



PROJECT REPORT

ON



“Integrated Common Services to Common People”

is submitted to

Intel Unnati Industrial Training 2024

**Prof. Ram Meghe Institute of Technology and Research, Badnera,
Amravati.**

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**Prof. Ram Meghe Institute of Technology and Research, Badnera,
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**PROF. RAM MEGHE INSTITUTE OF TECHNOLOGY AND RESEARCH, BADNERA,
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CERTIFICATE

This is to certify that

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has satisfactorily completed the project work towards the **Intel Unnati Industrial Training 2024** in discipline on the topic entitled **“Integrated Common Services to Common People”**, during the academic year 2024-2025 under my supervision. The student was trained by Intel experts.

Date: 8 July 2024

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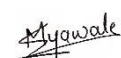
We were grateful for the opportunity to have worked on this project and for the valuable learning experience it has provided.

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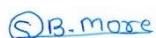


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ABSTRACT

A new web application emerges to bridge the knowledge gap and empower individuals in a world overflowing with healthcare information. This application, aptly named **Integrated Health Hub**, envisions a future where reliable healthcare information and services are conveniently accessible at one's fingertips. It empowers individuals, especially those unfamiliar with navigating complex online resources, to take charge of their well-being. Integrated Health Hub is a new health software that seeks to simplify the overwhelming amount of internet healthcare data. The website's objective is to serve as an all-encompassing resource for trustworthy health information and resources, enabling everyone to take charge of their health—especially those who find health websites difficult.

Integrated Health Hub integrates data from public sources, such as public datasets and healthcare organizations, to address the issue of information overload. Users can find local pharmacies, diagnostic centers, hospitals, and clinics by using location-based services. Beyond merely listing facilities, the app aims to be transparent by offering treatment cost estimates and, with user permission, integrating with health insurance companies to show coverage specifics. The benefits of Integrated Health Hub don't end there. It goes on to include elder care services, nurse availability, and emergency connections for oxygen and ambulance services. But the search for easily available medical care doesn't stop with the app. The Integrated Health Hub recognizes issues such as the reliance on outside sources for data accuracy, the lack of connectivity for people without internet access, and the difficulties in giving accurate cost predictions. Considering these drawbacks, the Integrated Health Hub represents a revolutionary step in the direction of an accessible and transparent healthcare system.

Keywords: Cost Transparency Emergency Services, Data Accuracy, Integrated Health Hub, Location-based services, Security, User-Friendly Interface, Web Application

CHAPTER 1:

INTRODUCTION

1. Introduction

Integrated Common Services (ICS) refer to an initiative that combines various public services into a single, unified platform. This means citizens can access and utilize different government services through a centralized system, eliminating the need to navigate multiple websites or departments. Essentially, ICS aims to simplify your interaction with the government.

1.1 Overview

A web application called Integrated Health Hub was created to close the knowledge gap between the masses of health information available online and the difficulties that average people have in locating trustworthy and pertinent sources for their routine medical requirements. By providing a user-friendly platform that makes it easier to locate licensed physicians, hospitals, labs, pharmacies, and other crucial healthcare services, this initiative hopes to empower people. The app connects users with the closest and best service providers by utilizing location-based features and extensive search possibilities. Furthermore, Integrated Health Hub offers helpful data including projected treatment fees, insurance coverage specifics, and contact details for nursing and elder care services. Users and service providers can both benefit from this effort. Consumers gain from better healthcare decision-making with knowledge, while service providers stand to benefit from more visibility and the chance to engage with a larger customer base.

1.2 Motivation

An abundance of health information is easily accessible online in the current digital era. For the average person, though, this wealth of options can frequently give rise to a problem. Even with the abundance of information available, it can be difficult to find trustworthy and pertinent sources for routine medical requirements.

The following factors motivated the development of the Integrated Health Hub:

- **Information Overload:** It can be difficult and time-consuming to sort through the large amounts of available internet health data, which can cause confusion and make it difficult to discover reliable information.

- **Limited Accessibility:** Even with a basic internet connection, those with low levels of digital literacy may find it difficult to navigate complicated medical websites or understand technical jargon.
- **Lack of Integration:** An experience that is fragmented is caused by information that is dispersed across multiple websites and platforms. Consumers frequently have to spend important time and energy visiting several websites in order to find the services they require. To overcome these issues, Integrated Health Hub offers a centralized platform that gives consumers the ability to:
- **Simplify Your Search for Healthcare:** Based on your unique needs, quickly find the closest and best healthcare providers.
- **Make Well-Informed Choices:** Make educated healthcare decisions by having access to clear details regarding the cost of services, health insurance, and provider qualifications.
- **Boost Efficiency:** By having all necessary healthcare resources easily accessible in a single, user-friendly application, you may save time and effort.

By tackling these issues, Integrated Health Hub hopes to make healthcare more easily accessible and effective for all.

1.3 Problem Statement.

The general public still has a difficult time locating trustworthy and pertinent resources to meet their basic healthcare needs, even with the abundance of health information available online. Among these difficulties are:

- **Data Overload:** It can be quite difficult to understand the vast variety of health information available online. Users frequently have trouble spotting reliable sources and understanding medical terms.
- **Restricted Accessibility:** People who don't have much experience with digital literacy or who don't have access to user-friendly interfaces may find it difficult to browse complicated medical websites or get the information they require.
- **Broken Fragmented Experience:** Users must visit many websites to find the services they need, which results in inefficiency and wasted time. Crucial healthcare resources are dispersed over different websites and platforms.

- **Transparency:** It might be challenging to locate or understand information about service prices, insurance coverage, and provider qualifications. This prevents consumers from selecting healthcare options with knowledge.
- **Insufficient or delayed treatment:** It might be detrimental to one's health to seek treatment later on due to difficulties locating appropriate healthcare facilities.
- **Confusion and misinformation:** Untrustworthy sources of health information might cause uncertainty and poor decision-making when it comes to selecting a healthcare provider. Wasted time looking for different resources keeps users from concentrating on their health needs.

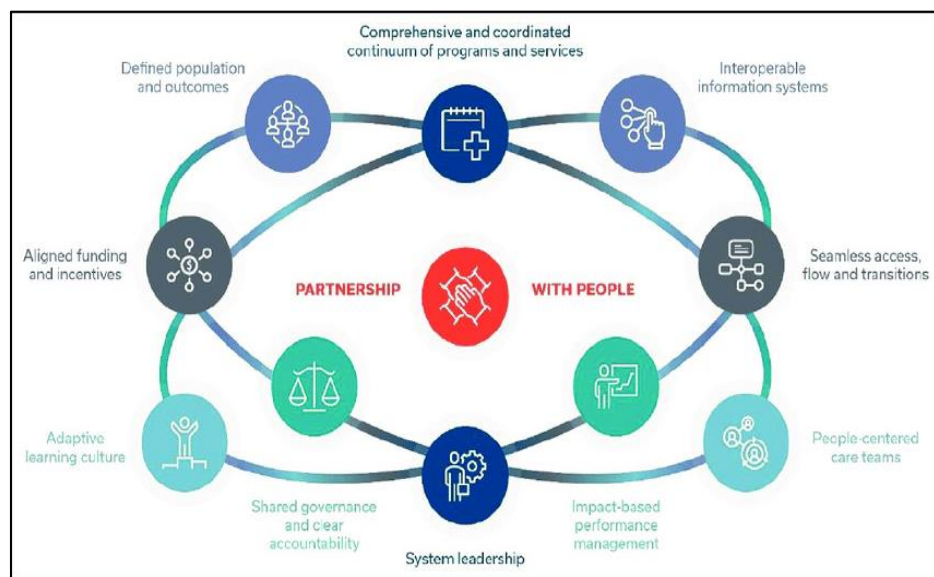


Figure 1: Integrated Services

This is an example of inefficient resource utilization.

By establishing an integrated system that offers an approachable and user-friendly solution for all healthcare needs, Integrated Health Hub seeks to address these problems.

1.4 Research Objectives

The subsequent research objectives are what are driving the creation of the Integrated Health Hub: Through the deployment of an all-inclusive healthcare platform, this research seeks to enhance user experience and accessibility of healthcare information. It will look into the difficulties users encounter when searching for healthcare information online and how user-centered design concepts can be used to make a more efficient platform. Additionally, the study will examine the

present methods for disseminating information about healthcare services and investigate the feasibility of combining search features with location-based services. This research will ultimately aid in the creation of a healthcare platform that enables users to quickly and easily discover trustworthy and dependable healthcare information by assessing user behavior, information distribution, and the efficacy of search and location capabilities.

