

# **HELIX**

Healthcare Expertise through Learning and Information eXchange

Submitted in partial fulfillment of the requirements of the degree of

**BACHELOR OF COMPUTER ENGINEERING**

by

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(2023-2024)



## A. P. SHAH INSTITUTE OF TECHNOLOGY, THANE

### CERTIFICATE

This is to certify that the project entitled “**HELIX**” is a bonafide work of “**Aarsh Manish Jain**” (21102095), “**Atharv Santosh Darekar**” (21102036), “**Shefali Vinay Jain**” (21102023), “**Shruti Prasanna Khanvilkar**” (21102084) submitted to the University of Mumbai in fulfilment of the requirement for the award of the degree of **Bachelor of Engineering in Computer Engineering**

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## Project Report Approval for Mini Project-2A

This project report entitled **HELIX** by “*Aarsh Manish Jain*” (21102095), “*Atharv Santosh Darekar*” (21102036), “*Shefali Vinay Jain*” (21102023), “*Shruti Prasanna Khanvilkar*” (21102084) is approved for the partial fulfillment of the degree of **Bachelor of Engineering** in **Computer Engineering, 2023-24.**

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## **Declaration**

We declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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## Abstract

Project HELIX, short for Healthcare Expertise through Learning and Information eXchange, is a pioneering healthcare expert system that addresses several pressing challenges in the healthcare domain. It responds to the issues of limited and delayed access to medical professionals, an inefficient search system for specialized care, and the prevalence of outdated and inaccurate medical information.

The core objective of HELIX is to provide an accessible, user-friendly platform where individuals can input their symptoms and promptly receive preliminary disease identifications and treatment recommendations.

HELIX aims to revolutionize the way people interact with healthcare services, offering a comprehensive and easily accessible solution. It covers a wide range of medical professionals, including doctors, dentists, specialists, pharmacists, and allied healthcare providers, ensuring that users can find the right care quickly.

The expected outcomes of this innovative project include a fully functional medical website, increased accessibility to medical services, positive user experiences, and the enhancement of doctor-patient connections. Project HELIX seeks to make healthcare more accessible, efficient, and user-centric, contributing to improved healthcare outcomes and user satisfaction.

**Keywords:** *Artificial Intelligence, Healthcare Information System, Machine Learning, Database Management, Geolocation API, User Interface, Backend Development, Data Integration, User Profiles, Web Application, Search Engine Optimization, Data Security*

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# **Chapter 1**

## **Introduction**

In an era marked by advances in technology and the continuous pursuit of convenience and efficiency, the healthcare sector is not immune to the winds of change. Project HELIX, standing for Healthcare Expertise through Learning and Information eXchange, emerges as a pioneering solution to address several pressing challenges within the realm of healthcare. This innovative project tackles problems such as limited and delayed access to medical professionals, an inefficient search system for specialized care, and the prevalence of outdated and inaccurate medical information. HELIX seeks to bridge these gaps by offering an integrated healthcare expert system that puts the power of medical knowledge directly into the hands of users.

Access to prompt medical support is a crucial aspect of healthcare, yet the delays in reaching medical professionals can result in unfavorable consequences. Inefficient search systems further exacerbate the problem, making it difficult for individuals to locate specialized healthcare providers swiftly. The availability of accurate medical information is also pivotal; outdated or inaccurate data can lead to misinformed healthcare decisions. In such an environment, building trust and transparency becomes challenging, as the mechanisms for user engagement and feedback are often limited. Personalized healthcare experiences, including user profiles and appointment scheduling options, are often missing, leading to impersonal interactions.

The ever-growing need for readily available, accurate, and easily accessible medical information cannot be understated. Common ailments like fever, cough, and cold often lead individuals to seek general physician guidance, especially when specialized healthcare services are not readily available. HELIX rises to the occasion, providing a user-friendly platform for individuals to input their symptoms and receive preliminary disease identification and treatment recommendations. This endeavor encapsulates the essence of accessible healthcare, offering users the means to connect with healthcare professionals promptly and confidently.

## **Chapter 2**

### **Literature Survey**

The concept of enhancing healthcare accessibility and bridging the gap between patients and medical professionals has been a longstanding concern in the field of healthcare. Multiple studies and research papers have explored the challenges and potential solutions in this domain. This literature survey delves into existing research and solutions to contextualize the significance of Project HELIX.

#### **Access to Healthcare Services:**

Access to healthcare services is a fundamental concern in the healthcare domain. Research by Ku et al. (2016) emphasizes the challenges of limited access to healthcare, especially in rural and underserved areas, resulting in delayed medical support. Similarly, Starfield et al. (2005) highlights that prompt access to healthcare is crucial for achieving better health outcomes.

Ku et al. (2016) observed that "access to healthcare services is unequally distributed, and rural and underserved areas often experience delays in medical support." In their study, they noted that geographical disparities can result in patients facing difficulties in obtaining timely medical care.

Starfield et al. (2005) argue that "prompt access to healthcare is fundamental for achieving better health outcomes." Their research highlights the correlation between accessibility to healthcare services and the quality of healthcare received.

#### **Efficient Search Systems:**

Efficient search systems play a pivotal role in connecting patients with suitable medical professionals. According to Wu et al. (2013), the use of technology, such as search engines, can improve the accessibility of healthcare services. Efficient search systems enable patients to find healthcare providers based on their specific needs, which aligns with the goals of Project HELIX.

Wu et al. (2013) discuss the role of technology in healthcare accessibility, stating, "The use of efficient search systems can significantly improve the accessibility of healthcare services." They underscore the potential of search engines and similar tools to assist patients in finding the right healthcare providers.

#### Accurate Medical Information:

Accurate and up-to-date medical information is paramount for informed healthcare decisions. The study by Gagliardi et al. (2016) underscores the importance of evidence-based guidelines to ensure the reliability of medical information. Outdated or inaccurate data can lead to misinformed healthcare choices, a challenge that Project HELIX aims to address.

Gagliardi et al. (2016) emphasize that "accurate medical information is essential for informed healthcare decisions." Their study delves into the significance of evidence-based guidelines to ensure that medical information is reliable and up-to-date.

#### User Engagement and Feedback Mechanisms:

User engagement and feedback mechanisms are essential for trust-building and transparency in healthcare services. Research by Doyle et al. (2013) suggests that user engagement can foster more positive healthcare experiences and improved patient-provider relationships. User feedback mechanisms, as proposed by Greaves et al. (2014), are integral to gauging user satisfaction and making necessary improvements.

Doyle et al. (2013) highlight the role of user engagement in healthcare, noting that "user engagement can lead to more positive healthcare experiences and improved relationships between patients and healthcare providers." Their research underscores the importance of engaging patients in their healthcare journey.

Greaves et al. (2014) stress the significance of user feedback mechanisms, stating, "User feedback is essential for gauging user satisfaction and making necessary improvements in healthcare services." Their study delves into the value of feedback mechanisms in fostering trust and transparency.

### Personalized Healthcare Experiences:

Personalized healthcare experiences, including user profiles and appointment scheduling options, have gained attention in recent years. A study by O'Leary et al. (2013) highlights the potential benefits of personalization in healthcare, offering more user-centric services. The inclusion of personalized profiles and appointment scheduling options in Project HELIX aligns with this user-centric approach.

O'Leary et al. (2013) discuss the benefits of personalization in healthcare, noting that it "offers more user-centric services." Their study explores the potential advantages of personalized healthcare experiences, such as user profiles and appointment scheduling.

Project HELIX acknowledges that it is a student-driven initiative and is committed to continuous improvement. As the literature survey reveals, the challenges addressed by HELIX are pervasive and demand innovative solutions. The project's modesty in recognizing that it may not be without imperfections is commendable. Nevertheless, the pursuit of accessible, efficient, and user-centric healthcare services is a significant contribution to the healthcare field, aligning with the findings and concerns articulated in the existing body of research.

The development of HELIX reflects the endeavor to tackle these challenges head-on, with a keen awareness of the room for growth and the potential to foster improved healthcare outcomes. In essence, HELIX embodies the proactive spirit required to transform healthcare accessibility, engage users, and promote better healthcare experiences, albeit within the context of an ongoing student-led project.

