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E-Health

Final Year Project Report

Submitted by

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Supervisor

Sir Mohsin Raza Khan

³
In partial fulfilment of the requirements for the degree of
Bachelor of Science in Computer Science
2021-25

Faculty of Engineering Sciences and Technology

Hamdard Institute of Engineering and Technology

Hamdard University, Main Campus, Karachi, Pakistan

Certificate of Approval



Faculty of Engineering Sciences and Technology

**Hamdard Institute of Engineering and Technology
Hamdard University, Karachi, Pakistan**

"E-Health" is a final year project developed by Muaaz Ahmed Baig (1726-2021), Syed Fazal Ullah (2173-2021), and S.M Hamza Sohail (2271-2021). The project was completed under the guidance of our supervisor and formally approved by the project evaluation committee at Hamdard Institute of Engineering and Technology, as part of the academic requirements for the Bachelor's degree in Computer Science.

Mr. XYZ
(Project Supervisor)

In-charge FYP-Committee

Mr. XYZ
(Project Co-Supervisor)

Chairman
(Department of Computing)

(Dean, FEST)

Authors' Declaration

We declare that this project report was carried out in accordance with the rules and regulations
of Hamdard University. The work is original except where indicated by special references in
the text and no part of the report has been submitted for any other degree. The report has not
been presented to any other University for examination.

Dated:

Authors Signatures:

Muaaz Ahmed Baig

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Plagiarism Undertaking

We, Muaaz Ahmed Baig, Syed Fazal Ullah, and S.M Hamza Sohail, hereby declare that all the work included in this Final Year Project report, titled "E-Health," has been completed entirely by us. We did not receive any major assistance from others, except for a few individuals whom we have acknowledged properly. We also confirm that no part of this report has been copied, and any external content used has been clearly cited and referenced.

Dated:

Authors Signatures:

Muaaz Ahmed Baig

Syed Fazal Ullah

S.M Hamza Sohail

Acknowledgments

First and foremost, we are deeply thankful to Almighty Allah, the Most Kind and Most Generous, for blessing us ³with the ability and knowledge to complete this project. We also hold great respect for the Holy Prophet Hazrat Muhammad (peace be upon him), whose teachings continue to guide and inspire people across all generations.

³We would like to sincerely thank Hamdard Institute of Engineering and Technology for their continuous support throughout our final year project. This journey has been a meaningful milestone for us as undergraduate students. We are especially grateful to our supervisor, Sir Mohsin, whose valuable guidance and encouragement played a key role in helping us complete this project. His honest feedback, constant support, and friendly attitude motivated us at every step and helped us turn our ideas into reality.

1 Document Information

Table 1: Document Information

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|------------------|--|
| Customer | |
| Project Title | Health |
| Document | Final Year Project Report |
| Document Version | 1.0 |
| Identifier | <>Final Report |
| Status | Final |
| Author(s) | Muaaz Ahmed Baig, S.M Hamza Sohail, Syed Fazal Ullah |
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1 Definition of Terms, Acronyms, and Abbreviations

This section should provide the definitions of all terms, acronyms, and abbreviations required to interpret the terms used in the document properly.

Table 2: Definition of Terms, Acronyms, and Abbreviations

| Scrum | It is used to agile methodology in this project |
|-----------------|--|
| Firebase | Firebase can help the hosting the mobile and web application |
| Frontend | It is part of the User Interface which shows in the screen using the HTML, CSS, JavaScript and the modern language that is React Native. |
| Backend | The back side of the application that can not shows the user. It can store the user data and help the functionality. |
| MongoDB | It is flexible and scalable data storage in the database system. |
| | |
| | |
| | |

Abstract

Getting proper healthcare isn't always easy especially for people living in far-off areas or when quick medical help is needed. Our E-Health app aims to solve this problem by offering a complete online solution. Through this platform, users can easily find doctors, book appointments, and even schedule lab tests without leaving their homes. It helps save time and avoids the hassle of standing in long queues. Patients can select doctors based on their field of expertise, check when they're available, and get online tokens that keep them updated about their turn and expected wait time. For lab tests, users can view a list of available labs, see test prices, and check important details, which makes the whole process simple, clear, and more convenient.

This E-Health application extends beyond appointments and lab tests by incorporating an integrated online medical store, enabling patients to order their prescribed medications online. This feature eliminates the inconvenience of visiting physical pharmacies. The primary goal of this application is to make healthcare services more accessible, convenient, and timely. By leveraging technology, we aim to simplify healthcare access for everyone, ensuring patients receive better and more prompt medical attention.

