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Design of Blood Donation Website

An Internship Report (18EC74)

Submitted by,

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1RV20EC021

Under the guidance of

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RV College of Engineering

In partial fulfillment of the requirements for the degree of
Bachelor of Engineering in
Electronics and Communication Engineering
2023-24

RV College of Engineering[®], Bengaluru

(Autonomous institution affiliated to VTU, Belagavi)

Department of Electronics and Communication Engineering



CERTIFICATE

Certified that the internship (18EC74) work titled ***Design of Blood Donation Website*** is carried out by **Anand (1RV20EC021)** who is bonafide student of RV College of Engineering, Bengaluru, in partial fulfillment of the requirements for the degree of **Bachelor of Engineering in Electronics and Communication Engineering** of the Visvesvaraya Technological University, Belagavi during the year 2023-24. It is certified that all corrections/suggestions indicated for the Internal Assessment have been incorporated in the Internship project report deposited in the departmental library. The Internship project report has been approved as it satisfies the academic requirements in respect of Internship project work prescribed by the institution for the said degree.

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DECLARATION

I, **Anand** student of seventh semester B.E., Department of Electronics and Communication Engineering, RV College of Engineering, Bengaluru, hereby declare that the Internship project titled '**Design of Blood Donation Website**' has been carried out by me and submitted in partial fulfilment for the award of degree of **Bachelor of Engineering in Electronics and Communication Engineering** during the year 2023-24.

Further I declare that the content of the dissertation has not been submitted previously by anybody for the award of any degree or diploma to any other university.

I also declare that any Intellectual Property Rights generated out of this project carried out at RVCE will be the property of RV College of Engineering, Bengaluru and we will be one of the authors of the same.

Place: Bengaluru

Date:

Name

Signature

1. Anand(1RV20EC021)

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INTERNSHIP CERTIFICATE

DAS CNC PRODUCTS PVT. LTD.,



Mfrs. : Precision Turned Components

GSTIN : 29AADCD1594J1ZC

Ref: A787

Date: 15/11/2023

Internship Certificate

To whom so ever it may concern

This is to certify that **Mr. Anand, 1RV20EC021**, VII Semester, BE Electronics and Communication Engineering of 'RV College of Engineering' Bengaluru has satisfactorily completed internship on '**web development for company web page**', during 25 September 2023 to 13 November 2023 (7 weeks).

We wish her every success in him life and career.

Thanking you, with regards.

For Das CNC Products Pvt Ltd



Shiv Shankar D R
(Director)

SYNOPSIS

In the fast-paced society, addressing healthcare needs is crucial, especially in emergencies. "Red Drop" is an innovative web platform designed to connect blood donors with individuals in need of blood, fostering a responsive and community-driven approach to blood donation. The platform facilitates the registration of blood donors and enables users to search for potential donors based on blood type and geographical proximity.

The primary objectives of the project are to create an accessible and user-friendly platform that streamlines the blood donation process. By leveraging technologies for frontend development such as Hyper Text Markup Language (HTML), Cascading Style Sheets (CSS), and JavaScript, the platform ensures an intuitive and engaging user interface. The backend, developed using Hypertext Preprocessor (PHP), manages critical functionalities, including user registration, database interactions, and server-side operations.

The database, implemented in MySQL, plays a pivotal role in storing and retrieving donor information securely. This relational database supports CRUD operations, ensuring data integrity and efficient management. The platform prioritizes the integration of geolocation services, employing the Google Maps API key to convert entered addresses into geotags, thereby enhancing the accuracy of donor location data. Furthermore, the web application includes an educational component aimed at raising awareness about the importance of blood donation. Information on eligibility criteria and the positive impact of blood donation is presented to users, fostering a deeper understanding of the cause and encouraging community engagement.

By addressing the critical aspects of user interface design, backend functionality, and geographical mapping, "Red Drop" strives to bridge the gap between blood donors and those in need, creating a valuable and accessible platform for promoting blood donation in the community. The project's holistic approach aligns with the contemporary emphasis on technology-driven solutions for enhancing healthcare outcomes and community well-being.

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ABBREVIATIONS

AWS Amazon Web Services

CNC Computer Numerical Control

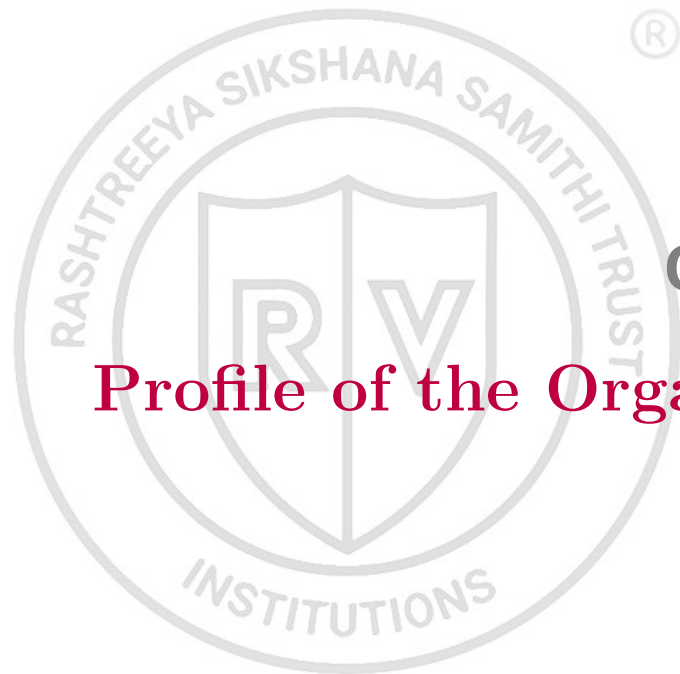
CSS Cascading Style Sheets

HTML Hyper Text Markup Language

PHP Hypertext Preprocessor

SQL Structured Query Language





Chapter 1

Profile of the Organization

CHAPTER 1

PROFILE OF THE ORGANIZATION

1.1 Introduction

The internship work is carried out in Das CNC Products Private limited. It manufactures auto turned Components and assemblies and the components which require high precision engineering. The Vision, Mission, Objectives, Outcomes and Benefits of the Organization are put forth in this chapter.

1.2 Das CNC Products Pvt.Ltd

The company has rich experience, enjoys good reputation in manufacturing of Precision components. The company is equipped to manufacture components made out of ferrous and non-ferrous materials up to 75mm in diameter, with additional facilities like milling, grinding etc.



Figure 1.1: Logo of the organization [1]

Figure 1.1 shows the logo of the organization. Das CNC Products Pvt Ltd established in 1985, began as a sole proprietorship, specializing in the processing of Turned Components through Automatic Lathes on a job work basis. It is known for its unwavering commitment to quality and a remarkable ability to swiftly develop new products, the company has experienced continuous growth over the years. In a pivotal move in 2009, it underwent a transformation, becoming a private limited company. This strategic shift not only underscored the company's evolution but also positioned it for further expansion and success in the manufacturing sector.

Some of the projects in the organization involves creating custom software for complete automation of processes in the automobile industry, catering to the specific needs of clients. The software is designed to handle basic, advanced, and special requirements of the company.

1.3 Vision

The organization's vision encompasses a commitment to reaching higher goals and sustaining excellence in the realm of business. The focus is on continually creating new opportunities for growth within strategic sectors. The vision also emphasizes an ongoing commitment to improving the quality, performance, and effectiveness of the quality management system. By aspiring to higher standards and constant enhancement, the organization aims to establish itself as a leader in its field, fostering a culture of innovation and adaptability.