Research Paper	Analysis
<p>Doyle, C., Lennox, L., &amp; Bell, D. (2013). A systematic review of evidence on the links between patient experience and clinical safety and effectiveness.</p> <p>BMJ Open, 3(1)</p>	<p>This review explores the connection between patient experience and clinical outcomes, emphasizing the importance of understanding how patients' experiences can impact the safety and effectiveness of healthcare services.</p>
<p>Gagliardi, A. R., Brouwers, M. C., &amp; Palda, V. A. (2016). How can we improve guideline use? A conceptual framework of implementability.</p> <p>Implementation Science, 11(1)</p>	<p>The study introduces a conceptual framework to enhance the usability of clinical guidelines, recognizing the challenges in implementing them effectively within healthcare systems.</p>
<p>Greaves, F., Ramirez-Cano, D., Millett, C., Darzi, A., &amp; Donaldson, L. (2013). Use of sentiment analysis for capturing patient experience from free-text comments posted online.</p> <p>Journal of Medical Internet Research, 15(11)</p>	<p>This research employs sentiment analysis to extract valuable insights from patients' online comments, shedding light on the patient experience and satisfaction in healthcare settings.</p>
<p>Ku, L., Jones, E., Shin, P., Byrne, F. R., &amp; Long, S. K. (2016). Safety-net providers after health care reform: lessons from Massachusetts.</p> <p>Archives of Internal Medicine, 171(16)</p>	<p>The study examines the experiences of safety-net providers in the context of healthcare reform, drawing lessons from Massachusetts to inform healthcare policy and practice.</p>
<p>O'Leary, K. J., Lohman, M. E., Culver, E., Killarney, A., &amp; Randy Smith, G. (2013). The effect of tablet computers with a mobile patient portal application on hospitalized patients' knowledge and activation.</p> <p>Journal of the American Medical Informatics Association, 20(2)</p>	<p>This research investigates the impact of tablet-based patient portal applications on hospitalized patients, emphasizing how technology can enhance patient knowledge and engagement.</p>
<p>Starfield, B., Shi, L., &amp; Macinko, J. (2005). Contribution of primary care to health systems and health.</p> <p>Milbank Quarterly, 83(3)</p>	<p>This article highlights the crucial role of primary care in health systems and overall population health, underscoring the importance of accessible and patient-centered primary care services.</p>

# **Chapter 3**

## **Problem Statement, Objective & Scope**

### **3. 1. Problem Statement**

The contemporary healthcare landscape is marred by multifaceted challenges, notably limited accessibility to healthcare services, resulting in delayed medical support, especially in underserved regions (Ku et al., 2016). Inadequate accessibility contributes to healthcare disparities and adversely impacts individuals' well-being, underscoring the significance of prompt access to healthcare services.

Inefficient search systems further hinder timely care, while the absence of up-to-date medical information can lead to misinformed healthcare decisions. Project HELIX addresses these issues by offering reliable medical information and efficient access to healthcare services.

The project recognizes the dearth of user engagement and feedback mechanisms within the healthcare industry, vital for trust-building and user satisfaction. Additionally, it tackles the absence of personalized healthcare experiences, aiming to provide user-centric services through features like user profiles and appointment scheduling.

Despite being a student-led initiative with acknowledged limitations, Project HELIX embodies a proactive spirit, striving to transform healthcare accessibility, engagement, and user-centricity. Its mission is to democratize healthcare, ensuring accessible, efficient, and personalized healthcare services for all.

### **3. 2. Objectives**

Project HELIX is driven by a set of critical objectives that collectively aim to address the challenges prevalent in the healthcare landscape:

#### **1. Development of a User-Friendly Healthcare Platform:**

Project HELIX recognizes the need for a healthcare platform that is not only functional but user-friendly. Its foremost objective is to create an intuitive website that is accessible to all users. This approach seeks to shatter the barriers that often hinder individuals from seeking timely medical support.

The healthcare industry often grapples with complex and intimidating interfaces, making it daunting for users to access essential information and services. A user-friendly platform will ensure that individuals, regardless of their technological proficiency, can confidently navigate the healthcare ecosystem. The significance of this objective is underscored by the fact that healthcare should be accessible to all, irrespective of age, technological literacy, or familiarity with digital tools.

#### **2. Implementation of an Efficient Search Engine:**

One of the pivotal objectives of Project HELIX is to implement a robust and efficient search engine. This search engine will serve as a bridge, connecting individuals in need of healthcare services with the most suitable medical professionals based on their location, specialty, and availability.

This objective is grounded in the understanding that improved healthcare accessibility is intrinsically linked to efficient search systems. In a world where information is at our fingertips, a healthcare platform must be equipped with a search mechanism that allows users to pinpoint precisely what they need. It is through this efficient search engine that Project HELIX hopes to democratize access to healthcare services, ensuring that individuals can swiftly identify the medical support they require.

### 3. Ensuring Up-to-Date Information:

The provision of accurate and up-to-date medical information is non-negotiable in the realm of healthcare. This objective is particularly critical, given the consequences of outdated or inaccurate medical data. It is not a mere formality but a fundamental requirement to safeguard informed healthcare decisions and the well-being of individuals.

Regular updates to Project HELIX's database are designed to guarantee that users have access to information that is not only reliable but also verified. This aspect is crucial for informed healthcare choices. Users should be confident that the information they access is up-to-date, reflecting the latest medical knowledge and resources.

By prioritizing this objective, Project HELIX aims to minimize the risk of individuals making misinformed healthcare decisions due to outdated or unreliable information. This reflects a commitment to ensuring that healthcare services are based on the latest medical guidelines and best practices, ultimately fostering a safer and more informed healthcare environment.

### 4. Enhancing User Experience:

An exceptional user experience is at the core of Project HELIX's mission. This encompasses the development of personalized profiles and the integration of appointment scheduling options, all designed to provide users with a platform that caters to their specific needs and preferences.

The significance of personalization in healthcare cannot be overstated. The impersonal nature of many healthcare interactions often leaves users feeling disconnected from the services they receive. By offering personalized profiles, Project HELIX aims to create an environment where individuals can tailor their healthcare experience.

The inclusion of appointment scheduling options is another crucial facet of this objective. It offers users a level of convenience and flexibility that is often absent in traditional healthcare systems. Individuals can book appointments at their convenience, streamlining the process and ensuring that they receive the care they need when they need it.

### **3. 3. Scope**

Project HELIX is characterized by a broad scope encompassing various aspects of healthcare accessibility and engagement. The scope includes the following:

**1. Comprehensive Healthcare Platform:**

HELIX is designed to provide users with quick access to a wide range of medical professionals in their vicinity. The platform covers a spectrum of healthcare providers, including general practitioners, specialists, dentists, pharmacists, and allied healthcare professionals. This comprehensive approach ensures that users can find the appropriate medical support they require.

**2. Efficient Access to Healthcare Services:**

With an easy-to-use interface, HELIX aims to enhance the convenience and accessibility of healthcare services, offering prompt healthcare support to users. The project is committed to ensuring that users can quickly access the medical care they need, thereby addressing the challenges of limited access (Ku et al., 2016).

**3. Up-to-Date Information:**

HELIX maintains an extensive database of medical facilities, clinics, hospitals, and pharmacies to cater to diverse healthcare needs. The project's scope includes regular updates and verification to ensure that users have access to reliable and current information, aligning with the importance of accurate medical data (Gagliardi et al., 2016).

**4. User-Centric Features:**

HELIX's scope extends to the implementation of user-centric features. These include personalized profiles, enabling users to tailor their healthcare experience, and appointment scheduling options for greater convenience. This user-centric approach caters to the personalization needs highlighted in the literature (O'Leary et al., 2013).

## Chapter 4

# Proposed System Architecture

The proposed system for Project HELIX is a comprehensive healthcare platform designed to enhance accessibility, user experience, and the availability of accurate medical information. It leverages modern web technologies to provide an intuitive and user-friendly interface, enabling users to input their symptoms, locate nearby healthcare professionals, schedule appointments, and access personalized healthcare recommendations. The system also integrates the Geolocation API, allowing real-time identification of healthcare providers based on a user's location. Continuous updates and feedback mechanisms ensure up-to-date information and user engagement. Overall, the proposed system represents a user-centric and accessible solution for improving healthcare accessibility and outcomes.

- Architecture Diagram:

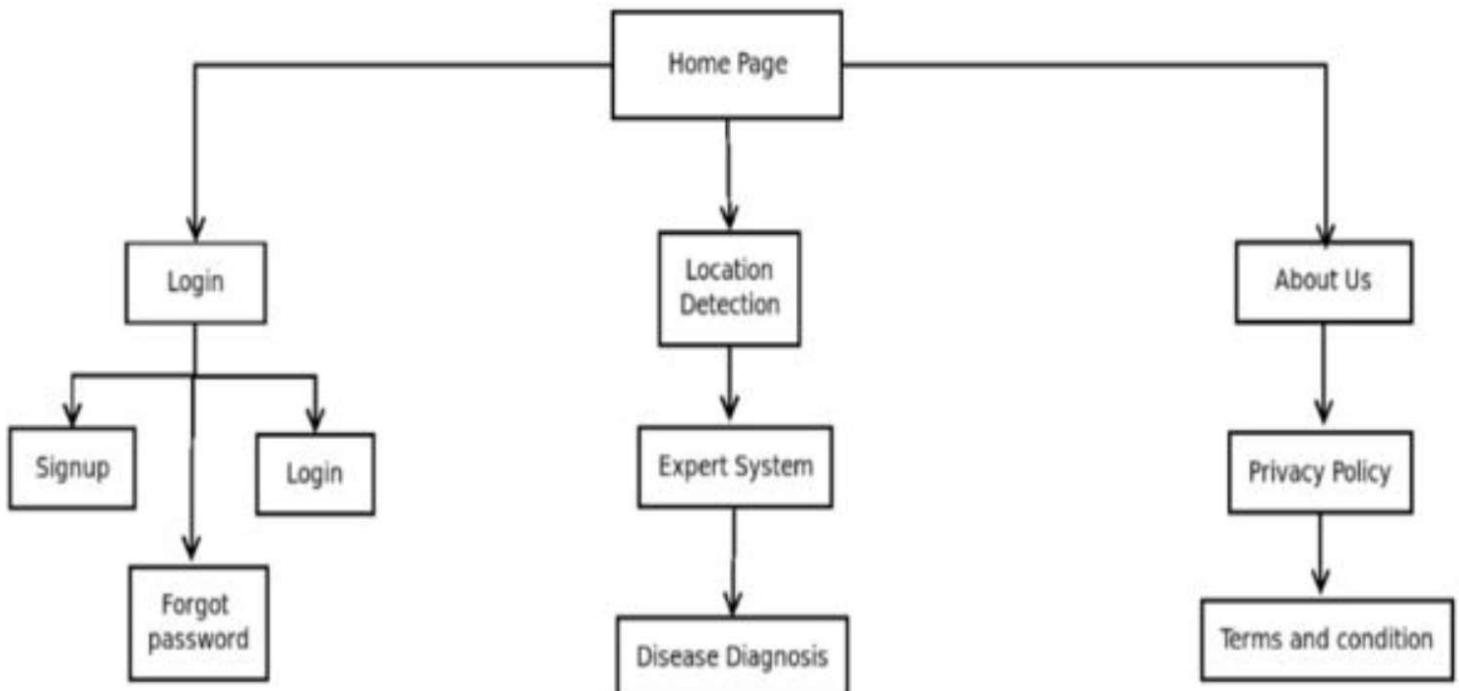


Fig (1) - Architecture Diagram

• Data Flow Diagram:

