

# **HUMAN COMPUTER INTERACTION HOMEWORK-2**

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## **Question 1**

**Example of Virtual Reality:**

**Home Tour VR Application**

Using this application, user can take tour of the house before it is constructed.

Here,

House is designed using VR technology and the user can go through the house and check how it looks by keeping furniture at different place, placing doors and windows at different places.

If the user is not satisfied with the design, house can be resigned based on the modifications suggested and can go through it again.

By using this application, user can get more satisfaction with the design rather than just seeing the design in 2D view. Thus can construct a more customizable house.

## **Question 2**

**Advantages:**

- Allows easy learning.
- Allows easy retention.
- Allows errors to be avoided.
- Visually presents task concepts.

**Disadvantages:**

- In devices where screen space is limited, Direct manipulation devices may consume more valuable screen space and thus force valuable information off-screen, requiring scrolling or multiple actions.
- Users must learn the meanings of visual representations and graphic icons.
- In case of small devices, selecting an icon may become difficult because of small icons, limited resolution.
- Hard to program

**Reference:** Shneiderman, Chapter 7.2.3

### Question 3

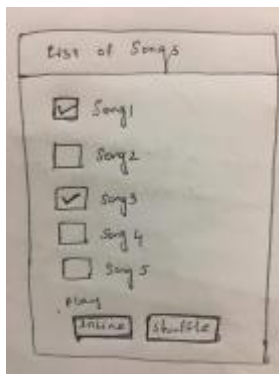
#### Binary menu

Binary menu prompting if the user wants to play all the selected songs in line.



#### Check boxes

Check box is for selecting more than one song.



#### Multiple-Item menu

Radio button is a type of Multiple-Item menu. User can select the song to play.



#### Pull-down menus

By pressing the arrow, it shows the list of songs to be played



**Explanation:**

- Binary Design is used for displaying only two menu items, we cannot display more than two menu items by using this menu type.
- Multiple-Item menu is used to show many menu items. Radio buttons are an example of multiple-item menu, as it displays more than one option for navigating.
- Check boxes are also example of multiple-item menu as more than one menu option can be displayed.
- Pull-down menu is a combo box, where you can select one option from list of menu items.

**Best Design**

Either using Radio button or check boxes gives the best design as the error rate will be less while using them.

Binary menu can't be used as you can't display more than two options.

Pull-down menu has more error rate, while using this there is a chance of selecting the wrong option.