Keywords:

- Timely Healthcare
- Remote Healthcare
- Patient Portal
- Online Consultation
- Doctor Search
- Clinic Management
- Laboratory Management System
- Lab Test Booking
- Medical Testing
- Online Pharmacy
- Online Medicine Ordering

CHAPTER 1

INTRODUCTION

1.1 Motivation

Our team is genuinely motivated to change the way people manage and access healthcare. We understand how frustrating the current system can be—with long waiting times, complicated procedures, and limited access to timely medical help, especially in areas that are often neglected. This project was born from our concern for these issues and our belief that technology can bring meaningful change by making healthcare easier, faster, and more focused on the patient's needs. Our goal is to give people more control over their health by offering tools that help them make better decisions and get quick medical support.

We've personally seen friends and family struggle to get timely treatment, and those experiences have pushed us to take this project seriously. It's clear that there's a real need for smart solutions that make it easier for patients to connect with doctors and healthcare providers. With E-Health, we aim to build a platform that makes communication smoother, appointment booking simpler, access to medical records and test reports easier, and even offers online access to needed medicines. In the end, our vision is to create a reliable and easy-to-use healthcare system that not only saves time and effort but also makes healthcare more reachable and affordable for everyone.

1.2 Problem Statement

The main problem our application aims to solve is the inconvenience patients face while seeking medical services. Usually, when someone visits a clinic, they have to wait a long time just to get an appointment or see the doctor. The same goes for laboratory tests—patients often spend hours waiting for their turn. On top of that, finding the right medicines nearby can also be a hassle, especially when local medical stores don't have the required stock. Our app is designed to reduce these issues by providing easier and faster access to all these services from one platform.

1.3 Goals and Objectives

The main goals of the E-Health Application are focused on making healthcare more accessible and efficient. We aim to build a secure and easy-to-use messaging system that helps doctors and patients communicate smoothly. One of our key features is a simple appointment booking system that cuts down wait times and keeps patients more involved in their care. The app will also allow users to safely access their medical records and test results anytime.

Besides that, we want to keep users informed by sharing helpful health tips and educational content. We're making sure the app follows proper data privacy and security standards. The design will be simple and user-friendly for both doctors and patients. Lastly, we're developing the app in a way that it can grow in the future, with room to add more features when needed. In short, our aim is to deliver a complete, reliable, and easy-to-use platform that improves healthcare delivery, encourages patient involvement, and strengthens doctor-patient communication.

2 Project Scope

- Through this E-Health System, Patients can search clinic or doctors based on specialization, name, or availability.
- Patients can receive a token number online for their appointment. Displays the current token number being served and an estimated wait time.
- A laboratory management system will work in the same way as a clinic management system.
- When scheduling a test, you can see a list of laboratories, their prices, and any other relevant details.
- This application will provide online service of medical store and patients can buy their prescribed medicines.

CHAPTER 2

RELEVANT BACKGROUND & DEFINITIONS

The project titled "E-Health Application" was initiated in response to the growing need to address inefficiencies and challenges within existing healthcare systems. Current practices often involve manual processes for appointment scheduling, patient record management, prescription refills, and communication between patients and healthcare providers. These manual methods are time-consuming, prone to errors, and can lead to delays in patient care. For example, manual appointment scheduling can result in double-bookings or missed appointments, while paper based records are not predictable to loss, damage, and unauthorized access. Communication delays can hinder timely diagnosis and treatment.

The lack of an integrated system also creates difficulties in accessing and sharing patient information across different healthcare providers, leading to fragmented care. Furthermore, patients often face challenges in obtaining timely updates on test results, prescription refills, and other important information. These issues contribute to a suboptimal patient experience and increase the administrative burden on healthcare staff. As the demand for healthcare services grows, the limitations of existing manual systems become even more apparent.

This project proposes the development of a robust E-Health platform that leverages technology to streamline and enhance various aspects of healthcare delivery. The proposed solution aims to improve accuracy, efficiency, and transparency while reducing manual workload and associated errors by automating appointment scheduling, patient record management, prescription refills, communication, and access to medical information. This solution ensures scalability, compliance with healthcare regulations (such as HIPAA), and a user-friendly interface for both patients and healthcare providers.

