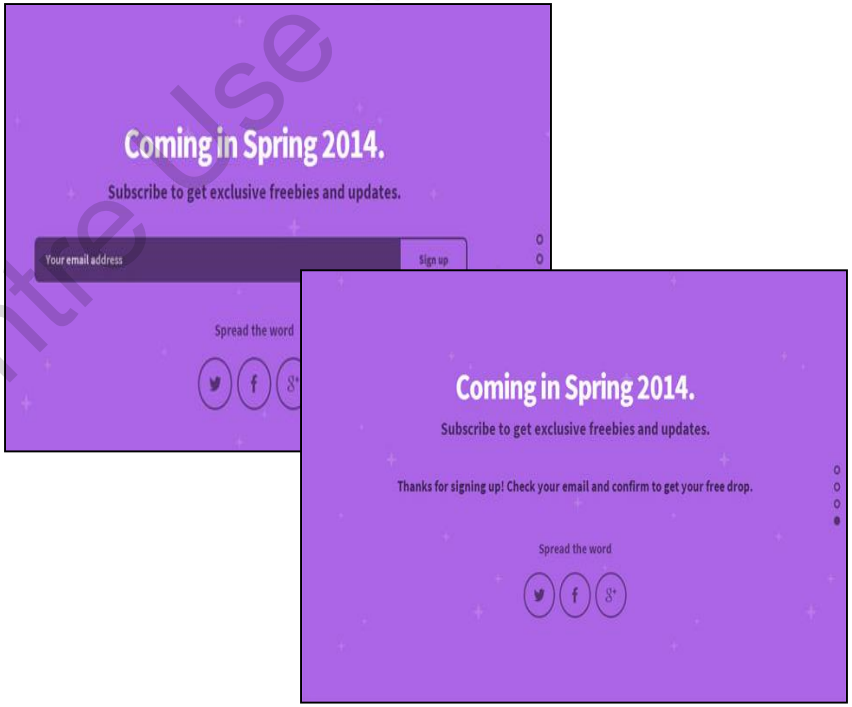


Example of a clearly visible UI
Image Courtesy: https://www.gmail.com

Dialogues/Principles and Attributes of User Interface Design

Feedback Principle

- The UI design should clearly inform users what is going on and show them the result of their actions.
- It should also inform users about the actions, changes of state or condition, and errors or exceptions that they will face on performing particular actions.

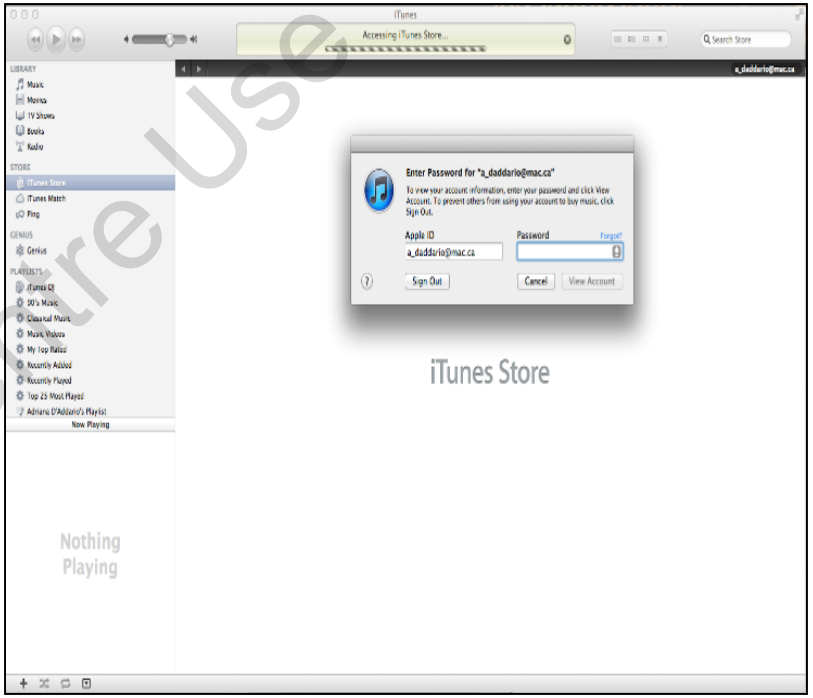


Example of UI displaying feedback
Image Courtesy: Kickdrop.me

Dialogues/Principles, Attributes of User Interface Design

Tolerance Principle

- It emphasizes the importance of designing the user interface to prevent users from making errors.
- It allows the user to learn how to use the site and inform them of errors.



