**Red letters on a black background

Description automatically generated**

**Blogging Website**

**Website Design and Development**

**40201260**

**Y/618/7419**

**Section (2)**

**Submitted by**

Hamza AL-Risheq

**Submitted to**

Eng.Hana AlRasheed

**summer 2022 – 2023**

Table of Contents

[1. DNS 3](#_Toc144848090)

[1.1 The definition of the DNS 3](#_Toc144848091)

[1.2 Types And Purpose Of DNS 3](#_Toc144848092)

[1.3 How Domain Names Are Organised and Managed 4](#_Toc144848093)

[2. Communication Protocols, Server Hardware, Operating System, And Web Server Software 4](#_Toc144848094)

[2.1 Communication Protocols Definition 4](#_Toc144848095)

[2.2 Relationship Between Protocols, Hardware, Operating System, Web Server Software 5](#_Toc144848096)

[2.2.1 Purpose And Relationship 5](#_Toc144848097)

[2.2.2 Relation To Designing, Accessing, and Publishing the Website 6](#_Toc144848098)

[3. Website Development Technologies, Tools, Techniques, And Frameworks 7](#_Toc144848099)

[3.1 Website Development Technologies 7](#_Toc144848100)

[3.1.1 Available Website Technologies 7](#_Toc144848101)

[3.1.2 Technologies Used to Design, Develop and Manage Your Website 8](#_Toc144848102)

[3.2 Website Development Tools 9](#_Toc144848103)

[3.2.1 Available Tools for Website Design and Development 9](#_Toc144848104)

[3.2.2 Tools Used to Design and Develop Your Website 10](#_Toc144848105)

[3.3 Website Development Techniques 10](#_Toc144848106)

[3.3.1 Available Techniques for Website Design and Development 10](#_Toc144848107)

[3.3.2 Techniques Used in Your Website 11](#_Toc144848108)

[3.4 Website Development Frameworks 12](#_Toc144848109)

[3.4.1 Available Frameworks for Website Design and Development 12](#_Toc144848110)

[3.4.2 Frameworks Used in Your Website. 12](#_Toc144848111)

[4. Search Engine Optimization 12](#_Toc144848112)

[4.1 Search Engine Optimization Definition and Purpose 12](#_Toc144848113)

[4.2 Indexing Definition 13](#_Toc144848114)

[4.3 Techniques For Improving the Ranking 13](#_Toc144848115)

[4.4 Evidence For the Used SEO Techniques in Your Website 15](#_Toc144848116)

[5. Front-End And Back-End Website Technologies 16](#_Toc144848117)

[5.1 Front-End And Back-End Definition and Related Technologies. 16](#_Toc144848118)

[5.1.1 Front-End Definition 16](#_Toc144848119)

[5.1.2 Front-End Technologies: 16](#_Toc144848120)

[5.1.3 Back-End Definition 16](#_Toc144848121)

[5.2 Presentation And Application Layers Definition 17](#_Toc144848122)

[5.2.1 Definition of the presentation layer 17](#_Toc144848123)

[5.2.3 Definition of the application layer 17](#_Toc144848124)

[5.2.4 Technologies and Tools Associated with the Application Layer: 17](#_Toc144848125)

[5.3 Relationship 17](#_Toc144848126)

[6. Online Website Creation Tools VS Custom-Built Websites 18](#_Toc144848127)

[6.1 Online Website Creation Tools 18](#_Toc144848128)

[6.1.1 Definition of online website creation tools 18](#_Toc144848129)

[6.1.2 Advantages of these tools 18](#_Toc144848130)

[6.1.4 Disadvantages of these tools 18](#_Toc144848131)

[6.2 Custom-Built Websites 19](#_Toc144848132)

[6.2.1 Definition of custom-built websites 19](#_Toc144848133)

[6.2.2 Advantages of custom-built websites 19](#_Toc144848134)

[6.2.3 Disadvantages of custom-built websites 20](#_Toc144848135)

[6.3 Comparison With Regards to Design Flexibility, Performance, Functionality, User Experience (UX) And User Interface (UI). 20](#_Toc144848136)

[7. Design And Development Process 21](#_Toc144848137)

[7.1 Website Vs. Design Document 21](#_Toc144848138)

[7.2 Evaluation and Analysis 22](#_Toc144848139)

[References 23](#_Toc144848140)

# DNS

## The definition of the DNS

Definition of DNS: Domain Name System is the process of converting domain names to IP addresses, which browsers use to load websites. People may enter common phrases into their browsers, like Fortinet.com, thanks to DNS servers, saving them from having to remember the IP addresses of every website.

The main purpose of DNS: The major function of DNS is to convert readable by humans domain names into readable by machines IP addresses, which computers use to identify and interact with one another. This procedure is crucial because, unlike humans, computers and networks utilize IP addresses to identify specific resources on the internet, but humans find it easier to remember domain names.

## Types And Purpose Of DNS

Types of DNS: Each sort of server in the DNS system plays a specific part in the process of converting domain names to IP addresses and vice versa. The main types of DNS servers are as follows:

• Recursive DNS resolver: In a recursive DNS lookup, one DNS server interacts with a number of additional DNS servers to locate an IP address and provide it to the client. Contrast this with an iterative DNS query, when the client speaks with each DNS server participating in the lookup directly. Although this is a pretty technical description, it should become clearer after looking more closely at the DNS system and the distinction between recursion and iteration.

• Root DNS server: Root server is the top-level DNS servers, and its situated at the DNS hierarchy's root level. Worldwide, there are 13 sets of root nameservers, denoted by the letters A through M. These servers store information about the authoritative nameservers in charge of top-level domain (TLD) extensions like.com,.org,.net, etc., but they are unaware of the IP addresses of specific domains.

• TLD DNS server: A TLD nameserver keeps track of data for all domain names that have the same domain extension, such as.com,.net, or whatever follows the last dot in a URL. For instance, a.com TLD nameserver stores data for each website whose domain name ends in '.com'. After receiving a response from a root nameserver, a recursive resolver would submit a query to a.com TLD nameserver in the case of a user looking for google.com, and that nameserver would respond by referring to the authoritative nameserver (see below) for that domain. The task of controlling TLD nameservers falls within the purview of the Internet Assigned Numbers Authority (IANA), a division of ICANN.

