

## HCI Imp Answers

**Q.1) Distinguish between short term & long term memory. State requirements to perform cognitive walkthrough of a system.**

**Ans.1)**

Sr. No.	Short-Term Memory	Long-Term Memory
1.	A type of memory that allows storing data temporarily.	A type of memory that allows storing data permanently.
2.	The capacity of short-term memory is small without any rehearsal.	The capacity of long-term memory is unlimited.
3.	Chunking can improve short-term memory.	Rehearsal and repetitive tasks enhances long-term memory.
4.	For ex. RAM	For ex. Hard Drives

**The requirements to perform cognitive walkthrough of a system are as followed:**

- i. Information processing
- ii. Capabilities
- iii. Limitations
- iv. Cooperative Working
- v. Perform Prediction

**Q.2) Describe five important differences between Short Term Memory and Long-Term Memory.**

**Ans.2)**

Sr. No.	Short-Term Memory	Long-Term Memory
1	Temporary storage of information	Long-term storage of information
2..	Limited capacity	Huge, if not unlimited, capacity
3.	Rapid access time (around 70 ms)	Relatively slow access time (around a tenth of a second)
4.	Information decays rapidly (around 200 ms)	Forgetting occurs more slowly, if at all
5.	Used for temporary recall of information	Used for the long-term storage of information
6.	Holds information that is currently being processed	Holds factual information, experiential knowledge, procedural rules, etc.
7.	Filtered by attention	Information is placed there through rehearsal
8.	Can be measured by sequence length or free recall	Can be measured by long-term recall

**Q.3) Explain in detail the interaction design process.**

**Ans.3)**

### The Interaction Design Process.

A system has been designed and built, and only when it proves unusable do they think to ask how to do it right! In other companies usability is seen as equivalent to testing – checking whether people can use it and fixing problems, rather than making sure they can from the beginning. In the best companies, however, usability is designed in from the start.

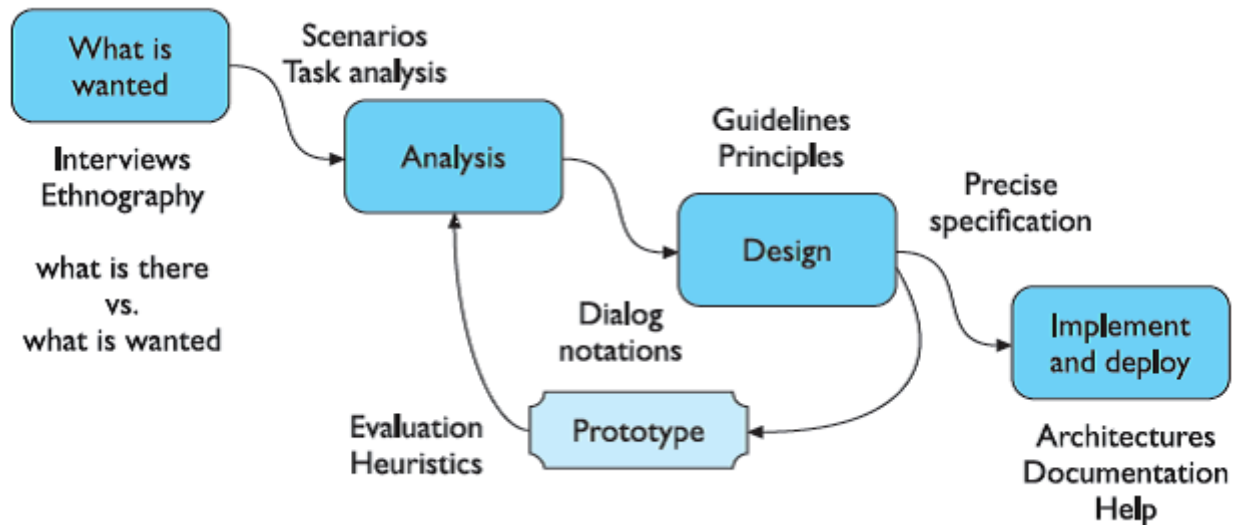


Figure: Interaction Design Process

#### 1. Requirements :

What is wanted, the first stage is establishing what exactly is needed. As a precursor to this it is usually necessary to find out what is currently happening.

#### 2. Analysis:

The results of observation and interview need to be ordered in some way to bring out key issues and communicate with later stages of design.

#### 3. Design:

Well, this is all about design, but there is a central stage when you move from what you want, to how to do it. There are numerous rules, guidelines and design principles that can be used to help.

#### 4. Iteration and prototyping:

Humans are complex and we cannot expect to get designs right first time. We therefore need to evaluate a design to see how well it is working and where there can be improvements.

#### 5. Implementation and deployment:

Finally, when we are happy with our design, we need to create it and deploy it. This will involve writing code, perhaps making hardware, writing documentation and manuals – everything that goes into a real system that can be given to others.

**Q.4) Explain in detail about cognitive model and its techniques.**

**Ans.4)**

Cognitive complexity refers to the number of mental structures an individual uses, how abstract they are and how they interact to shape his discernment, or an individual difference variable linked with a wide range of communication skills and associated abilities.

Individuals with high cognitive complexity have the capacity to analyze a situation to discern various constituent elements and explore connections and possible relationships among the elements. These individuals think in a multidimensional way.

The assumption of the complexity theory is that the more an event can be differentiated, and parts considered in novel relationships, the more sophisticated the response and successful the solution. Whereas less complex individuals can be trained to understand a complicated set of detailed differentiations for a specific context, highly complex individuals are highly flexible in creating distinctions in new situations.

Individuals with high cognitive complexity are open to new information, attracted to other individuals of high complexity, highly flexibility, socially influential, problem solvers, strategic planners, highly creative, effective communicators, and generally good leaders.

Some techniques used in cognitive model include:

**1. Hierarchical models:**

These models represent a user's task and goal structure by breaking down complex tasks into smaller subgoals.

**2. Linguistic models:**

These models represent the grammar and language used in the interaction between the user and the system.

**3. Physical and device models:**

These models represent human motor skills and the interaction with physical devices, such as keyboards, mice, and touchscreens.

**4. Cognitive architectures:**

These underlying frameworks provide a structure for cognitive models and represent the cognitive processes involved in human information processing.

**5. Problem space models:**

These models represent a problem-solving process by defining a set of states and operations that can be performed on those states to achieve a desired goal.

