THE SUPERIOR COLLEGE LAHORE

Faculty of Computer Science & IT
Department of Software Engineering

Final Year Project
PROJECT REPORT

Polio Protection

Project ID: **FYP-BSSE-F19-063**

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Project Report

Polio Protection

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Comments: _____

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Date: _____ Signature: _____

HEAD OF THE DEPARTMENT

Comments: _____

_____

Date: _____ Signature: _____

Dedication

Thanks to ALLLAH ALMIGHTY.

This work is dedicated to my Parents

That is all with the prayers of them. They give us blessing to do this and, on this day, we are able to write a report.

Acknowledgements

We have a great Thanks to our Supervisor **Sir Saleem Zubair** for their valuable guidance, constructive criticism and encouragement through the project.

Thanks to my team members who have made valuable comment suggestion on this report which us an inspiration to improve our assignment.

We thank all the people for their help directly and indirectly to complete my report.

Executive Summary

This application will be helpful for the children, parents and as well as for the Government of Pakistan. The vaccination done to the children monitor by the Government. Through this many of the children missed by the incorrect data and management of data will be abandoned. The team can mark the children and take the picture of the children with the house number and upload in the dashboard. The new entry of the children can be entered by the team of the relevant area team. The team can also create the work report and submit it online. The team can observe the temperature of the cold chain through this application. The hardware component will also helpful for the irrelevant wastage of the vaccinations. The solar plate umbrella provide help to give energy to the box.

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Chapter 1

Introduction

Chapter 1: Introduction

Polio disease is common in Pakistan. Vaccinations are done by the government of Pakistan but there is some difficulty faced by the team that team are not attached with central computerized. Large number of vaccinations are ruined by the increase in temperature to save the vaccinations we are adding some enhancement in the previous cold chain box so we are going to provide the solution.

Pakistan is struggling for the polio free country. The key factor that would be followed is EPI (Expanded Program on Immunization) in Pakistan.

The Immunization Schedule guideline are followed in this application.

- All the information like how many children are in the house (how many children who are vaccine not)
- Temperature of the cold chain box
- Location (GPS)
- Mark the children
- Add/drop children
- Create/ submit the report

1.1. Background

The purpose of this application will provide government the features of providing all the information about family (children or adult). This application also allows the feature to add the children data. Our services will be continued to pursue excellence services through our ongoing efforts to improve our services. So, the next step is to communicate the new standards of the team and the public to ensure that everything is meeting their satisfaction level with guarantee.

1.2. Motivations and Challenges

This application only used by the Teams and Admin. A great brand experience for user customers is the result of setting actual goals that meet both user and business targets. Many of the children are not vaccine on time therefore they got the virus of polio (in 2017 when a four-month male

child was paralyzed by polio in Lodhran). So, through this application we can save the life of acquitted children.

1.3. Goals and Objectives

We want minimize the polio disease form the Pakistan so we are going to develop the application which is attached with centralized system. Our goals are to create a reputation of quality, consistency.

Trained team of polio. Firstly, we experiment the application in the certain area through which we can easily understand the defects and efficiency of the team as well as application.

1.4. Literature Review/Existing Solutions

There is a traditional solution existing. Old-style way of preserving the vaccines are using. We are adding the new type of feature in the cold chain box. We are using the NADRA database in our application.

1.5. Gap Analysis

Many of the polio employee's do not do their work properly. Some vaccines are ruined/damaged. Many of the children missed in the campaign. This application provides the solution to all the problems faced to the government, public and the employees. This application provides the best quality. In this application the employee can also add the new entry as well.

1.6. Proposed Solution

We are going to develop an Android Mobile Application. In which we are going to use centralized database. Through which provisional government can monitor the data easily of the children who are vaccine or not. They can also monitor the team that they are doing their work properly are not.

Team able to enter the CNIC and phone number of the father through which the record of the children can be fetched form the database. Team can mark the name of the children and vaccine the children. Every team area assigns by the government. The team make the picture of the

vaccine child with the house number. 30% of the vaccination ruined by the hot temperature. So, we are adding solar cooling system in the cold chain box. Polio team can check the box temperature in the application.

