Salahaddin University-Erbil

College of Science

Computer Science & IT Department

Online E-Health Family Services

A Project submitted to the Computer Science & IT Department
University of Salahaddin-Erbil
In the Partial Fulfillment of the Requirement for the Degree of Bachelor of
Science in Computer Science & IT

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Dedication

This project is lovingly dedicated to our parents and siblings. I thank my special friend for his support and for his support and for helping me at some tips. Then for those who helped at least a bit. Also, we have all of the respect to our supervisor M. Hawkar Kheder Shaikha explained this project in deep and guides us.

Certification

I certify that the project titled "**Online E-Health Family Services**" was done under my supervision at the Computer Science and IT Department, College of Science, Salahaddin University-Erbil. In the partial fulfillment of the requirement for the degree of Bachelor of Computer Science and IT.

Supervisor

Signature:

Name:

Date: / /2024

Abstract

The healthcare sector often faces challenges in managing patient-doctor interactions, appointment scheduling, and healthcare information. There was a need for a solution that could streamline these processes and provide a user-friendly platform for both patients and doctors. The objective was to develop a comprehensive web application that facilitates efficient healthcare management. The aim was to provide a platform where patients and doctors could interact, schedule appointments, and manage healthcare information effectively. The problem was tackled by designing key features such as a user-friendly interface, robust search functionality, detailed profiles for doctors and patients, and a streamlined appointment booking system. The application also incorporated a robust verification system for doctors and a flexible patient registration process. Furthermore, it provided doctors with tools to manage their appointments and patient interactions effectively. The application successfully provides a reliable, user-friendly, and comprehensive healthcare resource. It ensures that all users can access the necessary resources to make informed decisions about their healthcare. The application has effectively addressed the initial problem by streamlining patient-doctor interactions and healthcare information management.

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Chapter One

1.1 Introduction

Our research project is centered around the development of a comprehensive web application that aims to revolutionize the healthcare sector by enhancing accessibility and convenience. This platform encompasses a wide array of features, including a user-friendly main page for efficient searches of hospitals and doctors, an extensive repository of drugs-related information, and streamlined registration processes to facilitate seamless connections between patients and their preferred healthcare providers. By addressing the existing challenges in healthcare access, our project aspires to foster an inclusive healthcare ecosystem. In this research we provided a friendly platform that the patients, doctors, administers and visitors are separated within their permission. Thus, the administers are the main user for the platform that they have permission to add doctors within a specific hospital or not, the patients can register with any doctor for following up and booking appointments, while the visitors can just read the general information that shared by hospitals or doctors.

1.2 Aims and Objectives

- Enhance the overall healthcare experience by promoting seamless navigation within the application.
- Enable informed decision-making by providing comprehensive and accurate healthcare information.
- Improve patient-provider interactions by facilitating efficient appointment scheduling and communication.
- Ensure that all users, regardless of their current engagement with the healthcare system, can access the necessary resources to make informed decisions about their healthcare.
- Represent a significant stride towards digital healthcare, promising to revolutionize the way healthcare services are accessed and delivered.

1.3 Literature Review

1.3.1 DoH-Hawler : https://www.dohhawler.org/

- The website mostly shares company-related news, not much about doctors, hospitals, or drugs.
- The website's design isn't very user-friendly.
- The website mainly shares updates from the Department of Health in Erbil (DOH-Hawler).
- The website is a bit complicated to navigate.

Figure 1.3-1 DoH-Hawler Website

1.3.2 Hawler Hospital: https://hawler-hospital.com/

- The platform does not provide any data or details pertaining to pharmaceutical products or drugs.
- There is a noticeable absence of information about medical practitioners or doctors on the platform.
- The platform does not offer the functionality to schedule or book appointments with healthcare professionals.
- The scope of the platform is restricted to only one hospital, limiting its applicability and usefulness for users seeking information or services.
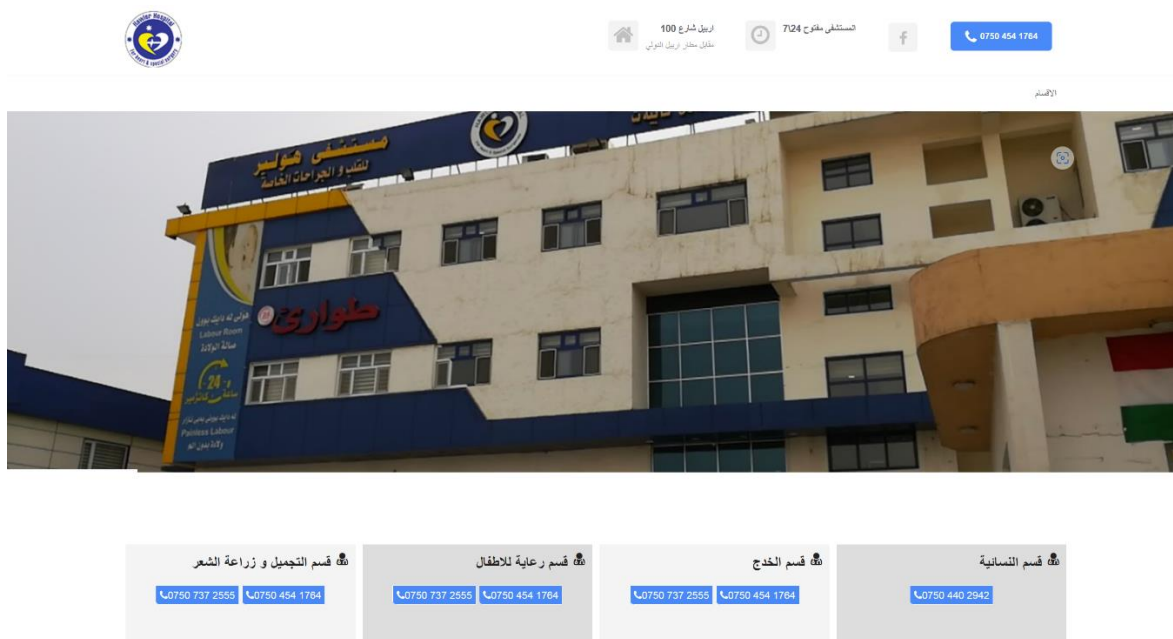

Figure 1.3-2 Hawler Hospital

Chapter Two

Methodology

2.1 Used technology

In this project we decided to use the efficient languages and tools. That's why after comparing many languages that web developers in today's world use, we came to the point that we must decide a language and tools that in many ways are better than others. We used HTML, CSS, Bootstrap, JS, PHP, Ajax and jQuery They are suitable for our project.

