DESIGN AND DEVLOPMENT OF
ECE-BITP WEBPAGE

A Project Report

Submitted in partial fulfilment of the requirements for the award of the Degree of

BACHELOR OF TECHNOLOGY
IN
ELECTRONICS AND COMMUNICATION ENGINEERING

BY

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APPROVAL OF THE GUIDE

Recommended that the Project entitled "DESIGN AND DEVELOPMENT OF ECE-BITP WEBPAGE" presented by Sahil Sharan under my supervision and guidance be accepted as fulfilling this part of the requirements for the award of Degree of Bachelor of Technology in Electronics and Communication Engineering. To the best of my knowledge, the content of this thesis did not form a basis for the award of any previous degree to anyone else.

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I certify that

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b) This work has not been submitted to any other Institute for any other degree.
c) I have followed all the guidelines provided by the Institute in writing the project report.
d) I have conformed to the norms and guidelines given in the Ethical Code of Conduct of the Institute.
e) Whenever I have used materials from other sources, have given due credit to them by citing them in the text of the report and giving their details in the references.
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Sahil Sharan

(Btech/15143/20)

Certificate Of Approval

This is to certify that the work embodied in this report entitled "DESIGN AND DEVELOPMENT OF ECE-BITP WEBPAGE" is carried out by **Sahil Sharan** (BTECH/15143/20) has been approved to the degree of bachelor of Technology in Electronics and Communication Engineering of Birla Institute Of Technology Mesra, Off Campus, Patna

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(Internal Examiner) (External Examiner)

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ABSTRACT

The "ECE Branch Web Portal" serves as a comprehensive platform designed to bridge the gap between the past, present, and future endeavours of the Electronics and Communication Engineering (ECE) branch at BIT-P. This project aims to centralize and organize vital resources, including question papers, assignments, alumni profiles, and major project archives, to facilitate seamless access and interaction for students, faculty, and alumni.

The portal features a user-friendly interface, offering intuitive navigation and search functionalities to effortlessly retrieve academic resources and historical data. Students can access a repository of past question papers and assignments, enabling them to prepare effectively for examinations and assessments. Additionally, the platform showcases a curated collection of major projects undertaken by ECE students, providing inspiration and insights into innovative research and technological advancements within the field.

One of the pivotal aspects of the portal is its dedicated alumni section, where former ECE students can create profiles, share their career trajectories, and connect with current students and faculty members. This fosters a vibrant alumni network, facilitating mentorship, knowledge exchange, and collaboration opportunities.

Through meticulous design and implementation, the "ECE Branch Web Portal" serves as more than just a repository of information; it embodies the spirit of community, collaboration, and continuous learning within the ECE branch at BIT-P, empowering individuals to explore, innovate, and succeed in their academic and professional endeavours.

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My apologies and heartful gratitude to all who have assisted me yet have not been acknowledged by name.

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1. INTRODUCTION

1.1 INTRODUCTION

This project is made with the purpose of addressing a critical need within the Electronics and Communication Engineering (ECE) program at BIT Patna. It aims to establish a centralized platform, titled "ECE Branch Portal," tailored specifically to the needs of ECE students. The overarching objective is to empower current and future cohorts of students by providing them with essential tools and networks to navigate their academic journey and cultivate professional growth.

The ECE Branch Portal serves as a digital repository, consolidating various academic resources, including project reports, question papers, assignments, and alumni profiles. By centralizing these materials, the platform seeks to streamline the academic experience, facilitating efficient access to crucial resources for project development, exam preparation, and coursework completion.

Furthermore, the platform aims to foster alumni engagement by providing a dedicated space for former ECE students to share their experiences, insights, and career trajectories. Through alumni profiles and networking functionalities, current students can leverage the wisdom and expertise of alumni mentors, enriching their academic journey and gaining valuable industry insights.

In essence, this project endeavours to mitigate the challenges encountered by students in accessing educational materials and establishing connections within the ECE community at BIT Patna. By promoting collaboration, knowledge sharing, and networking opportunities, the ECE Branch Portal seeks to empower students with the resources and connections necessary for success in both academic and professional realms.

1.2 LITERATURE REVIEW

In the domain of higher education, the significance of accessible resources and alumni networks in shaping students' academic and professional trajectories is well-documented. Within the realm of Electronics and Communication Engineering (ECE), the demand for centralized platforms facilitating access to project reports, question papers, and alumni connections is evident from scholarly discourse.

Research conducted by Zhang et al. (2018) underscores the challenges students face in accessing past project reports and materials for academic reference. Their study revealed that students often encounter barriers such as fragmented access to resources and limited awareness of available materials, hindering their ability to draw from previous experiences in project development.

Furthermore, studies by Davenport and Jones (2019) emphasize the pivotal role of alumni networks in supporting students' career development and transition to the professional realm. Their research highlights the value of alumni engagement initiatives in providing mentorship, networking opportunities, and industry insights to current students.

1.3 MOTIVATION

In embarking on this project, I was confronted with the daunting task of sourcing references and inspiration for my final year project. Faced with limited access to past project reports and a desire for guidance from the experiences of seniors, I envisioned a solution: a centralized platform where students could readily access a wealth of resources. Inspired by the notion of creating a space where knowledge is shared and connections are fostered, the project evolved to encompass not only project reports but also alumni profiles. By bridging the gap between past and present, this platform seeks to empower students with the resources and connections necessary for academic and professional success. It is driven by the belief that by leveraging the collective wisdom and experiences of our ECE community at BIT-P, we can facilitate learning, innovation, and growth for generations to come.

1.4 OBJECTIVE

Our objective is to develop a comprehensive online platform for the Electronics and Communication Engineering (ECE) branch at BIT-P, aimed at unifying past legacies, current activities, and future aspirations of our community. The primary goal is to create a centralized repository where students, faculty, and alumni can access various resources such as question papers, assignments, project reports, and alumni profiles. By enhancing accessibility to academic materials, we aim to facilitate effective exam preparation and coursework completion for students. Moreover, we seek to foster a culture of knowledge sharing and collaboration by providing students with the opportunity to showcase their major projects and research findings. The platform will also serve as a hub for alumni engagement, enabling former students to share their professional experiences and mentor current students. Through these efforts, we aspire to inspire innovation, promote community building, and continuously improve the platform to meet the evolving needs of our ECE community.