**Q.5) What is meant by GOMS? Give an example.**

**Ans.5)**

The GOMS model of Card, Moran and Newell is an acronym for Goals, Operators, Methods and Selection

### Goals

These are the user's goals, describing what the user wants to achieve. GOMS the goals are taken to represent a "memory point" for the user, from which he can evaluate what should be done and to which he may return any errors occur.

### Operators

These are the lowest level of analysis. They are the basic actions that the user must perform in order to use the system. They may affect the system (for example, press the "X" key) or only the user's mental state (for example, read the dialog box). There is still a degree of flexibility about the granularity of operators; we may take the command level issue the SELECT command or be more primitive: move mouse to menu bar, press center mouse button.

### Methods

There are typically several ways in which a goal can be split into subgoals. For instance, in a certain window manager a currently selected window can be closed to an icon either by selecting the "CLOSE" option from a pop-up menu, or by hitting the "L7" function key. In GOMS these two goal decompositions are referred to as methods, so we have the CLOSE-METHOD and the L7-METHOD.

### Selection

From the above snippet we see the use of the word select where the choice of methods arises. GOMS does not leave this as a random choice but attempts to predict which methods will be used. This typically depends both on the particular user and on the state of the system and details about the goals.

Rule 1: Use the CLOSE-METHOD unless another rule applies.

Rule 2: If the application is blocks use the L7-METHOD.

### Example

- Goals (G) as a task to do e.g., "Send e-mail".
- Operators (O) as all actions needed to achieve the goal e.g., "amount of mouse clicks to send e-mail".
- Methods (M) as a group of operators e.g., "move mouse to send button, click on the button".
- Selection (S) as a user decision approach e.g., "move mouse to send button, click on the button" or "move mouse to send button, click ENTER".

**Q.6) Describe in detail about Hypertext, Multimedia, WWW?**

**Ans. 6)**

**i. Hypertext.**

- The term hypertext means certain extra capabilities imparted to normal or standard text.
- Technical documentation consists often of a collection of independent information units.
- It consists of cross references which lead to multiple searches at different places for the reader.
- Hypertext is text which is not constrained to be linear, and it contains links to other texts which are known as hyperlinks.
- Hypertext is mostly used on World Wide Web for linking and navigating through different web pages.
- A hypertext consists of two different parts: Anchor and link.
- An anchor or node is an entry point to another document. In some cases, instead of a text, an image a video or some other non-textual element.
- A link or pointer provides connection to other information unit known as target documents.

**ii. Multimedia**

It refers to using computers to integrate text, graphics, animation, audio, and video into one application. Most multimedia applications are interactive, so that users may choose the material to view, define the order in which it is presented, and obtain feedback on their actions.

Interactivity also makes multimedia very suitable for video games, electronic newspapers and magazines, electronic books and references, simulations, virtual reality, and computer-based training. Multimedia applications can be created by using multimedia authoring software. Many multimedia applications are also deliverable via the World Wide Web.

- Graphics
- Audio
- Video
- Animation
- Multimedia Authoring Software

**iii. Web - World Wide Web**

The Web, or World Wide Web, is a system of Internet servers that support specially formatted documents. The documents are formatted in a markup language called HTML (Hyper Text Markup Language) that supports links to other documents, as well as graphics, audio, and video files. This means you can jump from one document to another simply by clicking on hot spots. Not all Internet servers are part of the World Wide Web.

**Q.7) Differentiate Linear Text vs. Hyper Text in communication.**

**Ans.7)**

**Linear text vs. Hypertext**

Multiplexed messages can be represented as updates to several parts of the hypertext, thus reducing the likelihood of breakdown and lost topics. In addition, if the messages themselves can be mini hypertexts, then eager messages listing several courses of action can be explicitly represented by the message.

Even static hypertexts, which have been carefully crafted by their authors, can be difficult to navigate. A hypertext that is created on the fly is unlikely to be comprehensible to any but those involved in its creation. Conklin and Begeman, themselves associated with the hypertext-based argumentation tool GIBIS, conclude that traditional linear text provides a continuous, unwinding thread of context.

For the asynchronous reader trying to catch up with a conversation, a linear transcript is clearly easier, but it is precisely in more asynchronous settings where overlap in linear text is most likely to cause confusion.

**OR**

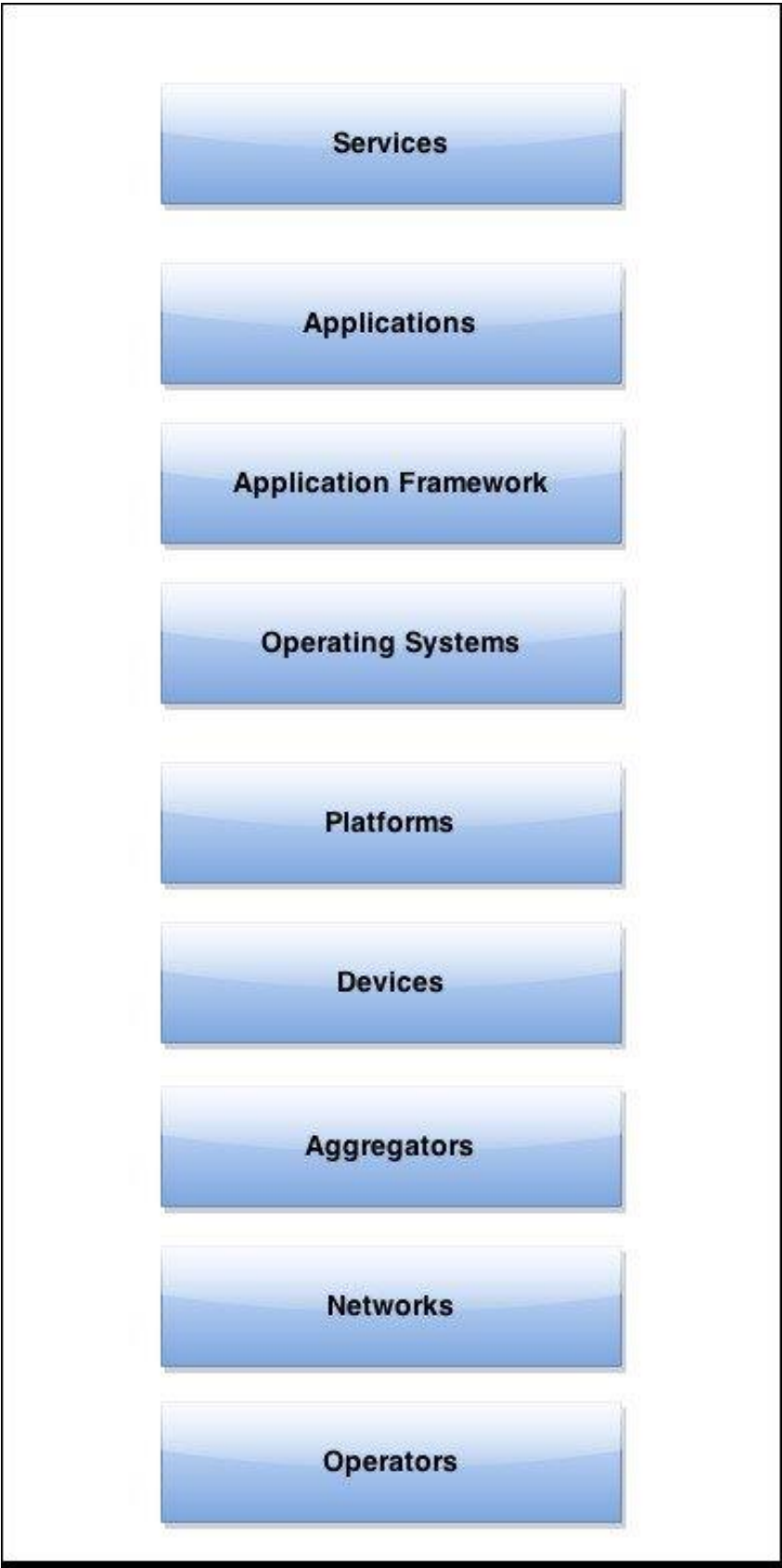
Aspect	Linear Text	Hypertext
Structure	Follows a sequential and linear structure.	Allows for non-linear, interconnected structure.
Navigation	Reading from start to finish.	Interactive navigation through hyperlinks.
Flexibility	Limited flexibility in exploring content.	Offers flexibility in jumping between topics.
Example	Traditional books, articles.	World Wide Web, online articles with hyperlinks.
Flow	Continuous flow of information.	Discrete nodes of information connected by links.

