



CA1 Web Development

Submitted to
Damien Kettle

Submitted by
Pratyush Kakkar
(20022933)

Date
6th December, 2024

Table of Contents

What is a Web Application?	3
Key Features of Web Applications:	3
Universal Access	3
Interactive Functionality	3
Browser Independence	3
How Web Applications Work	4
Technologies used to Develop Application	5
1. ASP.NET FRAMEWORK.....	5
Key Components of ASP.NET Framework	5
Additional Features of ASP.NET	5
2. HTML (HyperText Markup Language)	5
3. CSS (Cascading Style Sheet)	6
4. JavaScript	6
5. jQuery.....	6
6. SQL Server.....	6
7. Visual Studio 2022	6
Purpose of these Technologies	7
1. ASP.NET	7
2. C#.....	7
3. JavaScript and jQuery	7
4. CSS	7
5. SQL Server and Connection	7
6. Visual Studio.....	7
Alternatives to the Technologies.....	8
HTML:	8
CSS.....	8
JavaScript & jQuery	8
ASP.Net & C#	8
Visual Studio 2022	8
Bibliography	9

Himalayan Hike

The website revolves around *Himalayan Hike*, an adventure company specializing in treks and expeditions across the majestic Himalayan region. It offers **detailed insights** into the treks, **customer experiences**, **pricing options**, and **essential information** for enthusiasts of all experience levels. With a focus on connecting users to the **adventure of their dreams**, it showcases the **natural beauty of the Himalayas**, the variety of trekking routes, and the **unique services** offered to make every journey unforgettable.

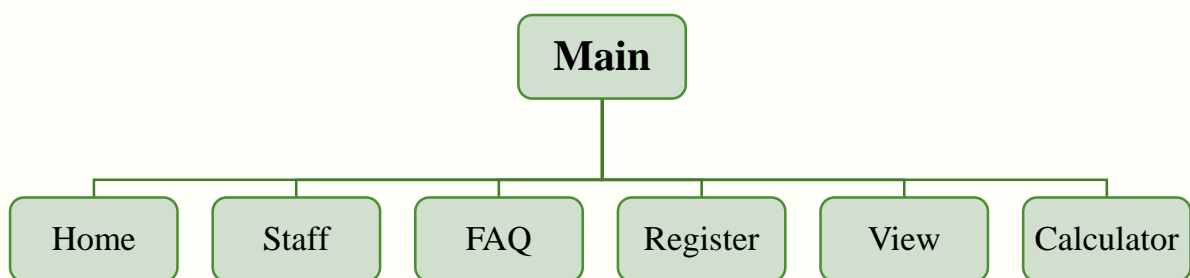


Figure 1 Sitemap of Himalayan Hike

What is a Web Application?

“A Web application is an application that is accessed via a Web browser over a network such as the Internet or an intranet. It is also a computer software application that is coded in a browser-supported language (such as HTML, JavaScript, Java, etc.) and relies on a common Web browser to render the application executable.” (Clarke, 2012)

Key Features of Web Applications:

Universal Access

Web applications can be used from various devices by mostly opening a browser but do not require installation on the user's device.

Interactive Functionality

Web apps are meant to be interactive. They enable users to input some information, to process requests, or to make transactions.

Browser Independence

Currently, almost all web applications are okay to be used via different browsers.

How Web Applications Work

Web applications operate based on a client-server architecture where the behaviour of an application depends on client actions, while server processes the requests. Here's a breakdown of the process:

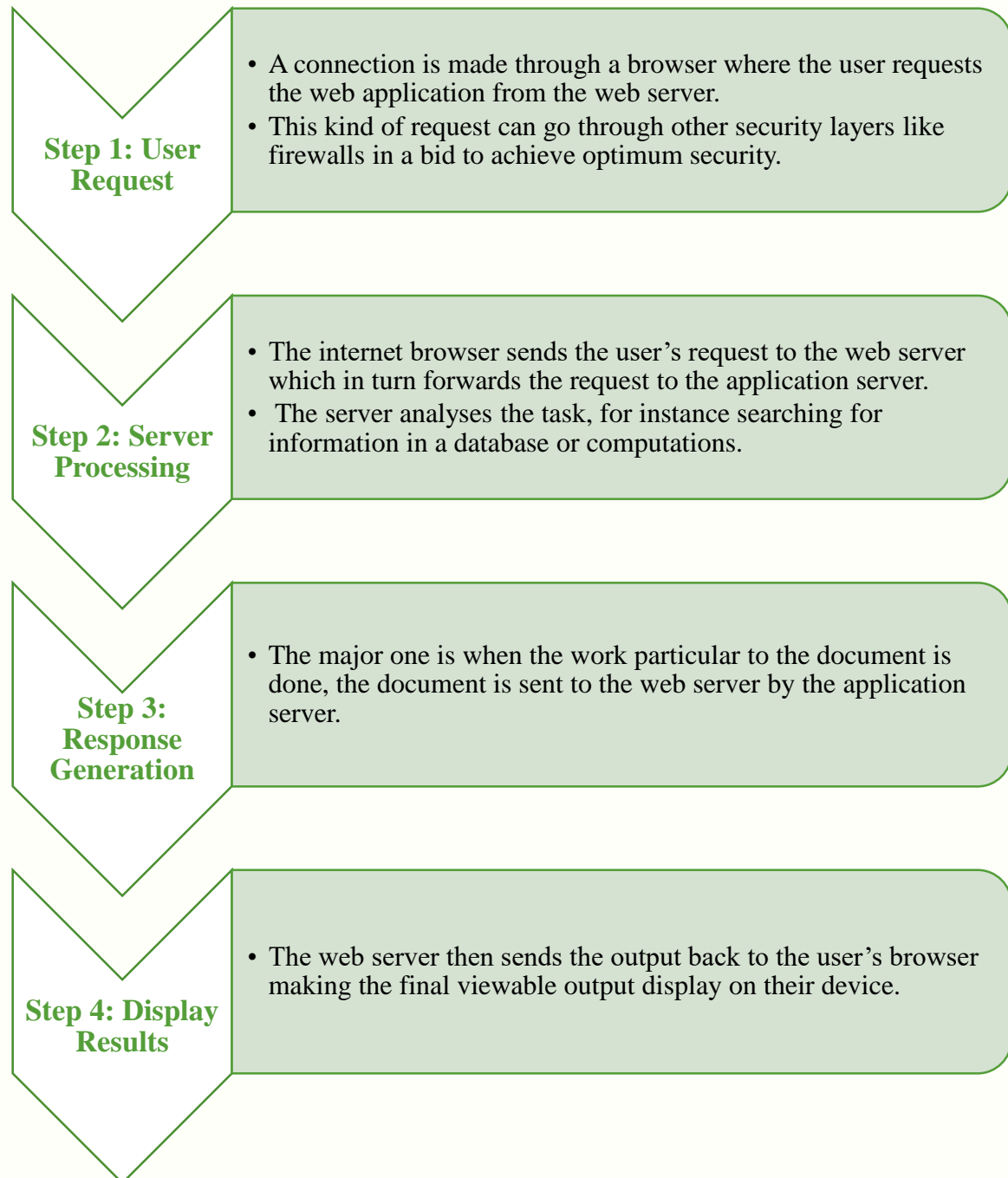


Diagram 1. 1 Step-by-Step Breakdown of How Web Applications Work

(Yasar, 2024)

Technologies used to Develop Application

1. ASP.NET FRAMEWORK

ASP.NET is an open-source web framework developed by Microsoft, designed for building dynamic web applications, websites, and services on the .NET (dotNET) framework.

Key Components of ASP.NET Framework

Programming Language:

ASP.NET supports two primary programming languages: VB.NET (Visual Basic) and C#.

Library:

The ASP.NET framework has a rich set of libraries that build upon the base .NET libraries.

Common Language Runtime (CLR):

The Common Language Runtime (CLR) is a core component of the .NET framework and is responsible for executing .NET programs.

Additional Features of ASP.NET

ASP.NET extends the capabilities of the .NET framework by offering additional tools and technologies that improve the development process. One such tool is the ASP.NET Web Application, which is used to build dynamic web pages and applications in C#.

(Umbraco, What is ASP.NET?: The open source web framework)

2. HTML (HyperText Markup Language)

HTML (HyperText Markup Language) is the base of web development, which determines the layout and content of Web pages. It utilizes tags enclosed in angle brackets < > to style items such as text, images and links.

HTML files contain structured tags saved with a .html extension. When opened in a browser, these tags guide the display of content.

(Hayes, 2024)

3. CSS (Cascading Style Sheet)

CSS is a styling language that defines the **appearance** and **layout** of web pages. It controls how content is visually presented when loaded in a browser.

(Juviler, 2024)

4. JavaScript

JavaScript is a versatile computer programming language central to web development. It enables the creation of **interactive** and **dynamic** features on websites and web applications.

(Andre, 2024)

5. jQuery

“jQuery is a fast, small, and feature-rich JavaScript library. It makes things like HTML document traversal and manipulation, event handling, animation, and Ajax much simpler with an easy-to-use API that works across a multitude of browsers.”

(openjsf.org, *jQuery*)

6. SQL Server

Microsoft SQL Server is an RDBMS designed to provide different applications, such as transaction processing, BI, and data analysis in the corporate IT system.