By fulfilling these research goals, Integrated Health Hub will be developed with user demands and a solid grasp of current obstacles in mind. This will guarantee that the application is made with the best possible accessibility, usability, and efficacy in mind, providing consumers with an easy-to-use platform for their healthcare needs.

CHAPTER 2:

LITERATURE REVIEW

2. Literature Review:

Research on health literacy, user-centered design, and the changing healthcare sector is essential for the creation of the Healthcare Companion application. This review delves into important aspects that affect the usability and efficacy of the program.

1. Design with the user in mind and health literacy

Sørensen et al. (2012) stress the significance of health literacy in relation to public health, since it guarantees that individuals can comprehend and apply health information efficiently [1]. The design of the application should put an emphasis on presenting information in a clear, succinct manner, avoiding medical jargon, and using language that is easy to understand. Qualitative Data Analysis for Health Services Research: Application improvement depends heavily on user input. Techniques for evaluating qualitative data in health service research are covered by Bradley et al. (2007) [2]. This method can be useful for comprehending user experiences and determining areas for improvement

2. Collaborative Management and User Engagement

Beyond Engagement and Participation: Community and User Co-Production of Public Services: It is crucial to include users at every stage of development. Bovaird (2007) promotes co-production between users and the community, in which consumers participate in the planning and creation of public services [3]. Throughout the process, user testing and feedback can guarantee that the application effectively meets the needs of the user. Collaborative Management of Chronic Illness: The app might make it easier for patients and medical professionals to communicate. In their exploration of cooperative management of long-term medical disorders, Von Korff et al. (1997) emphasize the advantages of enhanced communication [4].

3. Combining Service Discovery with Social Needs

Including Social Care in the Provision of Health Care: Valderas et al. (2009) draw attention to the idea of comorbidity, which describes how social determinants such as elder care access might affect

health outcomes [5]. The inclusion of elder care services in your application is consistent with this idea and meets both medical and social demands. Priorities for Service Research in a Changing Context: The healthcare industry is always changing. The significance of adjusting services to this evolving environment is emphasized by Ostrom et al. (2015) [6]. You can make sure your application stays relevant and helpful over time by taking into account upcoming developments in healthcare and technology.

4. Frameworks for Implementation and Data Security.

Promoting the Provision of Health Services Translating Research Results into Practice: There are frameworks in place to direct the application of advances in health services. Frameworks suggested by Damschroder et al. (2009) can guarantee that your application functions effectively with the current healthcare systems [7].

Data Security and Privacy: Sensitive information is related to healthcare. It is imperative to adhere to pertinent data privacy requirements, such as the Health Insurance Portability and Accountability Act (HIPAA). To safeguard user data, thorough research and implementation of security measures are essential [8].

User Self-Regulation and Life Course Health: An appreciation of user self-regulation models can help designers create features that give users the ability to take charge of their own health. This includes the Common Sense Model of Self-Regulation. People's understanding and management of their health are examined by Leventhal et al. (2012) [9]. Think of adding functions or instructional materials that encourage self-management and well-informed choices. Life Course Health Development Framework: A framework for comprehending health across an individual's lifespan is put forth by Halfon & Hochstein (2002) [10]. By keeping this structure in mind, developers may make sure the application meets the demands of users at all periods of life, from young individuals looking for general health information to older ones taking care of chronic illnesses.

Table 1: Past works on Healthcare Systems

Sr. No	Author	Methodology	Identified Gap
1	National Academies of Sciences, Medicine Division	Committee report with expert analysis	Enough research on the best practices and efficacious methods for incorporating social care into the provision of healthcare
2	Salisbury et al.	Literature review of existing research on comorbidity	Lack of agreed-upon categories for comorbidity makes it challenging to compare research and find successful therapies
3	Sørensen et al.	Systematic literature review analyzing existing models and definitions of health literacy	In order to ensure that patients comprehend information and actively engage, health literacy issues must be incorporated into all healthcare delivery methods.
4	Kirsh et al.	Framework development for a cohesive approach to implementation science	The Disparity between study results and real-world implementation in healthcare environments
5	Bovaird	Literature review of user and community involvement in public services	Very little empirical study has been done on community and user co-production in the context of healthcare delivery.

6	Curry et al.	Intervention study evaluating a collaborative care model for managing chronic illness	Further investigation is required to determine the efficaciousness and scalability of collaborative care models in various healthcare environments.
7	Hochstein & Halfon	Framework development for understanding health across the lifespan	Absence of a thorough framework that takes into account healthcare interventions across the course of an individual's life as well as societal determinants of health
8	Brissette et al.	Book chapter discussing self-management interventions	Research on self-management strategies that specifically address socioeconomic determinants of health is necessary in order to understand the difficulties that patients encounter outside of the healthcare system.
9	Devers et al.	Literature review on qualitative methods in health services research	Insufficient application of qualitative approaches in health services research, sometimes ignoring the wealth of information they offer on user

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			experiences and viewpoints
10	Ostrom & Voss	Literature review on service delivery models in a rapidly changing healthcare landscape	Research on creative, flexible, and user-centered service delivery methods is needed to address changing patient needs and healthcare trends.

CHAPTER 3: REQUIREMENT ANALYSIS

3 Requirement Analysis

The Integrated Health Hub is designed to connect patients with healthcare providers more effectively. To make this a reality, a deep dive into user needs is essential. This means understanding what patients want finding providers, cost estimates, what the system needs to do secure user management, searchable provider database, and what data is needed user info, provider details, potentially insurance. Security and the ability to handle a growing user base scalability will also be top priorities.

3.1 Functional Requirements: The following features are provided by the Integrated Health Hub application to meet the demands of patients and healthcare providers:

Regarding Patients:

- **Signup and Account Creation:** Manage profiles and create accounts securely. (Medics and Assistants).
- **Look for Medical Providers:** Locate medical professionals such as physicians, hospitals, clinics, pharmacies, and other healthcare providers by using criteria such as insurance network participation, ratings, location, specialization, and illness name.
- **See Provider Specifics:** Get comprehensive information on medical professionals, such as reviews, specializations, and contact information. (Admin may be able to add and remove items.)
- **Estimated Costs:** See projected costs for operations and therapies; these may be used with insurance information to estimate out-of-pocket expenses.
- **Location Services:** By using the user's current location, locate healthcare providers in the vicinity.
- **Schedule Appointments:** Incorporate features that let you make direct appointments with medical professionals. In addition to ordering prescription drugs online, users can schedule a doctor's visit online.
- **Secure Messaging:** Facilitate safe correspondence between medical professionals and patients. Doctors can receive messages from users.

For Healthcare Providers:

- **Claim a Profile:** In order to control their listing details and maybe get appointment requests, healthcare providers can claim their profiles. The administrator has the ability to administer services and add or remove doctors.
- **Update Profile Data:** The application keeps up-to-date a record of the specializations, contact details, and insurance networks that are accepted.
- **Manage Online Reputation:** Keep up a positive online presence and reply to patient reviews.

3.2 Non-Operational Conditions: The following features are provided by the Integrated Health Hub application to meet the demands.

- **Performance:** The application loads maps quickly and retrieves data with lightning speed.
- **Usability:** People with different degrees of digital literacy may easily navigate and comprehend the user interface. Consideration is given to accessibility features for users with disabilities.
- **Security:** User data is safeguarded by strong security methods. This covers data encryption (both at rest and in transit) and safe authentication procedures. As well as compliance with pertinent data privacy laws.
- **Scalability:** The system's architecture is built to manage an increasing number of users and data volumes effectively.

3.3 The Needs of Stakeholders: The Integrated Health Hub caters to two key stakeholders: patients who desire a smoother healthcare journey and providers who want to expand their reach and connect with more patients.

- **Patients:** Finding trustworthy healthcare information, comparing prices, and easily locating doctors are their top priorities. They ought to be able to make knowledgeable healthcare judgments thanks to the application.
- **Medical Professionals:** The main advantages are enhanced visibility and the possibility of drawing in new patients from the application's user base.
- **Government Agencies:** Information gathered by the app can help shape public health programs by offering insightful information about healthcare trends.

CHAPTER 4: SYSTEM DESIGN

4. System Design

The Health Hub is designed with building blocks in mind. The user interface is crafted with HTML for structure, CSS for styling, and potentially JavaScript for dynamic features. Pre-built components can accelerate development. Python manages the server-side using Flask, while a MySQL database stores user and healthcare provider information. Security is prioritized, and an API gateway acts as a central point for accessing various functionalities. This scalable system runs on the cloud, and developer-friendly tools like Git and Visual Studio Code aid in the creation process.