2. WEBSITE

Websites play a pivotal role in the digital landscape, serving as virtual gateways to information, services, and communities across the globe. They are dynamic platforms that enable individuals, businesses, organizations, and institutions to establish an online presence, connect with audiences, and disseminate content to a wide range of users.

In essence, websites serve as digital storefronts, providing users with access to a diverse array of resources, products, and services. From e-commerce sites that facilitate online shopping to educational platforms that offer courses and tutorials, websites cater to a myriad of needs and interests.

Moreover, websites serve as hubs for communication and collaboration, enabling users to interact, share ideas, and engage in discussions across various topics and domains. Some examples of such are Social media platforms online communities forums etc.

With the proliferation of mobile devices and advancements in technology, websites have become increasingly accessible and responsive. Responsive design techniques, coupled with innovative user interfaces, enhance usability and accessibility, making websites an integral part of our digital lives.

In summary, websites are versatile and dynamic platforms that empower individuals and organizations to connect, communicate, and collaborate in the digital age. As the digital landscape continues to evolve, websites will remain essential tools for information dissemination, commerce, and community building in the online world.

2.1 What is a “Website”

A website is a collection of web pages and related content that are typically hosted on a web server and accessible via the internet. It serves as a digital platform where individuals, businesses, organizations, and institutions can present information, offer products or services, communicate with users, and engage with their audience.

Websites are built using web technologies such as “HTML” (Hypertext Markup Language), “CSS”(Cascading Style Sheets), and JavaScript, among others. With the help of these technologies we can make a visually appealing webpage.

A website may consist of various components, including:

- **Web Pages:** These are individual documents containing text, images, multimedia content, and other elements. We can navigate among different webpages with the help of hyperlink.
- **Navigation Menus:** Normally present at the top or bottom of the page these provide hyperlinks that links the webpage to different pages making it eaiser to navigate to various related pages.
- **Content:** This includes text, images , videos, audio files, and other types of media that convey information or deliver a message to the website's visitors.
- **Design and Layout:** Design of a website is another important component of a webpage it plays an important role in making the webpage more accessible and more attractive for the users .

Websites serve a wide range of purposes, including:

- **Informational:** Websites can provide information about a particular topic, organization, product, or service. Examples include news websites, educational portals, and company websites.
- **E-commerce:** After covid the whole world understood the importance of going online which in turn made the E-commerce very active. Now we can find even small shops selling there products online. With the help of big companies like

Amazon, Facebook and Google they have also incorporated online payment mode.

- **Social Networking:** Today 61.4% of the world use social media with Facebook having he highest about 3billion active users closely followed by Youtube with about 2.5 billion active users. Hence Social media has became a platform which connects billions of people throughout the world.

Overall, websites are versatile tools that facilitate communication, commerce, and collaboration in the digital age.

Figure 2.1 Webpage

2.2 What is https

HTTPS stands for Hypertext Transfer Protocol Secure. It is an extension of HTTP (Hypertext Transfer Protocol), the protocol used for transmitting data between a web server and a web browser.

HTTPS adds a layer of security to the communication by using SSL/TLS (Secure Sockets Layer/Transport Layer Security) protocols. These protocols encrypt the data being transmitted, making it more secure and protecting it from eavesdropping, tampering, or interception by malicious third parties.

When you visit a website using HTTPS, the data exchanged between your web browser and the website's server is encrypted, ensuring that sensitive information such as login credentials, personal details, and financial transactions remain confidential. This is particularly important for websites that handle sensitive data, such as e-commerce sites, online banking portals, and social media platforms.

You can identify whether a website is using HTTPS by looking at the URL in your web browser's address bar. Websites using HTTPS have URLs that begin with "https://" instead of "http://". Additionally, most modern web browsers display a padlock icon or a green address bar to indicate that the connection is secure.

Overall, HTTPS is essential for maintaining the privacy and security of user data transmitted over the internet, and it is widely used to ensure safe and secure communication between web servers and web browsers.

2.3 What is WWW

WWW stands for World Wide Web, which is a system of interconnected hypertext documents accessed via the internet. It was invented by Sir Tim Berners-Lee in 1989 and became publicly available in 1991. The World Wide Web is often abbreviated as "the web."

The World Wide Web consists of millions of websites and web pages that are hosted on web servers located around the world. These web pages are written in languages such as HTML (Hypertext Markup Language), CSS (Cascading Style Sheets), and JavaScript, and they can contain text, images, videos, hyperlinks, and other multimedia content.

The web operates on the client-server model, where web browsers (such as Google Chrome, Mozilla Firefox, and Safari) act as clients, and web servers store and deliver web pages in response to client requests. When a user enters a web address (URL) into their web browser, the browser sends a request to the appropriate web server, which then retrieves the requested web page and sends it back to the user's browser for display.

The World Wide Web has revolutionized the way people access and share information, communicate, conduct business, and entertain themselves. It has become an indispensable tool in everyday life, enabling instant access to a vast array of resources and services from anywhere in the world.

2.4 What is Domain

A domain is a fundamental concept in the architecture of the internet, serving as a human-readable label that maps to specific resources, such as websites, web servers, or email servers. It provides a memorable and easy-to-use way for users to access online resources without needing to remember the underlying numerical IP addresses of the servers hosting those resources.

