BULLETIN WEB APPLICATION

The Project submitted to

Sant Gadgebaba Amravati University, Amravati

Towards partial fulfilment of the Degree of

Bachelor of Engineering

In

Information Technology

Guided by   **Submitted by**

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DEPARTMENT OF INFORMATION TECHNOLOGY
SHRI SANT GAJANAN MAHARAJ COLLEGE OF
ENGINEERING, SHEGAON (M.S.)
2022- 2023

SHRI SANT GAJANAN MAHARAJ COLLEGE OF ENGINEERING, SHEGAON

2022-2023

CERTIFICATE

This is to certify that **Ms. Aayushi Varma, Ms. Anagha Deshmukh, Ms. Poonam Jaikar, Ms. Komal Kumbhare** students of final year B.E. (Information Technology) in the year 2022-2023 of the Information Technology Department of this institute have completed the project work entitled **"Bulletin Web Application"** based on syllabus and has submitted a satisfactory account of his/her work in this report which is recommended for the partial fulfilment of the degree of Bachelor of Engineering in Information Technology.

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SHRI SANT GAJANAN MAHARAJ COLLEGE OF ENGINEERING, SHEGAON

2022-2023

CERTIFICATE

This is to certify that the project work entitled "**Bulletin Web Application**" submitted by **Ms. Aayushi Varma, Ms. Anagha Deshmukh, Ms. Poonam Jaikar, Ms. Komal Kumbhare** students of final year B.E. (Information Technology) in the year 2022-2023 of the Information Technology Department of this institute, is a satisfactory account of her work based on the syllabus which is approved for the award of the degree of Bachelor of Engineering in Information Technology.

Internal Examiner   External Examiner

Date: Date:

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ABSTRACT

The design and development of a web application to improve business processes and performance in our project. The objective of this project is to create an advertising website for a company using HTML, CSS, PHP, and JavaScript. The website will be designed to showcase the company's products and services and to attract potential customers. The website will feature an intuitive and user-friendly interface, with a focus on responsive design for optimal viewing on various devices. The project will involve developing a custom content management system (CMS) that will allow the company to easily update and manage their website content. Additionally, the website will incorporate various advertising strategies such as search engine optimization (SEO) and social media integration to increase visibility and reach. Overall, this project aims to provide the company with a modern and effective advertising platform to promote their brand and increase customer engagement.

Keywords - HTML; CSS; JavaScript; PHP; MySQL; jQuery.

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1. INTRODUCTION

1.1 Preface

In today's digital age, having a strong online presence is essential for businesses of all sizes. An advertising website can be an effective way to showcase products and services, reach a wider audience, and improve customer engagement. The purpose of this project is to design and develop a web application that enhances and advertises client's business on a global platform.

The project will involve creating a user-friendly and responsive website that provides visitors with an intuitive and informative experience. The website will be developed using a combination of HTML, CSS, PHP, and JavaScript, and will incorporate modern design and development practices to ensure optimal performance and security [8].

To achieve this goal, the project team will follow a structured development process that involves analyzing the client's requirements, designing the website's user interface and functionality, implementing the code, and testing the website for usability, functionality, and security. The project team will also collaborate closely with the client to ensure that the website meets their expectations and fulfills their business objectives.

This project has the potential to greatly benefit the client's business by improving their online presence, attracting new customers, and increasing revenue. By leveraging the latest web technologies and design principles, the project team aims to create a website that not only meets the client's needs but also sets them apart from their competitors.

1.2 Statement of Problem

Problem Identified

We have observe the small scale industries or startup companies are usually lack in there increasing client because of their traditional marketing style. Lack of global online presence is a significant problem that can limit the company's ability to reach potential customers beyond their local market. With the increasing use of the internet

and social media, having a strong online presence is crucial for businesses to succeed in the modern digital era.

Without a global online presence, the client's business may not be visible to potential customers outside their local area, leading to missed opportunities for growth and expansion. This can result in a significant loss of revenue and market share, especially if competitors have a strong online presence and are able to attract customers from other regions.

Solution to be given

Bulletin Web Application: By developing a web application to enhance the client's global online presence, the business can reach potential customers around the world, expand its customer base, and increase its revenue. The web application can provide customers with easy access to the client's products and services, allowing them to make purchases from anywhere in the world.

Furthermore, the web application can be optimized for search engine visibility, making it easier for potential customers to find the client's business online. The application can also be integrated with social media platforms and online advertising tools to increase the reach of the client's marketing campaigns and attract a wider audience. By leveraging the power of technology and developing a web application, the company can overcome this problem and expand its customer base and revenue potential.

1.3 Objectives of Project

The Objective of to enhance and advertise client's business on a global platform through design and development of a web application.

1. The main objective of this web application is to explore the business ideas on global platform using Search Engine Optimization.
2. To boost sales and improve awareness of this brand through a combination of graphic and textual content and contains an internal link to target ad pages using Retargeting .
3. To improve the communication between client and people on a global level through Chatbot using JavaScript.

1.4 Scope and Limitations of the Project

Scope

The scope of this project includes designing and developing an advertising website for a company using HTML, CSS, PHP, and JavaScript [23]. The website will have a responsive design and a user-friendly interface, with a focus on showcasing the company's products and services [9]. The project will involve developing a custom content management system (CMS) that will allow the company to easily manage and update their website content.

In addition to the technical aspects, the project will also include incorporating various advertising strategies such as search engine optimization (SEO) and social media integration. The website will be optimized for search engines and will have social media links to increase the visibility and reach of the company's brand.

The project will be developed based on the requirements and specifications provided by the company, and will be completed within the given timeframe and budget. The scope of this project does not include creating a brand identity or content creation for the website, as those aspects may be handled by the company separately.

Limitations

There may be several limitations to this project, depending on the specific requirements and resources available. Some potential limitations may include:

1. *Technical limitations:* The website may face technical limitations due to the use of specific technologies or restrictions imposed by the hosting provider or server environment.
2. *Budget constraints*: The project may have a limited budget, which may affect the scope and quality of the website's design and functionality.
3. *Time constraints:* The project may have a tight timeline, which may limit the amount of time available for development, testing, and deployment.
4. *Limited resources:* The project may have limited resources in terms of personnel, hardware, or software, which may impact the project's efficiency and effectiveness.

5. *Compatibility issues:* The website may face compatibility issues with certain browsers or devices, which may affect its usability and accessibility.

6. *Security concerns:* The website may be vulnerable to security threats such as hacking or malware, which may compromise the integrity and confidentiality of the company's data. It is important to identify and address these limitations early on in the project planning phase to ensure that the final product meets the company's expectations and requirements.

1.5 Organization of the Project

The project is organized as follows:

1. Chapter 1 gives introduction about the project in which we discuss problem statement and solution to be given. It gives the objectives of project.

2. Chapter 2 gives Literature Survey of the project. While making this report and developing this project we refer the list of literature.

3. Chapter 3 provides analysis of project. The hardware and software required for this project are analyzed in this chapter. Along with that feasibility study, use case representation of the project.

4. Chapter 4 provides design phase of project in which we discuss the design goals, design strategies, various UML diagrams representation including class diagram, sequence diagram, collaboration diagram.

5. Chapter 5 provides how project is implemented in which we discuss the implementation strategies and testing strategies which we used to test oproject module working.

6. Chapter 6 gives conclusion of the project.

7. Future Work of the project gives the brief of the new Technologies which we can add in the future to make it more effective project.

2 . LITERATURE SURVEY

Paper 01

Spider Trap—An Innovative Approach to Analyze Activity of Internet Bots on a Website was published in the IEEE Access journal in 2020. The authors of this work are P. Lewandowski, M. Janiszewski, and A. Felkner.

Description

This work presents an innovative approach to analyzing the activity of internet bots on a website using a "spider trap" technique [1]. This technique involves creating a hidden link that is not visible to human visitors but can be followed by bots. The link leads to a fake page that is designed to look like a real page on the website but contains unique identifying information. When a bot follows the link and accesses the fake page, the identifying information is recorded, allowing the researchers to track the bot's activity on the website. The authors tested the spider trap technique on a real-world website and compared the results to traditional methods of bot detection. They found that the spider trap approach was more effective in identifying and analyzing bot activity on the website. They also demonstrated how the technique can be used to identify the specific bots that are responsible for spamming or conducting other malicious activities on the website. This work presents a novel approach to bot detection and analysis on websites, which could be useful for website administrators and security professionals in identifying and mitigating bot-related threats.

Finding

The main finding of this work Spider Trap—An Innovative Approach to Analyze Activity of Internet Bots on a Website is that the spider trap technique is an effective approach for detecting and analyzing bot activity on a website. The authors compared the spider trap approach to traditional methods of bot detection and found that it was more successful in identifying bots and tracking their activity. Additionally, the authors demonstrated how the spider trap technique can be used to identify specific bots responsible for spamming and other malicious activities on the website. Overall, the findings suggest that the spider trap technique is a valuable tool for website

administrators and security professionals in identifying and mitigating bot-related threats.

Paper 02

The Effect and Technique in Search Engine Optimization was presented at the 2020 International Conference on Information Management and Technology (ICIMTech). The authors of this work are A. Dramilio, C. Faustine, S. Sanjaya, and B. Soewito [2].

Description

This work discusses the effects of search engine optimization (SEO) techniques on website ranking and traffic [2]. The authors review several common SEO techniques, including keyword research, meta tags optimization, link building, and content optimization, and examine their impact on website ranking and traffic. They also discuss the importance of analytics and monitoring in evaluating the effectiveness of SEO techniques. The authors conducted a case study to evaluate the effectiveness of the SEO techniques on a real-world website. They used Google Analytics to track the website's ranking and traffic before and after implementing the SEO techniques. The results of the case study showed a significant improvement in website ranking and traffic after implementing the SEO techniques. This work provides valuable insights into the effectiveness of various SEO techniques and highlights the importance of analytics and monitoring in evaluating their impact. The findings of this paper could be useful for website owners and SEO professionals in improving website ranking and traffic.

Finding

The main finding of this work The Effect and Technique in Search Engine Optimization is that implementing various SEO techniques such as keyword research, meta tags optimization, link building, and content optimization can significantly improve a website's ranking and traffic. The authors conducted a case study and used Google Analytics to track the website's ranking and traffic before and after implementing the SEO techniques. The results of the case study showed a significant improvement in website ranking and traffic after implementing the SEO techniques. Additionally, this work highlights the importance of analytics and monitoring in evaluating the effectiveness of SEO techniques. Overall, the findings of this paper suggest that SEO techniques are valuable tools for website owners and SEO professionals in improving website ranking and traffic.

Paper 03

A Model for Choosing Hosting for a Company's Website was presented at the 2019 IEEE International Scientific-Practical Conference Problems of Infocommunications, Science and Technology (PIC S&T). The authors of this work are N. Fil, L. Nefedov, and A. Binkovskaya [3].

Description

This work discusses the importance of selecting the right hosting service for a company's website and proposes a model for choosing the optimal hosting service based on several factors. The authors identified four criteria for evaluating hosting services: reliability, performance, security, and cost-effectiveness. They then developed a model that uses a weighted scoring system to evaluate potential hosting services based on these criteria. The authors applied the proposed model to a real-world case study involving a company that needed to choose a hosting service for their website. The results of the case study showed that the proposed model was effective in helping the company select the optimal hosting service based on their specific needs and requirements. This work provides valuable insights into the importance of selecting the right hosting service for a company's website and proposes a model that can be used to evaluate and select the optimal hosting service based on several factors. The findings of this paper could be useful for companies and website owners in selecting the best hosting service for their websites.

Finding

The main finding of this work A Model for Choosing Hosting for a Company's Website is that selecting the right hosting service is important for a company's website, and the proposed model can effectively help in choosing the optimal hosting service based on several factors. The authors identified four criteria for evaluating hosting services: reliability, performance, security, and cost-effectiveness, and developed a weighted scoring system to evaluate potential hosting services based on these criteria. The results of the case study showed that the proposed model was effective in helping the company select the optimal hosting service based on their specific needs and requirements. Overall, the findings of this work [15] suggest that

the proposed model can be a useful tool for companies and website owners in selecting the best hosting service for their websites.

Paper 04

Implementation of Selenium Automation & Report Generation Using Selenium Web Driver & ATF was presented at the 2021 International Conference on Advances in Electrical, Computing, Communication and Sustainable Technologies (ICAECT). The authors of this work are K. Sawant, R. Tiwari, S. Vyas, P. Sharma, A. Anand, and S. Soni [4] .

Description

This work discusses the implementation of Selenium automation and report generation using Selenium Web Driver and ATF (Automation Testing Framework). The authors highlight the importance of automation testing in software development and provide an overview of the Selenium Web Driver and ATF. They then present a case study that demonstrates the implementation of Selenium automation and report generation for a web-based application [4]. The case study shows how Selenium Web Driver and ATF were used to automate the testing process for a web-based application and generate detailed reports on the testing results. The authors also discuss the benefits of using Selenium automation, including improved testing efficiency, accuracy, and repeatability. This work provides valuable insights into the importance of automation testing in software development and presents a practical approach to implementing Selenium automation and report generation using Selenium Web Driver and ATF. The findings of this paper could be useful for software developers and testing professionals who are interested in implementing automation testing in their projects.

Finding

The main finding of this work Implementation of Selenium Automation & Report Generation Using Selenium Web Driver & ATF is that automation testing using Selenium Web Driver and ATF can significantly improve the efficiency, accuracy, and repeatability of software testing for web-based applications. The authors demonstrated this through a case study that showed how automation testing using

Selenium Web Driver and ATF can automate repetitive tasks and generate detailed reports on testing results. The authors also discussed the benefits of automation testing, including reduced testing time and costs, increased test coverage, and improved software quality. This work highlights the importance of implementing automation testing in software development and provides a practical approach to using Selenium Web Driver and ATF for automation testing. The findings of this paper suggest that automation testing using Selenium Web Driver and ATF can be an effective approach to software testing for web-based applications. The paper's insights could be useful for software developers and testing professionals who are interested in implementing automation testing in their projects.

Paper 05

New technologies for web development by Grega Jakus, Matija Jekovec, Sašo Tomažič, and Jaka Sodnik provides an overview of new and emerging technologies in web development [5].

Description

The authors discuss the evolution of web development over the years and the challenges that developers face in creating dynamic and engaging web applications. They then introduce several new technologies and frameworks that can help developers overcome these challenges and create better web applications. This work starts with an introduction to the traditional web development stack, which consists of HTML, CSS, and JavaScript. The authors discuss the limitations of this stack, such as slow performance and poor user experience. They then introduce several new technologies and frameworks, such as React, Angular, and Vue.js, which can help developers create faster and more dynamic web applications. The authors also discuss the rise of serverless computing and how it is changing the way web applications are developed and deployed. They introduce several serverless platforms, such as AWS Lambda and Azure Functions, and discuss their advantages and limitations. This work also covers the importance of security in web development and introduces several security-focused frameworks and tools, such as Helmet and OWASP. The authors emphasize the need for developers to prioritize security in their web applications to protect against potential threats and vulnerabilities.

Finding

The general idea of HTML5 and other tools presented in this paper is the formal specification and the establishment of uniform solutions for technologies and functionalities which have already been in use through various hacks and plug-ins proposed by web developers. The majority of modern rich and interactive web designs was based on Adobe Flash technology which was supported by all major browser vendors. The Flash plug-in 280 Jakus, Jekovec, Tomažič, Sodnik offered an excellent support for multimedia content, especially animations and animated interfaces. HTML5 simplifies the implementation of such functionality through native browser support. The new notable trend on the Web today is the introduction of semantics in web documents. The web content is shaped and designed primarily to be read and understood by people; therefore, a computer cannot provide any extensive help by analyzing, searching and processing the data. The introduction of semantics will eventually lead to the third generation of Web, the so-called Semantic Web. New development practices, rich web content and the need for semantics in web documents are already manifesting themselves in practice. Besides some changes in HTML syntax and vocabulary, the most important new features in HTML5 are the introduction of semantics in the form of microdata and ARIA attributes, support for RIA by bringing new form widgets, support for multimedia and dynamic graphic rendering.

Paper 06

A New PHP Web Application Development Framework Based on MVC Architectural Pattern and Ajax Technology by Stenly Ibrahim Adam and Stevani Andolo was published in IEEE in 2019 [6] .

Description

This work describes a new web application development framework developed using PHP programming language, which is based on the Model-View-Controller (MVC) architectural pattern and Ajax technology. This work starts with an introduction to the MVC pattern and its importance in web application development. The authors then discuss the limitations of existing PHP frameworks and the need for a new framework that can address these limitations and provide better performance and scalability .

The proposed framework is designed to be lightweight, modular, and extensible. It uses the MVC pattern to separate the presentation logic from the business logic and data access layer [21]. The framework also incorporates Ajax technology to enable asynchronous data exchange between the client and the server, resulting in faster and more responsive web applications. This work provides a detailed description of the framework's architecture and its key components, including the router, controller, model, and view. The authors also discuss the benefits of using the framework, such as improved code organization, better separation of concerns, and easier maintenance and testing.

Finding

The authors introduce the Model-View-Controller (MVC) pattern and Ajax technology as the basis of the framework and explain its design and architecture in detail. The proposed framework is lightweight, modular, and extensible, with the aim of providing better performance, scalability, and flexibility compared to existing PHP frameworks. This work presents the benefits of using the proposed framework, such as improved code organization, better separation of concerns, and easier maintenance and testing. Overall, this work provides a useful resource for web developers looking to build high-quality web applications using PHP.

Paper 07

The Design and Implementation of Responsive Web Page Based on HTML5 and CSS3 was presented at IEEE in 2019 by Nian Li and Bo Zhang [7].

Description

This work starts with an introduction to the importance of responsive web design in today's world where users access websites on a variety of devices with different screen sizes and resolutions. The authors then discuss the benefits and challenges of using HTML5 and CSS3 for responsive web design. This work provides a detailed description of the design and implementation of a responsive web page using HTML5 and CSS3. The authors explain the use of media queries and flexible grid systems to create a responsive layout that adjusts to different screen sizes. They also discuss the use of HTML5 and CSS3 features such as semantic markup, animations, and

transitions to enhance the user experience and improve performance [10] . The authors present the results of their implementation and compare it with other approaches. They also discuss the limitations of their approach and suggest future research directions.

Finding

This work provides a comprehensive overview of the importance of responsive web design and the benefits and challenges of using HTML5 and CSS3 for responsive web design. The authors present a practical approach to designing and implementing responsive web pages using HTML5 and CSS3, explaining the use of media queries and flexible grid systems to create a responsive layout that adjusts to different screen sizes. They also discuss the use of HTML5 and CSS3 features to enhance user experience and improve performance. This work presents the results of their implementation and compares it with other approaches, and concludes with a discussion on the limitations of their approach and future research directions. Overall, this work is a valuable resource for web designers and developers looking to create responsive websites using HTML5 and CSS3.

Paper 08

PHP Framework for Web Application Development , was presented at IASJSET in 2022 [8]. The author of this work is Sangay Tenzin.

Description

This work starts with an introduction to the importance of PHP frameworks in web development and explains the benefits of using frameworks over plain PHP. The author then presents the design and architecture of the proposed PHP framework. The proposed PHP framework is based on the Model-View-Controller (MVC) architectural pattern and uses object-oriented programming principles. The author explains the different components of the framework, including the router, controller, model, view, and database components, and how they work together to provide a modular and extensible framework for web application development. The author provides examples of how to use the framework for building web applications, including creating a basic CRUD (Create, Read, Update, Delete) application. This

work also includes performance comparisons of the proposed PHP framework with other popular PHP frameworks, demonstrating its efficiency and effectiveness. This work presents a new PHP framework for web application development based on the MVC pattern and object-oriented programming principles. The framework provides a modular and extensible approach to web application development and is shown to be efficient and effective in performance. This work is a valuable resource for web developers looking to build high-quality web applications using PHP.

