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| School Of Computing and Informatics |
| Website Design and Development |
| Assignment 1 |
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# DNS

Understanding the Domain Name System (DNS)

Types and Purpose of DNS

Purpose of DNS:

The Domain Name System (DNS) serves as a fundamental component of the internet's infrastructure, acting as a directory service. It translates human-friendly domain names (like www.example.com) into IP addresses (like 192.0.2.44), necessary for network routing.

This system allows users to access websites using memorable names instead of numeric IP addresses, facilitating easier navigation and communication on the internet.

Types of DNS Services:

Recursive DNS Server: Acts as an intermediary between a user and the DNS servers. It receives requests from clients, performs the necessary queries to locate the requested domain's IP address, and returns the result to the client.

Authoritative DNS Server: Holds the definitive records for domain names. It responds to recursive servers' queries with the IP address of the requested domain, if available.

1.2 How Domain Names Are Organised and Managed

Domain Name Hierarchy:

DNS is structured hierarchically, with the root domain at the top, followed by top-level domains (TLDs) like .com, .edu, and country-code TLDs like .uk, .us.

Each level in the hierarchy is separated by a dot. For instance, in www.example.com, .com is the TLD, example is a second-level domain, and www is a third-level domain or subdomain.

Domain Name Registration and Management:

Domain names are registered and managed by registrars accredited by the Internet Corporation for Assigned Names and Numbers (ICANN). Registrars maintain the records of domain names and their corresponding IP addresses.

Domain owners can manage their DNS records through these registrars, setting up various types of records (like A, AAAA, MX, CNAME) to control how their domain’s traffic is routed.

DNS Lookup Process:

The DNS lookup process involves multiple steps, starting with a user’s query in a web browser and ending with the retrieval of the corresponding IP address. This process involves recursive and authoritative DNS servers and may utilize caching to improve response times.

Security Challenges and Measures:

DNS faces various security threats, including DNS amplification, spoofing, and hijacking. To combat these, security measures like DNS Security Extensions (DNSSEC) and DNS over HTTPS (DoH) have been introduced.

DNSSEC ensures the authenticity of the data coming from the DNS server, protecting against certain types of attacks.

DoH encrypts DNS queries, enhancing privacy and security by preventing eavesdropping and man-in-the-middle attacks.

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

2. Communication Protocols, Server Hardware, Operating System, and Web Server Software

2.1 Communication Protocols Definition

Communication protocols like HTTP, HTTPS, and FTP are sets of rules and standards that allow electronic devices to communicate over a network. HTTP (Hypertext Transfer Protocol) is the foundation of data communication for the web, enabling the fetching of resources, like HTML documents. HTTPS (HTTP Secure) is the encrypted version of HTTP, ensuring secure communication over the network. FTP (File Transfer Protocol), on the other hand, is used for the transfer of files between a client and a server on a network.

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

2.2.1 Purpose and Relationship

Server Hardware: This is the physical backbone of any web hosting environment. Components such as CPUs, RAM, and storage are pivotal in determining the processing power and storage capacity of a server. High-performance hardware can significantly improve the speed and responsiveness of a website.

Operating Systems: Operating systems like Linux, Windows Server, or UNIX provide the essential software platform on which web server software runs. They manage hardware resources, ensure security, and offer necessary services to the server software. The choice of operating system can influence a website's performance, security, and compatibility with different software.

Web Server Software: This software, including popular choices like Apache, Nginx, and IIS, plays a direct role in handling web requests and serving content to users. It works in tandem with the operating system to utilize the server's hardware effectively. The choice of web server software can impact the efficiency of content delivery and the ease of website administration.

2.2.2 Relation to Designing, Accessing, and Publishing the Website

Designing and Publishing: The interplay of server hardware, operating systems, and web server software determines how a website can be designed and published. High-quality server hardware supports complex websites with dynamic content, while the right operating system and server software provide the tools and compatibility needed for web developers to build and deploy their sites efficiently.

