

User Interface design and real time Systems:-

\* User Interface Design :-

User Interface design (UI) is the design of the user interface for the mission and the software such as computers, home applications, mobile devices & other electronic devices, with the focus of software development and user experience. The goal of User Interface Design is to make user interaction as simple and efficient to solve the problem for the software Design.

Real-time Systems :-

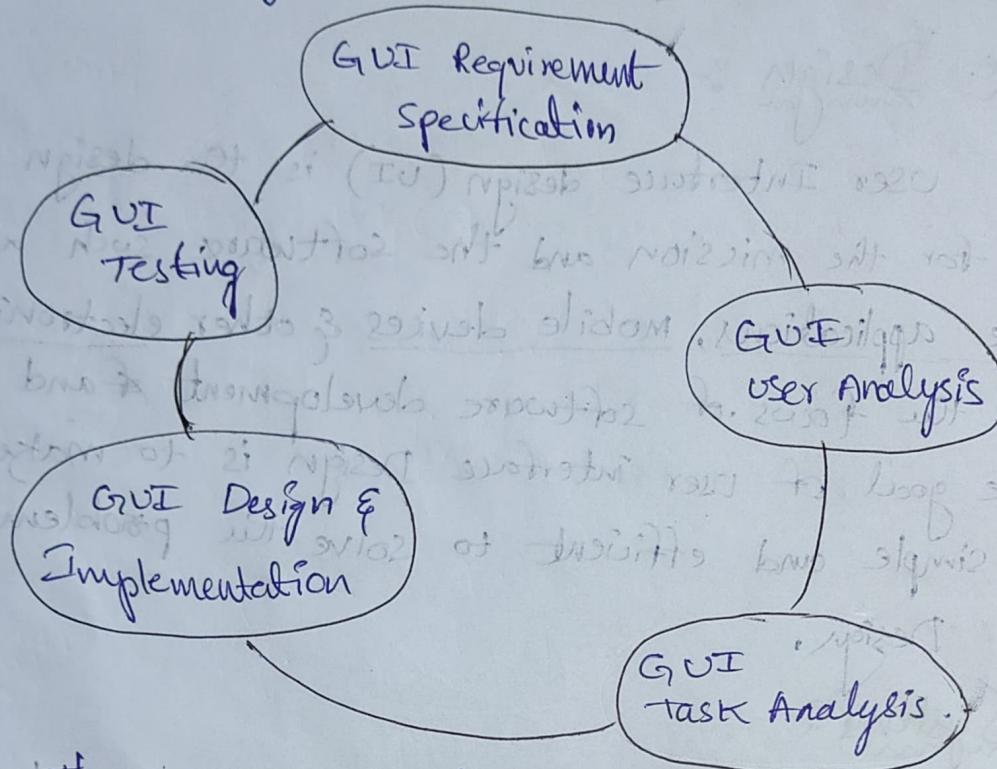
The Real-time Systems are the typical examples of the real time system includes "air traffic control system," Network -ing system, Control Command System are the real examples in real time distributed system.

The real time system are classified for the specially designed of computer system for a specific purpose commands and control systems, air traffic control system are the examples for the real time system.

User Interface System :-

In User interface Design there are a no. of activity performed for Designing the user interface. the process of GUI (Graphical user interface) Design and implementation in the SDLC. An any model can be used for GUI implementation among waterfall model, ~~hydralive~~ <sup>iterative</sup> model, spiral model for the design of user interface. A model used for

for the GUI Design and development of the specific given below the diagram.



There are six steps of the user interface design

1. GUI Requirement Specification/gathering
2. GUI User Analysis
3. GUI Task Analysis
4. GUI Design & Implementation
5. GUI Testing
6. GUI Requirement Specification

This Design may like to have a list of all the functional and non-functional requirements of GUI. This can be taken from user under and their existing software Solution.

2. User Analysis:-  
The designer studies who is going to use the software GUI. The target audience matters as the design details change according to the knowledge and competency

level of the user. If user is technical savvy, advanced and complex GUI can be incorporated. For a novice user, more information is included on how-to of software.

### 3. Task Analysis:-

Designers have to analyze what tasks is to be done by the software solution. Here in GUI, it does not matter how it will be done. Task can be represented in hierarchical manner taking one major task and dividing it further into smaller sub-tasks. Tasks provide goals for GUI presentation. Flow of information among sub-tasks determines the flow of GUI contents in the software.

### 4. GUI Design & Implementation :-

Designers after having information about requirements, tasks and user environment, design the GUI and implements into code and embed the GUI with working or dummy software in the background. It is then self-tested by the developers.

### 5. Testing :-

GUI testing can be done in various ways, organisation can have in-house inspection, direct involvement of users and release of beta version are few of them. Testing may include usability, compatibility, user acceptance etc...

### User Interface Rules:-

The following are general rules for GUI design

#### Strive for consistency:-

consistent sequences of action should be required in similar situations. Identical terminology should be used in prompts, menus, and help screens.

Consistent commands should be employed throughout.

Enable frequent users to use short-cuts:-  
the user's desire to reduce the no. of interactions increases with the frequency of use - Abbreviations, function keys, hidden commands, and macro facilities are very helpful to an expert user.