2.1.1 Web Languages

2.1.1.1 HTML

HTML is used for web designing, ever you think about how web browsers display web pages for you. It is a set of markup tags which contains the information that tells the web browser (Web browser read HTML tags and interpreted into human readable content) what should be displayed.

Figure 2.1-1 HTML logo

2.1.1.2 CSS

CSS is a style sheet language used for styling web pages. Have you ever pondered how web pages acquire their stylish appearances? The answer lies in CSS. It instructs the web browser on how to style HTML elements on a page, acting as the web's fashion designer by determining the colors, fonts, and layout of a page.

By keeping the style separate from the content, you can:

- **Avoid duplication:** Using CSS, you can apply the same style to multiple HTML elements without having to write the same code repeatedly.

- **Make maintenance easier:** If you want to change the style of an element, you only need to modify the CSS code, and the changes will be applied across all elements with that style.

- **Use the same content with different styles for different purposes:** With CSS, you can create different styles for the same HTML content, allowing you to present the same content in different ways for different scenarios.

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1. Bootstrap

   Bootstrap is the most popular, free and open-source framework for creating responsive layout in web pages, with much less effort. It contains HTML, CSS and JS components for creating forms, buttons, navigation, dropdown, modals, layout and many other things, the list is very long indeed. You can create all these without much effort, which otherwise would require a lot of CSS, HTML and JS code.


```css
.nav {
  background-color: #4F4D53;
  height: 48px;
  width: 100%;
}

.logo {
  position: relative;
  left: 25%;
  padding-top: 10px;
}
```

Figure 2.1-3 CSS Code


```html
<!-- Bootstrap core CSS -->
<link rel="stylesheet" href="/css/bootstrap.min.css">

<!-- Custom styles for this template -->
<link rel="stylesheet" href="/css/styles.min.css">
```

Figure 2.1-2 Bootstrap Link Code

2.1.1.3 JS

JavaScript is used for making web pages interactive. Ever thought about how web pages respond to your actions like clicks or key presses? JavaScript is a scripting language that allows web browsers to dynamically update and change content, making web pages more engaging and responsive.

1. Ajax

   With AJAX, web applications can send and retrieve data from a server in the background (asynchronously) without requiring a full-page refresh. This makes web applications faster and more responsive to user actions. AJAX is not a single technology, but a suite of technologies used together, including HTML (or XHTML), CSS, JavaScript, XML, JSON, and the XMLHttpRequest object.

   Many popular web applications such as Google Maps, Gmail, YouTube, and Facebook have been using AJAX to provide dynamic, user-friendly, and responsive interfaces to their users.

Figure 2.1-4 Ajax Logo

2. jQuery

jQuery is a JavaScript library that simplifies web development. It provides pre-written JavaScript code to ease tasks like HTML document traversal, event handling, and animation. This makes it easier and faster for developers to write complex JavaScript functionalities.
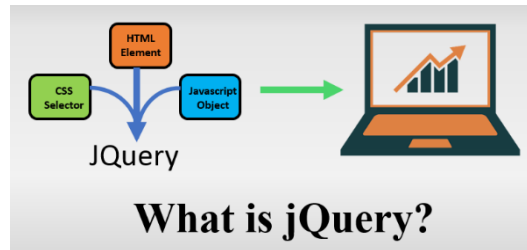

Figure 2.1-6 JS Logo

Figure 2.1-5 JQuery Structure

2.1.1.4   PHP

PHP is one of the most admired and popular server-side scripting languages which are widely used for creating websites. With faster turn-around time, enhanced security and affordability, PHP become the preferred choice of the website developers (Modern PHP, Released February 2015). Due to the plethora of benefits of this scripting language, many famous online businesses such as Facebook, Wikipedia, Flickr etc. are using this scripting language.

2.1.1.5   MySQL

MySQL is a popular choice for many developers and businesses due to its open-source nature, which makes it free and customizable. It's known for its high performance, able to handle large amounts of data and perform complex queries quickly. This makes it suitable for both small projects and large-scale

2.1.2   Software

2.1.2.1   VSS Code

Visual Studio is an Integrated Development Environment (IDE) that provides a comprehensive suite of tools for software development. It offers features like code editing, debugging, built-in compilers, code completion tools, and graphical designers. This makes it an ideal tool for developers as it enhances productivity and simplifies the process of creating robust, error-free code.

Figure 2.1-7 VS Code

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2.1.2.2   Xampp

XAMPP is a completely free, easy-to-install Apache distribution containing MariaDB, PHP, and Perl. It provides a local web server environment that allows developers to test their code in a safe and controlled manner. This makes it an ideal tool for web development as it ensures that the code runs smoothly before it's deployed to a live server.
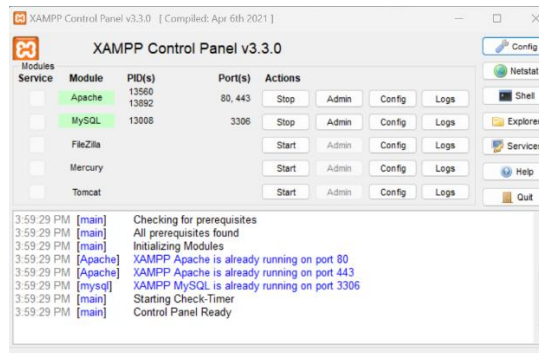