4.1 High-Level Architecture:

The Integrated Health Hub application utilizes a client-server architecture with the following components:

- **Client-side Application:** Created as a Web- application using a cross-platform framework like Flask to ensure compatibility with various smartphone and tablet operating systems
- **API Gateway:** Acts as a central point of entry for all the API requests from the client-side application, handling authentication, authorization, and routing requests to the appropriate backend services.
- **Backend Services (Microservices Architecture):** Separated backend services handle specific functionalities, promoting modularity, scalability, and independent development/deployment. Examples include:
 - **User Management Service:** Handles user registration, login, and profile management.
 - **Healthcare Provider Database:** Stores data about healthcare providers.
 - **Cost Estimation Service:** Provides determined costs for procedures and treatments.
 - **Location Services:** Integrates with map APIs for location-based functionalities.
 - **Security Service:** Handles user verification, authorization, and data encryption.

4.2 Database Design:

The database schema designed for data integrity, efficiency, and scalability. Here's a possible breakdown of some database tables:

Table	Action	Rows	Type	Collation	Size	Overhead
admin	Browse Structure Search Insert Empty Drop	1	InnoDB	latin1_swedish_ci	16.0 Kib	-
appointments	Browse Structure Search Insert Empty Drop	8	InnoDB	latin1_swedish_ci	16.0 Kib	-
doctor	Browse Structure Search Insert Empty Drop	4	InnoDB	latin1_swedish_ci	16.0 Kib	-
services	Browse Structure Search Insert Empty Drop	1	InnoDB	latin1_swedish_ci	16.0 Kib	-
4 tables	Sum	14	InnoDB	utf8mb4_general_ci	64.0 Kib	0 B

Screenshot 1 Database Structure

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	int(11)			No	None		AUTO_INCREMENT	Change Drop More
2	name	varchar(230)	latin1_swedish_ci		No	None			Change Drop More
3	email	varchar(230)	latin1_swedish_ci		No	None			Change Drop More
4	password	varchar(230)	latin1_swedish_ci		No	None			Change Drop More

Screenshot 2 Admin Database Structure

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	int(11)			No	None		AUTO_INCREMENT	Change Drop More
2	patient_name	varchar(100)	latin1_swedish_ci		No	None			Change Drop More
3	doctor	varchar(100)	latin1_swedish_ci		No	None			Change Drop More
4	service	varchar(100)	latin1_swedish_ci		No	None			Change Drop More
5	appointment_date	date			No	None			Change Drop More
6	appointment_time	time			No	None			Change Drop More
7	details	text	latin1_swedish_ci		Yes	NULL			Change Drop More
8	created_at	timestamp			No	current_timestamp()			Change Drop More
9	status	varchar(230)	latin1_swedish_ci		No	booked			Change Drop More

Screenshot 3 Appointment Database Structure

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	int(11)			No	None		AUTO_INCREMENT	Change Drop More
2	name	varchar(230)	latin1_swedish_ci		No	None			Change Drop More
3	specialization	varchar(230)	latin1_swedish_ci		No	None			Change Drop More
4	contact	varchar(230)	latin1_swedish_ci		No	None			Change Drop More
5	email	varchar(230)	latin1_swedish_ci		No	None			Change Drop More
6	fees	varchar(230)	latin1_swedish_ci		No	None			Change Drop More
7	password	varchar(230)	latin1_swedish_ci		No	123456			Change Drop More

Screenshot 4 Doctor Database Structure

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	int(11)			No	None		AUTO_INCREMENT	Change Drop More
2	service_name	varchar(255)	latin1_swedish_ci		No	None			Change Drop More
3	price	decimal(10,2)			No	None			Change Drop More
4	provider_name	varchar(255)	latin1_swedish_ci		No	None			Change Drop More
5	contact	varchar(20)	latin1_swedish_ci		No	None			Change Drop More
6	city	varchar(100)	latin1_swedish_ci		No	None			Change Drop More

Screenshot 5 Services Database Structure

To ensure the successful development of our Integrated Health Hub, we adopt an Agile development approach. This methodology emphasizes iterative and incremental development cycles, allowing us to adapt to evolving requirements and user feedback.

The Integrated Health Hub required fulfillment of some key stages sequentially. At first, the application automatically detects the user's location and then gives the nearby best Hospitals, to consult a doctor, find a lab service and Pharmacy, etc. Also, this application searches for the nearest best hospital services, with good-rated doctor information, and gives cost details and health insurance coverage details, Eldercare and Nurse service contact details (nearest location), Diagnostic center details, Nearest Emergency services like oxygen, Blood Banks, etc. Here's a breakdown of the development process:

- 1. Planning and prerequisites Gathering:** In this first stage, we will outline the main features the program offers to users, as well as our project goals and the unique demands of each user.

2. Development & Design:

1. **User Interface:** Offers an easy-to-use interface for engaging with the program. The Data Access Layer facilitates data retrieval and storage by interacting with the database.
2. **Database:** A central store for application data, including user and service provider information and location data.

Next, divide the development process into sprints so that iterative, targeted development cycles may be achieved. Perform comprehensive unit testing during these sprints to make sure each component operates as intended, and integration testing to confirm that the application's various components work together seamlessly.

3. **User Acceptance Testing (UAT):** In this critical stage, actual users evaluate the functionality and usability of the program. Before a final launch, their feedback is crucial for determining areas that require development and making sure the program satisfies their demands.
4. **Deployment & Maintenance:** The program will be made publicly available on a web server after it has undergone extensive testing and optimization in response to user input. There will be continuous maintenance to address issues, add new features in response to user input or evolving requirements, and maintain the seamless functioning of the application.

Key Features	Description
Nearby Hospitals	By one-click Users can get nearby Hospitals. Along with maps, ratings, contact details, costing, etc.
Book Appointment	Users can book online appointments with doctors and can get their prescriptions online.
Emergency Services	By one-click Users can get nearby Emergency Services along with maps, ratings, contact details, costing, etc.
Elder Care and Nurse Services	With one-click Users can get nearby Eldercare and Nurse Services along with maps, ratings, contact details, costing, etc.
Admin	In Admin, he can manage doctors, manage services (add or remove)
Doctor	In Doctor, the doctor can manage his appointment and consult with the patient, edit his details, etc.

The entire process of this Integrated Health Hub happened in a sequential manner and each step was mandatory for the next steps. All the key features of this application are shown in the above table.

To login into admin and doctor page. They need to fill correct user name and password. If any one of it is incorrect then login will failed.