1.4 Mission

Aligned with this vision, the mission of the organization is to innovate with passion, providing solutions that elevate the overall quality. The central mission revolves around the supply of precision turned components, precisely meeting the needs and expectations of customers. This commitment serves as a testament to the organization's dedication to excellence and customer satisfaction in every facet of its operations. By prioritizing precision and customer-centricity, the mission sets a clear path for the organization to deliver high-quality products and services, ensuring a positive impact on its stakeholders and the industry at large. Overall, the combination of vision and mission outlines a strategic roadmap for the organization's growth, emphasizing continuous improvement and customer-centric innovation.

1.5 Core values

The heart of the organization are five core values that define the culture. The foundation of organization rests upon five integral core values that intricately define the culture, embodying the principles that guide collective behavior and decision-making processes. These core values play a pivotal role in steering and molding the organizational culture, acting as a compass to align actions and decisions with the established principles.

1. Integrity: It underscores honesty and ethical behavior.
2. Teamwork: Fostering collaboration and leveraging diverse strengths. Teamwork is not merely a concept but a lived experience, encouraging open communication and mutual support to achieve common goals.
3. Accountability: Responsibility and ownership in all actions. Accountability pro-

motes a sense of ownership, ensuring that every team member is committed to delivering on their promises and contributing to our collective success.

4. Customer Focus: Prioritizing customer needs and satisfaction through attentive service. The company actively seek and value customer feedback, aiming to exceed expectations and cultivate lasting relationships built on satisfaction and trust.
5. Excellence: Our unwavering commitment to maintaining the highest standards of quality and continuous improvement, ensuring exceptional outcomes in every aspect of our work.

These values collectively shape companies identity, guide decision-making and inspire a culture of trust, innovation, and unparalleled dedication to the success of the organization and the satisfaction of stakeholders.

The current work is carried out under a project named inventory management system. The client for the project is Ramdas Industries, Kamakshipalya, Bangalore. The system encompasses three crucial components, namely Production and Stores Management Software, Gauges Software, and Tools Software, all tailored to meet the specific needs of the mechanical industry. Developed in the environment of VB6.0 and MS Access, this project represents a comprehensive automation initiative within the automobile sector. The customized software products created serve to address the basic, advanced, and special requirements of companies operating within this domain.

Among the key features offered by this Inventory Management System are robust Data Bank Management capabilities, including the creation, selection, and backup of data. The system also provides network support and features an interface developed to align with Microsoft Windows Standards, ensuring a user-friendly experience. A notable aspect is the implementation of user permissions, allowing for tailored access based on roles within the organization. In addition to its focus on inventory management, the organization undertook a distinct project involving the creation of an online platform for the sale or donation of old books and medicines. This platform stands out for its user-friendly interface, providing a hassle-free registration process for all users. Once registered, users can easily log in and choose between selling or buying items. For sellers, the platform simplifies the process of listing products, while buyers can seamlessly navigate through available options. The emphasis on user-centric design and convenience ensures a positive

experience for both sellers and buyers, making the platform a valuable tool in facilitating transactions and promoting sustainability through the reuse of books and medicines.

The task involved the creation of an online platform designed for the sale or donation of old books and medicines. The platform includes a user-friendly interface featuring a registration option for all users. Once registered, users can effortlessly log in using their credentials. Upon login, users are presented with options to either sell or buy items. For those looking to sell, the platform allows users to input product details and list items for sale. Conversely, users interested in purchasing products can choose the "buy" option and proceed with their transactions seamlessly. This streamlined process ensures a user-centric experience, emphasizing convenience for both sellers and buyers on the platform.

This chapter serves as an introductory glimpse into the organization's profile, encompassing its vision, mission, and core values. Beyond the technical aspects of projects like the Inventory Management System, it provides insights into the company's cultural ethos and the diverse range of projects it undertakes. Additionally, the mention of esteemed clients showcases the collaborative partnerships that contribute to the organization's success, highlighting its standing as a reputable player in the industry.



CHAPTER 2

ACTIVITIES OF THE ORGANIZATION

This chapter deals with the basic knowledge of the activities carried out by the organization. It illustrates different departments of the organization which helps to test and improve the design of any product.

Das Computer Numerical Control (CNC) products Pvt.Ltd is mainly focuses on manufacturing of auto turned components. At the core of the organization's operations lies the artistry of crafting Auto Turned Components and assemblies, where precision meets innovation. The organization's expertise extends to the meticulous manufacturing of components demanding the highest levels of precision engineering. Moreover, there is a commitment to continuous development, focusing on cutting-edge components that push the boundaries of technological advancement. The customers can get more information about the company and products at company website shown below in figure 2.1.



Figure 2.1: Company website [1]

The organization's Quality Policy serves as the guiding star in the relentless pursuit of excellence. The commitment is to not just meet but exceed customer expectations, ensuring satisfaction reaches new heights. The drive to improve quality performance and the effectiveness of the management system propels the organization forward. Additionally, there is a dedication to enhancing delivery performance, ensuring that every commitment is not just met but surpassed. At the core of the organization's ethos is a commitment to excellence that permeates every facet of its business. It provides internship opportunities to the students and hands on experience to the graduate people's.

Today the organization is equipped with state-of-art machineries which are managed by well qualified and experienced personnel, besides being backed by a band of committed suppliers.

Furthermore, the company's manufacturing and trading has grown from strength to strength. It has continuously invested in strengthening its manufacturing capabilities and has established facilities. Today the organization has over a dozen of CNC Sliding Head Turning Centres and Multispindle Automats. Das CNC's growth has been the strong relationship with customers and partners that have enabled the company to establish a global presence and bring value to a range of customers.

The main focus of the organization is to reach higher goals and maintain in the area of businesses. To continuously create new opportunities for growth in our strategic businesses. Continually improve the quality performance and effectiveness of quality management system. Innovating with passion, solutions are crafted to enhance quality. The mission encapsulates a commitment to supply precision turned components in accordance with the needs and expectations of the customer.

2.1 Products

The organization manufacture different products according to industry standards. The organization follows a very stringent quality standard, which are comparable to global standards. Besides a very strict documentation system even minor deviations are systematically evaluated and eliminated. Hence the organization has a very good proven quality track record .This diversified product portfolio showcases the organization's versatility and expertise across various sectors. The commitment to stringent quality control processes ensures that each product maintains the highest standards, contributing to the organization's stellar reputation for delivering reliable and superior-quality products.

The products manufactured at the company are listed below:

2.1.1 Glow Plug Housing, Slinding Head CNC Machines(2.2)

- Turning capacity of length max : 120 mm
- Turning capacity of diameter max : 18mm
- Milling operation

- Slotting operation



Figure 2.2: Glow Plug Housing [1]

2.1.2 Inlet Union Screw, Multi Spindle Machine (2.3)

- Turning capacity of length max : 60 mm
- Turning capacity of diameter max : 30mm
- Rolling and Reaming operation



Figure 2.3: Inlet Union Screw [1]

2.1.3 Nut Knurled Caps, Turning lath/CNC Machine (2.4)

- Cross hole drilling operation (min : 1mm)
- Turning capacity of length max : 80mm
- Turning capacity of diameter max : 25mm



Figure 2.4: Nut Knurled Caps [1]

2.2 Career at DasCNC

DasCNC is rapidly establishing itself in the industry domain. Embracing the principle of equal opportunity for growth and maintaining a professional management approach, DasCNC offers internships and hands-on training experiences to graduates. Prospective candidates interested in becoming part of the organization are invited. Should any vacancies align with the respective profiles, communication will be initiated.