Example of a tolerant UI
Image Courtesy: https://adaddario16.wordpress.com

Dialogues/Principles, Attributes of User Interface Design

Reuse Principle

- The UI design should reuse internal and external components and behaviors to maintain consistency with purpose.

Example of a reusable UI
Image Courtesy: http://www.ebay.in/

Types of User Interfaces

User interfaces can be classified into six categories:

- Command Language-based Interface
- Menu-based Interface
- Natural Language Interface
- Touch Sensitive Interface
- Web-based Interface
- Graphical User Interface (GUI)

Types of User Interfaces

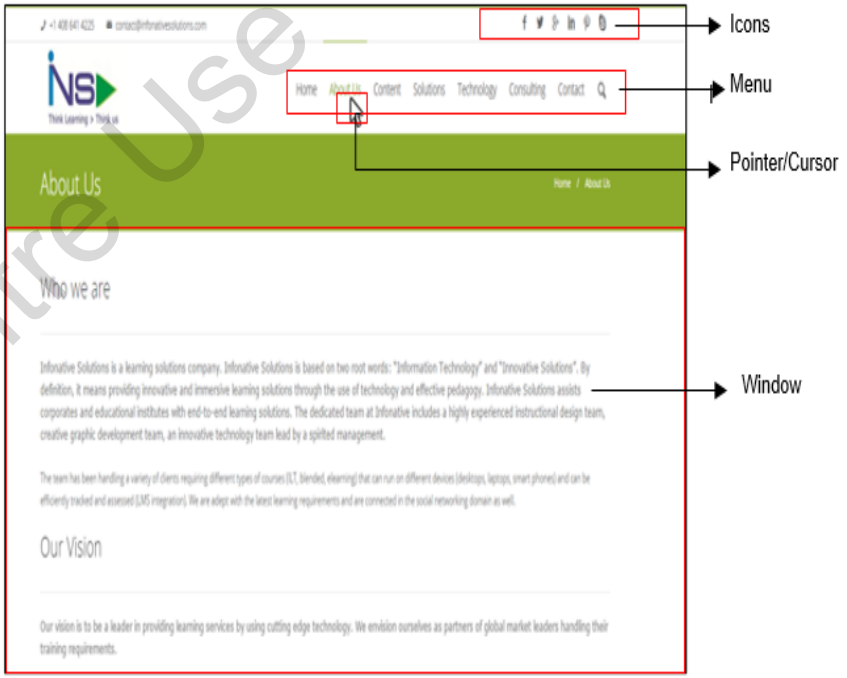
- **Command Language-based Interface:**
  - It is a means of interacting with a computer program where the user issues commands to the program in the form of successive lines of text.
  - Example: MS-DOS
- **Menu-based Interface:**
  - It allows the user to access command through the menu.
  - Examples: Cashpoint machines, iPods, and mobile phones
- **Natural Language Interface:**
  - It allows the user to speak in his normal everyday language in order to interact with the system.
  - Example: Speech recognition software

Types of User Interfaces

- **Touch Sensitive Interface**
  - It utilizes a touchscreen display as a combined input and output device.
  - Examples: Smartphones and POS machines
- **Web-based Interface**
  - It accepts the input from the keyboard and mouse and provides output by generating Web pages which are transmitted via the Internet.
  - These Web pages are viewed by the user using a Web browser program.