Finding

This work provides a detailed description of the framework's design and architecture, including its different components and how they work together to provide a modular and extensible approach to web application development. The author also provides examples of how to use the framework for building web applications, including creating a basic CRUD application, and includes performance comparisons with other popular PHP frameworks to demonstrate its efficiency and effectiveness. Overall, this work is a valuable resource for web developers looking for a new PHP framework to use for building high-quality web applications.

Paper 09

The Design and Implementation of Responsive Web Page Based on HTML5 and CSS3 by Nian Li and Bo Zhang [9].

Description

This work starts with an introduction to responsive web design, explaining the importance of creating web pages that can adapt to different screen sizes and devices. The authors then provide an overview of HTML5 and CSS3 and how these technologies can be used to create responsive web pages. They explain the use of media queries and flexible grid systems to create a responsive layout that adjusts to different screen sizes. They also discuss the use of HTML5 and CSS3 features to enhance user experience and improve performance, such as using SVG graphics and optimizing images.

This work presents a case study of implementing a responsive web page using HTML5 and CSS3, providing a step-by-step guide for creating a responsive layout,

optimizing images, and adding interactive features. The authors also compare their implementation with other approaches, demonstrating the effectiveness of using HTML5 and CSS3 for responsive web design. This work highlights the importance of responsive web design and provides a practical guide to creating responsive web pages using HTML5 and CSS3 technologies. This work is a valuable resource for web designers and developers looking to create high-quality, responsive web pages.

Finding

This work highlights the importance of responsive web design and provides a step-by-step guide to creating responsive layouts, optimizing images, and adding interactive features. The authors also compare their implementation with other approaches and demonstrate the effectiveness of using [11] HTML5 and CSS3 for responsive web design. Overall, this work is a valuable resource for web designers and developers looking to create high-quality, responsive web pages.

Paper 10

PHP Framework for Web Application Development by Sangay Tenzin presents a new PHP framework based on the Model-View-Controller (MVC) architectural pattern for web application development [10].

Description

This work provides a detailed description of the framework's design and architecture, including its different components and how they work together to provide a modular and extensible approach to web application development. The author explains the benefits of using the MVC architectural pattern for web development and highlights the importance of object-oriented programming principles for building scalable and maintainable web applications. This work also includes a performance comparison of the proposed framework with other popular PHP frameworks to demonstrate its efficiency and effectiveness.

The author provides examples of how to use the framework for building web applications, including creating a basic CRUD application. This work also explains how the framework can be extended to add new functionalities and features to web

applications. Overall, this work is a valuable resource for web developers looking for a new PHP framework to use for building high-quality web applications [10].

Finding

This work highlights the importance of using object-oriented programming principles for building scalable and maintainable web applications and provides a detailed description of the framework's design and architecture. This work includes a performance comparison of the proposed framework with other popular PHP frameworks to demonstrate its efficiency and effectiveness. The author also provides examples of how to use the framework for building web applications and explains how it can be extended to add new functionalities and features. This work is a valuable resource for web developers looking for a new PHP framework to use for building high-quality web applications. The framework proposed in this work has the potential to improve web application development by providing a modular and extensible approach to building scalable and maintainable web applications.

Paper 11

Modern JavaScript frameworks: A Survey Study by Rahman and Mustafa Mesut Koc presented in IEEE 2018 [11].

Description

This work Modern JavaScript frameworks: A Survey Study presents a survey study conducted to gather information about the most popular JavaScript frameworks used for building modern web applications. The authors of the work , Mohammad Ashiqur Rahman and Mustafa Mesut Koc, collected data from 286 participants, consisting of software developers, software engineers, and researchers, to identify the most popular JavaScript frameworks, their features, and their limitations. This work provides a detailed description of the survey methodology, including the survey instrument used and the data analysis techniques employed. The authors present the results of the survey in terms of the popularity of different JavaScript frameworks, the features and limitations of these frameworks, and the factors that influence the selection of a particular framework.

The authors also discuss the implications of their findings for developers and researchers working in the field of web application development. They highlight the importance of considering factors such as ease of use, performance, and community support when selecting a JavaScript framework for building modern web applications. Overall, this work provides valuable insights into the current state of JavaScript frameworks and their use in modern web application development. The findings of the survey can help developers and researchers make informed decisions when selecting a JavaScript framework for their projects**.**

Finding

The survey study conducted by the authors provides a comprehensive understanding of the factors that influence the selection of a particular JavaScript framework, such as ease of use, performance, and community support. This work is a valuable resource for developers and researchers working in the field of web application development, as it provides a detailed analysis of the most popular JavaScript frameworks and their strengths and weaknesses. The findings of the survey can help developers and researchers make informed decisions when selecting a JavaScript framework for their projects. This work highlights the importance of staying up-to-date with the latest trends and developments in JavaScript frameworks to ensure the development of high-quality and efficient web applications.

Paper 12

Developing Web Applications Using jQuery, JSON and MySQL by Arsalan A. Ahmed and Shaimaa N. Ahmed, published in the International Journal of Computer Science and Information Security in 2017 [12].

Description

This work highlights the advantages of these technologies in web application development and discusses the implementation details. The authors explain the use of jQuery for the creation of dynamic and interactive web pages. They also highlight the benefits of using JSON as a data interchange format to transmit data between the client and the server. This work also explains how to use MySQL as the backend database to store and manage data for the web application. The research paper

includes a case study of a web application developed using jQuery, JSON, and MySQL. The case study highlights the various features and functionalities of the web application, and the implementation details of each feature. The authors also discuss the performance evaluation of the web application, and the results obtained through the evaluation. The research paper provides a comprehensive overview of the use of jQuery, JSON, and MySQL in web application development. It also provides a practical example of the implementation of these technologies in a real-world web application. This work is a valuable resource for web developers and researchers interested in the use of these technologies in web development.

Finding

The research work provides a clear and detailed explanation of how to develop web applications using jQuery, JSON, and MySQL. The authors provide a practical example of a web application developed using these technologies, which helps to illustrate the benefits of using them in web development. This work highlights the advantages of using jQuery for the creation of dynamic and interactive web pages, and how JSON can be used as a data interchange format to transmit data between the client and the server. The authors also explain how MySQL can be used as the backend database to store and manage data for the web application. The case study included in this work demonstrates the effectiveness of using these technologies in web application development. The performance evaluation of the web application shows that it performs well, even under heavy load. The research paper is a valuable resource for web developers and researchers interested in the use of jQuery, JSON, and MySQL in web development. It provides practical guidance on how to implement these technologies in web applications, as well as demonstrating the benefits of using them.

Paper 13

Web Application Development with jQuery and MySQL by Artyom Anikin is a research paper published in the Journal of Open Source Software in 2018 [13].

Description

This work focuses on the development of web applications using jQuery and MySQL. It provides a comprehensive guide for developers interested in building dynamic web

applications using these technologies. This work starts with an introduction to jQuery and MySQL, explaining how they can be used together to create interactive and responsive web applications [13]. It then goes on to provide a step-by-step guide for building a sample web application, demonstrating how jQuery and MySQL can be used to build different components of the application. This work covers several topics related to web application development, including server-side programming, client-side programming, database management, and user interface design. It provides practical examples and code snippets to help developers understand how to use jQuery and MySQL effectively in web development. The author also discusses some of the challenges and best practices associated with using jQuery and MySQL in web application development, such as security concerns and database optimization. This work concludes with a discussion of the benefits of using jQuery and MySQL for web application development, including improved performance, enhanced user experience, and increased productivity.

Web Application Development with jQuery and MySQL is a valuable resource for developers interested in building web applications using these technologies. It provides practical guidance and real-world examples to help developers get started with building dynamic and responsive web applications.

Finding

This work provides practical guidance and real-world examples to help developers get started with building dynamic and responsive web applications using these technologies. It also discusses some of the challenges and best practices associated with using jQuery and MySQL in web application development, providing insight into how to use these tools effectively.

Paper 14

A Model for Choosing Hosting for a Company's Website is Published in IEEE in 2020 by Nataliya Fil , Leonid Nefedov and Angela Binkovskaya [14].

Description

The authors of this work recognize the importance of selecting the right hosting provider to ensure that the website is accessible, secure, and reliable. This work

proposes a six-stage model that businesses can use to guide their decision-making process when selecting a web hosting provider. The first stage of the model is defining hosting requirements. This involves identifying the specific needs of the company's website, such as bandwidth requirements, storage needs, and any other technical requirements. The second stage is evaluating hosting providers. This involves researching and evaluating potential hosting providers to determine if they meet the requirements identified in stage one. Factors to consider at this stage include uptime guarantees, pricing, customer support, and user reviews.

The third stage is assessing the reliability of hosting providers. This involves evaluating the hosting provider's track record of uptime and reliability, including any downtime or server issues that have been experienced in the past. The fourth stage is assessing the security of hosting providers. This involves evaluating the hosting provider's security measures, such as firewalls, SSL certificates, and backup and recovery options. The fifth stage is assessing the technical support of hosting providers. This involves evaluating the level of technical support provided by the hosting provider, such as the availability of support staff, response times, and the quality of support provided.

The final stage is choosing the best hosting provider. This involves using the information gathered in the previous stages to make an informed decision on the best hosting provider for the company's website. A Model for Choosing Hosting for a Company's Website provides a useful framework for businesses and individuals looking to select the best web hosting provider for their needs. By following the model outlined in the paper, companies can ensure that they select a hosting provider that meets their specific requirements and provides reliable, secure, and accessible hosting services for their website.

Finding

As this work is a conceptual model for selecting a hosting service for a company's website, there are no empirical findings to report. However, the authors suggest that the model can help companies make a more informed decision when choosing a hosting service by considering factors such as server reliability, bandwidth, security, and cost. They also highlight the importance of scalability and flexibility to

accommodate the company's future growth and changing needs. Overall, this work provides a useful framework for companies to evaluate their hosting options and make an informed decision based on their specific requirements.

Paper 15

Hybrid Database System of MySQL and MongoDB in Web Application Development by Ongo and Kusuma explores the use of both MySQL and MongoDB databases in web application development [15].

Description

This work discusses the limitations of using a single database system, such as MySQL or MongoDB, in web applications, and proposes a hybrid approach that combines both database systems to improve performance and scalability. This work also discusses the architecture of the proposed hybrid database system, which includes a MySQL database for structured data and a MongoDB database for unstructured data. The authors describe how the system can be used in web application development, highlighting its advantages in handling large amounts of data and improving application performance. In addition to discussing the architecture and benefits of the hybrid database system, the authors also provide a case study to demonstrate its effectiveness in a real-world application. They developed a web application for online food ordering and delivery using the hybrid database system, which resulted in improved performance and scalability compared to using a single database system. Overall, this work provides valuable insights into the benefits of using a hybrid database system in web application development and provides a practical approach for developers to implement such a system [15].

Finding

From the experimental results and analysis, they can conclude that the hybrid database model of MySQL and MongoDB improves the web application performance on large database size. The MongoDB have a relatively better write time than MySQL; but MySQL write procedure is more consistent. In term of disk space, CPU and RAM usage, hybrid model database MySQL and MongoDB uses less disk space than MySQL. But it comes with a price of higher RAM requirement. There is not

much difference in CPU usage for both websites using MySQL and hybrid database. The schemfree of MongoDB need to be considered when using MongoDB in hybrid model database with MySQL, in order to avoid system failure cause by the less consistent data from MongoDB. Hybrid database model of MySQL and MongoDB can be used by splitting the data. Sensitive and potentially duplicate data can be stored to MySQL, while high amount of small data, with high read or write traffic, are stored to MongoDB. This mechanism in hybrid database ensures maximum performance in storing and reading data. In the implementation of hybrid model database of MySQL and MongoDB, there are more complexity compared to MySQL system. The cost of the implementing needs to be considered by comparing them with the benefit that can be received. The current evaluations are performed on a single system, we suggest repeating the evaluation through experiments on another operating system and different web framework in future works. Further evaluation on the performance of the proposed hybrid database on bigger and more complex data is recommended for more conclusive results.

Paper 16

Design and Implementation of the Website Based on PHP & MYSQL was presented at the 2010 International Conference on E-Product E-Service and E-Entertainment by Xuefei Yu and Cheng Yi [16].

Description

The author describes the design and implementation of a website using PHP and MySQL. This work explains the advantages of using PHP and MySQL for website development and describes the process of designing and implementing a website using these technologies. The authors provide a detailed explanation of the website's architecture and the role of PHP and MySQL in its development. They also discuss the various features and functionalities of the website, including user registration and login, data retrieval and manipulation, and search functionality. This work provides insights into the process of building a website using PHP and MySQL and can serve as a valuable resource for web developers looking to use these technologies for website development.

This work explains the design and implementation of a website based on the PHP and MySQL combination. The authors discuss the various technologies used in developing the website, including HTML, CSS, and JavaScript. They also explain how the website's dynamic functionality was implemented using PHP and how the MySQL database was integrated to store and retrieve data. This work concludes by discussing the various challenges faced during the website's development and how they were overcome. Overall, this work provides a detailed insight into the process of developing a website using PHP and MySQL.

Finding

As this work presents a case study of designing and implementing a website using PHP and MySQL, the main finding is the successful development of a functional website with a user-friendly interface and efficient database management. The authors emphasized the importance of using a solid and organized framework in the development process, which could contribute to better maintenance and scalability of the website. This work also highlights some challenges encountered during the implementation, such as compatibility issues with different browsers and database management complexities. Overall, the study provides insights into the practical aspects of web development using PHP and MySQL and could be useful for web developers and researchers in the field.

Paper 17

Factor analysis of the results of digital technology applications in the company's marketing activities by V . P . Senenov , E. V. Budrina in IEEE 2017. They present a study on the effectiveness of digital technology in marketing activities [17].

Description

The authors analyzed the use of digital technologies such as social media, email marketing, search engine optimization, and web analytics in marketing campaigns. The study used factor analysis to determine the key factors that influence the success of digital marketing strategies. The findings suggest that effective digital marketing strategies require a combination of factors such as the use of different channels, targeted messaging, and engagement with customers. The study provides insights for

companies looking to improve their digital marketing strategies and provides a framework for evaluating the effectiveness of their digital marketing efforts.

This work discusses the application of digital technologies in marketing activities of companies and presents the results of a factor analysis conducted to identify the key factors affecting the success of digital marketing strategies. The study involved a sample of Russian companies from various industries, and the data was collected through a survey. The authors identified several factors that significantly influence the success of digital marketing, such as the level of integration of digital technologies with other marketing tools, the quality of the website and its content, and the effectiveness of advertising campaigns. This work highlights the importance of using digital technologies in marketing activities and provides practical recommendations for companies to improve their digital marketing strategies.

Finding

The study found that the use of digital technologies, such as social media, email marketing, and search engine optimization, can significantly improve the effectiveness of marketing activities in a company. Factor analysis revealed four main factors that influence the success of digital marketing efforts: technological factors, organizational factors, environmental factors, and customer factors. The study suggests that companies need to carefully consider these factors when developing their digital marketing strategies in order to achieve the best results. Additionally, the study highlights the importance of monitoring and analyzing digital marketing performance metrics to continuously improve marketing efforts.

Paper 18

The Software Challenges of Building Smart Chatbots by Daniel and Cabot, presented at the 2021 IEEE/ACM International Conference on Software Engineering [18].

Description

The authors explain that chatbots have gained significant popularity in recent years, as they enable companies to provide efficient and quick customer support. However, building smart chatbots that can understand and respond to user requests in natural language requires significant software engineering efforts. This work highlights

several challenges in building smart chatbots, including understanding the user's intent, designing natural language processing algorithms, handling large amounts of data, and testing and evaluating the chatbot's performance. The authors propose several solutions to address these challenges, such as using machine learning techniques to improve chatbot's natural language understanding and employing testing methodologies to evaluate the chatbot's performance. Overall, this work provides valuable insights into the software challenges of building smart chatbots, which can be useful for researchers and practitioners working in the field of natural language processing and chatbot development [18].

Finding

This work discusses the software challenges involved in building smart chatbots, including the need to integrate natural language processing (NLP) and machine learning (ML) techniques, handling ambiguity and uncertainty in user input, and ensuring the chatbot is able to handle a wide range of user requests. It also proposes solutions to these challenges, such as using open-source NLP and ML libraries, incorporating user feedback to improve the chatbot's accuracy, and building a modular architecture for easier maintenance and scalability.

Paper 19

A Literature Review on Agile Software Development by A. Kaushik, published in the International Journal of Advanced Research in Computer and Communication Engineering (IJARCCE) in September 2016 [19].

Description

This work begins with an introduction to the concept of agile software development and its principles, highlighting its focus on collaboration, flexibility, and delivering high-quality software in an iterative and incremental manner. The author then provides a literature review of various studies and research papers related to agile software development, covering topics such as the history and evolution of agile methodologies, their advantages and disadvantages, and their impact on software development processes. The article also discusses the different agile frameworks such as Scrum, Kanban, and Extreme Programming (XP), along with their characteristics,

roles, and responsibilities of team members, and the tools and techniques used in these frameworks. The author also presents case studies and success stories of companies that have adopted agile methodologies and achieved significant benefits in terms of productivity, quality, and customer satisfaction. The article provides a comprehensive overview of agile software development, its various frameworks, and their benefits and challenges. It can serve as a useful resource for software development practitioners, researchers, and students who wish to learn more about agile methodologies and their implementation in real-world scenarios.

Finding

A Literature Review on Agile Software Development by A. Kaushik provides a comprehensive overview of agile software development, including its principles, history, different frameworks, tools, and techniques used in agile methodologies. The article also discusses the advantages and disadvantages of agile software development and presents case studies and success stories of companies that have implemented agile methodologies.

Paper 20

The Influence of Agile Methodology (Scrum) on Software Project Management by F. Hayat, A. U. Rehman, K. S. Arif, K. Wahab, and M. Abbas was presented at the 20th IEEE/ACIS International Conference on Software Engineering, Artificial Intelligence, Networking and Parallel/Distributed Computing (SNPD) in 2019 [20] .

Description

This work discusses the influence of Scrum, an agile methodology, on software project management. The authors begin by introducing the concept of agile methodologies and the characteristics that differentiate them from traditional software development approaches. They then focus on Scrum and its role in software project management, highlighting its advantages such as improved communication, increased flexibility, and faster time-to-market. The article then presents a case study of a software development project that used Scrum as its methodology. The case study describes how Scrum was implemented, including the roles of team members, the Scrum ceremonies, and the tools used to manage the project. The authors also discuss

the results of the project and compare them to traditional software development approaches, highlighting the benefits of using Scrum. Overall, this work provides insights into the influence of Scrum on software project management and presents a real-world case study that demonstrates its effectiveness. It can serve as a valuable resource for software development practitioners who are considering adopting Scrum or other agile methodologies in their projects.

Finding

This work presents an introduction to agile methodologies and Scrum, highlighting their advantages over traditional software development approaches. The article also presents a case study of a software development project that used Scrum as its methodology and compares the results with traditional software development approaches.

Paper 21

Design and Development of UI/UX on Company Profile Web with Design Thinking Method by Yudho Yudhant, Sahil Aldi Susilo, and Winita Sulandari was presented at an IEEE conference in 2022 [21].