1.7. Project Plan

Mobile application location is easily accessible from all over the country by using internet/3G/4G. It will be easy to use for everyone. This application will only deal with polio vaccination. Essentially our goal is to minimalize the polio from all over the country as well as the world.

1.7.1. Work Breakdown Structure

WE	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1		**Requirement**	**40 days**	**Mon 9/16/19**	**Fri 11/8/19**	
1.1		defination Req	5 days	Mon 9/16/19	Fri 9/20/19	
1.2		External Req	5 days	Mon 9/23/19	Fri 9/27/19	2
1.3		User Interface Req	10 days	Mon 9/30/19	Fri 10/11/19	3
1.4		Functional Req	10 days	Mon 10/14/19	Fri 10/25/19	4
1.5		Non Functiona Req	10 days	Mon 10/28/19	Fri 11/8/19	5
2		**Design**	**30 days**	**Mon 11/11/19**	**Fri 12/20/19**	**1**
2.1		Architecture Diagram	5 days	Mon 11/11/19	Fri 11/15/19	
2.2		UML Diagram	5 days	Mon 11/18/19	Fri 11/22/19	8
2.3		User Interface Design	5 days	Mon 11/25/19	Fri 11/29/19	9
2.4		Database Design	15 days	Mon 12/2/19	Fri 12/20/19	10
3		**Development**	**35 days**	**Mon 12/23/19**	**Fri 2/7/20**	**7**
3.1		App Front-End	10 days	Mon 12/23/19	Fri 1/3/20	
3.2		Database Coding	10 days	Mon 1/6/20	Fri 1/17/20	13
3.3		App Back-End	10 days	Mon 1/20/20	Fri 1/31/20	14
3.4		Coding Review	5 days	Mon 2/3/20	Fri 2/7/20	
4		**Testing**	**10 days**	**Mon 2/24/20**	**Fri 3/6/20**	**12**
4.1		User Interface Testing	2 days	Mon 2/24/20	Tue 2/25/20	
4.2		Code Testing	2 days	Wed 2/26/20	Thu 2/27/20	18
4.3		Database Testing	2 days	Fri 2/28/20	Mon 3/2/20	19
4.4		bug Fixing	2 days	Tue 3/3/20	Wed 3/4/20	20
4.5		System Review	2 days	Thu 3/5/20	Fri 3/6/20	21
5		**Implementation**	**10 days**	**Mon 3/9/20**	**Fri 3/20/20**	**17**
5.1		HardWare Implementation	10 days	Mon 3/9/20	Fri 3/20/20	

Figure 1 1.1: Work Breakdown Structure

1.7.2. Roles & Responsibility Matrix

The purpose of roles & responsibility matrix is to identify who will do what.

WBS #	WBS Deliverable	Activity #	Activity to Complete the Deliverable	Duration (# of Days)	Responsible Team Member(s) & Role(s)