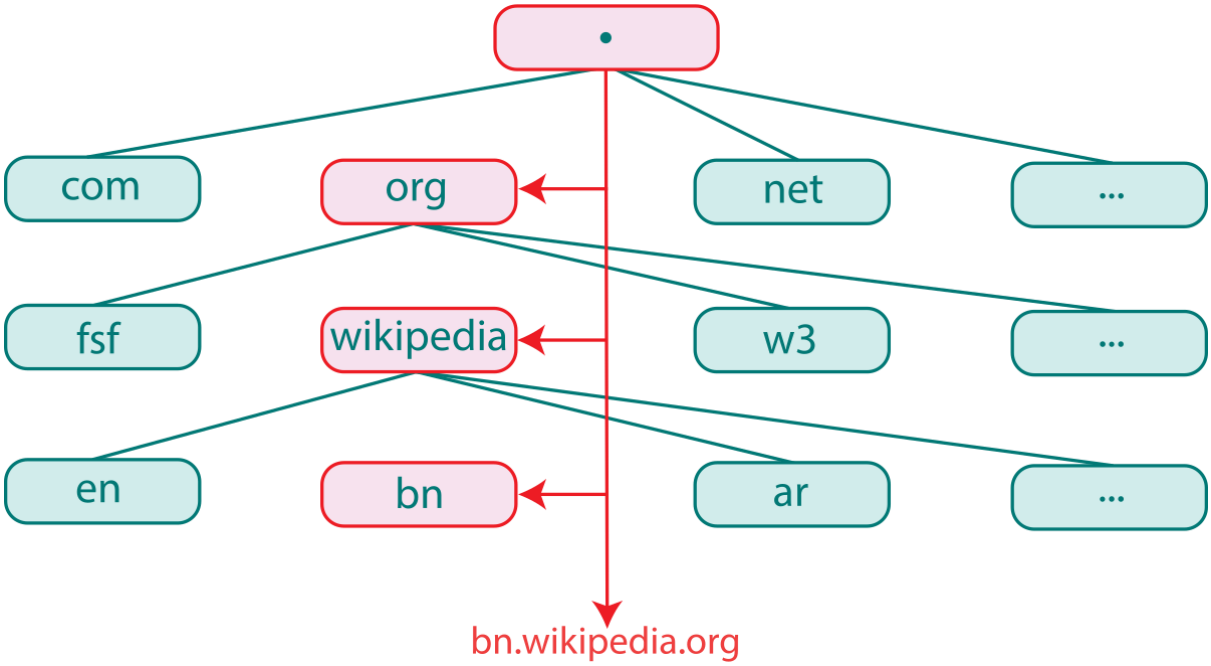

Figure 2.2 Domain

Here's a detailed breakdown of the components and functions of a domain:

1. Domain Name:

The domain name, a vital element of a domain, usually represents the identifiable name of a website or organization. It consists of alphanumeric characters (letters, numbers, and hyphens) and may encompass subdomains separated by periods. As an illustration, in the domain "example.com," "example" serves as the domain name.

2. Top-Level Domain (TLD):

The top-level domain (TLD) is the concluding segment of a domain, signifying the highest tier in the domain structure. Typically, it denotes the website's type, category, or geographical association. Examples of generic top-level domains (gTLDs) include ".com," ".org," ".net," ".edu," and ".gov," while country-code top-level domains (ccTLDs) are tied

to specific countries or territories, like ".us" for the United States and ".uk" for the United Kingdom. In the domain "example.com," the top-level domain is ".com."

3. Subdomain:

A subdomain is a segment of the domain name hierarchy positioned before the primary domain name. It serves to structure and classify content within a domain or establish distinct sections or branches of a website. For instance, in the domain "blog.example.com," the term "blog" functions as the subdomain..

4. Fully Qualified Domain Name (FQDN):

An FQDN, or Fully Qualified Domain Name, encompasses the complete and unequivocal address of a particular resource on the internet. It encompasses the domain name, any subdomains, and the top-level domain. For instance, "blog.example.com" exemplifies a fully qualified domain name.

Domains serve a pivotal role in enabling communication and interaction across the internet. When a user inputs a domain name into a web browser's address bar, the browser utilizes the Domain Name System (DNS) to convert the domain name into the corresponding numerical IP address of the server hosting the requested resource. Subsequently, the web browser establishes a connection with the server and retrieves the desired content, such as a web page or an email.

In essence, a domain furnishes a human-readable and memorable means of accessing online resources, thereby functioning as a fundamental element of the internet's infrastructure. It comprises a domain name, a top-level domain, and optionally, subdomains, collectively constituting a distinctive identifier for websites, email servers, and other internet-based services.

3. HOW TO MAKE A WEBPAGE

Creating a webpage is an exciting journey that begins with a thorough understanding of its purpose and audience. Imagine embarking on a digital adventure where every decision you make contributes to crafting a unique online experience!

Before delving into the realms of design and development, it's essential to have a crystal-clear vision of what your webpage aims to achieve and who it seeks to captivate. This entails deciphering the core objectives and identifying the target audience whose hearts and minds you aspire to capture. With this knowledge firmly in hand, you can tailor both the content and design elements to resonate profoundly with your audience's desires and expectations.

Now, picture yourself as the architect of a virtual universe, meticulously planning the blueprint of your webpage's content and structure. This involves mapping out the information landscape, arranging it in a logical and intuitive manner, much like arranging the chapters of a captivating story. Envision the flow of information, envision the strategic placement of key components such as headers and navigation menus, envision the holistic layout of the page, akin to a master painter envisioning the composition of a masterpiece.

With the groundwork laid and the vision crystalized, it's time to bring your creative vision to life through the enchanting process of design. Picture yourself as a digital artist, wielding a palette of colors, a repertoire of fonts, and a gallery of imagery to paint a vivid portrayal of your webpage's identity. Select colors that evoke the desired emotions, fonts that reflect the essence of your message, and imagery that resonates with your brand ethos.

However, in this digital landscape, where smartphones and tablets reign supreme, one must not overlook the importance of mobile responsiveness. Imagine yourself as a virtuoso conductor orchestrating a symphony, harmonizing the elements of design to ensure a seamless and enchanting experience across all devices and screen sizes.

Now, envision yourself as a virtuoso coder, weaving lines of HTML, CSS, and JavaScript to breathe life into your digital creation. Pay heed to the intricate details, ensuring accessibility, optimizing performance, and ensuring compatibility across a plethora of browsers and platforms.

