

Chapter-5

Interaction Design Basics

Interaction design is about creating inventions in often complex situations using technology of many kinds including pc software, the web and physical devices.

Design: Achieving goals within constraints. Design means plan, structure, model of the product or how your model looks in future?

* Interaction design means to design interactive system and its services. Example - Computer applications, websites, smart watches, sensors, social media, GPS etc.

* 3 Needs of Interaction design:

1) Goals

2) Constraints

3) Trade off

Goals: What is the purpose of design?

Who is going to use this design?

What expected from design?

Why design is required?

Constraints:

what material going to be used?

what standards going to implemented?

what can be the cost?

How much time required for develop?

Is there any safety & health issue?

Does it supports old video file formats?

Trade off:

Balance between goals & constraints

choice of user interface depends on work & goals and constraints.

Golden Rule of Design

golden rule of design involves understand material. Two type of materials that need to be understand.

① Understand People: Psychological social aspects,

Human errors & emotions, Work area.

② Understand Computer: Limitations, Capacity,

platforms, processors Tools, Framework, storage etc.

we need to understand these interactions also.

To err is human

It is the nature of humans to make mistakes, and system should be designed to reduce the likelihood of those mistakes and to minimize the consequences when mistakes happen.

⇒ If you design using physical materials (human), you need to understand how and where failures would occur and strengthen the construction, build in safety features, or redundancy.

The central message - the user

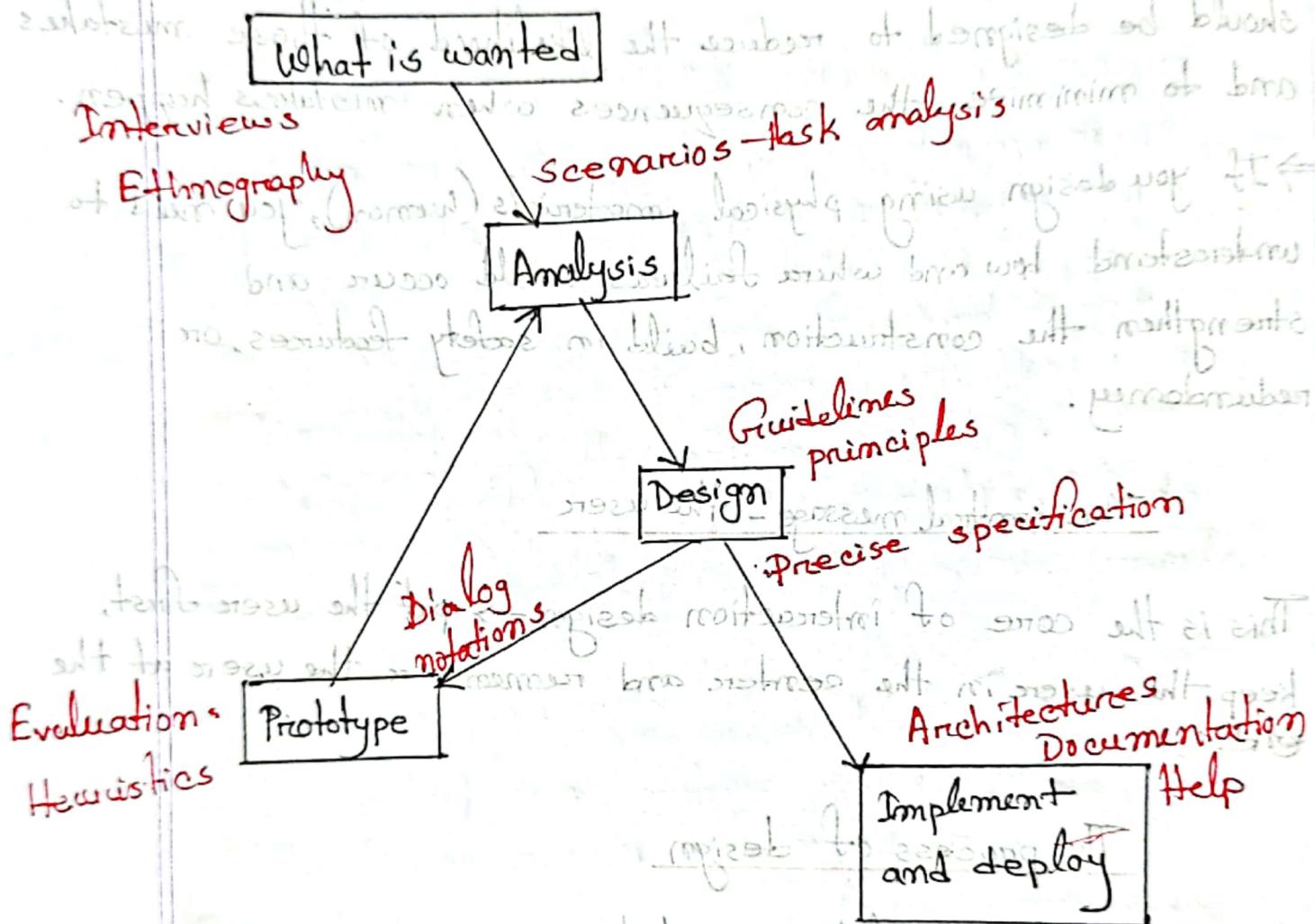
This is the core of interaction design → put the user first, keep the user in the center and remember the user at the end.

