

1.III) What is meant by GOMS? Give an example.

**Ans.1.III)**

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".

## **2.iii) Describe in detail about Hypertext, Multimedia, WWW?**

### **Ans. 2.iii)**

#### **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.

### 3.iii) Explain about the Elements of Mobile Design.

#### Ans. 3.iii)

#### 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 be 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 look and feel 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

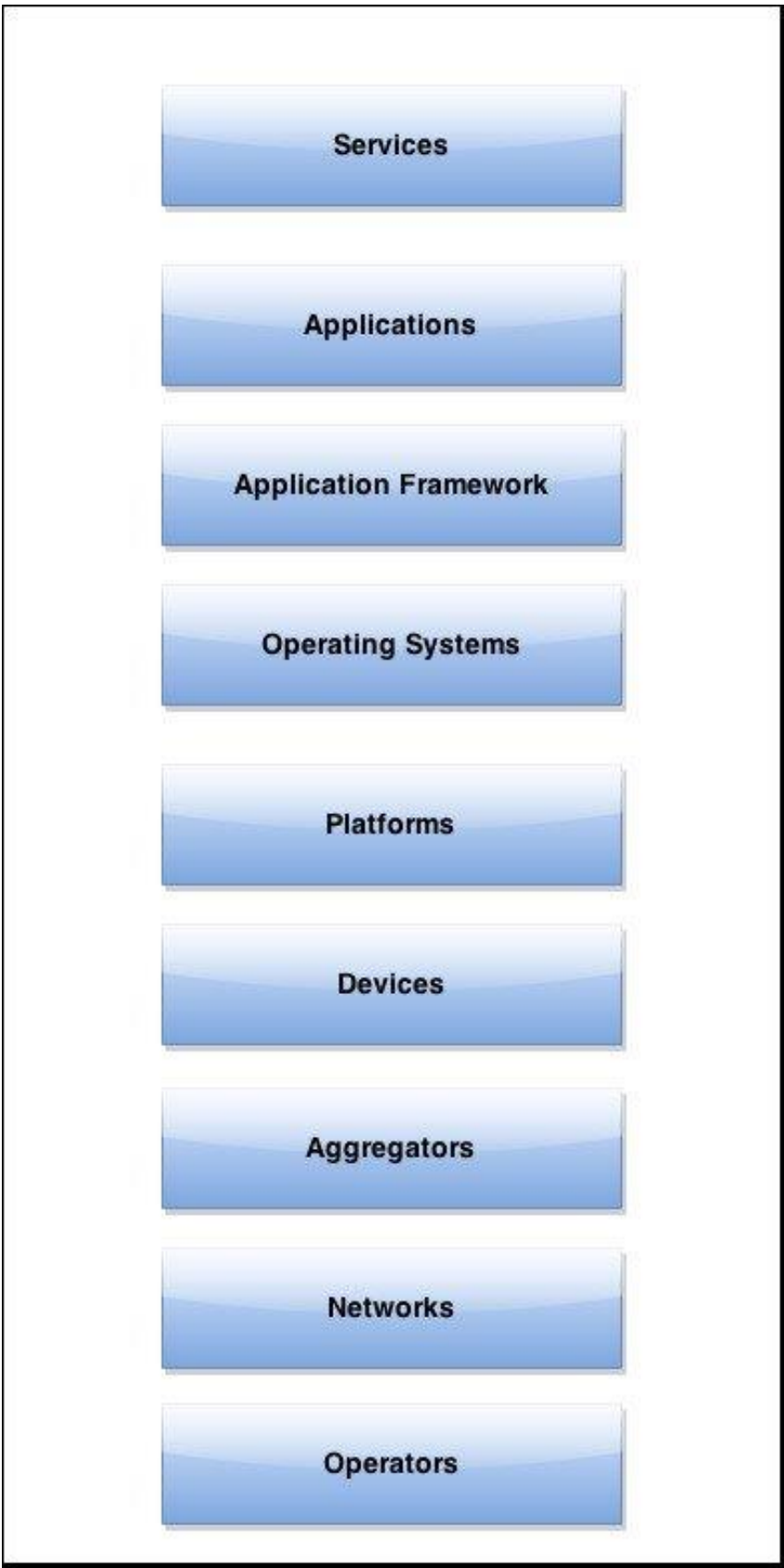
Graphics, including images and icons, contribute to the visual appeal and communication of information. Well-designed graphics enhance the user experience and can be used to represent actions, features, or convey emotions.