As your digital opus nears completion, it's time to embark on the exhilarating journey of testing. Picture yourself as an intrepid explorer, traversing the vast expanse of cyberspace, scrutinizing every nook and cranny of your webpage to unearth any lurking bugs or

imperfections. Test it on an array of devices and browsers, ensuring that it shines brightly and functions flawlessly in every corner of the digital realm.

With the trials of testing conquered and victory on the horizon, it's time to unleash your creation upon the world. Picture yourself as a herald, trumpeting the arrival of your masterpiece to the far reaches of the digital realm. Share it on social media, weave it into the fabric of email newsletters, and optimize it for search engines to ensure its visibility and allure.

But remember, your journey doesn't end here. Picture yourself as a vigilant guardian, keeping a watchful eye on your creation's performance, ready to make updates and enhancements as the digital landscape evolves.

In the end, creating a webpage is not merely a technical endeavor; it is a voyage of creativity, innovation, and self-expression. It is a canvas upon which you paint your digital dreams, a stage upon which you showcase your vision to the world. So, step forth with confidence, and let your creativity unfurl its wings in the boundless expanse of cyberspace!

3.1 Define Your Purpose

First step to make a webpage is to know the purpose for which the webpage is being made and use it as a blueprint to make the webpage.

Determining the Purpose: The first step is to clearly define the overarching purpose of your webpage. In this case, the purpose revolves around creating an online platform to represent the ECE branch of BIT Patna effectively. This could include providing information about the department, facilitating communication within the ECE community, and showcasing achievements and resources.

Identifying the Target Audience: Next, it's crucial to identify the specific audience you want to target with your webpage. For the ECE branch of BIT Patna, the target audience may include current students, prospective students, faculty members, alumni, parents, and industry professionals interested in the field of electronics and communication engineering.

Deciding on Content: With the purpose and audience in mind, you can decide on the content you want to include on your webpage. This could range from general information about the ECE department, such as its history, mission, and academic programs, to more specific resources like course materials, research publications, event calendars, and alumni success stories.

3.2 Design our Layout

Designing the layout of your webpage involves creating a visual structure that organizes the content in a cohesive and user-friendly manner. Here's a detailed explanation of how you can approach designing the layout for your webpage:

1. Identify Key Elements: Start by identifying the key elements that you want to include on your webpage. This may include a header with the logo and navigation menu, content sections such as About Us, Courses, Faculty, Resources, and Contact, as well as a footer with additional links and information.

2. Establish Visual Hierarchy: Determine the hierarchy of information on your webpage by prioritizing certain elements over others. For example, the header and navigation menu should be prominently displayed at the top of the page to facilitate navigation, while less important information can be placed further down the page or in smaller font sizes.

3. Plan the Grid System: Use a grid system to organize the layout of your webpage into columns and rows. This helps maintain consistency and alignment across different sections

of the page. Decide on the number of columns and their widths based on the content you want to include and the overall aesthetic you're aiming for.

4. Consider Responsive Design: Think about making your webpage responsive, so it looks great on any device. This means designing it to adjust smoothly to different screen sizes, whether it's a big computer screen, a tablet, or a smartphone. You can do this by using layouts that can stretch and shrink, images that can change size, and special coding tricks called media queries that tell the webpage how to look on different devices. This way, no matter how someone views your webpage, it'll always look fantastic!

5. Choose Colours and Typography: Select a colour scheme and typography that aligns with the branding of the ECE branch of BIT Patna and enhances readability and visual appeal. Choose colours that complement each other and convey the desired tone and mood, and select fonts that are legible and appropriate for web use.

6. Balance Visual Elements: Maintain a balance between text, images, and white space to create a visually appealing and easy-to-read layout. Avoid cluttering the page with too much content or visual elements, and use spacing and alignment to create a sense of order and hierarchy.

7. Provide Clear Navigation: Ensure that your navigation menu is easy to find and use, with clearly labeled links that guide visitors to different sections of your webpage. Consider using drop-down menus or a sticky navigation bar for improved usability, especially if your webpage contains a lot of content.

8. Prototype and Iterate: Create a prototype or wireframe of your webpage to visualize the layout and test different design ideas. Solicit feedback from others and iterate on your design based on their input, making adjustments as needed to improve usability and aesthetics.

3.3 Optimize for Seo

To make sure that a webpage shows up when relevant terms are searched we use strategies to make our webpage more visible and hence improving its ranking in search engine result page. We do show by following these procedures.

Keyword Research: We need to think of all the keywords a user might think of while searching for our page. As for example in my project a student might search for keywords like BIT-P, ECE, Question Paper, Major Projects , Assignments etc. After finding these words we can incorporate these words in our page's contents , headings and metadata.

Title Tags: To boost your webpage's search engine visibility, optimize your title tags by strategically placing relevant keywords at the beginning while ensuring they are descriptive and compelling. Aim to keep your titles under 60 characters to ensure they display effectively in search engine results pages (SERPs). Crafting concise and engaging titles that accurately represent your webpage's content is crucial for enticing users to click through. Avoid keyword stuffing and prioritize readability to maintain a natural flow. Consider incorporating your brand name if it adds value, but prioritize keywords for maximum search engine visibility. Experiment with different title tag formats and variations, monitoring performance metrics to refine and improve your approach over time.

Meta Descriptions: Crafting compelling meta descriptions is essential for enticing users to click through to your webpage. Summarize the content concisely while incorporating relevant keywords strategically. Aim to keep your descriptions under 160 characters to ensure they are fully displayed in search engine results pages (SERPs). Use persuasive language to capture the reader's attention and highlight the value proposition of your webpage. By striking a balance between informativeness and intrigue, you can maximize the likelihood of users clicking through to explore your content further.

Header Tags: Another important thing is we need to use our headings(H1) and subheading(h2-h6) properly. Many a times people use these just to make there content look bold and bigger instead of using it to define heading which is a very bad practice and this has and adverse effect on SEO. As a good developer we should refrain from using such tactics.

URL Structure: We should make url such that any one can understand what the page is all about just by looking at it. We can use keywords and separate them by using hyphens.