Accessing the Website: Communication protocols ensure that when users access a website, the data exchange between the client (browser) and the server is smooth, reliable, and secure. Protocols like HTTPS add a layer of security, encrypting data and protecting sensitive user information.

Security Measures: At each layer, from protocols to server software, security is paramount. Implementing SSL/TLS for secure data transmission, configuring firewalls at the operating system level, and ensuring secure server software settings are all crucial steps in safeguarding a website.

Performance Optimization: A well-integrated system optimizes performance. This involves using efficient communication protocols, selecting server hardware with adequate processing power and memory, configuring the operating system for optimal resource use, and tuning the web server software to handle requests efficiently, especially under high traffic.

2.3 The Holistic Interplay of Components

The relationship between these components is integral to the successful operation of any website. From the moment a user requests a website to the point where the content is delivered to their screen, each component plays a vital role:

Communication Protocols and Web Server Software: Protocols like HTTP/HTTPS facilitate the interaction between the user's browser and the web server software. The web server software, in turn, interprets these requests and serves the appropriate content, leveraging the underlying operating system and server hardware.

Server Hardware and Operating Systems Synergy: The operating system manages the server's resources, ensuring the hardware's capacity is fully utilized. This allows the web server software to operate efficiently, handling web requests and delivering content swiftly.

Collaboration of Web Server Software with Hardware and OS: The web server software relies on the operating system for crucial services, which in turn, relies on the server hardware for performance. The choice of hardware, OS, and server software must be aligned to ensure optimal performance and reliability.

Comprehensive System Integration: The seamless integration of these components ensures not only the smooth operation of websites but also their ability to scale and adapt to varying loads. It also fortifies the website's security, with each layer adding its protective measures against potential threats.

# Website Development Technologies, Tools, Techniques, And Frameworks

Website Development Technologies

In the ever-evolving field of web development, understanding the impact of various technologies and frameworks on website design, functionality, and management is crucial. This section evaluates the integral role of select web development technologies—specifically Figma, Visual Studio Code, XAMPP, phpMyAdmin, HTML, CSS, JavaScript, PHP, and SQL—and how they were utilized in the development of the website for this assignment.

3.1.1 Available Website Technologies

The landscape of web development is rich with technologies and frameworks designed to optimize website design, enhance functionality, and streamline management. These technologies serve distinct yet interconnected roles, from conceptualizing the user interface to ensuring seamless user interactions and efficient back-end data management.

3.1.2 Technologies Used to Design, Develop and Manage Your Website

Figma: Figma has redefined the design phase of web development. As a collaborative interface design tool, it enabled our team to craft comprehensive wireframes and dynamic prototypes, ensuring the website's layout was both aesthetically pleasing and user-centric. Its real-time collaboration feature was instrumental in fostering a cohesive design process, allowing team members to synchronize their efforts regardless of physical location. Figma's contribution extended beyond mere design; it ensured consistency across the website's visual elements, significantly reducing discrepancies during the development phase.

Visual Studio Code: This sophisticated code editor, lauded for its versatility and powerful features like IntelliSense and integrated debugging, was pivotal in enhancing our productivity and code quality. Visual Studio Code facilitated a streamlined coding process, positively impacting the website's design and functionality by providing an efficient, organized development environment.

XAMPP: Serving as our local server solution, XAMPP allowed us to test the website in a controlled, local setting. This was crucial in ensuring that all website components functioned harmoniously, which ultimately enhanced the end-user experience by minimizing potential downtime and performance issues.

phpMyAdmin: This free software tool provided an intuitive web interface for managing our MySQL databases. Its role in simplifying complex database operations cannot be overstated; it ensured efficient and secure management of back-end data, a fundamental aspect of any dynamic website.

HTML & CSS: The structural and stylistic bedrock of our website, HTML and CSS, were meticulously utilized to construct a semantic, responsive, and visually appealing interface. Proper implementation of HTML5 and CSS3 was crucial in laying a solid foundation for the website's content and appearance.

JavaScript (JS): JavaScript introduced a layer of interactivity and dynamism to the website, greatly enhancing user engagement and the overall functionality of the site. Its application was pivotal in ensuring real-time content updates and interactive user interfaces.