Types of User Interfaces

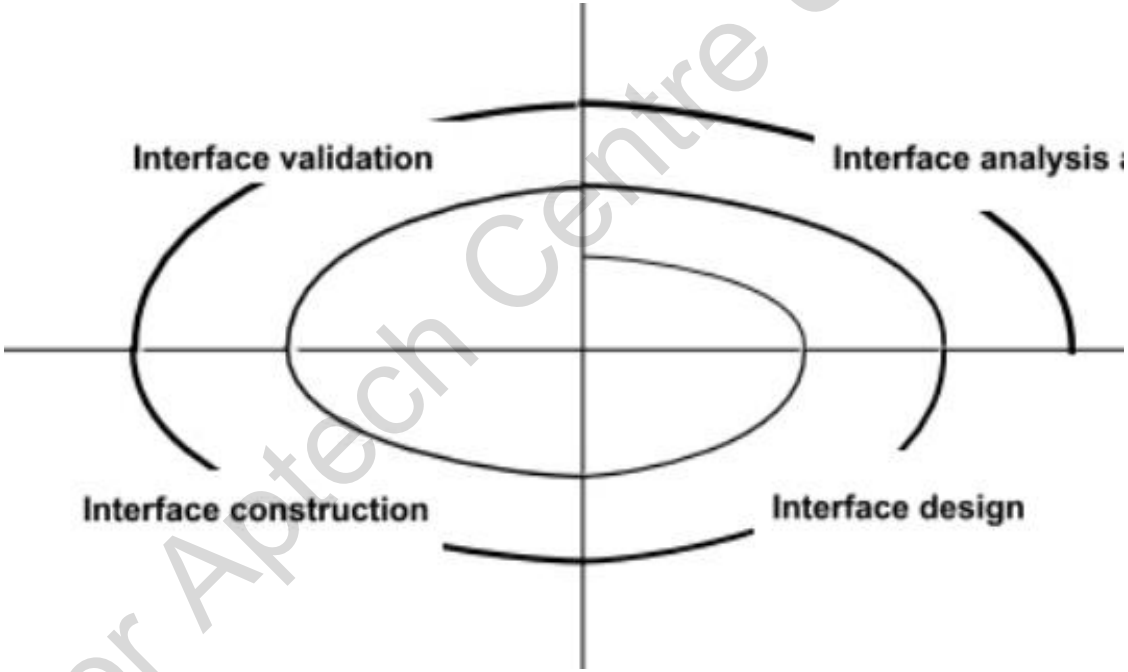
- **Graphical User Interface (GUI)**
  - It accepts the input through the computer keyboard and mouse and displays the final graphical output on the user's computer screen.
  - The most common elements of a GUI include:
    - Window
    - Menu
    - Icons
    - Pointer/Cursor



Elements of a Graphical User Interface (GUI)
Image courtesy: http://infonativesolutions.com/

Processes in User Interface Design

- User interface development process is repetitive and can be represented using a spiral model.
- The process encompasses four distinct framework activities:



User Interface Design Process

Processes in User Interface Design

First Step - Interface Analysis

- It involves understanding the:
  - End-users who will interact with the system through the interface
  - Tasks that end-users would need to perform to do their work
  - Content that will be presented as a part of the interface
  - Environment in which these tasks will be conducted