Content Optimization:

Quality Content: You might be able to catfish people to open your webpage by having a good SEO but if you really want to people to comeback to your page and recommend it to there friends and family you can do so by having a quality content only . The page should have correct information and it should also answer the needs of people. Use relevant keywords throughout the page.

Internal Linking: We should also interlink our pages so that person can go back and forth easily.

Image Optimization: Enhance your webpage's search engine visibility and accessibility by optimizing images with descriptive filenames and alt text. Incorporate relevant keywords into both the filenames and alt text to provide search engines with valuable context about the content of the images. This not only helps improve search engine rankings but also ensures that visually impaired users can understand the purpose of the images through screen readers. By utilizing descriptive filenames and alt text, you can effectively communicate the relevance of your images to both search engines and users, enhancing the overall user experience of your webpage.

Mobile Optimization: In the era where smartphones have dominated the world it is our duty as web developer to ensure that a website is optimized in such a way that it is easily accessible on mobiles too.

Page Speed: Boost your webpage's loading speed by implementing various optimization techniques. Start by optimizing images, reducing their file sizes without compromising quality. Next, minify CSS and JavaScript files to reduce their size and improve loading times. Enable browser caching to store frequently accessed resources locally, reducing the need for repeated downloads. Consider using a content delivery network (CDN) to distribute your content across multiple servers worldwide, ensuring faster delivery to users regardless of their location. Faster-loading pages are favoured by search engines and provide a smoother browsing experience for users, ultimately leading to higher search engine rankings and increased user satisfaction.

User Experience (UX): As a good developer we should always keep in mind the most important thing while making a page is User Experience. We can enhance the user

experience by organizing the content logically, ensuring intuitive navigation and optimizing for readability and accessibility.

Analytics and Monitoring: Keep tabs on your webpage's performance with the aid of tools such as Google Analytics and Google Search Console. These invaluable resources allow you to monitor critical metrics like organic traffic, keyword rankings, and click-through rates. By regularly reviewing these metrics, you can gain insights into how your webpage is performing in search engine results and identify areas for improvement. Make adjustments to your SEO strategy based on your findings, refining your approach to enhance results over time. With diligent monitoring and strategic adjustments, you can optimize your webpage's performance and drive greater success in search engine rankings.

4. CODING THE WEBPAGE

Coding your webpage involves creating the underlying structure, styling, and functionality using HTML, CSS, and JavaScript. Here's a detailed explanation of each aspect:

“HTML” (“Hypertext Markup Language”):

“HTML” is the muse of your website and is used to structure its content. It includes a sequence of elements, each with its very own motive and which means.

Use “HTML” tags to outline the structure of your webpage, such as headings, paragraphs, lists, hyperlinks, pictures, and different factors.

prepare your content into semantic “HTML” elements to enhance accessibility and search engine optimization. for example, use

“<header>”: -The header tag is used for the purpose of writing the heading. It is usually written first for a better software engine optimization.

“<nav>”: - As one can guess nav is used for making navigation menu. It is generally used after header.

“<main>”: - As the name suggests it is used to write the main content in the webpage. It generally has the greatest share of the web page.

“<section>”: - As the name suggests it is used to define different sections of the webpage.

“<article>”: - To optimize our page further we use tags like article to differentiate the contents of the page.

“<footer>”: - As the name suggests footer tag is used to define the footer of the webpage. It is usually written at the last of the html.

Ensure that your HTML code is well-formed, properly nested, and compliant with HTML5 requirements.

CSS (Cascading Style Sheets):

If HTML is the skeleton of the webpage then CSS is the skin. We use CSS to target the specific portion or whole HTML to give it Style that is we design the appearance of our webpage(including but not limited to layout, typography, colours, and visuals) using CSS.

“CSS” can we written in html itself by using “<style>” tag but taking everything into account it is generally considered a bad practice as it makes our code very complicated and hard to read and even harder to edit. As we write thousands of lines of code, we should write it so that it can be read by anyone very easily so in future if there is a need to edit the code it can be done. Another way of writing “CSS” is to create a file with “.CSS” extension and then link it to the “HTML” file.

Use “CSS” selectors to aim “HTML” elements and use styling on them. We can use selectors to aim at the elements by their “tag name” “class” “ID” or other differentiating features.

For “ID” we use “#” (Pound) symbol and for class “.” (Dot) symbol.

Apply styles using “CSS” properties such as font-family, color, background-color, padding, margin, border, width, height, and display.

Use CSS media queries to craft responsive designs able to seamlessly adapting to numerous display sizes and gadgets. by way of utilising media queries, you may specify exclusive patterns based totally on factors like display screen width, height, and device orientation. This enables your webpage to dynamically alter its layout, font sizes, and different styling attributes to make certain ideal display throughout a various range of gadgets, consisting of laptop computers, capsules, and smartphones. with the aid of harnessing the power of CSS media queries, you can deliver a consistent and attractive user experience irrespective of the user's selected tool or display length.

“JavaScript”:

If “HTML” is the skeleton and “CSS” is the skin and muscles then “JavaScript” is the brain of the webpage. It is a programming language which adds the interactive as well as the dynamic behaviour in the webpage.

Use JavaScript to manipulate HTML elements, respond to user interactions (e.g., clicks, mouse movements), and update the content of your webpage dynamically.

“JavaScript” can we written in html itself by using “<script>” tag but taking everything into account it is generally considered a bad practice as it makes our code very complicated and hard to read and even harder to edit. As we write thousands of lines of code, we should write it so that it can be read by anyone very easily so in future if there is a need to edit the code it can be done. Another way of writing “JavaScript” is to create a file with “.js” extension and then link it to the “HTML” file.

Leverage JavaScript libraries and frameworks like jQuery, React, or Vue.js to streamline complex tasks and elevate the functionality of your website. These powerful tools offer pre-built components and functionalities that simplify development, making it easier to create interactive and dynamic web experiences. jQuery facilitates DOM manipulation and event handling, while frameworks like React and Vue.js provide robust solutions for building single-page applications with reusable components. By incorporating these libraries and frameworks into your development workflow, you can expedite the creation process, enhance user interactivity, and deliver a more polished and sophisticated website to your audience. Ensure that your JavaScript code is efficient, well-organized, and follows best practices to improve performance and maintainability.