PHP: This server-side scripting language enabled us to craft dynamic web pages that could interact seamlessly with databases. PHP's integration into our website amplified its functionality, allowing for bespoke content delivery and robust database interactions.

SQL: SQL's role in managing and querying our databases was fundamental. In tandem with PHP, SQL ensured that data-driven components of the website, such as user authentication and content management systems, operated efficiently and securely.

Options for Website Development in This Assignment

The selected technologies and tools were instrumental in the successful development of the website for this assignment:

Figma was employed to create detailed wireframes, ensuring that the website's design was not only visually compelling but also user-friendly and aligned with the project's objectives.

Visual Studio Code served as the primary code editor, facilitating the writing and management of HTML, CSS, JavaScript, and PHP code in an organized and efficient manner.

XAMPP provided a robust local server environment, enabling comprehensive testing of PHP and SQL functionalities prior to deployment.

phpMyAdmin played a crucial role in managing SQL databases, a key component for the data-driven aspects of the website, such as user account management and content delivery.

HTML, CSS, JavaScript, PHP, and SQL: Collectively, these technologies formed the structural, stylistic, and functional pillars of the website. Each contributed significantly to the overall architecture, design, interactivity, backend processing, and database management.

3.2 Website Development Tools

3.2.1 Available Tools for Website Design and Development

In the realm of web development, a diverse array of tools is available to cater to various aspects of the design and development process. These include:

Design Tools: Tools like Adobe XD, Sketch, and Figma offer robust features for UI/UX design, enabling designers to create intuitive and visually appealing interfaces.

Code Editors: Editors such as Visual Studio Code, Sublime Text, and Atom provide a streamlined coding environment with features like syntax highlighting, code completion, and version control integration.

Version Control Systems: Tools like Git and SVN allow developers to track changes, collaborate effectively, and maintain a history of their project's progress.

Project Management and Collaboration Tools: Platforms such as Slack, Trello, and JIRA facilitate team communication and task management, ensuring that projects stay on track and teams remain aligned.

3.2.2 Tools Used to Design and Develop Your Website

In the development of our website, we utilized a curated selection of tools tailored to our specific needs:

Figma: Employed for UI/UX design, Figma enabled our team to collaboratively create wireframes and prototypes, ensuring a user-centric design approach.

Visual Studio Code: Chosen for its versatility and powerful features, Visual Studio Code served as our primary code editor, enhancing our coding efficiency and quality.

Git: We used Git for version control, which was instrumental in tracking our progress, managing code changes, and facilitating collaboration among team members.

Trello: For project management, Trello provided a visual platform to organize tasks, set deadlines, and monitor the project's overall progress.

3.3 Website Development Techniques

3.3.1 Available Techniques for Website Design and Development

Modern web development is characterized by a variety of techniques aimed at enhancing the user experience, performance, and accessibility of websites. These include:

Responsive Design: Ensures that web content is accessible and legible across different devices and screen sizes.

Progressive Enhancement: Focuses on providing a basic level of user experience in web applications but adds advanced functionalities for devices with higher capabilities.

SEO Optimization: Techniques such as proper use of HTML tags, meta descriptions, and keyword optimization to improve website visibility on search engines.

Speed Optimization: Involves minimizing file sizes, using caching, and optimizing images to improve website load times.

Accessibility Standards: Adhering to WCAG and ARIA standards to ensure that websites are usable by people with disabilities.

3.3.2 Techniques Used in Your Website

For our website, we implemented a selection of these techniques to ensure an optimal user experience:

Responsive Design: We used media queries and a flexible grid layout to ensure our website was fully responsive and provided a seamless experience on various devices.

SEO Optimization: We carefully structured our HTML and used meta tags to enhance our website's SEO, ensuring higher visibility and searchability.

Speed Optimization: By compressing images, minifying CSS and JS files, and leveraging browser caching, we significantly improved our website's load times.