Q.8) Give detail description about Mobile Ecosystem.

Ans.8)

The Mobile Ecosystem

Mobile is an entirely unique ecosystem and like the Internet, it is made up of many different parts that must all work seamlessly together. With mobile technology, the parts are different, and because you can use mobile devices to access the Internet, that means that not only do you need to understand the facets of the Internet, but you also need to understand the mobile ecosystem.



i. Operators

The base layer in the mobile ecosystem is the operator. Operators go by many names, depending on what part of the world you happen to be in or to whom you are talking. Operators can be referred to as Mobile Network Operators (MNOs); mobile service providers, wireless carriers, or simply carriers; mobile phone operators; or cellular companies.

ii. Networks

Operators operate wireless networks. Remember that cellular technology is just a radio that receives a signal from an antenna. The type of radio and antenna determines the capability of the network and the services you can enable on it. You ‘ll notice that the vast majority of networks around the world use the GSM standard, using GPRS or GPRS EDGE for 2G data and UMTS or HSDPA for 3G.

iii. Devices

What you call phones, the mobile industry calls handsets or terminals. These are terms that I think are becoming outdated with the emergence of wireless devices that rely on operator networks, but do not make phone calls. The number of these other devices is a small piece of the overall pie right now, but it is growing rapidly. Let ‘s focus on the biggest slice of the device pie—mobile phones. As of 2008, there are about 3.6 billion mobile phones currently in use around the world; just more than half the planet ‘s population has a mobile phone.

iv. Platforms

A mobile platform’s primary duty is to provide access to the devices. To run software and services on each of these devices, you need a platform, or a core programming language in which all of your software is written. Like all software platforms, these are split into three categories: licensed, proprietary, and open source.

v. Application Frameworks

Application frameworks often run on top of operating systems, sharing core services such as communications, messaging, graphics, location, security, authentication, and many others.



Q.9). What is Mobile Information Architecture ? Explain it with a neat diagram.

Ans.9)

Information Architecture

- The structural design of shared information environments
- The combination of organizations, labelling, search, and navigation systems within websites and intranets
- The art and science of shaping information products and experiences to support usability and find ability.
- An emerging discipline and community of practice focused on bringing principles of design and architecture to the digital landscape.

i. Information architecture

The organization of data within an informational space. In other words, how the user will get information or perform tasks within a website or application.

ii. Interaction design

The design of how the user can participate with the information present, either in a direct or indirect way, meaning how the user will interact with the website of application to create a more meaningful experience and accomplish her goals.

iii. Information design

The visual layout of information or how the user will assess meaning and direction given the information presented to him.

iv. Navigation design

The words used to describe information spaces; the labels or triggers used to tell the users what something is and to establish the expectation of what they will find.

v. Interface design

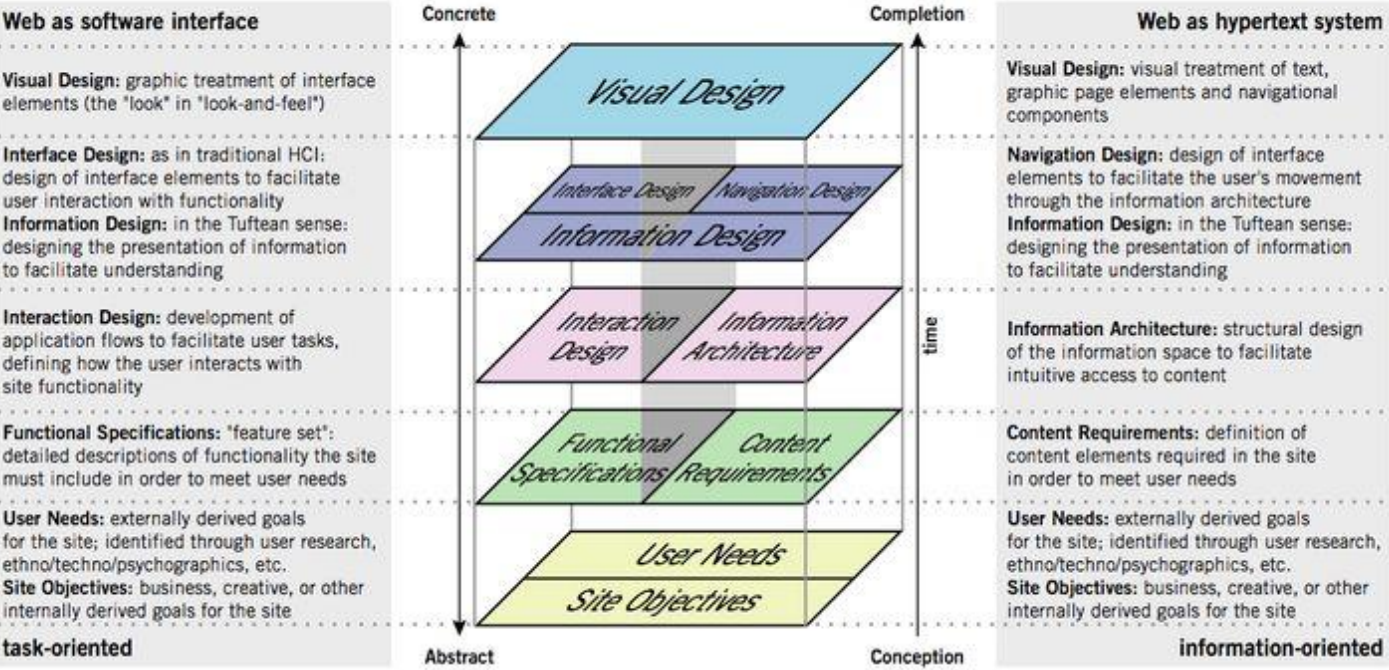
The design of visual paradigms is used to create action or understanding.