**Question 4**

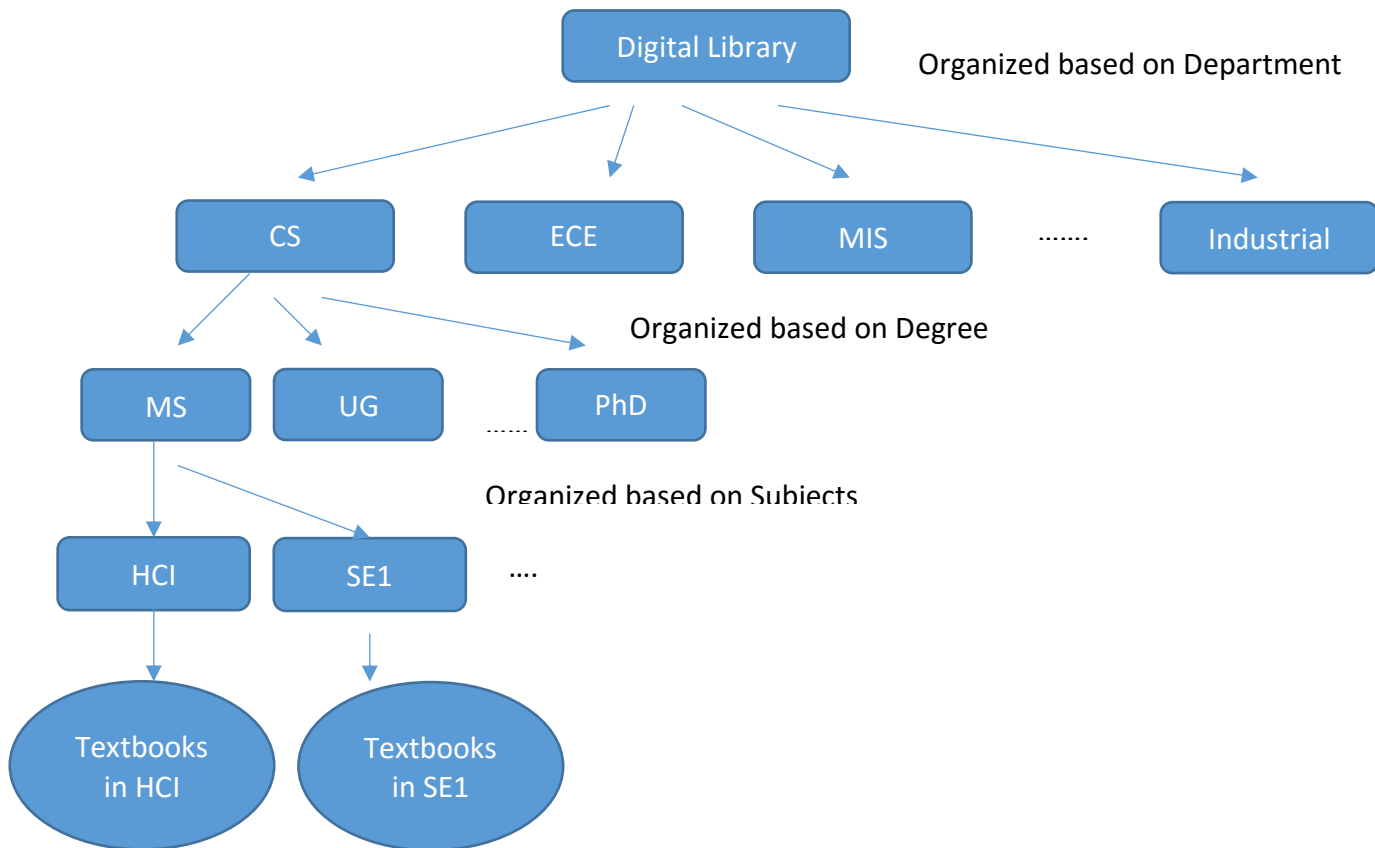
Let us consider a college having 1250 different books. In order to maintain information about these books in the system, we categorize books in the following ways:

Based on Department.

In department, they can be categorized based on level of degree (i.e) Masters, Under Graduation, PhD etc.

These levels of degree will have different subjects and these subjects will have books.

Menu tree for this digital library will look as the following:



While implementing this menu tree, first page of the digital library will have the list of all the departments. After selecting the particular department, it will navigate to the next page having list of degrees. After selecting particular degree, it will navigate to page having list of subjects. After selecting the subject, it will select the list of textbooks available for that subject.

### **Breath Vs Depth**

Breath is the number of items per level, Depth is the number of levels in the menu tree.

If more items are put into the main menu, the tree spreads out has fewer levels.

This shape is advantageous. Several authors urge using four to eight items per menu but at the same time, they urge using no more than three to four levels.

Many empirical studies have dealt with the depth/breadth tradeoff, and the evidence is strong that breath should be preferred over depth.

In the given example, I designed a menu tree which spreads out breath wise.

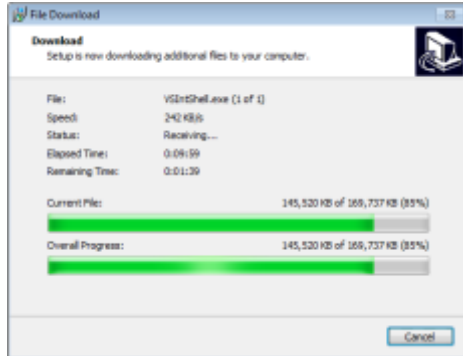
**Reference:** Shneiderman, Chapter 8.4.1

## Question 5

### Visibility of system status

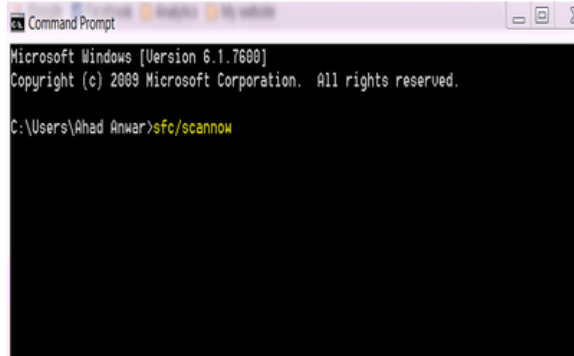
System should always keep users informed of what is going on, through appropriate feedback.