This chapter discussed about the activities performed by the organization and various opportunities provided to the graduate peoples as internship.



Chapter 3

Tasks Performed

CHAPTER 3

TASKS PERFORMED

Over a span of 7 weeks a series of tasks were performed. The activities in the first couple of weeks involved learning various skills and programming languages. Later, the work was focused on choosing a problem statement and build a solution to that corresponding problem based on the skills acquired in the previous weeks. The objective was to build a web app that helps the blood donors to connect with people who are in need of blood.

3.1 Technologies used

During the internship period, the primary focus was on developing a web application aimed at fostering connections between blood donors and individuals in need of blood donations. The overarching objective was to create a user-friendly platform that streamlines the process of identifying and connecting potential donors with those requiring blood.

Websites are digital platforms accessible through the internet that present information or provide services in a structured and visually appealing manner. Comprising web pages with text, images, multimedia content, and interactive elements. websites are designed to be viewed using web browsers.

Websites serve as repositories of information, offering a convenient way for individuals to access data, news, articles, and various resources. Websites facilitate communication by hosting blogs, forums, and social media platforms, enabling individuals to connect, share ideas, and engage in discussions. Educational websites offer courses, tutorials, and resources, making learning accessible to people worldwide.

Websites play a pivotal role in modern life, serving as versatile tools for communication, information dissemination, commerce, education, entertainment, and much more. They have become integral to how individuals and businesses interact with the digital world.

Figure 3.1 shows the technologies used for front end development. Website development is divided into two main parts: frontend development and backend development. Frontend development is primarily focused on the user interface, encompassing the content that is visible to users. The technologies commonly used for frontend development include Hyper Text Markup Language (HTML), Cascading Style Sheets (CSS), JavaScript



Figure 3.1: Frontend technologies [2]

and other javascript frameworks like React, Angular etc..

HTML structures the content on a webpage, CSS enhances its visual presentation, and JavaScript adds interactivity and dynamic features. Additionally, there are popular JavaScript frameworks like React and Angular, gaining increasing popularity due to their efficiency and capabilities. These frameworks streamline the development process, enabling the creation of responsive and feature-rich user interfaces.

In the context of the web application developed during the internship, Bootstrap, a popular front-end framework, was utilized to enhance the visual aesthetics and responsiveness of the user interface. Bootstrap provides a set of pre-designed components and styles that expedite the development process and ensure consistency across different devices. By incorporating Bootstrap into the project, the web application was able to achieve a polished and modern appearance, contributing to an improved user experience.

In contrast, backend development involves server-side operations, database management, and overall functionality that users don't directly interact with but are crucial for the website's operation. Backend development indeed revolves around interacting with databases and managing server side operations. Various programming languages and technologies are employed for backend development, including Hypertext Preprocessor (PHP), Node.js, and Java. Notably, Node.js is a JavaScript framework that enables the use of JavaScript for backend development.

Figure 3.2 shows the technologies used for backend development. Both frontend and backend development work together harmoniously to create a seamless and fully func-



Figure 3.2: Php and Mysql [3]

tional web application.

The database is deployed in amazon web services. Amazon Web Services (AWS) is a comprehensive and widely-used cloud computing platform provided by Amazon.com. AWS offers a broad set of cloud services, including computing power, storage, databases, machine learning, analytics, networking, security, and more.



Figure 3.3: Amazon Web Services (AWS) [4]

AWS provides a global infrastructure with data centers in various regions around the world. This allows users to deploy applications and services close to their end-users for improved performance and reduced latency. AWS has become a dominant force

in the cloud computing industry, serving millions of customers, from startups to large enterprises. Bookshelf website is designed using HTML,CSS, javascript for frontend and PHP, Mysql database for backend. PHP is used as server side language. The database is created in the localhost. Structured Query Language (SQL) is used for operations on the database. The work assigned for the current project by the company is creating user-friendly platform that streamlines the process of identifying and connecting potential donors with those requiring blood. Tasks assigned are

1. Information on Blood Donation Process:

- Provide comprehensive information about the blood donation process, including the steps involved, health requirements, and any post-donation guidelines.
- Offer educational content to dispel myths and encourage a positive attitude towards blood donation.

2. Eligibility Criteria:

- Clearly outline the eligibility criteria for blood donation, covering factors such as age, weight, health conditions, and recent travel history.
- Include a questionnaire to help potential donors assess their eligibility before registering.

3. Donor Registration Form:

- Develop a user-friendly registration form for donors to fill out.
- Include fields for the donor's name, contact details, blood group, and location/area.
- Implement data validation to ensure accurate and complete information.

4. Donor Database:

- Create a secure database to store donor information.
- Allow donors to update their details, such as contact information or blood group, as needed

5. Search Functionality:

- Enable a search feature for individuals seeking blood donors.
- Allow users to search based on blood group and location.
- Provide detailed profiles of registered donors, including their name, contact details, blood group, and location.

6. Mapping System:

- Implement a mapping system that visually represents the locations of donors with matching blood groups.
- Use markers or pins to plot donors on a map based on their respective locations.
- Provide an intuitive interface for users to easily identify and contact

3.2 Implementation

The webapp is built using theHTML,CSS,frontend javascript library and for backend PHP is used.

3.2.1 Home Page

In the web application, the home page serves as the initial point of interaction for users, prominently featuring the website's title, "**RedDrop**" as shown in the figure 3.4. The homepage is designed with a navigation bar that strategically provides links to various sections, offering a seamless user experience. Among the key navigational elements are links directing users to essential pages within the website.

The first link leads to the 'Contact' page, where users can find information and means to reach out for inquiries or support. This page is intended to enhance user engagement and facilitate communication between the platform and its users. The 'About Us' page is another significant section accessible through the navigation bar, providing users with insights into the mission, values, and background of the Red Drop initiative.

Furthermore, the navigation bar includes a link to the 'Eligibility for Blood Donation' page, where users can access detailed information regarding the criteria and requirements for blood donation. This section aims to educate users on the eligibility standards, fostering a sense of awareness and understanding.

To actively involve potential blood donors, the home page features links for both 'Blood Donor Registration' and 'Blood Donor Search.' The 'Blood Donor Registration'



Figure 3.4: Home page of **RedDrop** web app

link directs individuals interested in contributing to the cause to a registration form, where they can provide their details and express their willingness to donate. Conversely, the 'Blood Donor Search' link allows users in need of blood to explore and identify potential donors within the platform's network. Overall, the homepage and its associated navigation bar are meticulously crafted to offer a cohesive and intuitive user experience. The inclusion of these key links serves not only to inform and engage users but also to facilitate critical actions such as registration, information retrieval, and communication within the context of the Red Drop blood donation web application.

3.5.

3.2.2 Vision and Mission of the web app

In the web application, there are two distinct pages that provide valuable information to users as shown in figure 3.6. The first page focuses on the organization's mission, vision, and details about the blood donation process, while the second page specifically outlines the eligibility criteria for blood donation.