3.iv) Give detail description about Mobile Ecosystem.

Ans.3.iv)

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.

4.iii) Briefly explain about Mobile Application Medium Types.

**Ans.4.iii)**

#### Mobile Application Medium Types

The mobile medium type is the type of application framework or mobile technology that presents content or information to the user. It is a technical approach regarding which type of medium to use; this decision is determined by the impact it will have on the user experience.

##### i. SMS

The most basic mobile application you can create is an SMS application. Although it might seem odd to consider text messages applications, they are nonetheless a designed experience. Given the ubiquity of devices that support SMS, these applications can be useful tools when integrated with other mobile application types. Typically, the user sends a single keyword to a five-digit short code in order to return information or a link to premium content.

##### ii. Mobile websites

Mobile website is a website designed specifically for mobile devices, not to be confused with viewing a site made for desktop browsers on a mobile browser. Mobile websites are characterized by their simple -drill-down architecture, or the simple presentation of navigation links that take you to a page a level deeper.

Pros

- They are easy to create, maintain, and publish.
- They can use all the same tools and techniques you might already use for desktop sites.
- All mobile devices can view mobile websites.

Cons

The cons of mobile websites are:

- They can be difficult to support across multiple devices.
- They offer users limited experience.
- Most mobile websites are simply desktop content reformatted for mobile devices.

##### iii. Mobile Web Widgets

In response to the poor experience provided by the mobile web over the years, there has been a growing movement to establish mobile widget frameworks and platforms. For years, the mobile web user experience was severely underutilized and failed to gain traction in the market, so several operators, device makers, and publishers began creating widget platforms to counter the mobile web's weaknesses.

Pros

The pros of mobile web widgets are:

- They are easy to create, using basic HTML, CSS, and JavaScript knowledge.
- They can be simple to deploy across multiple handsets.
- They offer improved user experience and a richer design, tapping into device features and offline use.

Cons

The cons of mobile web widgets are:

- They typically require a compatible widget platform to be installed on the device.
- They cannot run on any mobile web browser.
- They require learning additional proprietary, non-web-standard techniques.

##### iv. Mobile Web Applications

Mobile web applications are mobile applications that do not need to be installed or compiled on the target device. Using XHTML, CSS, and JavaScript, they are able to provide an application-like experience to the end user while running in any mobile web browser. By Application -like experience, I mean that they do not use the drill-down or page metaphors in which a click equals a refresh of the content in view. Web applications allow users to interact with content in real time, where a click or touch performs an action within the current view.

Pros:

The pros of mobile web applications are:

- They are easy to create, using basic HTML, CSS, and JavaScript knowledge.
- They are simple to deploy across multiple handsets.
- They offer better user experience and a rich design, tapping into device features & offline use.
- Content is accessible on any mobile web browser.

Cons:

The cons of mobile web applications are:

- The optimal experience might not be available on all handsets.
- They can be challenging (but not impossible) to support across multiple devices.
- They do not always support native application features, like offline mode, location lookup, file system access, camera, and so on.

##### v. Games

The most popular of all media is available to mobile devices. Technically games are really just native applications that use similar platform SDKs to create immersive experiences (Figure). But I treat them differently from native applications for two reasons: they cannot be easily duplicated with web technologies and porting them to multiple mobile platforms is a bit easier than typical platform-based applications.