• Authoritative DNS server: Recursive DNS nameservers must receive information from authoritative DNS nameservers regarding the whereabouts of certain websites. These responses include crucial details for each domain, such as IP addresses.

## How Domain Names Are Organised and Managed

* Domain Name Hierarchy: The DNS system is organized in a hierarchical manner, resembling a tree. A single dot (.) serves as the tree's root, from which top-level domains (TLDs), second-level domains (SLDs), and subdomains sprout. A dot separates each level of the hierarchy from the next. For instance:

O Top-level domains, such as.com,.org, and.edu.

O Second-level domains include mywebsite.net, and example.com.

O Subdomains include subwebsite.example.com and subdomain.example.com.

* + ICANN: Domain names are registered with the Internet Corporation for Assigned Names and Numbers, or ICANN. ICANN will thus be responsible for monitoring how these names are used. The distribution of IP addresses is involved.
  + DNS Zone Files: There are corresponding DNS zone files for each domain name. These files include DNS records like A (Address) records for domain name to IP address mapping, CNAME (Canonical Name) entries for domain aliasing, MX (Mail Exchange) records for email routing, and more. These zone files are kept by the domain's authoritative nameservers, who also reply to DNS requests for that domain.

# Communication Protocols, Server Hardware, Operating System, And Web Server Software

## Communication Protocols Definition

Definition communication protocols: A set of official rules outlining how to send or exchange data, particularly across a network, is known as a communications protocol. A communications protocol that has been standardized is one that has been codified as a standard. DNS, the Internet Protocol IP, and the Hypertext Transfer Protocol secure (HTTPs) are a few examples of these.

Some of the communication protocols:

* HTTPS (Hypertext transfer protocol secure): Every communication between a web browser (the client) and a server is encrypted. The right display of online pages, the safe transmission of form input, as well as a number of other crucial surfing-related functions—these are the goals of this communication.
* HTTP (Hypertext transfer protocol): HTTP is a communication protocol used to link to Web servers on the Internet or, in the case of an intranet, servers on a local network. Creating a connection with the server and returning HTML pages to the user's browser is the main purpose of HTTP.
* FTP (File transfer protocol): is a common network protocol used to move files between hosts over a TCP-based network, such the Internet.
* TCP/IP (Transmission Control Protocol/ Internet Protocol): Its primary objective is to transmit data packets between the source application or device and the destination utilizing structures and methods that embed tags, such as address information, inside data packets.

## Relationship Between Protocols, Hardware, Operating System, Web Server Software

## Purpose And Relationship

* Server Hardware: server hardware is the physical infrastructure that’s work with software’s to do a specific job. Server hardware consists of main parts such as processors, random access memory (RAM), storage devices, power sources, and network interfaces. The choice of the hardware components based on the website is expected to depend on the performance standards, and the kinds of applications or services that it must support all influence the server hardware selection.
* Operating System: is the software used to manage server hardware and provide the best possible user and application experience. The operating system controls every app and software on the server. Also, the apps communicate with the operating system using a specified application program interface (API) to seek services. Using a user interface like a command-line interface (CLI) or graphical user interface (GUI), users may also communicate with the operating system directly. Operating systems like Windows, Linux, and CentOS are among the options.
* Web server Software: there is much software that can be installed on the web server to do the main functionality of the websites and to interact with clients. There are many types of these software’s such as HTTP, and HTTPS. HTTP, and HTTPs help to communicate between the web server and clients and to transfer data between user's web browser and a website server. Overall, the fundamental function of web server software is to manage incoming requests, retrieve the requested data from the server's file system or databases, and return the necessary responses via HTTPs to the clients.

The smooth transmission of web content and services for customers drives the harmonious interaction of protocols, hardware, operating systems, and web server software. While hardware supplies the physical infrastructure, such as CPUs, RAM, storage, and networking components, necessary for processing and serving data, protocols like HTTP and HTTPS create the rules of communication. By controlling hardware resources and providing a reliable foundation for program interaction through defined APIs, the operating system serves as a critical middleman. With the ability to manage client requests, retrieve material, and create answers via the HTTP and HTTPS protocols, web server software is at the forefront of user involvement. The distribution of material is made effective, secure, and trustworthy because to this synergy.

We can say that the connection between clients and servers is orchestrated by web server software, with hardware providing the basis, an operating system guaranteeing stability, and protocols facilitating organized communication, which together create the backbone of the digital world. By balancing these crucial elements, the ultimate objective is to provide users with a smooth, responsive, and enjoyable online experience.

## Relation To Designing, Accessing, and Publishing the Website

**Designing and publishing a website:** There are seven steps involved in developing, designing, and publishing a website: deciding how to publish your website; selecting a domain name; selecting a web hosting company; and developing, designing, and publishing your website's content. Developers create websites using a variety of computer languages, including HTML, CSS, PHP, and others. The completed website will be uploaded to a server. We may offer the website to the customers by combining the web server hardware and software.

**Accessing the website:** as client to access the website all I need to do is to write the domain name of the website in the search bar in a browser but how we really access the website. By the combination between the communication protocols, web server hardware and software the user will be able to access the website. There are two main protocols that are used to access the website DNS, and HTTPs.

**How does the HTTPs work:**

* A web browser sends an HTTPS request to the web server.
* Then the web server software receives the request, processes it, and retrieves the requested web page's content from its databases or storage.
* The requested web page's data is then sent back to the user's browser over HTTP from the web server.