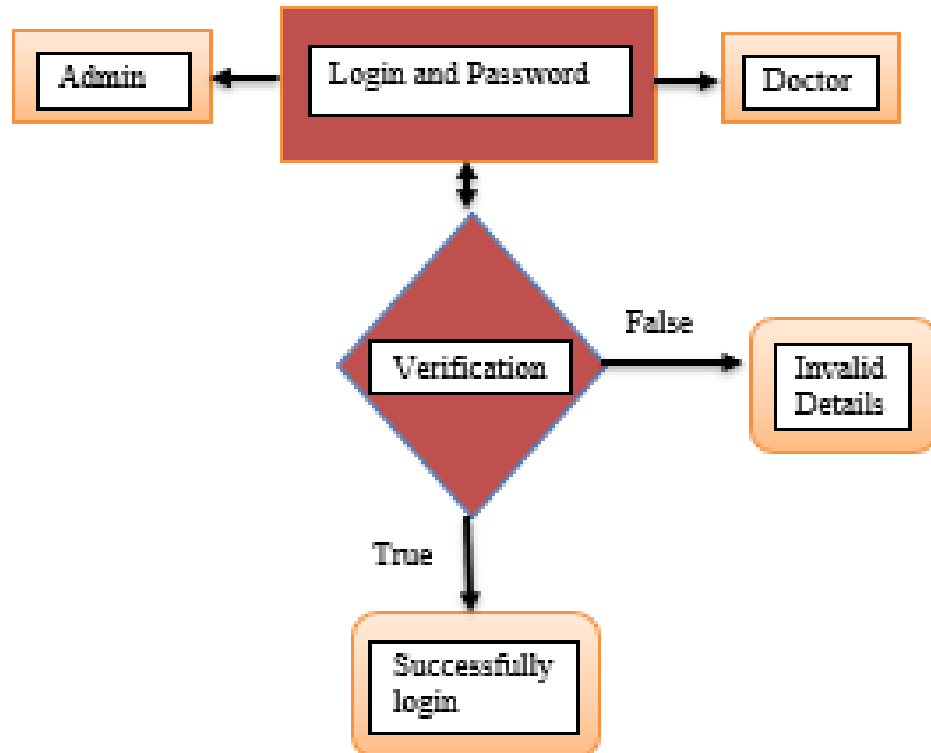


Figure 1. Admin and Doctor Login

- **Integrated Health Hub's Block Diagram**

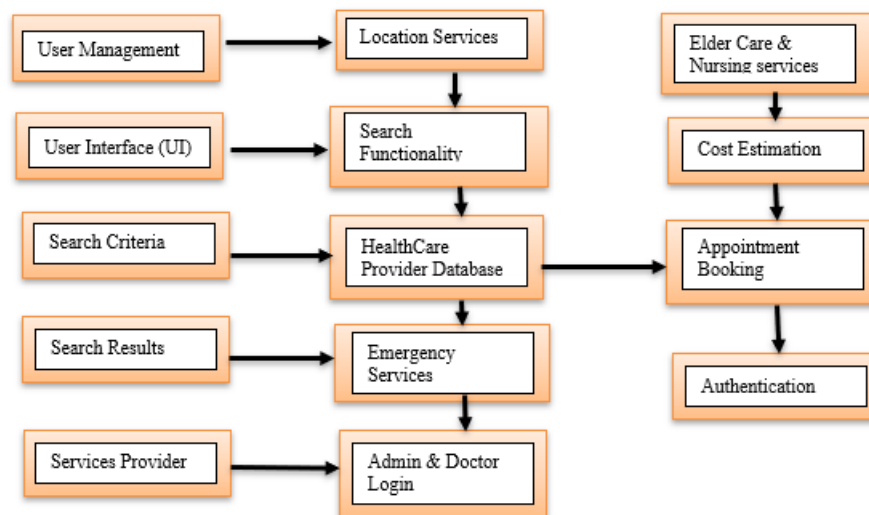


Figure 2. Block diagram

The diagram is divided into two main sections: User Interaction and System Processes.

- **User Interaction:**

User Interaction shows how users interact with the application

- **User Interface (A):** The user's entry point offers a user-friendly interface for searching for healthcare services, viewing results, and possibly managing appointments.
- **Location Services (B):** This block uses the user's device location automatically, which is important for locating emergency services and nearby healthcare providers.
- **Search Criteria (D):** This section allows users to define the parameters of their search. This could include the doctor's specialty, the type of service (hospital, lab, doctor, etc.), and the location.

- **System Functions:**

System Functions show the internal workings behind the scenes.

- **User Management (C):** This module manages user profiles, logins, and registrations. User data is protected by secure authentication mechanisms (block I).
- **Search Functionality (E):** This module queries the healthcare provider database (F) using the search criteria (D) and user location (B). It gathers pertinent data and shows it to the user on the UI (A) in an understandable and well-organized manner.
- **Healthcare Provider Database (F):** All registered healthcare providers, including clinics, physicians, hospitals, laboratories, pharmacies, and other pertinent services, are listed in one central database. It also has specifics like contact information, ratings, and potentially estimated service costs and insurance coverage.
- **Estimation of Cost (G):** With user authorization, this module link with outside healthcare cost databases or insurance company APIs to give users an estimate of the price of specific services.
- **Scheduling of Appointments (H):** With the help of this feature, users will be able to schedule appointments with medical professionals straight within the app.
- **Emergency Services (J):** This block gives customers instant access to the phone numbers of emergency service providers in the area, such as oxygen or ambulance services.

- **Service Provider Registration (K):** Healthcare providers can sign up for the application using this module. It gathers pertinent data, including contact details, profile facts, and maybe service offerings and approved insurance.
- **Verification (I):** There is one block inside this:
- **Service Provider Authentication (M):** Guarantees that access to the database is restricted to registered service providers only.

- **Information Flow:**

Here's the Information Flow of the Integrated Health Hub.

- To specify their search parameters, users communicate with the User Interface (A) (D).
- Before continuing, the User Management module (C) confirms user authentication (I).
- The Search Functionality (E) receives user location data via Location Services (B).
- The Healthcare Provider Database (F) is queried by the Search Functionality (E) using both search criteria (D) and location data (B).
- The user is presented with information that has been retrieved from the database (F) on the user interface (A).
- Based on the information retrieved, users can access features like Emergency Services (J) and Cost Estimation (G).
- Following successful authentication (M), service providers can register with the application through the Service Provider Registration block (K).
- Service providers with verified identities have the ability to amend their data in the Healthcare Provider Database (F).

CHAPTER 5:

IMPLEMENTATION

5. Implementation

The Health Hub employs a building-block approach. The user interface is crafted using HTML for structure, CSS for styling, and potentially JavaScript for interactivity. On the back-end, Python handles server-side tasks with Flask, while a secure MySQL database stores user and provider information.

5.1 Tools and Technologies

The particular tools and technologies utilized in the development of the Integrated Health Hub application are explained in this section. An explanation of each part is provided below:

- **Hardware Requirements:**

1. Processor: Intel core i5, AMD Ryzen 5
2. Hard Disk: 250 GB
3. RAM: 1 GB

- **Front-end programming:**

- 1) **HTML:** The building block for structuring the web application's content and layout is HTML.
- 2) **CSS:** The application's visual appearance, including the fonts, colors, and layout styles, are controlled by CSS.
- 3) **Bootstrap:** A system for building responsive web designs that makes everything easier. This ensures that the program adjusts to various screen sizes and technologies without any issues.

- **Backend Development:**

- 1) **Python:** The logic on the server side of the application is written in the Python programming language. Python is a common programming language for web development because of its large library and ease of reading.
- 2) **Flask:** Flask is a Python-based lightweight web framework. With Flask, we build web apps on a flexible basis without having to deal with the complexity of larger frameworks.

- **Database:**

1) **MySQL:** All of the application's data is stored in this relational database management system (RDBMS). This includes user data (registration details), provider data (hospital specifics, physician profiles, etc.), and maybe user-submitted ratings and reviews.

Libraries and Frameworks: Frameworks and Libraries are:

- **Client-side Development Frameworks:** Dynamic components and user interface (UI) behavior are managed on the client-side (user's browser) using PHP and Python, two server-side languages.
 - **UI Component Libraries:** To expedite development and guarantee a consistent design aesthetic, libraries such as Material UI and Bootstrap (which was addressed before) offer pre-built user interface components (buttons, forms, etc.).
 - **Data Access Libraries:** When working with a MySQL database, libraries such as SQLAlchemy (for Python) make it easier to write code that effectively stores, retrieves, and updates data.
 - **Security Libraries:** These are libraries that are used to build secure authentication techniques (password hashing, for example) to safeguard user information and stop illegal access.
- Platforms for the Cloud:
- **Scalability:** Applications withstand increasing demands without experiencing performance problems since cloud systems dynamically scale resources (computer power, storage) based on user traffic.
 - **Reliability:** Cloud service providers reduce the possibility of delay because of hardware issues by providing high uptime and redundancy.
 - **Cost-effectiveness:** Cloud platforms are an affordable option for web apps since they let us pay for resources only when you use them.

Database Management System (DBMS): This states the usage of MySQL as an RDBMS, or relational database management system. An RDBMS efficiently queries and retrieves information based on predetermined criteria by storing information in tables with rows and columns.

5.2 Configuring the Development Environment

The necessary tools for developers to create and oversee the Integrated Health Hub application are outlined in this section.

- **The IDE, or Integrated Development Environment:**

- 1) **Visual Studio Code:** This well-known code editor, which is utilized as the main platform for developers to write and update application code, has features like syntax highlighting, code completion, and debugging tools.

- **System for Version Control:**

- 1) **Git:** Git is used to manage different codebase versions by enabling us to monitor changes, work together efficiently, and change back to previous versions.

- **Tools for API Testing:**

- 1) **Google Near Me API:** The Google Near Me API is used to obtain the closest locations.

- **Tools for Documentation:**

The significance of producing understandable documentation for end-user user manuals and the application itself (API documentation). Sphinx (for Python documentation) is one example of a tool that may be selected depending on the requirements of the project.