4.1 HTML

“HTML”, or “Hypertext Markup Language”, is a programming language created to create and structure a “webpage”. It is like the skeleton of the “webpage” and provides basic building blocks for making the structure and content of the “webpage”.

HTML Boilerplate :-

“<!DOCTYPE html>” // here we specify that the type of document being used id “HTML”

“<html lang="en">” // here we specify that we are using English language

“<head>” //This specify that the start of the head of “HTML”

“<meta charset="UTF-8">” // This specify that we are using the character set “UTF-8”

“<meta name="viewport" content="width=device-width, initial-scale=1.0">” //

“<title>Document</title>”

“</head>”

“<body>”

“</body>”

“</html>”

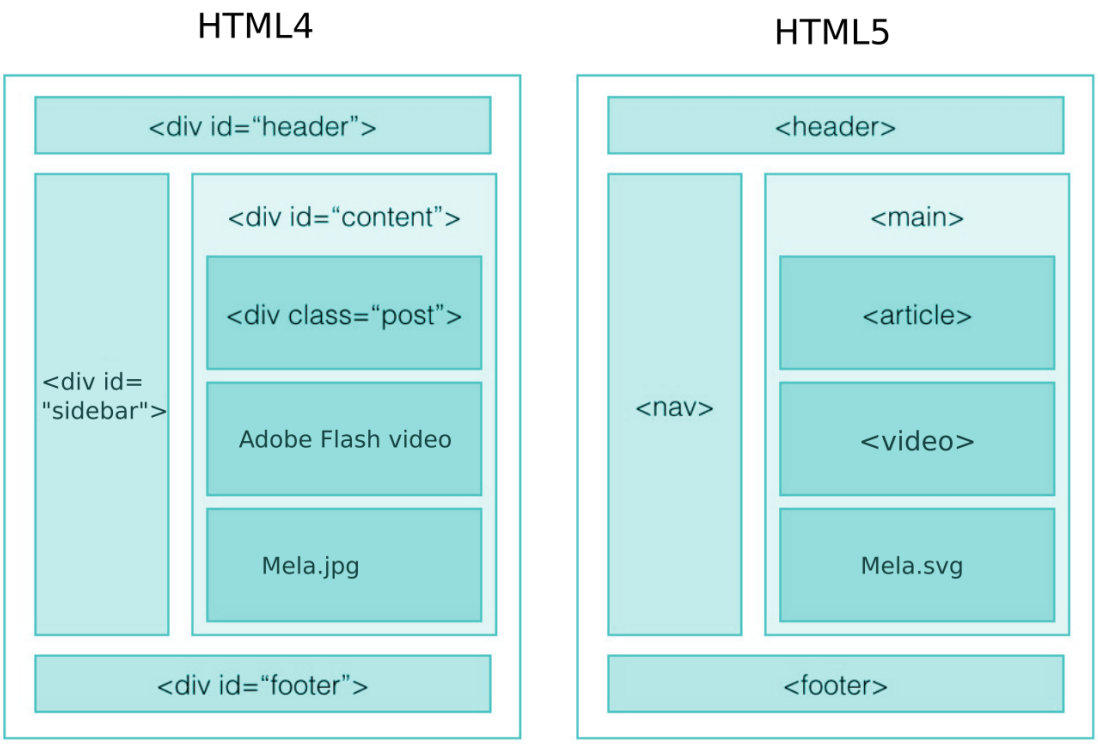

Figure 4.1 HTML

Here's an overview of HTML:

1. Elements: HTML documents consist of elements, which are represented by tags enc losed in angle brackets (< >). Elements typically have anIopeningitag, content, and aI closingItag. For example:

```html
<p>This is a paragraph.</p>
```

2. Attributes: Elements can have attributes that provide additional information or prop erties. Attributes are specified within the opening tag and typically consist of a name and a value. For example:

```"html"
<img src="image.jpg" alt="Image Description">
```

3. Document Structure: HTML documents are structured as a hierarchy of elements. T he top-
level element is usually the `<html>` element, which contains two main sections: the `<head>` section for metadata and the `<body>` section for the visible content of the webpage.

4. Headings: HTML provides six levels of headings, from `<h1>` (the most important) to `<h6>` (the least important). Headings are used to define the structure and hierar chy of the content on a webpage.

5. Paragraphs: The `<p>` element is used to define paragraphs of text. It is commonl y used for body text and other blocks of content.

6. Links: The `<a>` element is used to create hyperlinks, allowing users to navigate t o other web pages or resources. The `href` attribute specifies the URL of the destinat ion.

7. Images: The `<img>` element is used to embed images in a webpage. The `src` at tribute specifies the URL of the image file, and the `alt` attribute provides alternative text for accessibility.

8. Lists: HTML supports ordered lists (`

ol`) and unordered lists (`

ul`). Ordered lists are numbered, while unordered lists use bullet points. List items (`l i`) are used to define individual items within a list.

9. Tables: HTML allows you to create tables to display tabular data. Tables consist o f rows (`tr`), which contain cells (`td`) or header cells (`th`). Tables are often used to organize data in a structured format.

10. Forms: HTML provides form elements such as `<form>`, `<input>`, `<textarea>`, `<select>`, and `<button>` for creating interactive forms on web pages. Forms allow u sers to input data and submit it to a server for processing.

11. Semantic Elements: HTML5 introduced semantic elements such as `<header>`, `<n av>`, `<main>`, `<section>`, `<article>`, and `<footer>`, which provide more meaningf ul structure to web pages and improve accessibility and SEO.

HTML is the foundation of web development and is essential for creating web pages that are well-structured, accessible, and user-
friendly. By mastering HTML, you can create rich and engaging web experiences for your users.