#### Complies



Downloading the files will show us the progress.

#### Violates

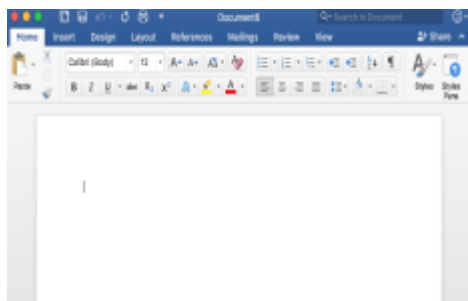


Some commands in command prompt will not show us any progress. It just waits for the command execution to complete.

### Match between system and the real world

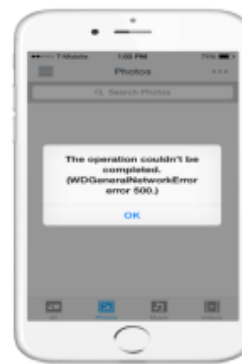
The words used in the system should match with the real world (i.e) user familiar words. Follow real world conventions, making information appear in a natural order.

#### Complies



In word, menus like save, insert, design etc. are similar to real time usage.

#### Violates



The message here displayed is not understood by the user as it is not used regularly in the real world.

## User control and freedom

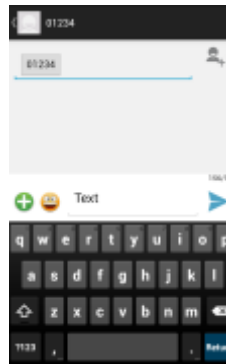
User sometimes by mistake chooses the wrong functionality option, in that case the user needs to come back easily rather than tangled in the unwanted navigation.

Complies



User can control Amazon cart by adding and deleting items in the cart.

Violates



After typing a long message in Android there is no option to undo that whereas iOS has an option to undo the message typed.

## Consistency and standards

Users should not have to wonder whether different words, situations, or actions mean the same thing.

Complies



Using cart symbol in any shopping website indicates the same meaning maintaining consistency and standards.

Violates

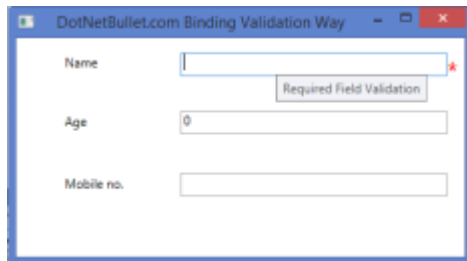


Different versions of adobe have different short cuts.

## Error prevention

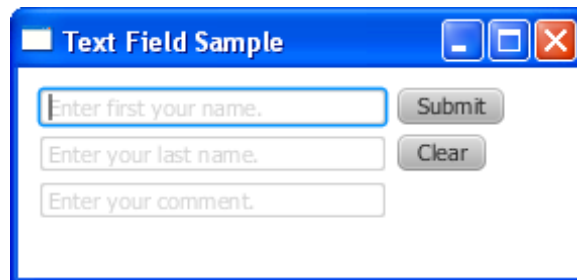
Even better than good error messages is a careful design which prevents a problem from occurring in the first place. Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action.

### Complies

A screenshot of a web browser window titled "DotNetBullet.com Binding Validation Way". It contains a form with three input fields: "Name", "Age", and "Mobile no.". The "Name" field has a red star icon at its end and a tooltip that says "Required Field Validation".

Having some symbol for required fields will prevent error.

### Violates

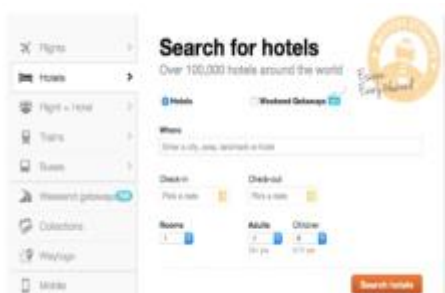
A screenshot of a window titled "Text Field Sample". It contains three text input fields with placeholder text: "Enter first your name.", "Enter your last name.", and "Enter your comment.". There are two buttons: "Submit" and "Clear".