Description

This work presents the design and development of a company profile website using the Design Thinking Method [21]. The authors begin by introducing the Design Thinking Method and its five stages, which include empathy, define, ideate, prototype, and test. They then explain how they applied these stages to design and develop the UI/UX of the company profile website.

The work presents a case study of a company profile website for a fictional company. The authors describe how they conducted user research, defined user personas and scenarios, ideated and prototyped UI/UX designs, and tested the website with users. They also discuss the tools and techniques used in each stage of the Design Thinking Method. Overall, the article provides insights into the application of the Design Thinking Method in designing and developing the UI/UX of a company profile website. It can serve as a useful resource for web designers, developers, and

researchers who are interested in using Design Thinking to create user-centered web experiences.

Finding

Design and Development of UI/UX on Company Profile Web with Design Thinking Method by Yudho Yudhant, Sahil Aldi Susilo, and Winita Sulandari presents the application of the Design Thinking Method in designing and developing the UI/UX of a company profile website. This work introduces the Design Thinking Method and its five stages, and explains how the authors applied these stages to design and develop the website. The article presents a case study of a fictional company and describes how user research, user personas and scenarios, UI/UX ideation and prototyping, and user testing were conducted.

Paper 22 :

Software Performance Testing Scheme Using Virtualization Technology by Gwang-hun Kim, Hui-choun Moon, and Gi-Pyeung Song was presented at an IEEE conference in 2010 [22].

Description

The paper introduces a software performance testing scheme that uses virtualization technology to improve the efficiency and effectiveness of software testing. The authors begin by discussing the challenges of software performance testing, such as the complexity of the system, the variability of the environment, and the difficulty of reproducing real-world scenarios. The paper then presents the proposed software performance testing scheme, which uses virtualization technology to create a virtual test environment that is isolated from the real-world environment. The authors describe how the virtual environment can be customized to simulate various scenarios and configurations, and how it can be used to conduct performance testing in a controlled and repeatable manner [22].This work also presents a case study of a software performance testing project that used the proposed scheme. The case study describes how virtualization technology was used to create a virtual test environment, and how performance testing was conducted using various scenarios and configurations. The authors also discuss the results of the project, highlighting the

benefits of using virtualization technology in software performance testing. Overall, the article provides insights into the use of virtualization technology in software performance testing and presents a scheme that can improve the efficiency and effectiveness of software testing. It can serve as a valuable resource for software testing practitioners who are interested in adopting virtualization technology in their testing processes.

Findings

Gwang-hun Kim, Hui-choun Moon, and Gi-Pyeung Song proposes a software performance testing scheme that uses virtualization technology to improve the efficiency and effectiveness of software testing. The authors introduce the challenges of software performance testing and describe how virtualization technology can be used to create a virtual test environment that is isolated from the real-world environment. They also present a case study of a software performance testing project that used the proposed scheme and discuss the results, highlighting the benefits of using virtualization technology in software performance testing.

Paper 23

HTML Educational Node. JS System (HENS): An Applied System for Web Development presented by Chippewa Software Technology, a technology company based in La Grange, KY, USA, at the IEEE Conference in 2014 [23].

Description

This work presented the HENS system, an applied system for web development that uses HTML and Node.JS technologies to teach students how to develop web applications. The system provides an interactive learning environment where students can learn and practice web development skills in a hands-on approach. The HENS system is designed to be flexible, allowing instructors to customize the system to fit their teaching style and course requirements. It includes features such as live coding, real-time collaboration, and debugging tools that make it easy for students to learn and experiment with web development concepts. Overall, the HENS system presented in this work provides an innovative approach to teaching web development skills using the latest web technologies. The system is designed to enhance the learning

experience of students and make web development education more accessible to everyone.

Finding

It can be concluded that the HENS system provides an innovative and effective approach to teaching web development skills using the latest web technologies. The system is designed to enhance the learning experience of students and make web development education more accessible to everyone. The HENS system provides an interactive learning environment where students can learn and practice web development skills in a hands-on approach, which can lead to better learning outcomes.

3. ANALYSIS

3.1 Detailed Statement of the Problem

The goal of this project is to promote client's business globally by creating a web application that enhances and advertises their services. The project's problem statement can be broken down into two main objectives:

- To design and develop a web application that will improve client's business processes and performance. This can include features such as automated data collection, analysis, and reporting, as well as streamlined communication and collaboration between departments [15].

- To assist the sales department of the company by organizing and categorizing information about their previous customer projects with a web application. This can help the sales team to access relevant information quickly and efficiently, allowing them to identify customer needs and offer tailored solutions.

Overall, the project aims to improve the efficiency and effectiveness of the client's business processes while also increasing their visibility and reach on a global platform. The web application will serve as a powerful tool for managing information, improving communication, and ultimately driving growth for the company.

3.2 Requirement Specifications

The requirements in this section provide a detailed specification of the user interaction with the software and measurements placed on the system performance.

3.2.1 Hardware Requirements :

- i5 Processor

- Memory:8 GB RAM

- System type: 64-bit OS

- Internet Connection

3.2.2 Software Requirements :

- Windows 10

- Visual Studio Code

- HTML5, CSS3

- JavaScript Frameworks: jQuery

- PHP

- MySQL Database

- Selenium web driver

3.3 Functional Requirements

A Functional Requirement defines a function of a system or its component, where a function is described as a specification of behavior between inputs and outputs. As defined in requirements engineering, functional requirements specify particular results of a system. This should be contrasted with non-functional requirements, which specify overall characteristics such as cost and reliability. Functional requirements drive the application architecture of a system, while non-functional requirements drive the technical architecture of a system. A Functional Requirement (FR) is a description of the service that the software must offer. It describes a software system or its component. A function is nothing but inputs to the software system, its behavior, and outputs. It can be a calculation, data manipulation, business process, user interaction, or any other specific functionality which defines what function a system is likely to perform. Functional Requirements in Software Engineering are also called Functional Specification. The functional requirements of this project include:

1) *Homepage:*

    The website has a homepage that showcases the company's products and services. The Home page design should be visually appealing and reflect the brand's style and values. The Home page design should use a color scheme and typography that is consistent with the website's overall design. The Home page design should be easy to read and navigate, with clear section headings

and visual cues. The Home page design should be optimized for fast loading times, with compressed images and optimized code.

2) *Navigation Menu:*

The website contains a navigation menu that allows users to easily access different sections of the website. The Navigation menu provides a way for users to navigate the website and access its various pages and features. The Navigation menu typically appears at the top of the website and includes links to different sections of the website, such as the Home page, Products page, About Us page, Contact Us page, and user or admin account pages. The Navigation menu may also include drop-down menus or submenus to provide additional navigation options.

3) *Contact Us:*

The website has a contact page that includes a contact form and the company's contact information. The Contact us functionality allows website visitors to send messages to the website's administrators or customer support team. The Contact Us page contains a form that collects the user's name, email address, and message. After submitting the form, the website sends an email to the website's administrators or customer support team with the user's message. The Contact Us functionality also includes error handling to ensure that all required fields are filled out and that the user's email address is valid.

4) *Chat bot Section:*

The website contains a Chat bot section that allows the user to interact with the company directly [17].

5) *Login Functionality:*

The website contains a login functionality that allows authorized users to access the CMS and update website content.

The Login functionality provides a way for users and admins to securely access their accounts on the website. The login page requires users and admins to enter their email address and password. After submitting the login form, the website verifies the user's or admin's credentials and grants access to their account. The login functionality includes error handling to prevent unauthorized access and ensure that users and admins enter valid login credentials.

6) *Admin Dashboard:*

The website has an admin dashboard that allows authorized users to manage website content, including adding new products, updating existing content, and moderating user-generated content. The admin dashboard is the central hub for managing the website's content and user accounts. It provides a secure login page for admins to access the dashboard, and once logged in, the dashboard displays a summary of website statistics, including traffic, sales, and user activity. The navigation menu allows admins to access different sections of the content management system (CMS), including managing website content, moderating user-generated content, managing user accounts, viewing website analytics, and managing orders.

7) *User Registration:*

The website should have a user registration functionality that allows users to create an account, save their preferences, and access personalized content. The user registration functionality allows users to create an account on the website, which enables them to save their preferences and access personalized content. The registration page requires users to enter their name, email address, and password. After submitting the registration form, users receive a confirmation email to verify their account. The user registration functionality also includes error handling to ensure that all required fields are filled out, and the password is strong enough.

8) User Profile:

The website should have a user profile section that allows registered users to view and edit their personal information, such as their name, email address, and contact information. The user profile section allows registered users to view and edit their personal information, such as their name, email address, and contact information. The user profile page also displays the user's order history and allows them to track the status of current orders.

3.4 Non Functional Requirements

Non-functional requirements or NFRs are a set of specifications that describe the system's operation capabilities and constraints and attempt to improve its

functionality. These are basically the requirements that outline how well it will operate including things like speed, security, reliability, data integrity, etc.

Non-Functional Requirement (NFR) specifies the quality attribute of a software system. They judge the software system based on Responsiveness, Usability, Security, Portability and other non-functional standards that are critical to the success of the software system. Example of nonfunctional requirement, "how fast does the website load?" Failing to meet non-functional requirements can result in systems that fail to satisfy user needs.

Non Functional requirements in Software Engineering allows you to impose constraints or restrictions on the design of the system across the various agile backlogs. Example, the site should load in 3 seconds when the number of simultaneous users is > 10000. Description of non-functional requirements is just as critical as a functional requirement.

Here, are some examples of Non-functional requirements:

- Users must change the initially assigned login password immediately after the first successful login. Moreover, the initial should never be reused.
- Employees never allowed to update their salary information. Such attempt should be reported to the security administrator.
- Every unsuccessful attempt by a user to access an item of data shall be recorded on an audit trail.
- A website should be capable enough to handle 20 million users with affecting its performance
- The software should be portable. So, moving from one OS to other OS does not create any problem.
- Privacy of information, the export of restricted technologies, intellectual property rights, etc. should be audited.

Here are some common non-functional requirements for this project.

1. **Performance**

   The website should be optimized for speed and should load quickly to enhance the user experience. This can be achieved through techniques like image

compression, minification of scripts and stylesheets, and efficient use of caching. A fast website is essential for keeping users engaged and preventing them from abandoning the site due to long load times.

2. **Security**

   The website should have appropriate security measures in place to protect user data and prevent unauthorized access. This can include measures like SSL encryption, password policies, and regular backups. Security is critical to maintaining user trust and preventing data breaches or hacking attempts.

3. **Reliability**

   The website is available and accessible at all times, with minimum downtime or maintenance periods. This is achieved through measures like redundant servers, automatic failover, and regular maintenance and monitoring. A reliable website is essential for ensuring that users can always access the site and that the company's online presence is always available.

4. **Usability**

   The website should is user-friendly and easy to navigate, with clear and concise instructions for all features and functionalities. This can be achieved through a simple and intuitive layout, clear labeling and instructions, and appropriate use of visual cues and feedback. Usability is essential for ensuring that users can easily find what they are looking for and accomplish their goals on the site.

5. **Compatibility**

   The website is compatible with different browsers and devices, ensuring that all users can access it regardless of their platform or location. This can be achieved through responsive design, use of web standards, and thorough testing across different platforms and devices. Compatibility is essential for ensuring that the website can reach the broadest possible audience and that users can access it regardless of their device or location.

6. **Accessibility**

   The website is accessible to users with disabilities, conforming to web accessibility standards and guidelines. This include measures like alternative text for images, keyboard accessibility, and support for screen readers.

Accessibility is essential for ensuring that all users, regardless of ability, can access the website and its content.

7. **Scalability**

   The website contains designed to accommodate future growth and expansion, with the ability to handle increasing traffic and content volumes over time. This is achieved through measures like scalable hosting solutions, use of content delivery networks, and appropriate use of database structures. Scalability is essential for ensuring that the website can accommodate the company's growth and changing needs over time.

8. **Maintainability**

   The website is easy to maintain and update, with a well-organized codebase and clear documentation to facilitate future changes and upgrades. This is achieved through the use of modular code, consistent naming conventions, and clear comments and documentation. Maintainability is essential for ensuring that the website can be updated and improved over time, without incurring unnecessary costs or downtime.

3.5 Feasibility Study

Here are some areas that a feasibility study for this project might cover:

Technical feasibility

This involves evaluating whether the development team has the necessary technical skills and resources to develop the advertising website using HTML, CSS, PHP, and JavaScript. We would need to consider factors such as server requirements, database configuration, and software dependencies. Additionally, we would need to ensure that the project is scalable and can handle a large number of users.

Economic feasibility

This involves evaluating the financial viability of the project. We would need to assess the estimated costs of development, hosting, and maintenance, as well as the potential return on investment (ROI) for the client. Additionally, we would need to consider the competitive landscape and market demand for the proposed advertising website.

Legal feasibility

This involves analyzing the legal and regulatory requirements that the advertising website must comply with. This includes data privacy and security regulations, intellectual property rights, and other relevant laws and regulations

Operational feasibility

This involves assessing whether the advertising website can be integrated into the client's existing business processes and workflows. This includes analyzing the impact of the website on the client's staff, their skill levels, and the training required to use the website effectively.

Schedule feasibility

This involves evaluating the project timeline and assessing whether the advertising website can be developed and launched within the required timeframe. This includes identifying potential risks and obstacles that could delay the project's completion and determining strategies to mitigate those risks.

3.6 Use Case Diagram:

A use case diagram is a graphical representation of the interactions between actors (users or external systems) and a system. It shows how users or external systems interact with a system to achieve a specific goal or perform a specific task. Use case diagrams are often used in software development to visualize the functional requirements of a system. They can be used to capture and communicate the high-level system behavior and identify the key functionalities of a system.

A typical use case diagram includes actors, use cases, and relationships between them. Actors represent the roles that interact with the system, while use cases represent the specific actions or functionalities that the system provides. The relationships between actors and use cases show how actors interact with the system to achieve their goals. Overall, a use case diagram helps to provide a clear and concise representation of the system requirements, which can be used by developers, project managers, and other stakeholders to ensure that the system meets the needs of its users.

Figure 3.1 shows the mom of Bulletin Web Application. The diagram provides the information of who the entities are and their role in the system. Each use case provide the role of particular user.
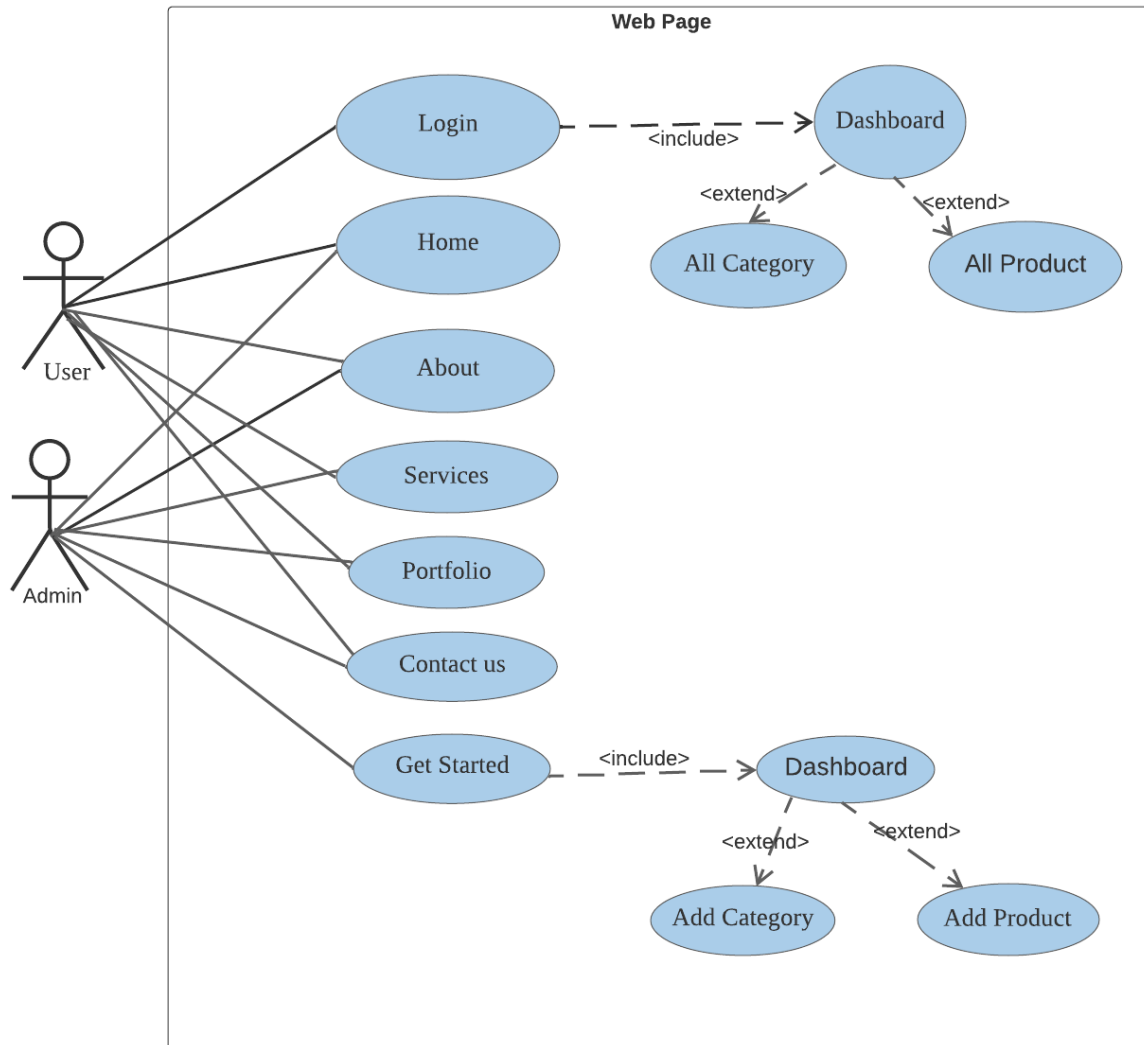
Fig 3.1 Use Case Diagram of Bulletin Web Application.

3.7 Use Case Specification:

The use case specification provides a detailed description of each use case in the use case diagram, including the flow of events, preconditions, post-conditions, and alternate scenarios. Here are some possible use case specifications for the project:

1. View Page

- Preconditions: The visitor has a web browser and an internet connection.

- Flow of events:

- The visitor navigates to the website's URL.
- The website loads the homepage.
- The visitor views the content on the page.

- Postconditions: The visitor can see the website's content.

2. Sign In

- Preconditions: The visitor has a user account and a web browser.

- Flow of events:

- The visitor clicks on the "Sign In" link in the navigation menu.
- The website displays a login form.
- The visitor enters their username and password.
- The website validates the credentials and logs the user in.

- Postconditions: The visitor is logged in to their account.

3. Contact Us Form

- Preconditions: The visitor is on the "Contact Us" page.

- Flow of events:

- The visitor fills out the contact form with their name, email address, and message.
- The website sends an email notification to the website's owner or support team.

- Postconditions: The visitor's message is sent to the website's owner or support team for review and response.

These use case specifications help to define the functionality and user interactions of the advertising website project in more detail.

4. Manage User Account

- Preconditions: The user is logged in and has permission to manage their account.

- Flow of events:

- The user navigates to the "My Account" page.
- The website displays the user's account details and options to edit or delete their account.
- The user can update their personal and payment information, view their ad history, and delete their account.

- Postconditions: The user's account details are updated or their account is deleted from the website

4. DESIGN

4.1 Design Goals

The Bulletin Web application was created with the intention of promoting and enhancing the client's business on a global scale.