The process of design

Testing usability for testing priority अप्राप्ति के लिए, whether people can use it and fixing problem.

Best company अप्राप्ति. Usability is designed in - from the start.

A simplified view of four main phases and an iterative interaction loop focusing on the design of interaction.



Prototyping Model

- ① Requirements
- ② Analysis
- ③ Design
- ④ Interaction and prototyping
- ⑤ Implementation and deployment

1. Requirements: What is wanted?

There are several techniques used for this in HCI:

interviewing people, videotaping them, looking at the documents and objects that they work with, observing them directly.

2. Analysis: The result of observation and interview need to

be ordered in some way to bring out key issues and communicated with later stages of design. We will look at scenarios, rich stories of interaction, which can be used in conjunction with a method like a task analysis or on their own to record and make vivid actual interaction. These techniques can be used both to represent the situation as it is and also the desired situation.

3. Design: We need to record our design choices in

some way and there are various notations and methods to do this, including those used to record the existing

situation. It is at this stage also where input from theoretical work is most helpful, including cognitive models, organizational issues and understanding communication.

4) Iteration and prototyping: Humans are complex and we can not expect to get designs right the first time, we need to evaluate a design to see how well it is working and where there can be improvements. It is hard to get real feedback without trying it out. Most user interface design, therefore involves some form of prototyping, producing early versions of systems to try out with real users.

5) Implementation and deployment: This will involve writing code, perhaps making hardware, writing documentation, and manuals designed system.

effort.

Constraints of Software Design Process

- ① User Focus
- ② Scenarios
- ③ Navigation Design
- ④ Screen Design & Layout

User Focus

The start of any interaction design exercise must be the intended user or users. Participation of real users in design process improve quality of product & produce better design. This is often stated as : know your users.

Over time many people are affected directly or indirectly by a system and these people are called stakeholders. So how to know about the users :

- 1) Who are they? : Qualification, Experience, Age, Computer user or not & work area.
- 2) Probably Not like you! : Develop as per user requirement not as per your need.

- 3) Talk to them: Structured interviews about their job or life, -technical & social discussion
 - 4) Watch them: Watch what people do? Their difficulties, spend working hours. Your observation tell you what they do & they will tell you why?
 - 5) Use your imagination: Every time its not possible to involve real users in design process then at least try to imagine their experiences, thinking the philosophy, imagination, design, user's behavior, etc.
- Some terms in User Focus:

1) Persona:

- * Persona is user focusing design process.
- * It is the example of imaging a user not a real user.
- * It use surrogate users & make them real.