4.2 CSS

CSS, or Cascading Style Sheets, is a style sheet language used to describe the presentation and formatting of HTML documents. It allows you to control the appearance of your web pages, including layout, colors, fonts, and spacing. Here's an overview of CSS:

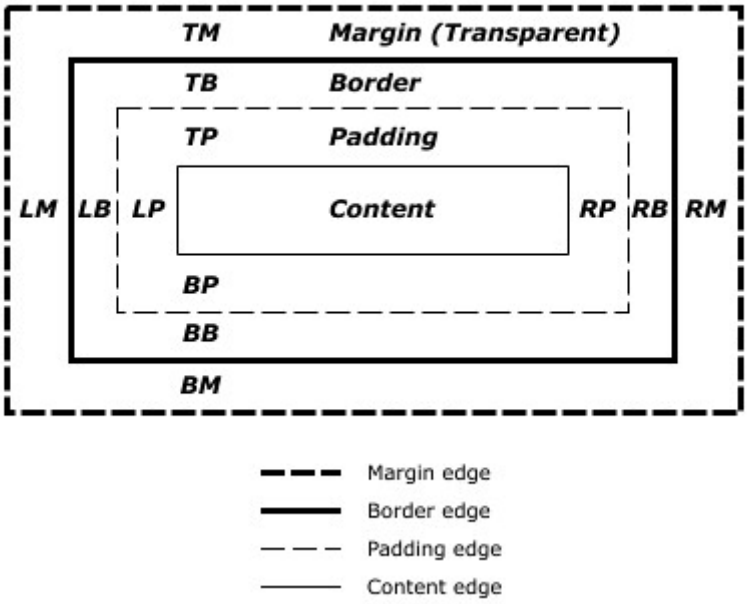

Figure 4.2 CSS

Selectors: CSS uses selectors to target HTML elements and apply styles to them. Selectors can target elements based on their tag name, class, ID, attributes, or relationship with other elements. For example:

```css
/* Targeting elements by tag name */
p {
    color: blue;
}

/* Targeting elements by class */
.heading {
```

```
    font-size: 24px;
}

/* Targeting elements by ID */
#logo {
    width: 100px;
}
```

2. Properties and Values: CSS properties define the visual characteristics of HTML el ements, such as color, font size, margin, padding, and border. Each property has a va lue that specifies how the property should be applied. For example:

```css
/* Setting color property */
p {
    color: red;
}

/* Setting font-size property */
.heading {
    font-size: 18px;
}

/* Setting margin property */
#logo {
    margin-top: 20px;
```

```
}
```

3. Selectors and Declarations: CSS rules consist of selectors and declarations. Selectors target HTML elements, while declarations set the styles to be applied to those elements. Multiple declarations can be grouped within a rule. For example:

```css
/* CSS rule with multiple declarations */
p {
    color: blue;
    font-size: 16px;
}
```

4. Inheritance and Cascading: CSS styles can be inherited from parent elements to child elements, allowing for consistent styling across a webpage. Additionally, CSS follows a cascading order of precedence, where styles are applied based on specificity, importance, and source order.

5. External, Internal, and Inline Styles: CSS can be applied to HTML documents in three ways: externally, internally, or inline. External stylesheets are linked to HTML documents using the `<link>` element, internal stylesheets are defined within the `<style>` element in the `<head>` section of an HTML document, and inline styles are applied directly to individual HTML elements using the `style` attribute.

6. Media Queries: CSS supports media queries, which allow you to apply different styles based on characteristics of the device, such as screen size, resolution, or orientation. This enables you to create responsive designs that adapt to different devices and screen sizes.

7. Vendor Prefixes: Some CSS properties require vendor prefixes to ensure compatibility with different web browsers. Vendor prefixes are prefixes added to property names to indicate which browser engine the property is intended for. For example, `-webkit-`, `-moz-`, and `-ms-`.

CSS serves as a cornerstone in web development, empowering developers to craft visually captivating and responsive web pages. Through CSS mastery, developers gain the ability to tailor the appearance of their web pages to align with specific design objectives, fostering immersive and engaging user experiences. Whether it's adjusting colors, fonts, layouts, or animations, CSS provides the flexibility and control necessary to transform static web content into dynamic and visually striking presentations. As a result, mastering CSS becomes an indispensable skill for web developers seeking to elevate the aesthetic appeal and functionality of their creations.

4.3 JAVA SCRIPT

JavaScript is a programming language commonly used in web development to add interactivity and dynamic behavior to web pages. Here's an overview of JavaScript:

1. Client-Side Scripting: JavaScript is primarily a client-side scripting language, meaning it runs in the web browser of the user. It allows you to manipulate HTML and CSS, handle events, and interact with the Document Object Model (DOM) of a webpage.

2. Event Handling: JavaScript allows you to respond to user actions, such as clicks, mouse movements, keyboard inputs, form submissions, and page loads. You can attach event handlers to HTML elements to execute JavaScript code when events occur.

3. DOM Manipulation: The DOM represents the structure of a webpage as a tree of objects, where each element in the HTML document is a node in the tree. JavaScript provides methods and properties to access, modify, and manipulate the DOM dynamically. You can add, remove, or modify HTML elements, change styles, update content, and more using JavaScript.

4. Variables and Data Types: JavaScript supports various data types, including numbers, strings, booleans, arrays, objects, functions, and more. You can declare variables to store data and perform operations on them using arithmetic, comparison, and logical operators.

5. Functions: Functions in JavaScript are reusable blocks of code that perform a specific task. You can define functions to encapsulate functionality and execute them multiple times throughout your code. Functions can accept parameters and return values, allowing for modular and flexible code.

6. Control Structures: JavaScript supports control structures such as conditional statements (if-else, switch-case) and loops (for, while, do-while) to control the flow of execution based on certain conditions or iterate over a set of values.

7. Error Handling: JavaScript provides mechanisms for handling errors and exceptions that may occur during the execution of code. You can use try-catch blocks to catch and handle errors gracefully, preventing them from crashing the entire application.

8. Asynchronous Programming: JavaScript supports asynchronous programming, allowing you to execute tasks concurrently without blocking the main thread. This is commonly used for handling asynchronous operations such as fetching data from servers, performing animations, and handling user input.

