POWERING POTENTIAL

Web Skills

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Web Development 2

Units – H3BJ04

Learning Outcomes

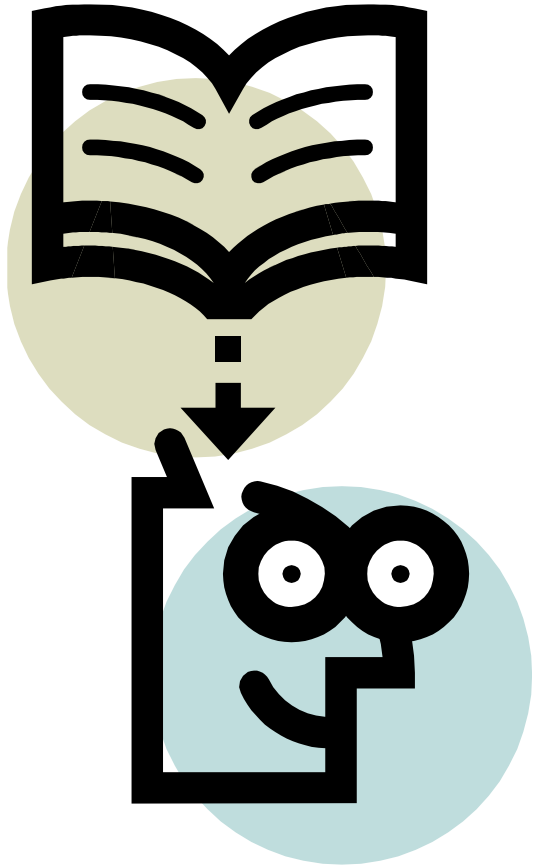
- → Understand web architecture and components
- → Understand the technologies that can be used to build and operate a website
- → Produce a website design for a given brief.
- → Implement a website from a design specification.

Timings

→ SESSION 1 : 9:30 to 11:00
→ BREAK 15 MINUTES
→ SESSION 2 : 11:15 to 12:00
→ LUNCH 1 HOUR
→ SESSION 3 : 13:00 to 15:00
→ BREAK 15 MINUTES
→ SESSION 4 : 15:15 to 16:00
→ Q&A Session : 16:00 to 16:30

COURSE CONTENT INFORMATION

Both modules are open book, use slides and online resources for more information (please do not copy and paste!)



HARDWARE COMPONENTS

1.1 Describe the hardware and software components which enable the internet and web

Hardware Components

- Web server
- Mail server
- Proxy server
- Router
- Network card

HARDWARE COMPONENTS

Web servers

Web servers host websites and generally handle requests for static information such as **HTML** pages or images. They are used to manage the website on the server and often include **FTP** software, which can easily host and share large files. The Apache web server is a popular type of **open source** web server software.

HARDWARE COMPONENTS

Mail server

A mail server (also known as a mail transfer agent or MTA, a mail transport agent, a mail router or an Internet mailer) is an application that receives incoming e-mail from local users (people within the same domain) and remote senders and forwards outgoing e-mail for delivery. A computer dedicated to running such applications is also called a mail server.
Microsoft Exchange, qmail, Exim and sendmail are among the more common mail server programs.

HARDWARE COMPONENTS

Proxy server

A proxy server is a dedicated computer or a software system running on a computer that acts as an intermediary between an endpoint device, such as a computer, and another server from which a user or client is requesting a service. The proxy server may exist in the same machine as a firewall server or it may be on a separate server, which forwards requests through the firewall.

HARDWARE COMPONENTS

Router

- In packet-switched networks such as the internet, a router is a device or, in some cases, software on a computer, that determines the best way for a packet to be forwarded to its destination.
- A router connects networks. Based on its current understanding of the state of the network it is connected to, a router acts as a dispatcher as it decides which way to send each information packet. A router is located at any gateway (where one network meets another), including each point-of-presence on the internet.

HARDWARE COMPONENTS

Network card

A network card needs to be installed in either the desktop computer or the laptop to enable connection.

SOFTWARE COMPONENTS

Browser

- A Web browser is a client program that uses HTTP (Hypertext Transfer Protocol) to make requests of Web servers throughout the Internet on behalf of the browser user. Most browsers support e-mail and the File Transfer Protocol (FTP) but a Web browser is not required for those Internet protocols and more specialized client programs are more popular.