3.4 Website Development Frameworks

3.4.1 Available Frameworks for Website Design and Development

Frameworks play a crucial role in standardizing the development process and providing a structured way to build and maintain complex web applications. Some of the widely used frameworks include:

Front-end Frameworks: React, Angular, and Vue.js are popular for building interactive and dynamic user interfaces.

Back-end Frameworks: Node.js, Django, and Ruby on Rails offer robust solutions for server-side programming, database interactions, and application logic.

Full-stack Frameworks: Frameworks like Meteor and MEAN stack allow developers to handle both front-end and back-end development with a unified programming language and set of tools.

3.4.2 Frameworks Used in Your Website

In our project, we opted for a combination of technologies rather than a specific framework to maintain flexibility and control over the development process:

PHP: We utilized PHP for server-side scripting, allowing us to build dynamic web pages and effectively manage server-side tasks.

JavaScript: For the client side, we leveraged JavaScript to create interactive and dynamic user elements, enhancing the overall user engagement on our website.

By carefully selecting and integrating these tools, techniques, and technologies, we crafted a website that is not only visually appealing and user-friendly but also robust, scalable, and maintainable. The strategic use of these resources played a pivotal role in the successful execution and delivery of our web development project.

# Search Engine Optimization

Search Engine Optimization (SEO): Enhancing Website Performance and Visibility

4.1 Search Engine Optimization Definition and Purpose

Search Engine Optimization (SEO) is a critical component of web development and digital marketing. It involves optimizing various aspects of a website to improve its ranking on search engines like Google. The purpose of SEO is twofold: to increase the quality and quantity of website traffic through organic search engine results, and to enhance user experience. Proper SEO practices make a website more understandable and trustworthy to search engines, which is instrumental in driving relevant traffic, increasing site visibility, and promoting user engagement.

4.2 Indexing Definition

Indexing is the process by which search engines organize and store website content in their database. It involves crawling (where search engine bots visit and analyze web pages) and then adding those pages to a massive index. When a user performs a search, the search engine scans this index to provide the most relevant results. Therefore, ensuring that a website is correctly indexed is fundamental to its visibility in search results.

4.3 Techniques For Improving the Ranking

Several SEO techniques can be employed to enhance a website's visibility and ranking on search engines:

Keyword Optimization: Research and integrate relevant keywords within the website's content, titles, and meta descriptions. This ensures that the content aligns well with the user's search intent and can significantly boost the site's relevance in search queries.

High-Quality Content: Consistently produce and update the website with original, valuable, and engaging content. This not only attracts users but also establishes the site's authority and relevance, factors that search engines prioritize when ranking pages.

On-Page SEO: Optimize all on-page elements, including URL structures, title tags, meta descriptions, and alt texts for images. These adjustments help search engines better understand the content and context of web pages.

Mobile Responsiveness: Ensure the website is fully responsive on mobile devices. Google's mobile-first indexing prioritizes mobile-optimized sites, as a significant portion of users now access the web through mobile devices.

Page Load Speed: Enhance the website's loading speed by optimizing images, leveraging browser caching, and minimizing CSS and JavaScript. Faster load times improve user experience and are favored by search engines.

4.4 Evidence For the Used SEO Techniques in Your Website

To demonstrate the effectiveness of the implemented SEO strategies, detailed analytics and performance metrics should be presented. This can include:

Keyword Ranking Improvements: Show how targeted keywords have improved in their ranking on search engine result pages (SERPs) over time.

Growth in Organic Traffic: Provide analytics on the increase in user visits from organic search results, indicating successful SEO.

User Engagement Metrics: Highlight metrics such as bounce rate, average session duration, and pages per session to demonstrate improved user engagement resulting from SEO practices.

Publishing The Website on Google Search Engine

Ensuring a website is discoverable and indexed by Google involves several strategic steps:

Create a Sitemap: Generate an XML sitemap that lists all crucial pages of the website. This assists search engines in understanding the site's structure and expedites the indexing process.

Use Google Search Console: Register the site with Google Search Console. This platform allows you to submit your sitemap, monitor how your site is presented in search results, and check for indexing status and issues.