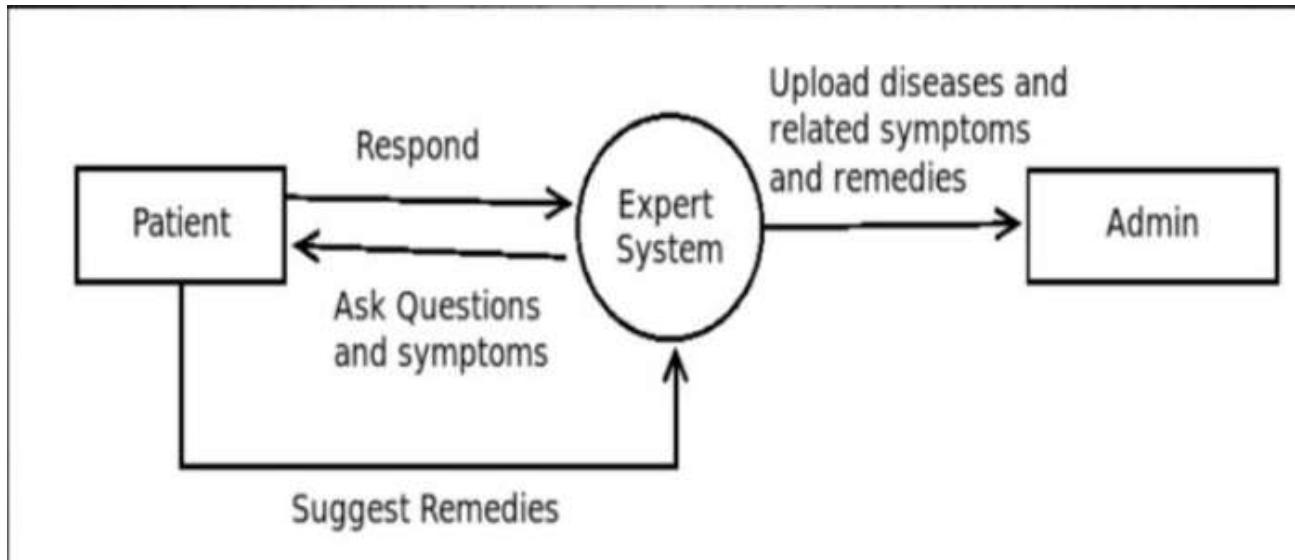


Fig (2) - DFD Level 0

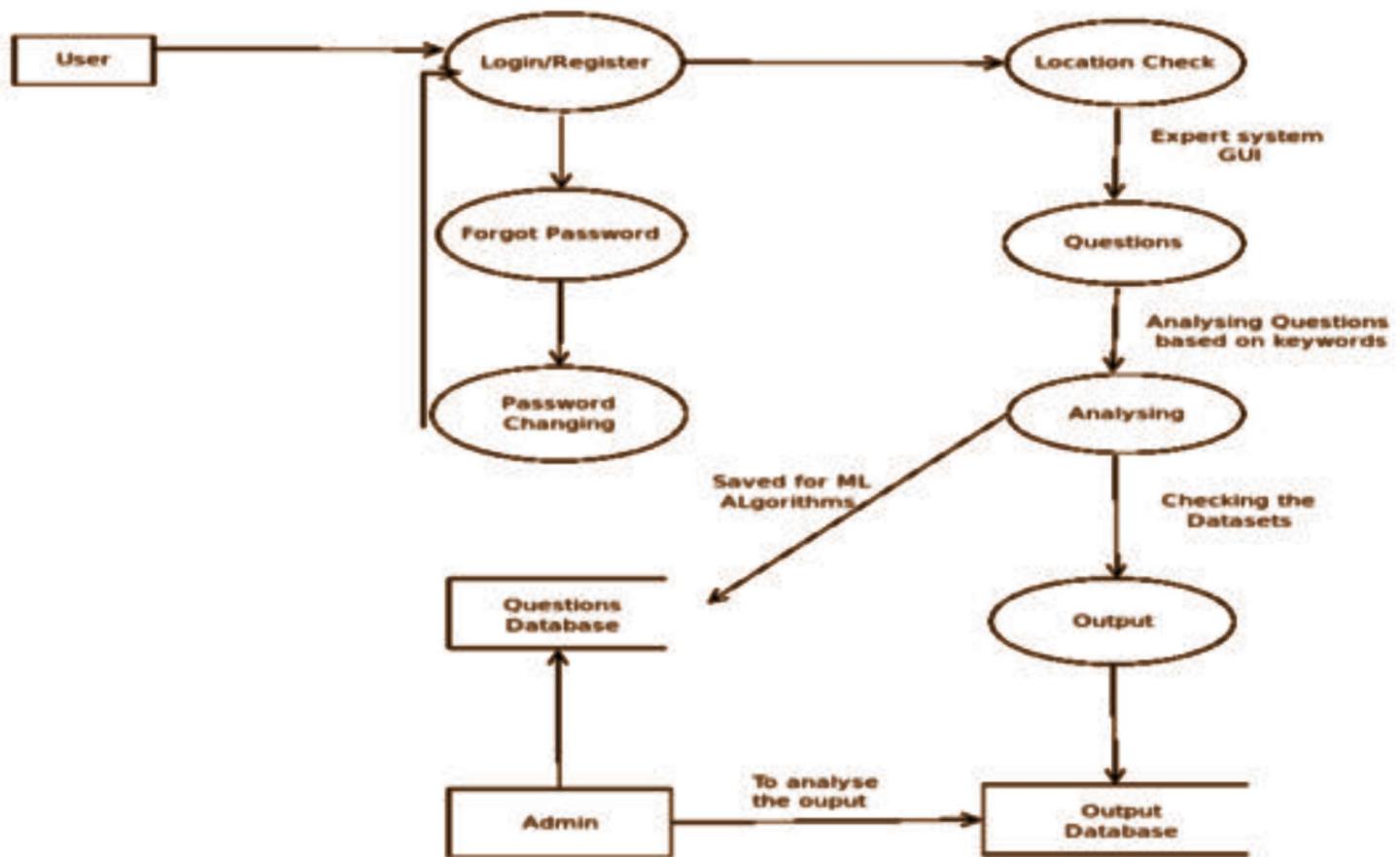


Fig (3) - DFD Level 1

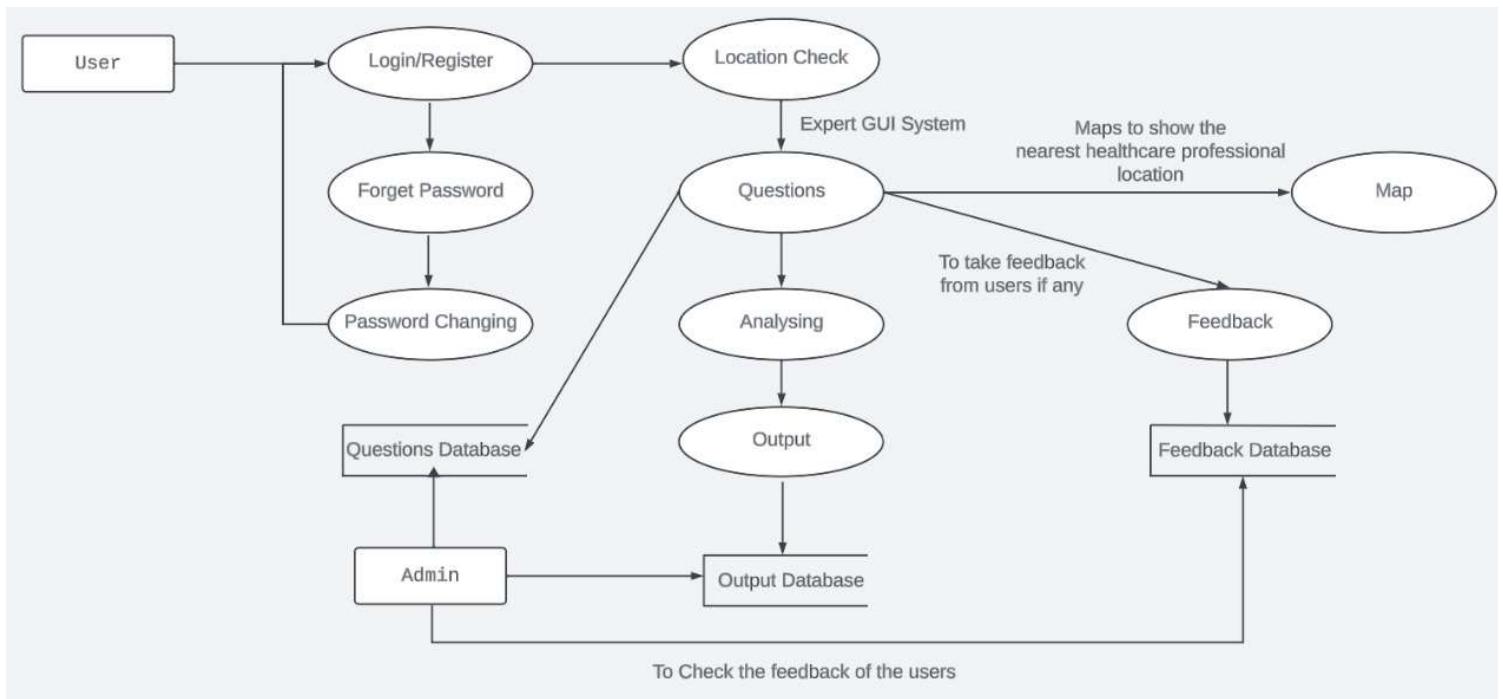


Fig (4) - DFD Level 2