1.7.3. Gantt Chart

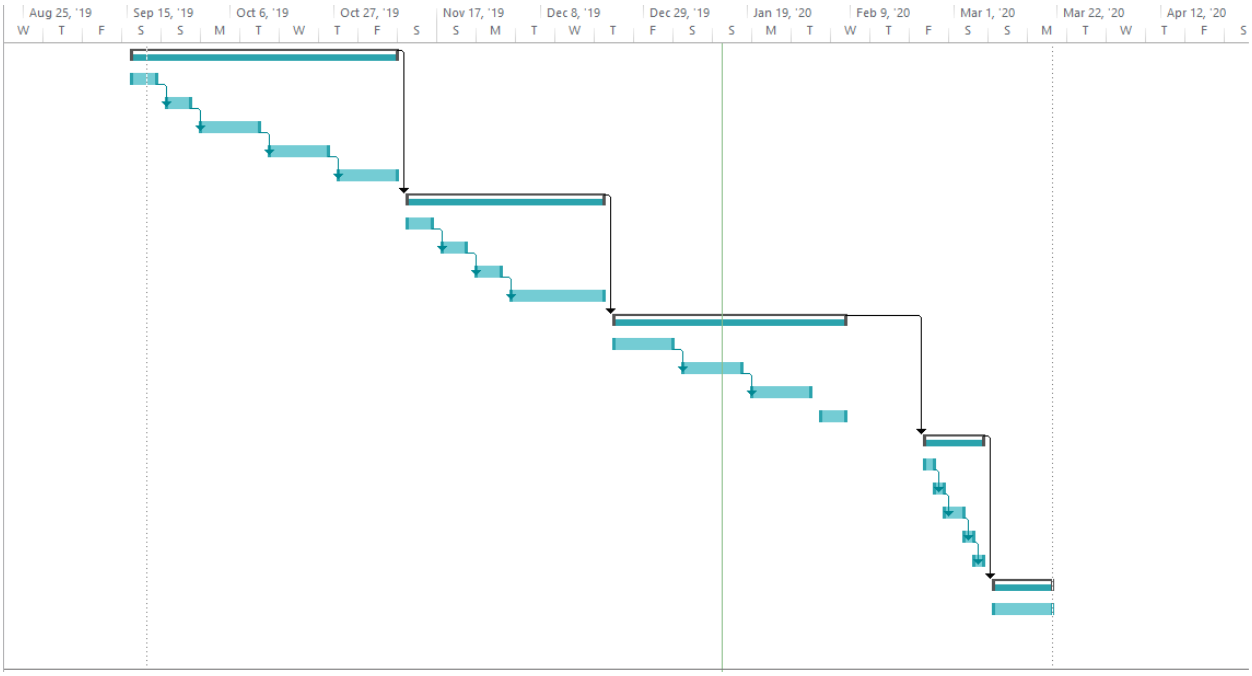

Figure 2 1.2: Gantt Chart

1.8. Report Outline

1. Introduction
2. Existing System / Competitive Analysis
3. Problem Statement
4. Proposed Solution
5. Project Scope
6. System Architectural Design
7. Implementation Tools and Technique
8. Project Plan – WBS & Gantt chart

Chapter 2

Software Requirement Specifications

Chapter 2: Software Requirement Specifications

2.1. Introduction

Polio disease is common in Pakistan. Vaccinations are done by the government of Pakistan but there is some difficulty faced by the team that team are not attached with central computerized. Large number of vaccinations are ruined by the increase in temperature to save the vaccinations we are adding some enhancement in the previous cold chain box so we are going to provide the solution.

- All the information like how many children are in the house (how many children who vaccine is not)
- Temperature of the cold chain box
- Location (GPS)
- Make the children
- Add/drop children
- Create/ submit the report

2.1.1. Purpose

Application enables government and parents to vaccine their children. Many of the parents aren't acknowledge form the drive of polio. Through this application we can mark, add and generate the progress report of the team. This application and hardware component can also minimize the cost of the government on the campaign. In few years the polio spread very fast in Pakistan.

2.1.2. Document Conventions

This record is particular. Stander rules of documentation has been followed in the order of standardized the work. In order to create efficient application in the premises of the centralized database system.

2.1.3. Intended Audience and Reading Suggestions

This report is for individuals like engineer, client, database staff and designer. They are, all things considered, understudies or youths at their first occupations.

2.1.4. Product Scope

Government can trace the record as well as well the team performance of the team. Team can add the record and verify with the database and give immunization to the children. The team can add and drop the children. The team can also generate the progress report. The team can also manage the temperature of the cold chain box. The team can mark the children. The team can also upload the picture of the children. Live location of the team monitors by the government of Pakistan.

2.1.5. References

[1] *https://www.endpolio.com.pk/*
[2] *https://github.com/PhilJay/MPAndroidChart*
[3]http://www.epi.gov.pk/immunisation-schedule/
[4]https://developer.android.com/docs

2.2. Overall Description

2.2.1. Product Perspective

This product is the replacement of the existing system. In this application immunization is done with the help of data and through online system. The record is verified through this application. All the polio teams can monitor with this application. Temperature of the box can be adjusted through this application. The team can mark the children. The team can also add and drop the children.