# Website Development Technologies, Tools, Techniques, And Frameworks

## Website Development Technologies

## Available Website Technologies

The website technologies are dived to two-part front-end technologies and back-end technologies:

* Front-End technologies: there are many available technologies that can be used in front-end, and I will mention some of them:
  + HTML (Hypertext Markup Language): it’s the technology that used to give the pages their structure we can say it’s the skeleton of the website. So, we can say that web pages' structure is decided by HTML. It takes more than just this structure to create an appealing and engaging web page.
  + CSS (Cascading Style Sheet): it’s a technology that used to give the pages their style. So, we can say it’s the skin that covers the skeleton and give it the good shape. Separate from the actual content, CSS style sheets can specify how text, tables, and other components should look and be formatted. Styles can be found in the HTML code of a webpage or in a different document that is referred to by several webpages. Using CSS, web designers may give a website a consistent appearance throughout.
  + JS (JavaScript): is a scripting language that enables the implementation of complex features on web pages. You can bet that JavaScript is used whenever a web page does anything other than simply sit there and display static information for you to look at. Examples include the display of timely content updates, interactive maps, animated 2D/3D graphics, scrolling video jukeboxes, etc. It is the third tier of the layer cake made up of common web technologies, the first two (HTML and CSS) of which we have already examined in great depth in other sections of the Learning Area. We can say that JS is the breathing, digestive, and circulatory systems are what provide life to the structure and the skin.
* Back-End technologies:
  + PHP (Personal Homepage): it’s a widely used open-source server-side scripting language for web development. One of the most important languages that connect the servers-side with the user-side (back-end with front-end). PHP may run on any operating system. (Cross-PlateForm) It operates on all platforms, including Mac, Linux, and Windows so you don't need a specific OS to utilize it. Everyone who wishes to expand upon the original code has access to it (Open source). All databases, both relational and non-relational, may be connected to PHP with ease. As result of that it can quickly establish a connection to any database, including MySQL, MongoDB, etc.
  + Python: it is an analysed, object-oriented, high-level, dynamically semantic programming language. It is particularly desirable for Rapid Application Development as well as for usage as a scripting or glue language to tie existing components together due to its high-level built-in data structures, dynamic typing, and dynamic binding. One of the main languages that is used for the server side. It is easy to learn and understand because it’s a high-level programming language.
  + MySQL: it’ s an Oracle-developed relational database management system (RDBMS) built on the structured query language (SQL). It’s a language that used for building the database on the server-side (back-end). A systematic collection of data is called a database. Since MySQL's open-source nature, dependability, and broad feature set, as well as continued development and support from Oracle, it is used as the backend by a number of big websites, including Facebook, Twitter, and YouTube.
  + Java: it’s a popular programming language for the back-end technologies. It is a network-centric, multi-platform, object-oriented language that may also be used as a platform by itself. It is a safe, quick and dependable programming language for creating everything from big data applications to server-side technologies to mobile apps and corporate software.

## Technologies Used to Design, Develop and Manage Your Website

* + - * For the front-end I used:
        + HTML to build the structure of the pages.
        + CSS to give the pages style and attracted skin.
        + JS to be able to use the event-driven feature.
      * For the back-end (Server-Side) I used:
        + PHP.
      * For database I used:
        + MySQL.

## Website Development Tools

Website development tools are an important thing and essential to build the website, because it helps the website developer and gives him a good place or area to build and design the website. Also, these tools give the developer the area to write their codes. As result, these tools enhance the performance, speed, and efficiency of the website.

## Available Tools for Website Design and Development

These tools are separated based on their functions (How they can be used):

* IDE: It’s a tool that gives the developer a platform to write and edit code as the text editor but with a huge number of features and helping tools.
  + VSCode (Visual Studio Code).
  + Eclipse.
  + Atom.
  + JetBrains WebStorm.
* Graphic Design tools: These tools help the developer to create their first design and visual representation of how the website will look so they will be able to understand how the website will work and what it looks like.
  + Figma.
  + Canva.
  + Adobe Photoshop.
  + Adobe color.
* Database Management: is software that enables and provides a platform, for the developers to programme, store, organize, access, query, and alter data within their database. It’s the backbone for many applications, because it enables smooth data interaction and promoting well-informed choices.
  + Xampp.
  + PhpMyAdmin.
  + Apache Server.
* Learning tools: helping in learning different types of knowledge that can help me to build and improve my website.
  + Get hub.
  + Google browser.
  + Opera search engine (browser).
* GSC (Google Search Console): is a free tool that aims to keep tracking of the SEO health and search engine performance of your website.

## Tools Used to Design and Develop Your Website

* IDE:
  + VSCode.
* Graphic design:
  + Figma.
  + Adobe Color.
  + Canva.
* Learning:
  + Opera search engine
  + Gethub.
* GSC.
* Database management:
  + Xampp.
  + PhpMyAdmin.
  + Apache server.

## Website Development Techniques

## Available Techniques for Website Design and Development

In the world of website design and development, we've got quite cool techniques to develop our websites. These techniques help us to design websites that not only work like a charm but also look fantastic. Let's dive into some of the common and accessible techniques:

* Mobile-first: In the "Mobile-First" technique, its aim to focus on meeting the needs of mobile users, ensuring that the website functions effectively and is user-friendly on small screens. It prioritizes simplicity, efficiency, and allowing the site to adapt smoothly to various screen sizes and devices. This technique results in faster page loading, enhanced mobile user experiences, and often leads to a more straightforward and user-centric website.
* Responsive Web Design (RWD): it is one of the most important techniques that used in web development. It adjusts the website's appearance dynamically based on the screen size and orientation of the device being used to access it. RWD is a solution to the challenge of designing for a wide array of consumer devices, ranging from small smartphones to large desktop monitors. To determine how a website will be structured, RWD relies on what are known as "breakpoints."
* Media Query: it allows the developers to apply CSS styles based on the type of device such as print, screen, or specific features like screen resolution and browser viewport width. These queries check various criteria such as screen dimensions, height, device orientation, portrait or landscape, screen resolution, and even features like touch input availability using conditional expressions. When a condition specified in the media query is met, the associated CSS rules are applied, enabling designers to customize a webpage's look and layout for different devices and situations. This flexibility ensures a consistent and user-friendly experience across various devices.
* Color palette: it’s a coloring technique aims to determine which colors must be used in the website. It is used in the website design to give the website a friendly, and attractive look.
* Grid and flex: CSS Grid serves the purpose of creating two-dimensional layouts, allowing developers to structure content in both rows and columns. On the other hand, Flexbox is tailored for one-dimensional layouts, primarily focusing on arranging elements in either a row or a column. Flexbox shines when it comes to aligning and distributing space among elements within a container. It's perfect for situations where you need to manage the arrangement of items that may vary in size. CSS Grid, however, is the go-to choose for crafting intricate layouts based on a grid structure. It provides robust control over rows, columns, and item placement within the grid. In many cases, web developers use these layout tools together to harness their complementary features and create adaptable and versatile designs. The decision on which framework to employ depends on the specific layout demands of the project at hand.
* Early testing: is a valuable technique that involves thoroughly testing each component or section of the website immediately after its completion, before moving on to the next part. This proactive approach is essential for identifying and rectifying errors and unexpected issues promptly, minimizing the accumulation of problems that could potentially disrupt the project later on.
* Percentage /em/rem instead of fixed units: because the fixed units will not be adaptive with different screen sizes.
* Semantic tags: HTML elements that give the developers information about the organization and content of a web page. Semantic HTML tags, as opposed to non-semantic or generic HTML elements, like div and span, give context and clarity about their intended use.