Definitions

1. **E-Health/Telehealth:** The use of electronic ⁸ information and communication technologies to deliver and support healthcare at a distance.
2. **Appointment Scheduling System:** An automated system for booking, managing, and tracking patient appointments.

3. **Patient Portal:** A safe and private online space where patients can view their medical history, stay in touch with their doctors, and manage their personal health information with ease.
4. **Real-Time Notifications:** Immediate updates provided to patients regarding appointments, test results, prescription refills, or other important information.
5. **Data Security and Privacy:** Steps are taken to ensure patient data is fully protected from any unauthorized access, misuse, exposure, tampering, or loss.
6. **Interoperability:** The ability for different systems, devices to exchange and use information.
7. **User-Friendly Interface:** An intuitive platform design that allows patients and healthcare providers to easily navigate and use the system.

CHAPTER 3

LITERATURE REVIEW & RELATED WORK

Literature Review

Many studies and real-world examples have shown how automation can greatly benefit the healthcare sector—especially by improving how patients move through the system, cutting down wait times, and boosting overall efficiency. Looking at the existing research gives us a solid understanding of why automation is so valuable in these areas.

1. **Challenges in Manual Management:** Manual systems for appointment booking, lab test scheduling, and prescription management often lead to inefficiencies, errors, and patient dissatisfaction.
2. **Benefits of Automated Work:** Automated systems offer benefits such as reduced wait times, improved accuracy in data management, real-time tracking of appointments and tests, and enhanced patient communication.
3. **Token Management Systems:** Effective token management systems can significantly reduce patient wait times and improve clinic flow by providing a clear and organized queuing system.
4. **Laboratory Information Management Systems:** These automate lab processes, from sample tracking to result reporting, increasing efficiency and reducing errors.
5. **Online Pharmacies:** Online medical stores offer convenience for patients by allowing them to order prescriptions remotely and often provide better price transparency.

Related Work

Various platforms and applications have been developed to address specific aspects of healthcare management. For example, some systems focus on online appointment booking, while others specialize in laboratory management or online pharmacies. However, many existing solutions are fragmented, lacking integration between these key components. Some systems also lack user-friendly interfaces or robust features like real-time tracking and notifications.

Gap Analysis

Many clinics and healthcare facilities still rely on manual or partially automated systems for managing appointments, lab tests, and medication dispensing. This leads to several challenges:

Current Problems

1. **Long Wait Times:** Manual token systems and inefficient appointment scheduling contribute to long patient wait times.
2. **Inefficient Lab Processes:** Manual lab processes are prone to errors and delays in result reporting.
3. **Inconvenient Medication Access:** Patients face inconvenience in obtaining prescriptions from physical pharmacies.
4. **Lack of Integration:** Existing systems often operate in silos, lacking integration between clinic management, lab management, and the medical store.

How This Project Fills the Gaps

This project aims to develop an integrated E-Health platform that addresses these gaps by:

- **Automated Token Management:** Providing an online token system with real-time updates and estimated wait times.
- **Integrated Laboratory Management:** Streamlining lab test ordering, result reporting, and data management.
- **Efficient Clinic Management:** Simplifying appointment scheduling, patient record management, and communication.
- **Integrated Medical Store:** Offering online access to medications with convenient ordering and delivery options.

CHAPTER 4

PROJECT DISCUSSION

1. Software Engineering Methodology

We adopted the Agile methodology, specifically the Scrum framework, for this project. Scrum's iterative and incremental approach, with short sprints (e.g., two-week cycles), daily stand-up meetings, and continuous feedback, allowed us to adapt to changing requirements and ensure consistent progress. This methodology facilitated effective collaboration within the team and with stakeholders.

2. Project Methodology

Our project methodology, based on Scrum, consisted of the following key stages:

- **Sprint Planning:** At the start of every sprint, we set clear goals, picked tasks from the product backlog (which includes all planned features), and divided responsibilities among the team.
- **Daily Stand-up Meetings:** We held quick daily check-ins to share progress, discuss any blockers, and stay aligned as a team.
- **Sprint Review:** After each sprint, we presented the finished work to stakeholders and collected their feedback for improvement.
- **Sprint Retrospective:** We took time to look back on the sprint, discussed what went well and what could be improved to make the next one even better.