2.2.2. Product Functions

Application:

- **Login:** User can login
- **Temperature:** User can control the cold chain box temperature through that application.
- **Search/Mark:** User can search/mark data.
- **Add/Drop:** User can add/drop the children.
- **Report:** User can also generate the report.
- **Verify:** Use can verify the record.
- **Logout:** User cans logout

2.2.3. User Classes and Characteristics

There are the two type of the users of the application.

Admin:

- View all the result
- Check the team work.
- Add/Drop the team.
- View the campaign.
- Add new campaign.
- Create report.
- All team information.

User:

- Mark children.
- Add/Drop the Children.
- View Area.
- Create the report.
- Cold chain box(temperature).
- Team information.

2.2.4. Operating Environment

- Android

2.2.5. Design and Implementation Constraints

- The information of the all users, team members must be stored in a database.
- MySQL will be used in the application.
- The application is running 24 hours a day.
- Users may access from any mobile and tab that has internet browsing capabilities and an internet connection.
- Users must have their correct usernames and passwords to enter into their online account and do actions.

2.2.6. User Documentation

We will be provided the tutorial which will represent the whole system function and how it works.

2.2.7. Assumptions and Dependencies

- Google Firebase database use to store the data.
- Android studio used to develop application.

2.3. External Interface Requirements

2.3.1. User Interfaces

The interface will meet the following requirements to conform to the user's needs. It will be simple and easy to understand. Controls which allow the user to interact with the application will be clear and imply their functionality within the application. The interface will include user inputs as well.