Figure 2.1-8 Xampp

2.2 Use Case Diagram

This represents the use case diagram for our project, illustrating the interactions between different components.
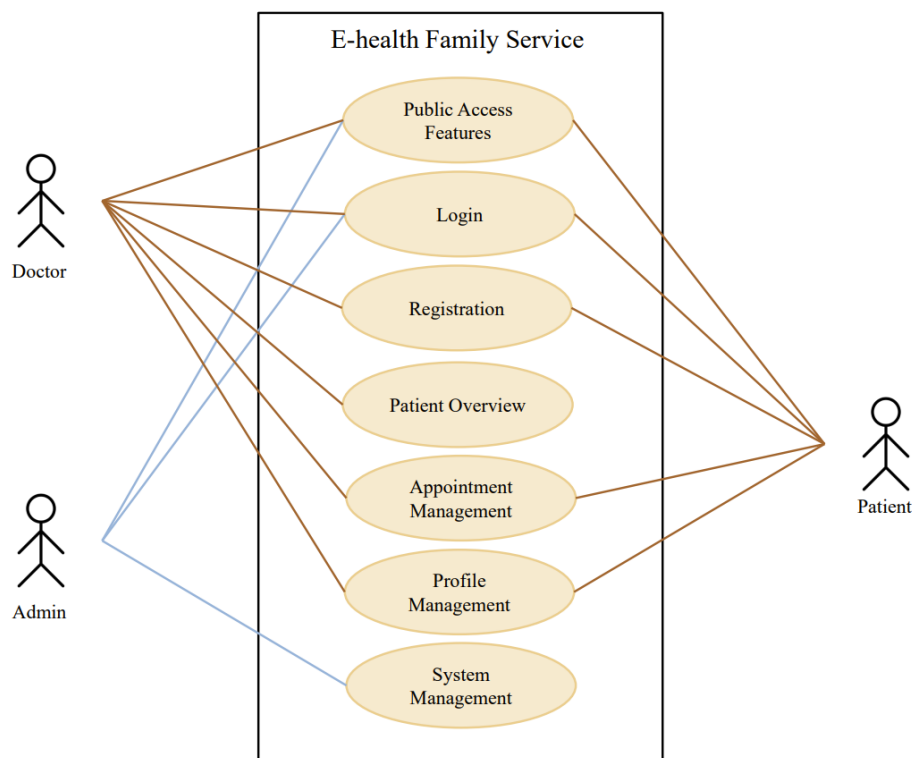

Figure 2.1-1 Use Case Diagram

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2.3 ER Diagram

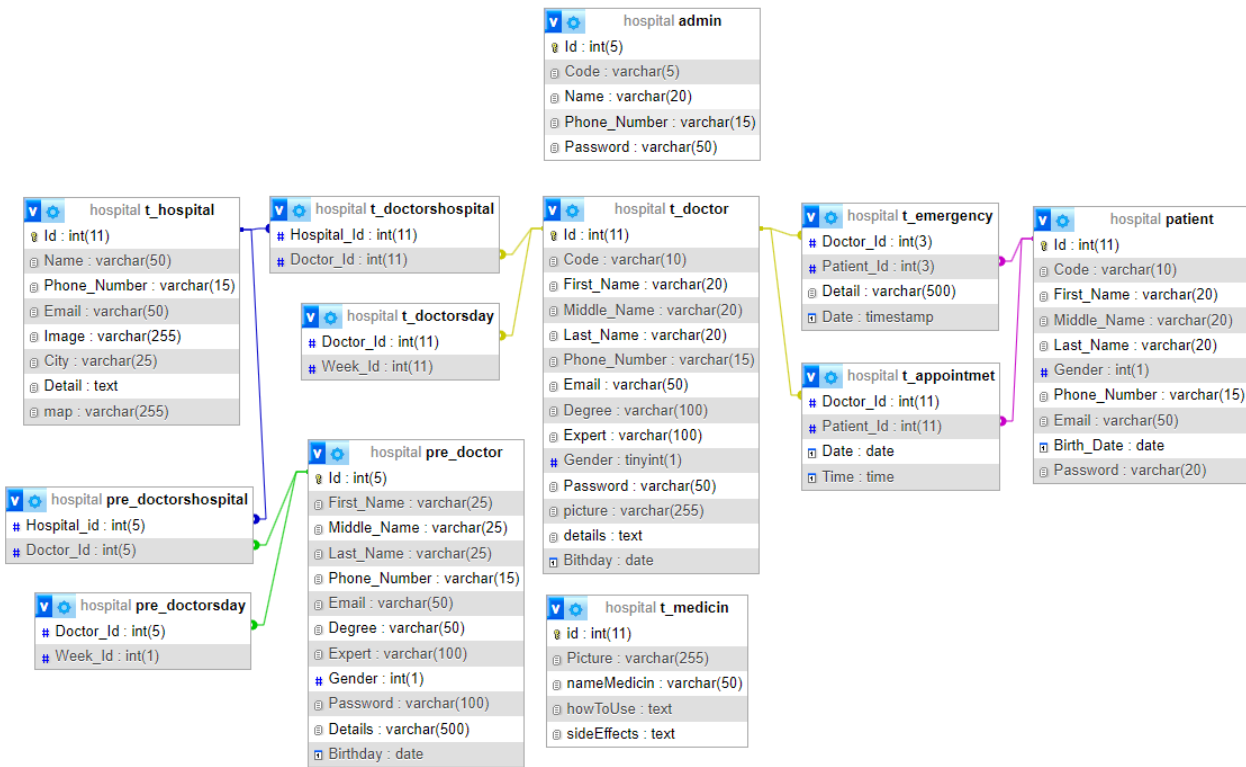These tables were used in our project to display our collected data and findings.

Figure 2.3-1 ER Diagram

Chapter three

Design and Analysis

In this chapter, we will illustrate the GUI of out application.

3.1 Public Access Features

3.1.1 Healthcare Resources overview

The application's initial interface presents a snapshot of various healthcare resources, including doctors, hospitals, and drugs. Users can see the names of these resources at a glance. For more detailed information, users can click on the individual names. This design ensures a streamlined and efficient user experience, allowing users to navigate the application with ease and access essential healthcare information conveniently.