3. Phases of Project

The project was divided into the following phases:

1. **Requirements Gathering and Analysis:** Defining the functionalities of the token management, lab management, clinic management, and medical store modules.
2. **System Design:** Designing the database schema, user interfaces, and overall system architecture.
3. **Development:** Implementing the features in each module through iterative sprints.
4. **Testing:** Conducting unit, integration test, and user acceptance tested to ensure quality.
5. **Deployment:** Deploying the application to a server or hosting environment.
6. **Maintenance (Optional):** Ongoing bug fixes and updates after deployment.

4. Software/Tools Used in Project

- **Frontend:** React Native (for the user interface)
- **Backend:** (Specify your backend technology, e.g., Node.js with Express etc)
- **Database:** MongoDB (as mentioned before)
- **Cloud Platform/Hosting:** (If applicable, e.g., Firebase as you mentioned, AWS, Google Cloud, etc.)
- **IDE (Integrated Development Environment):** (e.g., VS Code)
- **Version Control:** Git (e.g., GitHub)
- **Other Libraries/Frameworks:** (List any other significant dependencies used)

5. Hardware Used in Project

- Developer Laptops/Desktops: (Specify general specs, e.g., Intel i5/i7 processors, 8/16GB RAM)
- Testing Devices: (If applicable, e.g., various mobile devices for testing responsiveness)
- Server (If applicable): (If you set up your own server for testing or deployment)

This structured outline should give you a good starting point for writing Chapter 4.

Remember to provide specific details and explanations relevant to your project's implementation. For example, in the "Software/Tools" section, you would list the specific versions of ReactJS, Node.js, etc., that you used. If you used any specific libraries for token management, lab integration, or payment processing, list them here as well.

Chapter 5

IMPLEMENTATION

Let's outline Chapter 5, "Implementation," focusing on the key aspects you've provided and keeping in mind your E-Health application's features (token management, lab management, clinic management, and medical store).

CHAPTER 5: IMPLEMENTATION

This chapter details the implementation of the E-Health application, covering the system architecture, functional and non-functional specifications, and the testing process.

5.1 Proposed System Architecture/Design

(Here, you'll describe the overall structure of your application. A diagram would be very helpful here. A common architecture for web applications is a three-tier architecture)

Our system follows a three-tier architecture:

- **Presentation Tier (Frontend):**
This is the user interface that patients and staff interact with. It's built using ReactJS, providing a responsive and user-friendly experience.
- **Application Tier (Backend):**
This tier handles the application logic, data processing, and communication between the frontend and the database. (Specify your backend technology here, e.g., Node.js with Express).
- **Data Tier (Database):** This tier stores the application's data, including patient information, appointments, lab results, medication details, etc. We use MongoDB as our database.

(You can add more detail here, such as:

- How the different modules (token, lab, clinic, medical store) interact.
- API design (if you have specific APIs).
- Security measures implemented.)

5.2 Functional Specifications

(This section describes what the system does. List the key functionalities of each module)

- **Token Management:**
 - Online token generation for patients.
 - Real-time display of current token number and estimated wait time.
 - Token status updates (e.g., called, in progress, completed)
- **Laboratory Management:**
 - Lab test ordering and scheduling.
 - Result entry and reporting.
 - Integration with lab equipment (if applicable).
 - Storage and retrieval of lab results.

- **Clinic Management:**
 - Appointment schedule and management.
 - Patient record management.
 - Doctor and staff management.
 - Communication features (e.g., messaging).
- **Medical Store:**
 - Online medicine catalog.
 - Prescription upload and verification.
 - Order placement and tracking.
 - Inventory management.

5.3 Non-Functional Specifications

(This section describes how the system performs. These are qualities like performance, security, usability, etc.)

- **Performance:** System is to be responsive and handle a large number of users.
- **Security:** Patient data must be protected through secure authentication, authorization, and data encryption. (Mention HIPAA compliance if applicable).
- **Usability:** The user interface should be intuitive and easy to navigate for both patients and staff. 4
- **Scalability:** System is to be able to handle increase the data volume and user traffic.
- **Reliability:** The system should be available and operational with minimal downtime.
- **Accessibility:** The system should be accessible to users with disabilities (WCAG compliance).

5.4 Testing

(Briefly describe the testing strategy you used)

We employed a combination of tests methods:

- **Unit Test:** We tested each part of the system separately to make sure every component works correctly on its own.
- **Integration Test:** We checked how different modules work together to ensure smooth interaction across the system.
- **User Acceptance Test (UAT):** We involved real users, like patients and staff, to test the system and confirm that it meets their expectations and needs..