## 3.3.2 Techniques Used in Your Website

* Responsive Web Design.
* Media Query.
* Color palette.
* Grid and flex.
* Early testing.
* Percentage /em/rem instead of fixed units.
* Semantic tags.

## Website Development Frameworks

## Available Frameworks for Website Design and Development

* Front-End Frameworks: are collections of written code that give the developers a scalable and maintainable framework for more quickly developing user interfaces. Developers can take ideas and reuse parts of the HTML, CSS, and JavaScript components in the front-end frameworks within their website.
  + React
  + Vue.js
  + Bootstrap
* Back-End Frameworks: is a collection of tools and modules that aid in developing a website's architecture. Most of these frameworks are focused on the scripting languages like Ruby or JavaScript or compiled languages like Java, C#, etc. As results these frameworks help the developers to get a good start to build their website rather than building everything from scratch.
  + Ruby on Rails
  + Django.
  + Laravel.

## Frameworks Used in Your Website.

Nothing.

# Search Engine Optimization

## Search Engine Optimization Definition and Purpose

The main process of SEO is to improve the website's visibility and ranking in search engine results pages. By making the website more relevant and appealing to search engines like Google, Opera, and Firfox. SEO primarily aims to boost the unpaid traffic to that website. The SEO contains a variety of tactics and techniques to increase the website's online exposure and increase the likelihood that your website will show up in the top search results when pertinent keywords or phrases are entered in. As a result, if your sites are more noticeable and well-known in search results, they are more likely to be found and clicked on. So, the objective of search engine optimization is to encourage visitors to return to your website or become customers. Which will affect your website interest because of the numbers of the new visitors that visit your website.

So, the main purpose of the SEO is to enhance the likelihood that people will find the website when they conduct relevant keyword or subject searches.

## Indexing Definition

Website indexation is the process through which a search engine adds online material to its index. It refers to the method of classifying and arranging web information so that it may be accurately and rapidly accessed in response to user search queries. It contains compiling data on the numerous websites accessible over the internet into an orderly database, sometimes referred to as an index. Based on the terms or phrases users submit, search engines may swiftly identify and provide relevant search results to them thanks to this index.

This is accomplished through search engines "crawling" webpages in search of relevant keywords, metadata, and other signals that determine how and where to rank content. Websites that are indexed have to have an intuitive, discoverable, and understandable content approach. Also, Web indexes assist users in finding information by a range of keywords and compile data by a certain subject. Web indexes are hypertext links that are directly connected to the content of the web page itself rather than page numbers.

## Techniques For Improving the Ranking

* Keep up with the SEO Standards: Keep up with the most recent changes to the algorithms and best practices for SEO. Maintaining the most recent upgrades may assist guarantee that your website maintains its competitiveness and good search engine results positioning. You may increase your website's traffic and search engine rating by putting these methods into practice. In order to get effective results, SEO requires a long-term commitment of time and work. It's important to be persistent and pick your SEO tactics carefully. The outcomes may not be apparent right away, but they are certain. Be persistent and patient as you work to increase the SEO of your website. A company may improve its search engine position by putting these SEO methods into practice.
* Use social media: with this recognizable improvement of social media and their affects on our lives. I see that one of the most important and fast ways to improve the reach and the ranking of your website is marketing your website in social media.
* Optimize your website's content, titles, meta descriptions, and headers with the use of important keywords and phrases. This aids search engines in comprehending the subject matter and applicability of your material to user searches.
* Quality material: Produce compelling, insightful, and high-quality material that speaks to the wants and desires of your target market. Unique ideas, answers, or information are more likely to be shared and linked to, which raises the rating of the content they include.
* Build your website to be able to fit all the platforms so you will be able to cover larger number of customers which will increases your rank.
* With the fast life we live the customers do not like to wait so one of the best ways to improve your rank is by making your website load faster by caching data, applying image optimization techniques, and using a reputable hosting company. Pages that load more quickly benefit users and are recommended by search engines.
* Backlinks As we get into the more technical aspects of things, obtaining backlinks is a critical component of SEO effectiveness. This occurs when a blog post or article on another website connects to yours. This not only helps you increase your domain authority, but it also directly increases the likelihood that visitors will click through to your website if it appears on other trustworthy domains.
* User experience (UX) as a priority: Nothing is more frustrating than trying to utilize a website that you can hardly use. In reality, most individuals give up after more than a few seconds of annoyance, and Google will struggle to make the most of it as well. Dead links, error pages, and disorganized site architecture all affect the impression visitors get of your website. So, it will affect your rank when you build a perfect good experience for the user, you will leave an good impression on his mind so he will come again for you.
* Marketing is one of the most prevalent strategies to enhance your website's ranking. This involves promoting your website through various means, including social media platforms, collaborating with other websites, and optimizing your presence in search engine results. Marketing efforts help raise awareness about your website, attract more visitors, and ultimately boost its visibility and credibility.
* Off-page SEO is equivalent to actions you take outside of your website to increase its reputation, rank, and trustworthiness online. The main actions here include things like establishing links to your website from other websites and making sure you have a strong online presence.