Customers can learn more about the work of the agency, does by visiting the services part, which lists all the services the company offers, and the portfolio area, which displays the company's recent and previous work. Additionally, this will improve the agency's chances of obtaining leads and publicity rise. Customers can contact and engage with the admin using the chatbot and contact us area, which will help raise awareness on a global scale.

This web application makes it simple for the agency to communicate with clients on a worldwide scale. It provides good user experience by having better accessibility, usability and providing a more efficient way for the interaction between the user and the admin. For that we aim to offer a chatbot that the user can use can get more information regarding the company.

4.2 Design Strategy :

Design strategy applies the tactical thinking of a business strategy to the needs of the user in order to create the most effective website. This intersection between corporate strategy and design thinking achieves long term goals through creative application targeted at end-user. Unlike strategic planning, which collects data to make decision about how to approach a goal, strategic thinking involves an entire group that makes meaningful contributions at all levels in the business.

Here are some specific design strategies that applied to this project

1. User research: The first step in the design strategy would be to conduct user research to gain insights into the target audience's needs and preferences. This may involve conducting surveys, focus groups, or user testing sessions to understand how users interact with similar websites and what features and design elements they prefer.

2. Branding and visual design: Once the user research is complete, the design team would focus on creating a visual design that reflects the client's brand identity and messaging. This may involve creating a logo, selecting a color scheme, and designing layout templates for the website.

3. Information architecture: The design team would then develop an information architecture that organizes the website's content in a logical and intuitive manner. This may involve creating a site map, developing wireframes, and creating a content strategy that supports the client's marketing goals.

4. Responsive design: With the rise of mobile devices, it is important that the website be designed with a responsive design approach, which means that the website is optimized for different devices and screen sizes. This may involve designing a mobile-first approach and using responsive design frameworks such as Bootstrap or Foundation.

5. Content creation: The design strategy would also include a content creation plan that supports the client's marketing goals. This may involve creating original content such as blog posts, videos, and infographics, or curating relevant content from external sources.

6. Testing and optimization: Once the website is launched, the design team would continue to test and optimize the website's design elements and functionality to ensure that it is meeting the client's marketing goals and user needs [5]. This may involve conducting A/B testing, user testing, and ongoing performance monitoring.

4.3 Module Diagram

A module diagram is a type of UML (Unified Modeling Language) diagram that shows the modular structure of a system or application, including its components, their relationships, and their interactions. Here are some possible modules that might be included in a module diagram for this project:

1. User Interface (UI): This module would contain the HTML, CSS, and JavaScript code that makes up the user interface of the website. It would handle user interactions such as input validation, navigation, and dynamic content loading.

2. Server-Side Code: This module would contain the PHP code that handles server-side processing, such as database queries, form submissions, and session management.

3. Database: This module would represent the database that stores the website's data, such as user accounts, product information, and customer orders. It would include tables, relationships, and queries

4. Authentication: This module would handle user authentication and authorization, including login and registration functionality, password reset, and user role management.

5. Content Management: This module would allow website administrators to manage website content such as pages, blog posts, images, and videos.

6. Search Engine Optimization (SEO): This module would include functionality to optimize the website for search engines, such as meta tags, structured data, and sitemap generation.

7. Analytics: This module would include tools to track website analytics, such as user behavior, traffic sources, and conversion rates.

The Figure 4.1 shows the module diagram that would show the relationships between these modules, such as which modules depend on others or interact with each other. It would also show the interfaces or APIs that are exposed by each module, allowing for clear communication between the different parts of the application. The module diagram shows the three model used in this project that are : Admin model, User model and Chatbot model .Chatbot is used for the user to communicate with admin [1]. The module diagram would provide a high-level overview of the system architecture and help guide the development process.
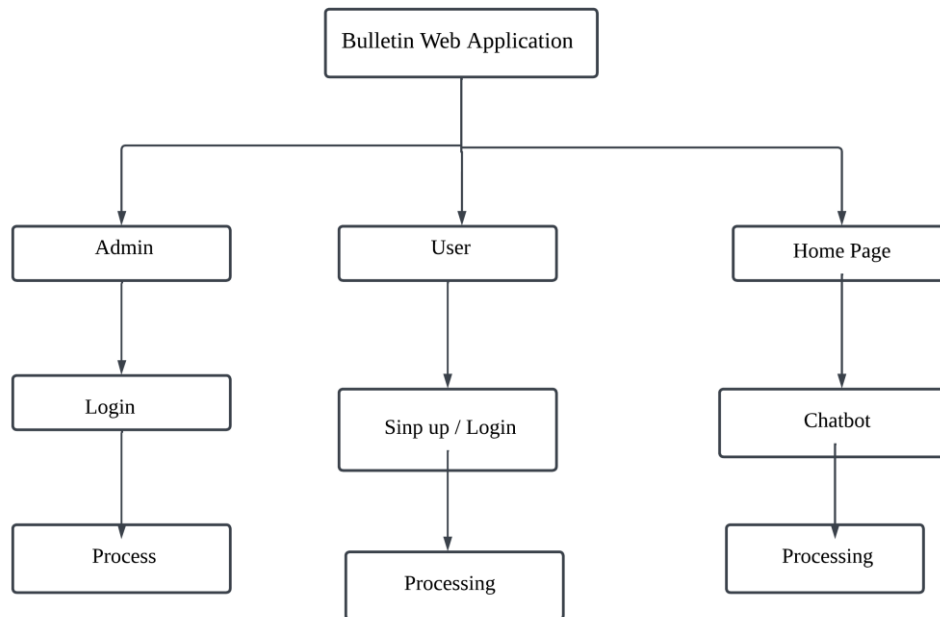
Fig. 4.1 : Module Diagram of Bulletin Web Application.

4.4 Architecture Diagram

An architecture diagram shows the overall structure of a system or application, including its components, layers, and interactions. The architecture diagram could include the following layers or components:

1. Presentation Layer: This layer would contain the user interface of the website, including HTML, CSS, and JavaScript code. It would be responsible for presenting the website's content to the user and handling user interactions.

2. Application Layer: This layer would contain the server-side code written in PHP. It would handle the business logic of the website, such as processing form submissions, querying the database, and generating dynamic content.

3. Data Layer: This layer would include the database used by the website to store data such as user accounts, product information, and customer orders. It could use a database management system such as MySQL or PostgreSQL.

4. Server: This component would represent the physical or virtual server that hosts the website. It would run the web server software, such as Apache or Nginx, and manage the server-side code and database connections.

5. Network: This component would represent the network infrastructure used by the website, including routers, switches, firewalls, and load balancers. It would handle the transmission of data between the server and client.

6. Browser: This component would represent the user's web browser, such as Chrome or Firefox. It would send HTTP requests to the server and receive HTML, CSS, and JavaScript responses to display the website to the user.

The architecture diagram would show the relationships between these components, such as how the browser communicates with the server using HTTP requests and responses, how the server processes requests using the application and data layers, and how the data is stored and retrieved from the database. It would provide a high-level overview of the system architecture and help guide the development process.

Architecture diagrams are essential in any software development project, regardless of its size or complexity. Here are some reasons why architecture diagrams are needed in a project:

- Planning and Design: Architecture diagrams are critical for planning and designing a software system. They provide a visual representation of the system's components, their relationships, and how they interact with each other. This helps stakeholders to understand the system's structure and behavior and to identify any potential issues before development begins.
- Communication: Architecture diagrams are a valuable tool for communicating the system's design to stakeholders. They help developers, project managers, and business analysts to understand the system's components and how they work together. They can also help stakeholders to provide feedback and suggestions for improvements.
- Implementation: Architecture diagrams are useful during the implementation phase of a project. They provide developers with a clear roadmap for building the system and ensure that each component is designed and implemented according to the agreed-upon architecture.
- Testing: Architecture diagrams are helpful during the testing phase of a project. They provide a reference for testers to ensure that each component of

the system is working as intended and that the system as a whole is functioning correctly.

- Maintenance: Architecture diagrams are valuable for maintaining a software system over time. They provide a reference for developers to understand the system's structure and behavior, making it easier to identify and fix issues as they arise.

Architecture diagrams are an essential component of any software development project. They help stakeholders to understand the system's structure and behavior, provide a roadmap for implementation, and serve as a reference for testing and maintenance. As one can see in the figure 4.2 it shows the architecture diagram of Bulletin Web Application
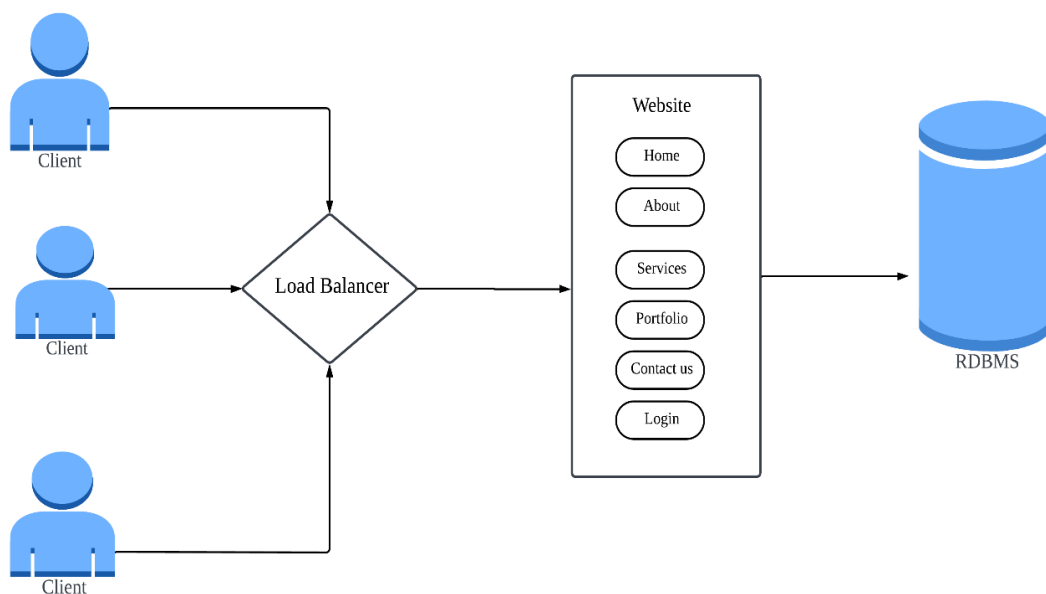
Fig. 4.2 : Architecture Diagram of Bulletin Web Application.

4.5 Class Diagram

A class diagram is a type of UML diagram that represents the structure of a system by modeling its classes, their attributes, methods, and the relationships between them. Class diagrams provide a high-level view of a system's design and architecture and

are widely used in software development to visualize, document, and communicate the system's structure.

1. Classes: In a class diagram, a class is represented as a rectangle with the class name at the top. A class is a blueprint for creating objects that defines a set of attributes and methods that the objects will possess. Attributes represent the properties or characteristics of a class, while methods represent the behaviors or actions that the class can perform.

2. Inheritance: Inheritance is a relationship between classes where one class is a subclass or child of another class. Inheritance allows subclasses to inherit the attributes and methods of the superclass, as well as define their own unique attributes and methods. In a class diagram, inheritance is represented as an arrow pointing from the subclass to the superclass with an open arrowhead.

3. Association: Association is a relationship between classes where objects of one class are connected to objects of another class. Associations can be one-to-one, one-to-many, or many-to-many. In a class diagram, associations are represented as a line connecting two classes, with a label indicating the type of relationship. Multiplicity is used to indicate the number of instances of one class that can be associated with the instances of another class. Multiplicity is represented as a number or a range of numbers near the end of an association line.

4. Aggregation: Aggregation is a relationship between classes where one class represents a whole and the other class represents a part of that whole. The parts can exist independently of the whole. In a class diagram, aggregation is represented as a diamond shape on the class end of the association line.

5. Composition: Composition is a stronger form of aggregation where the parts cannot exist without the whole. In a class diagram, composition is represented as a filled diamond shape on the class end of the association line.

The figure 4.3 shows the Class diagrams that provide a visual representation of a system's structure and relationships between its classes. They are a powerful tool for designing and communicating the architecture of a system and are widely used in software development to model complex systems.
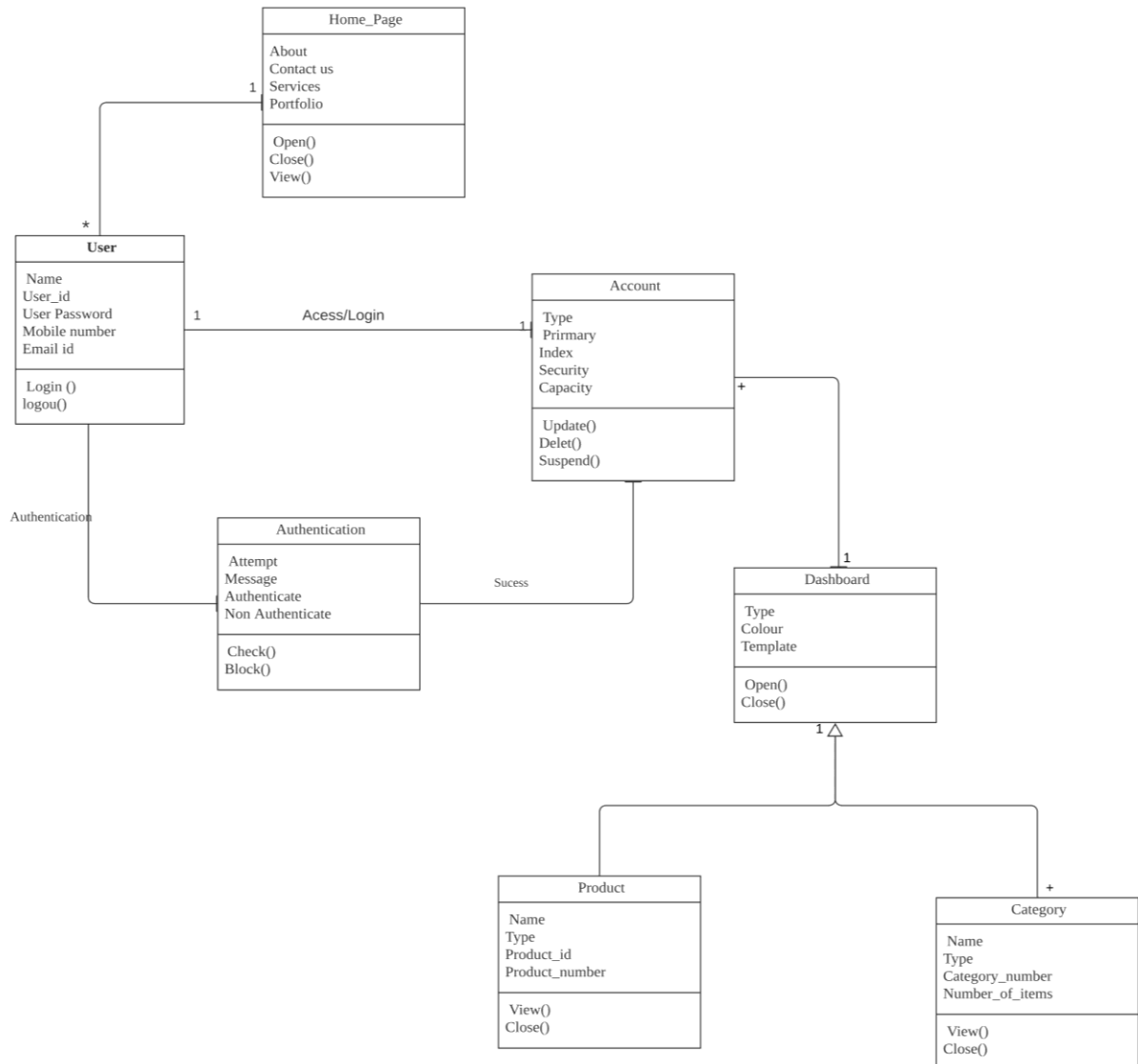
Fig. 4. 3 : Class Diagram of Bulletin Web Application.

4.6 Sequence Diagram

A sequence diagram is a type of interaction diagram in UML (Unified Modeling Language) that depicts the interactions between objects in a system in a particular scenario or use case. The purpose of a sequence diagram is to visualize how objects in

a system interact with each other and in what sequence during a particular operation or task. Sequence diagrams can be used to model both simple and complex scenarios, and they help to identify potential problems and bottlenecks in a system's design. In a sequence diagram, objects are represented as vertical lifelines, and the interactions between them are represented as horizontal arrows. Each arrow represents a message that is passed between the objects. Messages can be synchronous or asynchronous, and they can include parameters and return values.

Figure 4.4 shows the Sequence diagrams of Bulletin Web Application that can depict the order of events and the duration of each event. This information can be used to identify performance issues or to optimize the system's design. Sequence diagrams are a powerful tool for visualizing the interactions between objects in a system and for identifying potential issues in a system's design. They are widely used in software engineering to model and design complex systems.
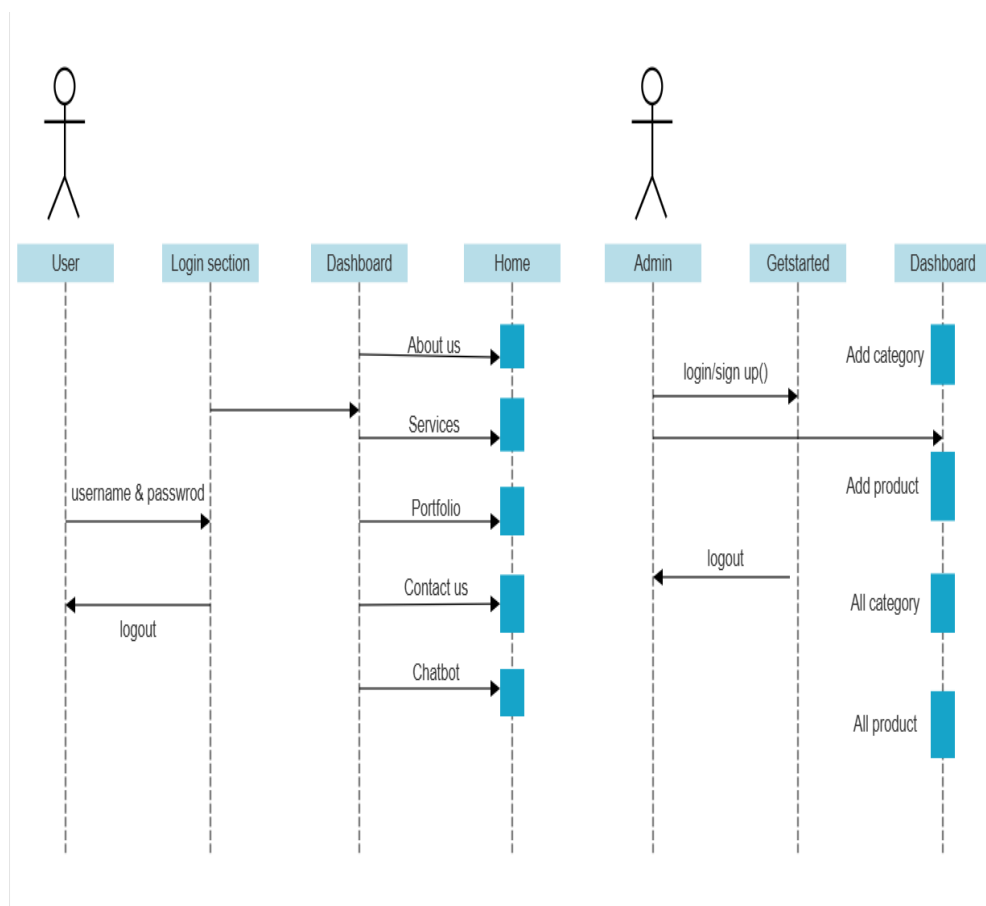
Fig . 4. 4 : Sequence Diagram of Bulletin Web Application

4.7 Collaboration Diagram

A collaboration diagram, also known as a communication diagram, is a type of interaction diagram in UML (Unified Modeling Language) that visualizes the interactions between objects in a system in a particular scenario or use case. Collaboration diagrams are similar to sequence diagrams, but they emphasize the relationships between objects and the messages they exchange rather than the order in which messages are sent. In a collaboration diagram, objects are represented as boxes, and the relationships between them are represented as labeled arrows. The primary benefit of using a collaboration diagram is that it provides a clear and concise visual representation of the interactions between objects in a system. This can help to identify potential problems and bottlenecks in a system's design and to facilitate communication and collaboration among team members.