5.5 Purpose of Testing

(Explain why testing is important)

The purpose of testing was to:

- Identifying the bugs and fix it.
- Make sure the system fulfills both its functional goals and performance related expectations.
- Validate the system's performance, security, usability, and reliability.
- Ensure a high-quality user experience.

5.6 Test Cases

(Provide a few examples of test cases. A table format is often used)

| Test Case ID | Module | Test Description | Expected Result | Actual Result | Status |
|--------------|-------------------|------------------------------------|--|---------------|--------|
| TC001 | Token Management | Generate a new token online | Token generated successfully with unique ID | | |
| TC002 | Lab Management | Schedule a lab test | Test scheduled and confirmation sent to patient | | |
| TC003 | Medical Store | Order a prescription medication | Order placed successfully and order details displayed | | |
| TC004 | Clinic Management | Book an appointment with a doctor. | Appointment booked successfully and confirmation sent to patient and doctor. | | |

(Remember to fill in the "Actual Result" and "Status" columns after performing the tests.
Expand this table with more relevant test cases. Include both positive and negative test cases (e.g., trying to book an appointment at a time that's already booked.)
This expanded outline provides a more comprehensive structure for Chapter 5. Remember to fill in the details with specific information from your project. Diagrams, screenshots, and code snippets (where relevant) can greatly enhance this chapter.

Chapter 6

EXPERIMENTAL EVALUATIONS & RESULTS

This presents the evaluation of E-Health application, detailing the testbed setup and discussing the results obtained.

6.1 Evaluation Testbed

(This section describes the environment in which you conducted your tests. Be specific)

- **Hardware:**
 - Client Devices: Specify the devices used for testing (e.g., desktop computers with specific OS and browser versions, mobile phones with different OS versions and screen sizes).
 - Server Environment: Describe the server where your application was deployed (e.g., cloud platform, server specifications like CPU, RAM, OS).
- **Software:** List the specific versions of browsers, operating systems, and any testing tools used.
- **Network Conditions:** If relevant, mention the network conditions under which testing was performed (e.g., local network, simulated internet connection with different bandwidths).
- **User Group (if applicable):** If you conducted user testing, describe the demographics of the participants (e.g., age range, technical proficiency).

Example:

"The evaluation was conducted using a combination of desktop computers (Windows 10, Chrome v90, Firefox v80), mobile phones (Android 11, iOS 14), and a cloud-based server (AWS EC2 instance with 2 vCPUs and 4GB RAM). User testing involved 10 participants aged between 25 and 45 with varying levels of technical experience. Network conditions during testing simulated a typical broadband internet connection."

6.2 Results and Discussion

(This is the core of the chapter. Present your findings using tables, graphs, and clear explanations. Focus on metrics relevant to your application)

Here are some possible evaluation areas and metrics:

- **Usability Testing:**
 - **Task Completion Rate:** Percentage of users who successfully completed specific tasks (e.g., booking an appointment, ordering medication).
 - **Task Complete Time:** This is time taken to complete the specific tasks.
 - **Error Rate:** Number of bugs made by users during task completion.
 - **System Usability Scale (SUS) Score:** A standardized questionnaire for measuring usability.

- *Example:* "85% of users successfully booked an appointment within 2 minutes. The average time to order medication was 1 minute 30 seconds. The average SUS score was 80, indicating high usability."
- **Performance Testing:**
 - **Response Time:** Time taken for the system to respond to user actions (e.g., loading a page, submitting a form).
 - **Throughput:** Measures how many requests the system can process each second.
 - **Resource Utilization:** Tracks how much CPU and memory the server uses when handling various levels of traffic.
 - *Example:* "The average page load time was under 2 seconds. The system could handle 100 concurrent users with acceptable response times."
- **Functionality Testing:**
 - Test cases from Chapter 5 can be summarized here with the results (pass/fail). Focus on key functionalities of each module.
 - *Example:* "All test cases related to token generation, appointment booking, and medication ordering passed successfully."
- **User Feedback (if applicable):**
 - Summarize feedback collected from user testing or surveys.
 - *Example:* "Users found the interface intuitive and easy to navigate. Some users suggested adding more detailed information about doctors' specializations."

