



Independent University, Bangladesh

Mobile Application Development of “Patient’s Appointment Record” at TechTrio Solutions

An undergraduate internship report submitted by
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Under the guidance of

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In consideration of the partial fulfilment of the requirement for the degree of
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Department of Computer Science and Engineering
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Abstract

This report highlights about the activity of mobile app development department of TechTrioZ Solutions and my contribution to their project. The report is broadly categorized into nine different chapters. It starts with an introduction, objectives of the study, scope of the report, Background of the project and limitation. Chapter two describes the overview of Techtrioz Solutions, Chapter three focuses on Literature Review. Chapter four focuses on methodology of our project “Appointment Diary, Designing, Software development models, Implementation, Testing, Deployment, and maintenance. Chapter nine narrates a concluding summary, recommendation. This internship gave me a chance to work with real life software application. This mobile application is aimed to automate the patient appointment system which is manually maintained in many hospitals and doctor’s chambers. After the automation this will mean better services and good keeping of records, data integrity, data security, quick search and also paperless environment. The project has mainly tackled management of information for the patients. This report mainly have been documented based on my overall work in the company as an intern.

Attestation

I understand the nature of plagiarism, and I am aware of the University's policy on this. I certify that this is an original work by me during. However, following internationally accepted academic guideline of using others written work and / or software (in the form of code) in my University project is properly cited if used in any part of this work.

Signature:

Name: -----

Signature:

Name: -----

Letter of Transmittal

25th January, 2021

Mrs. Sabrina Alam

Lecturer,

Department of Computer Science & Engineering,

School of Engineering & Computer Science,

Independent University, Bangladesh

Subject: Submission of Internship Report for the completion of Graduation.

Dear Madam,

I am hereby submitting my Internship Report, which is a part of the BSc. Program in Computer Science and Engineering curriculum. It is a great achievement to work under your active supervision. This report is based on, “Internship at TechTrio Solutions”. I have got the opportunity to work at TechTrio Solutions for three months, under the supervision of Mahmuda Islam Ma’am, Managing Partner, TechTrio Solutions.

This internship has given me both academic and practical exposures. The internship has given me the opportunity to develop a network with the corporate environment. I tried to make this report as much informative as possible with the experience I have gained during my internship period. In order to prepare a well-organized internship report, I have followed the guidelines and described the required fields with sufficient details. I, however sincerely believe that this report will serve the purpose of my internship program.

I shall be highly obliged if you are kind enough to receive this report and provide your valuable judgment. It would be my immense pleasure if you find this report useful and informative to have an apparent perspective on the issue.

Sincerely Yours,

Fatema Jannat Nishat

ID#1630324

Department of Computer Science,

School of Engineering & Computer Science,

Independent University, Bangladesh

Acknowledgement

First of all, I would like to thank almighty Allah, for his grace in accomplishing my internship report timely.

I would like to express my gratitude to the **Faculty of Computer Science and Engineering** department to keep internship credit in the curriculum of the graduation program and give me a scope of tasting the flavor of industry-oriented tasks and the field of work with my interest. I would like to thank specially and heartily to my supervisor, **Mrs. Sabrina Alam**, Lecturer, Department of Computer Science and Engineering, Independent University, Bangladesh, who encouraged and directed me with her continuous guidance, invaluable instructions, stimulating suggestions and thoughtful advice during pursuing this internship and preparation of this report.

I am also thankful to my organization supervisor **Mahmuda Islam**, Managing Partner, **TechTrioZ Solutions** from the core of my heart for her kind support, guidance, constructive, supervision, instructions and advice as well as for motivating me to do the internship smoothly at **TechTrioZ Solutions**.

I feel proud and gratified that I was always held the under supervision of the Mobile App Development team and got advices directly from **Mahmuda Islam** ma'am. Here, with daily reporting along with mental and professional support enhances my experience in the internship life.

I am also indebted to the employees of Software development team and also specially **Mr. Naimul Baset** sir, CEO & Co-founder, **TechTrioZ Solutions** who gave me immense support while working. Moreover, to prepare this report and other documentation regarding Internship Report and else I would show appreciation to all the members of **TechTrioZ** team, who always advised me and helped me through hands and pens. Moreover, I must mention the wonderful working environment and group commitment of this organization that has enabled me to deal with a lot of things.

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Chapter 1

Introduction

1.0 INTRODUCTION

Internships are often very closely related to a student's academic and career goals. The purpose of internship program is to help students focus on their career interests and potentials. The whole program entitles to give the opportunity to learn, observe and determine their goals and aims. Internship provides a student an opportunity to relate their theoretical knowledge with the tough real-world environments. An internship report also provides the faculty with in-depth information about the profession they are responsible for preparing students to participate in. Being an intern, the main challenge was to translate the theoretical concepts into real life experience. I started my Internship with Software Developer Team at TechTrioZ Solutions on 25th October, 2020. The expectations were high and now almost nearing the end of my internship, I must admit that it was really a wonderful experience. The journey was not that simple. There were many obstacles, new systems that I had to handle with. However, after overcoming each challenge, I had discovered a new potential within myself. The skills that I have gathered are priceless to me. In addition to that, some of the non-technical skills that I have procured, combined with those technical skills will certainly prove worth in my career.

This chapter gives an outlook about the project (Mobile Application) which I developed during my internship along with the software developer team under the supervision of Mahmuda Islam ma'am, managing partner, TechTrioZ Solutions. Mobile application has become a necessity of any organization which has a number of members associated with it, along with new members interested in joining it. This "Patients Appointment Diary" is an application aimed to assist in management of noting down the patient's information activities within the hospital or any medical service organization. It will provide a platform to doctors in where they can keep proper records of patients. This will ensure availability of right information, information safety, easy storage, access and retrieval. This aims at building a computerized patient's appointment record management system that would be more effective and efficient than the existing manual system.

1.1 Background

Generally, for taking appointment from a doctor, Patients need to call at hospital or chamber and assistants receive the call and this information are written on papers or note books. As they write these down in a notebook, doctors do not have any access in these when they stay out of the chamber. Doctors need to call their assistant every time for patient's update. Because of that doctors are not able to make any scedule properly. Moreover, this existing method pose a high threat in terms of security of their information i.e. can get lost, unauthorized people can easily access the information, data confidentiality and integrity not maintained. No proper backups and the system are tedious.

This Mobile based real time patient's record system will solve all these problems. So, by using this app doctors can access real time date wise patient's lists and fees. This will play an important role to make doctor's life easier. This data will be stored in the database for further reference or audit.

1.2 Objective

Project objectives are what we plan to achieve by the end of our project. Objective of a project is specific, measurable and must meet time, budget and most importantly meet the client's requirements. The main objectives of this application are described below:

- Automate the current manual patient's data recording system and maintain a date wise patients' database, maintain data security and user rights.
- To provide information about fees, appointment time, appointment date and overall patients details.
- To compute the total fees according to date.
- To create a data bank for easy access or retrieval of patients details and the users who registered to the system.
- To access patient's list in the app from any place, so doctors can schedule their plan accordingly.
- To store patient's data in the database for further reference or audit.

1.3 Scope of the project

This Mobile based real time patient's record system will permit to register doctor and assistant. It also provides log in page after registration process. It provides different user interface with different functionality for doctors and assistant. The assistant enters patient's details in the form for the next process to follow. It also maintains patients' information and retrieval of patient's details. The main users of the project are doctors and doctor's assistants. It also enables doctors to check the status of their patients. They can able to see how many patients are coming, how many appointments done, how many appointments pending. The system provides information about the patients according to their appointment time and date. Most importantly, the system computes the total fees according to date and avails that information to the doctors.

1.4 Company Profile of TechTrio Solutions

TechTrio is an IT and Business process re-engineering company. It Established in November 2019. Though **TechTrio** Solutions is a startup company it has some department for different types of work. It has a group of experts from different fields to make reliable products. Their main services are to set up and maintain business's dashboards, data mining, and reporting. They also provide full range of consultancy and implementation of Cloud Computing Architecture by designing highly fault tolerant, scalable, secured, compliant and cost-effective solution according to need. Transition project management and road map preparation services are also provided by company's certified experts. They are specialized to support with their professional services like IT system design, Data storage and Backup design, Cloud Architecture, Software development, Comparative Analysis and Evaluation. Business Process documentation, policy preparation, Delegation of Authority matrix preparation and alignment with IT systems.

