

Module_6

User Interfaces and Interactions

CS 4712 UIE
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Introduction and background

- Past decades, the art of how people have been interacting amongst each other has been changing at an increasing rate
 - this is all due to the results in the waves of successful research in *Human-Computer Interaction* (HCI)
- Every new model of computers, cellular devices, or any Internet of Things devices (IoT) the process of computing at a fundamental level is changed

Interface and Interaction

- UI stand for user interface designer.
 - UI designer are those who work on interface elements such as text field, text, button, etc.
- IxD stand for user interaction designer.
 - IxD designers are those who charge of the websites/apps moving elements and interaction.

Interface and Interaction Styles

Interaction Styles:

- Some common types interaction styles are:
 - Buttons
 - Touchscreens
 - Stylusus
 - Auditory

Interface and Interaction Styles

Interaction Styles Advantages:

- Advantages that these interaction styles have:
 - **Buttons** - Simple, Does exactly as told
 - **Touchscreens** - Direct manipulation
 - **Stylus**- More precise than touching with a finger
 - **Auditory** - You only need voice to use

Interface and Interaction Styles

Interaction Styles Disadvantages:

- Disadvantages that these interaction styles have:
 - Buttons - Limited choices because of simplicity
 - Touchscreens - Buggy finger sensor, skewed perspective of the screen could cause difficulty
 - Stylus - It's a separate object from the device it's used for, There is a chance of losing it
 - Auditory - Limited choices because of data

Interface and Interaction Styles

Choosing a Style:

- All styles are fundamentally the same but they all won't be able to fulfil the same requirements that a user would want.
- Before choosing an interface style for any project it is important to make sure that the interface has the most minimal drawback when implemented into the project.

Concept of Direct Manipulation

Characteristics:

- Central theme in interface design.
- Direct manipulation are visibility of the object of interest, fast, reversible, incremental action, and replacement of complex command language syntax by direct manipulation of the object of interest.
- Continuous Visibility of objects and actions.
 1. The System is portrayed as an extension of the real world.
 2. Action are rapid with visible display of results
 3. Use pointing device to directly manipulate visible objects on the screen
 4. Incremental actions are easily reversible.
 5. Physical procedures rather than complex syntax.



Concept of Direct Manipulation

Example:

Computer-aided design:

- Computer-aided design use a direct manipulation
- Manipulate the object of interest
- Problem solving by analogy to the real-world

Office automation:

- Apple Lisa System
- Microsoft Windows use a descendant
- Rapid and continuous graphical interaction

Concept of Direct Manipulation

Technologies that derive from the word processor:

- Integration: graphics, photographs.
- Desktop publishing software: newsletters, reports, brochure, books
- Slide-presentation software
- Hypermedia environments and the Web
- Grammar checkers
- Spell checkers
- Document assemblers such as contracts

Concept of Direct Manipulation

Advantages:

1. Presents task concepts visually
2. Easy to learn
3. Easy to retain
4. Encourage exploration
5. More natural
6. Exploits visual / spatial cues
7. Symbols recognized faster than text

Disadvantages:

1. Hard to make coding
2. Greater design complexity - controls and basic alternatives must be chosen from a pile of choices
3. Require graphics pointing devices
4. Lack of experimentally-derived design guidelines
5. Not familiar: Symbolic representation may not be as familiar as words or numbers.
6. Inconsistencies in technique: Differences in techniques

General Principles of User Interface Design

- -There are many various different principles when designing a user interface
 - -Some steps are unnecessary in the grand scheme of things but there are some main principles that are very important.
- -These main principles are a staple in designing a good and well received interface.

General Principles of User Interface Design

#1. Simplicity

- -Some of the best interfaces are simple and to the point.
- Having a more simple interface will help the user understand and navigate the interface
- Simple interfaces avoid unnecessary elements and are clear in the language they use.
 - Simple interfaces are almost invisible to the user, allowing for a more common sense choice.



General Principles of User Interface Design

#2. Consistency

- Using more elements that are common to one another in a User Interface will make the users feel more comfortable.
- The users will also be able to get tasks done much more quickly
- it will also be very important to create patterns in language as well as layouts and designs throughout the interface to assist with efficiency.
- Once the user learns how to complete a task, they will be able to do that again throughout the interface.

General Principles of User Interface Design

#3. Compatibility

- -"Know the user"
- -Design the interface to fit what the user will use it for and how the user will use it.
 - -The structure and flow of functions should allow an easy transition throughout all the tasks in the interface.
 - -There should be compatibility throughout platforms allowing the user to use the interface on various different platforms without any major design/layout changes.

General Principles of User Interface Design

#4. Control

- The user must be in complete control over the interface.
- There should be no interruptions or errors when the user is controlling the interface.
- Actions should be a result from the user explicitly requesting an activity to be performed.

General Principles of User Interface Design

#5. Recovery

- A user should be able to retract any or all actions that they chose to do with ease.
 - This will allow the user to return to the right track or previous step without any real loss in progress.
- The user should not be locked into a decision permanently.
- Recovery should be an obvious choice.

General Principles of User Interface Design

#6. Feedback

- This is very important because it will relay to the user if they actually clicked that button or if the interface is actually responding.
- This can be done by having a sound go off when an action is complete or have a color change.
- The user need to know if their actions are being received and recorded.

General Principles of User Interface Design

#7. Efficiency

- Make sure the user will complete their task in the most efficient way possible.
- Make sure that there are no unneeded steps to reach a goal.
- Transitions should be smooth and concise, allowing for the user to continue without any interruptions.

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