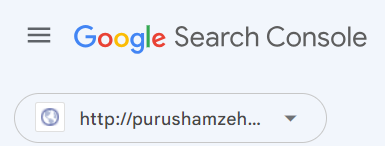
## Evidence For the Used SEO Techniques in Your Website

Here I used meta keywords, description, and robust in the home page and the aboutus page.

Then I used the GSC to analyize and to track my website ranking I created by following these step:

* I went to this page <https://search.google.com/search-console/about>
* I pressed on start.
* Then I created account on google analytics.
* Then I chose to put the url for my website.
* After that I uploaded the verifaction file.
* I went to the control panel that controls my website.
* I uploaded the verifaction file.
* Then I reentered the url link in the same box that I entered in it to get the verifaction file.

In the end I got an file in GSC so I can track my website rank which will help me to know and analyze how to improve my website.



# Front-End And Back-End Website Technologies

## Front-End And Back-End Definition and Related Technologies.

### 5.1.1 Front-End Definition

Is the user interface and interactions that users will view and interact with directly. Also, the front end known as the client-side. From the style and design to the animations and user interactions, it includes everything a user encounters in a web application. The visual aspects are rendered via front-end technologies, which also encourage user interaction. The goal of front-end developers is to create an interface that is both aesthetically pleasing and intuitive to use. Let’s assume that you've opened a website via a browser to check the weather or read through the day's news on a website, everything you see, feel, and interact with it is the front end. Simply put, the front end is the result of combining two distinct components: visual design (the appearance) and user interface (the feel).

### 5.1.2 Front-End Technologies:

* The structure and content of web pages are defined by HTML (Hypertext Markup Language).
* CSS (Cascading Style Sheets): Manages how web pages are presented and are laid out.
* JavaScript: Enhances web sites' interactivity and dynamic behavior.

### 5.1.3 Back-End Definition

The back end is the server-side, manages the background processes that fuel the front-end. It consists of the server, database, and application logic that manages user accounts, processes, stores data, and carries out different computing operations. The Back-End developers make sure that data is safely saved and processed quickly in order to provide the Front-End with the necessary capabilities. The part of a website that users cannot view is also called the back end. It responds to user requests by passing data from the back end to the front end so that it may be displayed. It is the beating heart or the churning motor of a website. Servers, databases, operating systems, and other components make up a website's back end and work together to guarantee that users receive the right information as rapidly as possible.

5.1.4 Back-End Technologies:

* Server-Side Languages: Such as Python, Ruby, Java, Node.js, PHP, etc.
* Databases, which are used to store and manage data and include MySQL, PostgreSQL, and MongoDB.
* Server management entails establishing (configuring) and maintaining the server infrastructure.
* Security: Putting policies and software’s to safeguard data and stop illegal (unauthorized) access and attacks.

## Presentation And Application Layers Definition

### 5.2.1 Definition of the presentation layer

User interface and UI process components that facilitate system interaction make up the presentation layer, which is available to users via a browser. So, it known as the user interface layer. Additionally, it is in charge of how users are shown the visual components and interactions. Customers can view and interact with this portion of the application. The primary goal of the Presentation Layer is to deliver a user interface that is engaging and visually beautiful so that users can interact with the program's features and functions.

5.2.2 Technologies and Tools Associated with the Presentation Layer:

* HTML.
* CSS.
* JavaScript.
* Front-End frameworks like React, Angular, and Vue.js for building complex UIs.
* Tools for designing user interfaces (UIs) that are visually attractive.

### 5.2.3 Definition of the application layer

The processing and administration of the program's essential features are handled by the application layer, and it known as business logic layer. Between the Presentation Layer and the Data Layer (database), it serves as a bridge. The logic and regulations governing how data is processed, verified, and altered in response to user interactions are included in the application layer. Additionally, it is used to regulate user and database interactions. It receives requests from the client side, sends them to the databases, and then sends the requested requests back to the display layer after receiving the required answer.

### 5.2.4 Technologies and Tools Associated with the Application Layer:

* Server-side programming languages like Python, Ruby, Java, and PHP.
* Back-End frameworks such as Express (for Node.js), Ruby on Rails, Django (for Python).
* Components of business logic that manage certain application features.

## Relationship

For a smooth user experience, the Presentation Layer and the Application Layer collaborate closely in an integrative way. So, the application layer receives user input and information converts it into meaningful actions, then the presentation layer manages the visual representation and user interactions. The user is finally provided with the intended functionality and experience thanks to the collaboration between the two levels. Which make sure that the user's interactions are converted into the proper business logic and data activities. As result, of the relationship between these two layers the user will get the best experience and feeling when she\he opens the website.

# Online Website Creation Tools VS Custom-Built Websites

## Online Website Creation Tools

### Definition of online website creation tools

Online website creation tools help to build a website without having any coding knowledge. Independent contractors, small business owners, and anybody else who wants to construct a website quickly and inexpensively can choose this simple alternative. These feature a user-friendly drag-and-drop interface that offers a ton of flexibility and customizability. This page explains what website builders are, how to use them, and what features they provide. Users may design, modify, and publish websites using these tools' simple user interfaces without needing to know complex coding. Using a number of tools and templates at their disposal, users may create appealing, practical websites that meet their needs.

### Advantages of these tools

* Less Cost: Because you don't need to pay for a web designer with some knowledge of designing you will be able to create a website.
* Everything you need is included in one package to develop a website: Numerous website builders also provide domain and hosting services. It indicates that the website builder has completely met all of your needs for your website. The benefit of this is that you won't have to manage and pay individually for two or three platforms in order to build and maintain your website. You may obtain everything with a single website bundle or plan if you use a website builder instead.
* program Installation Is Not Necessary: Online website builders work within web browsers, negating the requirement for program installation on your PC. This also makes it possible for team members to collaborate regardless of where they are located.
* Usefulness: The user-friendly interface of online website construction tools is one of its most important benefits. They are created with simplicity in mind, making it possible for anyone with no coding experience to construct websites.