Collaboration diagrams can also be used to model both simple and complex scenarios, and they can be used in conjunction with other UML diagrams, such as class diagrams and activity diagrams, to provide a comprehensive view of a system's design. Collaboration diagrams are a powerful tool for visualizing the interactions between objects in a system and for identifying potential issues in a system's design. They are widely used in software engineering to model and design complex systems.

Some of the key benefits of using collaboration diagrams in a project include:

- Improved communication: Collaboration diagrams make it easier for team members to communicate with each other, as they provide a clear, visual representation of how different components of the system interact with each other.
- Increased efficiency: By showing the interactions between objects in the system, collaboration diagrams can help identify potential bottlenecks or areas where optimization is needed, which can lead to more efficient code.
- Better understanding of the system: Collaboration diagrams can help team members gain a better understanding of the system as a whole, rather than just their individual parts. This can lead to more cohesive and well-designed code.

As shown in the figure 4.5 and figure 4.6 shows the collaboration diagram for the Bulletin Web Application .We have created two collaboration diagram for User

and Admin Dashboard. First figure 4.5 shows the collaboration diagram for User side of Bulletin Web Application and second shows the collaboration diagram for Admin side of Bulletin Web Application.
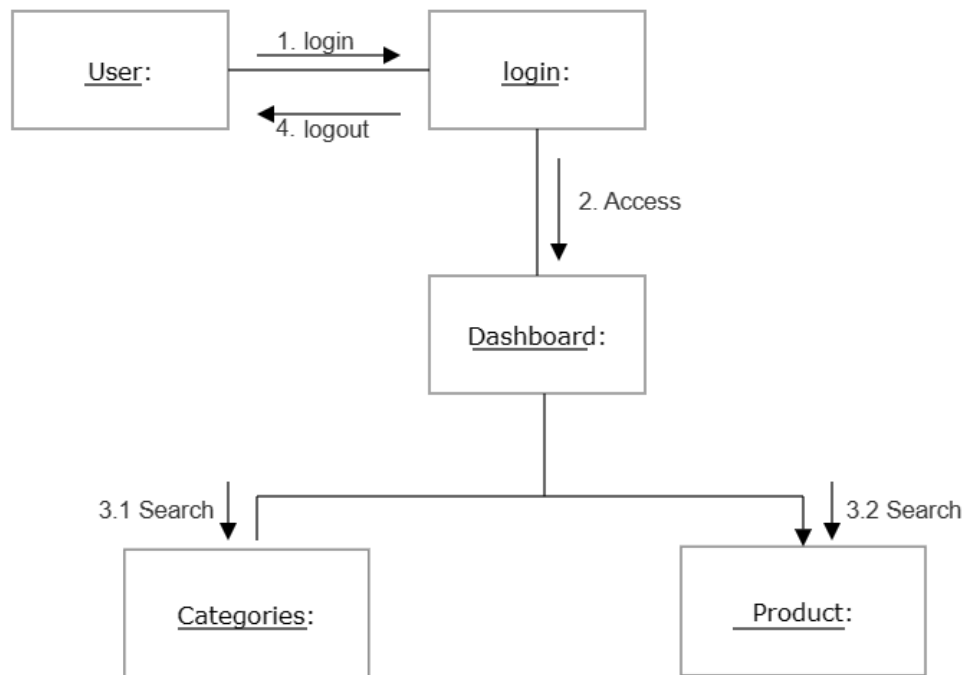
Fig. 4.5 : Collaboration Diagram for User login in Bulletin Web Application
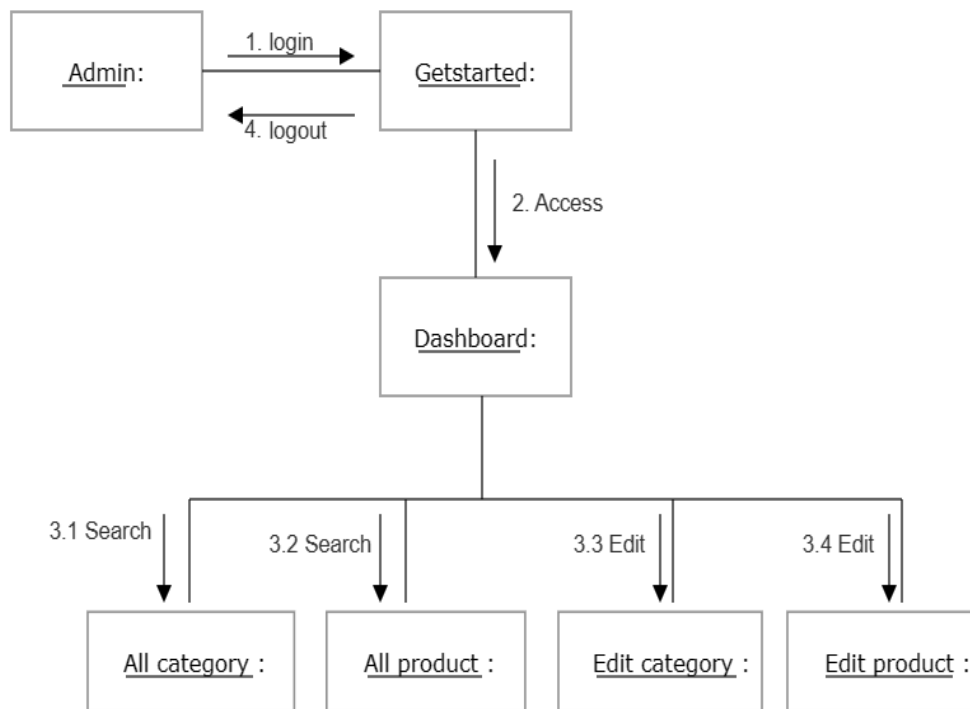
Fig. 4.6 : Collaboration Diagram of Admin login in Bulletin Web Application

4.8 State Chart Diagram

A state chart diagram, also known as a state machine diagram, is a type of behavioral diagram in UML (Unified Modeling Language) that depicts the behavior of an object or system in response to external stimuli or events. In a state chart diagram, an object or system is represented as a set of states and transitions between those states. Each state represents a specific condition or mode of operation, and each transition represents a change in the system's state in response to an event or condition.

State chart diagrams are useful for modeling complex systems that have a large number of states or that respond to multiple inputs or stimuli. They can help to identify potential problems in a system's design, such as race conditions or deadlocks, and they can be used to optimize the system's performance. State chart diagrams can also be used to model the behavior of a single object or to represent the behavior of an entire system. They can be used in conjunction with other UML diagrams, such as class diagrams and activity diagrams, to provide a comprehensive view of a system's design. State chart diagrams are a powerful tool for modeling the behavior of complex

systems and for identifying potential issues in a system's design. They are widely used in software engineering, embedded systems, and other fields where complex systems are designed and implemented. The Following figure 4.7 shows the state chart diagram of Bulletin Web Application. That show flow how user will access the Bulletin Web Application.
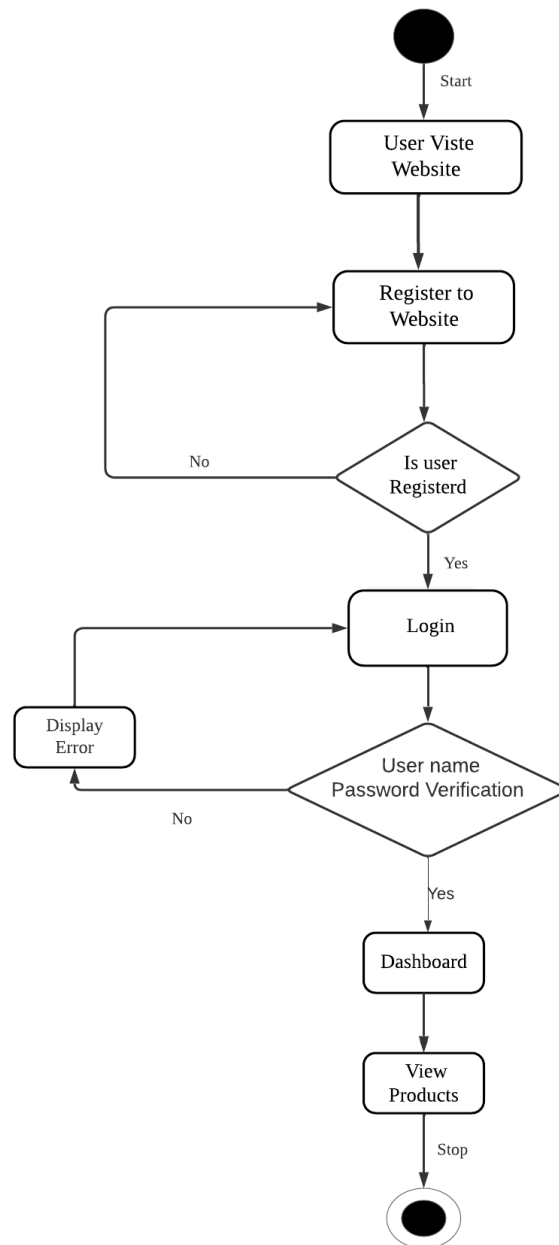
Fig. 4. 7 : State Chart Diagram of Bulletin Web Application.

4.9 Activity Diagram :

An activity diagram is a type of behavioral diagram in UML (Unified Modeling Language) that depicts the flow of control or the sequence of activities in a system or process. Activity diagrams are used to model both simple and complex workflows and processes. In an activity diagram, the steps in a process are represented as nodes, and the flow of control between those steps is represented as arrows. The nodes can represent tasks, actions, decisions, or other types of activities, and the arrows can represent the order in which those activities are performed. Activity diagrams can be used to model a wide variety of processes, from simple linear workflows to complex decision trees and parallel processes. They can help to identify potential bottlenecks or inefficiencies in a system's design, and they can be used to optimize the system's performance. Activity diagrams can also be used in conjunction with other UML diagrams, such as class diagrams and state chart diagrams, to provide a comprehensive view of a system's design.

The purpose of an activity diagram is to

- Model the workflow or business process of a system, showing the sequence of activities or steps that are performed.
- Illustrate the flow of data or information between activities, showing how data is passed from one activity to another.
- Identify the conditions and constraints that apply to the activities, such as the rules, decisions, and exceptions that govern the behavior of the system.
- Clarify the roles and responsibilities of the actors or users involved in the process, showing who performs each activity and how they interact with the system.
- Provide a high-level view of the system behavior, enabling stakeholders to understand the system's structure and operation.

Following figure 4.8 shows the Activity Diagram of Bulletin Web Application and also show how the Bulletin Web Application created by step by step.
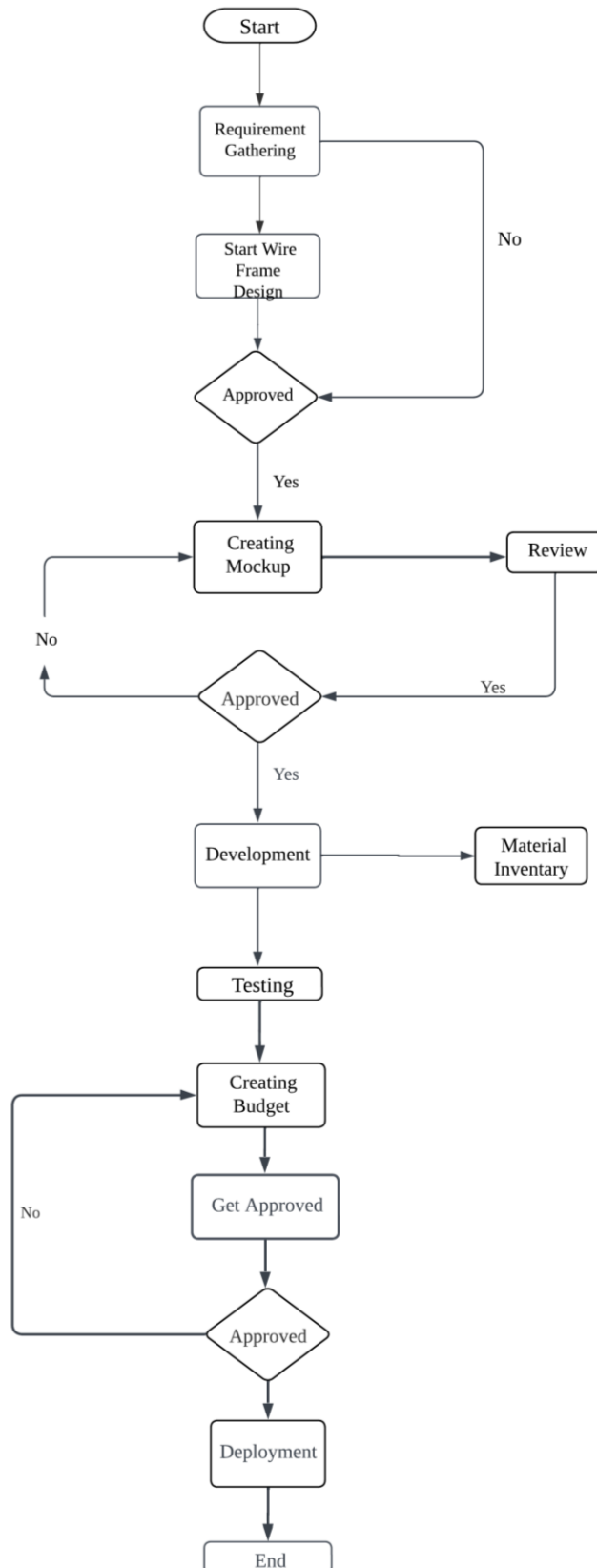
Fig. 4.8 : Activity Diagram Of Bulletin Web Application.

5. IMPLEMENTATION

5.1 Implementation Strategy

Bulletin Web Application is implemented in such a way that it provides all information about the company, and some sample of products that company manufactured to the user so that user will know the existence of the company. The information provided such as Services, Portfolio, About section and chatbot for user interaction with company.

The procedure for implementing Bulletin Web Application is realized in the following steps:

1. Requirement Gathering
2. Planning
3. Design
4. Development
5. Testing
6. Deployment
7. Maintenance

1. Requirement gathering

In this step, we work with the client to gather all the requirements for the web application. This includes identifying the key features and functionalities, as well as any technical or design specifications. The we then analyzes these requirements to ensure they are complete, clear, and feasible. This step is critical to ensure that the project has a clear scope and is aligned with the client's goals.

2. Planning

Once the requirements are defined, we start develops a project plan that outlines the timeline, budget, resources, and deliverables. This plan should also identify any risks and assumptions, and define the milestones and review points to track progress. Planning is essential to ensure that the project stays on track, and that the team has the necessary resources and support to deliver the web application on time and within budget.

3. Design

The design process involves creating a design document that outlines the architecture, user interface, and database design for the web application. The design should be reviewed with the client to ensure that it meets their requirements and expectations. This is critical process to ensure that the web application is designed to be user-friendly, scalable, and secure.

4. Development

In this process, we develops the web application using HTML, CSS, PHP, and JavaScript. The we should follow best practices for coding, testing, and version control to ensure that the code is of high quality and can be easily maintained. Regular code reviews and testing are essential to catch any bugs or issues before they impact the quality of the final product.

5. Testing

The testing process involves testing the web application to ensure that it meets the functional and non-functional requirements. This includes conducting unit tests, integration tests, and system tests to ensure that the web application performs as expected. User acceptance testing is also critical to validate that the application meets the client's expectations and is user-friendly.

6. Deployment

In this phase, the web application is deployed on a reliable and scalable server infrastructure. The team should configure the server and database settings to ensure optimal performance and security. Regular backups and updates are also critical to ensure that the web application remains secure and up-to-date.

7. Maintenance

The final process of the implementation strategy is maintenance. This involves providing ongoing support and maintenance to ensure that the web application remains secure, up-to-date, and bug-free. We monitor the application for performance and availability and resolve any issues promptly. Regular updates and patches should

also be applied to ensure that the web application remains secure and meets any changing requirements.

5.2 Hardware Platform Used

The hardware Platform used for any developments is key to fasten up the process of development. Device used like computing system, memory requirement both primary and secondary are come under the hardware requirements. As we have discussed earlier in the functional requirements about the hardware requirements that we have used in this project, same are shown below .

- i5 Processor
- Memory:8 GB RAM
- System type: 64-bit OS
- Internet Connection

5.3 Software Platform Used

- Windows 10
- Visual Studio Code
- HTML5, CSS3
- JavaScript Frameworks: jQuery
- PHP
- MySQL Database
- Selenium web driver

5.4 Deployment diagram

A deployment diagram is a UML diagram that shows the physical deployment of software components in a system. It illustrates how software components are distributed across hardware nodes, and how they interact with each other to achieve the system's functionality. A typical deployment diagram consists of nodes, components, and relationships between them. The nodes represent the physical hardware that the software components are deployed on, such as servers, routers, or

workstations. The components represent the software modules that make up the system, such as applications, databases, or web services. The relationships between nodes and components are represented by deployment relationships, such as association, dependency, and realization. These relationships show how the components are deployed on the nodes and how they interact with each other to achieve the system's functionality.

Deployment diagrams are useful for system architects and developers to understand the physical layout of the system and to plan for scalability, availability, and security. They also help in identifying potential deployment issues, such as bottlenecks, single points of failure, and resource constraints. The below figure 5.1 show the Deployment Diagram.
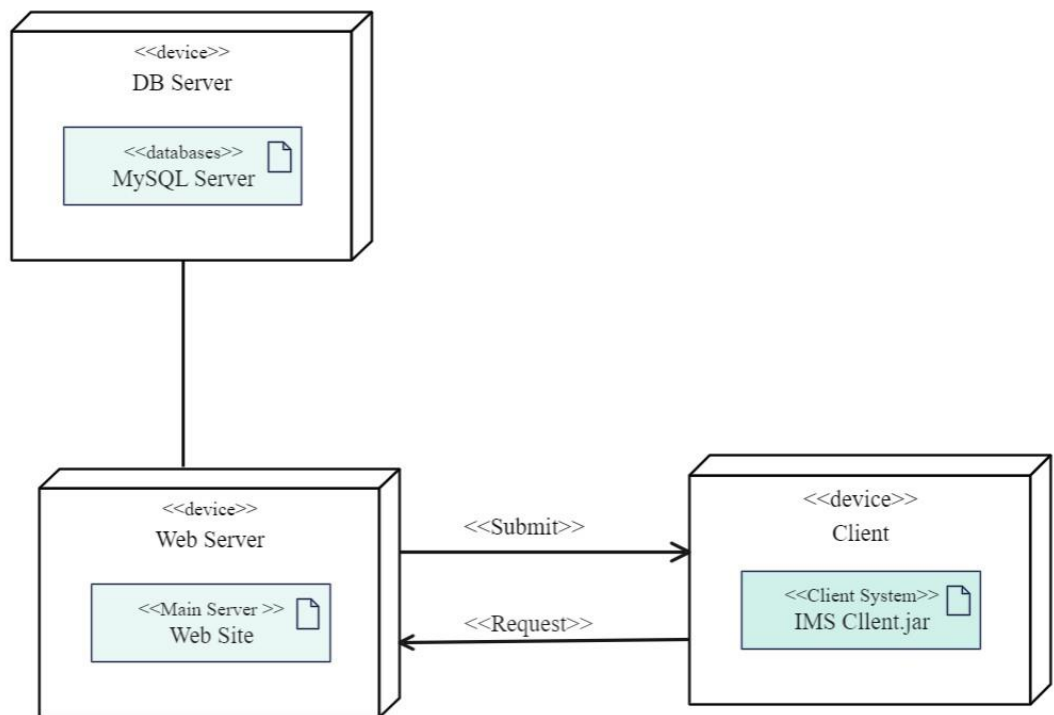
Fig. 5. 1: Deployment Diagram of Bulletin Web Application

5. 5 Implementation Level Details

Figure 5.2 show the flow of work done for creating the Bulletin Web Application. First, start with the requirement gathering then make a wire frame design then approved it by clients if they approved the wireframe create mockup otherwise go

back to requirement gathering. After creation of mockup get approval of client if yes go ahead on development phase otherwise again make a new one.