This design cannot prevent error as it doesn't have any symbols or anything to indicate required field.

## Recognition rather than recall

Minimize the user's memory load by making objects, actions and options visible.

### Complies



This clearly shows us what we are searching for. Rather than making the user to recall

### Violates

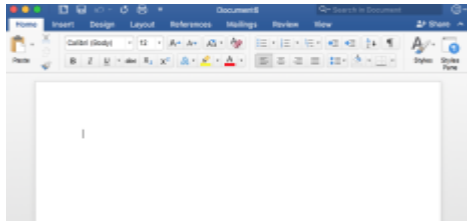


It always confusion for the user to find shut down button in windows 8.

## Flexibility and efficiency of use

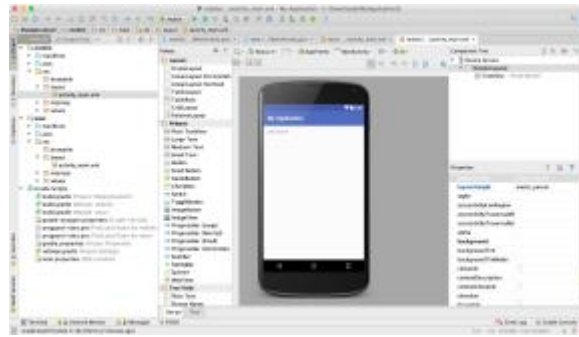
Accelerators may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users.

## Complies



Word provides flexibility for both novice and experts by providing both menus and commands.

## Violates



An expert can use the Android studio very easily. But, it is a bit confusing for the novice while using that..

## Aesthetic and minimalist design

Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.

## Complies



In an application, the pictures used must match with the topic under discussion and there should not be any irrelevant data.

## Violates



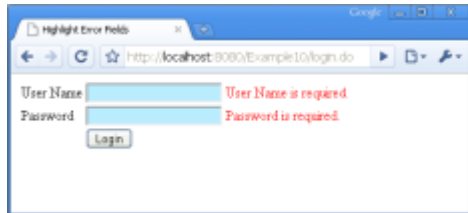
Every component in GUI should have some meaning.



## Help users recognize, diagnose, and recover from errors

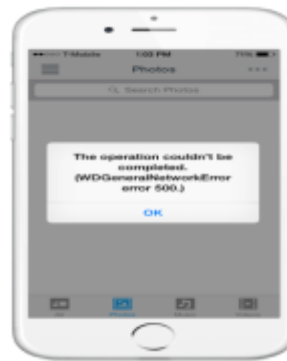
Error messages should be explained in plain language.

Complies



User should understand the error message. So, error message should be in natural language.

Violates



Here, message is some code which is not understood by the user.

## Help and documentation

Even though system can work without documentation it is better to provide help and documentation.

Complies



Some domain specific websites require a help on how to use it. So, it is good to have help in an application so that even a novice can use it.

Violates



This game doesn't have HELP option. So, initial user will not know what the game is about and how to play it.

**Reference:** <https://www.nngroup.com/articles/ten-usability-heuristics/>

## Question 6

From the mentioned applications Paper and Pacemaker, it is stated that as the size of device decreases the need for Human interaction and this reduction is satisfied by algorithms in the application. For this research:

### Research Question

Does decrease in size of the device limit the user customization functionalities in application?

Does developer need to focus more on algorithms as the screen size of device decreases?

### Hypothesis

As the size of the device decreases, the input from the user decreases and this is compensated with algorithms.

**Intended population:** Users using different devices with different size.

**Independent Variables:** Size of the screen.

**Dependent variables:** Degree of user Customization.

### Design of the Experiment:

We carry out this experiment by considering different users who are using different devices of different size and ask them the customization levels they had while using the same application in small device.

We can take expert reviews.

The observed data can be tabulated. The table can look as below.

User	Device	Customization level
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Values for the above table are calculated for the same application and the procedure is repeated for different applications.

The values for customization level can be a range from 1 to 5.

**Reference:** Material posted in Piazza “Why my Evil lecturer forcing me learn statistics?”