Example of a table for Performance Testing:

| Test Scenario | Number of Concurrent Users | Average Response Time (ms) |
|---------------------|----------------------------|----------------------------|
| Homepage Load | 10 | 500 |
| Appointment Booking | 50 | 1200 |
| Medication Ordering | 100 | 2000 |

Example of a graph for Usability Testing: A bar chart showing task completion rates for different tasks.

Discussion:

After presenting the results, discuss their implications.

- Did the system meet the expected performance and usability goals?
- What are the strengths and weaknesses of the system based on the evaluation?
- What are the potential areas for improvement?
- How do your results compare to similar existing systems (if you have any data for comparison)?

By following this structure and providing specific data and analysis, you can create a strong and informative "Experimental Evaluations & Results" chapter. Remember to use visuals (graphs, charts) to present your data effectively.

CHAPTER 7

CONCLUSION AND DISCUSSION

Let's outline Chapter 7, "Conclusion and Discussion," specifically for your E-Health application.

CHAPTER 7: CONCLUSION AND DISCUSSION

This chapter summarizes the project, highlighting its strengths, limitations, and potential future work.

7.1 Strengths of this Project

*(This section emphasizes the positive aspects and achievements of your E-Health application.
Focus on how it addresses the problems you identified in earlier chapters)*

Here are some possible strengths, tailored to your application's focus:

- **Integrated Platform:** The key strength is the integration of multiple healthcare services (token management, lab management, clinic management, and medical store) into a single platform. This provides a more convenient and streamlined experience for patients.
- **Improved Patient Experience:** The application aims to reduce wait times, simplify appointment booking and lab test scheduling, and provide easy access to medications, leading to a better overall patient experience.
- **Enhanced Efficiency:** Automation of key processes (token generation, lab result reporting, prescription processing) improves efficiency for both patients and healthcare providers.
- **Accessibility and Convenience:** The online platform makes healthcare services more accessible, especially for people in remote areas or those with limited mobility.
- **Real-time Information:** Features like real-time token tracking and appointment reminders keep patients informed and reduce missed appointments.
- **Transparency:** Providing clear information about lab test prices and medication availability promotes transparency in healthcare costs.
- **User-Friendly Interface:** A well-designed user interface makes the application easy to use for people with varying levels of technical proficiency.

Example:

"The primary strength of this project lies in its integrated approach, combining token management, lab management, clinic management, and an online medical store into a single, user-friendly platform. This integration streamlines the patient journey, reducing the need to navigate multiple systems. The implementation of real-time token tracking and automated appointment reminders significantly improves patient convenience and reduces missed appointments. Furthermore, the online medical store offers greater accessibility to medications, particularly for those in remote areas."

7.2 Limitations and Future Work

(This section acknowledges the limitations of your project and suggests areas for future improvement or expansion)

Here are some potential limitations and future work items:

- **Limited Scope:** The current implementation focuses on specific features (token, lab, clinic, medical store). Future work could expand the scope to include other functionalities, such as:
 - Telemedicine/video consultations.
 - Integration with electronic health records (EHRs).
 - Payment gateway integration for online payments.
 - Health tracking and monitoring features.
 - Integration with insurance providers.
- **Scalability Testing:** While you may have done some performance testing, more extensive scalability testing could be performed to ensure the system can handle a very large number of users and transactions.
- **Security Enhancements:** While security measures were implemented, ongoing security audits and updates are crucial to protect patient data.
- **Accessibility Enhancements:** Further improvements could be made to ensure accessibility for users with disabilities, adhering to WCAG guidelines.
- **User Feedback and Iteration:** Gathering more user feedback after deployment would be valuable for further improving the application.
- **Mobile App Development:** Developed the react native mobile apps (apple and Android) could enhance performance and user experience.
- **Connecting with Wearable Devices:** In the future, the app could link with wearable gadgets to enable real-time health tracking and seamless data sharing with doctors.

Example:

"While the application provides a comprehensive set of features within its defined scope, it currently lacks integration with existing EHR systems. Future work could focus on establishing secure data exchange with EHRs to provide a more holistic view of patient health. Additionally, integrating a payment gateway would allow for online payments for consultations and medications. Further usability testing with a larger and more diverse user group would also be beneficial."

7.3 Reasons for Failure – If Any (Or Lessons Learned)

(This section addresses any challenges or setbacks faced during the project. If there were no major failures, you can reframe this as "Lessons Learned" or "Challenges and Solutions.")
If your project was generally successful, you can discuss lessons learned:

- **Challenges and Solutions:** Discuss any technical or logistical challenges you encountered and how you overcame them. This shows your problem-solving skills.

