ALMUSTAQBAL UNIVERSITY
DEPARTMENT OF COMPUTER TECHNIQUES ENGINEERING

MULTIMEDIA COMPUTING

Lecture 2
Fourth Stage

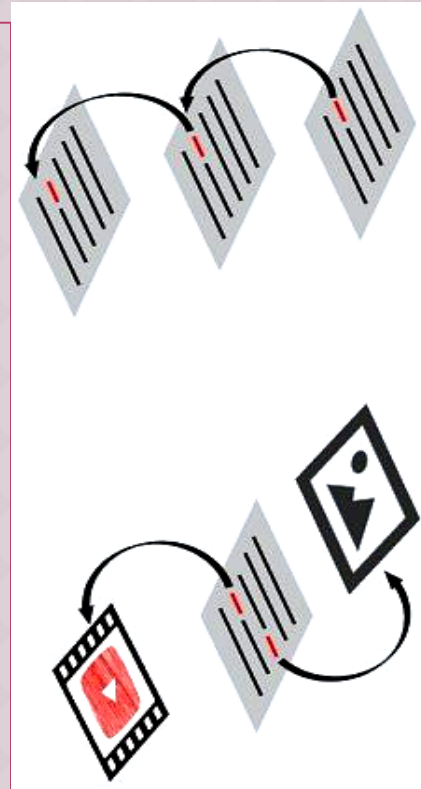**Hyper Text & Hypermedia**

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OUTLINE

- INTRODUCTION
- APPLICATIONS OF MULTI MEDIA
- COMPONENTS OF MULTIMEDIA
- MULTIMEDIA CHARACTERISTICS

INTRODUCTION

hypertext and hypermedia are fundamental components of the digital age, as they facilitate information sharing, learning, communication, creativity, and entertainment in ways that were not possible in the pre-digital era. Their importance continues to grow as technology advances and the digital landscape evolves.

Definition:

1. **Hyper Text**: Hyper Text is like magic text on the computer. It has special words that, when you click them, can take you to other places, like websites or different parts of a document. It's a way to explore information with just a click.

2. **Hypermedia:** Hypermedia is the next level. It's not just words you can click on, but also pictures, sounds, videos, and more. It's like using all kinds of media to learn and have fun on your computer or the internet.

Return

Why use hypertext and hypermedia:

1. **Ease of Information Access:** Hypertext and hypermedia make it easy to access vast amounts of information on the internet. Through hyperlinks and multimedia elements, users can quickly navigate and explore a wide range of content.

2. **Enhanced Learning and Engagement:** In education, hypermedia can provide interactive and engaging learning experiences. Students can access multimedia resources, simulations, and interactive content that cater to different learning styles.

3. **Rich Content Delivery:** Hypermedia allows for the integration of various media formats, including text, images, audio, and video. This richness in content enables more effective communication and storytelling.

4. **Cross-Referencing and Cross-Linking**: Hypertext enables cross-referencing and cross-linking of information. This means that content can be interconnected, allowing users to dive deeper into related topics, enhancing understanding.

Return

Why use hypertext and hypermedia:

5. Multimedia Communication: In the digital age, rich media is essential for effective communication. Hypermedia allows businesses, artists, and content creators to convey their messages through a combination of text, images, audio, and video.

6. Interactive User Interfaces: Hypermedia elements are essential in the design of interactive user interfaces for software applications and websites, making them more user-friendly and visually appealing.

7. Research and Information Retrieval: In research, hypermedia helps scholars access and cite sources easily, leading to more efficient and comprehensive work.

8. Global Connectivity: Hypertext and hypermedia enable global connectivity. People from different parts of the world can access and share information, fostering collaboration and cultural exchange.

Return

HTTP (HYPER TEXT TRANSFER PROTOCOL)

is the foundation of data communication on the World Wide Web. It's a protocol that defines how data is transmitted and formatted on the internet. When you enter a web address (URL) in your web browser and hit "Enter," your browser uses HTTP to request and receive web pages and other resources from web servers. Here's a simple example to help explain HTTP:

Return

HTTP (HYPER TEXT TRANSFER PROTOCOL)

Example: Browsing a Website

1. **User Action:** You open your web browser and type "https://www.example.com" into the address bar and press Enter.
2. **Browser Request:** Your web browser initiates an HTTP request to the web server hosting "www.example.com." It's requesting the default page, which is often "index.html."
3. **Server Response:** The web server receives your request, processes it, and then sends back an HTTP response. This response contains the content of the "index.html" page and metadata.
4. **Browser Rendering:** Your web browser receives the HTTP response, interprets the HTML code, and displays the webpage on your screen. The browser may also fetch additional resources, such as CSS files, images, and JavaScript, by sending more HTTP requests.
5. **Interactive Elements:** As you interact with the webpage (e.g., clicking on links or submitting forms), your browser sends additional HTTP requests to the server for new pages or data. This allows you to navigate the website.

Return

HTTP (HYPER TEXT TRANSFER PROTOCOL)

Key features of HTTP

- **Statelessness:** Each request-response cycle is independent, meaning the server doesn't retain information about previous requests. This helps distribute requests and makes the web scalable.