Figure 3.1-1 Home page

3.1.2 Navigation Bar

3.1.2.1 Resources list

The navbar includes buttons that guide users to lists of doctors, hospitals, and drugs. By clicking on these categories, users are directed to comprehensive lists of these resources.

Figure 3.1-2 Resources list

3.1.2.2 Search Functionality

The navbar also features a search input that allows users to quickly find specific doctors, drugs, or hospitals within the application's database.
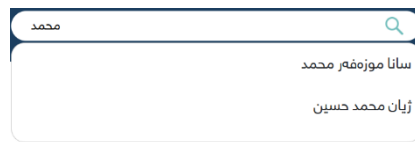

Figure 3.1-3 Search

3.1.2.3 User Authentication

The navbar includes buttons for login and signup. These buttons guide users to the respective pages where they can either log into their existing account or sign up to create a new one.
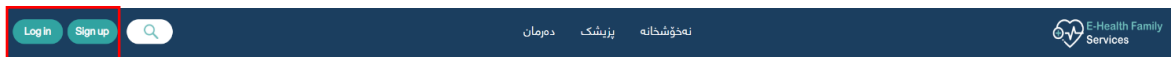

Figure 3.1-4 User Authentication

3.1.3 Access to Resource Lists

When a category (doctors, hospitals, or drugs) is selected from the navigation bar, users are led to a corresponding list. Each list provides a succinct overview of each resource within the chosen category
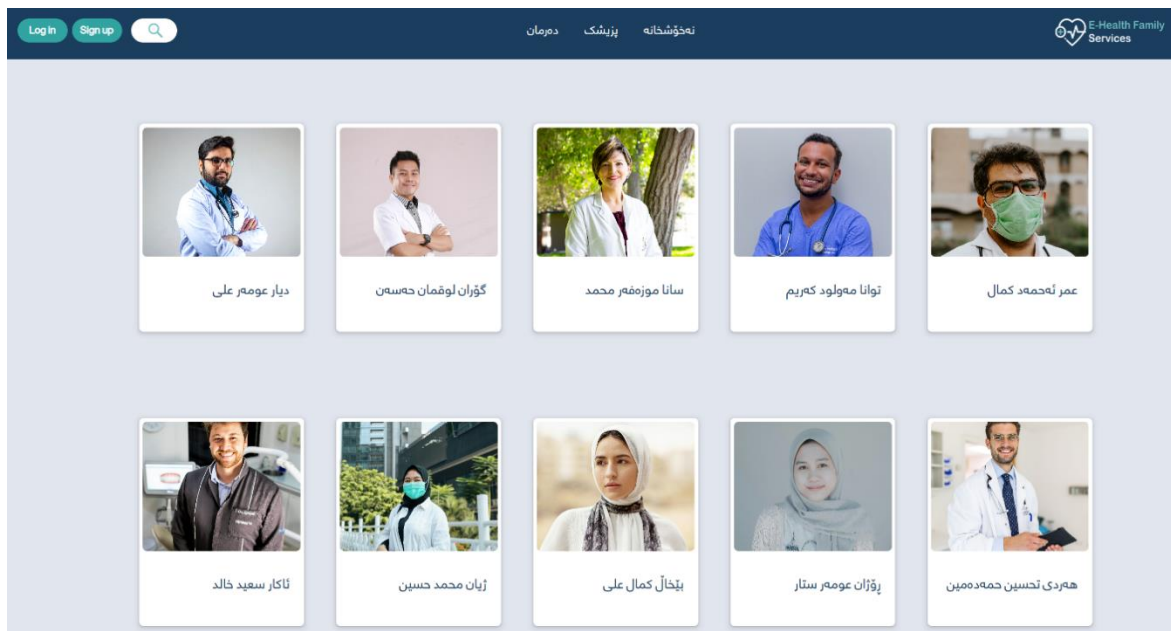

Figure 3.1-5 Doctors List

3.1.4 Detailed Resource Information

3.1.4.1 Doctors

When a user clicks on a doctor from the list, they can access detailed information about the doctor, including their qualifications, areas of expertise, and working schedule.
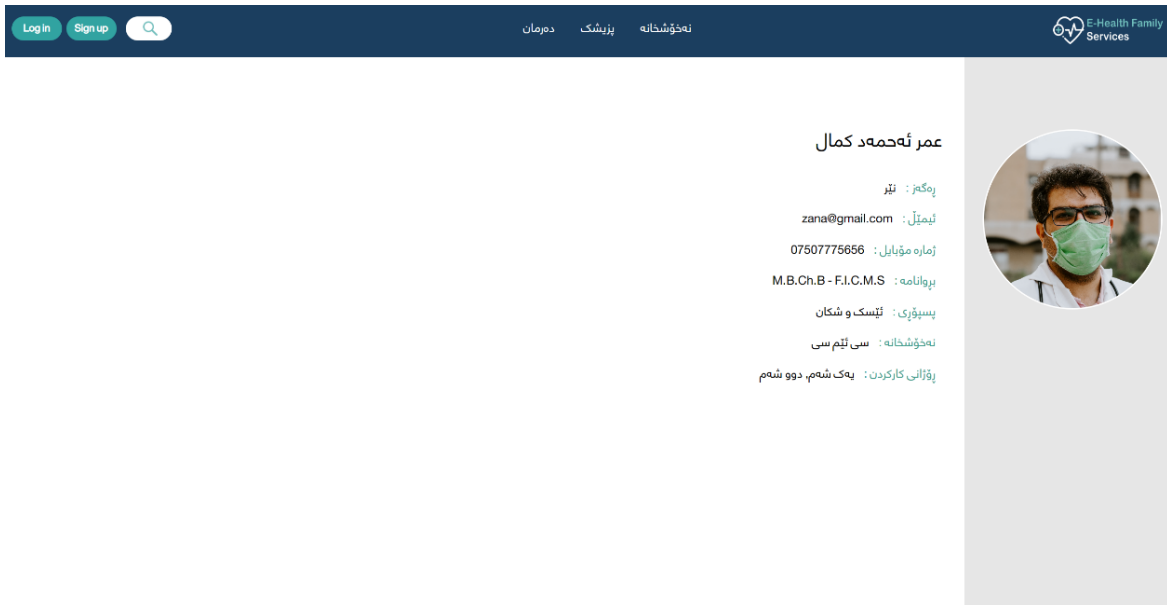