Development phase comprise of coding and design of project. After completing this phase test, it by testing process. Create a budget of project and get approved by client if they approve go head otherwise go back to previous phase i.e., creating a budget.

Then there is next and last phase which is deployment. The website will go live and the process ends here.
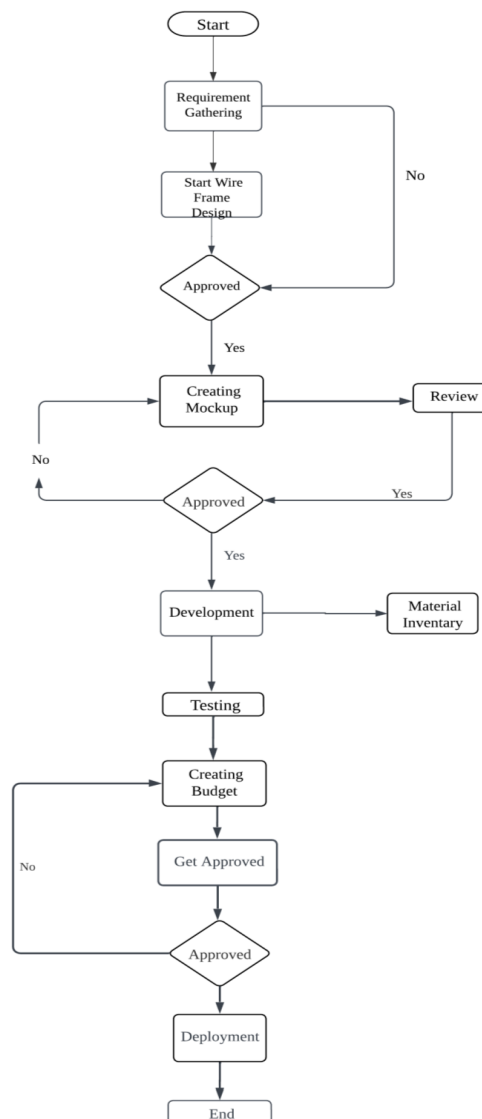
Fig. 5.2 : Flow chart of Bulletin Web Application.

The technology Stack of project is: -

- HTML (Hypertext Markup Language) is used for creating the structure of a webpage. It defines the content [7] and layout of the page using tags and attributes.

- CSS (Cascading Style Sheets) is used for styling the webpage. It defines the visual appearance of the page, including colors, fonts, and layout [9].

- JavaScript is used for adding interactivity to the webpage. It allows to create dynamic effects like animations, pop-ups, and form validation [6].

- PHP (Hypertext Preprocessor) is used for server-side scripting. It allows to create dynamic web pages that can interact with databases and other server-side technologies [8].

- Node.js is used for server-side programming in JavaScript. It allows to build scalable network [19] applications using an event-driven, non-blocking I/O mode.

- jQuery is a JavaScript library that makes it easier to work with HTML documents and events. It simplifies HTML document traversal and manipulation, event handling, and AJAX. It is often used for creating dynamic web pages and web applications [10].

- MySQL is a popular open-source relational database management system. It is often used in web development for storing and retrieving data from databases [11].

- jQuery can be used with MySQL to create dynamic web pages that can interact with databases [12]. For example, we use jQuery AJAX to fetch data from a MySQL database and display it on a webpage .

5.6 Testing

We have used Selenium tool for the testing of Bulletin web application. Which is basically used to automate the testing across various web browsers, automation testing using Selenium Web Driver and ATF can significantly improve the efficiency, accuracy, and repeatability of software testing for web-based applications. Selenium Web Driver and ATF can automate repetitive tasks and generate detailed reports on testing results. It provides the advantages such as Language and Framework Support,

Open Source Availability, Multi-Browser Support, Support Across Various Operating Systems, Ease Of Implementation, Flexibility, Less Hardware Usage.Testing is the process of evaluating a system or its component(s) with the intent to find whether it satisfies the specified requirements or not [21]. If testing is done successfully it will remove all the errors from the software [4].

Principles of Testing

a) All the tests should meet the customer requirements.

b) To make this project's software testing should be performed by a third party.

c) Exhaustive testing is not possible. As we need the optimal amount of testing based on the risk assessment of the application.

d) All the tests to be conducted should be planned before implementing it

e) It follows the Pareto rule (80/20 rule) which states that 80% of errors come from 20% of program components.

f) Start testing with small parts and extend it to large parts.

There are different types of testing that can be performed on software systems. Some common types of testing are:

Unit Testing

Unit testing is a method of testing individual units or components of a software application. It is typically done by developers and is used to ensure that the individual units of the software are working as intended. Unit tests are usually automated and are designed to test specific parts of the code, such as a particular function or method. Unit testing is done at the lowest level of the software development process, where individual units of code are tested in isolation.

The main advantages of unit testing include:

➤ It helps to identify bugs early in the development process, before they become more difficult and expensive to fix.

➤ It helps to ensure that changes to the code do not introduce new bugs.

➤ It makes the code more modular and easier to understand and maintain.

➤ It helps to improve the overall quality and reliability of the software.

Integration Testing

Integration testing is a method of testing how different units or components of a software application interact with each other. It is used to identify and resolve any issues that may arise when different units of the software are combined. Integration testing is typically done after unit testing and before functional testing, and is used to verify that the different units of the software work together as intended.

Integration testing can be performed in different ways, such as:

- Top-down integration testing: It starts with the highest level modules and integrates them with lower-level modules.
- Bottom-up integration testing: It starts with the lowest-level modules and integrates them with higher-level modules.
- Big-Bang integration testing: It combines all the modules and integrates them all at once.
- Incremental integration testing: It integrates the modules in small groups, testing each group as it is added.

The main advantages of integration testing include:

1. It helps to identify and resolve issues that may arise when different units of the software are combined.
2. It helps to ensure that the different units of the software work together as intended.
3. It helps to improve the overall reliability and stability of the software.
4. It's important to keep in mind that Integration testing is essential for complex systems where different components are integrated together.

As with unit testing, integration testing is only one aspect of software testing and it should be used in combination with other types of testing such as unit testing, functional testing, and acceptance testing to ensure that the software meets the needs of its users.

Functional Testing

It is a type of software testing which is used to verify the functionality of the software application, whether the function is working according to the requirement specification. In functional testing, each function tested by giving the value, determining the output, and verifying the actual output with the expected value. Functional testing performed as black-box testing which is presented to confirm that the functionality of an application or system behaves as we are expecting. It is done to verify the functionality of the application.

Functional testing also called as black-box testing, because it focuses on application specification rather than actual code. Tester has to test only the program rather than the system.

Goal of functional testing :

The purpose of the functional testing is to check the primary entry function, necessarily usable function, the flow of screen GUI. Functional testing displays the error message so that the user can easily navigate throughout the application.

Regression Testing

Regression testing is a method of testing that is used to ensure that changes made to the software do not introduce new bugs or cause existing functionality to break. It is typically done after changes have been made to the code, such as bug fixes or new features, and is used to verify that the software still works as intended.

Regression testing can be performed in different ways, such as:

Retesting: This involves testing the entire application or specific functionality that was affected by the changes.

Re–execution: This involves running a previously executed test suite to ensure that the changes did not break any existing functionality.

Comparison: This involves comparing the current version of the software with a previous version to ensure that the changes did not break any existing functionality.

The main advantages of regression testing include:

1. It helps to ensure that changes made to the software do not introduce new bugs or cause existing functionality to break.
2. It helps to ensure that the software continues to work as intended after changes have been made.
3. It helps to improve the overall reliability and stability of the software.
4. It's important to keep in mind that regression testing is an ongoing process that should be done throughout the software development
5. lifecycle to ensure that the software continues to work as intended. It should be automated as much as possible to save time and resources. Additionally, it's important to have a well-defined regression test suite that covers.

Smoke Testing

This test is done to make sure that the software under testing is ready or stable for further testing . It is called a smoke test as the testing of an initial pass is done to check if it did not catch the fire or smoke in the initial switch on.

Alpha Testing

This is a type of validation testing. It is a type of acceptance testing which is done before the product is released to customers. It is typically done by QA people.

Load Testing

In software testing, load testing is an integral part of performance testing under non-functional testing. Load testing is testing where we check an application's performance by applying some load, which is either less than or equal to the desired load. Here, load means that when N-number of users using the application simultaneously or sending the request to the server at a time. Load testing will help to detect the maximum operating capacity of an application and any blockages or bottlenecks. It governs how the software application performs while being accessed by several users at the same time. The load testing is mainly used to test the Client/Server's performance and applications that are web-based. In other words, we can say the load testing is used to find whether the organization used for compering the application is necessary or not, and the performance of the application is

maintained when it is at the maximum of its user load. Generally, load testing is used to signify how many concurrent users handle the application and the application's scale in terms of hardware, network capacity etc.

Stress Testing

Stress Testing is testing used to check the accessibility and robustness of software beyond usual functional limits. It mainly considers for critical software but it can also be used for all types of software applications. It is also known as Endurance Testing, fatigue testing or Torture Testing. The stress testing includes the testing beyond standard operational size, repeatedly to a breaking point, to get the outputs. It highlights the error handling and robustness under a heavy load instead of correct behavior under regular conditions. In other words, we can say that Stress testing is used to verify the constancy and dependability of the system and also make sure that the system would not crash under disaster circumstances. To analyses how the system works under extreme conditions, we perform stress testing outside the normal load.

Scalability Testing

Another type of performance testing is scalability testing, which comes under the non-functional testing of software testing. It is used to check an application's performance by increasing or decreasing the load in particular scales known as scalability testing. It is executed at a hardware, software, or database level. It is specified as the capacity of a network, system, application, product, or process to make the function correctly when modifications are made in the system's size or volume to meet an increasing need. In this testing, the Test Cases are designed and implemented in a well-organized manner. It also analysis the system, processes, or database's ability to meet an upward need.

For example, a web page scalability testing depends on the number of users, CPU usage, network usage. In contrast, scalability testing of a web server depends on the number of requests processed.

6. CONCLUSION

We conclude that the Bulletin Web Application aimed to enhance and promote the client's business on a global platform through the design and development of a web application. Throughout the project, a feasibility study was conducted to ensure that the project was viable and met the clients' requirements. The project was also planned and executed using appropriate project management methodologies, such as Agile or Waterfall. Extensive testing was also conducted to ensure that the system met the project's requirements and specifications. The project's successful implementation resulted in an advertising website that improved the clients' business processes, assisted the sales department by organizing and categorizing customer projects, and enhanced the clients' global online presence. The website was deployed on a reliable and scalable hardware platform, ensuring that it was accessible to users from anywhere in the world. Overall, the project was a success, and the client was satisfied with the results. The project provided valuable insights and lessons learned, which can be applied to future software development projects.

FUTURE WORK

Since this project was started with very little knowledge about the Bulletin Web Application, we came to know about the enhancement capability during the process of building it . Some of the scope we increase for the betterment and effectiveness oar listed below :

 1. Content updates: Keep website fresh and engaging by regularly updating content. This could include adding new blog posts, case studies, client testimonials, or even adding new pages to showcase services.

2. Search engine optimization (SEO): Make sure website is optimized for search engines by regularly reviewing and updating metadata, using targeted keywords, and optimizing website speed and mobile responsiveness.

3. Social media integration: Integrate website with social media accounts to increase online visibility and promote your brand. We can also add social sharing buttons to website to encourage visitors to share content on their social media accounts.

4. Analytics and tracking: Use tools like Google Analytics to track website's performance and gain insights into audience's behavior. Use this data to optimize website and improve marketing strategies.

5. Lead generation: Implement lead generation forms and calls-to-action on website to capture leads and build email list. We can then use email marketing to nurture these leads and convert them into customers.

6. User experience (UX) improvements: Continuously review and improve website's UX to ensure it is user-friendly and easy to navigate. This can include optimizing website's layout, improving website's speed, and making sure website is accessible to all users [20].

7. Security updates: Keep the website secure by regularly updating software and plugins, using strong passwords, and implementing security measures like SSL certificates.

USER MANUAL

Bulletin Web Application

Steps to be Followed by User to access this Application

Step 1: This is the Home Page of Bulletin Web Application.

Step 2: The About Us section shows the details about the company.
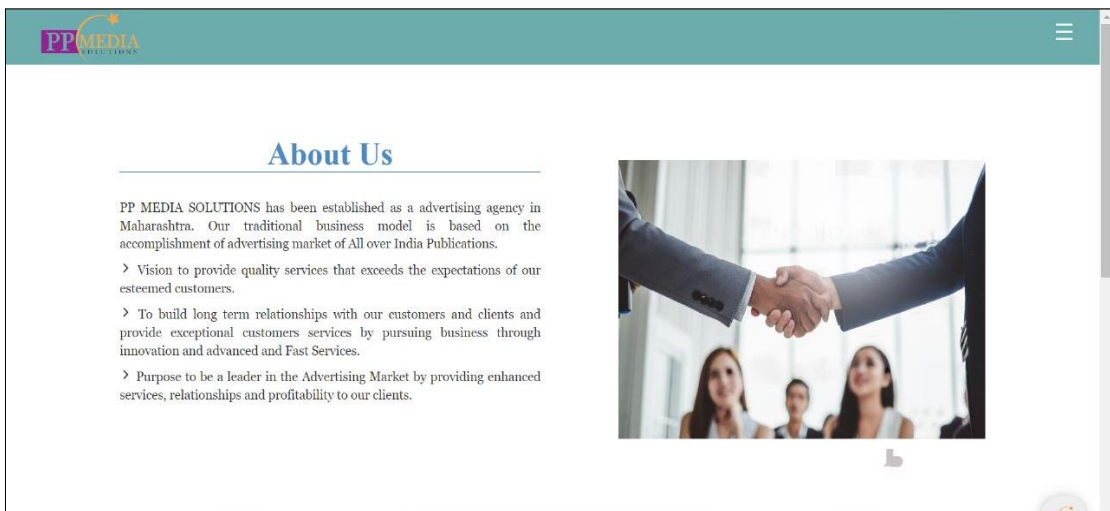
Step 3: In the About Us section there is the company's Partners slider that shows the clients' logos and the Footer section which is available on every page of the website.
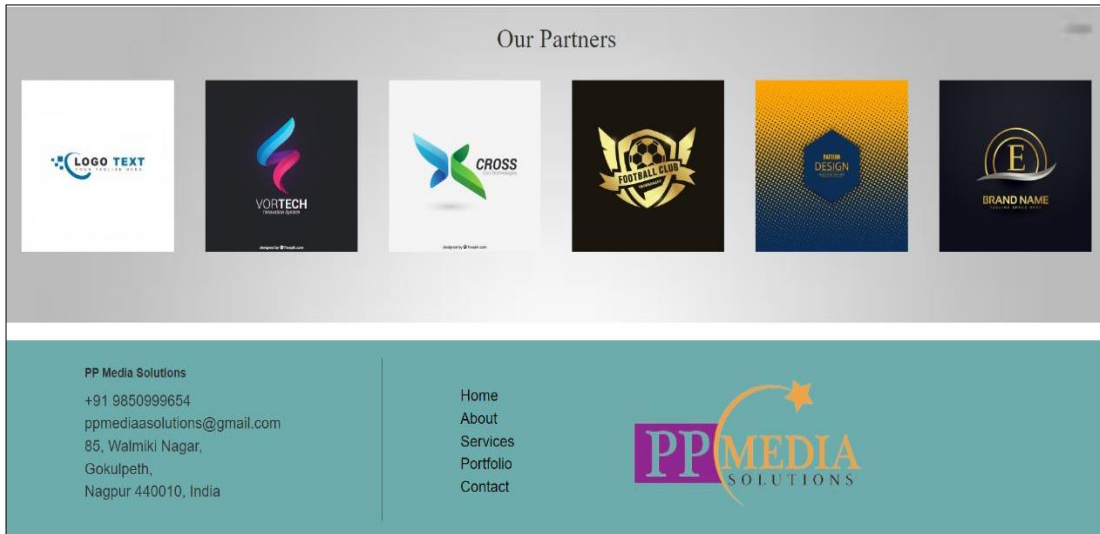
Step 4: The services section showcases all the services provided by the company to the clients/users.
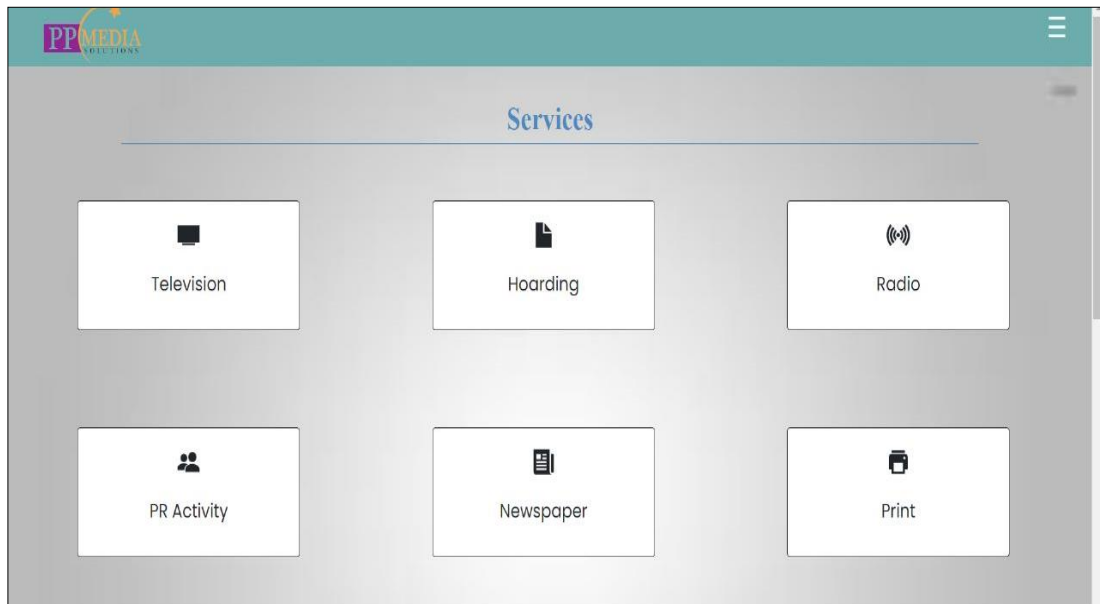
Step 5: In the services section, there is Why Choose Us, this part will be helpful for the clients to know that the company provides the best services
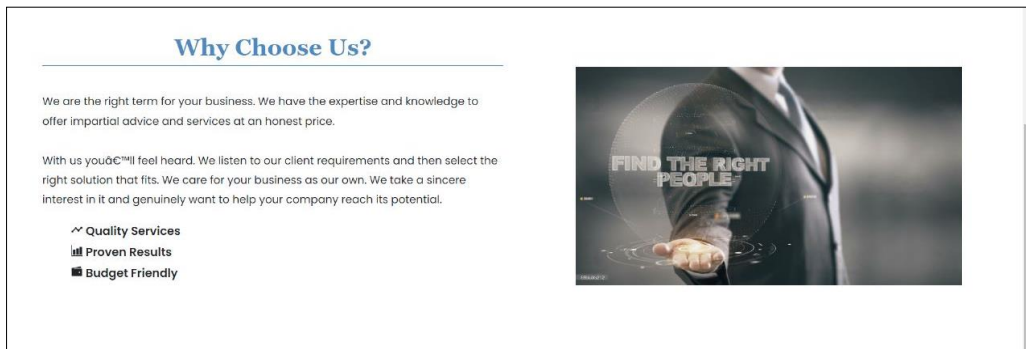
Step 6: The Portfolio section will show the previous work of their services done by PP Media Solutions.
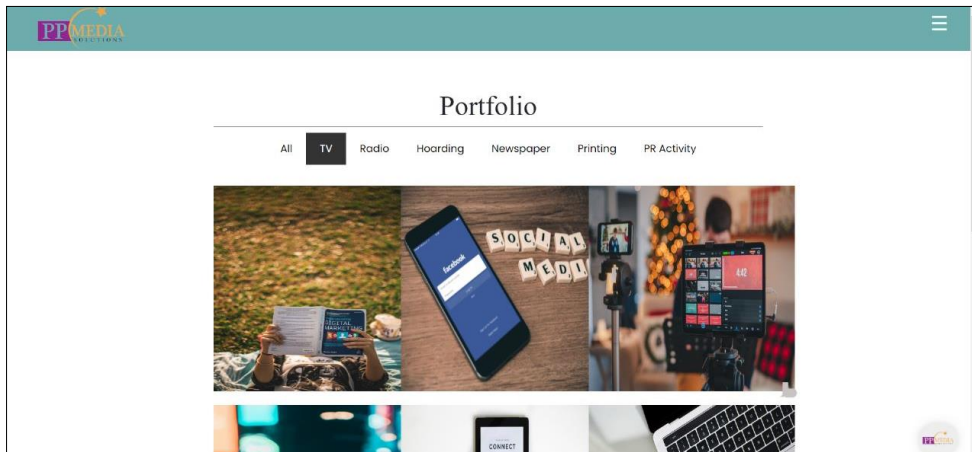
Step 7: In the Contact Us section, if any user/clients have any query related to services then they can contact them. This will send an email to the admin.
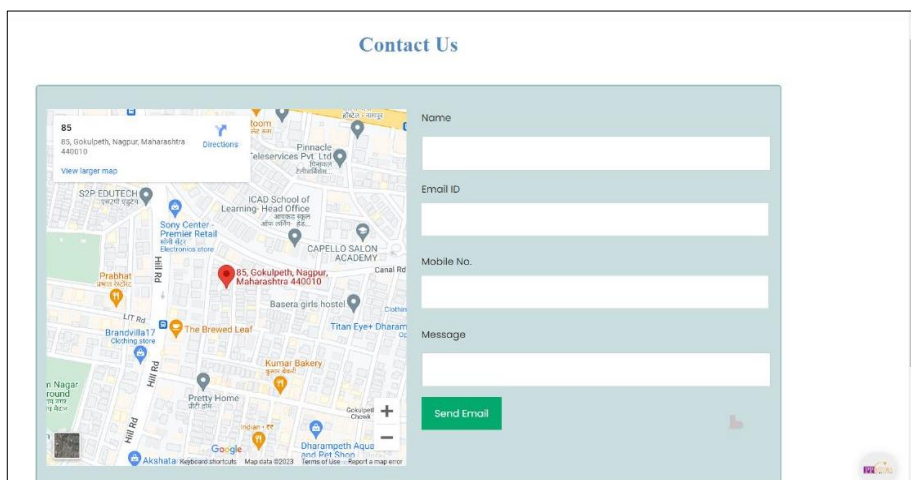
Step 8: Chatbot is used for the conversation, which will occur between the client and the company's admin.
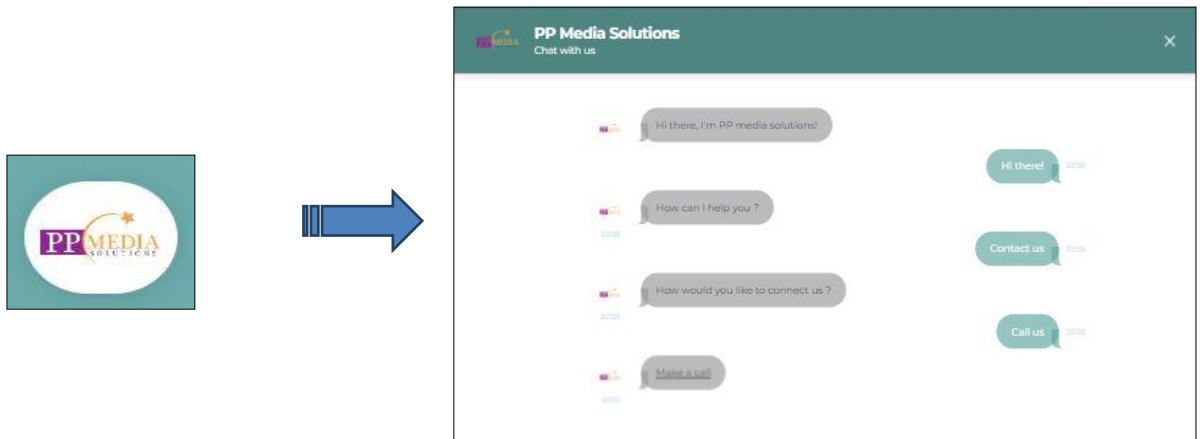
Step 9: The below part shows the Login and Signup for the user.