Offer information feedback:-

For every operator action, there should be some system feedback. for frequent and minor actions, the response must be modest, while for infrequent and major actions, the response must be more substantial.

Design dialog to yield closure :-

Sequences of action should be organised into groups with a beginning, middle, and end. The informative feedback at the completion of a group of actions gives the operators the satisfaction of accomplishment, a sense of relief, the signal to drop contingency plans and options from their minds, and this indicates that the way ahead is clear to prepare for the next group of actions.

Offer simple error handling :-

As much as possible, design the system so the user will not make a serious error. If an error is made, the system should be able to detect it and offer simple, comprehensible mechanisms for handling the error.

Permit easy reversal of actions :-

This feature relieves anxiety, since the user knows that error can be undone. Easy

reversal of action encourages exploration of unfamiliar options. The units of reversibility may be a single action, a data entry, or a complete group of actions.

reduce Short-term memory load :-

The limitation of human information processing in short term memory requires the displays to be kept simple, multiple page displays be consolidated, window-motion frequency be reduced, and sufficient training time be allotted for codes, mnemonics, and sequences of actions.

Human Computer Interaction (HCI)

Human computer interaction is the study and plan for the designing of a human computer activities. Human computer interaction users productivity, safety and entertainment to support the fulfilling human computer activities and it is applied various types of computer systems including air traffic control, neural processing, office & computer gaming sector. Human computer interaction is easy, safe, effective systems can be used by the developer.

Software Engineering focus on the production of software application to solve the problems. HCI designed always user friendly to execute the software applications. Note all the usabilities of the computer system can be combined with hardware and software applications. Here some of the HCI interacting with the system is

1. User
2. Computer
3. Interaction

## 1. User:-

In this HCI the user can give the instructions to the system so that system can be generating according to the user guidelines. The user can do some any type of additions and natural different types of plain games a part of the system.

2. Computer:-

When the computer were referring to any technology from the desktop computer, Laptop's were used a large scale of computer system. The computer devices such as mobile phones can also be consider to be a part of the system.

## 3. Interaction:-

There are difference between human and machine in such a way that both the user and the computer interact with each other so that the system will give the successful results. In the interaction both the hardware and software are involved into the system to became the success of the project.

The goals of the HCI are the useful and safety systems as well as functional system. In order to produce the computer system with good usability and development of the system.

1. Understand the factors that determine how people use technologies.
2. Develop tools & technologies to enable building the suitable system.

3. HCI active, efficient, effectiveness and safe interaction.
4. In HCI people will use computer system or laptops.

## \* Human Computer Interface Design

Human interface with computers throughout the user interface. This includes software and hardware such as which is displayed on the computer system with the support of hardware such as external devices like mouse, keyboard and other physical devices which is generated by the result of the system. The human computer interface designer is interacting with the different projects between user and the hardware system. Usability and experience of the system with the help of HCI Design. There are few types of human computer interface design such as

1. Usability.
2. User Experience.

### Usability:-

In this HCI Design is specially designed with the computer system. including efficiency, Safety, utility, and other facilities can be used in the software systems. The main usability is requirement gathering, or resources of the system.

### User Experience:-

In this HCI Design focusing on creating the system that are satisfying, entertaining, helpful, motivating to work on more and more experience upon the project.

The User Experience is supportive work with the various projects and other team members for the development of HCI Design.

## Interface Design:-

They are a large no. of factors which should be considered in analysis and designing of the system using HCI principles. Many of these factors interact with each other, making them analyse even more complex.

The main factors are listed in the table as shown below.

1. Organisation factor
2. Environmental Factor
3. Safety factor.
4. Continuous Process & Capabilities
5. Comfort factors
6. User interface factor.
7. Task Factor
8. System Factor & Functionalities
9. Productivity Factor.
  1. Organisation Factor  
Training, Job design, role of the workers, working organisation.
  2. Environmental Factor  
Noise of the System, Heating of the System, Lighting of the System

### 3. Safety Factor:-

The user should have safety and security.

### 4. Continuous processing & Capabilities :-

In Interface design have motivation, Engagement, Satisfaction, Personality and experience.

### 5. Comfort Factor:-

System Factors, System settings, Equipment or the system, layout of the system.

### 6. User Interface :-

Input device, Output device, Icons, Commands, Navigation, Graphics, Natural language, User support & multi-media.

### 7. Task Factor :-

In this project have easy, complex, tasks allocation, monitoring and skills of the project.

### 8. System factor & Functionalities :-

Hardware, software, applications

### 9. Productivity Factor:-

In this project increases the output, increases the quality of the software, Decreases the cost of the project, Decreases the error in the project.

## Interface Standards :-

Interface standards in a software engineering ensure that similar communication and interaction between different components. Systems to communicate from one computer to another computers to develop application programs. interface (API). There are sum of the communication protocol standards.

1. HTTP (Hyper text transform protocol)
2. FTP (File transform protocol)
3. SMTP (Simple mail transform protocol)

## Benefits of interface standards:-

- Scalability.
- Flexibility.
- Maintainability.
- Cost effectiveness.
- Improving user experience.

By using interface standards software engineering can be developed a step by step procedural efficient communication and scalability of the architecture. It is possible to good interface design. of the project.