2.3.2. Hardware Interfaces

- Mobile
- Laptop

2.3.3. Software Interfaces

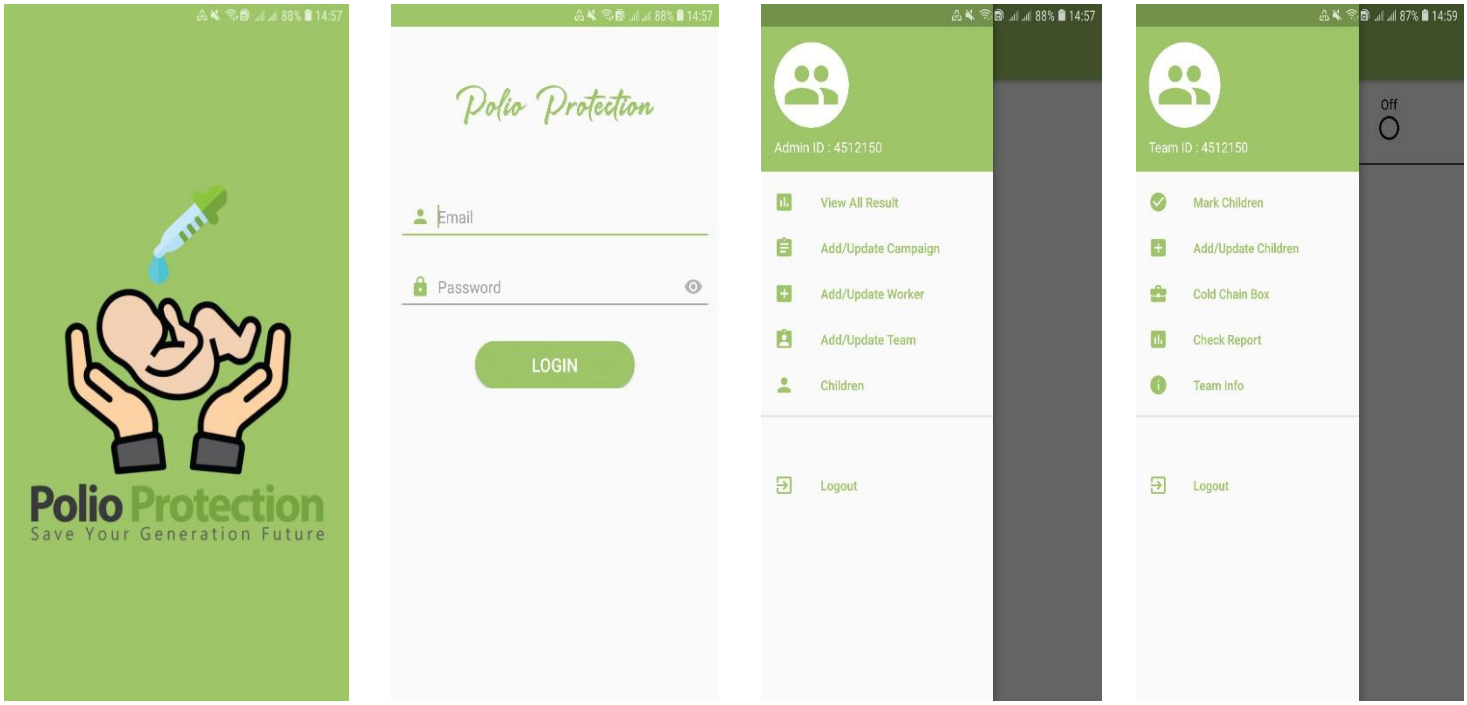

Figure 3 2.2: Software Interface

2.3.4. Communications Interfaces

The communication between the different parts of the system is important since they depend on each other. However, in what way the communication is achieved is not important for the system and is therefore handled by the underlying operating systems the mobile application.

2.4. System Features

There are the two type of the users of the application.

Admin:

- View all the result
- Check the team work.

- Add/Drop the team.
- View the campaign.
- Add new campaign.
- Create report.
- All team information.

User:

- Mark children.
- Add/Drop the Children.
- View Area.
- Create the report.
- Cold chain box(temperature).
- Team information.

2.4.1. System Feature

Team

- **Mark Children**

  Team can fetch the data through the father CNIC. Mark the child after vaccination. Take the picture of the child and upload in the dashboard.

- **Add/Drop Children**

  If the child is not in the list team can add the children. If the parent is shifted form one house to another. Team can add/drop the children.

- **View Area**

  The team can view the area assign to him. Check the children live location. Give the vaccination to the children.

- **Create Work Report**

The team can create the report by the date and submit it online to the admin.

- **Cold Chain Box**

  Team can check the temperature of the cold chain box in the application. The beep alarm is ring when the temperature of the box is below the temperature.

- **Team Info**

  Team leader can check the team information.

Admin

- **View All Result**

  The admin can sort the result submitted to him. The progress graph of the result is built by its own.

- **Check Team Work**

  The admin can view the team work. Live location of the team and assign work to the team.

- **Add/Drop Team**

  The admin can add/drop the team. Admin create the new team.

- **View Campaign**

  Admin can view the campaign. The duration of the campaign.

- **Create Report**

  The admin can create the report which is submitted to him by the team

- **All Team Info**

  The admin can view and update the all team information.

2.5. Other Nonfunctional Requirements

2.5.1. Performance Requirements

If there are performance requirements for the product under various circumstances, state them here and explain their validation, to help the developers understand the intent and make suitable design choices. Specify the timing relationships for real time systems. Make such requirements as specific as possible. You may need to state performance requirements for individual functional requirements or features.

2.5.2. Safety Requirements

All the addition, logged information, update, user activities are backup at the end of each day automatically.

2.5.3. Security Requirements

Any adjustment (insert, update and delete) for the Database might be synchronized and done just by the System administrator.

2.5.4. Software Quality Attributes

1. **Reliability**

   The application can be used by the multiple users concurrently. Any user can access the application with using even low performance mobile.

2. **Availability**

   The application is available during 24 x 7.

3. **Maintainability**

   The application shall be providing the capability to back up the data.

4. **Portability**

   User can login the application at any time.

5. **Robustness**

   The application will not be fragmented down easily.

2.5.5. Business Rules

There are two type of the users are using the system, such as

- User
- Admin

User:

The user can mark the children.

Add and drop the children.

Make the progress report.

Can check the temperature of the cold chain box.

Admin:

Admin have all the rights of the application.