### Disadvantages of these tools

* Less Control Over Code: Because online website builders give users less control over the underlying code, users who are knowledgeable with coding may find them restricting. Implementing custom features or functionality might be difficult.
* Scalability Restrictions: Complex or quickly expanding websites may not be a good fit for some website builders. The chosen platform may not be able to meet the website's demands as they change.
* Investment and liability for something you don't own: To utilize the website online builder and receive savings, the cost is calculated on a monthly basis, or you must purchase a monthly package. But you must pay extra for the premium functionality. To make specific adjustments to the website in accordance with demand, you must also engage a web developer or website building professional. It denotes a price. It is comparable to the business owner paying rent every month. What are the benefits of doing business online, then? Internet access is cost-free.

## Custom-Built Websites

### Definition of custom-built websites

A custom-built is website that has been individually designed, developed, and created to meet the needs, preferences, and goals of a particular person, or business. Custom-built website is created from the scratch by website developers with experience in coding, designing, and creating websites, as opposed to using pre-designed templates or website builders. As a result, the website developer must completely code every component of the website.

### Advantages of custom-built websites

* Scalability: When the company expands, these customized websites are readily scalable to handle more traffic, content, and features without requiring substantial updates.
* Flexibility and functionality: By integrating unique features and functions that may not be included in off-the-shelf alternatives, custom websites improve user experience and engagement.
* Unique Design: Custom-built websites allow for a unique design that distinguishes you from rivals and builds user recognition and a strong brand identification.
* Before going live, custom websites are thoroughly tested: This is excellent for ensuring that your website functions properly and is accessible to all browsers. Your website's capabilities and any required software integration will also be evaluated to make sure everything is operating properly.
* Security: Specialized security measures can be used in custom-built websites to lessen vulnerabilities and the danger of hacking.
* You have complete ownership and control over the code, design, and data, which makes it simpler to make upgrades and adjustments to suit your needs.

### Disadvantages of custom-built websites

* Higher Cost: Building a customized website needs more time, work, and knowledge, thus it is typically more expensive than utilizing website builders or pre-designed templates.
* Technical Knowledge Required: To build a customized website, you'll need to have a strong understanding of web development, coding languages, and design. To do this, you might need to hire knowledgeable specialists.
* Maintenance Obstacles: Managing the full codebase makes ongoing maintenance more difficult. Technical assistance or ongoing developer engagement may be needed for this.
* Development Time: Compared to utilizing pre-existing solutions, employing custom-built websites sometimes requires lengthier development periods due to the unique nature of the project. Which it might cost a potential delays because unexpected difficulties or complications during development may cause project delays, which may affect the anticipated launch date.

## Comparison With Regards to Design Flexibility, Performance, Functionality, User Experience (UX) And User Interface (UI).

|  |  |  |
| --- | --- | --- |
| Areas of comparison | Custom-Built Website | Online Website Creation Tools |
| Design Flexibility | Designers have total control over every visual element of the website, they create a custom design that exactly matches the brand's identity. | Limitation in producing really original designs. Users are limited to the modification possibilities and pre-designed layouts (templates) offered by the platform. |
| Performance | Because of the full control of the code and design. So, This will lead to quicker loading times, more effective resource usage, and an improved user experience. | Because the website is built by using tools that you do not know how it built. Some tools focus on speed optimization, others could produce bloated code or limit the possibilities for optimization, which could have an impact on loading times and user experience. (So, it will affect the performance negatively). |
| Functionality | Customized website will incorporate particular elements and features made to meet the demands of the website. This covers distinctive exchanges, intricate data structures, and service connections. | These tools offer fixed templates of limited designs. So, they will not be adaptable enough to support highly specific capabilities. Users are only able to use the functions that the platform offers. (which will affect the functionality negatively). |
| User Experience (UX) | The user experience is customized based on your code and design to control it. Your UX can be the best or the worst based on your coding and designs. | The user experience is controlled by the tools that you use so you will not be able to control it or handle it so maybe it will be a good experience or bad one. |
| User Interface (UI) | Since the developer controls the design, you are not constrained and may create whatever you want. | Your options for designing and creating the interface are constrained by the tools available. |
| Cost | Higher Cost. | Less Cost. |
| Time | More time. | Less Time. |

# Design And Development Process

## Website Vs. Design Document

Alright., let's talk about the difference between a 'Design Document' and a 'Website.' Imagine the Design Document as the master plan for your website – it's like the blueprint for how your website will look and function. It's a detailed guide that covers everything from the site's structure and features to how it will be used by people. This document is super important because it helps everyone involved – the developers, designers., stakeholders, and team members – understand how to create the final product. These days, Design Documents really focus on making sure the website is user-friendly and has a great overall look and feel (UI/UX)., They include things like technical specs,, prototypes., and more to give a clear roadmap for meeting the website's goals.

Now, on the other hand, we have the 'Website' itself. This is the living, breathing online platform that comes to life based on what's laid out in the Design Document. It's like the virtual space where businesses, individuals, or organizations can share stuff with a big audience. A website is made up of lots of connected web pages all under one domain name. Think of it like a digital store – it's where people can come to browse, buy things, or get information.

To break it down, the Design Document is the planning phase, while the Website is the real deal – the actual online space where things happen. The Design Document guides how the Website will look and work, ensuring that the user experience is top-notch. For example, if you wanted to create an online store., the Design Document would outline how the store should look, what features it should have, and how customers will navigate it. The Website, in this case., is where customers can actually shop for products..

## Evaluation and Analysis

Creating a web-based project demands a comprehensive approach, involving a range of technical, design, and usability considerations. When assessing my web application, I undertake a thorough evaluation of its core functionalities, user experience, visual appeal, and overall effectiveness. This analysis aims to provide insights into the strengths, weaknesses., and areas for potential enhancement within my project.

To begin with, let's delve into the functionality of the website. It is crucial to ensure that its features align with the outlined requirements. Fortunately, the website offers a robust set of functions., including user authentication (login and signup), blog management (adding, deleting, and editing), and blog viewing. Importantly, these features function seamlessly, meeting the objectives defined in the project scenario without significant errors or issues.

Moving on to the user experience (UX) and user interface (UI), the website has undergone meticulous design.. It incorporates responsive design principles, a harmonious color scheme, engaging visuals, and interactive elements. These components come together to create an exceptional user experience and an aesthetically pleasing user interface., Users are greeted with an engaging, user-friendly environment that enhances their interaction with the site..