Step 10: After the user's login, the user will directly redirect to the user's dashboard.
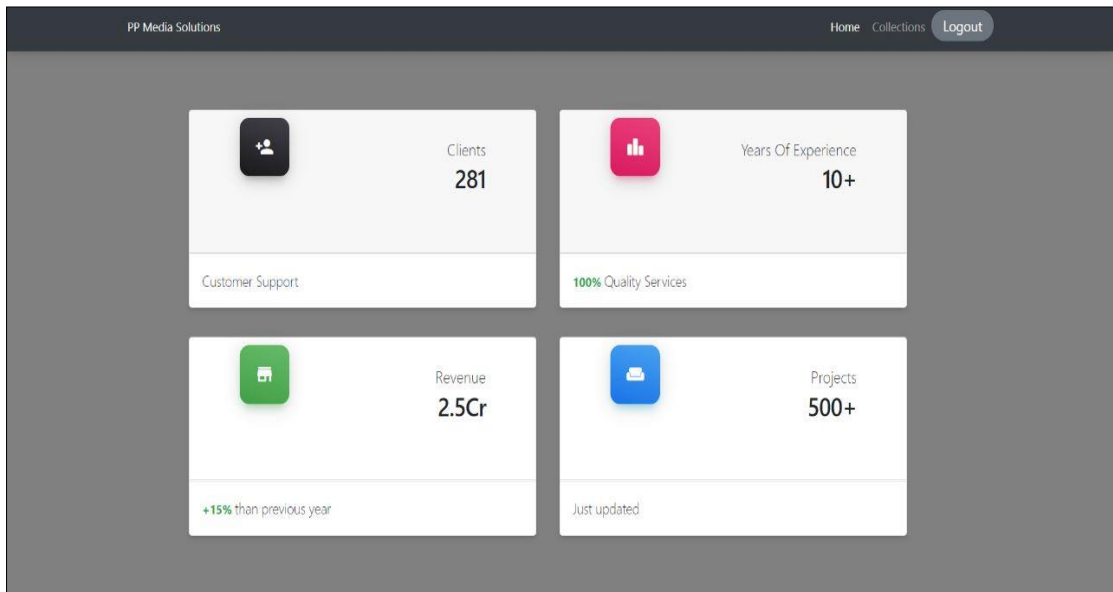
Step 11: In the user's dashboard, there is company's Collections page which will showcase the collection of the products as per the category.
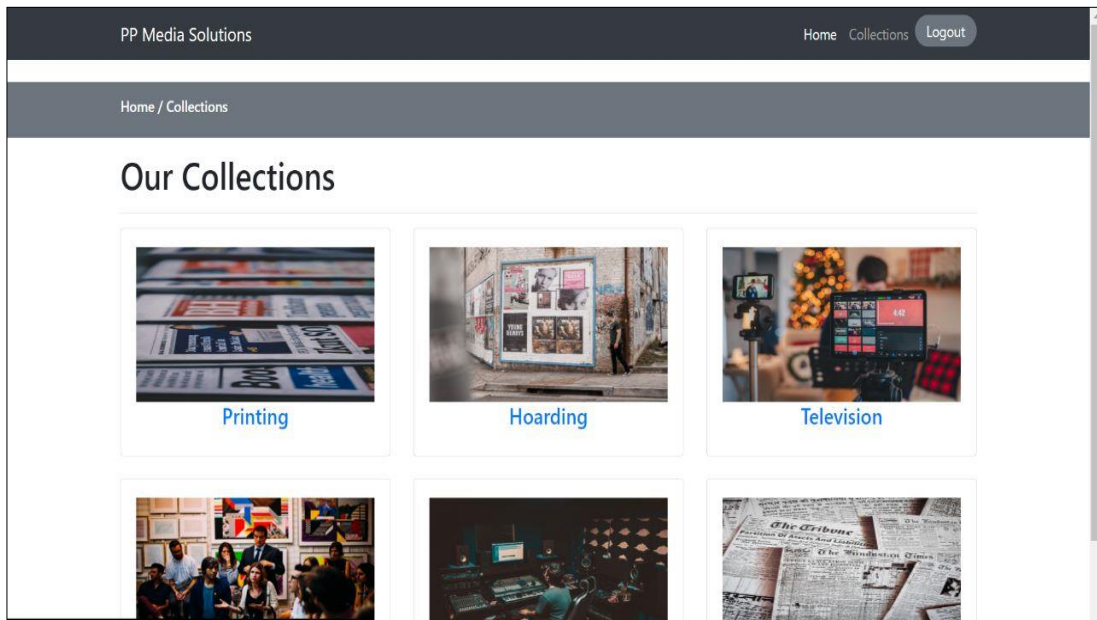
Step 12: It will display the products by the respective category like if the clients want to print a magazine.
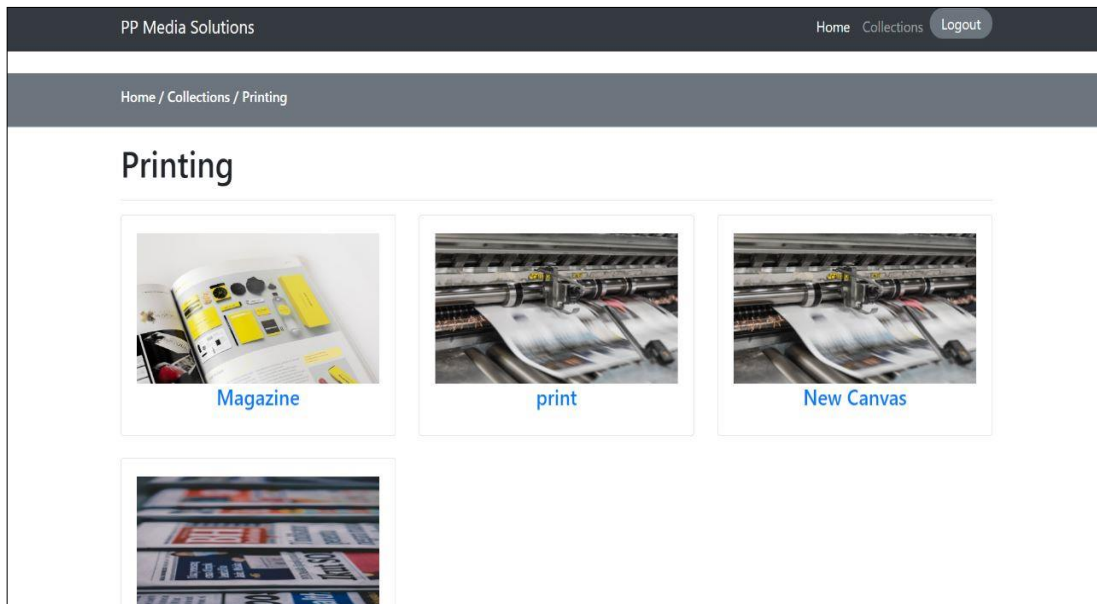
Step 13: It will display the single-product view where the client can see the description of the product.
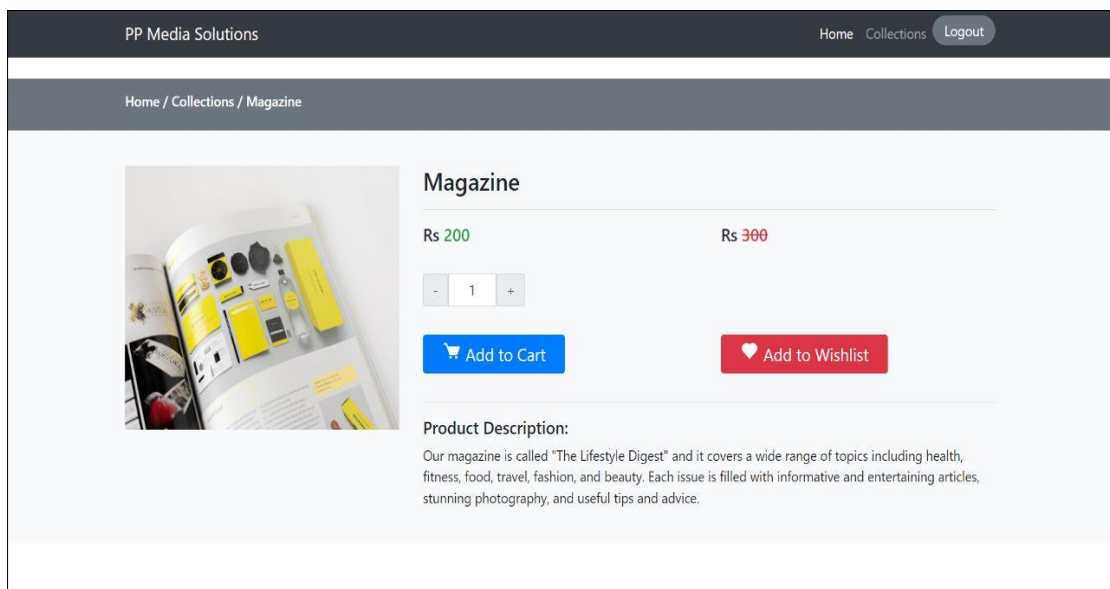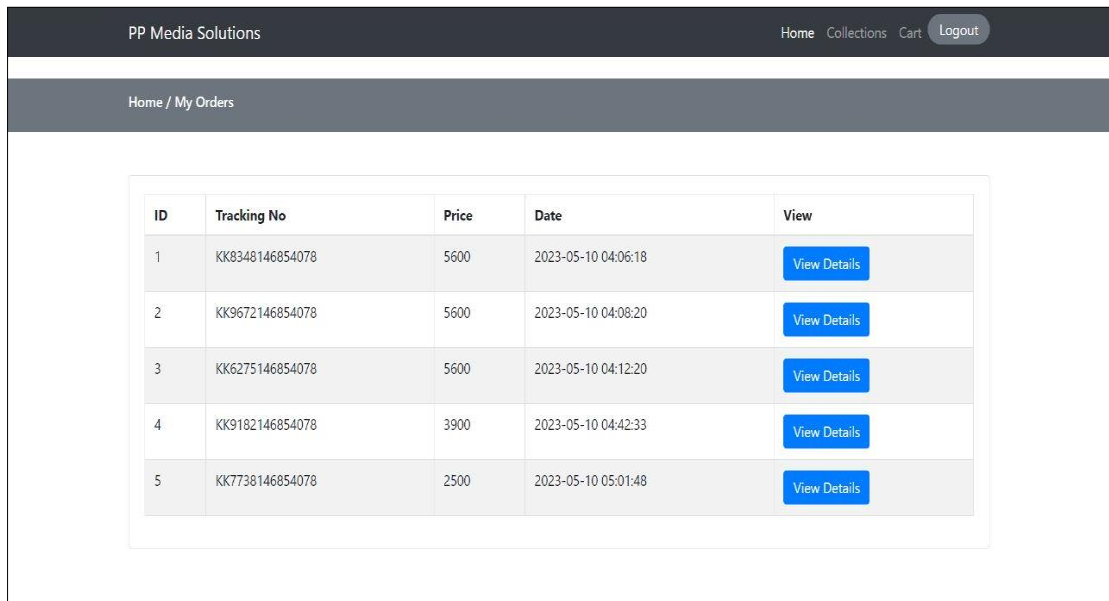
Step 14: So, when the client adds the product to the cart, the product will be displayed on the cart as shown below.
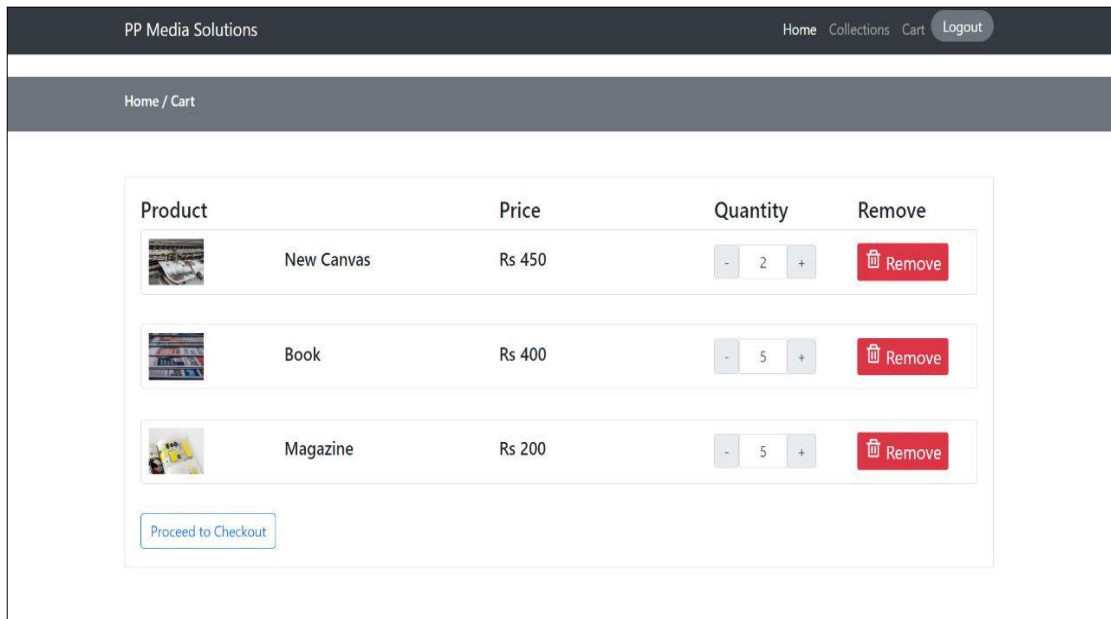
Step 15: Now the clients can fill in the details/address, and then proceed further by clicking confirm and place an order or by the online payment.
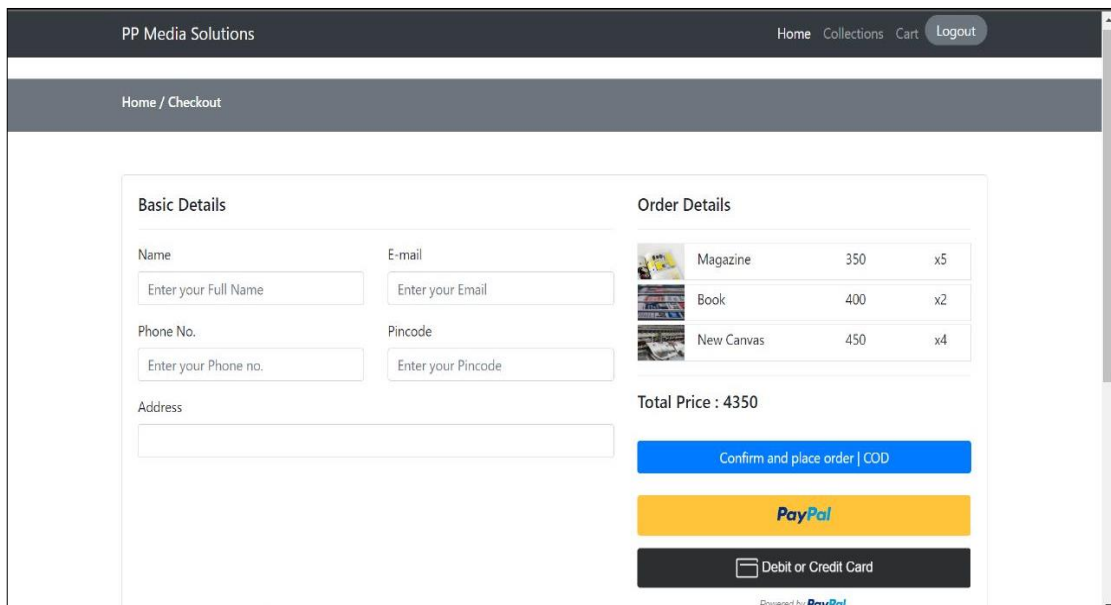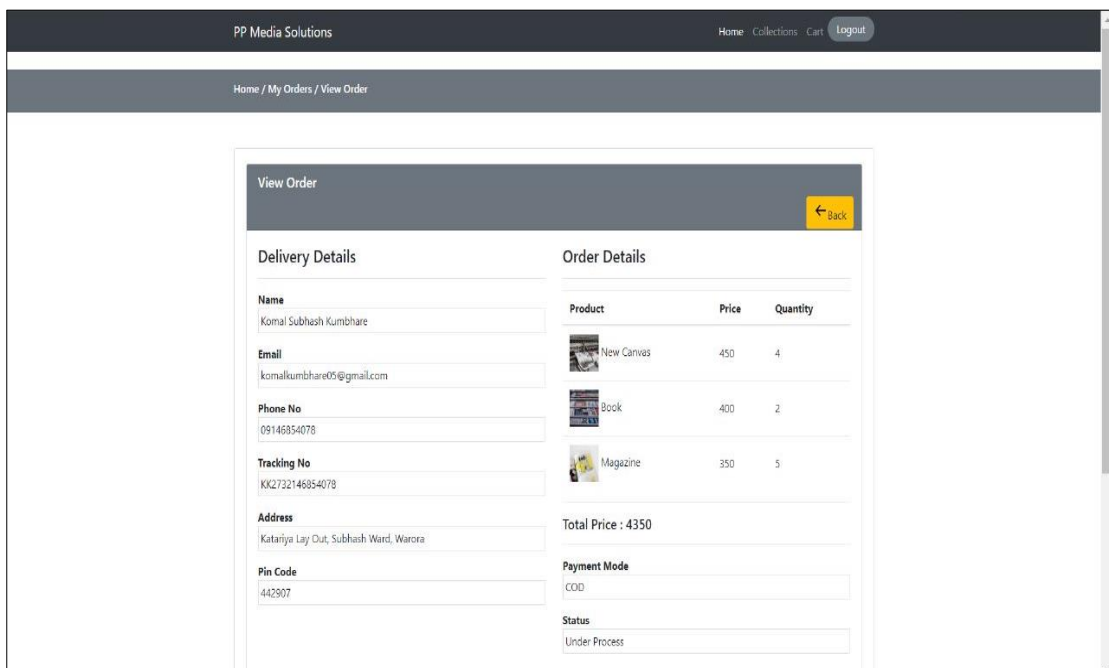
Step 16: After placing the order, the client/user can see the My Orders table which shows the tracking number, price, and date.