Mission and Vision:

Technically, the 'Mission and Vision' page is designed to offer users insights into the core values and objectives of the organization behind the web app. The content is likely structured using HTML to organize and present textual information, while CSS is applied for styling and layout. Images or multimedia elements may be incorporated to enhance

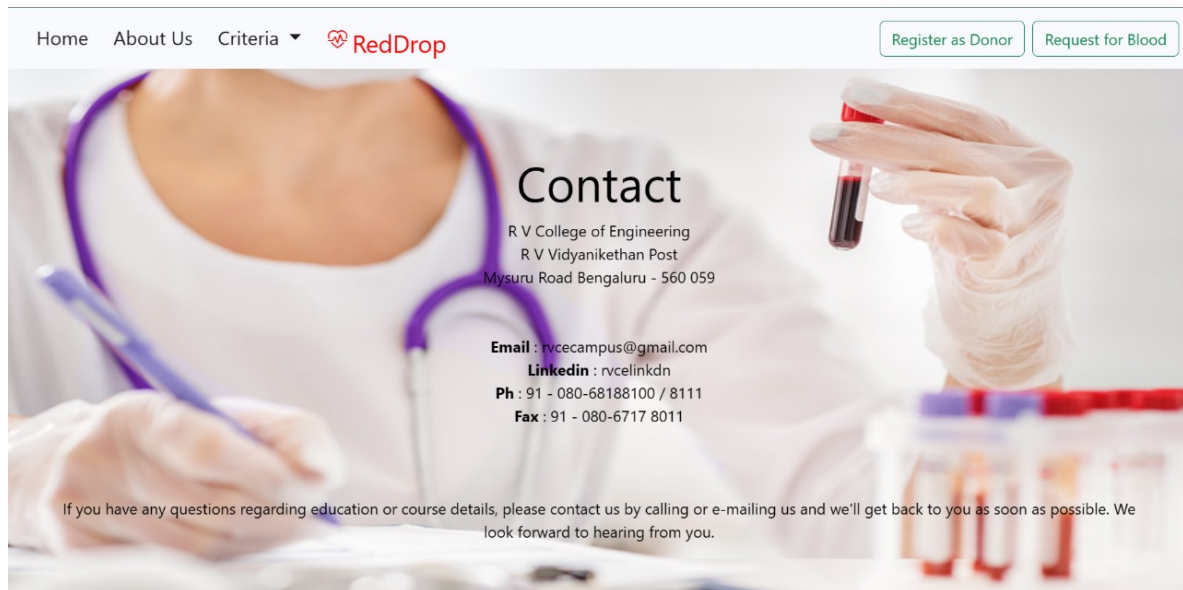


Figure 3.5: Contact information page of **RedDrop** web app

the visual appeal and convey the essence of the organization's mission and vision.

Interactive elements, such as buttons or links, can be implemented using JavaScript to allow users to navigate seamlessly between sections of the page or to related pages. The technical implementation ensures that the content is responsive, adapting to various screen sizes for an optimal viewing experience on different devices.

Blood Donation Process details:

On the 'Blood Donation Process' page, the technical approach is similar. HTML is used to structure the content, presenting information about the steps involved in the blood donation process. Visual aids, diagrams, or multimedia elements may be employed to illustrate the process effectively. CSS styling ensures a visually cohesive and appealing layout.

The use of JavaScript may be considered for interactive elements, such as collapsible sections or tooltips, to provide users with a dynamic and engaging experience. This page may also contain links to relevant resources or further information, implemented using HTML anchor tags.

Eligibility Criteria Page:

Moving to the 'Eligibility Criteria' page, the technical implementation focuses on presenting detailed information about the requirements for blood donation as shown in figure 3.7. HTML is employed to organize and structure the content, providing clear sections for different eligibility criteria. CSS is utilized for styling, ensuring a visually pleasing

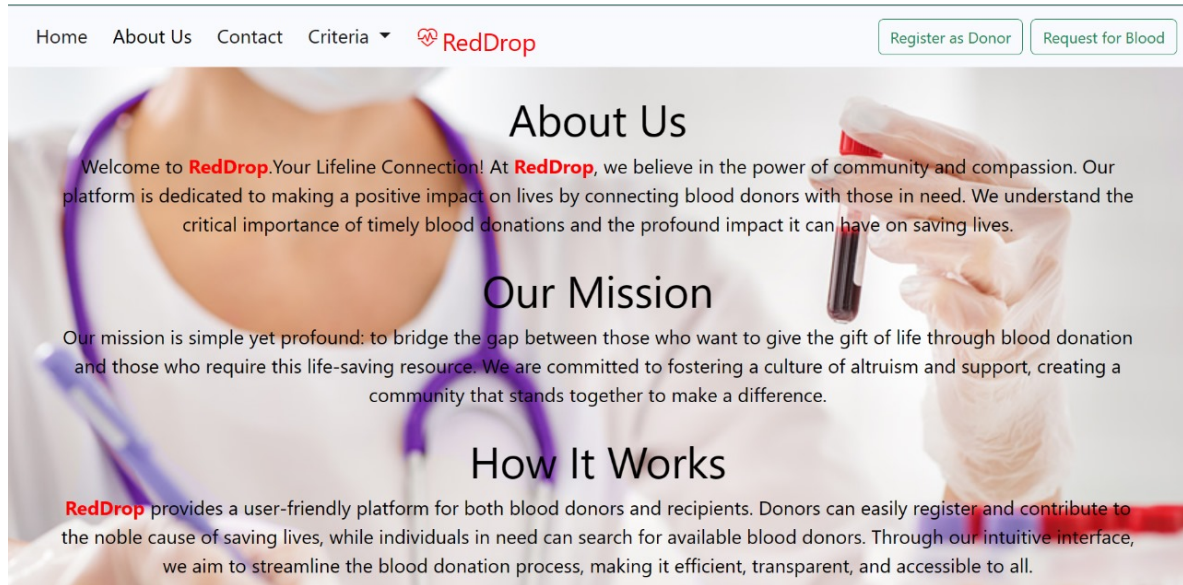


Figure 3.6: Vision and Mission of **RedDrop** web app

and readable presentation. Interactive elements, such as dropdowns or tabs, may be implemented using JavaScript to organize information in a user-friendly manner. Links within the page can connect users to related resources or additional details about specific eligibility criteria. In both cases, the technical design ensures a user-friendly interface, responsiveness across various devices, and the incorporation of multimedia and interactive elements to enhance the overall user experience. The consistent use of HTML, CSS, and JavaScript facilitates seamless navigation and presentation of information on these pages within the web application.

3.2.3 Blood donor registration form

In the registration page for blood donors, the technical implementation involves collecting essential information such as name, email, phone number, blood group, and location. The location can be submitted in two ways:

- **Current Location Option:**

Utilizes the Google Maps API key to automatically fetch the longitude and latitude of the user's current location as shown in figure 3.8. The web page includes a button or option to enable users to choose the "Current Location" option, triggering the retrieval of geotags through the Google Maps API.