Figure 3.1-6 Doctors Information

3.1.4.2 Hospitals

When a hospital name is clicked, it reveals a profile with its city, contact details, affiliated doctors, and a location map
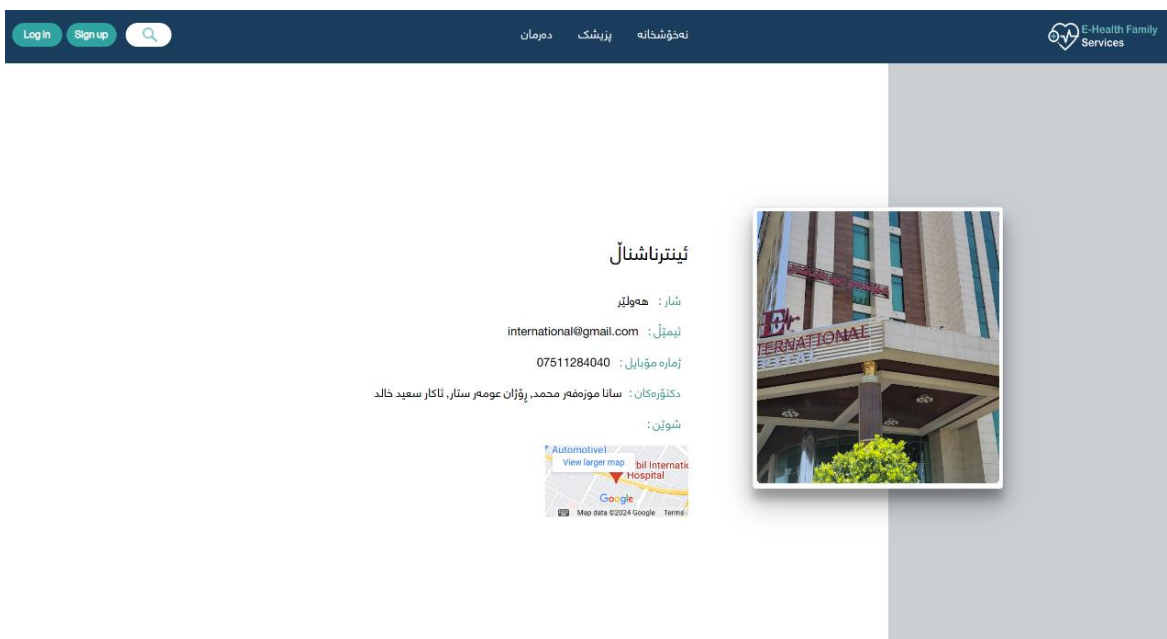

Figure 3.1-7 Hospitals Information

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3.1.4.3   Drugs

The app offers drug profiles with usage and side effects, promotes understanding of treatments, advises consultation with healthcare professionals before starting new medications, and ensures users have the information for informed decisions
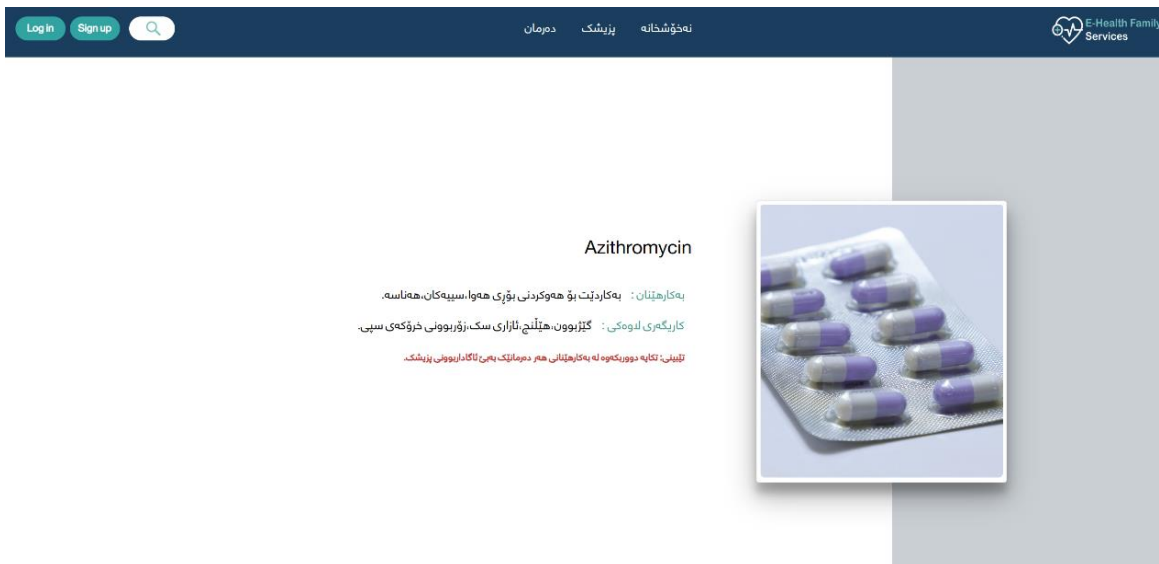

Figure 3.1-8 Drugs Information

3.2 Account Registration & Login

Both doctors and patients can register for an account, allowing them to access personalized features and services. Once registered, they can log in to access their accounts.