2) Cultural probes:

- * Gathering inspirational data about people, life, values & thoughts.
- * The probes are small packages that include maps, camera, photos, diaries, stories,

- * It stored meaningful and ethical information.

Scenarios

- * Scenarios are stories for Design/Rich Stories of Interaction/Description of System Design.
- * Simplest design representation, but one of the most flexible and powerful.
- * Some scenarios are quite short → The user intends to press the 'quit' button so loses his work.
- * User Scenarios are described in details action & goals of product design.
- * Scenarios force you to think about the design in detail and notice potential problems before they happen.
- * What is the system doing now? This can help to verify that the design would make sense to the user and also that proposed implementation architectures would work.

Why Scenarios

1. Communicate with others: Other designers, clients, or users. It is easy to mis understand each other whilst discussing abstract ideas.
2. Validate other models: A detailed scenario can be 'played' against various more formal representations such as task models or dialog and navigation models.
3. Express Dynamics: Individual screen shots and pictures give you a sense of what a system would look like, but not how it behaves.
4. Reusability: Scenarios are reused for designing other interactive systems.
5. Implementation phase: Scenarios check implementation work & generate test case for final evaluation of design.

Types of Scenarios

1. Goal or Task Based Scenarios:

Goal or Task given by the user. You should complete this before deadline.

2. Elaborated Scenarios:

It gives detail information about develop contents, behavior of project & design, schedule of project start to end etc.

3. Full Scale Task Scenarios:

It includes all important steps of particular tasks, payment methods, documents & analysis of requirements with develop design.

* Linearity property of the scenario has both positive and negative points:

1) Positive (Time is linear): Our lives are linear as we live in a time and so we find it easier to understand simple linear narratives. We are natural story-tellers and story listeners.

2) Negative (No alternatives): Real interactions have choices, some made by people, some by systems. A simple scenario does not show these alternative paths. In particular, it is easy to miss the unintended things a person may do.

Navigation design.

Navigation is the process of navigating a system application or websites using dialog boxes, widgets, hyperlinks or hypermedia's etc. One of the most important aspects of websites.

Constraints of Navigation Design:

1. Widget: The appropriate choice of widgets and wording in menus and buttons will help you know how to use them for a particular selection or action.

2. Screen or Windows: You need to find things on the screen, understand the logical grouping of buttons.

3. Navigation within the application: You need to be able to understand what will happen when a button is pressed, to understand where you are in the interaction.

4. Environment: The word processor has to read documents from disk, perhaps some are on remote networks! You swap between applications, perhaps cut and paste.

The place to start when considering the structure of an application is to think about actual use: asking

- 1) who is going to use the application?
- 2) How do they think about it?
- 3) what will they do with it?

Two main kinds of issues:

- ① local structure → looking from one screen or page out
- ② global structure → structure of site, movement between screens.

Local Structure: Here are four things to look for when looking at a single web page, screen state of a device.

- 1) knowing where are you: showing the current path with the navigation path at the top of the web page.

Example → This PC > Study(D:) > human computer interaction

- 2) knowing what you can do: Using buttons with proper choice of button name on it so that the user can understand easily what will happen by pressing the button. The clickable links by underlining into the

words. Not using confusing notations in the words.
passive components (like link underlined)

3) knowing where you are going - etc what will happen

will happen: Making the clickable links are buttons self-explanatory so that users understand what will be the consequences after pressing it without trial and error approach.

4) knowing where you've been - or what you've done:

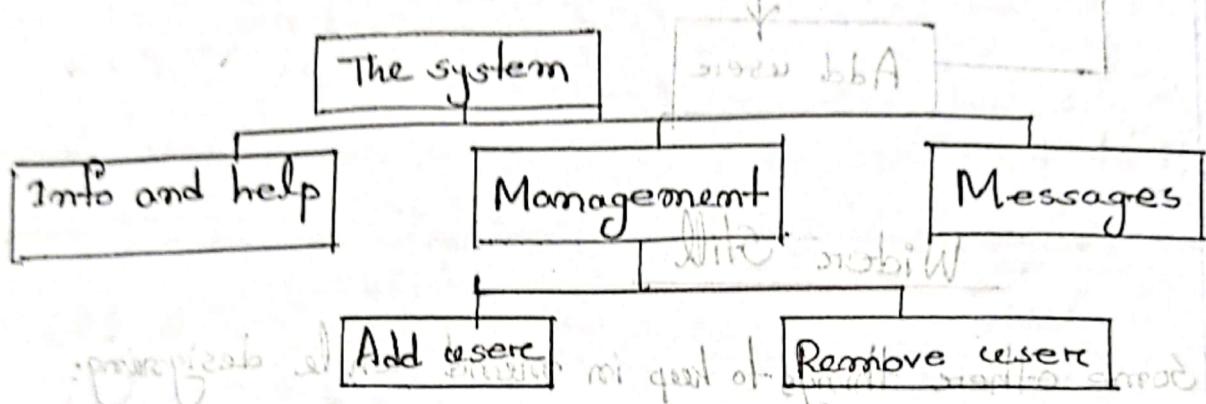
Having a back button or back option to the previous page so that users can understand the navigation and its hierarchy easily.

Global Structure: This is the way the various screens (page) of device relates link to one another.

Global Structure - hierarchical Organization

* Looking at the overall ~~structure~~ of an application.

This is the way the various screens, pages or device states link to one another.



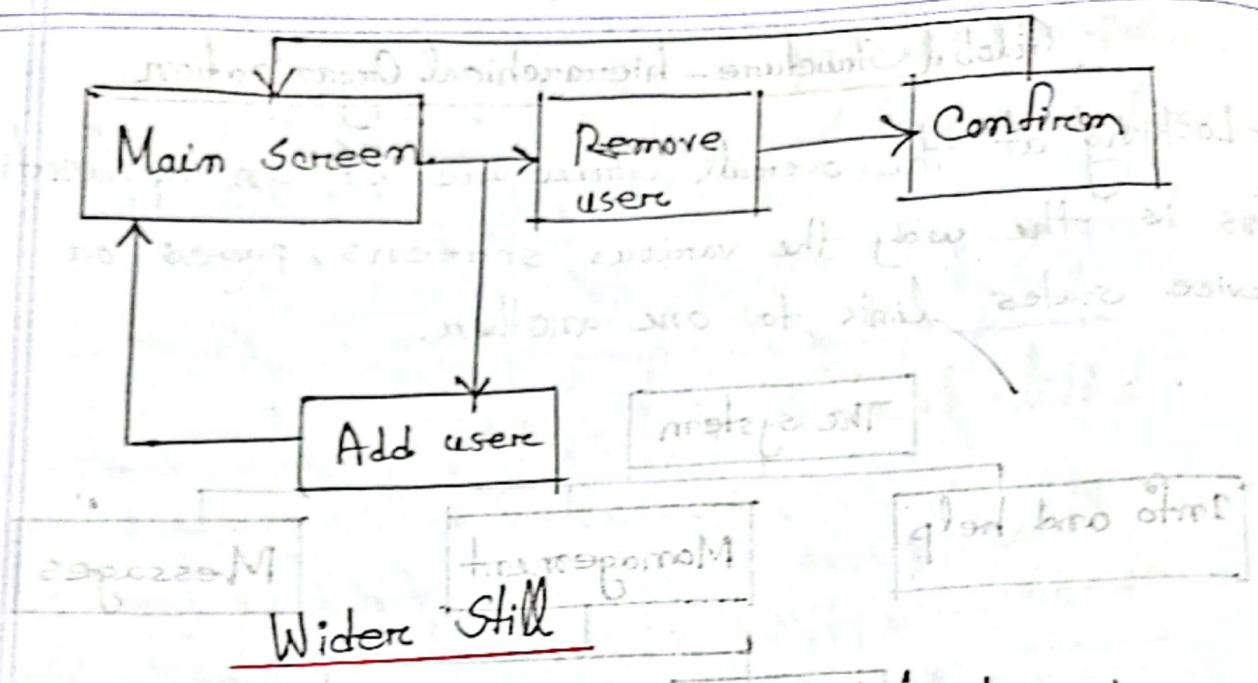
Global Structure - dialogue

* dialogue is used to refer to this pattern of interactions between the user and a system.