5.3 Specifics of the implementation:

The Integrated Health Hub will be separated into modular sections with distinct functions. Here's an advanced look at a few essential features:

- 1) **User Management:** Using password hashing techniques and secure authentication protocols, the User Management service will manage admin and doctor registration, login, and profile administration.

2) Search Functionality: Based on user-specified parameters (such as location or specialization), the search functionality queries the Healthcare Provider Database via the API Gateway. Results are shown on the client-side application in an easy-to-use manner.

3) Cost Estimation: With user authorization, the Cost Estimation service may link with third-party healthcare cost databases or insurance company APIs.

Database Code:

```
$servername = "localhost";  
  
$username = "root";  
  
$password = "";  
  
$dbname = "healthcare";  
  
// Create connection  
  
$conn = new mysqli($servername, $username, $password, $dbname);  
  
// Check connection  
  
if ($conn->connect_error) {  
  
    die("Connection failed: " . $conn->connect_error);  
  
}
```

This PHP code sets up a link to a database named "healthcare." It assumes the database is on the same machine (localhost) and uses the default "root" user. While it checks for connection issues, the password is currently blank (insecure!). Remember, this is just the initial connection; additional code would be needed to actually use the database.

5.4 Implementation Details

An API gateway serves as a central hub for the front end to access various functionalities offered by the back-end services. The Integrated Health Hub is built using a combination of technologies. The user interface is created with HTML for structure, CSS for styling, and possibly JavaScript frameworks for interactivity. Pre-built UI components from libraries like Bootstrap can accelerate up development and ensure a consistent look. On the back end, Python handles server-side logic using a lightweight framework like Flask. Data is stored in a MySQL database, and libraries like

SQLAlchemy help manage data interactions. Security is a priority, so libraries are used to implement secure authentication tools such as Git for version control, Visual Studio Code for writing code, and API testing tools to make sure everything functions properly. Lastly, user manuals and API references are produced with the aid of documentation tools.

CHAPTER 6:

TESTING

6.1 Testing Methodologies:

To ensure the functioning, performance, and security of the Integrated Health Hub, a thorough testing approach is used. The following are the main testing approaches:

- **Integration Testing:** To guarantee smooth communication between various components, such as doctor-admin-user, components have been combined and evaluated collectively.
- **System Testing:** To replicate actual usage scenarios, the system is tested as a whole. Verifying whether or not every parameter is operating as intended.
- **Usability Testing:** To assess the Integrated Health Hub's functionality and pinpoint areas for development, user testing sessions are held with members of the intended audience.
- **Security Testing:** Potential security vulnerabilities are found and fixed through penetration testing.

6.2 Example Cases and Situations:

For every functionality, specific test cases covering a range of circumstances and user inputs are prepared. Here are a few instances:

- **Search Functionality:** Test situations include geography, specialization, keywords, ratings, and insurance network participation filtering.
- **User management:** Test cases confirm that the capabilities of registration, login, and profile management are executed successfully.
- **Security Testing:** Potential attacks such as SQL injection and attempts at unauthorized access are simulated using test cases.

6.3 Testing Outcomes and Bug Fixes:

A thorough test report listed all of the defects found and how they were fixed. Before deployment, the development team takes care of all high-priority and serious bugs.

6.4 Performance Testing: To assess the Integrated Health Hub's reaction times under various load scenarios, performance testing is carried out. This guarantees that the program is capable of managing an increasing user base.

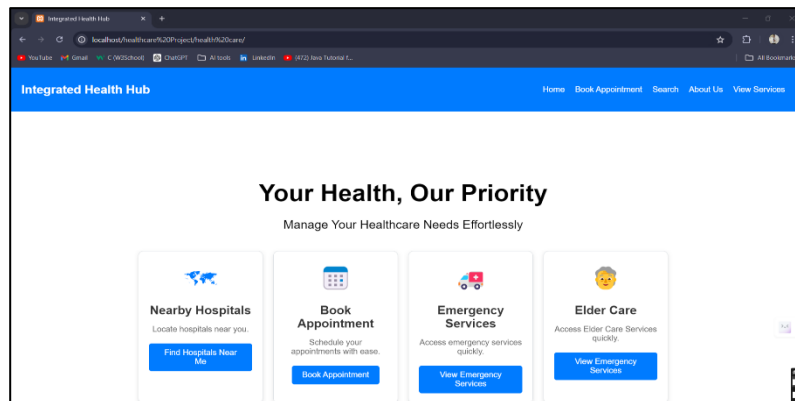
CHAPTER 7:

RESULT & DISCUSSION

7. Result & Discussion.

The Health Hub's modular design and focus on user needs aim to enhance patient access to care and provider reach. Ongoing research and user testing are vital to optimize the system and ensure it delivers on these objectives.

7.1 Home Page.



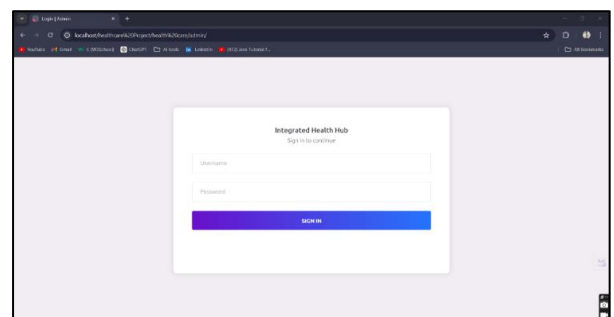
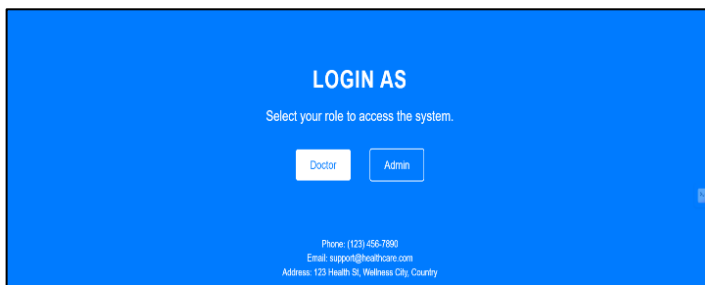
Screenshot 7.1 Home Page.

Screenshot 7.1 represents the Home Page of the Integrated Health Hub. The application Hosting address is <http://localhost/healthcare%20Project/health%20care/>. The Home Page has the following buttons:

- 1) Nearby Hospitals.
- 2) Book Appointment.
- 3) Emergency Services.
- 4) Elder Care.
- 5) Search
- 6) About us.
- 7) View Services.

Also, it has a login button for Admin and Doctor Below.

7.2 Admin and Doctor Sign-in Page.



Screenshot 7.2 Admin and Doctor Sign-in Page.

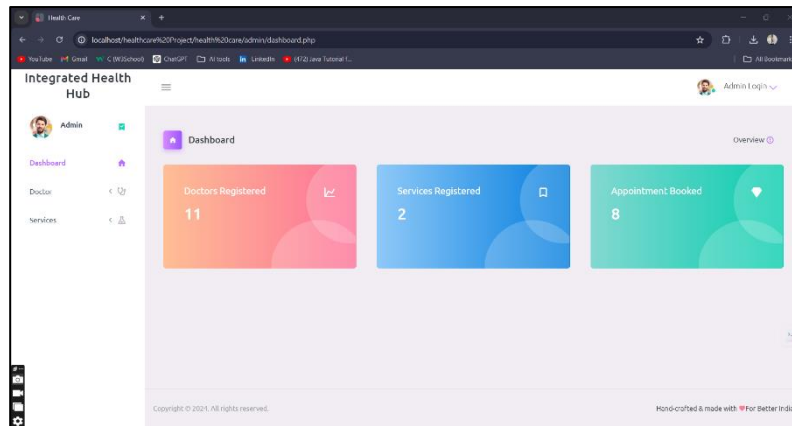
Screenshot 7.2 represents the Admin and Doctor Sign-in page of the application. Where the Admin or Doctor has to put their Email ID in Username and Password to go to the next page. But if the Password or Username is incorrect then he can't Sign in.

Admin Login Details:- Username: admin@admin.com Password: admin@123

Doctor Login Details:- Username: draman@gmail.com Password: aman@123

(NOTE :- Login details for each Doctor is Different. It's given in Database)

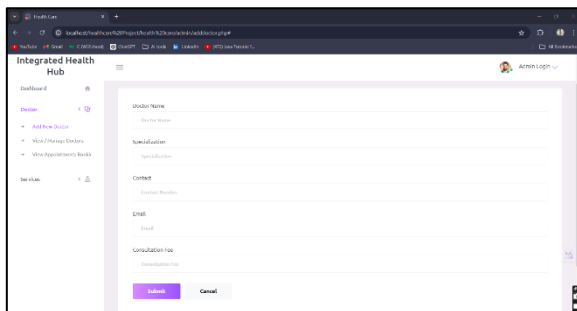
7.3 Admin Dashboard.