TechTrio Way

Making our people successful by enlightening them with positive thinking, learning to respect people, making honesty, integrity and safety our way of life and boosting them spirit by "WE" culture.

1.4.1 Vision, mission & values

Vision

To become a top-rated IT solution provider at home and abroad touching many hearts by innovation, transformation and resource development.

Mission

To realize the Vision TechTrioZ will:

- Generate technology-based ideas and solutions for the stakeholders for doing right things and for doing things right.
- Capacity development, process improvement and digital transformation are the key drivers.

Values

- Quality of work
- On time, In-Full Delivery
- Customer Orientation
- Innovation and Idea generation
- Fairness and transparency
- Continuous improvement
- Health and safety

1.4.2 Their main expertise is:

- IT services and solutions provider (Process re-engineering and smart web-based software development)
- IT Consultancy
- Mobile Computing (Apps Development)
- Data Analytics for Decision Making
- Big Data analysis, Application of Data Science, Market & Business Intelligence

- Cloud Migration
- Block Chain Process implementation

1.4.2 Key projects of TechTrioZ

TechTrioZ Solutions, a fast-growing tech company working on various projects which helps people to experience the greater benefits. Their key projects which are ongoing:

- Price Analytics Dashboard (Technology: Django, RestAPI, Vue.JS, MySQL and QlikSense)
- Rebate Management System (Technology: Django, RestAPI, Vue.JS, MySQL)
- Easy ERP System. (Technology: Django, RestAPI, Vue.JS, PostgreSQL)
- Education system. (Technology: Django, RestAPI, Vue.JS, PostgreSQL)

Chapter 2

Internship experience & observation details

2.0 Internship Experience & Observation Details

As a student of Computer Science (CSC) everyone has to conduct a practical orientation in any organization for fulfilling the requirements of the 12 weeks Internship Program. The main purpose of the program is to expose the students to the real-world situation. Practical knowledge is fundamental for the application of theoretical intelligence. Bearing this in mind and internship program was being included in the CSC curriculum. The goal of this analysis is to expose the student in the organizational work situation and also to provide an opportunity for applying classroom learning in practice.

I have started working at TechTrio Solutions on 25th October 2020 as an intern in Software developer Team. For the internship period of 12 weeks, Mrs. Mahmuda Islam ma'am, managing partner of TechTrio was my supervisor. I found very friendly environment there from the first day of my working. Each of the person of the company was so nice and cooperative to me. My supervisor was also very cooperative and friendly whenever I faced any kind of problems in doing the works assigned to me, She always helped me to get out of the problem. I have learned a lot of things there. The most important thing I have observed there is that working is mandatory but beside this we have to be very friendly with others and have to communicate with the people beside our time of working. I have learned also how to cope up with the culture and working environment. Another thing is I have learned that in working life we need to do a lot of work and have to work with lot of data but one thing we need to remember that in every kind of pressure situation, we have to be handled this situation efficiently with patience. Punctuality is very important in working life. Though I have maintained punctuality very efficiently. I used to go there in between 9.30 AM and leaved at 5.0 PM. I have also tried my level best to do the assigned works without any error and tried to deliver the works in the given time.

2.1 Job Responsibilities

During my internship period at TechTrio Solutions, I have acquired a new kind of experience. In the very first day I was introduced and I got the basic knowledge about what's projects are going on in the company. Then from next day I started work with Software developer team under the supervision Of Mahmuda Islam ma'am, Managing Partner, TechTrio Solutions. First 2 weeks I was told to observe how they work, what's language and framework they are using. They provided me some tutorials of Django rest framework with vue.js. I started watch tutorials and implemented them in their assigned work. Then I was told to develop a mobile application using flutter and firebase along with their development team according to their requirements. The application is about online patient's appointment record system. I started developing flutter mobile app with the help of my supervisor and team members. At first, I completed the whole user interface design along with navigation button. Then I started backend development and database part. I have stuck with many errors and problems, but the team was always there to help me with necessary information. Working with firebase was completely a new experience for me. The team was always helpful to me learn new things. Overall these 12 weeks was a fruitful learning journey of my life.

Chapter 3

Literature Review

3.0 Literature Review

Literature review is a text written by someone to consider the critical points of current knowledge including substantive findings as well as theoretical and methodological contributions to a particular topic. Main goals are to situate the current study within the body of literature and to provide context for the particular reader. In the recent years, the advances in mobile technology have brought an exorbitant change in daily lifestyle of individuals. Smartphones/mobile devices are rampant in all aspects of human life. This has led to an extreme demand for developing software that runs on mobile devices.

3.1 Undergraduate Courses related to the Project

In Independent University, Bangladesh, the department of Computer Science organized the courses and syllabus in a very efficient way which helped me a lot to accomplish my project. From CSC101 to 400 level courses, all are very helpful for me. Database management system, Web application, Mobile application, System analysis and design, Software Engineering, Software Quality and testing, C++, Java, data Structure all of these courses helped me to documented and implemented my task in internship program. In my project I have implemented what I have learned in these respective courses. Specially the programming languages and Management system of database helped me a lot to develop this project.

3.2 Related Works

Coding – To implement the mobile application I need to code a lot, without having any introductory programming knowledge no one can write code that I have gained from CSC 101, object Oriented Programming course.

Structuring Data – A project has lots of different categories data which need to be structured properly. In this project, Data Structure and Database management system courses' knowledge helps me to structure this project data in well manner.

Logic Application – To implement any logic need to choose write approach which also called efficient Algorithm. The knowledge of Algorithms course is applied here.

Project Management – To complete any project needs a proper management in workloads. The knowledge of Software engineering course is applied here.

System Analysis – Every system needs to be analysis. Hence, The knowledge of System Analysis and design is applied here.

Chapter 4

Methodology

4.0 Methodology:

The term methodology means the techniques and procedures adopted by conducting a project study. It outlines how the data will be collected, and the tools for collecting data, system methodology, the proposed system input and output, users and system development tools.

4.1 SYSTEM DEVELOPMENT METHODOLOGY (SDLC)

System development methodology is a technique that is used to show how the proposed system will developed. In this case, the methodology used will be a waterfall model.

4.1.1 Waterfall Model

It is comprised of the stages that the developer will use when developing the system. It is a sequential model hence the name waterfall. The developer has to finish with one stage before going to the next one. It comprises of the feasibility study, analysis phase, design phase, coding phase, testing phase, implementation phase and finally the maintenance phase. It is a simple model and easy to use and understand. With waterfall development based methodologies, the analysts and users proceed sequentially from one phase to the next. The deliverables from each phase are voluminous and are presented to the project sponsor for approval as the project moves from phase to phase. Once the phase is approved by the sponsor it ends and the next phase begins.

Diagram of Waterfall model

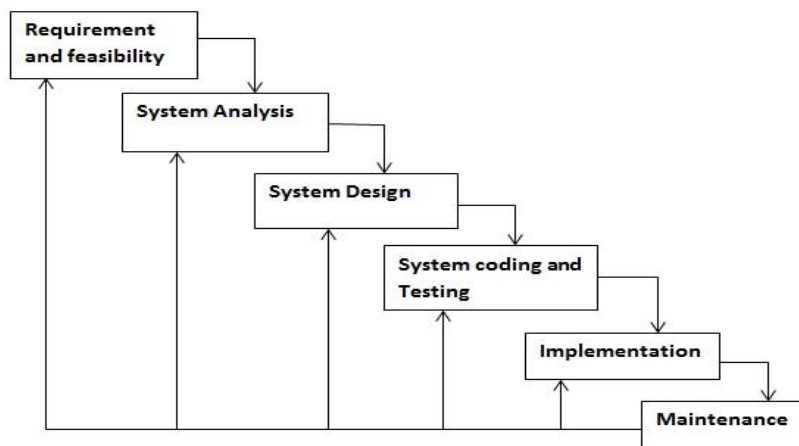


Figure 1. 4.1.1 Water Fall Model

4.1.1.1 Feasibility study

Here, we carried out a study to gain an understanding of the customers' current system and problems experienced in this system through interviews, observations, participations etc. We used the obtained data to determine the viability of the system being proposed in terms of technical, economic and social feasibilities.

