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| **Qualification** | **BTEC Level 5 HND Diploma in Computing** | | |
| **Unit number and title** | 10: Website Design & Development | | |
| **Submission date** |  | **Date Received 1st submission** |  |
| **Re-submission Date** |  | **Date Received 2nd submission** |  |
| **Student Name** | Nguyễn hoàn tuấn vũ | **Student ID** | BSA180017 |
| **Class** | BSAF-1901-2 | **Assessor name** | Thái thị thanh thảo |
| **Student declaration**  I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice. | | | |
|  |  | **Student’s signature** |  |

**ASSIGNMENT 1 FRONT SHEET**

**Grading grid**

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| P1 | P2 | P3 | P4 | M1 | M2 | M3 | D1 |
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| **Submission Format:** |
| *Format:* Two ten-minute Microsoft® PowerPoint® style presentations to be presented to your colleagues  *Submission* Students are compulsory to submit the assignment in due date and in a way requested by the Tutors. The form of submission will be a soft copy posted on <http://cms.greenwich.edu.vn/>  *Note:* The Assignment *must* be your own work, and not copied by or from another student or from books etc. If you use ideas, quotes or data (such as diagrams) from books, journals or other sources, you must reference your sources, using the Harvard style. Make sure that you know how to reference properly, and that understand the guidelines on plagiarism. *If you do not, you definitely get failed* |
| **Unit Learning Outcomes:** |
| **LO1** Explain server technologies and management services associated with hosting and managing websites.  **LO2** Categorise website technologies, tools and software used to develop websites. |
| **Assignment Brief and Guidance:** |
| You work as a full-stack web team leader for a leading creative web solutions and marketing company. Your team is about to have a big contract to develop an online shopping mall. |
| One of the preparation tasks is to choose appropriate tools and techniques to realise a custom built website.  As part of your role, you have been asked to create an engaging presentation to help train junior staff members on basic web technologies including hosting and website management as well as server technologies. Your presentation should not only explain basic knowledge in the domain but also points out the impact of these technologies to website design, functionality, management or performance.  You also need to present more technical presentation to senior staff members to discuss about front-end, back-end technologies as well as other tools, techniques and software used to develop website from simple (online website creation tools) to complicated (custom built). Your presentation will be used as guidance of choosing suitable tools and techniques for the next project. |

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| **Learning Outcomes and Assessment Criteria** | | |
| **Pass** | **Merit** | **Distinction** |
| **LO1** Explain server technologies and management services associated with hosting and managing websites | | **LO1 & 2**  **D1** Justify the tools and techniques chosen to realise a custom built website. |
| **P1** Identify the purpose and types of DNS, including explanations on how domain names are organised and managed.    **P2** Explain the purpose and relationships between communication protocols, server hardware, operating systems and web server software with regards to designing, publishing and accessing a website. | **M1** Evaluate the impact of common web development technologies and frameworks with regards to website design, functionality and management.    **M2** Review the influence of search engines on website performance and provide evidence-based support for improving a site’s index value and rank through search engine optimisation. |
| **LO2** Categorise website technologies, tools and software used to develop websites | |
| **P3** Discuss the capabilities and relationships between front-end and back-end website technologies and explain how these relate to presentation and application layers.    **P4** Discuss the differences between online website creation tools and custom built sites with regards to design flexibility, performance, functionality, User Experience (UX) and User Interface (UI). | **M3** Evaluate a range of tools and techniques available to design and develop a custom built website. |

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| **❒ Summative Feedback: ❒ Resubmission Feedback:** | | |
| **Grade:** | **Assessor Signature:** | **Date:** |
| **Signature & Date:** | | |

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**ASSIGNMENT 1**

1. Identify the purpose and types of DNS, including explanations on how domain names are organised and managed.
   1. purpose and types of DNS.

* DNS (Domain Name System) is a domain name resolution system that allows to establish a link between a domain name and a server's IP, making it possible for visitors to remember only domain names without having to care about the domain name. IP address by number. It is like a phone book on the Internet. For example, when you type www.hostinger.com in your browser, the DNS system will convert this address into an IP address where your website is hosted.
* All DNS servers fall into one of four categories: Recursive resolvers, root nameservers, TLD nameservers, and authoritative nameservers.

1. Recursive resolvers

The recursive solver (also known as a DNS receiver) is the first stop in DNS queries. The recursive resolver acts as a middleman between the client and the DNS name server. After receiving the DNS query from the web client, the recursive resolver responds with the data stored in the cache or sends the request to the nameserver, followed by another request to the nameserver. TLD and then a final request to the authoritative nameservers. After receiving the response from the authoritative name server containing the requested IP address, the recursive resolver will send the response to the client.

1. root nameservers

13 DNS name servers are known for every recursive resolver and they are the first stop in the recursive resolver's task for DNS records. The root server accepts recursive resolution queries that include the domain name, and the root name server responds by directing the recursive resolver to the TLD name server, based on that domain extension (.com , .net, .org, etc.). Original name servers are overseen by a nonprofit called Internet Assigned Names and Numbers (ICANN).