Performance is another crucial aspect of the evaluation. Leveraging appropriate tools and technologies, the code demonstrates commendable performance. While there's room for improvement through the use of more robust tools, considering the limited resources, the code's performance can be considered excellent. It remains responsive., ensuring a smooth user experience, even under resource-constrained conditions.

Security is always a paramount concern. To enhance the code's security, various measures have been implemented. These include adhering to secure coding practices such as using POST requests, employing try-catch blocks for error handling, modularizing the code., and maintaining code backups. While there is room for enhancement, these measures collectively strengthen the code's security and safeguard its availability.,

Lastly, regarding cross-platform compatibility, the website prioritizes responsiveness. Whether users are accessing it from a desktop computer, cell phone, or any other device., they can do so seamlessly without encountering errors or an unfriendly interface. This achievement is a result of the techniques employed to ensure that the website caters to all users and customers.,

Of course, like any website in development, ours is not exempt from having its fair share of bugs, issues, and limitations. These shortcomings are a result of constraints such as limited time., resources, and experience. Nevertheless, we remain committed to continuously improving and enhancing the website to provide the best possible user experience.

# References

Denis. (2021). How are domain names organized and managed? iNET Systems. <https://blog.inetsystems.com/faq/how-are-domain-names-organized-and-managed> (Accessed: 25 July 2023).

Bellon, L. (2023). What is the difference between authoritative and recursive DNS nameservers? Cisco Umbrella. <https://umbrella.cisco.com/blog/what-is-the-difference-between-authoritative-and-recursive-dns-nameservers#:~:text=Authoritative%20DNS%20nameservers%20are%20responsible,each%20domain%2C%20like%20IP%20addresses> (Accessed: 25 July 2023).

‌Cloudflare. n.d. “DNS server types| Cloudflare.” <https://www.cloudflare.com/learning/dns/what-is-recursive-dns/> (Accessed: 25 July 2023).

Cloudflare. DNS server types | Available at: <https://www.cloudflare.com/learning/dns/dns-server-types/> (Accessed: 25 July 2023).

Mailchimp. (n.d.). *7 Steps for Publishing a Website*. [online] Available at: https://mailchimp.com/resources/how-to-publish-a-website/. (Accessed: 25 July 2023).

Awati, R. (2022). *What is Hypertext Transfer Protocol Secure (HTTPS)?* [online] SearchSoftwareQuality. Available at: https://www.techtarget.com/searchsoftwarequality/definition/HTTPS. (Accessed: 26 July 2023).

Bigelow, S. (2021). *What is an Operating System (OS)? Definition, Types and Examples*. [online] WhatIs.com. Available at: https://www.techtarget.com/whatis/definition/operating-system-OS. (Accessed: 26 July 2023).

Law Insider. (n.d.). *Server Hardware Definition*. [online] Available at: https://www.lawinsider.com/dictionary/server-hardware. (Accessed: 26 July 2023).

ARDC. (2020, May 24). *Standardised Communications Protocols* [Review of *Standardised Communications Protocols*]. Https://Ardc.edu.au; ARDC. https://ardc.edu.au/resource/standardised-communications-protocols/#:~:text=A%20communications%20protocol%20is%20a,been%20codified%20as%20a%20standard. (Accessed: 26 July 2023).

www.microsoftpressstore.com. (n.d.). Discovering the Domain Architecture | Microsoft Press Store. [online] Available at: https://www.microsoftpressstore.com/articles/article.aspx?p=2248811&seqNum=4 (Accessed: 26 July 2023).

‌altexsoft (2019). *Web Application Architecture: How the Web Works*. [online] AltexSoft. Available at: https://www.altexsoft.com/blog/engineering/web-application-architecture-how-the-web-works/. (Accessed: 26 August 2023).

inoxoft.com. (2020). *How to Design a Web Application Architecture: Components, Models and Types | Inoxoft*. [online] Available at: https://inoxoft.com/blog/web-application-architecture-components-models-and-types/#:~:text=The%20application%20layer%27s%20function%20is (Accessed: 26 August 2023).

e-tutes.com. (n.d.). *Session, Presentation, and Application Layers - Computer Network Tutorial*. [online] Available at: https://e-tutes.com/lesson2/session-presentation-and-application-layers/#:~:text=The%20Application%20Layer%20(which%20is (Accessed: 26 August 2023).

Singla, A. (2021, July 5). *Presentation Layer in OSI model*. GeeksforGeeks. https://www.geeksforgeeks.org/presentation-layer-in-osi-model/ (Accessed: 26 August 2023).

airfocus.com. (n.d.). *What Is A Back End (In A Website)?* [online] Available at: https://airfocus.com/glossary/what-is-a-back-end/ (Accessed: 26 August 2023).

*What is a Front End (In a Website) - Definition & Development*. (n.d.). Airfocus.com. https://airfocus.com/glossary/what-is-a-front-end/ (Accessed: 26 August 2023).

Anon, (n.d.). *The Pros and Cons of Custom Websites - Freelance Full Stack Developer in London, UK*. [online] Available at: https://www.green-box.co.uk/the-pros-and-cons-of-custom-websites/ (Accessed: 26 August 2023).

*What is a custom website? What do they cost and do you need one? - Vemo Media*. (n.d.). https://vemomedia.com/en/blog/what-is-custom-website/ (Accessed: 26 August 2023).

Hoory, L. (2022, December 8). *What Is A Website Builder? All You Need To Know*. Forbes Advisor UK. https://www.forbes.com/uk/advisor/business/software/what-is-a-website-builder/ (Accessed: 26 August 2023).

Bhujwala, A. (2019). *Benefits of Using a Website Builder*. [online] Constant Contact. Available at: https://www.constantcontact.com/blog/benefits-of-using-a-website-builder/ (Accessed: 26 August 2023).

Fortinet. (n.d.). *What is TCP/IP in Networking?* [online] Available at: https://www.fortinet.com/resources/cyberglossary/tcp-ip#:~:text=IP%20is%20the%20main%20protocol (Accessed: 26 August 2023).