The role of information architecture is played by a variety of people, from product managers to designers and even developers. To make things more confusing, information architecture can be called many different things throughout the design and development process. Words like intuitive, simple, findable, usable, or the executive favorite easy to- use—all describe the role that information architects play in creating digital experiences.

The Elements of User Experience

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30 March 2000

**A basic duality:** The Web was originally conceived as a hypertextual information space; but the development of increasingly sophisticated front- and back-end technologies has fostered its use as a remote software interface. This dual nature has led to much confusion, as user experience practitioners have attempted to adapt their terminology to cases beyond the scope of its original application. The goal of this document is to define some of these terms within their appropriate contexts, and to clarify the underlying relationships among these various elements.



Mobile Information Architecture

Information architecture has become a common discipline in the web industry; unfortunately, the mobile industry, like software, has only a handful of specialized mobile information architects. Although mobile information architecture is hardly a discipline in its own right, it certainly ought to be. This is not because it is so dissimilar from its desktop cousin, but because of context, added technical constraints, and needing to display on a smaller screen as much information as we would on a desktop.

The role of a mobile information architect would be to interpret this content to the mobile context.

- Do you use the same structure, or sections?
  - Do you present the same information above the fold?
  - If so, how should that be prioritized?
  - How does the user navigate to other areas?
  - Do you use the same visual and interaction paradigms, or invent new ones?
  - And if you do start to invent new paradigms, will you lose the visual characteristics of what users expect?
- Keeping It Simple.
  - Support your defined goals.
  - Clear, simple labels.

**Q.10) Explain in detail about drag and drop operations?**

**Ans. 10)**

Drag and Drop is a very interactive and user-friendly concept that makes it easier to move an object to a different location by grabbing it. This allows the user to click and hold the mouse button over an element, drag it to another location, and release the mouse button to drop the element there. In HTML 5 Drag and Drop are much easier to code and any element in it is draggable.

**Drag and Drop Operations:** There are various Drag and Drop operations, some of them are listed below:

- **ondrag:** It is used when the element or text selection is being dragged into HTML.
- **ondragstart:** It is used to call a function, drag(event), that specifies what data to be dragged.
- **ondragenter:** It is used to determine whether or not the drop target is to accept the drop. If the drop is accepted, then this event has to be cancelled.
- **ondragleave:** It occurs when the mouse leaves an element before a valid drop target while the drag is occurring.
- **ondragover:** It specifies where the dragged data can be dropped.
- **ondrop:** It specifies where the drop has occurred at the end of the drag operation.
- **ondragend:** It occurs when the user has finished dragging an element.

**Q.11) Discuss in detail the purpose of drag and drop.**

**Ans.11)**

One of the most useful purposes of drag and drop is to allow the user to directly place objects where they want them on the page. A typical pattern is Drag and Drop Modules on a page. Netvibes provides a good example of this interaction pattern.

The purpose of drag and drop is to provide a user-friendly and intuitive way for users to interact with digital content. It allows users to select an object or piece of information and move it to a different location by dragging it with the cursor and dropping it in the desired location.

In terms of user interface design, drag and drop is an important interaction pattern that can enhance the usability and efficiency of an interface. It can simplify complex tasks by allowing users to directly manipulate objects instead of relying on traditional input methods like menus or buttons. Drag and drop can also improve the overall user experience by providing visual feedback and affordances that indicate the draggable nature of objects and valid drop targets.

Designing drag and drop interactions requires careful consideration of various factors, such as indicating druggability, defining valid drop targets, and choosing the appropriate visual representations for dragged objects. It is important to create a clear and consistent interface that guides users in understanding how to use drag and drop effectively.

Overall, drag and drop is a powerful tool in user interface design that can enhance usability, efficiency, and user satisfaction.

**Q.12) Explain in detail the various ways to reveal contextual tools.**

**Ans.12)**

### **The various ways to reveal Contextual Tools**

**Contextual Tools are the Web's version of the desktop's right-click menus. Instead of having to right-click to reveal a menu, we can reveal tools in context with the content. We can do this in a number of ways:**

**i. Always-Visible Tools: Place Contextual Tools directly in the content.**

**The simplest version of Contextual Tools is to use Always-Visible Tools. Digg is an example of making Contextual Tools always visible.**

**ii. Hover-Reveal Tools: Show Contextual Tools on mouse hover.**

**One way to do this is to reveal the tools when the user pauses the mouse over an object. The Hover-Reveal Tools pattern is most clearly illustrated by 37 Signal's Backpack it. To-do items may be deleted or edited directly in the interface. The tools to accomplish this are revealed on mouse hover.**

**iii. Toggle-Reveal Tools: A master switch to toggle on/off Contextual Tools for the page.**

**A variation on the two previous approaches is to not show any Contextual Tools until a special mode is set on the page. A good example of Toggle-Reveal Tools is in Basecamp's category editing.**