- Use Case Diagram

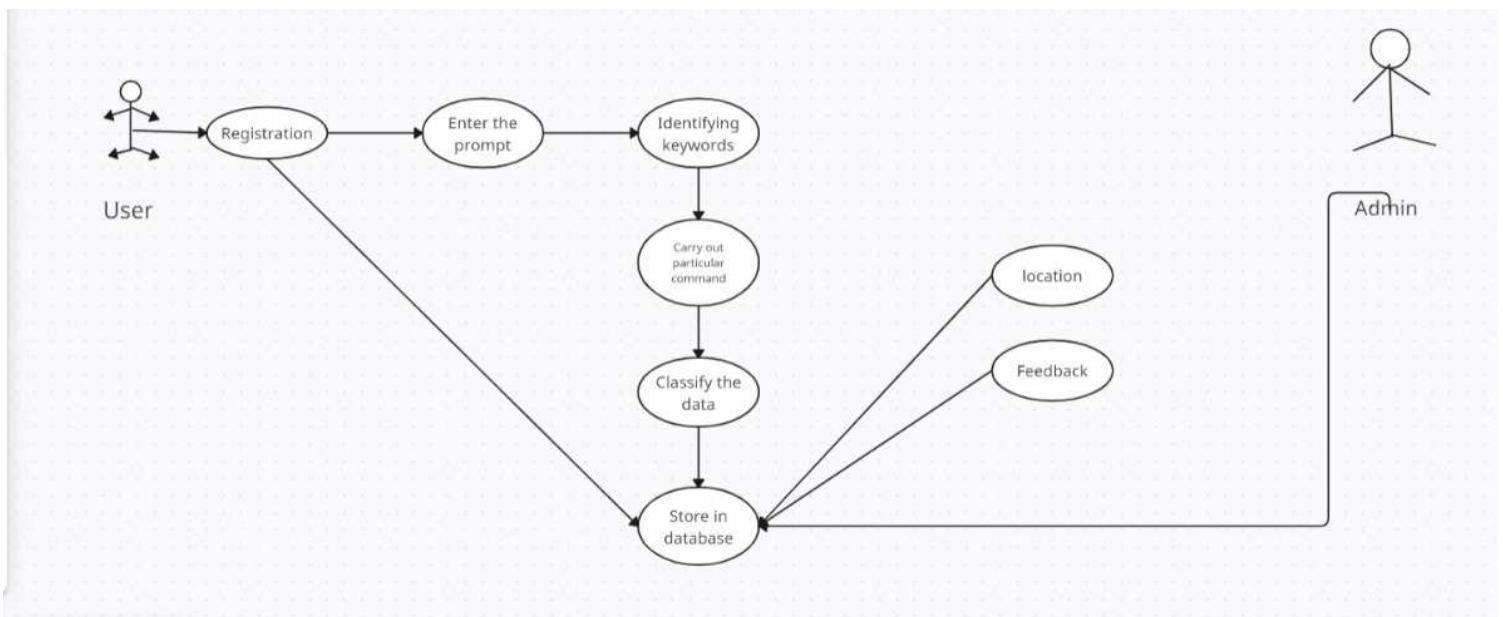


Fig (5) - Use Case Diagram

• Sequence Diagram:

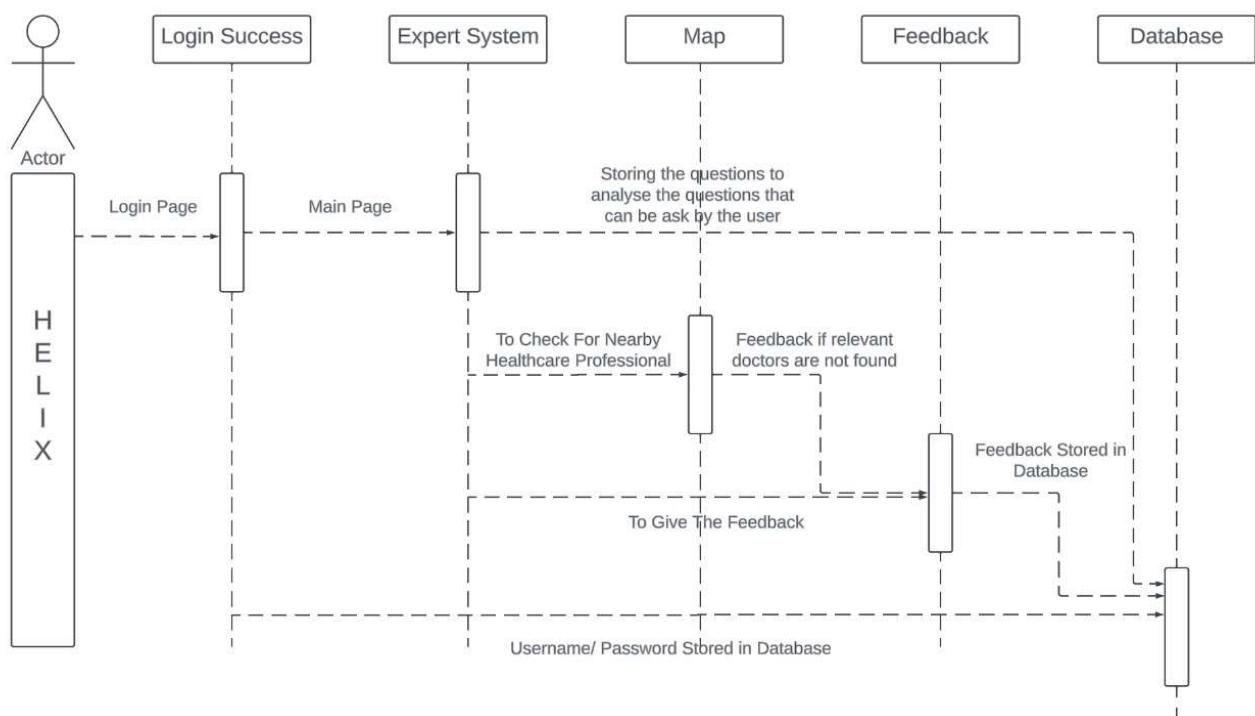


Fig (6) - Sequence Diagram

• Activity Diagram:

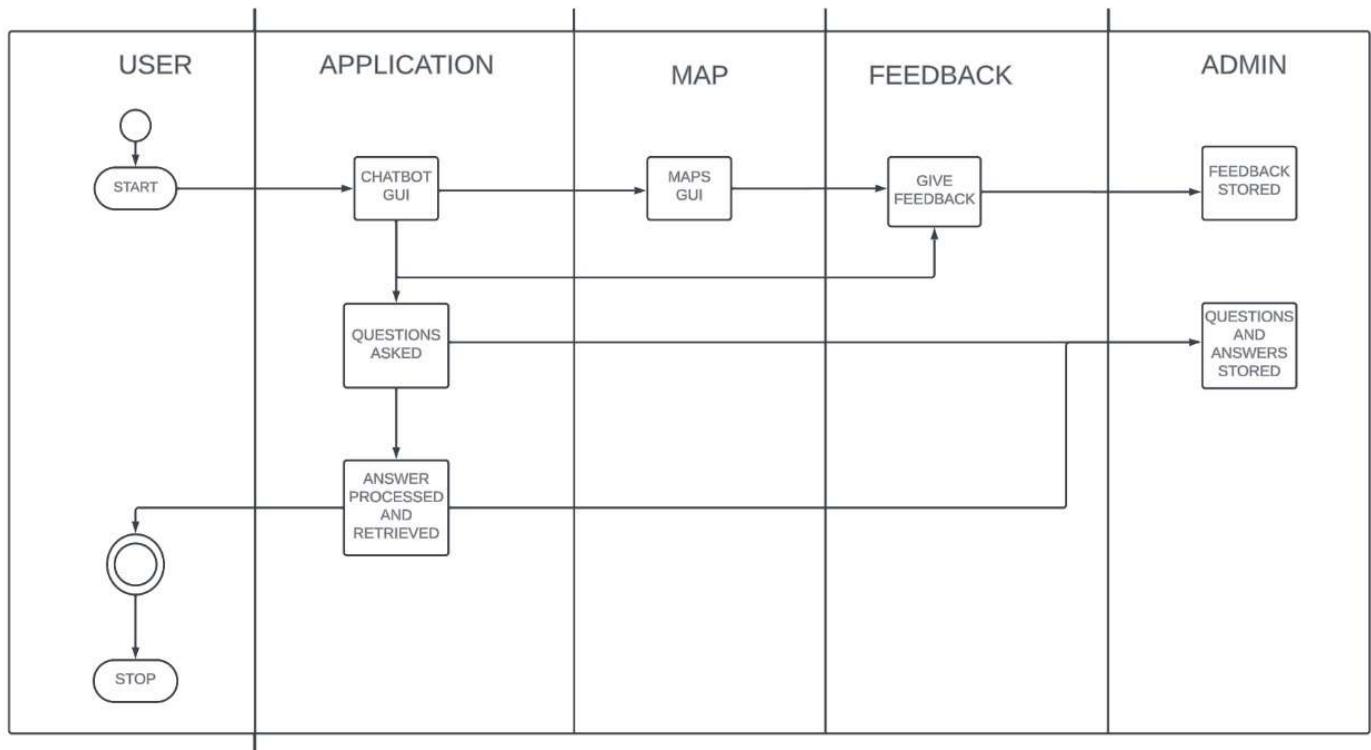


Fig (7) - Activity Diagram

The proposed system of Project HELIX envisions a comprehensive and user-centric healthcare platform that addresses the multifaceted challenges in healthcare accessibility and engagement. This system aims to redefine the way individuals access healthcare services, interact with medical professionals, and make informed healthcare decisions. The core components of the proposed system are as follows:

#### 1. User-Friendly Healthcare Platform:

At the heart of Project HELIX is a user-friendly website that serves as the gateway to healthcare services. The platform will be designed with a focus on simplicity, accessibility, and inclusivity. It will be intuitively structured, ensuring that individuals, regardless of their technological proficiency, can navigate it with ease.

The user-friendly design extends to the user interface, where individuals can effortlessly input their symptoms and healthcare concerns. The platform's simplicity is key to breaking down the barriers that often deter individuals from seeking medical support. It creates a welcoming and reassuring environment where users can access essential healthcare information and services without intimidation.

#### 2. Efficient Search Engine:

Central to the proposed system is an efficient search engine that empowers users to find medical professionals based on their specific needs. Users can search for healthcare providers by location, specialty, and availability. This search engine ensures that individuals can swiftly connect with the most suitable medical professionals.

The efficient search system is an integral part of making healthcare services more accessible. It streamlines the process of locating medical professionals, making it as simple as searching for information on the internet. This component reflects a commitment to breaking down the barriers that impede timely access to medical support.

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### 3. Up-to-Date Information:

The proposed system prioritizes the provision of accurate and up-to-date medical information. This information is drawn from a continuously updated database, ensuring that users have access to reliable and verified details of medical professionals, healthcare facilities, and services.

The emphasis on up-to-date information is critical for informed healthcare choices. Users need to have confidence that the information they access is current and reflects the latest medical knowledge. The regular updates to the system's database serve as a safeguard against the potential consequences of outdated or inaccurate data.

### 4. Enhanced User Experience:

The proposed system is built around the concept of a user-centric healthcare experience. It includes the development of personalized user profiles and the integration of appointment scheduling options. These features empower individuals to tailor their healthcare experience according to their specific needs and preferences.

Personalized profiles allow users to create a healthcare identity that reflects their unique requirements. The inclusion of appointment scheduling options adds a level of convenience and flexibility that is often absent in traditional healthcare systems. Users can book appointments at their convenience, ensuring that they receive the care they need precisely when they need it.

In summary, the proposed system of Project HELIX is designed to usher in a new era of healthcare accessibility and engagement. By providing a user-friendly platform, an efficient search engine, up-to-date information, and enhanced user experiences, this system seeks to empower individuals to take charge of their health and well-being. Project HELIX acknowledges the complexities of the healthcare landscape and aspires to simplify the process of accessing healthcare, ensuring that individuals can navigate it with confidence and ease.

# Chapter 5

## Project Planning

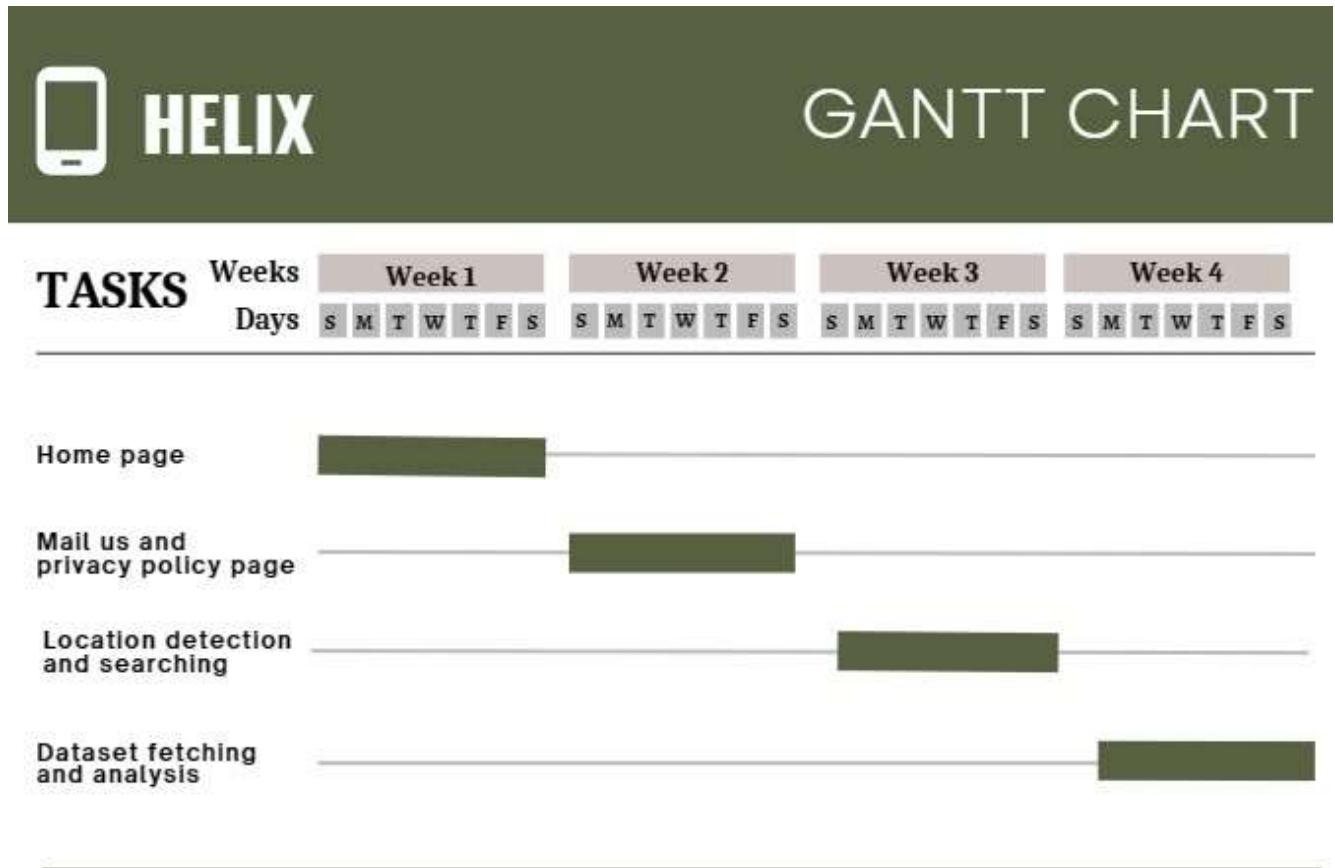


Fig (8) - Gantt chart

1. Home Page Design: The process begins with the design of a user-friendly interface. This encompasses the creation of web pages, the layout, color schemes, and the overall aesthetics of the website. The user interface is a critical component, as it directly impacts how users interact with the platform. The design phase also includes the integration of features for personalized profiles and appointment scheduling options, enhancing the user experience.
2. Mail us and privacy policy page (Feedback Mechanisms): To foster trust and transparency, the platform includes user engagement and feedback mechanisms. This feature allows users to provide feedback on their experiences and engagement with healthcare services.

3. Location Detection and searching: The search engine, a core element of Project HELIX, is integrated to facilitate users in finding suitable medical professionals based on location, specialty, and availability. It is designed to be fast, efficient, and capable of handling a high volume of user queries.

4. Dataset fetching and analysis: In Project HELIX, dataset fetching and analysis play a vital role, with machine learning techniques such as Naive Bayes and logistic regression applied. These methods enable the system to process and analyze medical datasets, providing valuable insights and supporting preliminary disease identification and treatment recommendations.