4.1.1.2 Requirements analysis

At this stage, we gathered information about what the customer needs and define the problems the system is expected to solve. I also included customers' business context, product functions and its compatibility. We gathered requirements such as software like the programming language to use, database model and hardware needed such as laptop, printers etc.

4.1.1.3 Design

At this stage we made an overall design of the system architecture and physical design which includes User interface and Database design. It's at this stage that we identified any faults before moving onto the next stage. The output of this stage is the design specification which is used in the next stage of implementation.

4.1.1.4 Coding/Implementation

At this stage, I began coding as per the design specification(s). The output of this step is one or more product components built according to a pre-defined coding standard and debugged, tested and integrated to satisfy the system architecture requirements.

4.1.1.5 Testing

In this stage, we will ensure both individual and integrated whole are methodically verified to ensure they are error free and satisfy customer requirements. We will involve both unit testing of individual code modules, system testing of the integrated product and acceptance testing conducted by or on behalf of customer. We will ensure bugs found are corrected before moving to the next stage.

4.1.1.6 Installation

It is done once the product has been tested and certified as fit for use. The system is prepared for use at customer site.

4.1.1.7 Maintenance

This stage occurs after installation. It involves making modifications on the system to improve performance. Such changes are user initiated or as a result of bugs being discovered which were initially not known. These modifications are recorded for documentation and system update.

4.1.1.8 Benefits of waterfall model

- It improves on quality getting requirements and design first helps to catch and correct possible errors at the design stage than at the testing stage, after all components have been integrated.
- Simple and easy to understand and use
- Easy to manage due to the rigidity of deliverables and review process
- Phases are processed and completed one at a time

4.2 SYSTEM ANALYSIS

4.2.1 Existing System

The existing system was found to be completely manual, i.e. patients' information is captured in note books, there also required to call assistant to know the patients update.

4.2.2 Problems of Existing System

Considering the above section, there are many problems associated with the existing manual system, they include the following:

- Doctor don't see any update as patient's appointment notebook is maintained by assistant.
- There is a problem of storage of the records i.e. can easily get lost.
- Information retrieval from these sources is not easy.

4.2.3 Requirements Analysis

4.2.3.1 User Requirements

It is very important to get users of the system fully involved such that the problem of change management does not arise. The system is expected to be:

- Easy to learn and use
- Improve on the efficiency of information storage and retrieval
- Produce results faster i.e. measurements date wise patient's status,date wise fee calculation.
- Provides attractive interfaces with easy navigation throughout the system
- Faster, flexible and convenient.
- A system that stores data timely and accurately

4.2.3.2 Functional Requirements

Functional requirements capture the intended behavior of the system. This behavior may be expressed as services, tasks or functions the system is required to perform. Therefore the proposed system is able to:

Name of the Function: Must be compatible with all android devices .		
Input: 1. N/A	Process: 1. Apps must be developed in a common development environment.	Output: 1. This app will be accessible in every android/ios devices.
Precondition: User must have an android phone/IOS which has ability to run the app.		
Post condition: 1. Everyone can use this app.		
Alternate Options: N/A		

Table 1. 4.1: Consistency table

Name of the Function: Registration		
Input: Name, Email, Password	Process: User must have to register the form for register	Output: An account will be created against that email.
Precondition: User must have an android phone/IOS with internet connection which has ability to run the app.		
Post condition: User can login and can do their activities.		
Alternate Options: showing alert if email and password is not valid		

Table 2. 4.2: Registration table

Name of the Function: Log in		
Input: Email, Password	Process: Log into assistant/doctor interface	Output: Different interface for different user and their activities
Precondition: User must have an android phone/IOS with internet connection which has ability to run the app.		
Post condition: User can login and can do their activities.		
Alternate Options: showing alert if email and password is not match/wrong		

Table 3. 4.3: log in table

Name of the Function: Enter patient details (Assistant)		
Input: 1.Assistant's Email, Password 2.patient's info and doctor's email	Process: Successfully added under specific doctor's patient's list	Output: A row will be added to the patient's table
Precondition: User must have an android phone/IOS with internet connection which has ability to run the app.		
Post condition: New patient will be added in the patient data table		
Alternate Options: N/A		

Table 4. 4.4: Enter patient table

Name of the Function: Approve/delete patient(Assistant)		
Input: 1.Assistant's Email, Password 2.doctor's email	Process: Can approve and delete by tapping button	Output: Patient's data table will be updated according to the action.
Precondition: User must have an android phone/IOS with internet connection which has ability to run the app.		
Post condition: Patient data table will be updated		
Alternate Options: N/A		

Table 5. 4.7: Approve/delete table

Name of the Function: view specific patient data table (Doctor)		
Input: 1.Doctor's Email, Password 2.date	Process: Can view his patient,s table from any date	Output: Patient's data table will be seen according to date.
Precondition: User must have an android phone/IOS with internet connection which has ability to run the app.		
Post condition: Patient data table will be seen		
Alternate Options: N/A		

Table 6. 4.8: view data table

Name of the Function: see total fee(Doctor)		
Input: 1.Doctor's Email, Password 2.date	Process: Can view his fees from any date	Output: Doctor's fees will be seen according to date.
Precondition: User must have an android phone/IOS with internet connection which has ability to run the app.		
Post condition: Doctor's total fees will be seen		
Alternate Options: N/A		

Table 7. 4.9: Calculate fee table

4.2.3.3 Non-functional Requirements (NFR)

Non-functional requirements are requirements which specify criteria that can be used to judge the operation of a system, rather than specific behaviours. This is contrasted with functional requirements that specify specific behaviour or functions. Systems must exhibit software quality attributes, such as accuracy, performance, cost, security and modifiability plus usability, i.e. easy to use for the intended users. NFRs help to achieve the functional requirement of a system. Thus the proposed system does the following:

- The system has high performance and reliability level. The mean time between failures, mean time to repair, and accuracy are very high.
- The system has user-friendly interfaces. This ensures the ease with which the system can be learned or used. The system can allow users to install and operate it with little or no training
- Handles growing amounts of work in a graceful manner as can be readily enlarged i.e. the ease, with which the system can be modified to handle a large increase in users, workload or transactions.
- The system prevents unauthorized access to the system with user authentication via login-on system.

4.3 Design

At this stage we will make an overall design of the system architecture and physical design which includes User interface and Database design. Also necessary diagram for the project, such as dataflow diagram, use case diagram and rich picture. It's at this stage that I will identify any faults before moving onto the next stage. The output of this stage is the design specification which is used in the next stage of implementation.