Step 17: Now the client/user can see the ordered details in the View Order page and shows the payment mode along with status.

Steps to be followed by Admin :-
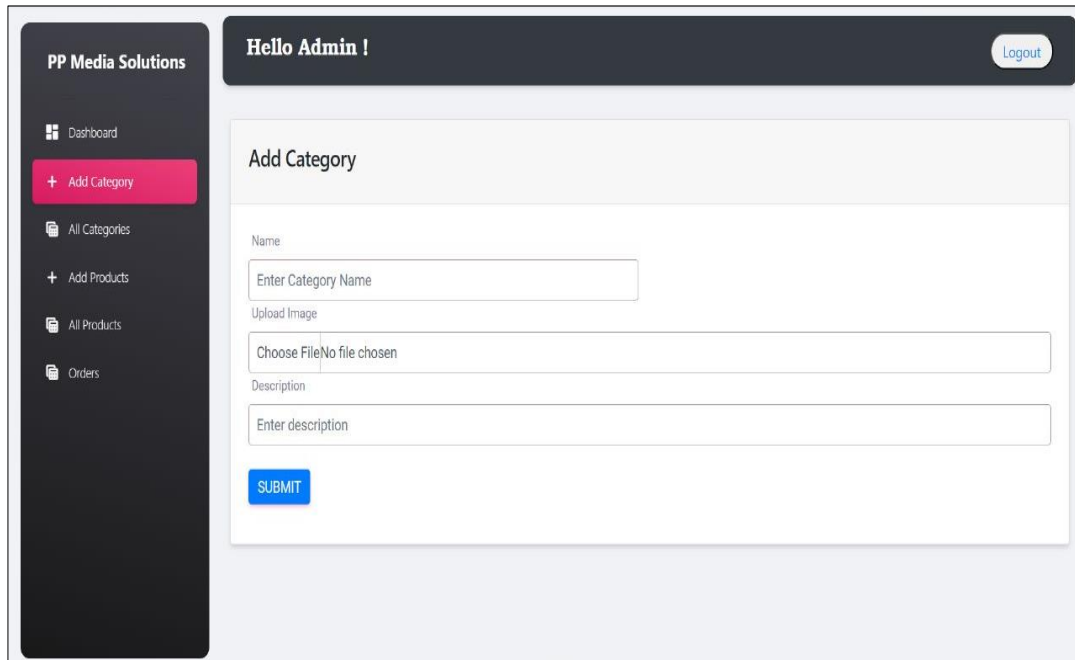
Step 1: Admin login to the account and the login page look like this .
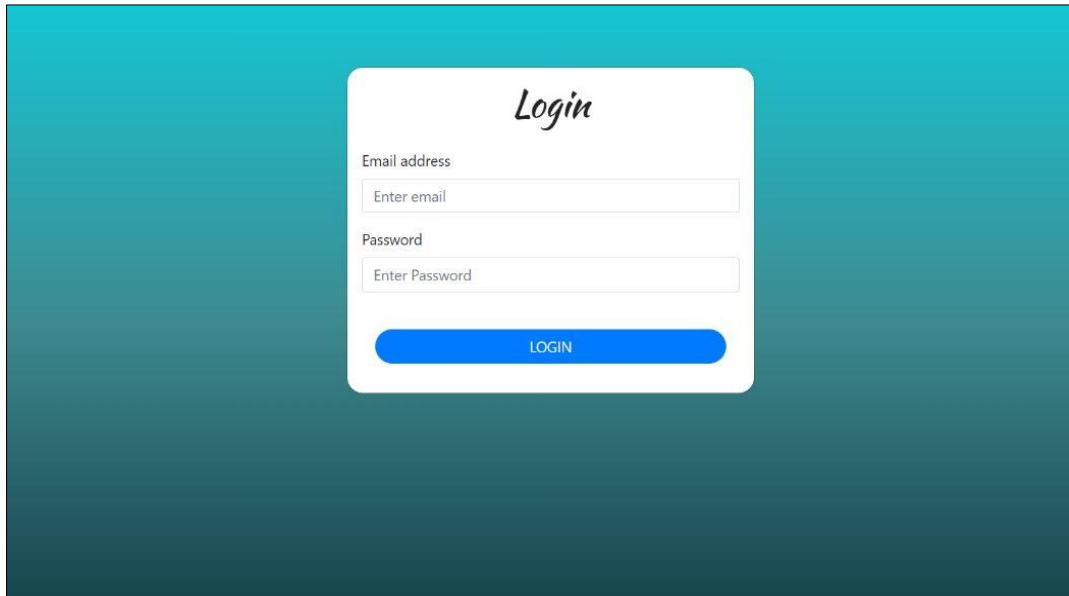
Step 2 : After the admin's login, it will redirect to the admin's dashboard.
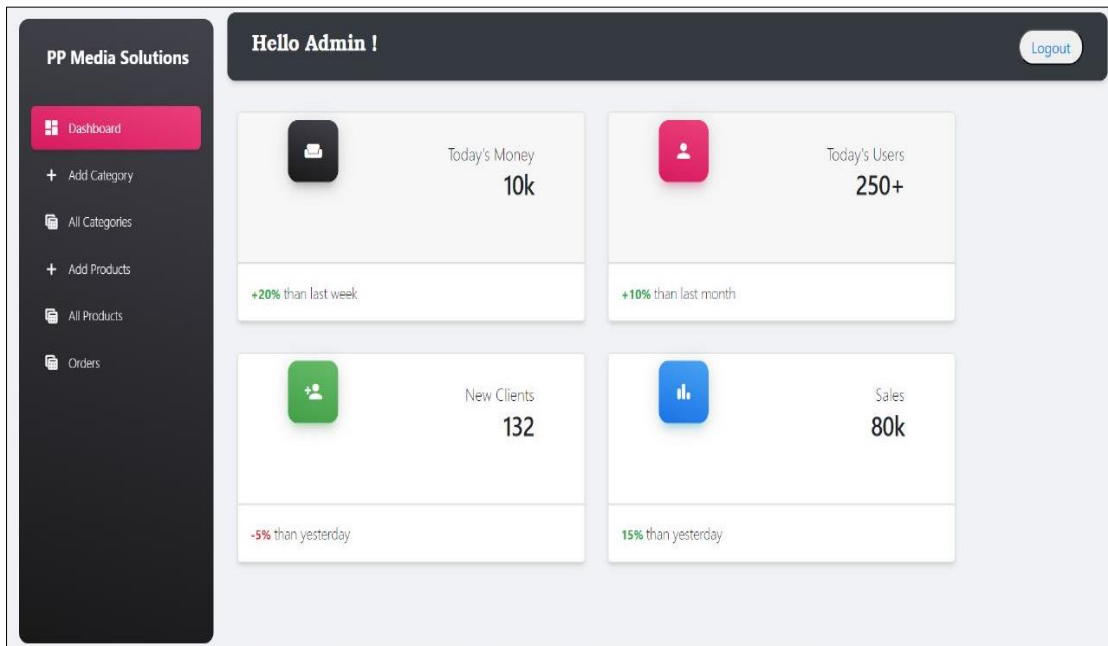
Step 3 : In the Add Category section admin can add the category of the products.
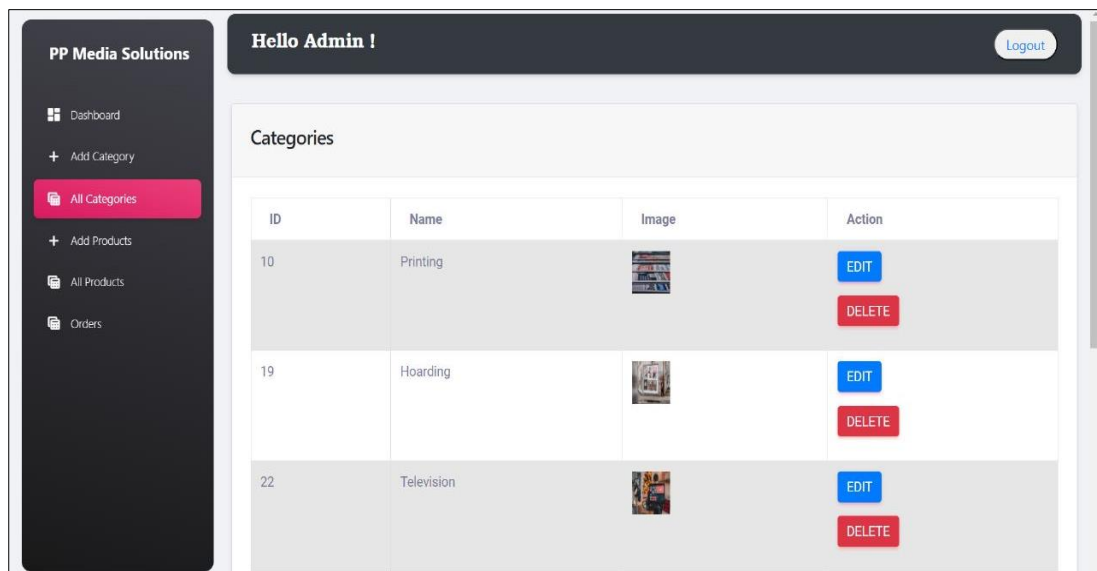
Step 4 : In the All Categories section, it will display the category that has been added using the add category.

Step 5 : If the admin wants to edit the category then the admin can easily edit it and update it.

Step 6 : In the Add Products section, the admin can add the products as per category.

Step 7 : In the All Products section, it will display the products that have been added through the add products.

Step 8 : If the admin wants to edit the product so the admin can easily edit it and update it.

Step 9: In the Orders page, the clients' orders will be displayed.

Step 10 : In the below page, admin can see the clients' order, here the admin will update the status completed when the clients' order is ready to dispatch.

REFERENCES

[1]   P. Lewandowski, M. Janiszewski and A. Felkner, Spider Trap—An Innovative Approach to Analyze Activity of Internet Bots on a Website, in IEEE Access, vol. 8, pp. 141292-141309, 2020, doi: 10.1109/ACCESS.2020.3012969.

[2]   A. Dramilio, C. Faustine, S. Sanjaya and B. Soewito, The Effect and Technique in Search Engine Optimization, 2020 International Conference on Information Management and Technology (ICIMTech), 2020, pp. 348-353, doi: 10.1109/ICIMTech50083.2020.9211171.

[3]   N. Fil, L. Nefedov and A. Binkovskaya, A Model for Choosing Hosting for a Company's Website, 2019 IEEE International Scientific-Practical Conference Problems of Infocommunications, Science and Technology (PIC S&T), 2019, pp. 387-390, doi: 10.1109/PICST47496.2019.9061555.

[4]   K. Sawant, R. Tiwari, S. Vyas, P. Sharma, A. Anand and S. Soni, Implementation of Selenium Automation & Report Generation Using Selenium Web Driver & ATF, 2021 International Conference on advances in Electrical, Computing, Communication and Sustainable Technologies (ICAECT), 2021, pp. 1-6, doi: 10.1109/ICAECT49130.2021.9392455.

[5]   Saundariya K, Abirami M, Senthil Kumaran R, Prabhakaran D, Srimathi B, Nagaranjan G, WEBAPP SERVICE FOR BOOKING HANDYMAN USING MONGODB, EXPRESS JS, REACT JS, NODE JS, IEEE Explore, 2021.

[6]   Stenly Ibrahim Adam, Stevani Andolo, A New PHP Web Application Development Framework Based on MVC Architectural Pattern and Ajax Technology, IEEE, 2019.

[7]   Nian Li, Bo Zhang, The Design and Implementation of Responsive Web Page Based on HTML5 an00d CSS3, IEEE, 2019.

[8]   Sangay Tenzin, PHP Framework for web Application Development, IARJSET,2022.

[9]   Rahman and Mustafa Mesut Koc Modern JavaScript frameworks: A Survey Study by Rahman and Mustafa Mesut Koc presented in IEEE 2018.

[10] Developing Web Applications Using jQuery, JSON and MySQL by Arsalan A. Ahmed and Shaimaa N. Ahmed, published in the International Journal of Computer Science and Information Security in 2017.

[11] Web Application Development with jQuery and MySQL by Artyom Anikin

is a research paper published in the Journal of Open Source Software in 2018.

[12] Nataliya Fil , Leonid Nefedov and Angela Binkovskaya A Model for Choosing Hosting for a Company's Website is Published in IEEE in 2020

[13] Developing Web Applications Using jQuery, JSON and MySQL by Arsalan

[14] Ongo and Kusuma Hybrid Database System of MySQL and MongoDB in Web Application Development

[15] Design and Implementation of the Website Based on PHP & MYSQL" was presented at the 2010 International Conference on E-Product E-Service and E-Entertainment by Xuefei Yu and Cheng Yi .

[16] V. P. Semenov , I. K. Soldatov ; "Factor analysis of the results of digital technology applications in the company's marketing activities" presented in IEEE 2017.

[17] The Software Challenges of Building Smart Chatbots" by Daniel and Cabot, presented at the 2021 IEEE/ACM International Conference on Software Engineering.

[18] A. Kaushik, "A Literature Review on Agile Software Development," IJARCCE, vol. 5, no. 9, Sep, 2016.

[19] Hayat, F., Rehman, A. U., Arif, K. S., Wahab, K., & Abbas, M. (2019). The Influence of Agile Methodology (Scrum) on Software Project Management. 2019 20th IEEE/ACIS International Conference on Software Engineering, Artificial Intelligence, Networking and Parallel/Distributed Computing (SNPD). doi:10.1109/snpd.2019.8935813.

[20] Yudho Yudhant , Sahil Aldi Susilo , Winita Sulandari "Design and Development of UI/UX on Company Profile Web with Design Thinking

Method" presented in IEEE 2022.

[21]   Gwang – hun Kim , Hui- choun Moon , Gi-Pyeung Song "Software Performance Testing Scheme Using Virtualization Technology" presented in IEEE in 2010.

[22]   Chippewa Software Technology, La Grange ,KY , USA   ; "HTML Educational Node. JS System (HENS): An Applied System for the Web Development " in IEEE Conference in 2014.

[23]   HTML Educational Node. JS System (HENS): An Applied System for Web Development presented by Chippewa Software Technology, a technology company based in La Grange, KY, USA,   at the IEEE Conference in 2014.

DISSEMINATION OF WORK

List of Research paper Published :

1. Review paper -

Title	: *Comparative Analysis Study of Nature-Inspired Meta-Heuristic Optimization Algorithms*
Authors	: Amit S. Manekar, Anagha Deshmukh, Poonam Jaikar, Komal Kumbhare, Aayushi Varma.
Publication	: IEEE National Students' Conference on Innovations in Rural Development.
Date	: Yet to be published.

2. Research Paper -

Title	: *Bulletin Web Application*
Authors	: Amit S. Manekar, Anagha Deshmukh, Poonam Jaikar, Komal Kumbhare, Aayushi Varma.
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