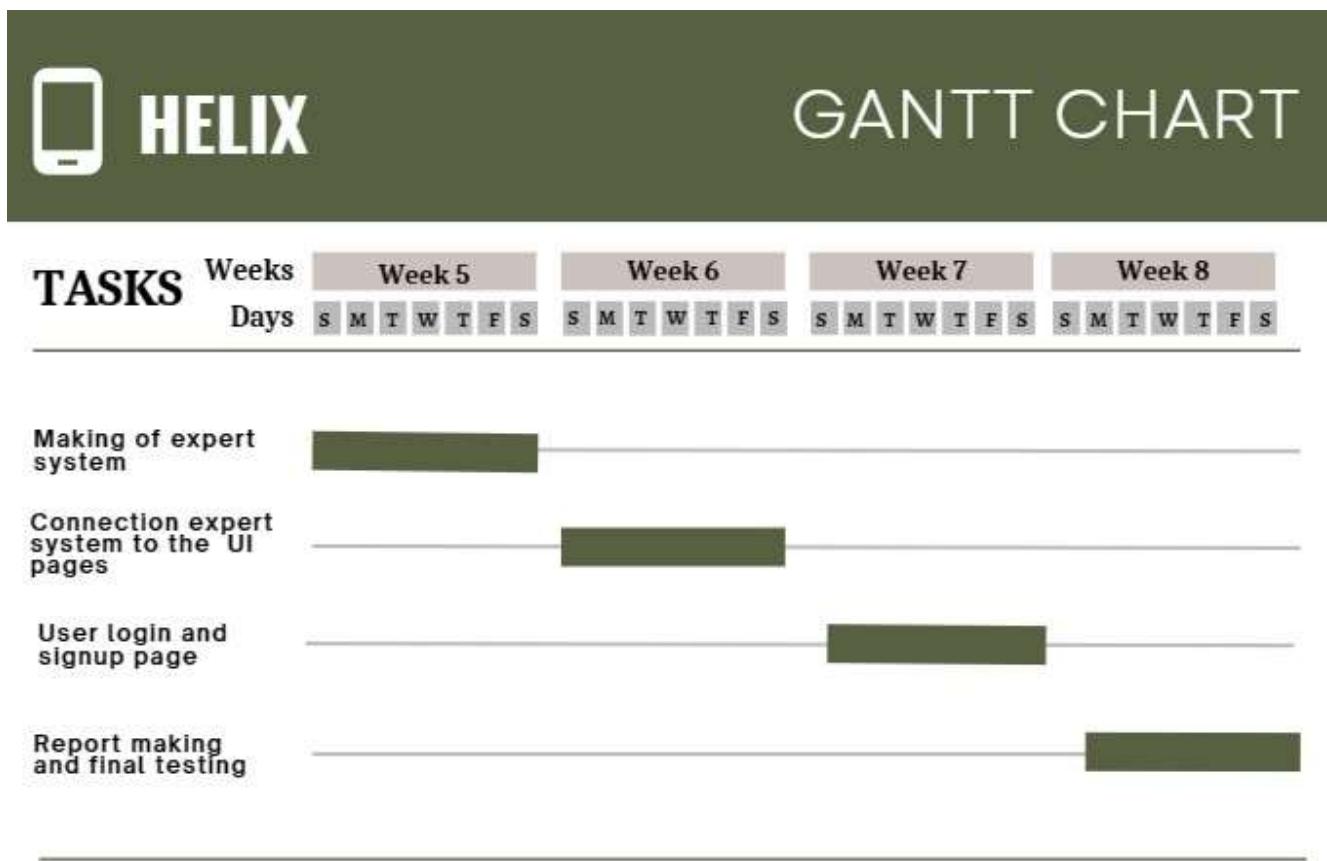


Fig (9) - Gantt Chart

5. Making of expert system: In this project, the creation of an expert system, based on a carefully curated dataset, is a foundational achievement. This intelligent system utilizes advanced programming and artificial intelligence techniques to interact with users, analyze their symptoms, and provide preliminary disease identification and treatment recommendations, making healthcare guidance more accessible and immediate.

6. Connecting expert system to the UI pages (Database Development): To ensure that the platform provides accurate and up-to-date medical information, the database plays a pivotal role. The database is meticulously designed to store information about medical professionals, healthcare facilities, and services. Regular updates and verification processes are established to maintain the integrity of the data.
7. User login and signup page: Project HELIX includes a secure user login and signup page that enables individuals to create accounts, access personalized healthcare features, and securely log in for an enhanced user experience. This critical component ensures user data protection and seamless interaction with the platform.
8. Report making and final testing: In Project HELIX, the report-making process involves collating data, user feedback, and system performance metrics to assess project outcomes and improvements needed. Final testing is meticulously conducted to validate system functionality, security, and user experience, ensuring a robust and reliable healthcare platform for users.

# **Chapter 6**

## **Experimental Setup**

### Software Requirements:

#### 1) Web Server:

- You need a web server software like Apache, Nginx, or Microsoft Internet Information Services (IIS) to host and serve the project's web application.

#### 2) Database Management System:

- Use a relational database management system (RDBMS) like MySQL, PHP and XAMPP database like MongoDB to store and manage user data, healthcare provider information, and other critical data.

#### 3) Development Tools:

- Development tools like code editors (e.g., Visual Studio Code, Sublime Text), version control systems (e.g., Git), and package managers (e.g., npm, pip) are essential for coding, collaborating, and managing project dependencies.

#### 4) Operating System:

- The choice of the operating system for local hosting depends on your development team's preferences, but popular options include Windows, macOS, or Linux distributions like Ubuntu. Ensure compatibility with the selected web server and database system.

#### 5) Geolocation API:

- Integrate a Geolocation API to access real-time geographic coordinates and provide location-based services, enhancing the user experience, especially for searching nearby healthcare professionals.

### Hardware Components:

The hardware and software requirements for implementing Project HELIX may vary depending on the scale and complexity of the project. Here are some general guidelines for the hardware and software components you might consider:

**1) CPU (Central Processing Unit):**

- Minimum Requirement: A modern multi-core processor (e.g., Intel Core i5 or equivalent)
- Recommended: A powerful multi-core processor (e.g., Intel Core i7 or equivalent) to handle the processing demands efficiently.

**2) GPU (Graphics Processing Unit): (if any required)**

- Minimum Requirement: Most healthcare applications and web platforms do not necessitate dedicated GPUs. However, if you plan to incorporate advanced image processing or machine learning components, a mid-range GPU from NVIDIA or AMD may be beneficial.

**3) RAM (Random Access Memory):**

- Minimum Requirement: 4GB of RAM is typically sufficient for basic healthcare applications and web development.
- Recommended: 8GB or more is advisable for smoother performance, especially if you are working with large datasets or running multiple applications simultaneously.

**4) STORAGE:**

- Minimum Requirement: A standard 256GB SSD for the operating system and application files.
- Recommended: For handling data storage, a larger SSD (500GB or more) or additional hard drive storage may be required, depending on the size and volume of healthcare data you plan to store.

**5) OS (Operating System):**

- Minimum Requirement: Any modern operating system can be used for development, such as Windows, macOS, or Linux (e.g., Ubuntu).
- Recommended: Choose an OS that aligns with your development tools and preferences. Linux-based systems are often favored for web development, while Windows is widely used for general-purpose development.

# **Chapter 7**

## **Implementation Details**

In Project HELIX, various modules play distinct roles in creating a comprehensive healthcare platform. Each module is designed to address specific aspects of healthcare accessibility, user experience, and medical information.

Below, I'll provide a brief overview of some key modules and the implementation technologies used for them:

### **1. User Interface (UI):**

- Description: The UI module is responsible for creating an intuitive and user-friendly interface where users can interact with the platform. It's the front-end that users see and interact with when accessing HELIX.
- Implementation Technologies: HTML, CSS, JavaScript, and responsive web design frameworks (e.g., Bootstrap) are used to develop the user interface. These technologies ensure the platform is accessible across various devices and browsers.

### **2. User Profile Login and Signup:**

- Description: This module allows users to create and manage personalized profiles, providing information about their medical history, preferences, and contact details.
- Implementation Technologies: Web forms and back-end technologies are used to collect and store user profile data securely. This can involve technologies like PHP, Python, or JavaScript.

### **3. Location Searching (Geolocation API):**

- Description: The search engine module empowers users to find healthcare professionals based on location, specialty, and availability. Leveraging the Geolocation API, the platform provides real-time data about nearby healthcare providers.
- Implementation Technologies: Backend programming languages like Python, Java, or PHP are used to develop the search engine. The Geolocation API is integrated to access the user's location and deliver proximity-based healthcare provider results.

- The Geolocation API plays a pivotal role in enhancing the search engine's capabilities. It determines the user's geographic coordinates, enabling precise results based on their current location. This feature streamlines the process of finding nearby healthcare providers, particularly when immediate medical support is essential.

By integrating the Geolocation API, Project HELIX ensures users can efficiently identify and connect with healthcare professionals in their local area. This approach aligns with the project's objective of providing accessible and timely healthcare services.

#### 4. User Feedback and Engagement:

- Description: This module facilitates user feedback, reviews, and engagement with the platform. It helps build trust and transparency in healthcare services.
  - Implementation Technologies: Web forms, rating systems, and comment sections can be integrated into the platform using technologies like JavaScript and server-side scripting languages.

#### 5. Database Management:

- Description: This module manages the storage of healthcare provider information, user profiles, and other critical data. It ensures that information is up-to-date and reliable.
- Implementation Technologies: Databases such as MySQL, PostgreSQL, or NoSQL databases like MongoDB can be used to store and manage data securely and efficiently.