4.3.1 Data Flow Diagram

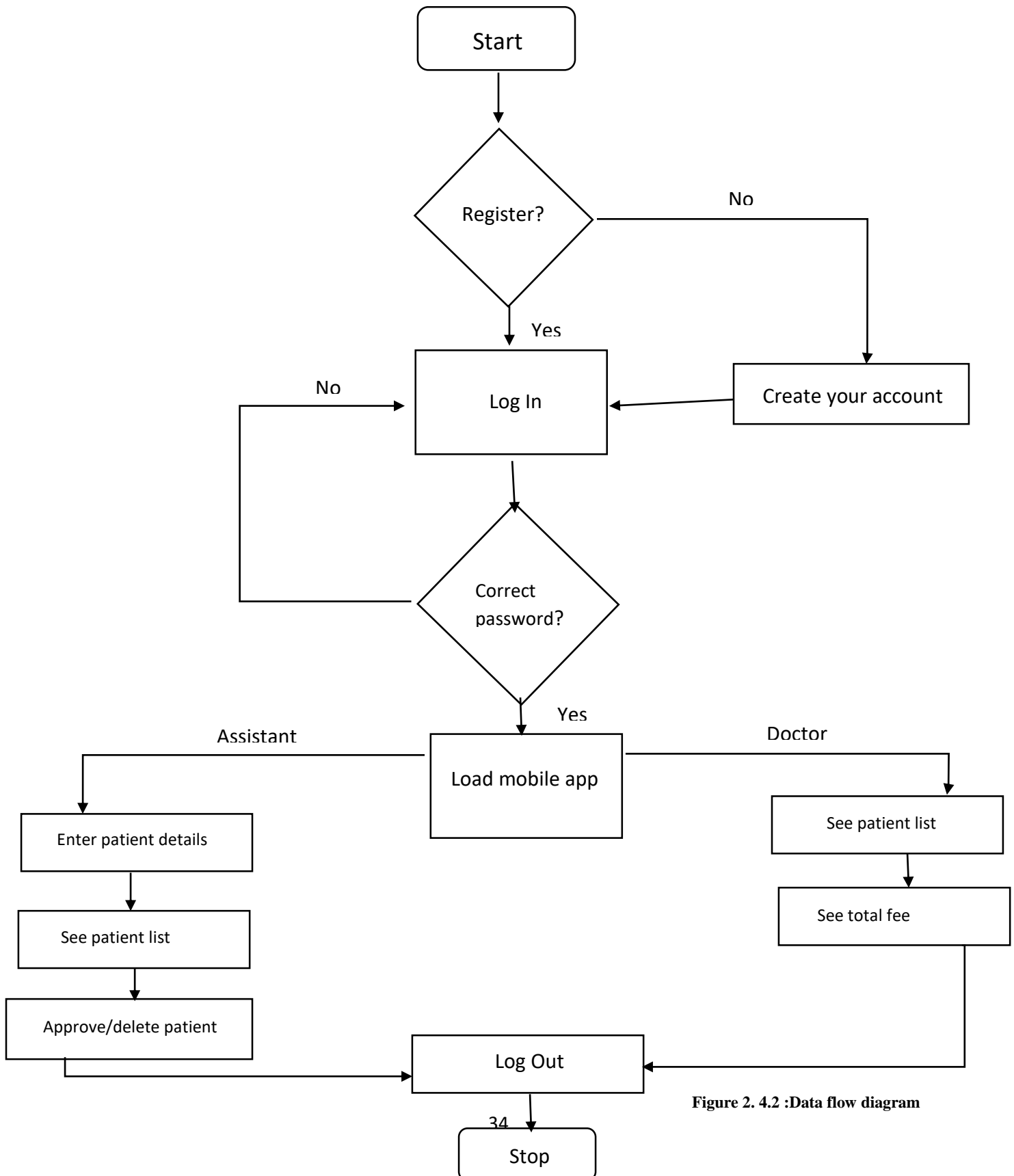


Figure 2. 4.2 :Data flow diagram

4.3.2 Use Case Diagram

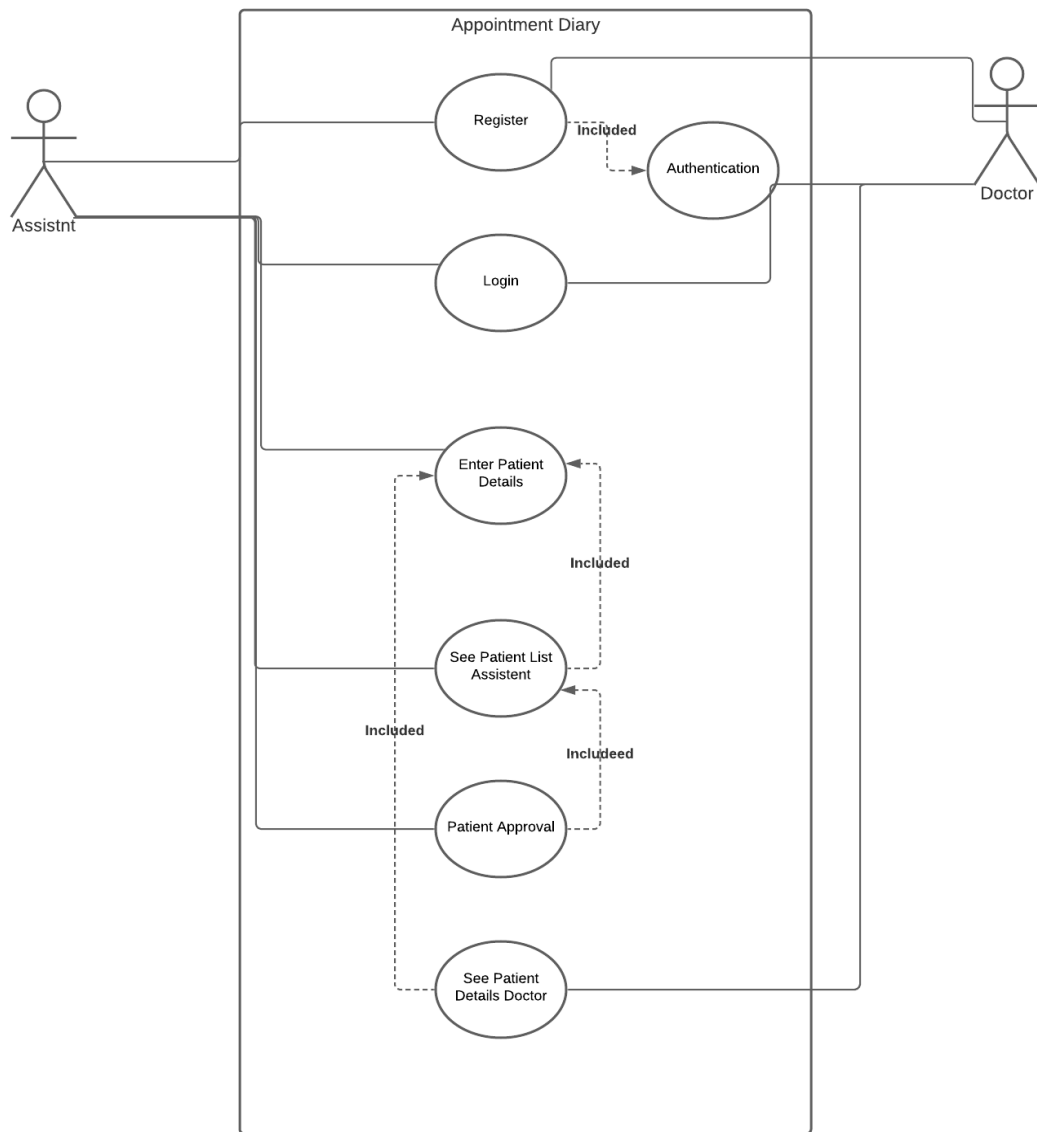


Figure 3. 4.3: Usecase diagram

4.3.3 Firebase Firestore

We stored our data in firebase firestore. The Firebase Realtime Database is a cloud-hosted NoSQL database that lets us store and sync data between users in realtime. This how we organized our data in firestore.

We made two data collection “Doctor” and “assistants”. In those collection doctor’s and assistant’s information is stored. Under Doctor collection, we have another sub-collection named “patients” where patient’s information is stored.