2.6. Other Requirements

In SRS many requirements are not fulfilled these requirements are called Non-Functional requirements

There are numerous kinds of possibility

- Security
- Technical
- Economic
- Specification
- Information
- Motivational
- Legal and Ethical
- Technical

Chapter 3

Use Case Analysis

Chapter 3: System Analysis

This chapter describes the system analysis and models of our application system. These models tell us how the user interacts with the system and what the sequence of activities that occur as the software is used

3.1. Use Case Model

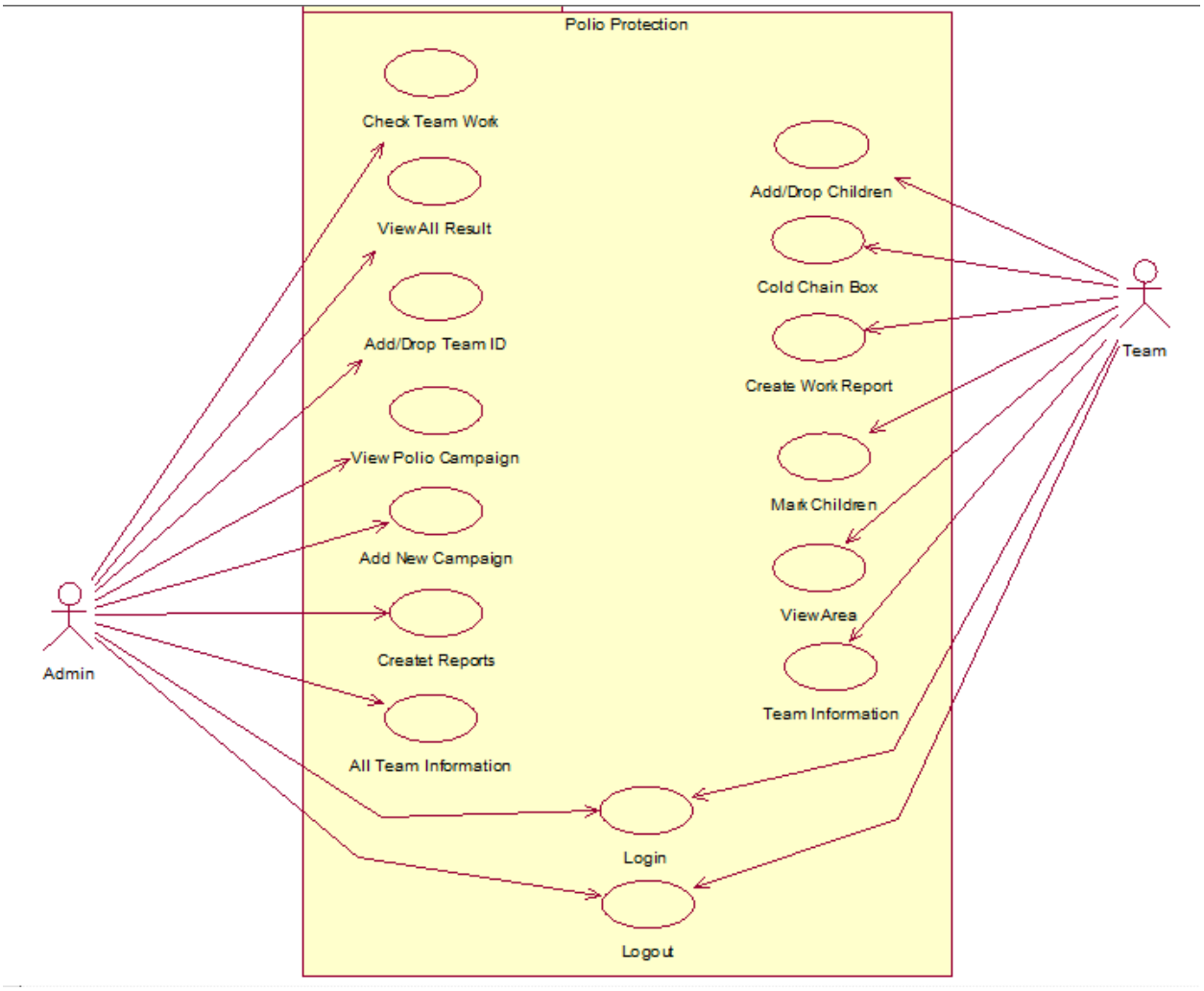

Figure 4 3.1: Use Case Model

3.2. Fully Dressed Use Cases

Use Case 1
Login

Table 1 Use Case 1 Login

Use suite ID	S001
Use Case ID	C001
Actor	Team
Use Case Summery	To verify that login button functions correctly.
Related Requirement	None
Prerequisites	Team must be registered
Test Procedure	Open application Enter User name and password Click on the login button
Test Data	Login detail Team: team, 12345 Login detail Admin: admin, 12345
Expected Result	If the username and password are valid then the home activity should be opened. When User enters in invalid User Name then message show “Your User Name is invalid Please Enter the correct User Name, Retry option”. When User enters a wrong Password then message show “Your Password is invalid Please Enter the correct Password, Retry option”.
Actual Result	Login successful

Use Case 2
House No

Table 2 Use Case 2 House No

Use suite ID	S002
Use Case ID	C002
Actor	Team
Use Case Summery	To verify that Mark Children functions correctly.
Related Requirement	None
Prerequisites	Team must be login
Test Procedure	Open Mark Children activity from navigation menu Enter House No Click on the Search button
Test Data	House No: 123456
Expected Result	If the house no is valid then the children data activity should be opened. When team enters in invalid house no then message show “House No Not Found Please Enter the correct House No”.
Actual Result	Find the House and view all children list less than 5 year

Use Case 3
Mark Children

Table 3 Use Case 3 Mark Children

Use suite ID	S003
Use Case ID	C003
Actor	Team
Use Case Summery	To verify that Mark Children functions correctly.
Related Requirement	None
Prerequisites	Team must be login House no must be valid
Test Procedure	Open Mark Children activity from navigation menu Enter the children name Mark children and enter Ok button