**iv. Multi-Level Tools: Progressively reveal actions based on user interaction.**

**Contextual Tools can be revealed progressively with Multi-Level Tools. Songza\* provides a set of tools that get revealed after a user clicks on a song. Additional tools are revealed when hovering over the newly visible tools.**

**v. Secondary Menus: Show a secondary menu (usually by right-clicking on an object).**

**A secondary menu is shown, usually by right-clicking on an object, to reveal additional contextual tools.**

**Q.13) Explain in detail about Contextual tools?**

**Ans. 13)**

**Contextual Tools are the Web's version of the desktop's right-click menus. Instead of having to right-click to reveal a menu, we can reveal tools in context with the content.**

**Contextual tools are a way to provide users with relevant actions or options based on the content they are interacting with. They are a way to bring functionality closer to the user and make it easily accessible within the context of the content.**

**We can do this in a number of ways:**

- **Always-Visible Tools: Place Contextual Tools directly in the content.**
- **Hover-Reveal Tools: Show Contextual Tools on mouse hover.**
- **Toggle-Reveal Tools: A master switch to toggle on/off Contextual Tools for the page.**
- **Multi-Level Tools: Progressively reveal actions based on user interaction.**
- **Secondary Menus: Show a secondary menu (usually by right-clicking on an object).**

**Q.14) Describe in detail about overlay and its types.**

**Ans.14)**

Overlays are really just lightweight pop ups. We use the term lightweight to make a clear distinction between it and the normal idea of a browser pop up. Browser popups are created as a new browser window Lightweight overlays are shown within the browser page as an overlay. Older style browser pop ups are undesirable because: Browser pop ups display a new browser window. As a result, these windows often take time and a sizeable chunk of system resources to create. Browser pop ups often display browser interface controls (e.g., a URL bar). Due to security concerns, in Internet Explorer 7 the URL bar is a permanent fixture on any browser pop-up window.

**Types of overlays: Dialog Overlays, Detail Overlays, and Input Overlays**

**i. Dialog Overlay**

Dialog Overlays replace the old-style browser pop ups. Netflix provides a clear example of a very simple Dialog Overlay. In the previously viewed movies for sale section, a user can click on a —Buy button to purchase a DVD. Since the customer purchasing the DVD is a member of Netflix, all the pertinent shipping and purchasing information is already on record. The complete checkout experience can be provided in a single overlay.

**ii. Detail Overlay**

The second type of overlay is somewhat new to web applications. The Detail Overlay allows an overlay to present additional information when the user clicks or hovers over a link or section of content. Toolkits now make it easier to create overlays across different browsers and to request additional information from the server without refreshing the page. Taking another example from Netflix, information about a specific movie is displayed as the user hovers over the movie's box shot.

**iii. Input Overlay**

Input Overlay is a lightweight overlay that brings additional input information for each field tabbed into. American Express uses this technique in its registration for premium card such as its gold .

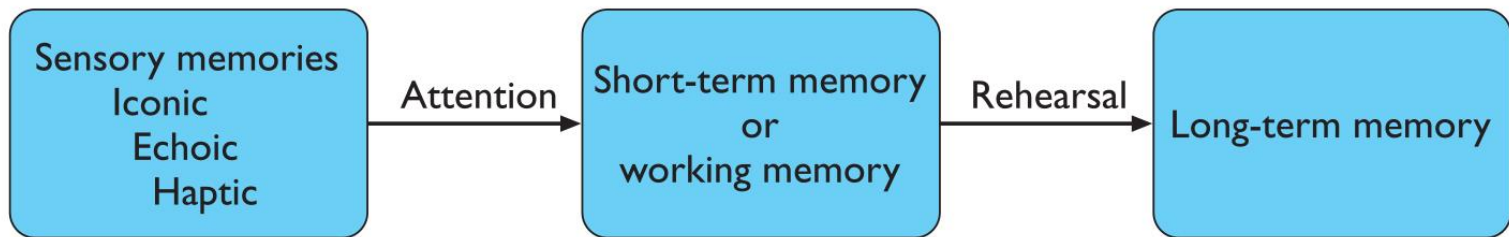


**Q.15) What are the different types of memory in human brain?**

**Ans.15)**

Our memory contains our knowledge of actions or procedures. It allows us to repeat actions, to use language, and to use new information received via our senses. It also gives us our sense of identity, by preserving information from our past experiences.

Memory is the second part of our model of the human as an information-processing system. Memory is associated with each level of processing. Bearing this in mind, we will consider the way in which memory is structured and the activities that take place within the system. It is generally agreed that there are three types of memory or memory function: sensory buffers, short-term memory or working memory, and long-term memory.



**A model of the structure of memory**

### **1. Sensory memory**

The sensory memories act as buffers for stimuli received through the senses. A sensory memory exists for each sensory channel: iconic memory for visual stimuli, echoic memory for aural stimuli and haptic memory for touch. These memories are constantly overwritten by new information coming in on these channels.

### **2. Short-term memory**

Short-term memory or working memory acts as a “scratchpad” for temporary recall of information. It is used to store information which is only required fleetingly. Short-term memory can be accessed rapidly, in the order of 70 ms. It also decays rapidly, meaning that information can only be held there temporarily, in the order of 200 ms. Short-term memory also has a limited capacity.