Second Step - Interface Design

- It involves the commencement of interface design activity

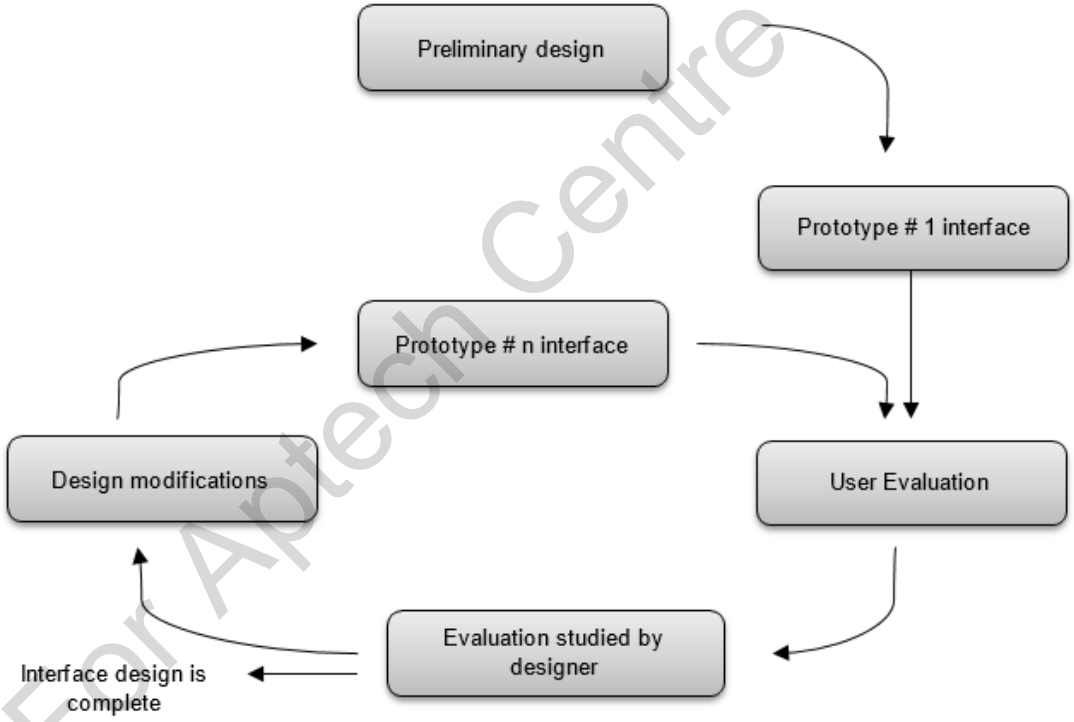
Third Step - Interface Construction/Implementation

- It involves implementation of the design model as a prototype

Processes in User Interface Design

Fourth Step - Interface Evaluation

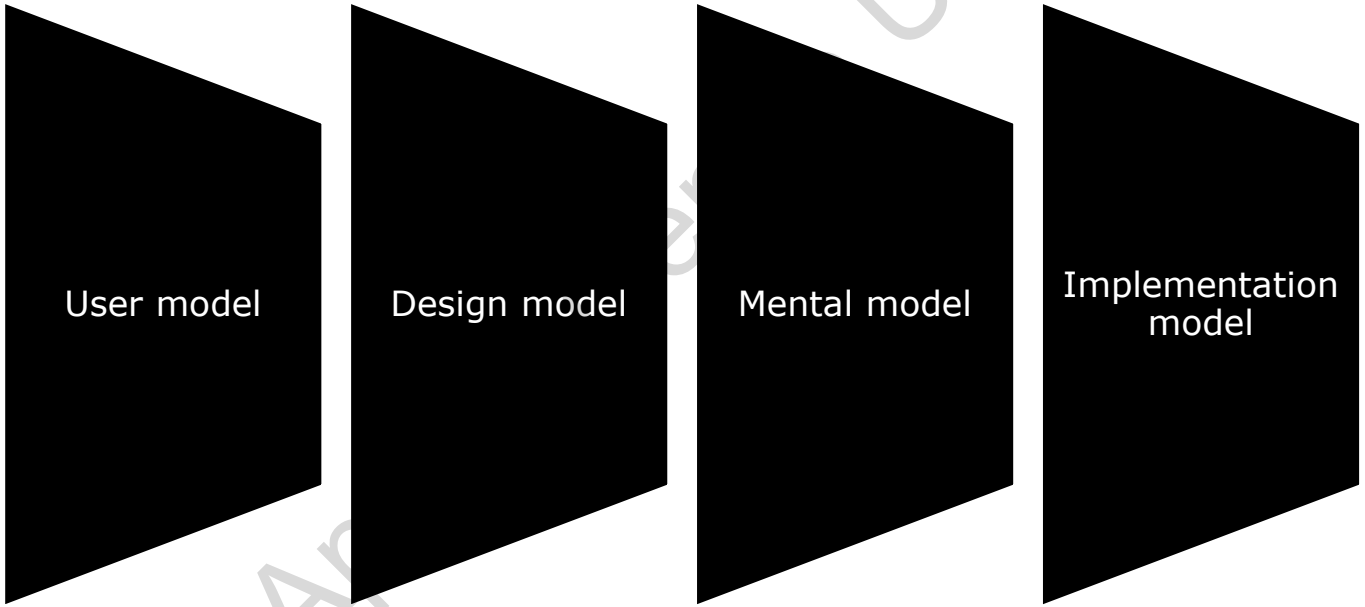
- It involves evaluation of the design prototype to determine whether it meets the needs of the user.