9. Browser APIs: JavaScript provides access to various browser APIs, allowing you to interact with browser features and functionalities. This includes APIs for manipulating the browser history, accessing geolocation data, working with local storage, making HTTP requests, and more.

JavaScript is a versatile and powerful language that enables you to create rich and interactive web experiences. By mastering JavaScript, you can enhance the functionality and user experience of your web applications and build modern, responsive, and dynamic websites.

5. CODE

5.1 HTML

```
<!DOCTYPE html>

<html lang="en">


<head>

    <meta name="description"

        content="Made in 2024, for the students of BIT-P. The goal of this website is but not limited to connecting Alumni, ">

    <meta charset="UTF-8">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <link rel="icon" type="image/png" href="images/Designer.png">

    <link rel="stylesheet" href="Style.css">

    <title>ECE-BITP</title>

    <style>

                                                                /*          @import
url('https://fonts.googleapis.com/css2?family=Dancing+Script&family=Great+Vibes&family
=Oswald:wght@200..700&family=Playball&display=swap'); */

                                                                @import
url('https://fonts.googleapis.com/css2?family=Dancing+Script&family=Great+Vibes&family
=Oregano:ital@0;1&family=Oswald:wght@200..700&family=Playball&display=swap');

    </style>

</head>


<body>

    <nav id="navbar">

        <div id="logo">
```

```
            <img src="images/Designer.png" alt="">
        </div>
        <ul>
            <li class="item"><a href="#">Home</a></li>
            <li class="item"><a href="#">Assignment</a></li>
            <li class="item"><a href="#">Question Paper</a></li>
            <li class="item"><a href="#">Projects</a></li>
            <li class="item"><a href="#">Alumni</a></li>
        </ul>
    </nav>
    <section id="home">
        <h1 class="h-primary">Department of Electronics and Communication</h1>
    </section>
    <box id="box-1">
        <div id="alumni-1">
            <img src="images/alumni.jpeg" alt="">
           <p>Lorem ipsum dolor sit amet consectetur adipisicing elit. Ipsa commodi libero labore eveniet, eos
              rerum ullam minus vel perferendis dolor laborum reiciendis? Earum, architecto a libero quod ducimus
               perspiciatis.</p>
        </div>
        <div id="Question-1">
            <img src="images/ai-generated-8703969_1280.jpg" alt="">
            <p>Lorem ipsum dolor sit amet consectetur adipisicing elit. Voluptates aut est distinctio enim veniam sequi,
```

```
                asperiores voluptas qui at perferendis eius fuga, unde a dolor officiis nemo nulla quia earum!</p>
            </div>
            <div></div>
            <div></div>
        </box>
</body>
</html>
```

5.2 CSS

```
/* Css Reset */

*{

    margin: 0;

    padding: 0;

}

#logo{

    display: grid;

    margin: 10px;

    justify-content: left;

}


#logo img{

    /* justify-self: left; */

    margin: 10px;

    height: 90px;

    width: 90px;

    border-radius:112px;

    z-index: -1;

}

/* Navigation */

#navbar{

    display: grid;

    grid-template-columns: 1fr 2fr 1fr;

    /* justify-content: center; */
```

```
    align-items: center;
    /* position: relative; */
}

#navbar ul{
    display: flex;
    justify-self: center;
    margin: 0;
    padding: 0;
}
#navbar::before{
    content: "";
    background-color: rgb(155 135 218 / 40%);
    position: absolute;
    height: 100%;
    width: 100%;
    z-index: -1;
    text-align: center;
}

#navbar ul li{
    list-style: none;
    font-size: 1.3rem;
}
```

```
#navbar ul li a{
    padding: 2px 35px;
    display: flex;
    text-decoration: none;
    align-items: center;
    text-align: center;
}

#navbar ul li a:hover{
    background-color: rgb(155 135 218 / 20%);
    border-radius: 12px;
}

/* Section */
#home{
    display: flex;
    justify-content: center;
    /* align-items: center; */
    text-align: center;
}
#home::before{
    content: "";
    background:url(images/bg1.png);
    background-repeat: no-repeat;
    position: absolute;
```

```
    height: 100%;
    width: 100%;
    z-index: -1;
}

/* Utility */
.h-primary{
font-size: 2.8rem;
/* font-family: "Oswald", sans-serif; */
}
#box-1{
    display: grid;
    grid-template-rows: auto;
    border: 2px solid red;
}
#alumni-1{     background-color: rgb(155 135 218 / 20%);
```

6. FUTURE WORK

Transitioning from frontend progress, backend development takes the forefront in furthering the alumni page project. With a focus on backend systems, the goal is to establish a robust infrastructure capable of managing an expanded pool of alumni contacts efficiently. This phase aims to enhance both the content and functionality of the page, thereby enriching user engagement and overall experience.

Backend development involves creating mechanisms for collecting, processing, and securely storing alumni contact information. By implementing validation checks and encryption protocols, data integrity and confidentiality are ensured, safeguarding sensitive information from unauthorized access. Additionally, efficient algorithms for data retrieval and presentation are devised to enable quick searching and filtering through vast amounts of information, enhancing performance and user satisfaction.

Scalability is another key aspect addressed in backend development. As the alumni page attracts more users and accumulates a larger volume of data, the backend infrastructure must be scalable to accommodate increased traffic and data volume seamlessly. Cloud-based solutions and distributed computing architectures are employed to enable seamless scalability, ensuring the page can handle spikes in traffic without downtime or performance degradation.

Security is paramount in backend development, with measures implemented to protect against potential threats and vulnerabilities. This includes securing APIs, implementing authentication and authorization mechanisms, and staying updated with software patches to mitigate security risks effectively. By prioritizing security, the alumni page can maintain the integrity of user data and build trust with its audience.

Overall, backend development is essential for enhancing the functionality, scalability, and security of the alumni page. By prioritizing backend systems, organizations can create a robust infrastructure capable of efficiently managing alumni data, delivering personalized user experiences, and ensuring compliance with regulatory requirements.

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