Figure 3.2-1 Doctor Signup

Figure 3.2-2 Patient Signup

Figure 3.2-3 Log in

3.3 Appointment Management

3.3.1 Patients

3.3.1.1 Normal Situation

Patients can book appointments with doctors. They select a hospital, choose a doctor based on their preference, and pick an available date and time for the appointment.
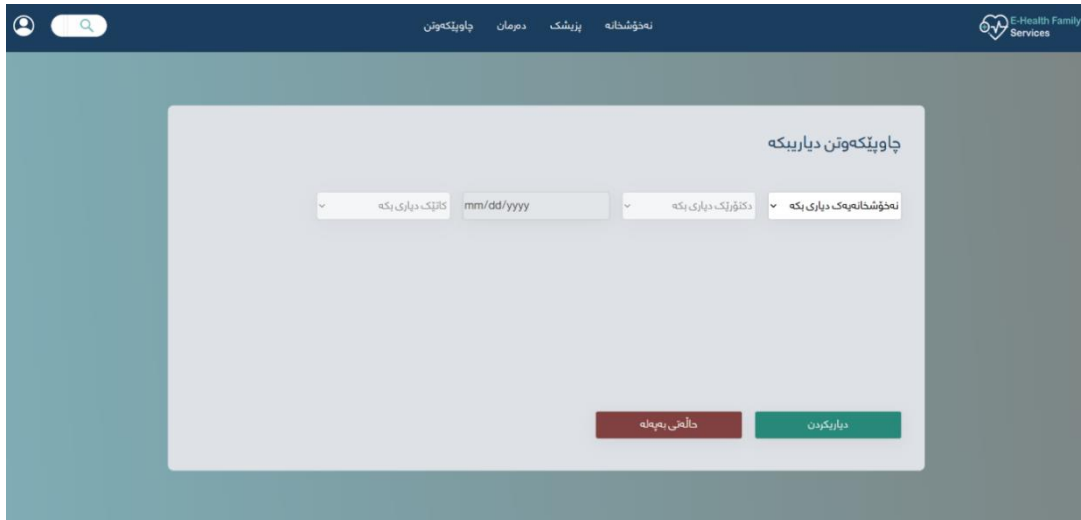

Figure 3.3-1 Booking Appointment

3.3.1.2 Emergency Situation

In situations where all time slots are booked and no dates are available for selection, the application provides an 'Emergency' option. By selecting this option and providing a description of the emergency situation, the patient can alert the doctor to the urgency of their condition. This feature underscores the application's commitment to providing timely healthcare services, even in emergency situations.
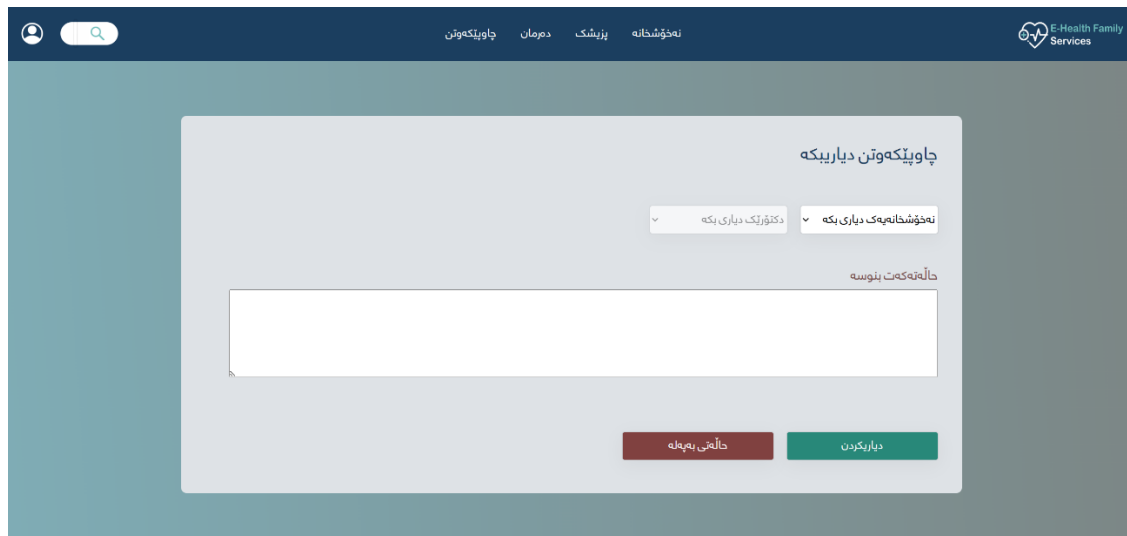

Figure 3.3-2 Emergency Situation

3.3.2 Doctors

3.3.2.1 Normal Cases

Doctors can view their daily appointments and patient profiles. Profiles include personal information and medical history. During each appointment, doctors can add notes and prescribe medicines, which are saved to the patient's medical history.
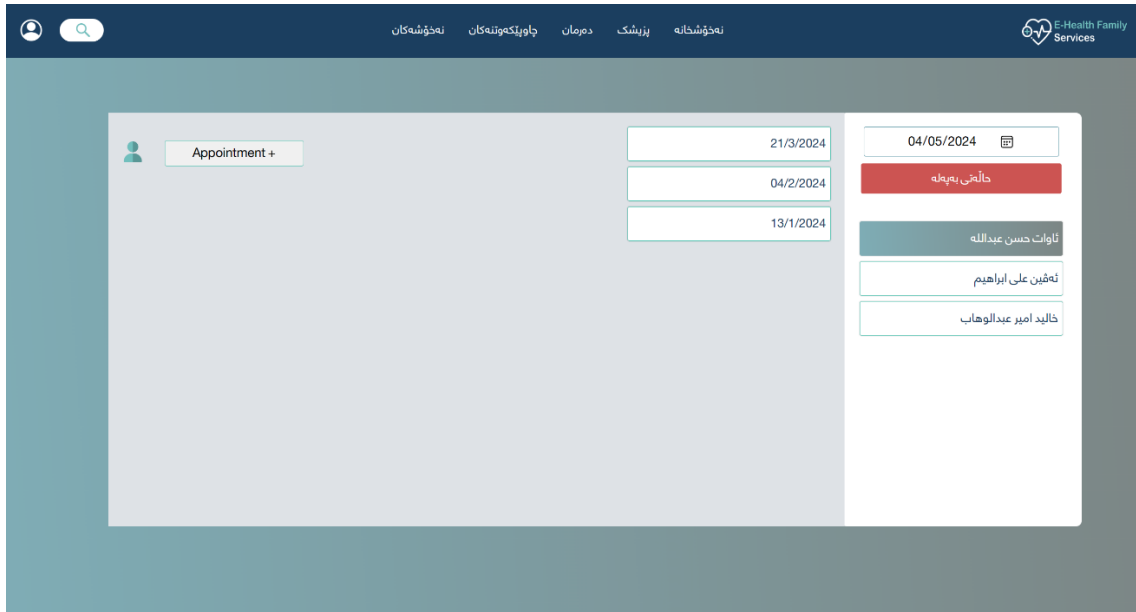

Figure 3.3-3 Appointment List

3.3.2.2 Emergency Cases

The 'Emergency Situation' feature enables doctors to promptly access and modify emergency patients' medical records, ensuring immediate and effective care during urgent situations.