- The first Web browser, called WorldWideWeb, was created in 1990. That browser's name was changed to Nexus to avoid confusion with the developing information space known as the World Wide Web.

SOFTWARE COMPONENTS

Email

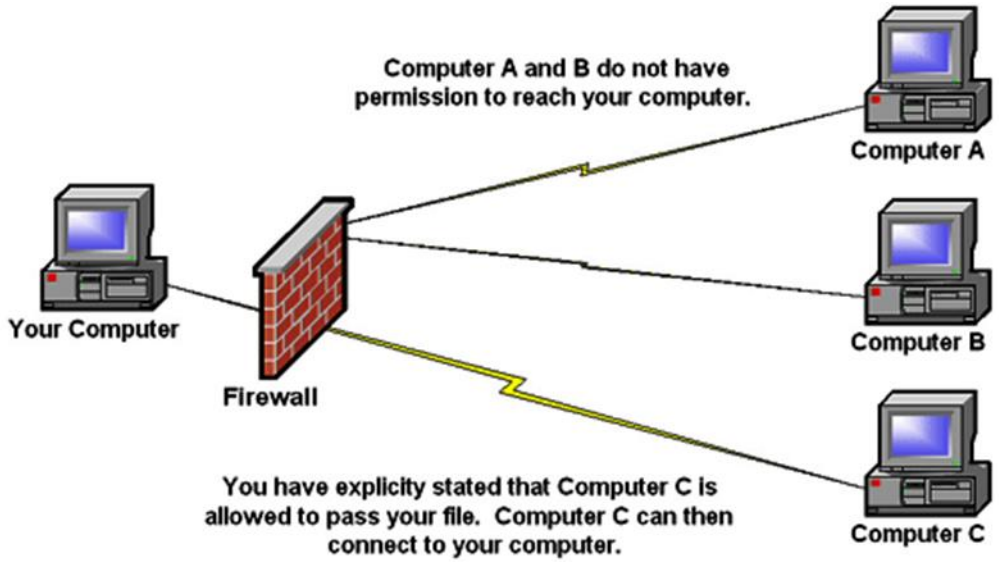
- Web Mail Interface: Using a web based email client, eg Gmail, Hotmail – all emails remain on web server.
- POP3: Traditional method to access email, where messages are downloaded directly to your computer. Used with email client, eg Outlook

  IMAP: The IMAP connection is somewhat of a cross between POP and the web mail interface where the local email client synchronizes with the different storage folders that can be seen from the web interface (located on the email server).

SOFTWARE COMPONENTS

Firewall

- A firewall is software that works as a barrier between your computer and the internet depending on predefined security rules.
- A firewall acts as the first line of defence against potential intrusion by setting up predefined security rules that will actively monitor your network.



PROTOCOLS

TCP/IP

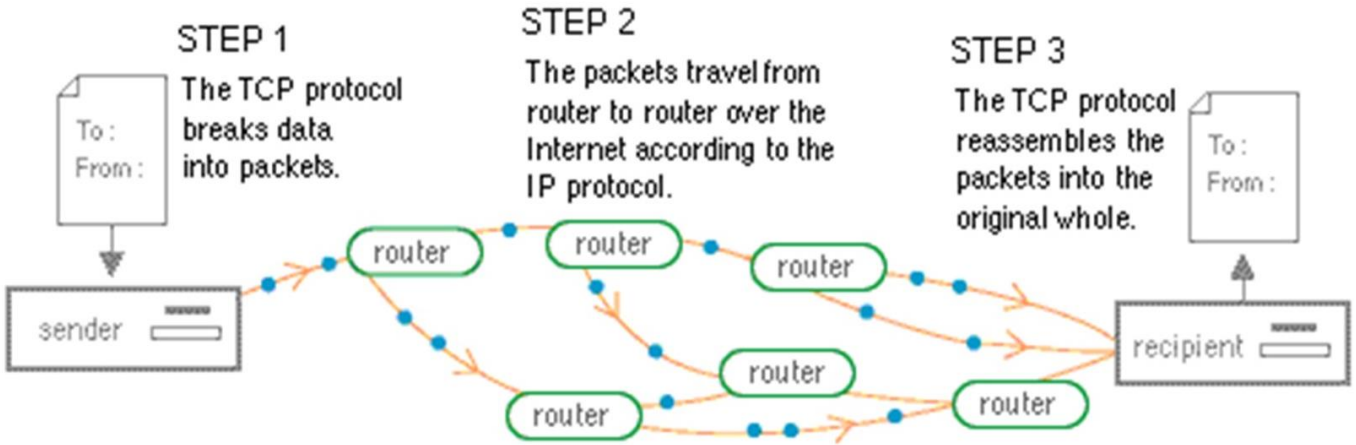


Figure 2. How data travels over the Net.