- **Text-Based:** HTTP messages are text-based, making them human-readable. This aids in debugging and understanding the communication between clients and servers.

- **Simple and Extensible:** While HTTP is straightforward, it's also extensible. It can be extended with headers and methods to support more advanced features and functionality.

- **Secure Version:** HTTPS (Hyper Text Transfer Protocol Secure) is a secure version of HTTP that encrypts data between the client and server, ensuring privacy and data integrity. It's commonly used for online transactions and securing sensitive information.

Return

HYPERMEDIA & MULTIMEDIA

1. **Hypermedia:** Hypermedia is like interactive content that goes beyond just text. It includes text, images, audio, video, and links that allow you to explore and interact with information in a dynamic way. It's the foundation of interactive websites and e-learning platforms.

2. **Multimedia:** Multimedia is a combination of different types of media, like text, images, audio, video, and more, all presented together. It's used in various forms of communication and entertainment, such as videos, interactive presentations, and video games.

MULTIMEDIA VS HYPERMEDIA

MULTIMEDIA
is the use of computers or related devices to present text, audio, video, animation, interactive features, and still images.

HYPERMEDIA
is the use of text, data, graphics, audio and video as elements of an extended hypertext system in which all elements are linked, where the content is accessible via hyperlinks.

Return

HYPERMEDIA & MULTIMEDIA

Benefits of Hypermedia:

1. **Engaging Learning:** In education, hypermedia offers interactive and engaging learning experiences. Students can explore content through multimedia, improving comprehension and retention.

2. **Rich Content:** Hypermedia combines various media formats (text, images, audio, video) to convey information in a more comprehensive and engaging manner.

3. **Personalization:** Users can choose their own learning path, which is especially valuable in e-learning and self-paced education.

4. **Interactivity:** Hypermedia allows users to interact with content, such as clicking on links, watching videos, and engaging with simulations, enhancing the learning process.

5. **Visualization:** It is effective for data visualization, making complex information more accessible and understandable through interactive graphs and charts.

Return

HYPERMEDIA & MULTIMEDIA

Challenges of Hypermedia

1. **Complexity:** Creating hypermedia content can be complex and time-consuming due to the integration of various media types and interactive elements.
2. **Access Barriers:** Multimedia content may not be accessible to all users, particularly those with disabilities, unless careful attention is paid to accessibility features.
3. **Technical Requirements:** Users may need specific hardware or software to access hypermedia content. Compatibility issues can limit accessibility.
4. **Bandwidth and Loading Times:** Media-rich content can require high bandwidth, leading to longer loading times, especially for users with slower internet connections.
5. **Distraction:** While interactivity can enhance engagement, it can also be distracting, potentially hindering the learning process.
6. **Maintenance:** Hypermedia content requires ongoing updates and maintenance to ensure that links, media, and interactive elements remain functional.
7. **Privacy and Security:** Embedded content, like videos or interactive applications, may pose privacy and security risks. Users must trust the source of the content they interact with.
8. **Cost:** Developing and hosting hypermedia content can be expensive, particularly when it involves high-quality multimedia production.

Return

HYPERMEDIA & MULTIMEDIA

Hypermedia Technologies

1. **HTML (Hypertext Markup Language):** HTML is the standard language used to create web pages with text, links, images, and multimedia elements.

2. **HTTP (Hypertext Transfer Protocol):** HTTP is the protocol used for transferring hypermedia content over the internet.

3. **CSS (Cascading Style Sheets):** CSS is used to define the presentation and layout of hypermedia content, including fonts, colors, and spacing.

4. **JavaScript:** JavaScript is a scripting language that enhances the interactivity of web pages by allowing dynamic content and user interactions.

5. **SVG (Scalable Vector Graphics):** SVG is a format for creating vector graphics that can be interactive and scale without loss of quality.

Return

HYPERMEDIA TECHNOLOGIES

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6. **XML (eXtensible Markup Language):** XML is used for structuring and encoding hypermedia content, often in the form of data or configuration files.

Return

HYPERMEDIA TECHNOLOGIES

7. **SMIL (Synchronized Multimedia Integration Language):** SMIL is a markup language for creating multimedia presentations with synchronized audio, video, and text.

8. **Flash (Adobe Flash):** Although less common now, Adobe Flash was historically used for creating multimedia-rich, interactive web content.

9. **WebRTC (Web Real-Time Communication):** WebRTC is a technology that enables real-time audio and video communication in web applications.

10. **AR (Augmented Reality) and VR (Virtual Reality) Technologies:** Technologies like WebVR, WebAR, and A-Frame enable the creation of immersive and interactive augmented and virtual reality experiences in web browsers.

11. **Interactive Document Formats:** Formats like PDF (Portable Document Format) can support hypermedia elements, such as clickable links and embedded multimedia.

12. **Web APIs (Application Programming Interfaces):** Various web APIs allow developers to integrate and manipulate hypermedia content, such as the Web Audio API for audio processing and the Web Speech API for speech recognition.

Return

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Return