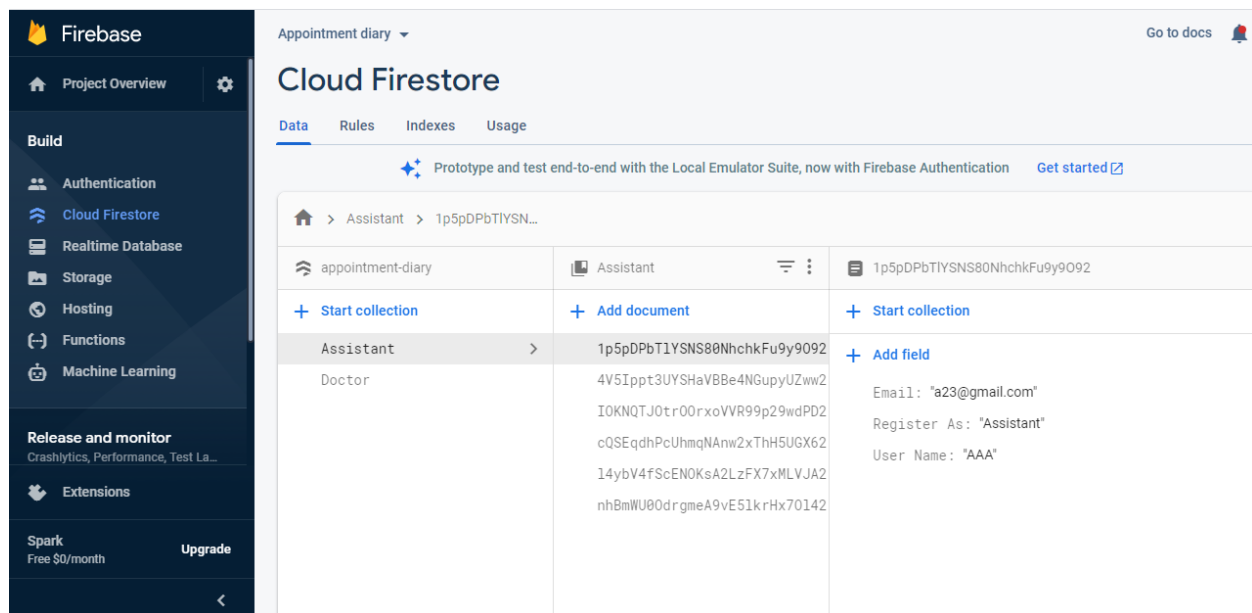


Figure 4. 4.4:Firestore database

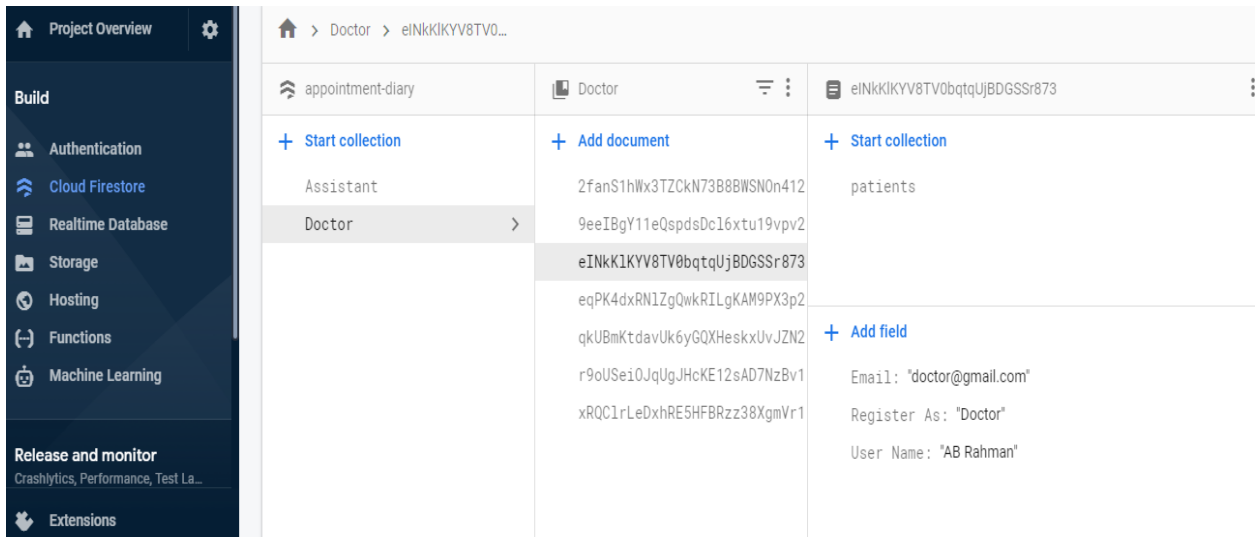


Figure 5. 4.5:Firestore database

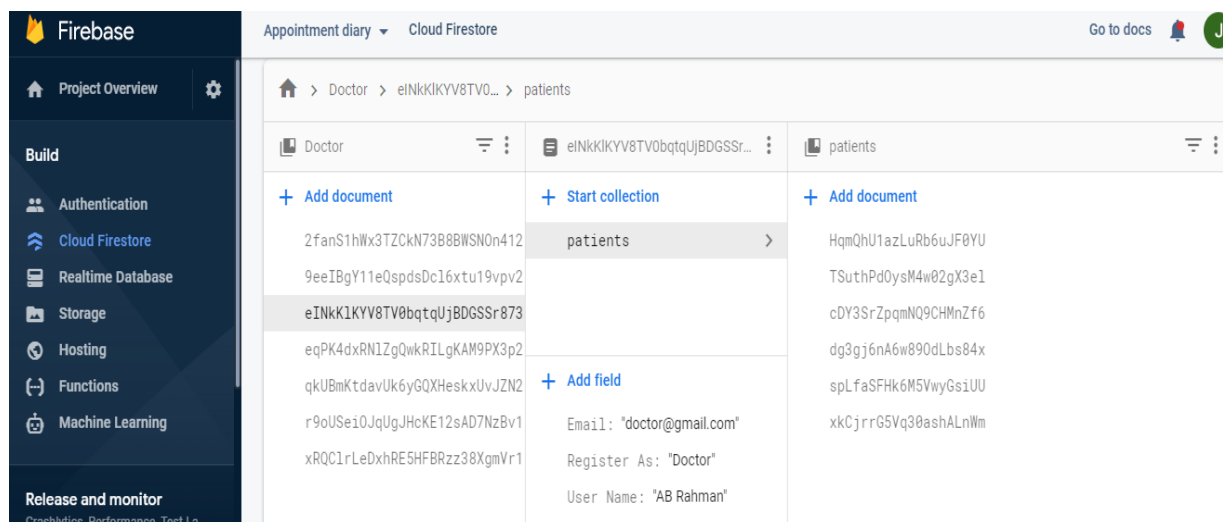


Figure 6. 4.6:Firestore database

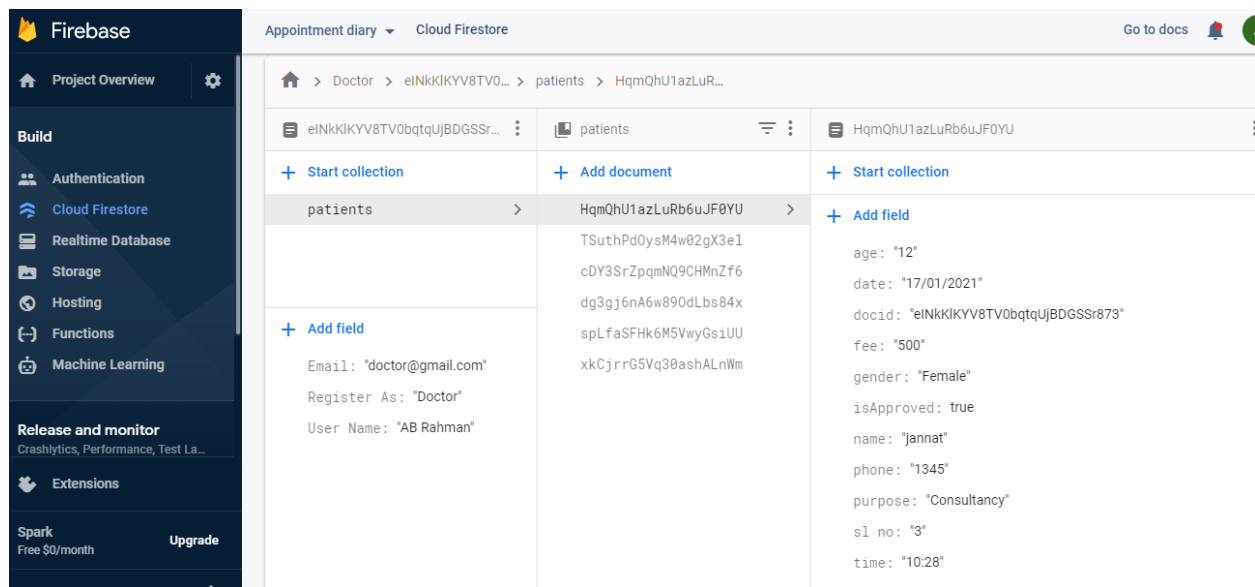


Figure 7. 4.7:Firestore database

Chapter 5

Project Management

5.0 Activity Wise Time Distribution

Activity wise days of work distribution			
		Expected Days	Considered Days
Learning Process	10%	15	15
Installment	20%	7	10
Requirement	15%	10	12
Design	30%	10	13
Implementation/Coding	15%	30	30
Testing and Deployment	10%	12	10
	100%		