3.3.2.3 Follow Up

Doctors can view the previous visits of patients and their medical history, allowing them to track progress and make informed decisions for future care.

3.3.2.4 Date Input Feature

The application includes a date input feature, allowing doctors to view appointments for other dates. This helps doctors manage their schedules effectively and prepare for upcoming appointments.

3.4 Doctor's Patient Overview

- The 'Patients' provides doctors with a comprehensive list of all their patients.

- Doctors can filter patients based on time frames ('Today', 'This Month', 'This Year', or a custom range), allowing them to track and manage patient visits effectively.

- A gender-based filter ('Male' or 'Female') is available, aiding in the analysis of patient data based on gender demographics.

- A search input is provided for doctors to quickly locate specific patient profiles, enhancing the application's utility.
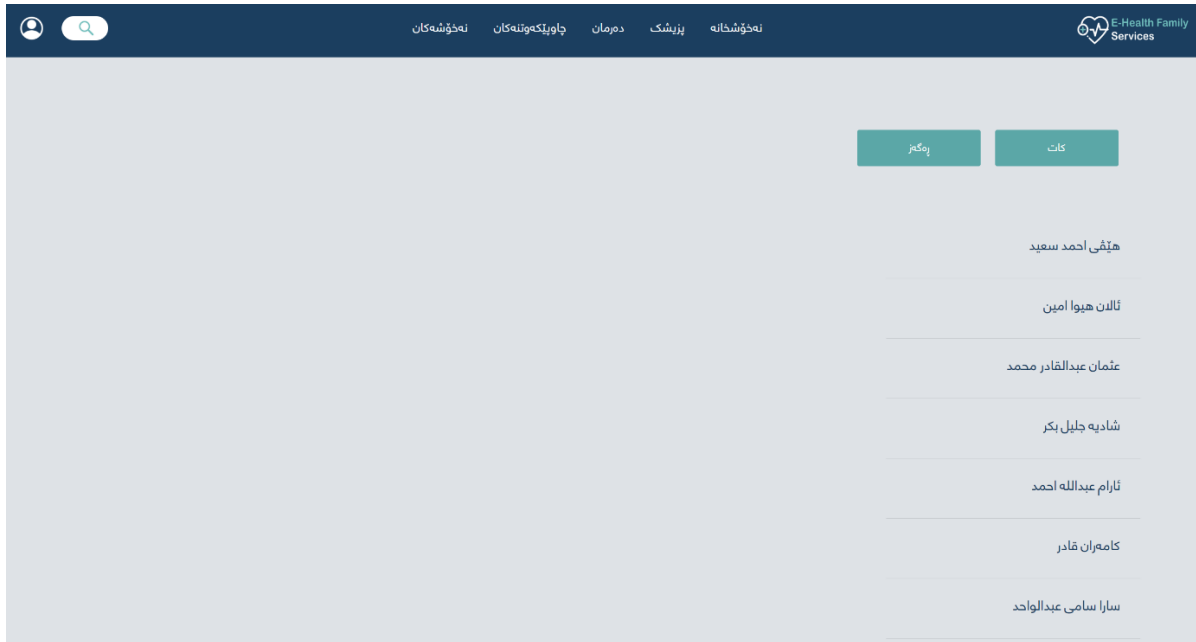

Figure 3.4-1 Patient List

3.5 Profile Management

The application allows both patients and doctors to update their profiles, ensuring the accuracy of personal and professional information. Patients can correct inaccuracies in their personal details, while doctors can modify their contact information, qualifications, working schedule, and profile photo. Additionally, both patients and doctors have the option to delete their accounts if needed.

Figure 3.5-1 Profile Management

3.6 Admin

The Admin role in the application has the highest level of access and control. They can manage all aspects of the application, ensuring its smooth operation.

Figure 3.6-1 Doctors Request

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3.6.1 Doctors

3.6.1.1 Adding and Verifying

When a doctor initiates the sign-up process, their profile undergoes an admin review for validation. Additionally, admins have the authority to directly enroll new doctors into the system. This process involves capturing the doctor's professional details and establishing their account.

3.6.1.2 Rejecting and Deleting

Admins have the authority to reject a doctor during the verification process if necessary. They also have the power to delete doctor profiles for various reasons such as account inactivity, violation of terms, or at the doctor's request.

3.6.2 Hospitals

Admins can add new hospitals to the system and delete existing ones when necessary.

3.6.3 Drugs

Admins have the ability to add new drugs to the system's database and remove existing ones if required.

Chapter Four

5.1 Conclusion

The current state of digital healthcare in Kurdistan reveals a significant gap that needs to be addressed. There is a distinct lack of web applications or research focusing on improving healthcare services through digital means. This presents a unique opportunity for the development of a platform that could transform healthcare delivery in the region. Such a platform would streamline appointment management, provide comprehensive medicine profiles, and enhance the patient experience. Despite potential challenges, particularly in the area of data security, the benefits of such a platform are substantial. This research emphasizes the transformative power of digital technology in healthcare and the need for its adoption in Kurdistan. The development of such a platform could serve as a benchmark for other regions, contributing to the global advancement of digital healthcare solutions. In conclusion, while there is a clear lack of such applications and research in Kurdistan, the potential for growth and innovation in digital healthcare is vast. The development of a web application that enhances healthcare services could revolutionize the healthcare landscape in the region. Despite the challenges, the potential benefits for patients, doctors, and the healthcare system as a whole are immense. This pioneering approach opens avenues for future enhancements and wider applications, setting a new standard for digital healthcare in Kurdistan and beyond.