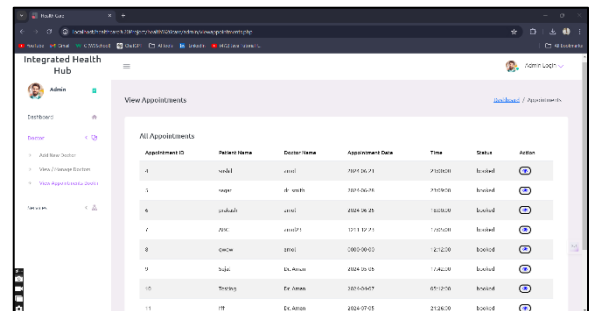
Screenshot 7.3 Admin Dashboard.

Screenshot 7.3 represents the Admin Dashboard. Here's the dashboard showing some Doctors Registered, Services Registered, and Online Visitors. This Page has a Sign-out button, Doctor, and Services Button.

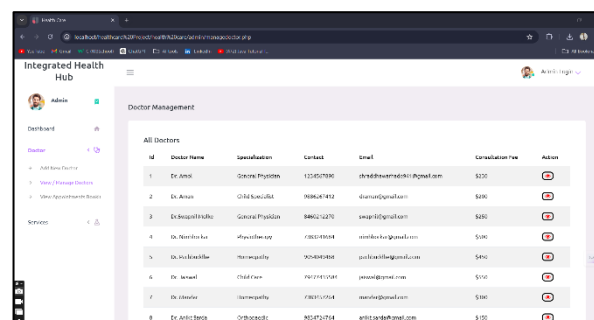
7.4 Doctor Management.



Screenshot 7.4.a Add New Doctor.



Screenshot 7.4.b View Appointment Booking.



Screenshot 7.4.c View/ Manage Doctors.

Screenshot 7.4.a represents a page to add a New Doctor to the Application. S.S 7.4.b represents the appointments that are booked by the users. S.S 8.4.c represents the list of doctors who are registered in the Application.

7.5 Services Management.

The screenshot shows the 'Add New Services' form in the Integrated Health Hub application. The form is titled 'Service Information' and contains the following fields: Service Name, Price, Provider Name, Contact, and City. Each field has a corresponding input box. At the bottom of the form, there are two buttons: 'Submit' (in purple) and 'Cancel' (in grey). The left sidebar shows the navigation menu with 'Services' selected. The top right corner shows 'Admin Login'.

Screenshot 7.5.a Add new Services.

Screenshot 7.5.a represents the page that has a form to add new services to the application.

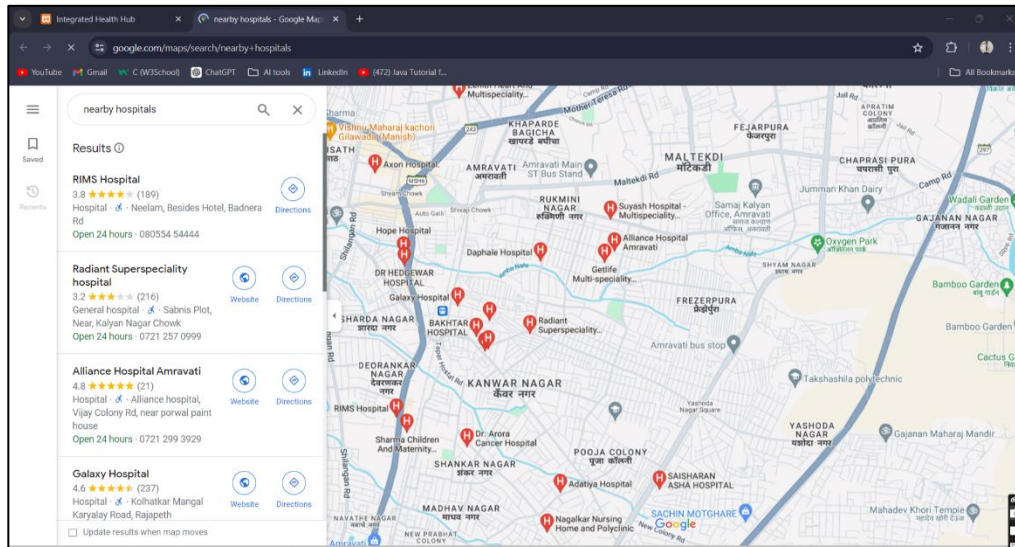
The screenshot shows the 'Manage Services' page in the Integrated Health Hub application. The page displays a table titled 'All Registered Services' with the following columns: Service ID, Service Name, Price, Provider Name, Contact, City, and Action. The table contains two rows of data. Below the table, there is a footer with the text 'Copyright © 2024. All rights reserved.' and 'Hand-crafted & made with ❤️ For Better India'.

Service ID	Service Name	Price	Provider Name	Contact	City	Action
3	Oxygen Services	600.00	MediTrust Medical Equipments	9054623490	Amravati	Delete
4	Blood Bank	300.00	Belaji Blood Bank	9854672345	Amravati	Delete

Screenshot 7.5.b View Registered Services.

Screenshot 7.5.b represents the services that are registered in the Application. We can also delete the services.

7.6 Nearby Hospitals.



Screenshot 7.6 Nearby Hospitals.

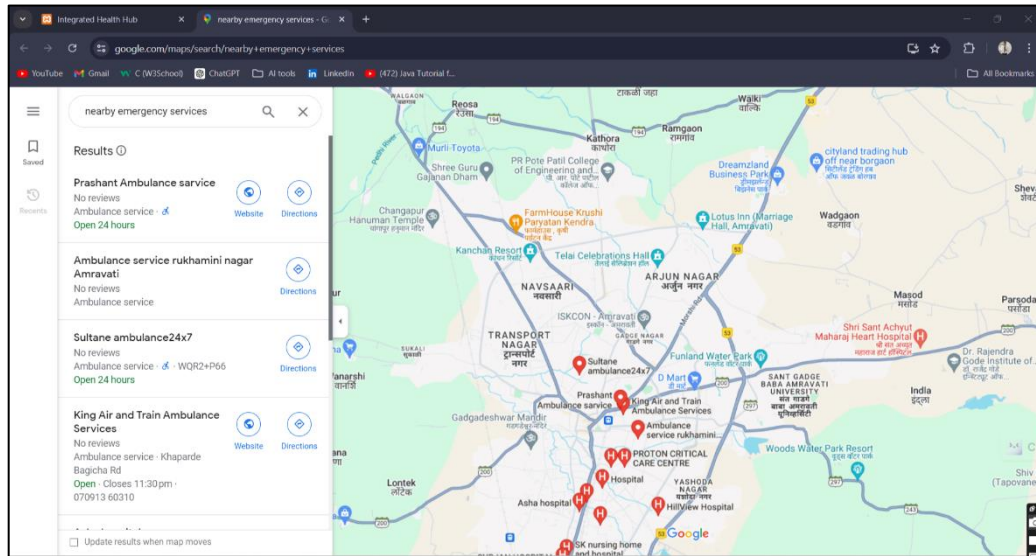
Screenshot 7.6 Nearby Hospitals represents the output when we click on the Nearby Hospital button on UI. It detects the user's location automatically and gives Nearby Hospitals according to it. It gives Hospitals Details, Directions, Ratings, etc. It has used Nearme API by Google.

7.7 Book Appointment.

Screenshot 7.7 Book Appointment.

Screenshot 7.7 Book Appointment represents the page to book an online appointment with a Doctor and get a prescription online.