Table 8. 5.1 :Activity table

5.2 Gantt Chart

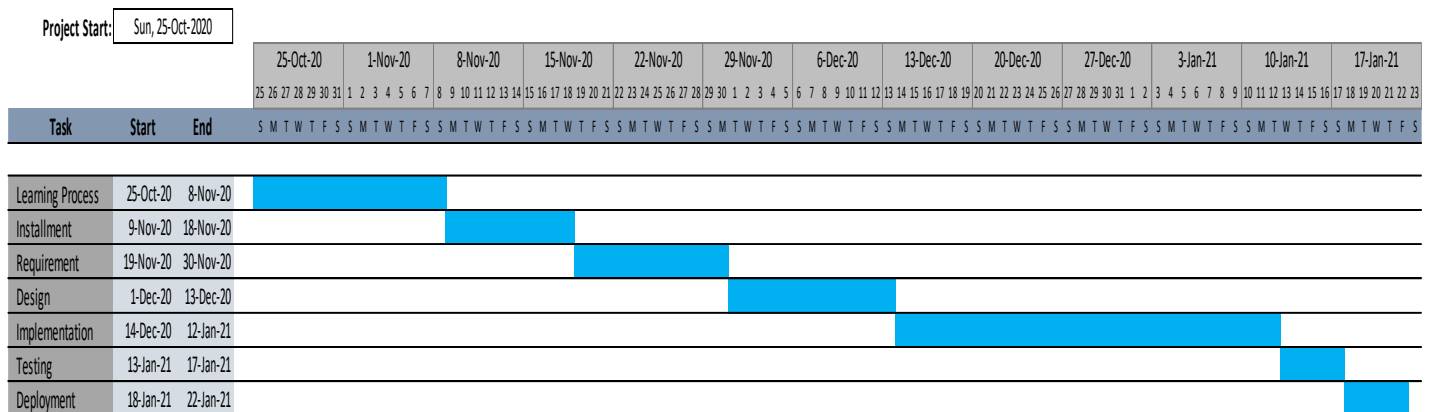


Figure 8. 5.1 :Gantt Chart

Chapter 6

Result and Test Analysis

6.1 Testing

Testing is the process of verifying and validating the system for the conformance with specification and meeting the customer's requirements. The objectives of testing are to ensure that the system programs are error free, guarantee the system end users can interact with the system well and ensure that the components of the system interface are working well

6.1.1 Functional Testing

The purpose of functional testing is to ensure that the program performs all the functions that were originally specified, that all the input is correctly accepted. It relates to the whole system and does not require a technical understanding of the system. All the functions of the system as originally specified are systematically tested to ensure that nothing has been accidentally omitted or misinterpreted. A positive attempt is made to anticipate errors than an inexperienced user might make, and tests made to check the effect of such errors and ensure that they do not result in incorrect actions or bad data being stored in the database.

6.1.2 System Testing

This is where the system is checked whether it has met the user requirements and performs as per expectations. The following are the tests to be used. On completion of the whole system, each of it is tested to ensure no errors have been introduced. The system is tested with a realistic amount of test data, the system tested with about 50 records in each of the main tables.

6.1.2.1 Recovery Testing

Recovery testing can be carried out to determine what happens, for example if there is a power failure in the middle of data entry. Is the whole database corrupted or not?

6.1.2.2 Acceptance Testing

The user is invited to test the system to ensure that it fulfills the stated objectives. The tester observed this testing and not stop the user from mistakes. The system should cope with unexpected user behaviour.

6.1.2.3 User Acceptance testing

This is testing of the system by the user department after the system has passed the systems test

6.1.3 Unit testing

After the parts of the system are completed they are first tested. All the new hardware, procedural manuals and all system interfaces tested to ensure that they meet the required standards.

6.1.4 Test Data

The purpose of test data is to verify and make sure that the system is operating well and according to the standards set. It involves checking the new system if it is working correctly. It is tested in modules to establish if there is any problem in any module. This is whereby each module is tested on its own. While testing entries inputted as they are so as to be acceptable in the database else errors will occur. As an example, patient's phone no should be in numbers, otherwise the field won't accept it.

6.2 Test Results

After completing test process, we found some defects while running the software. Some issues came up while retrieving the data from the firestore database. But we passed in most of the test. There was also some issue with responsiveness but after a few tests the issue got resolved. The main task of this project is to record appointments and approve those appointment from assistant's side and viewed that updated data table from doctor's side. Fortunately, these functionalities run without any flaw. After getting the errors and defects, we tried to go over through all the problems and fix that.

Chapter 7

Project as Engineering Problem Analysis

7.1 Sustainability of the Work

Now a days, In Bangladesh most of the people from all classes drastically use smartphone. Smartphone and internet make people life easier. People are now searching for an easy solution of every situation which reduce the daily life hassles. So, people get more dependent into online based solutions.

The growth and analysis suggest that the use would increase even further in the future. This change in the social atmosphere, it is safe to believe that the Appointment record system is highly sustainable. It is very likely that in the near future people would be more interested to meet their everyday needs through online activities. The Appointment record app advocates for such a change, securing it sustainability.

7.2 Social and Environmental Effects and Analysis

We all know how busy life leads a doctor with a tight schedule. They can't plan anything properly for their tight schedule. If they able to know before, how many patients are coming, what is the time line of appointment, they can utilize their time more efficiently. They can make proper plan for their personal life according to the schedule. The most important effect of the Appointment Recording System on a social level is its time-saving quality. Time is priceless and valuable and the usage of this app make user life hassle free. On an individual level, the effect has a great positive outcome. The Appointment Recording app has also effect on the environment as well. It will create a paperless environment in hospitals or doctor chambers. It will make our environment clean and less polluted.

7.3 Addressing Ethics and Ethical Issues

The Appointment System does not have any ethical threat or risk. The doctors and patients are required to provide some general information during their registration. The patients need to provide some basic information for their appointment. All these data are stored safely and securely in database. Only registered user with authentication can access the information. The privacy of the information is strictly maintained.

Chapter 8

Internship Outcome & Issue Analysis

8.1 Problems & Challenges Faced in the Workplace

During my 3 months Internship period in TechTioz Solutions, I have faced some challenges which I never used to with. But I have taken this challenging time as a lesson of my life. These difficult situations and new experiences will help me to sustain in the corporate world in future.

- I think only 12 weeks are not enough to adapt and understand the overall work flow and operations of a company which is involved with so many different projects and different department.
- It was very difficult for me to maintain work progress as like as other team members. Since they are very experienced and good at their work, I was a bit slow comparing to them at first phase.
- At beginning phase, it was excessive work load for me. I had to work like a full-time employee as my office time was 9:30 am to 5:30 pm. Since I don't have any experience like that before, I felt too tired to complete my assigned work. It was too difficult for me to handle this mental pressure. But after passing some days this situation was habituate for me. My work skill has improved then before. I could not able to overcome this situation without the support and cooperation of my office members. Their hard work and experience inspired and motivated me a lot to work harder.

8.2 Job Analyzing of the Issue(s) Based on Relevant Theory

These courses below were relevant to my work. These courses' output helped me a lot to complete my many tasks.

System Analysis and Design: System analysis and design deal with planning the development of information systems through understanding and specifying in detail what a system should do and how the components of the system should be implemented and work together. During my internship, system analysis and design course helped me to prepare business plan requirement, various diagram.

Software Engineering: Software engineering is defined as a process of analyzing user requirements and then designing, building, and testing software application which will satisfy those requirements. This course helped me to understand my work methodology, project as a product, designing and testing.

Database Management: A database management system is a course that makes which is about to organize data in a database. The functions of a DBMS include concurrency, security, backup and recovery, integrity and data descriptions. The knowledge of database help me to store, filter, manage and organize data efficiently.

Data Structure: In computer science, a data structure is a data organization, management, and storage format that enables efficient access and modification. The knowledge of this course helped me a lot to understand the effective way of storage format to access easily for the user.