Pros: The pros of game applications are:

- They provide a simple and easy way to create an immersive experience.
- They can be ported to multiple devices easily.

Cons: The cons of game applications are:

- They can be costly to develop as an original game title.
- They cannot easily be ported to the mobile web.



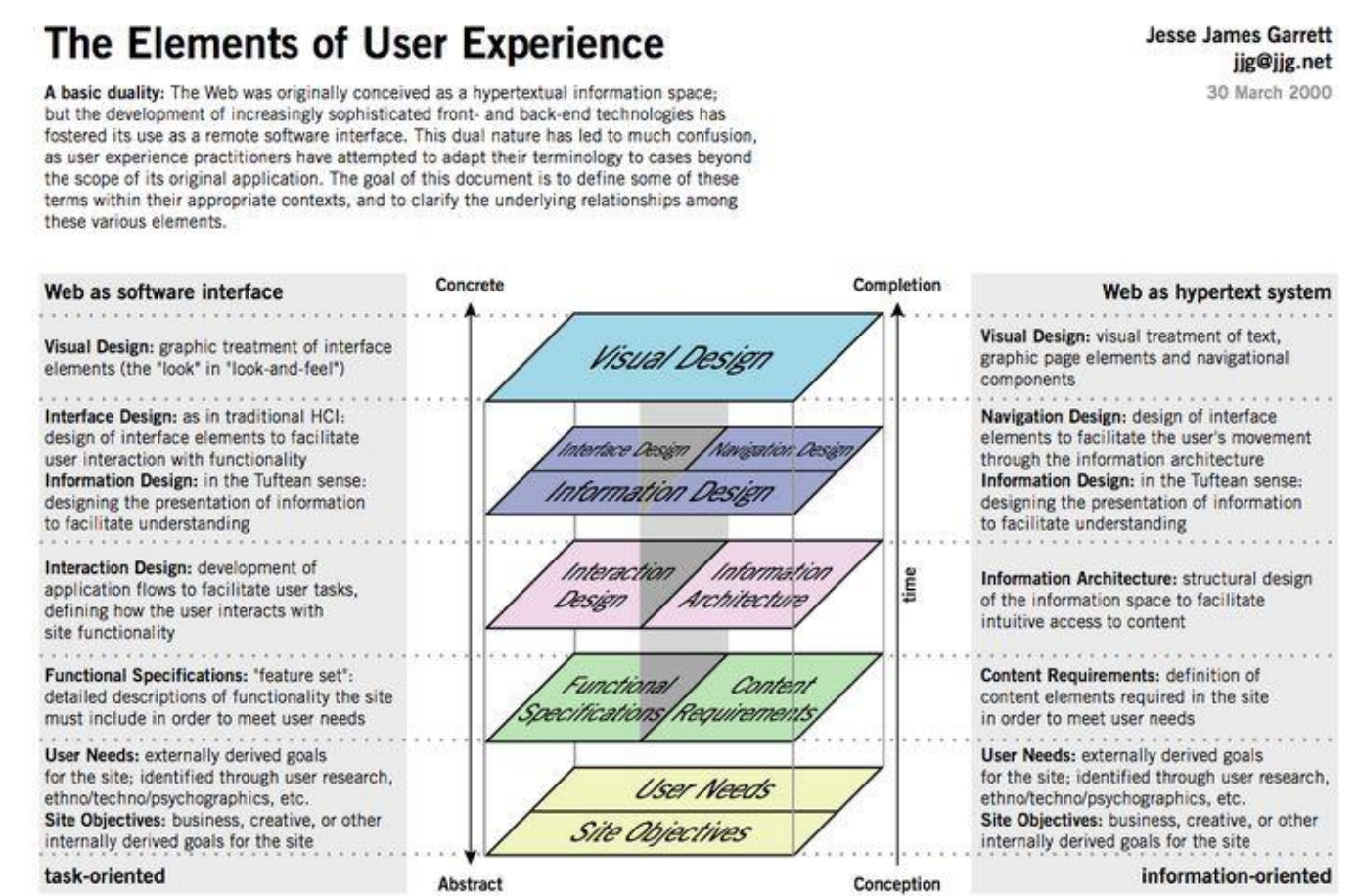
4.iv). What is Mobile Information Architecture ? Explain it with a neat diagram.