- **Manual Entry of Location:**

Allows users to manually input their location details as shown in figure 3.9. After

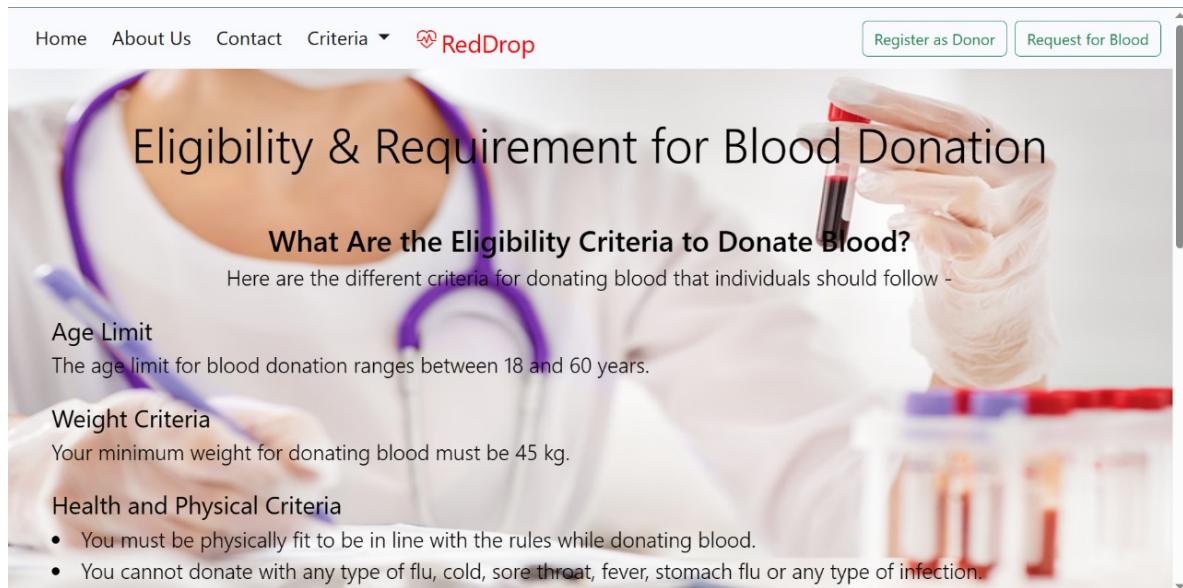


Figure 3.7: Eligibility to donate blood information in **RedDrop** web app

the user enters the location manually, the system uses the same Google Maps API key to convert the entered location into geotags. Both options ensure flexibility for users, enabling them to choose the most convenient way to provide their location information.

Upon completion of the registration form, users can click the "Submit" button. Subsequently, the form is validated to ensure that the required fields are filled and they are valid. Following steps are used to validate form:

- JavaScript Function `validateForm()`:

The `validateForm` function is called when the form is submitted (`onsubmit` attribute in the `<form>` tag). It retrieves the values entered by the user for each input field.

- Basic Validation:

Checks if any of the required fields (Name, Email, Phone, Blood Group, Location) are empty. If any field is empty, an alert is shown, and the form submission is prevented (return false).

- Email Validation:

Uses a regular expression (`emailRegex`) to validate the format of the email address. If the email is not in a valid format, an alert is shown, and the form submission is prevented.

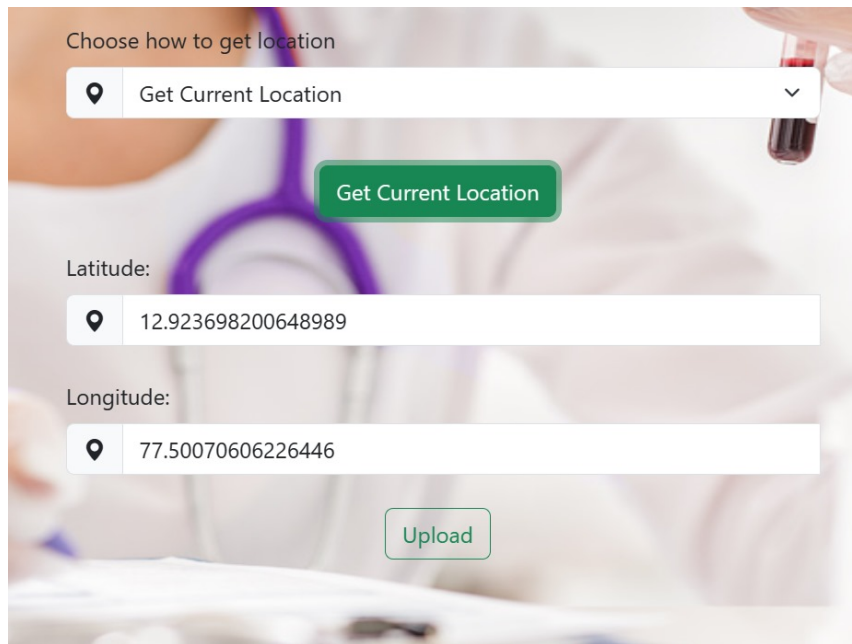


Figure 3.8: Current location option in form

- **Phone Number Validation:**

Uses a regular expression (phoneRegex) to validate that the phone number consists of 10 digits. If the phone number is not valid, an alert is shown, and the form submission is prevented.

Subsequently, they are redirected to a page that communicates the importance of blood donation. The content on this redirection page may include information about the impact of blood donation, the lives it can save, and the role each donor plays in contributing to the well-being of the community. This page aims to educate and motivate users, emphasizing the significance of their registration and participation in the blood donation initiative. The integration of the Google Maps API key enhances the accuracy of location data and contributes to a seamless and user-friendly registration process.

3.2.4 Google Map API key

Google Maps API is a set of application programming interfaces that lets user talk to its services. It will allow user to build simple apps to very sophisticated location-based apps for Web, iOS, and Android. Using Google Maps API, user can:

- Show Google Maps on the browser, iOS, or Android devices.
- Place or pin a Marker on the map when you want to indicate a specific geographic coordinate (latitude and longitude).

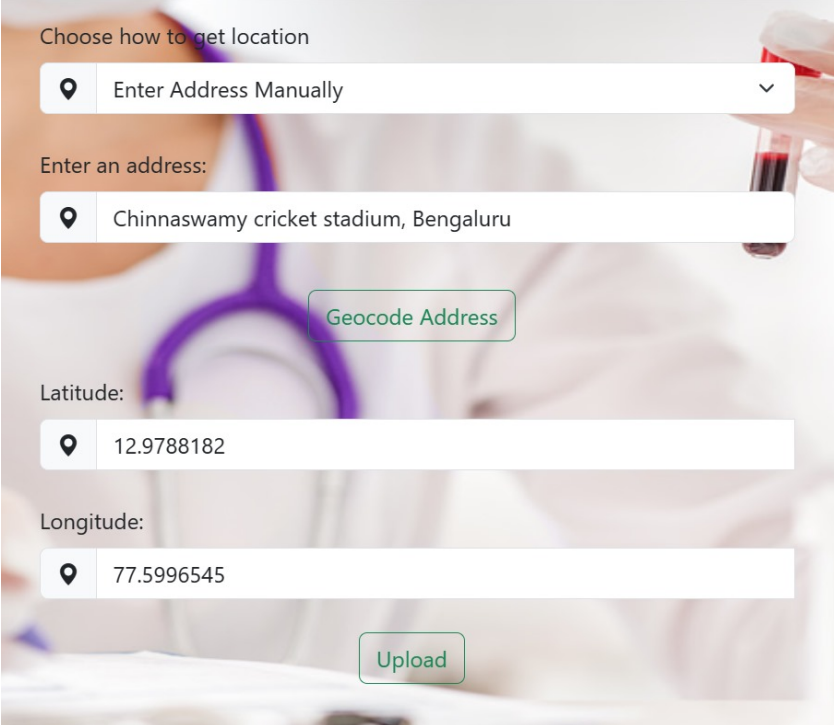
The image shows a web form titled "Choose how to get location". It has a dropdown menu with "Enter Address Manually" selected. Below this is a text input field labeled "Enter an address:" containing "Chinnaswamy cricket stadium, Bengaluru". A green button labeled "Geocode Address" is next to it. Below the address field are two more text input fields: "Latitude:" with the value "12.9788182" and "Longitude:" with the value "77.5996545". A green button labeled "Upload" is at the bottom of the form. The background of the form is a blurred image of a medical professional in a white coat with a stethoscope, holding a test tube.