PROTOCOLS

TCP/IP (Transmission Control Protocol / Internet Protocol

- A set of protocols, services, and applications for linking computers of all kinds
- TCP manages the assembling of a message or file into smaller packets that are transmitted over the Internet and received by a TCP layer that reassembles the packets into the original message.

- IP handles the address part of each packet so that it gets to the right destination. Each gateway computer on the network checks this address to see where to forward the message. Even though some packets from the same message are routed differently than others, they'll be reassembled at the destination.

PROTOCOLS

Application layer e.g. HTTP, HTTPS, SMTP

- consists of protocols that focus on process-to-process communication across an IP network and provides a firm communication interface and end-user services. Examples are:

- HTTP: How should message be transmitted, how should web browser respond
- HTTPS:Protocol for secure communication
- SMTP: Simple mail transfer protocol
- FTP: File transfer protocol

PROTOCOLS

1.3 Explain the role of internet service providers, web hosting services and domain name registrars

Internet Service Providers

- A company that provides Internet services, including personal and business access to the Internet

Domain Name Registrars

- accredited company who has the authority to register domain names.

Web Hosting Services

- Web hosting provides server space, Web services and file maintenance for Web sites controlled by individuals or companies that do not have their own web server.

WEB COMPONENTS

1.4 Describe available types of web components.

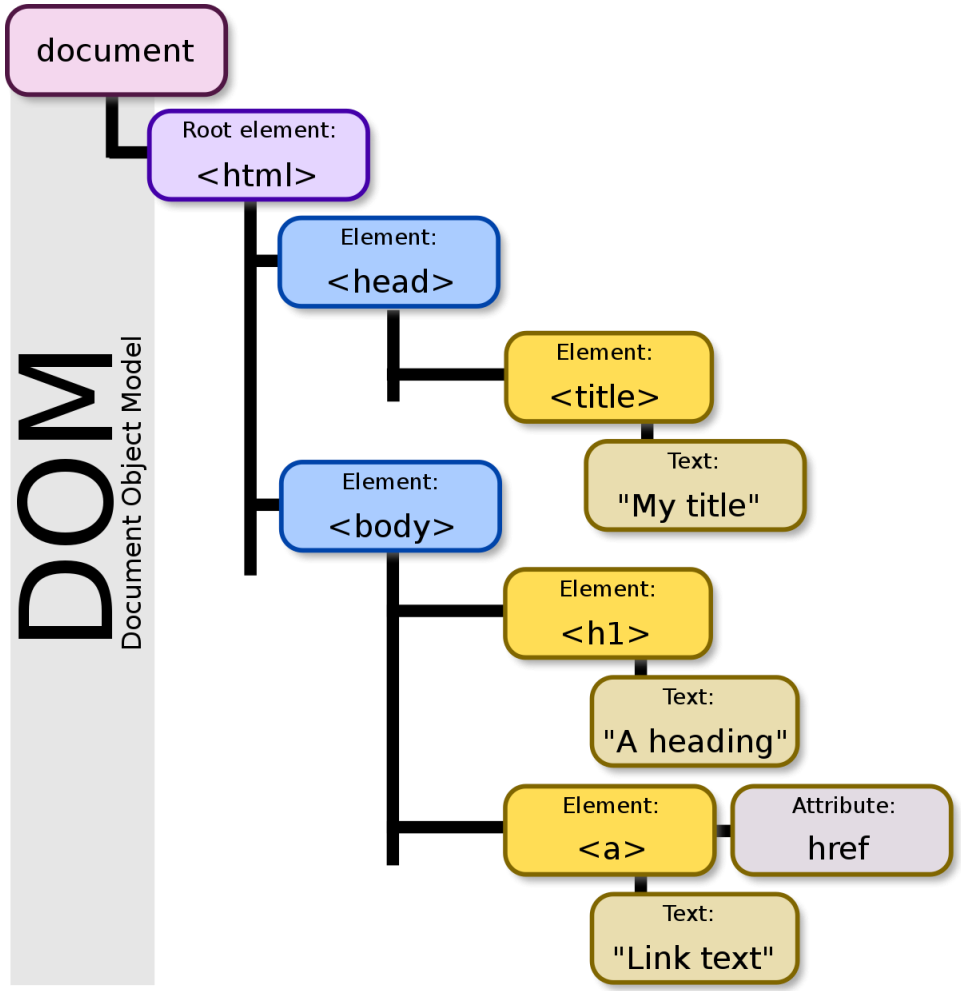
These allow us to bundle Markup and styles into custom HTML elements. These new elements fully encapsulate (enclose) all of their HTML and CSS. Basically we can create our own customised HTML tags i.e.