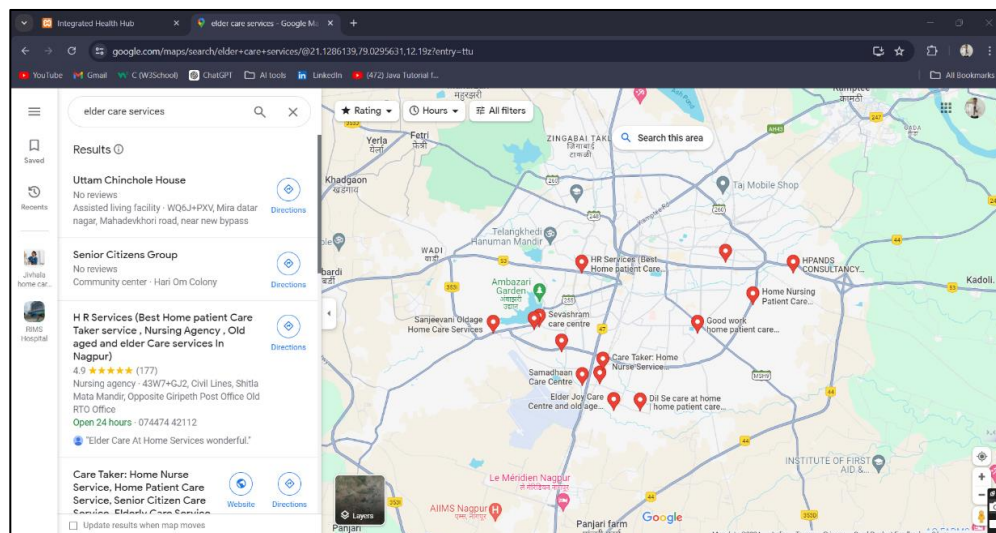
7.8 Emergency Services.



Screenshot 7.8 Emergency Services.

Screenshot 7.8 Emergency Services represents the output when we click on the Emergency Services button on UI. It detects the user's location automatically and gives Nearby Emergency Services according to it. It gives Emergency Services Details, Directions, Ratings, etc. It has used Nearme API by Google.

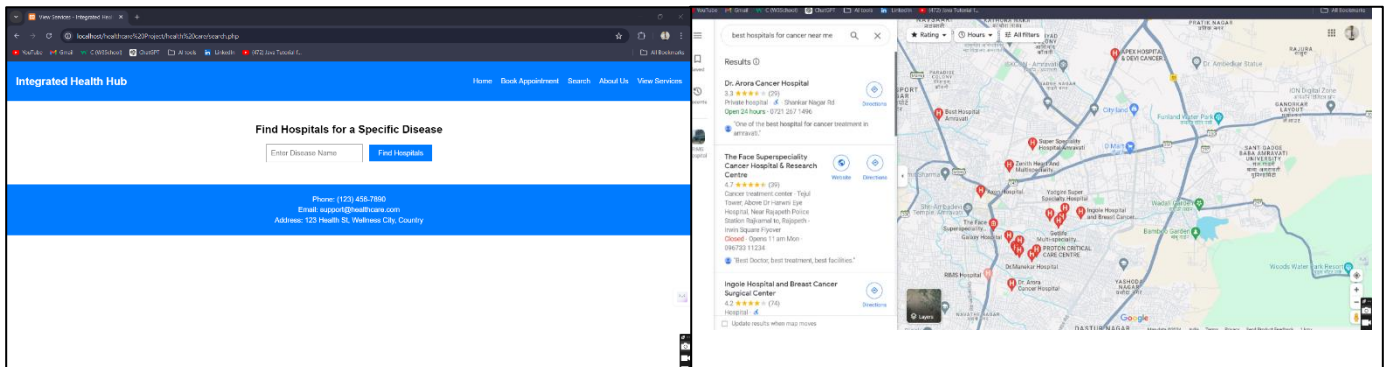
7.9 Elder Care Services.



Screenshot 7.9 Elder Care Services.

Screenshot 7.8 Elder Care Services represents the output when we click on the Elder Care button on UI. It detects the user's location automatically and gives Nearby Elder Care Services according to it. It gives Elder Care Services Details, Directions, Ratings, etc. It has used Nearme API by Google.

7.10 Search Button.

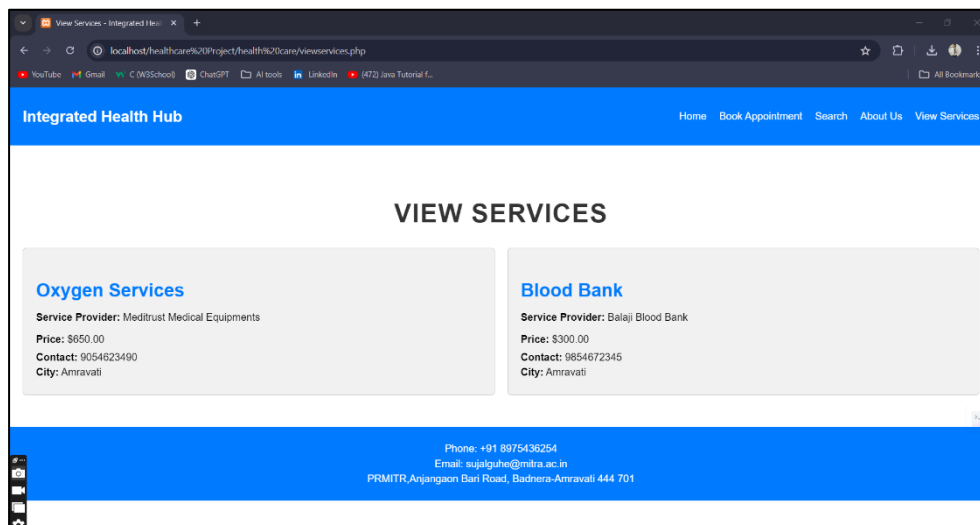


Screenshot 7.10.a Search Button.

Screenshot 7.10.b Output.

Screenshot 7.10. a Search Button represents the output when we click on the Search button on UI. We can add any disease name and click on find hospitals. It detects the user's location automatically and gives Nearby Emergency Services according to it. It gives Emergency Services Details, Directions, Ratings, etc. It has used Nearme API by Google.

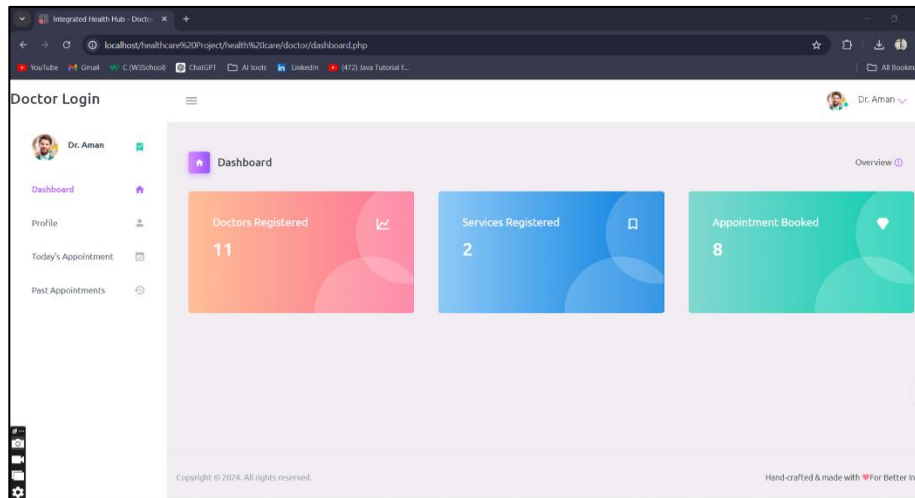
8.11 View Services.



Screenshot 7.11 View Services.

Screenshot 7.11 represents the View Services page in which the user can see the services registered in the application.

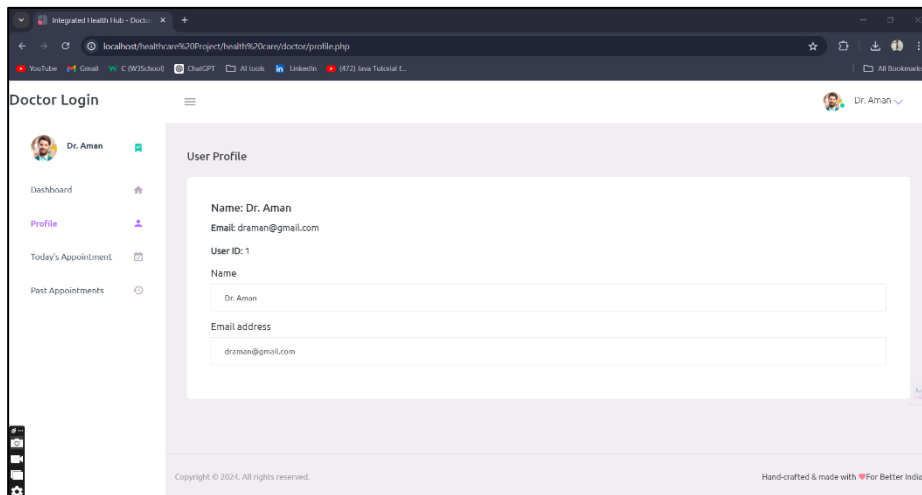
7.12 Doctor Dashboard.