Figure 3.9: Manually entering location option in form

- Show an InfoWindow which is a popover so you can show more information about a place above the marker when clicked.
- Draw a polygon that covers a specific area on the map based on a number of coordinates specified in an ordered sequence.
- Create a polyline which is a path on the map based on a number of coordinates specified in an ordered sequence. The path line will be created between two lines, then the second to the third, and so on.

Google provide different type of map API. The Places API provides a suite of functionalities to retrieve information about locations. The Nearby Search Request allows users to obtain places based on specific criteria such as location, type (e.g., restaurants, bars), and radius. This API furnishes comprehensive details, including the name, address, and coordinates of nearby places. The Text Search Request broadens the scope by enabling users to find places based on a textual query, such as "restaurants in Toronto." Furthermore, the Place Details Request offers in-depth information about a specific place, encompassing details like website address, phone number, opening hours, and reviews, accessible through a unique place-id. The Autocomplete API enhances user experience

by suggesting street addresses in a dropdown list as users type, particularly useful when location sharing is restricted or unsupported.

In addition to the Places API, the Distance Matrix API and Directions API are integral for calculating travel distance and time between addresses. The Distance Matrix API provides insights into distances and times based on transportation modes like driving, walking, bicycling, and transit. Similarly, the Directions API calculates travel distance and duration between multiple locations. These APIs collectively empower developers to incorporate robust location-based functionalities into their applications, offering users seamless access to nearby places, detailed place information, and precise travel metrics. Google Maps Platform products are secured from unauthorized use by restricting API calls to those that provide proper authentication credentials. These credentials are in the form of an API key - a unique alphanumeric string that associates a Google billing account with a project, and with the specific API or SDK. The API key is a unique identifier that authenticates requests associated with the project for usage and billing purposes. At least one API key must be associated with the project. Google strongly recommends restricting API keys to limit their usage to only the APIs needed for an application. This restriction enhances the security of the application by safeguarding it from unwarranted requests. Additional information on API security best practices is available for reference.

The implementation of manual entry of location and conversion into geotags using the Google Maps API key involves several key steps. First, users manually input their location details in the registration form. A user-triggered button initiates the conversion process. The Google Maps Geocoding API is then used to convert the entered location into geotags (latitude and longitude). This requires obtaining an API key from the Google Cloud Console and configuring the application to use it.

Geocoding and Reverse Geocoding are processes related to mapping and location-based services: Geocoding:

- Geocoding is the process of converting a human-readable address or location description into geographic coordinates, typically latitude and longitude.

Example: If you provide a street address (e.g., "123 Main Street, City, Country") to a geocoding service, it will return the corresponding geographic coordinates (e.g., latitude 37.7749, longitude -122.4194).

- **Reverse Geocoding:** Reverse Geocoding is the opposite process. It involves taking geographic coordinates (latitude and longitude) and converting them into a human-readable address or location.

Example: If you have the coordinates (37.7749, -122.4194), using reverse geocoding would provide you with the corresponding address, such as "123 Main Street, City, Country."

When the user clicks the conversion button, the web application sends a request to the Geocoding API, passing the entered location details as parameters. The API responds with geotags, and the application extracts the latitude and longitude values from the response. Finally, the converted location is displayed on the client side or stored in the backend database associated with the user's registration. It's essential to comply with Google's terms of service, secure the API key, and implement error handling and security measures in the implementation process. Following are the key steps involved:

- **Collecting Manual Location Input:**

In the registration form, include input fields for users to manually enter their location details. This may include fields for address, city, state, zip code, etc., depending on the level of granularity developer require.

- **User-Initiated Conversion Trigger:**

Add a button or trigger that allows users to initiate the conversion of their manually entered location into geotags. This can be labeled as "Convert to Geotags" or a similar user-friendly term.

- **Integration with Google Maps API:**

Use the Google Maps Geocoding API to convert the entered location into geotags (latitude and longitude). Ensure that the web application is set up to communicate with the Google Maps API. This involves obtaining an API key from the Google Cloud Console and configuring current application to use this key.

- **API Request:**

When the user clicks the conversion button, the web application makes a request to the Geocoding API, passing the entered location details as parameters in the request.

- **Response Handling:**

Receive the API response, which includes the geotags corresponding to the entered location. Extract the latitude and longitude values from the response.

- **Update Form or Store Data:**

Once the application has the geotags, it can update the form on the client side to display the converted location and store the latitude and longitude values in the backend database associated with the user's registration.

3.2.5 Blood donor search option

The blood donor search functionality in the web app is constructed through the integration of JavaScript (JS) and PHP. The user begins by filling out a form which is shown in figure 3.10, entering the required details such as blood group and location. Similar to the donor registration page, the location can be input manually or obtained automatically using the Google Maps API key to fetch the latitude and longitude of the current location. Upon clicking the search button, the entered details are processed by the PHP

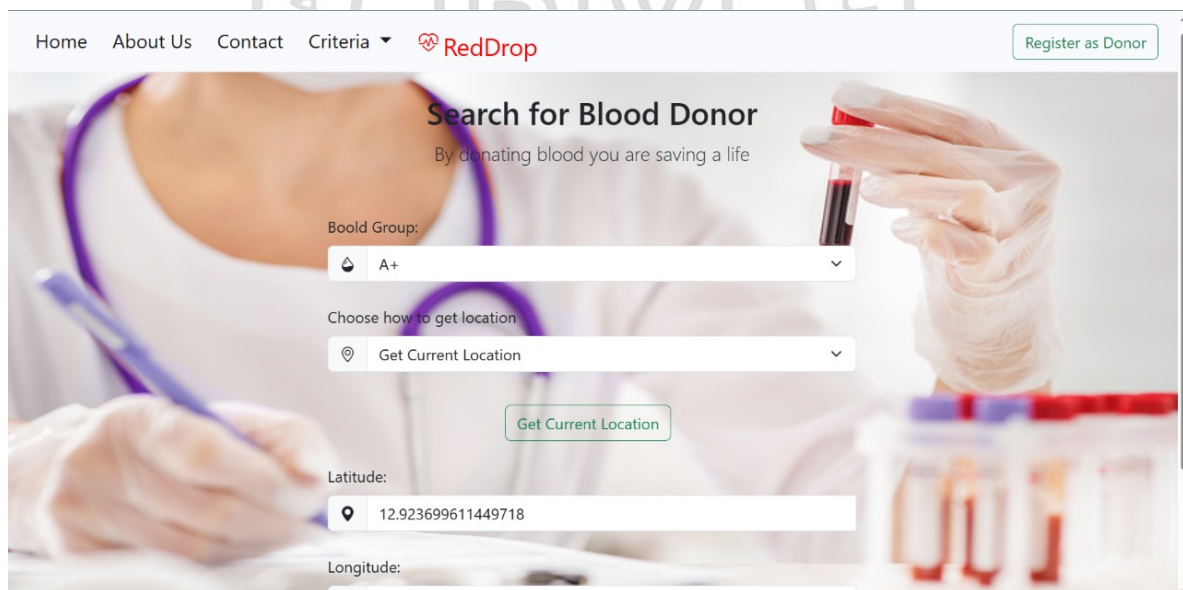


Figure 3.10: Blood donor search form

backend. The system then leverages the Google Maps API key to calculate the distance between the user's location and the registered blood donors in the database. Donors with matching blood groups and within a 10km range are identified.