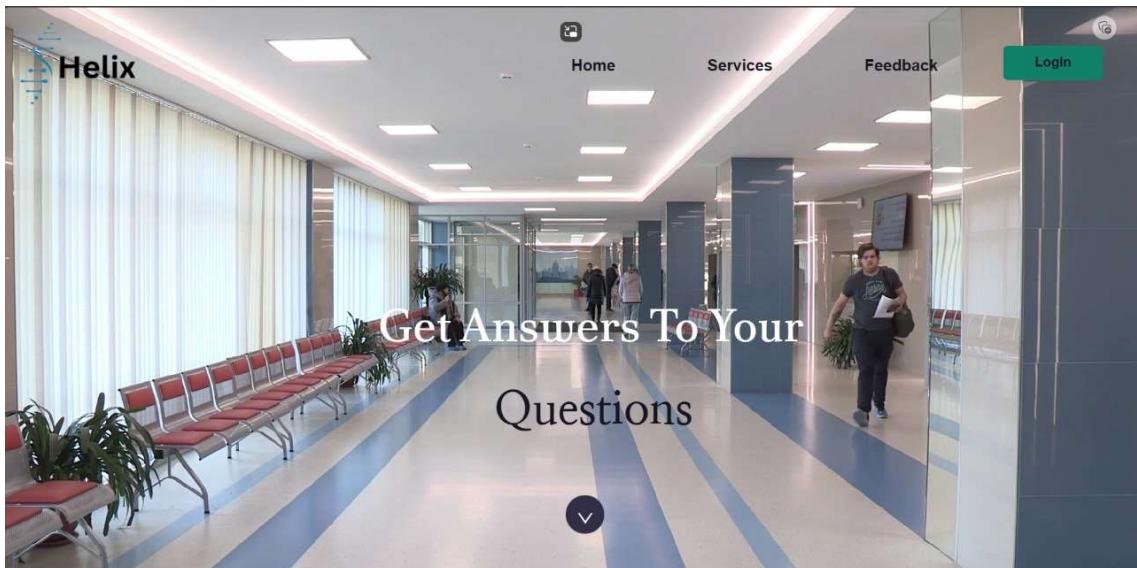
# Chapter 8

## Result

1. User Interface (UI):

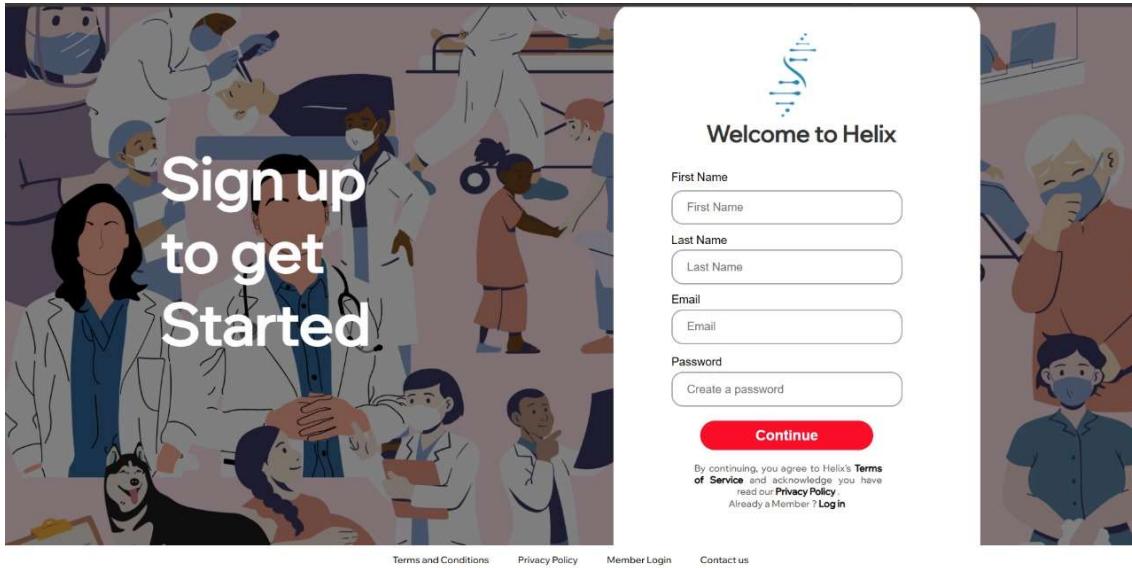


Fig(10)

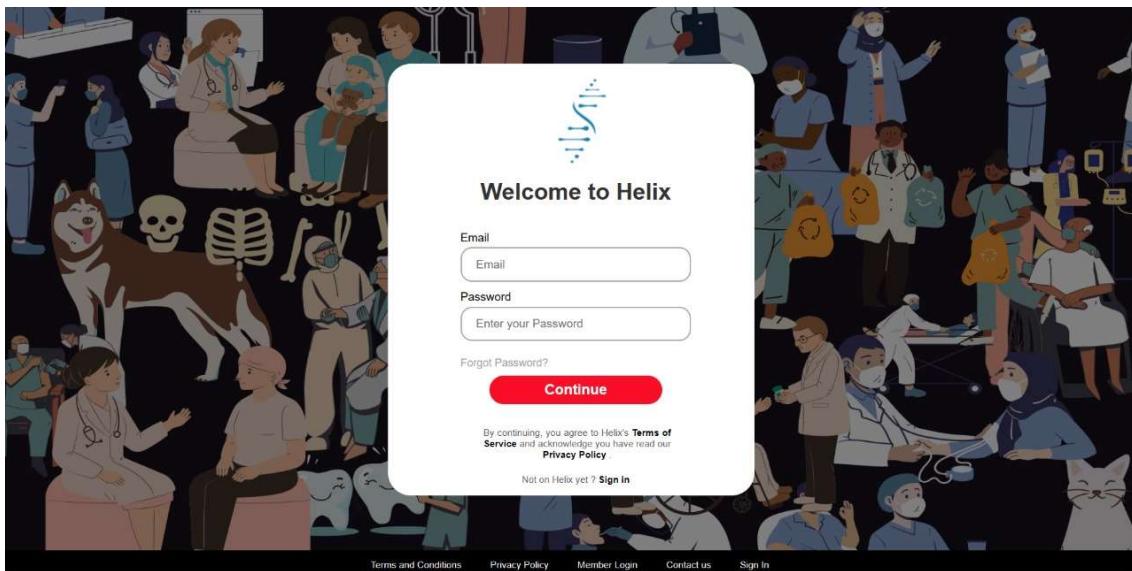


Fig(11)

2. User Profile Login and Signup:

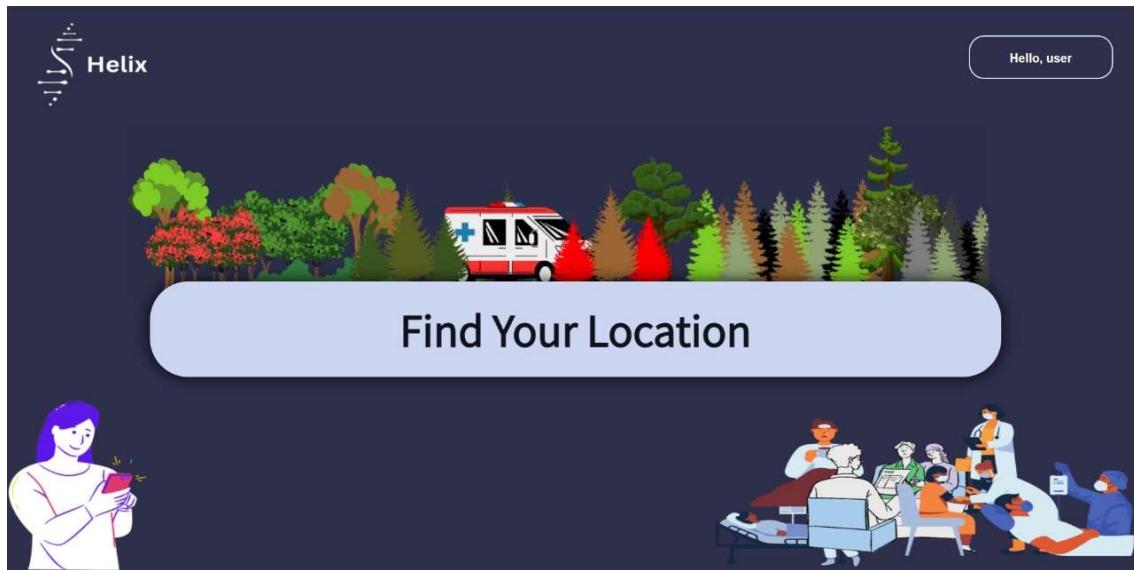


Fig(12)



Fig(13)

### 3. Location Searching (Geolocation API):



Fig(14)