5.2 Future Works

- **Doctor-Patient Chat:** We plan to create a real-time chat feature that will allow patients and doctors to communicate directly within the application. This will facilitate immediate interaction, enabling patients to ask questions or express concerns, and doctors to provide timely responses and advice.

- **Healthcare Discussion Boards**: We also aim to develop a feature where patients can post about their illnesses in a forum-like environment. Doctors will then have the opportunity to respond to these posts, providing their professional insights and recommendations. This feature will not only foster a sense of community among users but also serve as a valuable source of information and support for patients navigating their health journeys.

- **Doctor Rating System**: We plan to implement a feature that allows patients to rate their doctors based on their experiences. Patients can provide ratings after their appointments, which will then be visible to all users. This system will not only help other patients make informed decisions when choosing a doctor, but also encourage doctors to provide the best care possible.

References

[1] Ancker, J.S., Barron, Y., Rockoff, M.L., Hauser, D., Pichardo, M., Szerencsy, A., & Calman, N. (2011). Use of an electronic patient portal among disadvantaged populations. Journal of General Internal Medicine, 26(10), 1117-1123.

[2] Bullinger, A.C., Rass, M., Adamczyk, S., Moeslein, K.M., & Sohn, S. (2012). Open innovation in health care: Analysis of an open health platform. Health Policy, 105(2-3), 165-175.

[3] Duckett, J. (2011). HTML & CSS: Design and Build Web Sites. John Wiley & Sons.

[4] Haverbeke, M. (2011). Eloquent JavaScript: A Modern Introduction to Programming. No Starch Press.

[5] Horvath, M., Levy, J., L'Engle, P., Carlson, B., Ahmad, A., & Ferranti, J. (2011). Impact of health portal enrollment with email reminders on adherence to clinic appointments: a pilot study. Journal of Medical Internet Research, 13(2), e41.

[6] Jonas, S., Goldsteen, R.L., & Goldsteen, K. (2007). An Introduction to the US Health Care System. Springer Publishing Company.

[7] Nath, C., Huh, J., Adupa, A.K., & Jonnalagadda, S.R. (2016). Website sharing in online health communities: a descriptive analysis. Journal of Medical Internet Research, 18(1), e11.

[8] Shaw, C.L., Casterline, G.L., Taylor, D., Fogle, M., & Granger, B. (2017). Increasing health portal utilization in cardiac ambulatory patients: a pilot project. CIN: Computers, Informatics, Nursing, 35(10), 512-519.

[9] Song, M.J., Ward, J., Choi, F., Nikoo, M., Frank, A., Shams, F., Tabi, K., Vigo, D., & Krausz, M. (2018). A process evaluation of a web-based mental health portal (WalkAlong) using Google Analytics. JMIR Mental Health, 5(3), e50.

[10] Tan, J. (Ed.). (2005). E-Health Care Information Systems: An Introduction for Students and Professionals. John Wiley & Sons.

[11] Wiedemann, A., & Palmer, S. (2013). Practical PHP and MySQL Website Databases: A Simplified Approach. Apress Media LLC.

پوخته

زۆرجار کەرتی چاودێری تەندروستی رووبەرووی ئاستەنگ دەبێتەوە لە بەڕێوەبردنی کارلێکەکانی نەخۆش و پزیشک، خشتەی چاوپێکەوتن و زانیارییەکانی چاودێری تەندروستی. پێویستی بە چارەسەرێک هەبوو کە بتوانێت ئەم پرۆسانە رێکبخات و سەکۆیەکی بەکارهێنەر دۆستانە بۆ هەردوو نەخۆش و پزیشک دابین بکات. ئامانج لێی پەرەپێدانی بەرنامەیەکی وێبی گشتگیر بوو کە بەڕێوەبردنی کارامەی چاودێری تەندروستی ئاسان دەکات, وە سەکۆیەک کە نەخۆش و پزیشکەکان بتوانن کارلێک بکەن، کاتەکانی چاوپێکەوتن دابنێن و زانیارییەکانی چاودێری تەندروستی بە شێوەیەکی کاریگەر بەڕێوەببەن. کێشەکە بە دیزاینکردنی تایبەتمەندییە سەرەکییەکانی وەک ڕووکارێکی بەکارهێنەر دۆستانە، کارایی گەڕانی بەهێز، پرۆفایلی ورد بۆ پزیشکان و نەخۆشەکان و سیستەمێکی رێکخراو بۆ حجزکردنی چاوپێکەوتن چارەسەر کرا. هەروەها ئەپلیکەیشنەکە سیستەمێکی بەهێزی پشتراستکردنەوەی بۆ پزیشکان و پرۆسەی تۆمارکردنی نەخۆشی لەخۆگرتبوو. جگە لەوەش، ئامرازەکانی بۆ پزیشکان دابین کرد بۆ بەڕێوەبردنی چاوپێکەوتنەکانیان و کارلێکەکانی نەخۆشەکان بە شێوەیەکی کاریگەر. بەرنامەکە بە سەرکەوتوویی سەرکەوتووییەکی سەرچاوەیەکی چاودێری تەندروستی جێی متمانە و بەکارهێنەر دۆستانە و گشتگیر دابین دەکات. دڵنیای دەدات لەوەی کە هەموو بەکارهێنەران دەتوانن دەستیان بە سەرچاوەی پێویست بگات بۆ بڕیاردانی ئاگادارانە سەبارەت بە چاودێری تەندروستی خۆیان. ئەپلیکەیشنەکە بە شێوەیەکی کاریگەر کێشەی سەرەتایی چارەسەر کردووە بە رێکخستنی کارلێکەکانی نەخۆش و پزیشک و بەڕێوەبردنی زانیارییەکانی چاودێری تەندروستی.