Example:

"One of the main challenges encountered during development was integrating the different modules seamlessly. This was addressed by implementing a well-defined API and conducting thorough integration testing. Another challenge was ensuring data consistency across the different modules. We addressed this by implementing robust data validation and synchronization mechanisms."

If there *were* significant failures or unmet objectives, you should honestly address them, explaining the reasons for the failure and what could have been done differently. This demonstrates self-awareness and learning.

By following this structure and filling in the details with specific information from your project, you can create a comprehensive and insightful conclusion.

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A5. Flyer or Poster Design

The poster features a central smartphone displaying a medical app interface with a plus sign. Surrounding the phone are various medical icons: a stethoscope, a microscope, test tubes, a syringe, and a person icon. In the top left corner, there's a red triangle containing the letters 'F21'. At the top center is the logo of Standard University. A large black diagonal band across the middle contains the project details. On the right side of this band is a circular logo with 'CS' in it.

PROJECT NAME
E-HEALTH

PROJECT SCOPE
THIS E – HEALTH SYSTEM, PATIENTS CAN SEARCH CLINIC OR DOCTORS BASED ON SPECIALIZATION, NAME, OR AVAILABILITY. A LABORATORY MANAGEMENT SYSTEM WORK IN THE SAME WAY AS A CLINIC MANAGEMENT SYSTEM. THIS ALSO PROVIDE ONLINE MEDICAL STORE SERVICE.

PROJECT OBJECTIVE
THE E-HEALTH PROJECT ARE TO DESIGN A SECURE AND USER-FRIENDLY MESSAGING SYSTEM COMMUNICATION, DEVELOP AN INTUITIVE APPOINTMENT SCHEDULING FEATURE, IMPROVE PATIENT ENGAGEMENT, AND CREATE A SECURE AND EASILY ACCESSIBLE PLATFORM TO VIEW THEIR MEDICAL RECORDS AND TEST RESULTS.

PROJECT STATUS
SECOND EVALUATION

SUPERVISOR
MOHSIN RAZA
CO-SUPERVISOR

MUAAZ AHMED (1726-2021)
S.M HAMZA SOHAIL (2271-2021)
SYED FAZALULLAH (2173-2021)

A1b. Jury Comments on Project Proposal Evaluation

Hamdard University
Faculty of Engineering Sciences and Technology
Department of Computing

FYP -PE-2024

FINAL YEAR PROJECT - PROPOSAL EVALUATION

Project Title: F - HEALTH

Project ID: _____

Project Domain: Process Automation Evaluation Date: 31/July/24

Supervisor Name: Sir Ahsan Raza Co-Supervisor Name: _____

Project Members:

| Sn. No. | Name | CMS ID |
|---------|-----------------|-------------|
| 1 | Muazz Ahmed | 1726 - 2021 |
| 2 | Sir Hamza Sohal | 2271 - 2021 |
| 3 | Syed Fazlullah | 2113 - 2021 |
| 4 | | |

For Evaluators only:

| Evaluation Parameters | Please select the appropriate option | | | |
|--|--|--|--|--|
| | E: Excellent | G: Good | S: Just Satisfactory | N: Not Satisfactory |
| Subject Knowledge | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N |
| Problem Statement | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N |
| Organization & Content of Presentation | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N |
| Project Scope Defined | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N |
| Methodology | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N |
| Language & Grammar | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N |
| Attire, Delivery and Presentation Skills | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N |
| Work Division | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N | <input type="checkbox"/> E <input checked="" type="checkbox"/> G <input type="checkbox"/> S <input type="checkbox"/> N |
| Name & Sign of Evaluator: | | | | |

Suggestions of evaluators:

- Need to focus more on domain/problem understanding
- Need to focus on technical aspects, tools etc.
- Teamwork is weak.
- Overall OK.

For FYP Committee only:

Result Summary

On basis of evaluations, recommended action decided in FYP committee meeting:

Approved Approved (with Revision) Re-Evaluate

Date: 31/07/24 Name and Sign of Convener FYP Committee: Muazz Ahmed Naz

A8. DOCUMENT CHANGE RECORD

| Date | Version | Author | Change Details |
|------|---------|--------|----------------|
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