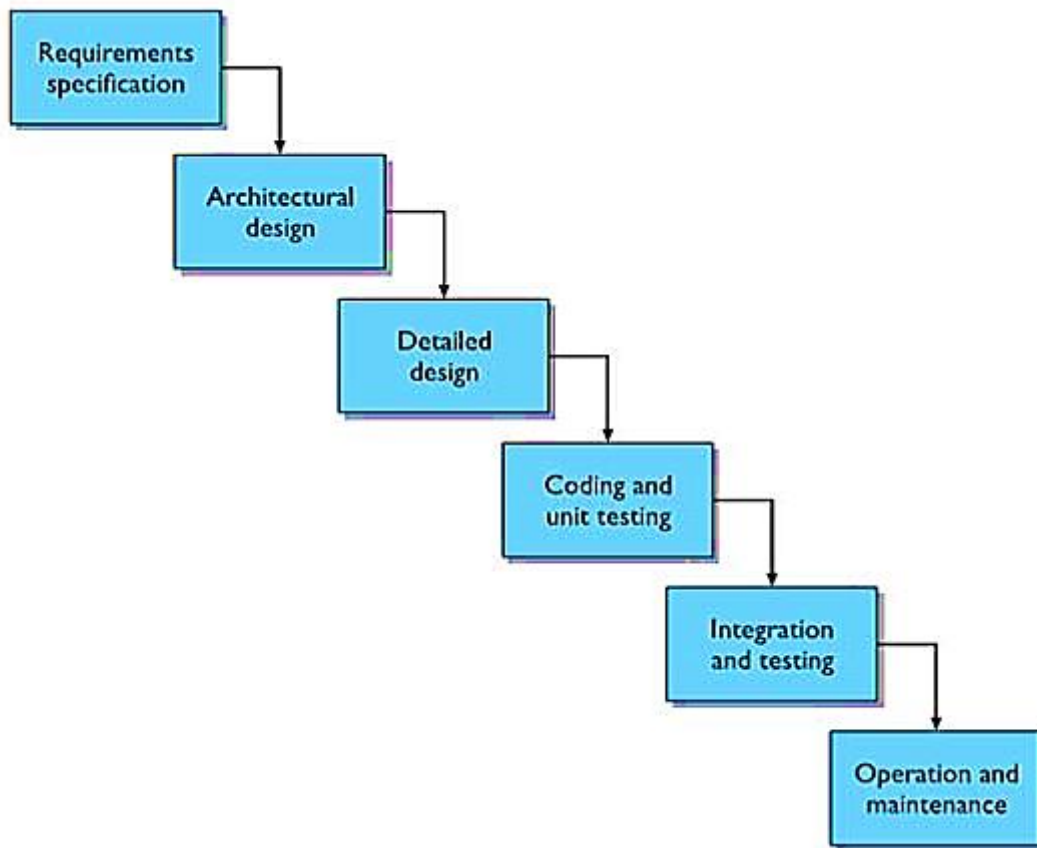
### **3. Long-term memory**

If short-term memory is our working memory or ‘scratchpad’, long-term memory is our main resource. Here we store factual information, experiential knowledge, procedural rules of behavior in fact, everything that we know. It differs from short-term memory in a number of significant ways. First, it has a huge, if not unlimited, capacity. Secondly, it has a relatively slow access time of approximately a tenth of a second. Thirdly, forgetting occurs more slowly in long-term memory, if at all.

**Q.16) Explain the software life cycle model in HCI software process.**

**Ans.16)**

The software life cycle refers to the stages involved in the development of a software product with a focus on human-computer interaction. The software life cycle process in HCI software development typically includes the following stages:



**1. Requirements Gathering:**

This stage involves understanding the needs and requirements of the users and stakeholders. It includes activities such as user research, interviews, and observations to gather information about user preferences, goals, and tasks.

**2. Design:**

In this stage, the design team creates the user interface and interaction design based on the gathered requirements. It includes creating wireframes, prototypes, and visual designs to define the structure, layout, and functionality of the software.

**3. Implementation:**

The design is then translated into actual code during the implementation stage. The development team writes the software code, integrates different components, and ensures that the software functions as intended.

**4. Integration and Testing:**

Once the individual components are implemented, they are integrated into a cohesive system. Testing is performed to ensure that the software behaves correctly, meets the requirements, and provides a satisfactory user experience. This stage may also involve acceptance testing with the customers to ensure that the system meets their needs.

**5. Maintenance:**

After the software is released, it enters the maintenance stage. This stage involves ongoing support, bug fixes, updates, and enhancements based on user feedback and changing requirements. Maintenance continues until a new version of the software is released or the product is phased out.

It is important to note that the software life cycle in HCI software development is iterative and never complete. The design process involves continuous refinement and improvement based on user feedback and evaluation.



**Q.17) Explain in detail about the various socio-technical models?**

**Ans.17)**

The socio-technical systems view came about to counter this technology-centric position, by stressing that work systems were composed of both human and machine elements and that it was the interrelationship between these that should be central.

Socio-technical models for interactive systems are therefore concerned with technical, social, organizational and human aspects of design. They recognize the fact that technology is not developed in isolation but as part of a wider organizational environment. It is important to consider social and technical issues side by side so that human issues are not overruled by technical considerations.

The key focus of the socio-technical approach is to describe and document the impact of the introduction of a specific technology into an organization. Methods vary but most attempt to capture certain common elements:

- The problem being addressed: there is a need to understand why the technology is being proposed and what problem it is intended to solve.
- The stakeholders affected, including primary, secondary, tertiary and facilitating, together with their objectives, goals and tasks.
- The workgroups within the organization, both formal and informal.
- The changes or transformations that will be supported.
- The proposed technology and how it will work within the organization.
- External constraints and influences and performance measures.

Various Socio-Technical Models are:

**1. CUSTOM methodology**

CUSTOM is a socio-technical methodology designed to be practical to use in small organizations. It is based on the User Skills and Task Match (USTM) approach, developed to allow design teams to understand and fully document user requirements. CUSTOM focusses on establishing stakeholder requirements: all stakeholders are considered, not just the end-users.

**2. Open System Task Analysis (OSTA)**

OSTA attempts to describe what happens when a technical system is introduced into an organizational work environment. Like CUSTOM, OSTA specifies both social and technical aspects of the system. However, whereas in CUSTOM these aspects are framed in terms of stakeholder perspectives, in OSTA they are captured through a focus on tasks.

**3. Soft Systems Methodology**

Soft Systems Methodology (SSM) arises from the same tradition but takes a view of the organization as a system of which technology and people are components. There is no assumption of a particular solution: the emphasis is rather on understanding the situation fully.

**4. Participatory design**

Participatory design is a philosophy that encompasses the whole design cycle. It is designed in the workplace, where the user is involved not only as an experimental subject or as someone to be consulted when necessary but as a member of the design team. Users are therefore active collaborators in the design process, rather than passive participants whose involvement is entirely governed by the designer.

**5. Effective Technical and Human Implementation of Computer-based Systems (ETHICS)**

ETHICS methodology, stakeholders are included as participants in the decision making process. ETHICS considers the process of system development as one of managing change: conflicts will occur and must be negotiated to ensure acceptance and satisfaction with the system. If any party is excluded from the decision-making process then their knowledge and contribution is not utilized, and they are more likely to be dissatisfied. However, participation is not always complete.

**6. Ethnographic methods**

Ethnography is based on very detailed recording of the interactions between people and between people and their environment. It has a special focus on social relationships and how they affect the nature of work. The ethnographer does not enter actively into the situation and does not see things from a particular person's viewpoint.