(Awati et al., 2024)

7. Visual Studio 2022

Visual Studio is a highly functional integrated development environment that covers all stages of software development. It allows developers to code, edit, test, compile, and package applications and also deploy them in one place. Compilers, code completion tools, source control, extensions together with other features to boost productivity;

(Anandmeg, *What is the visual studio Ide?*)

Purpose of these Technologies

1. ASP.NET

ASP.NET facilitated the creation of a reusable **SiteMaster** layout, streamlining the integration of headers and footers across all webpages for consistent design.

2. C#

- Enabled the use of textboxes and built-in validators for input format checks in the **Register Form**, eliminating the need for jQuery.
- Supported the implementation of the **Calculator Page**, developed efficiently using its robust features.

3. JavaScript and jQuery

- Secured the **View Page**, ensuring only users with valid passwords could access it.
- Enhanced the **FAQ Page** with dynamic interactivity and responsive features.

4. CSS

External stylesheets were used to maintain a unified design across all pages, styling headings, backgrounds, tables, and other elements.

5. SQL Server and Connection

- Handled user data entered through the **Register Page**, securely storing it in the database.
- Enabled the retrieval and display of stored data as needed.

6. Visual Studio

Visual Studio served as the primary development environment, offering tools for coding, debugging, and deploying the application seamlessly. Its comprehensive features enhanced the development process, making it efficient and streamlined.

Alternatives to the Technologies

HTML:

There does not exist a proper alternative to HTML.

CSS

It is a client side language hence most other options convert into CSS before runtime. These include **SASS**, **LESS** that are preprocessors, **Tailwind CSS**, the style attribute in JavaScript can also be used for styling.

JavaScript & jQuery

“HTML, CSS, and JavaScript. These are the only coding languages that browsers natively recognise.” (Young, 2024) Most JavaScript alternatives are transpilers these include **TypeScript**, **CoffeeScript** etc. A complete replacement would be **WebAssembly** but it would work best in specific scenarios. (Panchenko, 2021)

ASP.Net & C#

These include **Ruby on Rails**, **Django with Python**, **Spring Boot** that uses **Java** as well as **PHP** with **Laravel**. (*Top 10 ASP.NET alternatives - which is the best? 2022*)

Visual Studio 2022

There are many different IDEs such as **JetBrains Rider** for .NET, **Eclipse**, **PyCharm** which focuses on **Python**. (*Top 10 visual studio alternatives 2022 | G2*)

Bibliography

1. Clarke, J. (2012) *SQL injection attacks and defense* \$C. Sin Lugar: Syngress.
2. Yasar, K. (2024) *What is web application (web apps) and its benefits?*, TechTarget.
<https://www.techtarget.com/searchsoftwarequality/definition/Web-application-Web-app>
3. *What is ASP.NET?: The open source web framework* (no date) Umbraco.
<https://umbraco.com/knowledge-base/aspnet/>
4. Hayes, A. (2024) *Hypertext markup language (HTML): What it is and how it works*, Investopedia.
<https://www.investopedia.com/terms/h/html.asp>
5. Juviler, J. (2024) *The Ultimate Guide to CSS*, HubSpot Blog.
<https://blog.hubspot.com/website/css-tutorial>
6. Andre Munro (Dec 2024) *JavaScript* Encyclopedia Britannica
<https://www.britannica.com/technology/JavaScript>
7. openjsf.org, O.F.- (no date) *JQuery*.
<https://jquery.com/>
8. Awati, R., Hughes, A. and Stedman, C. (2024) *What is Microsoft SQL server?: Definition from TechTarget, Search Data Management*.
<https://www.techtarget.com/searchdatamanagement/definition/SQL-Server>
9. Anandmeg (no date) *What is the visual studio Ide? Microsoft Learn*.
<https://learn.microsoft.com/en-us/visualstudio/get-started/visual-studio-ide?view=vs-2022>
10. Young, S. (2024) *The best languages for web development*, Code Institute Global.
<https://codeinstitute.net/ie/blog/the-best-coding-languages-for-web-development-in-2022/>
11. Panchenko, O. (2021) *Top 10 javascript alternatives for web development in 2021, Custom IT development: Software Engineering with FREYSOFT*
<https://freysoft.com/blog/top-javascript-alternatives-for-web-development/#:~:text=Kaffeine%2C%20Opal%2C%20CoffeeScript%2C%20TypeScript,competitive%20advantage%20to%20your%20project.>
12. *Top 10 ASP.NET alternatives - which is the best?* (2022) Back4App Blog.
<https://blog.back4app.com/asp-net-alternatives/>
13. (No date) *Top 10 visual studio alternatives 2022* | G2.
<https://www.g2.com/products/visual-studio/competitors/alternatives>