Design Evaluation Cycle

Models in User Interface Design

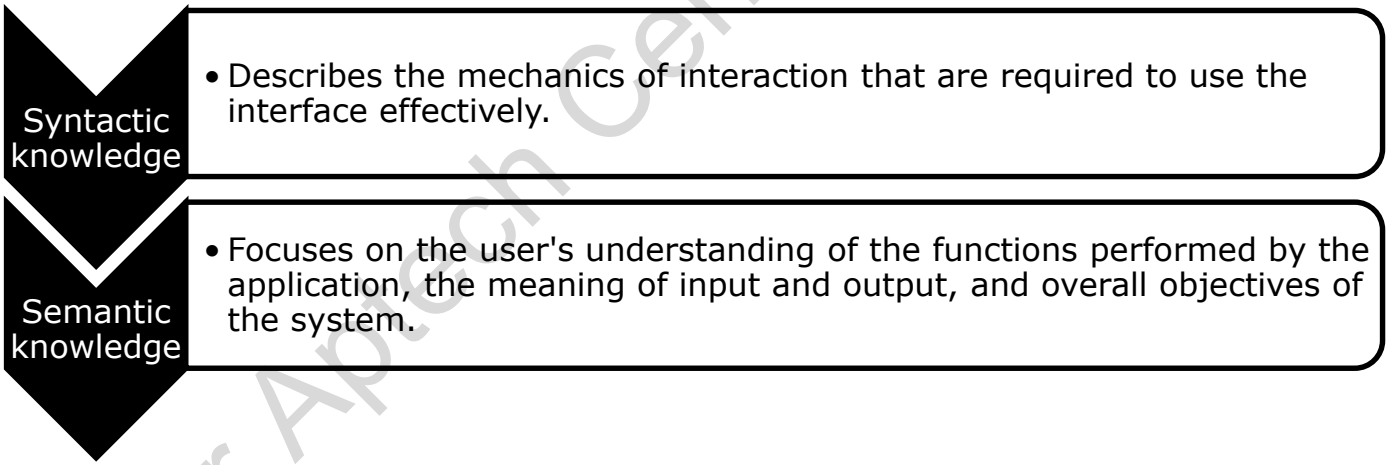
In designing the user interface, four model types are especially important:



Models in User Interface Design

User Model:

- It is established by a software engineer.
- It describes the profile of the end-users of the system.
- It focuses on the syntactic and semantic knowledge of the user.



Models in User Interface Design

Mental Model:

- It is developed by the user while interacting with the system.
- It is a representation of user's system perception- 'How do users think this works?' based on past experiences, knowledge, or common sense.

Design Model:

- It is created by a software engineer.
- It results from the analysis phase of the requirements and takes into account the data and architectural, interface, and procedural aspects of the system.

Models in User Interface Design

Implementation Model

- It is created by the software implementers.
- It is a representation of how a system actually works.
- It consists of the look and feel of the interface along with all supporting information such as resources, tutorials, help files, and videos that describe system syntax and semantics.

Summary

- A user interface is the means by which a user and a computer system interacts.
- User Interface Design is the design of Websites, computers, and software applications focusing on maximizing user experience and interaction.
- The fundamental parts of most user interfaces include Input Controls, Navigational Components, Informational Components, and Containers.
- The UI design principles focuses on improving the quality of user interface design.
- The six important UI design principles are the Structure principle, Simplicity principle, Visibility principle, Feedback principle, Tolerance principle, and Reusability principle.

Summary

- The User interface development process is repetitive and can be represented using a spiral model.
- The User interface development process encompasses four distinct framework activities including Interface analysis, Interface design, Interface construction/implementation and Interface validation.
- The four model types especially important in designing a user interface are User model, Design model, Mental model, and Implementation model.
- The most widely used type of user interface in use today is the graphical user interface.
- The most common elements of a GUI include Window, Menu, Icons, and a Pointer.