<my custom tag> </my custom tag>

- Web components are a set of standards for creating reusable HTML elements.
- For example if you wanted to create an image carousel, you could make a new html element <image-carousel>, with all its JavaScript and CSS inside the element itself. After that is done, you could use this element anywhere in your document.

WEB COMPONENTS

Document Object Model - HTML

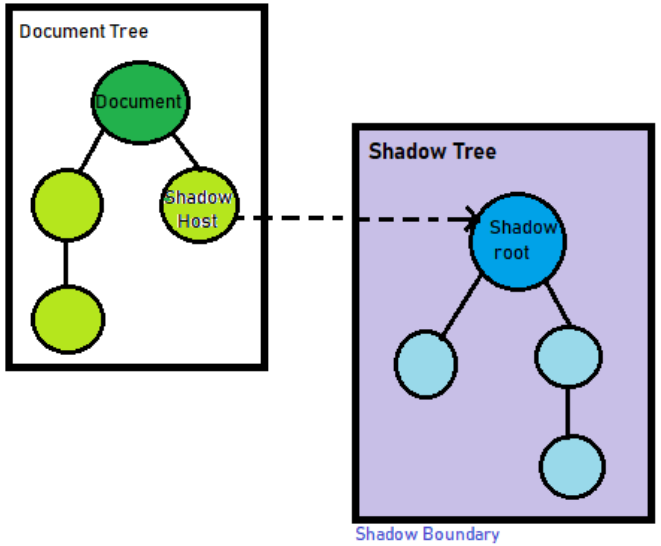


WEB COMPONENTS

Web components

Shadow DOM (Supported by most major browsers – opera, Mozilla firefox, Chrome. More support being developed for Safari/IE)

A key feature of Web Components is the Shadow DOM, which encapsulates everything inside your element. So in the example above, CSS and JS won't interfere from other elements or global scripts, preventing JS conflicts and CSS bleed.



WEB COMPONENTS

Custom elements

These are elements that you code yourself then register so you can reuse at will

HTML imports

- **HTML Imports** are HTML documents that are linked as external resources from another HTML document. For example you can link **Bootstrap5** which is a complete set of Markup and CSS styles that will automatically be applied as styles to your web pages.
- **Templates:** Web Components' template tags allow the development of native templates that are standardized and often more efficient in browsers than current templating methods

MARKUP LANGUAGES

2 Understand the technologies that can be used to build and operate a website

2.1 Explain the use of markup languages

Markup languages are designed for the processing, definition and presentation of text. The language specifies the code for formatting, both the layout and style, within a text file. The code used to specify the formatting are called ***tags.***

MARKUP LANGUAGES

HTML, XML and XHTML are all common Markup languages

HTML stands for……..?

XML stands for…….?

XHTML stands for…..?

Find out about and give an example of each. (yes – the code! – hint….)

http://www.w3schools.com/

http://www.w3schools.com/html/html_xhtml.asp

WEB TECHNOLOGIES

2 Understand the technologies that can be used to build and operate a website

2.2 Explain the use and functionality of:

Web runtime environments

Web application programming languages

WEB TECHNOLOGIES

2 Understand the technologies that can be used to build and operate a website

Runtime Environment

RTE software allows a programmer to test a program while it is running. The runtime environment can also be a virtual machine, such as the JRE (Java Runtime Environment) or CLR (Common Language Runtime) for .NET framework.