**7. Contextual inquiry**

Contextual inquiry has much in common with the ethnographic tradition: it studies the user in context, trying to capture the reality of his work culture and practice. However, it is also an approach rooted in practice and it differs in a number of significant ways from pure ethnographic study: the intention is to understand and to interpret the data gathered, and rather than attempting to take an open-ended view, the investigator acknowledges and challenges her particular focus. In addition, the explicit aim is to design a new system, whereas in a pure ethnographic study, it would be open ended.

**Q.18) List and explain the elements of mobile design.**

**Ans.18)**

### **The Elements of Mobile Design**

Good design requires three abilities: the first is a natural gift for being able to see visually how something should look that produces a desired emotion with the target audience. The second is the ability to manifest that vision into something for others to see, use, or participate in. The third knows how to utilize the medium to achieve your design goals.

Elements of mobile design that you need to consider, starting with the context and layering in visual elements or laying out content to achieve the design goal. Then, you need to understand how to use specific tools to create mobile design, and finally, you need to understand the specific design considerations of the mobile medium.

#### **i. Context**

I will not labor the point except to say that context is core to the mobile experience. As the designer, it is your job to make sure that the user can figure out how to address context using your app.

#### **ii. Message**

Message is the overall mental impression you create explicitly through visual design. I like to think of it as the holistic or at times instinctual reaction someone will have to your design. If you take a step back, and look at a design from a distance, what is your impression? Or conversely, look at a design for 30 seconds, and then put it down.

#### **iii. Look and Feel**

Look and feel is used to describe appearance, as if I want a clean look and feel, or I want a usable look and feel. The problem is: as a mobile designer, what does it mean? And how is that different than messaging? I think of looking and feeling in a literal sense, as something real and tactile that the users can look at, and then feel something they can touch or interact with. Look and feel is used to evoke action how the user will use an interface.

#### **iv. Layout**

Layout is an important design element, because it is how the user will visually process the page, but the structural and visual components of layout often get merged together, creating confusion, and making your design more difficult to produce. The first-time layout should rear its head is during information architecture.

#### **v. Color**

The fifth design element, color, is hard to talk about in a black-and-white book. It is fitting, because it was not that long ago that mobile screens were available only in black and white well, technically, it was black on a green screen. These days, we have the entire spectrum of colors to choose from for mobile designs.

#### **vi. Typography**

Typography involves the choice of fonts, font sizes, and text formatting. Clear and readable typography is crucial for effective communication of information on mobile screens, considering their smaller size.

#### **vii. Graphics**

Graphics, including images and icons, contribute to the visual appeal and communication of information. Well-designed graphics enhance the user experience and can be used to represent actions, features, or convey emotions.

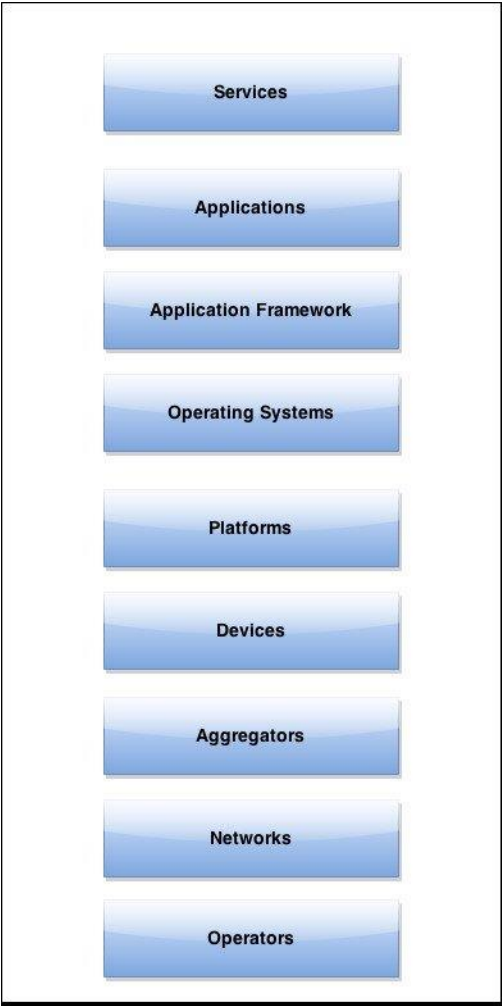
Q.19) Describe the following:  
a) Mobile Ecosystem  
b) Platforms

Ans.19)

a) Mobile Ecosystem

Mobile Ecosystem

Mobile is an entirely unique ecosystem and like the Internet, it is made up of many different parts that must all work seamlessly together. With mobile technology, the parts are different, and because you can use mobile devices to access the Internet, which means that not only do you need to understand the facets of the Internet, but you also need to understand the mobile ecosystem.



i. Operators

The base layer in the mobile ecosystem is the operator. Operators go by many names, depending on what part of the world you happen to be in or to whom you are talking. Operators can be referred to as Mobile Network Operators (MNOs); mobile service providers, wireless carriers, or simply carriers; mobile phone operators; or cellular companies.

ii. Networks

Operators operate wireless networks. Remember that cellular technology is just a radio that receives a signal from an antenna. The type of radio and antenna determines the capability of the network and the services you can enable on it.

iii. Devices

What you call phones, the mobile industry calls handsets or terminals. These are terms that I think are becoming outdated with the emergence of wireless devices that rely on operator networks, but do not make phone calls.

iv. Platforms

A mobile platform’s primary duty is to provide access to the devices. To run software and services on each of these devices, you need a platform, or a core programming language in which all of your software is written. Like all software platforms, these are split into three categories: licensed, proprietary, and open source.

v. Application Frameworks

Application frameworks often run on top of operating systems, sharing core services such as communications, messaging, graphics, location, security, authentication, and many others.

b) Platforms

Platforms

A mobile platform’s primary duty is to provide access to the devices. To run software and services on each of these devices, you need a platform, or a core programming language in which all of your software is written. Like all software platforms, these are split into three categories: licensed, proprietary, and open source.

In the context of mobile information architecture, platforms refer to the different operating systems or software environments on which mobile applications are developed and run. These platforms include iOS (Apple’s operating system), Android (Google’s operating system), Windows Mobile, and others. Each platform has its own set of design guidelines, development tools, and user interface elements that need to be considered when designing and organizing information for mobile applications.

Q.20) Explain the various mobile information architecture.

Ans.20)

The various mobile information architecture.