In the following formula (Equation 3.1), the distance is calculated:

$$\begin{aligned} \text{Distance} = 6371 \times 2 \times \arcsin \bigg(& \\ & \sin^2 \left(\frac{\pi}{180} (\text{Latitude}_2 - \text{Latitude}_1) \right) \\ & + \cos \left(\frac{\pi}{180} \text{Latitude}_1 \right) \times \cos \left(\frac{\pi}{180} \text{Latitude}_2 \right) \\ & \times \sin^2 \left(\frac{\pi}{180} (\text{Longitude}_2 - \text{Longitude}_1) \right) \bigg)^{\frac{1}{2}} \end{aligned} \quad (3.1)$$

The provided expression in (Equation 3.1) is a formula for calculating the distance between two points on the Earth's surface using their latitude and longitude coordinates. It is based on the Haversine formula, which is commonly used in geolocation applications to compute the great-circle distance between two points on a sphere.

Here's a breakdown of the formula:

- 6371: The Earth's average radius in kilometers.
- Latitude₂&Longitude₂: It is the latitude & longitude of the user searching for the blood donors.
- Latitude₁&Longitude₁: It is the latitude & longitude of the different blood donors location in the database.

The formula calculates the great-circle distance between two points using their latitude and longitude. The distance is expressed in kilometers. It is important to note that this formula assumes a perfect sphere for Earth, which is not entirely accurate as the Earth is slightly ellipsoidal. For more precise calculations, it is suggested to consider using more complex ellipsoidal models.

The search results are dynamically generated and presented on a redirection page. This page displays relevant information about the matched donors, including their names, phone numbers, and blood groups as shown in figure 3.11. Simultaneously, the Google Maps API key is utilized to plot these donors on an interactive map. The plotted map allows users to visually explore the geographical distribution of matching donors. Each donor's location is represented as a marker on the map as shown in figure 3.12. Upon clicking on a specific marker, an interactive pop-up window appears, displaying the donor's name, phone number, and blood group. This feature enhances user engagement and facilitates seamless communication between those in need of blood and potential donors.

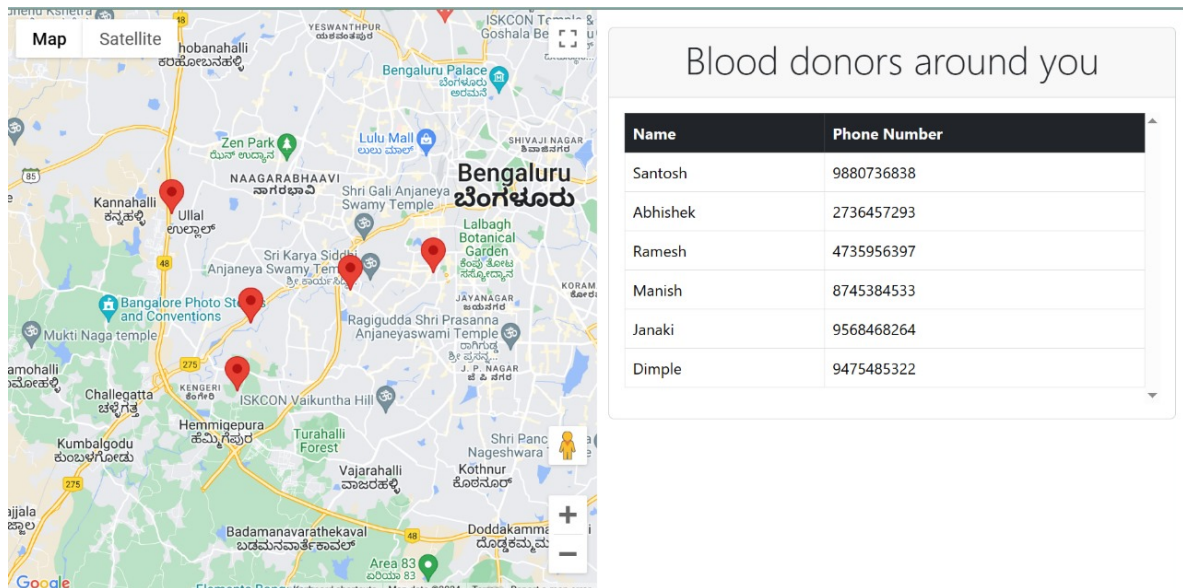


Figure 3.11: Blood donors location plotted on map

The person searching for blood donor will get an idea of how far the donor is and how much time it can take him to reach the destination. By analyzing the distance of each blood donor and their availability the person can choose the blood donor and contact him to further communication.

The integration of JavaScript and PHP ensures a dynamic and responsive user interface. JavaScript plays a crucial role in handling user interactions and dynamically updating the content on the page, while PHP likely manages server-side logic and data retrieval. The logic implemented using latitude and longitude coordinates during donor registration is crucial for accurate plotting of donors on the map. This approach ensures precision and effectiveness in showcasing the geographical distribution of potential donors, thereby enhancing the overall functionality of the blood donor search feature within the web application.

3.2.6 Database

The database for storing donor information is structured using MySQL, managed through MySQL Workbench, and hosted on an XAMPP server. Within the database, a single table has been established to organize and store pertinent donor details. This table comprises several columns, each designated for specific information as shown in figure 3.13 :

- Name: Records the name of the blood donor.