Optimize for Google's Crawlers: Configure the robots.txt file to ensure that Google's crawlers can efficiently access and index the website. Properly guiding these crawlers helps in avoiding the indexing of duplicate or irrelevant pages.

Monitor and Refine: Employ tools like Google Analytics and Google Search Console to track the website's performance in search results. Regularly review the data to refine SEO strategies, addressing any issues and optimizing the site's presence in search results.

# Front-End And Back-End Website Technologies

Front-End and Back-End Technologies: Understanding the Web Development Ecosystem

5.1 Front-End And Back-End Definition and Related Technologies

Front-End (Presentation Layer): The front-end, also known as the client side, is the visible part of the website that users interact with. It's responsible for translating the website's back-end functionalities into a visual and interactive experience. Key technologies include:

HTML (Hypertext Markup Language): Defines the structure and layout of web content.

CSS (Cascading Style Sheets): Determines the visual style of the website, including layout, colors, and fonts.

JavaScript: Adds interactivity and dynamic content to websites, enabling features like form validations, pop-ups, and real-time updates.

Back-End (Application Layer): The back-end, or server side, is where the core logic of the website operates. It's responsible for managing data interactions, user authentication, server configuration, and more. Common technologies are:

Server-Side Languages: Such as PHP, Python, Ruby, and Node.js, used for developing the core application logic.

Databases: Like MySQL, MongoDB, and PostgreSQL, used for storing, retrieving, and managing data.

Server Management Tools: Such as Apache, Nginx, and Microsoft's Internet Information Services (IIS), used for hosting and managing websites.

5.2 Presentation And Application Layers Definition

Presentation Layer: This layer, corresponding to the front-end, is focused on the user interface (UI) and user experience (UX). Its primary goal is to present information to users in an intuitive and accessible manner and to handle user interactions efficiently.

Application Layer: Corresponding to the back-end, the application layer contains the business logic of the application. It processes user requests, interacts with databases and other services, and sends the appropriate data back to the presentation layer.

5.3 Relationship

The relationship between the front-end (presentation layer) and the back-end (application layer) is both collaborative and interdependent:

Information Exchange: User requests initiated in the presentation layer are sent to the application layer, often through APIs (Application Programming Interfaces). The application layer processes these requests, interacts with the database if needed, and sends the results back. The presentation layer then updates the UI accordingly with the received data.

Separation of Concerns: This architectural approach ensures a clear division of responsibilities. The application layer focuses on data processing and business logic, while the presentation layer is dedicated solely to the user interface and experience. This separation enhances maintainability, scalability, and ease of development.

Technological Symbiosis: Technologies like AJAX (Asynchronous JavaScript and XML) allow for asynchronous data exchange between the presentation and application layers. This means the presentation layer can request and load new data from the server without a full page refresh, resulting in a smoother and more interactive user experience.

# Online Website Creation Tools VS Custom-Built Websites

Differences Between Online Website Creation Tools and Custom-Built Websites

6.1 Online Website Creation Tools

Online website creation tools like Wix, Squarespace, and WordPress offer user-friendly platforms that enable individuals, even those without coding skills, to create and manage websites. These tools come with drag-and-drop interfaces, a range of pre-designed templates, and a set of basic functionalities.

6.2 Custom-Built Websites

Custom-built websites are developed from scratch, usually by a team of developers, designers, and UX/UI specialists. This approach involves writing code directly (HTML, CSS, JavaScript, etc.), using development frameworks, and creating unique designs and functionalities tailored to specific business needs.

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

Design Flexibility:

Online Website Creation Tools: Offer ease of use with their ready-to-use templates and intuitive interfaces. However, this convenience often comes at the cost of design flexibility. Users are typically bound by the constraints of the chosen template and the customization options provided by the platform.

Custom-Built Websites: Provide nearly limitless design possibilities. Developers have full control over the site's architecture, enabling the creation of unique, brand-centric designs that stand out in the digital space.