Introduction to Communication: Our CMN101 course was all about communication skills, listening, speaking, observing and empathizing. It is also helpful to understand the differences in how to communicate through face-to-face interactions, phone conversations and digital

communications, like email and social media. This course helped me a lot communicate efficiently.

8.3 Recommendation

Here is some recommendation for company:

- For fresh ideas and new perspective, they need to recruit more youth and fresher because youth are the source of new ideas and new innovation.
- Since TechTrioZ work for many systems for their operation and clients, so they need watchful maintenance of the systems by the responsible management.
- They should maintain standard quality of products and services.
- They should maintain collecting continuous feedback from client side.
- Though they work with so many projects and which are more than enough for this company. Still my recommendation will be more focused on promotional activities.

Chapter 9

Conclusion & Implication

9.0 Conclusion and implication

During my internship I worked on a flutter mobile application. In medical system, maintaining all the manually is very difficult. So, there is no more need to record information of patients in a notebook manually. With the Internet connection, doctors and his/her assistant maintain /update all the data. This system is very user friendly that anyone can easily use it.

It has been a great opportunity for me to work as a mobile app developer during internship at TechTrioZ solutions. This three-month internship program was like a step stone to my carrier within the work advertise. During internship I learned numerous vital information almost IT sector. The internship program made a difference me to pick up vital information almost how the IT segment forming in our nation. Internship at TechTrioZ instructed me how to handle distinctive client, later program related advances, regularly utilized advances and best utilized of this innovation. This program gave me a clear thought around proficient life as a software developer. During internship, during this study, I know much more about mobile app development. How it works? The properties, objects and others. This internship gives me a chance of developing communication skills, growing creative thinking and imagination capability.

10. References

- <https://techtrioz.com/>
- [https://en.wikipedia.org/wiki/Flutter_\(software\)](https://en.wikipedia.org/wiki/Flutter_(software))
- <https://firebase.google.com/>
- https://flutter.dev/?gclid=CjwKCAiAr6-ABhAfEiwADO4sfQnW6QDyZyNs4jmDai_MO0RgIAy9Vhky7GVLQ6xonjztsIEoRw88shoCqrYQAvD_BwE&gclid=aw.ds
- <https://dart.dev/>

11.0 Appendix

11.1 Appendix A

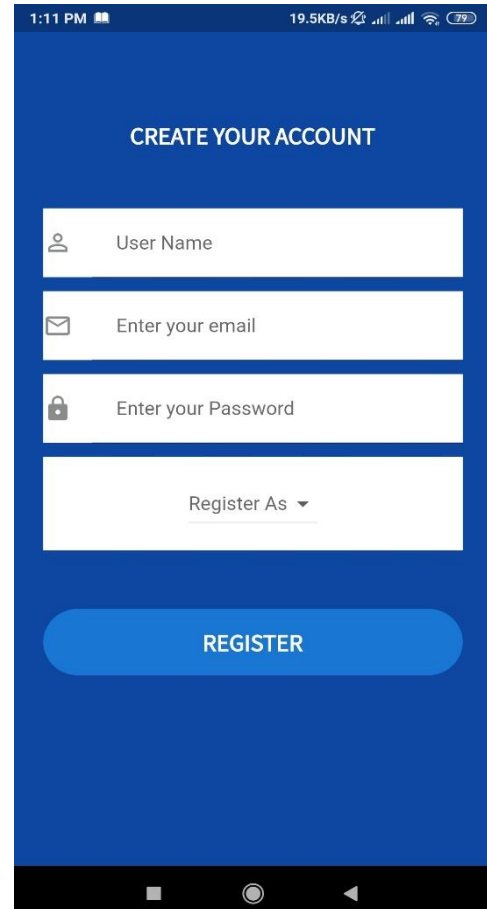
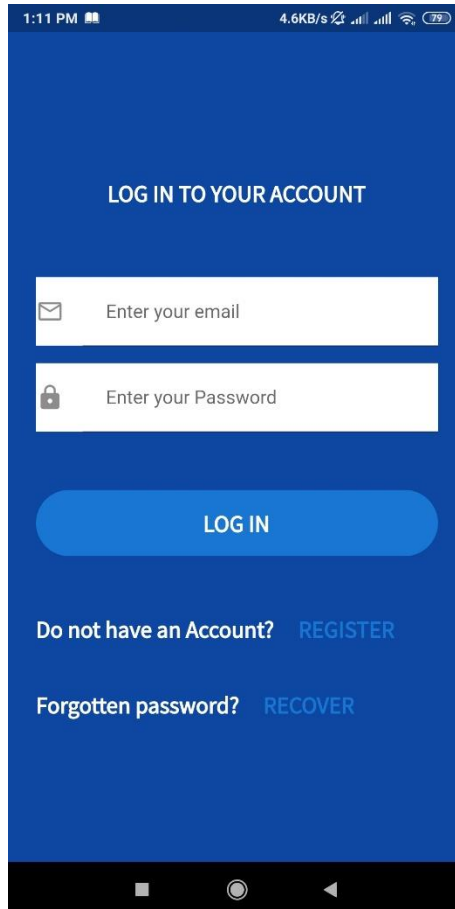
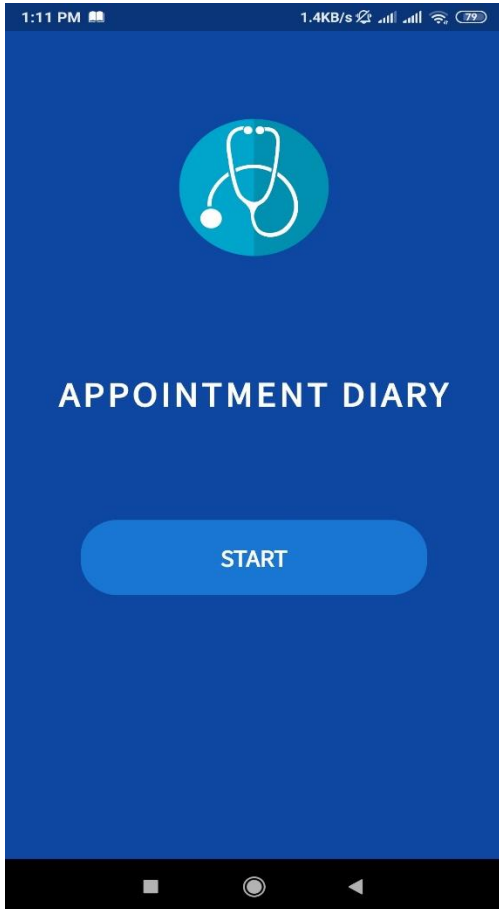
Daily Task