1. TLD nameservers

The TLD nameserver maintains information for all domains that share a common domain name extension, such as .com, .net or anything that comes after the final dot in the url. For example, the TLD .com domain host contains information for every website ending in '.com'. If the user is searching google.com, after receiving a response from the root name server, the recursive resolver will send a query to the TLD .com domain name server, which will respond by pointing to the nameserver (see below) for that domain name.

The management of the TLD name server is handled by an assigned Digital Allocation Authority (IANA), an affiliate of ICANN. IANA divides TLD servers into two main groups:

* Generic top-level domain names: These are country-specific domain names, some of the most commonly known TLDs include .com, .org, .net, .edu and .gov.
* Country code top-level domain names: They include any domain names specific to a country or state. Examples include .uk, .us, .ru and .jp.

There is actually a third category for infrastructure fields, but it is almost never used. This category was created for the .arpa domain, which is the forward domain used to create modern DNS; Its significance today is largely historical.

1. authoritative nameservers.

When the recursive resolver receives a response from the TLD name server, that response directs the resolver to the authoritative name server. Authorized nameservers are often the last step of the resolver in the journey to find the IP address. Authorized nameservers contain information specific to the domain it serves (e.g. google.com) and it can provide recursive resolution with that server's IP address found in the DNS record or if the domain has CNAME (alias) records it will provide recursive resolution with an alias domain, where the recursive resolver will have to perform a completely new DNS lookup to create a records from an authoritative name server (usually an A record containing the IP address). Cloud DNS authoritative name server distribution, comes with Anycast routing to make them more reliable.

* 1. how to organize and manage domain names.
* Domain names:

The name of your domain is essentially the same as the physical address of your site. Like a street address or zip code, a web browser needs a name for a domain, to direct you to a website. A web browser also needs a domain name for you. Two key elements are a domain name. For example, Facebook.com domain name consists of the name of the site (Facebook) and the extension of the domain name (.com). If a company (or individual) purchases a domain name, it can specify which server the domain name refers to. Domain names work by using the server hosting your website as a shortcut. Anybody who wants to go to your website would have to enter without a domain name.

* Management of the Domain Name System:

Due to the importance of the Domain Name System (DNS), management and maintenance are required. Although the Internet does not have a central government, the "space" assignment (IP, DNS, ASN) on the Internet is strictly regulated. The domain name system is managed by the following organizations:

* (ICANN) Internet Corporation in name and number assigned
* (IANA) An Internet numbering authority
* The operators of top level domains (like Verisign).
* Registration is accredited (like GoDaddy).

The domain name system is a hierarchy and at the top of the hierarchy is a DNS root zone. IANA manages the DNS root zone - with ICANN-provided supervision - by managing data (root zone files) in the root nameservers. In addition to maintaining the Root Zone File, ICANN also maintains the Root Zone Database (information published in the WHOIS service) and Key Lock Management (KSK): providing DNS security using DNSSEC. ICANN creates policies for root zone management through advice provided by two technical agencies: the Root Server Systems Advisory Committee (RSSAC) and the Security and Stability Advisory Committee (SSAC).

ICANN assigns organizations to manage top-level Domains (such as com domain names) and recognizes namespaces registered and purchased registrars - on behalf of companies and individuals - in top-level Domains this highest. Some people specify third-party registration. The global policy for the Top-level Domains is developed by two ICANN organizations: the Generic Name Support Organization (GNSO) and the National Code Name Support Organization (ccNSO).

ICANN also assigned the responsibility of assigning IP numbers and some DNS functions to five Regional Internet Registries (RIPE NCC, LACNIC, APNIC, ARIN, AfriNIC), who include the Digital Resource Organization.

1. Explain the purpose and relationships between communication protocols, server hardware, operating systems and web server software with regards to designing, publishing and accessing a website.
2. Communication protocols and server hardware:

* Web communication protocol is the technology used to transmit information via the internet. For example, web browsers use these protocols to request information from a web server, which is then displayed on the browser screen as text and images. The extent to which users can interact with that information depends on the protocol.

Some web communication protocols are used:

* Hypertext Transfer Protocol (HTTP)
* Telnet
*  File Transfer Protocol (FTP)
* Hypertext Transfer Protocol Secure (HTTPS)
* IP Security (IPSec)

A program that uses HTTP to serve website creation files for users to respond to their requests sent by their computer's HTTP clients is called the web server. Put simply, a web server is an Internet server that responds to HTTP requests to provide content and services.

* Web server computers have more memory, bigger and faster hard drives, and faster processors than desktop or laptop computers. Hardware and operating system is the key to performance evaluation.

Large e-commerce websites must provide millions of personal websites every day. They also have to process thousands of customer and supplier transactions every day. One approach to web server architecture is called centralized architecture, using a few very big and very fast computers. Another approach is a decentralized architecture, using a large number of servers.