Allows applets and applications/programmes to be run on any computer that the runtime environment is installed on. Eg to play a Flash movie you would only need a player, NOT the Flash software it was created on.

WEB TECHNOLOGIES

Runtime Environment

Find out about these runtime environment programs:

Java Runtime Environment (JRE)

Adobe AIR

WEB TECHNOLOGIES

Web application programming languages

Basic web development languages

HTML and CSS are the two most basic web development languages, and are used to build nearly all webpages on the Internet.

Client-side scripting

Client-side scripting — which includes HTML and CSS — is any code that runs within a web browser. This means that the web browser temporarily downloads all the files from a web server and, in turn, displays a static web page;

WEB TECHNOLOGIES

Web application programming languages

Server-Side Scripting

All websites need to be hosted (i.e. stored) in a database on a web server. Server-side scripting simply refers to any code that facilitates the transfer of data from that web server to a browser. It also refers to any code used to build a database or manage data on the web server itself. Server-side scripts run on the web server, which has the power and resources to run programs that are too resource intensive to be run by a web browser.

Examples include:

- Java
- JavaScript
- PHP
- Python
- Ruby

WEB TECHNOLOGIES

2. Select and use website software tools and features to develop multiple page websites with multimedia and interactive features.

2.1. Plan and create web page templates to layout content.

Create a mockup of how you want your web template to look. Include in your document

Now create it using wix

Include a snip in your document

http://www.wix.com

WEB TECHNOLOGIES

2.3 Explain the role of databases in building websites and web applications

In order to work properly, every website needs a database to store its code, images, files and other data. (NOT just user data!)

- Store
- Search
- View
- Extract

- Read up on what you will need and what type of database can be used. Can you find a SQL* database example (look at images)? (*Structured Query Language)

WEB TECHNOLOGIES

2.4 Identify typical product stack combinations that can be used for web development

A web stack, also called a web application stack, is a compilation of software set up especially for implementing websites and web applications. The term, ‘stack’, refers to the fact that the system’s individual components are built upon one another. The basic requirements necessary to construct a web stack include: an operating system, a webserver, a database, and a script interpreter. Together with the proper server hardware, this bundle of IT components ensures that necessary information about corresponding web projects is forwarded to requesting clients (generally, this is the internet browser). The browser then processes the HTML, CSS, and JavaScript codes and depicts the web space for the user.

- LAMP
- XAMMP
- WISA

Find out about each and describe what they are built from

WEB TECHNOLOGIES

2.4 Identify typical product stack combinations that can be used for web development

Investigate common web stacks:

LAMP

XAMPP

WISA

Find out about each and describe what they are built of and what can they be used for.

WEB TECHNOLOGIES

2.4 Identify typical product stack combinations that can be used for web development

Investigate common web stacks:

LAMP

XAMPP

WISA

Find out about each and describe what they are built of and what can they be used for.

PRODUCE A WEB SITE

3 Produce a website design for a given brief

3.1 Produce a proposal document for a web-site design

You have one shot to convince the client you are the best person for the job.

- Problem Statement (Define The Problem)
- Proposed Solution (Propose The Solution)
- Pricing Information (Provide Costs To Fix Problems)
- Next Step(s) (Create a Call To Action)

PRODUCE A WEB SITE

3 Produce a website design for a given brief

3.2 Identify the components required by a web-site design.

Front end elements

- Navigation structure (menu)
- Page layout
- Logo
- Content (text/videos/images)
- Design

PRODUCE A WEB SITE

3 Produce a website design for a given brief

3.2 Identify the components required by a web-site design.

Backend elements

- Ecommerce
- Content management system (maybe): Wordpress, Joomla, Drupal
- Site search:
- Contact Form
- Database
- Security

PRODUCE A WEB SITE

3 Produce a website design for a given brief

3.2 Identify the components required by a web-site design.

Other components

- Domain name
- Hosting

PRODUCE A WEB SITE

3 Produce a website design for a given brief

3.3. Produce an implementation plan for a website development project

In order to know what we need to do and when we need an implementation plan

IMPLEMENT A WEB SITE

4 Implement a website from a design specification

4.1 Develop a fully functional website to meet requirements

http://www.wix.com

IMPLEMENT A WEB SITE

4 Implement a website from a design specification

4.2 Test a website and review against requirements