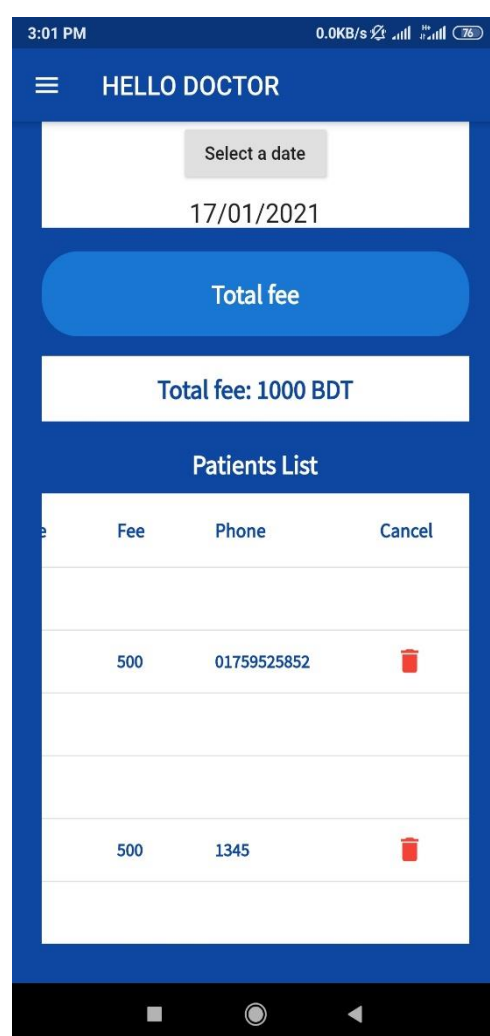
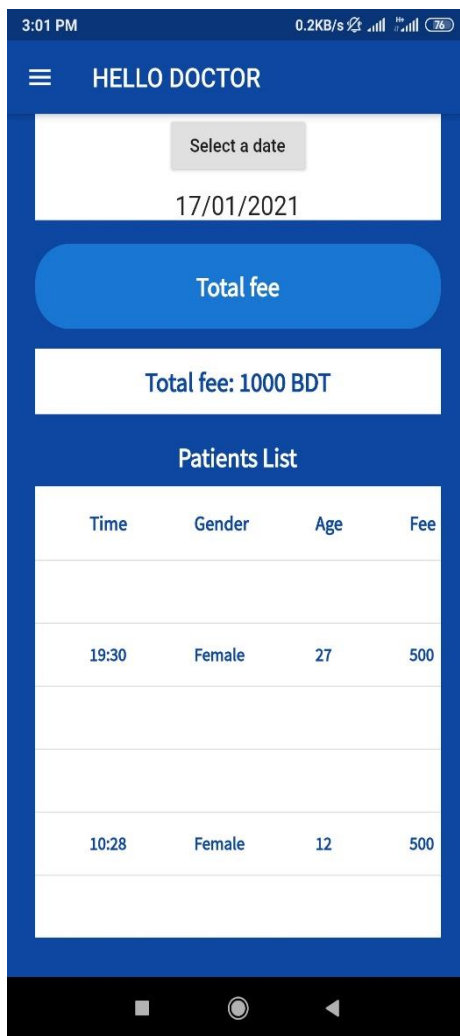
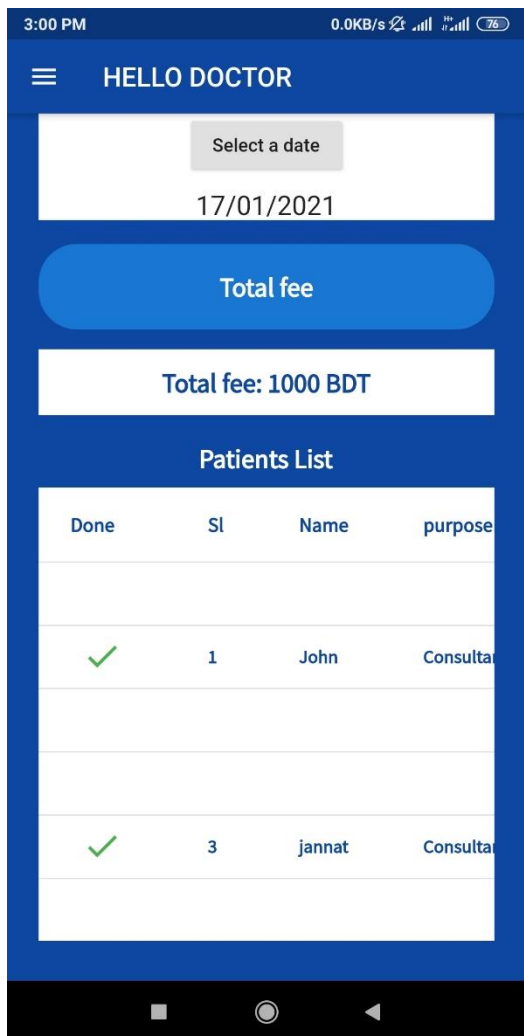
Date	Task
25/10/2020	Introduction with all the member, showing office environment, which works/project going on
26/10/2020	Discussing about project
27/10/2020	They provided me a vue js course video in udemy
28/10/2020	watched the course and practiced the topic based on that course
29/10/2020	watched the course and practiced the topic based on that course
1/11/2020	watched the course and practiced the topic based on that course
2/11/2020	watched the course and practiced the topic based on that course
3/11/2020	weekly meeting to check everyone progress
4/11/2020	They have told me to design a mobile app using vue native framework and vue.js
5/11/2020	Provided another course on vue native, I started watching them
8/11/2020	I installed everything, set up environment for vue native
9/11/2020	They asked for a process flow diagram of my app and I prepared that
10/11/2020	They asked for UI design demo of the app and I prepared It
11/11/2020	I faced so many errors and problem because of their version change and upgrade ,I tried to fix them
12/11/2020	I stucked with an error and trying to fixed it
15/11/2020	Still stucked with same error, browsed the problem and discussed with office member
16/11/2020	weekly meeting to check everyone progress and discussion about Company's upcoming project
17/11/2020	I have faced too many problem with vue version 4,there are lack of documentation, and the version ,dependencies are conflict with another version

18/11/2020	They asked me to move on to flutter development, as my project was an mobile app, I discussed with flutter team
19/11/2020	Finally I started flutter, install and set up everything successfully
22/11/2020	I read documentation, watch video on udemy for clearing my concept
23/11/2020	I discussed with senior, they suggest me how should I start with flutter and how things are structured
24/11/2020	At first I create a demo app with some normal text and style to check everything work fine or not
25/11/2020	Made another app with pictures using format, styling etc.
26/11/2020	learned about widget, child, container, column, row in flutter
29/11/2020	Made my log in and register page of app
30/11/2020	made another pages for app
1/12/2020	created navigation for pages
2/12/2020	weekly meeting, discussion about problem
3/12/2020	made necessary table, text form field for app
12/12/2020	Added current date showing field in the app
13/12/2020	polished and fixed full UI and completed the design of full UI
14/12/2020	weekly meeting, discussed about problems and solutions, they asked me to make some change in the app
15/12/2020	Started watching some tutorial on Firebase and authentication
20/12/2020	Faced some problem during set up firebase with flutter, tried to fix them
21/12/2020	finally able to fix the issue, completed the authentication process
22/12/2020	Watched more tutorial on firebase cloudstore
23/12/2020	made data collection with field in firestore and tried to fetch,but failed
24/12/2020	Stucked with the same problem and tried to fixed it
27/12/2020	fixed the problem and start implantation
28/12/2020	did the different UI for Assistant and Doctor log in
29/12/2020	did the filtering for patient data under specific doctor
30/12/2020	did the implementation for patient data according to date under specific doctor

31/12/2020	did implementation for total fee calculation
2/1/2021	did implementation for total fee calculation for specific date
3/1/2021	The table was overlapped to the screen, so fixed it
4/1/2021	implement for assistant to put patients data under specific doctor
5/1/2021	was tried to fetch date wise patient table from assistant side, but failed
6/1/2021	still stucked with same problem and read a lot of documentation about it
7/1/2021	Finally able to fix the problem
10/1/2021	Implemented for providing access to the assistant to delete and approve
11/1/2021	implementing to show approved and updated data from doctor,s interface
12/1/2021	found problem with date formate,the input date is not matching with database one. Trying to solve it
13/1/2021	finally found the problem and fixing it, now data are coming completely to interface according to date
14/1/2021	validating all the form and input field
17/1/2021	from my side project was running smoothly, building a apk for my app and provide Techtrioz to test it
18/1/2021	They have found some defects and told me to work on that
19/1/2021	The problem was the apk was not worked in some specific mobile set.It was occurred for version control of flutter.I am fixing it today
20/1/2021	Then re-build the apk and again provided them,it runs perfectly.But there is some validation problem while registration
21/1/2021	They told me to fix that problem and I fixed it and provide them the updated one
24/1/2021	They tested it along with our team, gave me feedback. They were satisfied with my work, all the functionality of this app run smoothly

11.1 Appendix B (UI Screenshots)





3:02 PM 0.0KB/s 76%

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ENTER PATIENT DETAIL

Date:24/01/2021

👤 Enter doctor email

🕒 Time: 15:1

📄 Serial No

👤 Patient Name

2009

Age:12

Gender ▾

3:04 PM 0.5KB/s 76%

≡

Patient
successfull
y added to
the list!!!

See Patient list

Add to the list

3:02 PM 0.2KB/s 76%

≡ Assistant Page

👤 Enter doctor email

Done

Select a date

Nothing has been selected

Patients List for Dr. null

Please Select the Date