Test Data	Children name: ABC
Expected Result	If the Children find so, click the check box. When Children not found then message show "Children Not Found, Please Add the Children".
Actual Result	Children Mark successful

Use Case 4
Add Children

Table 4 Use Case 4 Add Children

Test suite ID	S004
Use Case ID	C004
Actor	Team
Use Case Summery	To verify that Add Children functions correctly.
Related Requirement	None
Prerequisites	Team must be login
Test Procedure	Open Add Children activity from navigation menu Enter the children name Enter the children gender Enter the children house no Enter the children guardian ID card no
Test Data	Children name: ABC Children gender: male/female House no: 123456 Guardian ID card no: 1234567890123
Expected Result	If the Guardian ID card no correct then message show “Children Add successful”. When the Guardian ID card no correct then message show “Guardian ID Card No Not Correct”.
Actual Result	Children Add successful

Use Case 5

Drop Children

Table 5 Use Case 5 Drop Children

Use suite ID	S005
Use Case ID	C005
Actor	Team
Use Case Summery	To verify that Drop Children functions correctly.
Related Requirement	None.
Prerequisites	Team must be login Children must be adding on database
Test Procedure	Open Drop Children activity from navigation menu Enter House No || Guardian ID card no Search the Children from the list Drop the children
Test Data	House no: 123456 Children name: ABC
Expected Result	If the House no || ID card no are valid then the Children List activity should be opened and search the Children if Children is finding so remove the list. If the House no || ID card no are valid then the Children List activity should be opened and search the Children if Children is no found message show “Children Not Found”. If the House no || ID card no are not valid then message show “House No || ID Card no is not found”.
Actual Result	Drop Children successful

Use Case 6

View Area

Table 6 Use Case 6 View Area

Use suite ID	S006
Use Case ID	C006
Actor	Team
Use Case Summery	To verify that View Area functions correctly.
Related Requirement	None
Prerequisites	Team must be login Polio campaign start
Test Procedure	Open View Area activity from navigation menu
Test Data	
Expected Result	If the Polio campaign start, then show the map. If the Polio campaign Not start then message show “Polio Campaign Not Start”.
Actual Result	Show Map