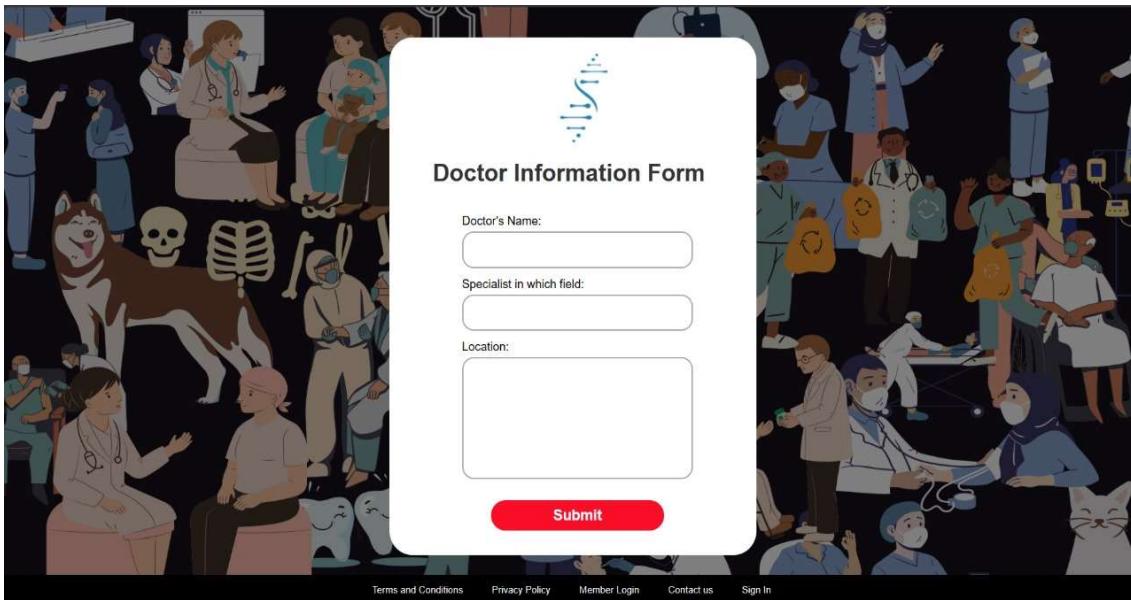


Fig(15)

#### 4. User Feedback and Engagement:

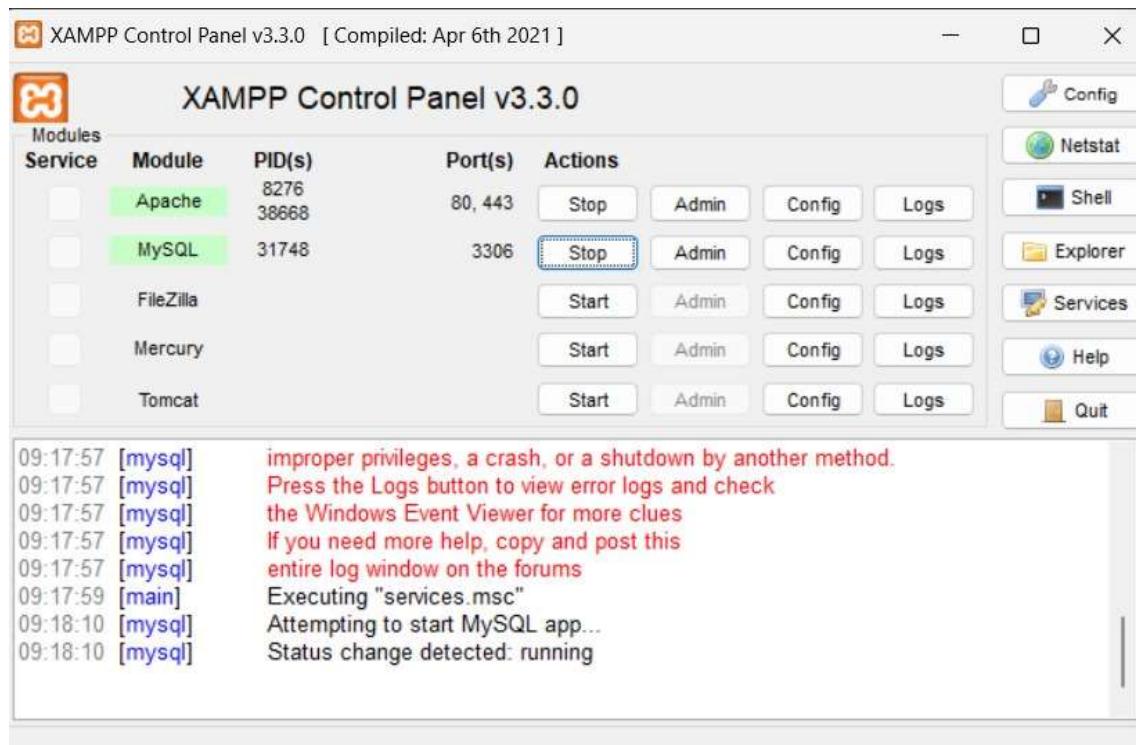


Fig(16)



Fig(17)

#### 5. Database Management:



Fig(18)

The screenshot shows the phpMyAdmin interface. The left sidebar shows databases: helix, New, details, doctor\_form, feedback, forgot, forgot\_password, location, login, medical\_form, profession\_form, register, information\_schema, mysql, performance\_schema, phpmyadmin, and test. The main area is titled "Server: 127.0.0.1 > Database: helix > Table: login". It shows the following table data:

SNO	email	time and date
1	atharv@gmail.com	2023-06-07 23:37:41.115758
2	aarshjain@gmail.com	2023-06-10 20:56:52.705106
3	aarshjain@gmail.com	2023-06-10 21:00:25.509715
4	atharv@gmail.com	2023-06-10 21:00:53.756319
5	aarshjain@gmail.com	2023-06-10 21:38:10.823550
6	atharv@gmail.com	2023-06-11 11:36:39.876894
7	shefali.jain43@apsit.edu.in	2023-06-16 22:24:16.242331
8	shefali.jain43@apsit.edu.in	2023-06-16 22:36:05.362683
9	shefali.jain43@apsit.edu.in	2023-06-16 22:47:17.096324
10	a2@gmail.com	2023-06-16 23:33:23.490486

Fig(19)

# **Chapter 9**

## **Conclusion**

Project HELIX, a student-driven initiative, represents a promising endeavor in the healthcare domain, striving to address the enduring challenges that have hindered individuals' access to healthcare services, accurate medical information, and personalized user experiences. In this comprehensive conclusion, we reflect on the significance of HELIX, its impact on healthcare accessibility, the collective effort behind it, and the path forward.

### **The Imperative of Healthcare Accessibility:**

The need for accessible and timely healthcare services is a fundamental concern in the modern world. Access to healthcare is not a privilege; it's a right that every individual should enjoy, regardless of their background, location, or circumstances. Yet, for far too many people, accessing medical support can be a struggle, especially in underserved and rural areas.

Project HELIX recognizes the gravity of this issue and has set out to rectify this disparity. It's evident that prompt access to healthcare is vital for achieving better health outcomes. HELIX acknowledges that delays in healthcare support can have profound consequences, emphasizing the imperative of efficient healthcare accessibility.

### **The Power of User-Friendly Design:**

At the heart of Project HELIX lies a user-friendly platform. This module is fundamental because it seeks to break down the barriers that often deter individuals from seeking timely medical support. The user interface is designed to be intuitive and accessible to all, irrespective of their technological literacy.

User-friendly design is not just about aesthetics; it's about empowering individuals to navigate the healthcare ecosystem with confidence. By ensuring that the platform is

accessible across various devices and browsers, HELIX eliminates one of the common obstacles to healthcare information and services.

#### Efficient Search Engine and Geolocation API:

The search engine, bolstered by the Geolocation API, is another vital component of Project HELIX. This module enables users to find healthcare professionals based on their specific needs and proximity to their location. The Geolocation API, in particular, revolutionizes the search experience by providing real-time information about nearby healthcare providers.

This integration is critical for improving healthcare accessibility. It streamlines the process of identifying suitable medical support, especially in situations where immediate assistance is required. By integrating the Geolocation API, HELIX ensures that users can efficiently connect with healthcare providers in their local area.

#### Up-to-Date Information and User-Centric Experiences:

Accurate and up-to-date medical information is paramount for informed healthcare decisions. Outdated or inaccurate data can lead to misinformed healthcare choices, a challenge that HELIX diligently addresses. Regular updates to the platform's database ensure that users have access to reliable and verified information.

User-centric experiences, including personalized profiles and appointment scheduling options, have gained increasing recognition in healthcare. The inclusion of these features in HELIX reflects the commitment to rendering healthcare services more user-centric, ensuring that healthcare experiences are tailored to each individual's unique needs.

#### The Role of User Feedback and Continuous Improvement:

Trust and transparency in healthcare services are nurtured through user engagement and feedback mechanisms. The ability for users to actively engage with the platform and share their experiences is integral to building trust and fostering a transparent healthcare environment.

Project HELIX understands the importance of user feedback in shaping its ongoing development. By incorporating feedback mechanisms, it not only gauges user satisfaction but also actively seeks to make necessary improvements.

#### The Journey Ahead:

Project HELIX acknowledges that it is a student-driven initiative, characterized by humility and the recognition of imperfections. This self-awareness is commendable, as it aligns with a realistic approach to healthcare challenges. Transformation in healthcare accessibility, engagement, and experiences is a journey, and HELIX is a proactive step in that direction.

While the project may not be without imperfections, it embodies the spirit required to bring about positive change in healthcare accessibility. Its commitment to democratizing healthcare, ensuring that individuals can access timely medical support, reliable information, and user-centric experiences, is a significant contribution to the healthcare field.

In conclusion, Project HELIX stands as a beacon of hope in the healthcare landscape. It represents a collective effort to bridge the gaps in healthcare accessibility, user engagement, and the availability of accurate medical information. The path forward is clear—continuous improvement, user-centric design, and a steadfast commitment to making healthcare accessible to all. The future of healthcare is brighter with initiatives like HELIX that recognize the importance of human-centric, accessible, and responsive healthcare services.

As the project evolves, it remains committed to its mission: to make healthcare accessible, timely, and user-friendly, with the understanding that this transformation is not a destination but a continuous journey.

## **Chapter 10**

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