Ans.4.iv)

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.



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.

5.iii) Explain in detail about various patterns that support virtual pages.

**Ans.5.iii)**

Virtual pages Overlays allow you to bring additional interactions or content in a layer above the current page. Inlays allow you to do this within the page itself. However, another powerful approach to keeping users engaged on the current page is to create a virtual page. That is to say, we create the illusion of a larger virtual page.

Patterns that support virtual pages include:

- i. Virtual Scrolling
- ii. Inline Paging
- iii. Scrolled Paging
- iv. Panning
- v. Zoomable User Interface

#### i.Virtual Scrolling

Virtual Scrolling is a technique used in web design to manage large amounts of data or content on a webpage. It allows users to scroll through the content without having to load all of it at once, creating the illusion of a larger virtual page. Instead of traditional pagination where users have to click through multiple pages, Virtual Scrolling dynamically loads and displays content as the user scrolls down the page. This provides a seamless and continuous scrolling experience for the user. Examples of Virtual Scrolling can be seen in Yahoo! Mail, Microsoft Live Search, and PicLens.

#### ii.Inline Paging

Inline Paging is a technique used to make pagination feel less like a page switch. Instead of scrolling through content, only the content is switched while the rest of the page remains stable. This creates an Inline Paging experience. It is commonly used in websites like Amazon's Endless.com for search results.

Inline Paging supports virtual pages by creating the illusion of a larger virtual page. It allows users to navigate through different sections of content without actually switching to a new page. By only switching the content within the page, Inline Paging gives the impression of a continuous flow of information, making it easier for users to access and interact with different sections of the virtual page.

#### iii.Scrolled Paging

Scrolled Paging in virtual pages combines scrolling and paging to provide a way to view more content by scrolling it into view. It is a variation of the Virtual Scrolling pattern and is similar to Virtual Paging as it includes paging controls. The additional effect of Scrolled Paging is to animate the scrolled content into view. This approach is used in carousels, such as the one used by Yahoo! Underground to page/scroll through articles. Scrolled Paging enhances the user experience by allowing them to seamlessly navigate through content while maintaining the stability of the page.

#### iv.Panning

Panning refers to the ability to move or scroll horizontally or vertically within a virtual canvas or space. It allows users to navigate and explore content that is larger than the visible area of the screen. Panning is commonly used in applications such as maps or image viewers, where users can drag or swipe to move the viewable area and explore different parts of the content. The purpose of panning is to provide users with the flexibility to navigate and interact with content that extends beyond the boundaries of the screen, enhancing the user experience and allowing for more efficient exploration of large or detailed information.

#### v.Zoomable User Interface

A Zoomable User Interface (ZUI) is a type of interface that allows users to navigate and interact with content by zooming in and out of elements on the page. It provides users with the freedom to explore and manipulate the interface in both two-dimensional and three-dimensional space. The purpose of a ZUI is to create a virtual canvas that supports an infinite interface, allowing users to zoom in for more detail or zoom out for a broader view. This type of interface can be particularly useful for applications such as maps, where users can pan and zoom to explore different areas. ZUIs are starting to emerge in web design with the advancement of technologies like Flash and Silverlight.

#### 5.iv) Explain in detail about drag and drop operations?

##### Ans. 5.iv)

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.



**6.iii) Describe in detail about overlay and its types.**

**Ans.6.iii)**

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 .

**6.iv) Demonstrate the process flow of web interface design.**

**Ans.6.iv)**

### **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.**