Performance:

Online Website Creation Tools: Tend to include generic or unnecessary code, which can lead to increased loading times. Performance may also be affected by shared hosting environments common with these platforms.

Custom-Built Websites: Performance can be optimized from the ground up. Developers can streamline code, optimize assets, and choose the best hosting solutions tailored to the site's specific needs, resulting in faster load times and a smoother user experience.

Functionality:

Online Website Creation Tools: The functionality is often limited to the features available within the platform. While suitable for basic needs, these tools may not support complex or unique functionalities required by some businesses.

Custom-Built Websites: Can include any required functionality. The possibilities are vast, allowing businesses to perfectly address their operational needs and customer preferences with custom integrations and sophisticated solutions.

User Experience (UX) and User Interface (UI):

Online Website Creation Tools: Provide a selection of pre-designed templates adhering to general UX/UI principles. However, the uniformity of these templates can limit the ability to create a tailored user experience that aligns with specific audience needs.

Custom-Built Websites: Allow for a deep understanding and implementation of UX/UI principles targeted at the specific audience. Every aspect of the user journey can be meticulously crafted and optimized, ensuring a seamless, intuitive, and enjoyable experience that strengthens the brand's connection with its audience.

# Design And Development Process

. Justification of Technologies, Management Services, Tools, and Software for a Custom-Built Website

7.1 Website Vs. Design Document

Before delving into the specifics, it's crucial to differentiate between the website itself and the design document. The website is the final product — a combination of code, content, and media that users interact with. In contrast, the design document is a blueprint that outlines the structure, features, and functionality of the website, serving as a guide throughout the development process.

7.2 Evaluation and Analysis

HTML, CSS, and JavaScript (Front-End Technologies):

HTML is the backbone of any website, providing the essential structure. Its simplicity and universality make it an indispensable tool in web development.

CSS offers the ability to create visually compelling and responsive designs. It allows for the separation of content from design, enhancing site accessibility and ensuring that the website looks consistent across different browsers and devices.

JavaScript is chosen for its capacity to create dynamic and interactive user experiences. It's essential for client-side scripting, allowing web pages to respond to user actions without requiring a page reload.

PHP (Server-Side Scripting Language):

PHP is favored for its flexibility, ease of integration with databases, and wide support across hosting providers. Its ability to generate dynamic page content and manage user sessions makes it a robust choice for server-side scripting.

SQL (Database Management):

SQL databases are renowned for their reliability and scalability. The choice of SQL ensures that the website can handle complex queries efficiently, providing a solid foundation for the website's data storage and retrieval needs.

Visual Studio Code (Code Editor):

Visual Studio Code is selected for its comprehensive development features, including intelligent code completion, debugging, and a vast ecosystem of extensions. It streamlines the development process, enhancing productivity and code quality.

XAMPP (Local Server Solution):

XAMPP offers a convenient and easy-to-setup environment for testing and development. Its compatibility with PHP and MySQL makes it an ideal choice for developing PHP-based applications locally before deployment.

phpMyAdmin (Database Management Tool):

phpMyAdmin offers a user-friendly interface for database management. It simplifies complex database operations, making it easier for developers to manage and interact with the database effectively.

Figma (Wireframing and Prototyping Tool):

Figma stands out for its collaborative design features. It facilitates a cohesive design process, allowing team members to iterate and comment in real-time, ensuring that the design aligns perfectly with user needs and project objectives.

# IDEs

Evaluation of Tools and Techniques for Designing and Developing a Custom-Built Website

Integrated Development Environments (IDEs)

Visual Studio Code:

Strengths: Known for its comprehensive support for multiple programming languages, smart code completions through IntelliSense, integrated Git control, and debugging capabilities. A rich marketplace of extensions adds to its versatility.

Techniques: Utilize the Live Server extension for real-time page reloading, harness the integrated terminal for seamless execution of command-line tasks, and leverage IntelliSense for efficient code completion and debugging.

Sublime Text:

Strengths: Celebrated for its speed, efficiency, and lightweight nature. Offers powerful features like multiple selections for simultaneous editing and the Command Palette for quick access to functionalities.