1. Site Maps:

Site maps are a classic information architecture deliverable. They visually represent the relationship of content to other content and provide a map for how the user will travel through the informational space. Mobile site maps are similar to site maps used on the web. However, there are a few tips specific to mobile that should be considered.

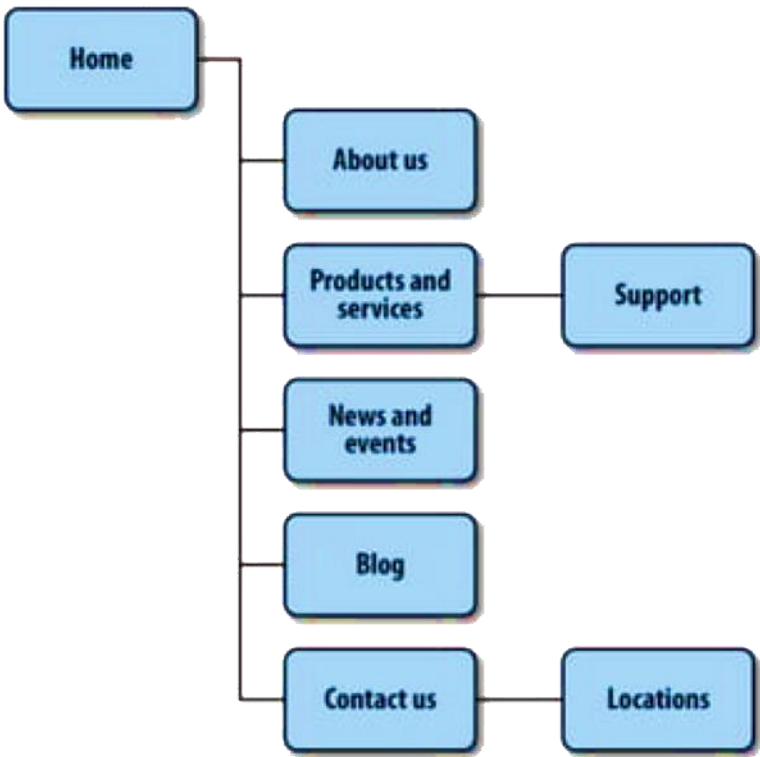


Fig: Example of a sitemap

2. Clickstreams:

Clickstreams are used for showing the behavior on websites and displaying the order in which users travel through a site's information architecture. They are usually based on data gathered from server logs and are typically historical, used to identify flaws in the information architecture. Clickstreams can be visualized using heat-mapping or simple percentages to show where users are going.

3. Wireframes:

Wireframes are a way to lay out information on the page, referred to as information design. They show how the user will directly interact with the content. Wireframes make the information space tangible and useful. They are like the peanut butter to the site map jelly in the information architecture sandwich.

4. Prototyping

Wireframes lack the capability to communicate more complex, often in-place, interactions of mobile experiences. This is where prototypes come in.

Prototypes might sound like a scary (or costly) step in the process. Some view them as redundant or too time-consuming, preferring to jump in and start coding things. But as with wireframes, I have found that each product we have built out some sort of prototype has saved both time and money.

Types of Prototypes

i. Paper Prototype

A paper prototype, where the interaction is nothing more than drawings on note cards.

ii. Context Prototype

An example of a context prototype, or taking images loaded onto a device and testing them in the mobile context.

iii. HTML Prototypes

An HTML/XHTML prototype that you can actually interact with on real mobile devices.

These components, along with clear and simple labels, support the defined goals of the mobile application and help create an effective mobile information architecture.

**Q.21) Explain the steps involved in designing a web interface.**

**Ans.21)**

**The steps involved in Designing a Web Interface.**

**1. User Interface Design Basics**

User Interface (UI) Design focuses on anticipating what users might need to do and ensuring that the interface has elements that are easy to access, understand, and use to facilitate those actions. UI brings together concepts from interaction design, visual design, and information architecture.

**2. Choosing Interface Elements**

Users have become familiar with interface elements acting in a certain way, so try to be consistent and predictable in your choices and their layout. Doing so will help with task completion, efficiency, and satisfaction.

**3. Interface elements include but are not limited to:**

- **Input Controls:** buttons, text fields, checkboxes, radio buttons, dropdown lists, list boxes, toggles, date field
- **Navigational Components:** breadcrumb, slider, search field, pagination, slider, tags, icons
- **Informational Components:** tooltips, icons, progress bar, notifications, message boxes, modal windows
- **Containers:** accordion There are times when multiple elements might be appropriate for displaying content. When this happens, it is important to consider the trade-offs.
- **For example:** sometimes elements that can help save you space put more of a burden on the user mentally by forcing them to guess what is within the dropdown or what the element might be.

**4. Best Practices for Designing an Interface**

Everything stems from knowing your users, including understanding their goals, skills, preferences, and tendencies. Once you know about your user, make sure to consider the following when designing your interface:

**5. Keep the interface simple.**

- The best interfaces are almost invisible to the user.
- They avoid unnecessary elements and are clear in the language they use on labels and in messaging.
- Create consistency and use common UI elements.
- By using common elements in your UI, users feel more comfortable and are able to get things done more quickly.
- It is also important to create patterns in language, layout and design throughout the site to help facilitate efficiency.
- Once a user learns how to do something, they should be able to transfer that skill to other parts of the site.

**Q.22) Demonstrate the process flow of web interface design.**

**Ans.22)**

### **The Process Flow of Web Interface Design**

Different techniques and patterns can be used to showcase the process flow of web interface design. Here are some of them:

**1. Magic Principle:**

This technique involves thinking about what if the user could invoke some magic to complete a task. It helps in discovering the underlying mental model of the user and designing a more intuitive interface.

**2. Interactive Single Page Processor:**

Instead of breaking down the process into multiple pages, this technique treats the process as a real-world object and makes it available on a single page. It allows users to interact with the process flow seamlessly.

**3. Dialog Overlay Process:**

This technique utilizes dialog overlays to encapsulate multi-step flows within a dialog. It helps in keeping the context of the page intact while conducting a conversation with the user.

**4. Configuration Process:**

This technique focuses on creating an engaging and delightful experience for the user. It is often used in configurator process interfaces, where users can customize and see real-time previews of products.

**5. Static Single Page Process:**

In this technique, the complete process flow is placed on a single page. Users can see all the tasks needed to complete the process at once. It can be effective if the tasks are clear and not overwhelming for the user.

These techniques and patterns help in process flow of designing web interfaces that are user-friendly, intuitive, and efficient.