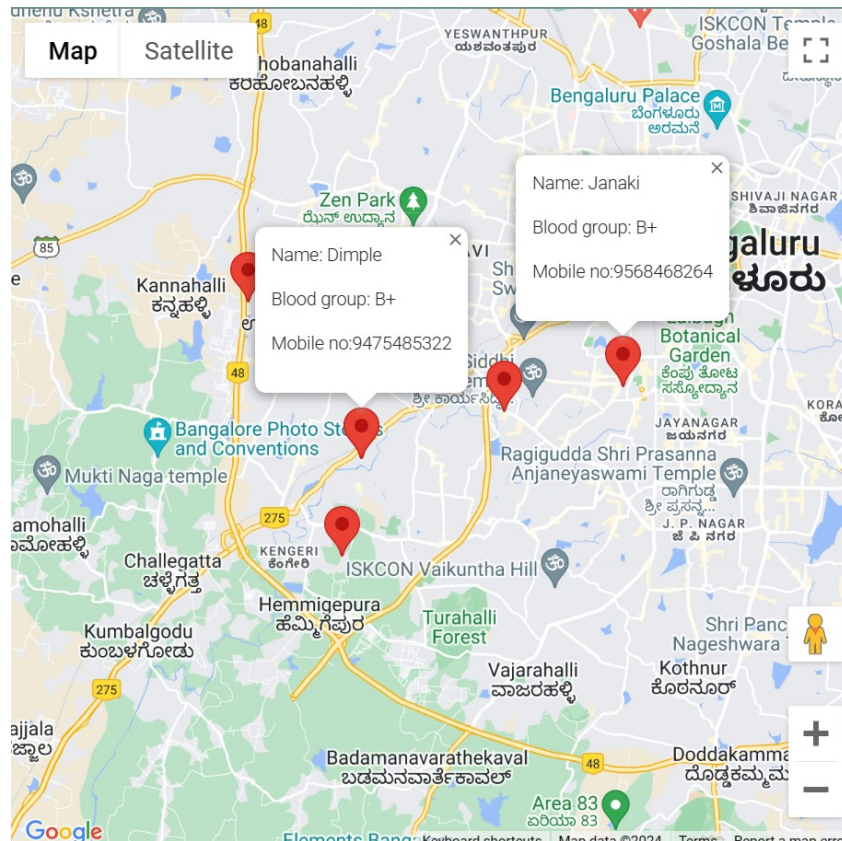


Figure 3.12: Blood donor name and contact is shown in map

- Email: Captures the email address associated with the donor.
- Phone Number: Stores the contact number provided by the donor.
- Blood Group: Identifies the blood group type of the donor.
- Longitude: Represents the longitudinal coordinate of the donor's location.
- Latitude: Denotes the latitudinal coordinate of the donor's location.

User-entered details, such as name, email, phone number, and blood group, are stored in their respective columns. The longitude and latitude columns are populated using a geo-tag conversion process during donor registration. The geotags are derived by converting the donor's entered address into corresponding geographical coordinates, ensuring precise location information.

The integration of MySQL workbench allows for efficient database management, offering a user-friendly interface for creating, modifying, and querying the database. XAMPP serves as the server environment for hosting the MySQL database. It facilitates seamless

	▼ name Guridi	email	bloodgroup	mobile_no	latitude	longitude
Edit Copy Delete	Canara bank	abhigunari2002@gmail.com	A+	9740300974	12.9826812744140620	77.5127029418945300
Edit Copy Delete	Santosh	santoshtalekattu@gmail.com	B+	8867076715	12.8998842239379880	77.4957885742187500
Edit Copy Delete	robert	abc@gmail.com	B+	8867076715	12.9237737655639650	77.5005798339843800
Edit Copy Delete	Shyam	shyam123@gmail.com	B+	0273542883	12.9237241744995120	77.5006942749023400
Edit Copy Delete	Shyam	shyam123@gmail.com	B+	0273542883	12.9237241744995120	77.5006942749023400
Edit Copy Delete	Ram	ram@gmail.com	B+	1234567890	12.9975004196167000	77.5832977294921900
Edit Copy Delete	basavaraj	santoshtalekattu@gmail.com	A+	0886707671	12.8998842239379880	77.4957885742187500

Figure 3.13: Database to store blood donor information

interaction between the web application and the database. XAMPP is a popular open-source cross-platform web server solution stack that includes Apache, MySQL, PHP, and Perl.

This technical setup ensures a robust and organized structure for storing donor information. The geotag conversion process enhances the spatial accuracy of the stored data, supporting functionalities such as the dynamic plotting of donors on the map and the accurate calculation of distances for blood donor searches. Overall, the described technical setup ensures an organized and efficient system for managing donor information, utilizing geotags to enhance spatial accuracy and support map-related functionalities in the blood donation web application.

This chapter explained about the overall tasks performed. It includes developing website from frontend to the backend. The chapter provides an inclusive explanation of tasks associated with developing a website, covering the entire spectrum from the frontend, where users interact with the site, to the backend, which manages the server-side processes and data.



Chapter 4

Reflections

CHAPTER 4

REFLECTIONS

Reflecting on the project, the comprehensive integration of geolocation services and dynamic web development techniques was instrumental in achieving the project goals. The use of the Google Maps API key played a pivotal role in converting user-entered addresses into geotags. This integration significantly improved the accuracy and spatial relevance of donor information within the database. Geotags proved instrumental in achieving location-based matching of donors and enriching the overall efficiency of the blood donation initiative.

The proficiency gained in managing a MySQL database using MySQL Workbench and configuring server-side processing through XAMPP underscored the importance of robust backend infrastructure. This aspect was crucial in supporting seamless interactions between the web application and the database, ensuring the reliability and security of data transactions.

The successful integration of the Google Maps API key for dynamic map plotting enriched the user experience by visually presenting the geographical distribution of blood donors. This not only facilitated effective communication but also demonstrated the practical application of APIs in enhancing the functionality of the web application.

The implementation of an automated blood donation process showcased the practicality of using geotags for location-based matching of donors. This approach streamlined the communication between potential donors and recipients, contributing to the overall efficiency and impact of the blood donation initiative.

The inclusion of educational content within the web application served to inform and engage users, fostering a sense of awareness about the importance of blood donation. This strategic integration aligned with the project's goal of not only facilitating connections but also promoting a deeper understanding of the significance of the cause and spreading an awareness among the people about the need of blood donation and its impact on the society..

Overall, the project provided valuable insights into the technical intricacies of web development, database management, and API integration. The practical application of these skills in creating a user-centric platform for blood donation highlighted the intersection of technology and social impact, emphasizing the potential for technology to address

real-world challenges.

4.1 Learning Outcomes

The internship was conducted for a period of 6 weeks and it provided an enriching and immersive experience, fostering a multifaceted learning journey that extended beyond the confines of traditional educational settings. Through hands-on projects, collaborative endeavors, and exposure to real-world challenges, several key learning outcomes emerged, shaping a comprehensive understanding of both technical and soft skills.

- **Database Management Proficiency:**

Acquired the ability to design and manage a relational database using MySQL Workbench, including the creation of tables, column definitions, and data manipulation for efficient storage and retrieval of donor information.

- **Integration of Geolocation Services:**

Implemented the integration of geolocation services, utilizing the Google Maps API key to convert user-entered addresses into latitude and longitude coordinates. This enhanced the accuracy of donor location data within the database.

- **Dynamic Web Page Development:**

Gained experience in dynamic web page development using a combination of JavaScript (JS) and PHP. This included creating interactive forms, processing user inputs, and dynamically generating content based on backend logic.

- **User-Friendly Interface Design:**

Demonstrated the ability to design and implement a user-friendly interface by employing HTML and CSS. Ensured consistent navigation and a visually appealing layout for an enhanced user experience.

- **Server-Side Processing with XAMPP:**

Developed proficiency in server-side processing using XAMPP, allowing the seamless interaction between the web application and the MySQL database. This involved configuring the server environment and ensuring secure data transactions.

- **API Integration for Map Plotting:**

Successfully integrated the Google Maps API key to dynamically plot donor lo-

cations on an interactive map. This involved retrieving latitude and longitude coordinates from the database and presenting them visually for users.

- **Blood Donation Process Automation:**

Implemented an automated blood donation process, where donors could register and provide essential details. Leveraged geotags and the Google Maps API key to facilitate effective communication between potential donors and individuals in need of blood.

- **Educational Content Integration:**

Incorporated educational content within the web application, providing users with information on the significance of blood donation, eligibility criteria, and related topics to promote awareness and engagement.

- **Responsive Design Implementation:**

Ensured a responsive design for the web application, accommodating users accessing the platform from various devices. Employed HTML, CSS, and JavaScript to create a seamless and visually consistent experience.

- **Data Security and Privacy Compliance:**

Demonstrated an understanding of data security and privacy considerations. Implemented encryption protocols and adhered to relevant regulations to safeguard sensitive user information within the web application and database.

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