1. Operating systems and web server software:

There are two types of operating systems commonly used for network servers: Windows and Linux / Unix:

* Windows:

If you use the official Microsoft ASP.NET website, MS SQL, or Access database you need to host Windows because those technologies are not available on other platforms. Support for traditional Asp is better on Windows and ColdFusion hosting is most common on Windows servers. On the other hand, Windows servers are more exposed to viruses and hacker attacks. Windows hosting is also more expensive and Windows servers tend to crash a bit more frequently. Windows also occupies more server resources than Linux, resulting in fewer hosting accounts per server and higher price.

* Linux / Unix:

With Linux, you get a stable server platform with high security and no virus threats. Linux is free and doesn't take up as many server resources as Windows, so hosting Linux is cheaper.

You have a good choice of scripting language. The most popular database solution for Linux is MySQL, which is also open source and works very well. And with a great selection of free online resources, Linux hosting is the best choice for most self-taught webmasters and businesses. Although ASP is supported on Linux platforms, it is said to be less stable than on Windows servers.

1. Discuss the capabilities and relationships between front-end and back-end website technologies and explain how these relate to presentation and application layers.

* Briefly, front-end refers to the client side or the web design in the web industry. Back-end refers to the server side.

1. Front-End

What is front-end development? The front-end is everything involved with what the user sees, including design and some languages like HTML and CSS.

There are a lot of different jobs associated with the front-end. Keep in mind that a lot of these titles are subjective, so while front-end developer may mean something at one company, it can mean something completely different at another company.

Here are a few examples of front-end job titles:

* A web designer, you guessed it, designs websites. The job title of web designer is pretty broad, though. A web designer could just be someone who designs the sites in a program like Photoshop or Fireworks and will never touch the code. But in another location, a web designer could do all the design comps in Photoshop, and then be responsible for creating all the HTML and CSS (and sometimes even JavaScript) to go along with it.
* A User Interface (UI) Designer is basically a visual designer and is generally focused on design. They're not usually involved in the implementation of the design, but they might know light HTML and CSS so they can communicate their ideas more effectively to the front-end developers.
* User Experience (UX) designers work in the front-end, studying and researching how people use the sites. Then they make changes through a lot of testing.
* A Front-End Developer or Designer can create a site without any back-end development. The site they would create without a web developer, or using the back-end, is a static site. A static site is something like a site for a restaurant or hair salon. It doesn't require any information to be stored in a database. The pages will almost always stay the same, unless it's time for a redesign. A front-end developer may be required to have a grasp on testing, as well as be well versed in HTML, CSS and JavaScript. This person may or may not have experience with creating the design in a design program. A different version of this title is front-end engineer. People who work with specific front-end languages like JavaScript Developer are also considered front-end developers.

1. back-end

What is back-end web development? The back-end, or the "server-side", is basically how the site works, updates, and changes. This refers to everything the user can't see in the browser, like databases and servers.

Usually people who work on the back-end are called back-end programmers or back-end developers. back-end Developers are mostly worried about things like security, structure, and content management. They usually know and can use languages like HTML and CSS, but it’s not their focus.

Creating a dynamic site requires back-end developers, or at least back-end development. A dynamic site is a site that's constantly changing and updated in real-time. Most sites are dynamic sites, as opposed to static sites. Facebook, Google Maps and this blog are all considered dynamic sites since their content is constantly changing and updating.

A dynamic site requires a database to work properly. All information is stored in the database, like user profiles or images they've uploaded, or blog posts. Web developers work with programming languages like PHP or .Net, since they need to work with something the database understands. The code they write communicates with the server and then tells the browser what to use from the database.

1. Discuss the differences between online website creation tools and custom built sites with regards to design flexibility, performance, functionality, User Experience (UX) and User Interface (UI).

4.1 What is website creation tools (website builder):

website creation tools is a program, or tool, that help you build a website without manual code editing.

Website builders typically feature drag-and-drop software that lets you customize elements on a page with layouts chosen from a handful (and sometimes hundreds) of available web page templates.

* There are several online website creation tools:

Some online website creation tools such as winx, WordPress, etc.

It has additional functions available. You just need to select those functions and add them. Creating a website will not take much time.

4.2 Compare the differences between online website creation tools and custom built sites:

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|  | **Website builder** | **Custom built sites** |
| Flexibility | - Available in many functions, less time consuming  - No custom designs, limited features | - Can custom according to need |
| Performance | - Slow load time  - lack of search engine optimization (SEO) factors | - Fast loading time  - SEO better |
| Functionality | - Easy to use  - Limited by the available functions | - Not limited in functionality |
| User experience (UX) | - Don’t guaranteed 100% good performance on all devices | - Can work well on all devices |
| User interface (UI) | - Based on available templates | - Can custom according to need |

# **References**

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