A simple way is to use a ~~network~~ diagram showing the principal states or screens linked together with arrows.

This can:

- 1) show what leads to what
- 2) show what happens when something has been seen
- 3) include branches and loops
- 4) be more task-oriented than a hierarchy



Some other things to keep in mind while designing:

1) Style issue: We should normally conform to platform standards, such as positions for menus on a PC application, to ensure consistency between applications, for example, on our proposed personal movie player we should

make use of standard fast forward, play icons.

2) Functional issues: On a PC application we need to be able to interact with files, read standard formats and be able to handle cut and paste.

3. Navigation issues: We may need to support linkages between applications. For example allowing the embedding of data from one application in another.

Screen Design & Layout

Through screen required information conveyed to the user. Screen Design develop using different techniques such as CRT, LED & Touch screen etc.

* The basic principles at the screen level reflect those in other areas of interaction design:

- 1) Ask → What is the user doing?
- 2) Think → What information is required? What comparisons may the user need to make? In what order are things likely to be needed?
- 3) Design → Form follows function; let the required interactions drive the layout.

Tools for Screen design Layout

1. Grouping and Structure:

- * If things logically belong together, then we should normally physically group them together.
- * This may involve multiple levels of structure.

Billing details

Name

Address

Credit card no.

Delivery details

Name

Address

Delivery time

2. Order of groups & items:

- * In general we need to think what is the natural order for the user?
- * This should normally match the order on screen.
- * For data entry forms or dialog boxes we should also set up the order in which the tab key moves between fields.

3. Decoration:

- * How to design uses boxes and a separating line to make the grouping clear.
- * Decorative features like font, style, and text colours can be used to highlighting grouping.

4. Alignments:

- * Read text from left to right, lists of text items should normally be aligned to the left.
- * Numbers, Should normally be aligned to the right or at the decimal point.

Alex Dix
Janet Finley

627.	865	1. 12617
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5. White Space:

- * Spacing or white space is any section of a document that is unused or space around an object.
- * White spaces help separate paragraphs of text, graphics, and other portions of a document and help a document look less crowded.
- * Using white space effectively in a document keeps the reader reading the document and helps the reader quickly find what they are interested in reading.

User action and Control

- ① Entering information
- ② knowing what to do
- ③ Affordances

Entering Information: forms or dialogue boxes

use ~~multiple~~ data input ~~for~~ alignment

is important

<input type="text" value="Name:"/>	<input type="text" value="Name: Blaue strasse 10"/>
<input type="text" value="Address:"/>	<input type="text" value="Address: 123 Dusseldorf"/>

wrong

Right

logical layout ~~अली रखते~~ -

① Use task analysis

② groupings

③ natural order for entering information

- top-bottom, left-right

- set tab order for keyboard entry

knowing what to do: concerning about giving information

* What is active what is passive

- where do you click
- where do you type

* Consistent style helps

- link text → underlined links

* Labels and icons

- standards for common actions (save, print etc)
- তুমা যাবনা কি হবে স্ট্রিল Bold button of MS word ,
কাঞ্চন click করলে bold হবে তা তুমি না ।

Affordances:

* Physical object এর জোড়া shape and size দিয়েই
যাম action কি হব , যৈতন দ্বারা ধূলতে হলে Push
কুরব করি Pull করব তা প্রস্তুত handle দিয়েই তুমা যাব
Also cultural গুণাবস্থা আছে ।

Screen object এর জোড়া button আকলে click করতে
হয় action এর জন্য ; কিন্তু double click করতে হয়
real button এর মত প্রোগ্রাম click করলে কাউ হয় না ।