Screenshot 8.12 Doctor Dashboard

Screenshot 7.12 represents the Doctor Dashboard. Here's the dashboard showing the number of Total Appointments, Pending Appointments, and Online Visitors. This Page has Sign Out, Profile, Today's Appointment, and Past Appointment Buttons.

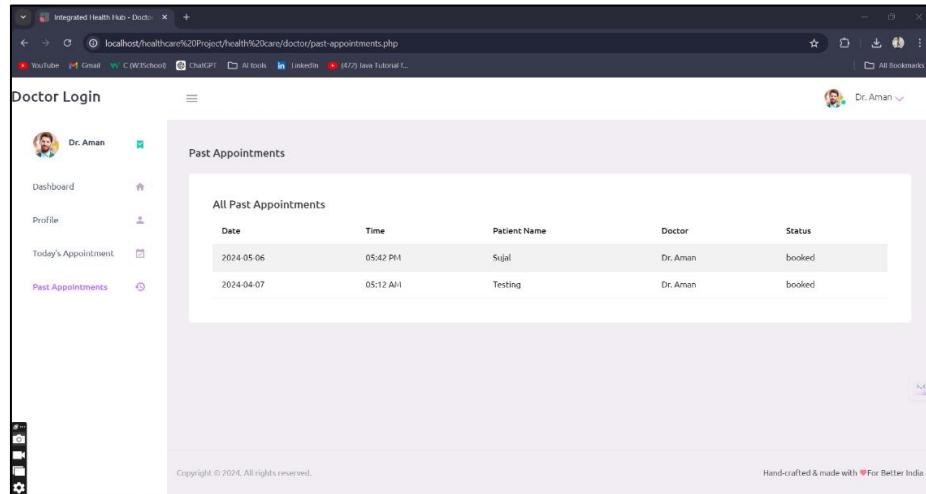
7.13 Profile.



Screenshot 7.13 Profile

Screenshot 7.13 represents the Profile of the Doctor. Here this page shows the Doctor's Information. Having User ID, Name, and Email ID.

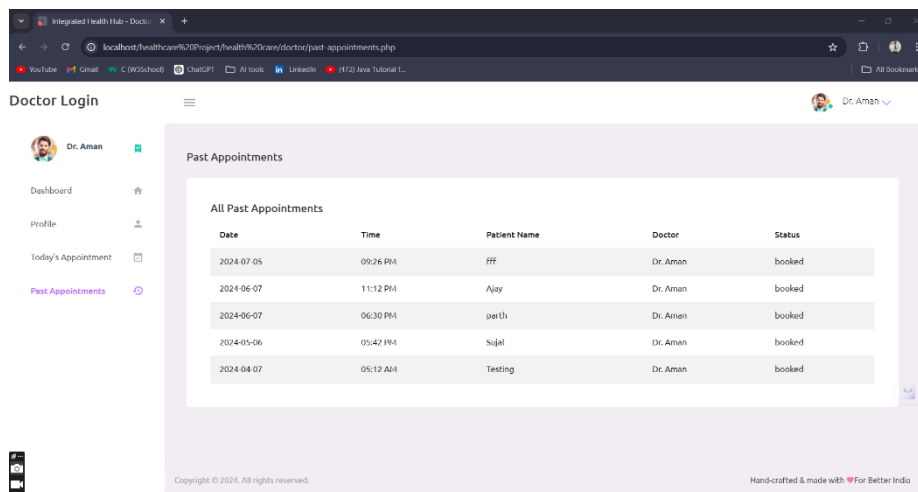
7.14 Today's Appointment.



Screenshot 7.14 Today's Appointment

7.14. represents Today's Appointment. Here's Doctor can view the No. of Appointment.

7.15 Past Appointment.



Screenshot 7.15 Past Appointment

Screenshot 7.15 represents Past Appointment. Here this page represents Past Appointments.

CHAPTER 8: CONCLUSION & FUTURE SCOPE

8 Conclusion and Future Scope

While integrating social services and empowering patients hold potential in healthcare, gaps in knowledge remain. Further research is crucial to optimize these strategies and ultimately improve patient well-being.

8.1. Conclusion

With the Integrated Health Hub application, the future of healthcare navigation seems bright. It serves as a beacon of hope, enabling consumers to confidently negotiate the intricacies of healthcare information. This user-friendly app provides a one-stop shop for healthcare services, addressing the annoyance of never-ending internet searches. Beyond just finding services, the app offers tools for doctor consultations, lab service searches, hospital searches, pharmacy searches, and more.

The app provides information about highly rated doctors along with the closest and best hospital services. It also provides information about costs and health insurance coverage. Furthermore, the contact information for the diagnostic center, eldercare, and nurse services. Emergency services (such as oxygen) closest to you. The effect is felt throughout the healthcare system. Patient trips that are more efficient and transparent about costs can lead to higher

Patient satisfaction. Important data insights can also guide the allocation of resources and future healthcare policy. The Integrated Health Hub is intended to be a platform that is always changing, adding new features and adjusting to user input. This continued development reinforces the application's position as a full healthcare navigation tool, as do future features like appointment scheduling and secure communication. The Integrated Health Hub application has the opportunity to completely transform the way we access healthcare by empowering people with knowledge and promoting a more open, accountable, and transparent system.

8.2 Future scope

The potential for the Integrated Health Hub application to further change healthcare navigation is enormous given its future scope. Here are a few fascinating options:

Improved User Experience:

- **Personalized Search and Recommendations:** By using user-specific information and preferences, the application can tailor search results and make recommendations for medical services that take into account each user's needs and medical background.
- **Appointment Scheduling and Telemedicine Integration:** Users may be able to make appointments with medical professionals directly through the application or connect with telemedicine services for online consultations.
- **Secure Messaging Platform:** The application's secure messaging platform may make it easier for patients and healthcare professionals to communicate directly, which could enhance coordination of care.

Advanced-Data Analytics and Insights:

- **Disease Outbreaks and Public Health Initiatives:** Information gathered by the program may be anonymized and combined to provide insightful evaluations that inform public health initiatives by revealing patterns and disease outbreaks.
- **Research Collaboration and Drug Development:** The application may hasten drug development and enhance available treatments by providing a platform for safe and anonymous data collecting for medical research.

Additional Cooperation & Joint Ventures:

- **Establishing Connections with Public Health Agencies:** Working together with public health organizations may give users access to official health resources and information.
- **Connection with Insurance Providers:** More association with insurance providers might enable real-time eligibility checks, estimations of costs based on certain plans, and possibly even the ability to file claims.

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APPENDICES:

TEAM MEMBERS AND CONTRIBUTION

Team Members:-



Sujal Guhe



Mrunali Yawale



Samiksha More

Team Members

To build the Integrated Health Hub, a team with skills in crafting user interfaces HTML, CSS, JavaScript and handling server-side logic Python, Flask is needed, along with database knowledge MySQL.

1) Sujal Guhe, UI Designer and Team Lead:

- A track record of effectively managing Web development projects.
- Experienced in minimizing risks, resource management, and project planning.
- Provides that the project satisfies user needs and remains on time.
- Proficiency in creating user interfaces (UI) and user-centered design techniques.
- Creates an intuitive and user-friendly web application interface.
- Emphasizes user experience, usability, and accessibility.
- Produces designs and mockups for user testing and input.

Data analysts examine medical data to glean insights and enhance search engine optimization.

2) Murali Yawale, The Front-End Developer:

- Highly proficient in HTML, CSS, and JavaScript technologies for web development.
- Creates the application's user interface.
- Integrates collecting information and display with backend APIs. (NearMe API)
- Provides cross-browser compatibility and responsiveness.

Content Writer: Produces educational and understandable material for the program's website.

3) Samiksha More, Back-End Developer:

- Good knowledge of managing databases and server-side development.
- Creates the application's server-side functionality.
- Puts in place APIs for data transmission and user interaction.
- Uses an encrypted database to control the storage and retrieval of data.

QA Tester (Sujal, Mrunali, Samiksha):

- Careful testing methodology for online apps.
- Performs extensive testing (functional, usability, security) to find and correct bugs.
- Guarantees that the program performs as planned and offers a satisfying user experience.