Fortinet. (n.d.). *What is File Transfer Protocol (FTP) meaning*. [online] Available at: https://www.fortinet.com/resources/cyberglossary/file-transfer-protocol-ftp-meaning#:~:text=FTP%20(File%20Transfer%20Protocol)%20is (Accessed: 26 August 2023).

PCMAG. (n.d.). *Definition of HTTP*. [online] Available at: https://www.pcmag.com/encyclopedia/term/http#:~:text=(HyperText%20Transfer%20Protocol)%20The%20communications. (Accessed: 26 August 2023).

Paine, S. (n.d.). *HTTPS - Meaning and Function*. [online] SISTRIX. Available at: https://www.sistrix.com/ask-sistrix/technical-seo/http/https-meaning-and-function/#:~:text=HTTPS%20stands%20for%20HyperText%20Transfer (Accessed: 26 August 2023).

Goodwin, D. (2017). *What Is SEO / Search Engine Optimization?* [online] Search Engine Land. Available at: https://searchengineland.com/guide/what-is-seo (Accessed: 26 August 2023).

VONT. (2017). *What is Search Engine Optimization (SEO)? And Why is it Important?* [online] Available at: https://www.vontweb.com/blog/what-is-search-engine-optimization-seo/#:~:text=Search%20engine%20optimization%20(SEO)%20is (Accessed: 26 August 2023).

Anon, (2020). *What is Indexing - Definition, meaning and examples*. [online] Available at: https://www.arimetrics.com/en/digital-glossary/indexing (Accessed: 26 August 2023).

www.wordstream.com. (n.d.). *8 Expert Tips to Build a Winning SEO Strategy in 2021*. [online] Available at: https://www.wordstream.com/blog/ws/2021/03/05/seo-strategy.

blog.hubspot.com. (n.d.). *Why Website Indexation Is A Must-Have for Marketers*. [online] Available at: https://blog.hubspot.com/marketing/website-indexation#:~:text=Website%20indexation%20is%20the%20process (Accessed: 26 August 2023).

‌ Anon, (2022). *The Differences Between Website Design and Website Development - cydomedia*. [online] Available at: https://cydomedia.com/the-differences-between-website-design-and-website-development/#section-01 (Accessed: 27 August 2023).

Techopedia (2020). *What is a Website? - Definition from Techopedia*. [online] Techopedia.com. Available at: https://www.techopedia.com/definition/5411/website (Accessed: 26 August 2023).

Amazon Web Services, Inc. (n.d.). *What is Java? - Enterprise Java Beginner’s Guide - AWS*. [online] Available at: https://aws.amazon.com/what-is/java/ (Accessed: 27 August 2023).

Talend (2023). *What is MySQL? Everything You Need to Know | Talend*. [online] Talend Real-Time Open Source Data Integration Software. Available at: https://www.talend.com/resources/what-is-mysql/ (Accessed: 27 August 2023).

Python Software Foundation (2019). *What is Python? Executive Summary*. [online] Python.org. Available at: https://www.python.org/doc/essays/blurb/ (Accessed: 27 August 2023).

freeCodeCamp.org. (2021). *What is PHP? The PHP Programming Language Meaning Explained*. [online] Available at: https://www.freecodecamp.org/news/what-is-php-the-php-programming-language-meaning-explained/#:~:text=PHP%20is%20an%20open-source (Accessed: 27 August 2023).

Mozilla. (2019, July 2). *What is JavaScript?* MDN Web Docs. https://developer.mozilla.org/en-US/docs/Learn/JavaScript/First\_steps/What\_is\_JavaScript (Accessed: 27 August 2023).

Techterms.com. (2019). *CSS (Cascading Style Sheet) Definition*. [online] Available at: https://techterms.com/definition/css (Accessed: 27 August 2023).

Chris, K. (2021). *What is HTML – Definition and Meaning of Hypertext Markup Language*. [online] freeCodeCamp.org. Available at: https://www.freecodecamp.org/news/what-is-html-definition-and-meaning/ (Accessed: 27 August 2023).

‌Anon, (2022). 6 Most Popular Backend Frameworks for Web App Development. [online] Available at: https://www.mindinventory.com/blog/best-backend-frameworks/ (Accessed: 28 August 2023).

www.revelo.com. (n.d.). *Front End Frameworks: What are the Best Options and Benefits?* [online] Available at: https://www.revelo.com/blog/front-end-frameworks#:~:text=Front%20end%20frameworks%20are%20sets (Accessed: 28 August 2023).

Rouse, M. (2019). *What is a Database Management System (DBMS)? - Definition from Techopedia*. [online] Techopedia.com. Available at: https://www.techopedia.com/definition/24361/database-management-systems-dbms (Accessed: 28 August 2023).

Simplilearn.com. (2020). *What is an HTML Semantic Tag and Why Do You Need To Use It?* [online] Available at: https://www.simplilearn.com/tutorials/html-tutorial/html-semantics (Accessed: 1 September 2023).

Techopedia.com. (n.d.). *What is a Color Palette? - Definition from Techopedia*. [online] Available at: https://www.techopedia.com/definition/6547/color-palette (Accessed: 1 September 2023).

‌ Schade, A. (2014). *Responsive Web Design (RWD) and User Experience*. [online] Nielsen Norman Group. Available at: https://www.nngroup.com/articles/responsive-web-design-definition/ (Accessed: 1 September 2023).

Xia, V. (2017). *What is Mobile First Design? Why It’s Important & How To Make It?* [online] Medium. Available at: https://medium.com/@Vincentxia77/what-is-mobile-first-design-why-its-important-how-to-make-it-7d3cf2e29d00 (Accessed: 1 September 2023).

The Next Scoop. (2021). *5 Latest Web Design Techniques That Should Be Implemented On Your Website*. [online] Available at: https://thenextscoop.com/web-design-techniques/ (Accessed: 1 September 2023).

developer.mozilla.org. (2023). *Using media queries - CSS: Cascading Style Sheets | MDN*. [online] Available at: https://developer.mozilla.org/en-US/docs/Web/CSS/CSS\_media\_queries/Using\_media\_queries (Accessed: 1 September 2023).

‌