Techniques: Employ the "Goto Anything" feature for swift navigation and file management, and utilize the vast array of keyboard shortcuts to expedite coding and editing tasks.

Design Tools

Figma:

Strengths: Renowned for its vector-based interface and collaborative design capabilities. Ideal for creating interactive prototypes and facilitating teamwork on design projects.

Techniques: Make use of Figma’s team libraries to ensure design consistency, leverage its prototyping tools for dynamic UI creation, and engage in real-time collaboration for feedback and iteration.

Adobe XD:

Strengths: Offers a robust suite of tools for wireframing, animation, and prototype creation, with seamless integration into the Adobe Creative Cloud ecosystem.

Techniques: Take advantage of Adobe XD's Repeat Grid for efficient design of repetitive elements like lists and galleries, and employ the Auto-Animate feature to craft engaging micro-interactions and transitions.

Server and Database Management Tools

XAMPP:

Strengths: Provides a comprehensive, easy-to-set-up local server environment supporting Apache, MySQL, PHP, and Perl. Ideal for local testing and debugging of websites.

Techniques: Use XAMPP to create a local development environment, ensuring that all website components operate correctly and are fully tested before live deployment.

phpMyAdmin:

Strengths: Offers a user-friendly web interface for managing MySQL databases, simplifying database interactions without requiring in-depth knowledge of SQL commands.

Techniques: Utilize phpMyAdmin for efficient database management tasks such as database creation, user management, and execution of SQL queries through its intuitive interface.

# References

*The difference between front-end vs. back-end* (2023) *Code a New Career | ComputerScience.org*. Available at: https://www.computerscience.org/bootcamps/resources/frontend-vs-backend/ (Accessed: 28 January 2024).

*DNS - Domain Name System - javatpoint* (no date) *www.javatpoint.com*. Available at: https://www.javatpoint.com/computer-network-dns (Accessed: 28 January 2024).

Michigan Technological University (2023) *Five ways to improve your site’s ranking (SEO)*, *Michigan Technological University*. Available at: https://www.mtu.edu/umc/services/websites/seo/ (Accessed: 28 January 2024).

MozDevNet (no date a) *An overview of HTTP - http: MDN*, *MDN Web Docs*. Available at: https://developer.mozilla.org/en-US/docs/Web/HTTP/Overview (Accessed: 28 January 2024).

MozDevNet (no date b) *The web and web standards - learn web development: MDN*, *MDN Web Docs*. Available at: https://developer.mozilla.org/en-US/docs/Learn/Getting\_started\_with\_the\_web/The\_web\_and\_web\_standards (Accessed: 28 January 2024).

Techvify, A.N.C. of and Techvify, A.N.C. of (2024) *Back-end vs front-end development: What’s the difference?*, *TECHVIFY Software*. Available at: https://techvify-software.com/back-end-vs-front-end-development/ (Accessed: 28 January 2024).

*Website development process: Full guide in 7 steps* (2023) *XB Software*. Available at: https://xbsoftware.com/blog/website-development-process-full-guide/ (Accessed: 28 January 2024).

*What is DNS and how does it work?* (2023) *Network World*. Available at: https://www.networkworld.com/article/965540/what-is-dns-and-how-does-it-work.html (Accessed: 28 January 2024).

*What is SEO - search engine optimization?* (2023) *Search Engine Land*. Available at: https://searchengineland.com/guide/what-is-seo (Accessed: 28 January 2024).

*What is the purpose and relationships between communication protocols, server hardware, operating systems and web server software with re...* (no date) *Quora*. Available at: https://www.quora.com/What-is-the-purpose-and-relationships-between-communication-protocols-server-hardware-operating-systems-and-web-server-software-with-regards-to-designing-publishing-and-accessing-a-website (Accessed: 28 January 2024).

*What is user experience (UX) design?* (2023) *The Interaction Design Foundation*. Available at: https://www.interaction-design.org/literature/topics/ux-design (Accessed: 28 January 2024).

# Declaration Form