Use Case 7

Create Work Report

Table 7 Use Case 7 Create Work Report

Use suite ID	S007
Use Case ID	C007
Actor	Team
Use Case Summery	To verify that Create Work Report functions correctly.
Related Requirement	None
Prerequisites	User must be login
Test Procedure	Open Create Work Report activity from navigation menu Sort by Campaign Sort by Date
Test Data	
Expected Result	If the date || campaign is valid then the Report Create. When the date || campaign is Not valid then then message show “Result Not Found”.
Actual Result	Report successful Create

Use Case 8

Cold Chain Box

Table 8 Use Case 8 Cold Chain Box

Use suite ID	S008
Use Case ID	C008
Actor	Team
Use Case Summery	To verify that Cold Chain Box functions correctly.
Related Requirement	None
Prerequisites	User must be login Cold Chain Box must be on
Test Procedure	Open Cold chain box activity from navigation menu Manage Temperature up/down
Test Data	
Expected Result	If the Cold Chain Box Not on then message show "Please Turn on the Box". If the Cold Chain Box on then show Temperature and connecting status.
Actual Result	Cold Chain Box Work View successful

Use Case 9

Team Info

Table 9 Use Case 9 Team Info

Use suite ID	S009
Use Case ID	C009
Actor	Team
Use Case Summery	To verify that Team Info functions correctly.
Related Requirement	None
Prerequisites	Team must be login
Test Procedure	Open Team Info activity from navigation menu
Test Data	
Expected Result	Team view all his information.
Actual Result	Team Info Activity Work successful

Use Case 10
Logout

Table 10 Use Case 10 Logout

Use suite ID	S0010
Use Case ID	C0010
Actor	Team
Use Case Summery	To verify that logout button functions correctly.
Related Requirement	None.
Prerequisites	Team must be login
Test Procedure	Click Logout from navigation menu
Test Data	
Expected Result	
Actual Result	Logout successful

Use Case 11

Add Team

Table 11 Use Case 11 Add Team

Use suite ID	S0011
Use Case ID	C0011
Actor	Admin
Use Case Summery	To verify that Add Team functions correctly.
Related Requirement	None
Prerequisites	Admin must be login
Test Procedure	Open Add Team activity from navigation menu Team ID auto generate Enter the Team Area Enter the Team info
Test Data	Children ID auto generate: 123456 Team City: Lahore Team Hospital: XYZ Team Area: EFG
Expected Result	Check Team City & Team Hospital & Team Area IF Not Found then message show "Team Add successful". Check Team City & Team Hospital & Team Area, Already Exist Team on Same Information then message show "Team Already successful".
Actual Result	Team Add successful

Use Case 12
Drop Team

Table 12 Use Case 12 Drop Team

Use suite ID	S0012
Use Case ID	C0012
Actor	Admin
Use Case Summery	To verify that Drop Team functions correctly.
Related Requirement	None.
Prerequisites	Admin must be login Team must be adding on database
Test Procedure	Open Team Children activity from navigation menu Search the Team from the Database Drop the Team
Test Data	Team id: 123456
Expected Result	If Team ID are valid then the Team remove the list. if Team is no found message show “Team Not Found”.
Actual Result	Drop Team successful

Use Case 13
View All Result

Table 13 Use Case 13 View All Result

Use suite ID	S0013
Use Case ID	C0013
Actor	Admin
Use Case Summery	To verify that View All Result functions correctly.
Related Requirement	None
Prerequisites	Admin must be login
Test Procedure	Open View all result activity from navigation menu
Test Data	
Expected Result	All Result View In graphics
Actual Result	Report successful Create

Use Case 14
Create Report

Table 14 Use Case 14 Create Report

Use suite ID	S0014
Use Case ID	C0014
Actor	Admin
Use Case Summery	To verify that Create Work Report functions correctly.
Related Requirement	None
Prerequisites	Admin must be login
Test Procedure	Open Create Report activity from navigation menu Sort by Campaign Sort by Date Sort by Team Sort by Area
Test Data	
Expected Result	If the date || campaign || Team || Area is valid then the Report Create. When the date || campaign || Team || Area are Not valid then then message show “Result Not Found”.
Actual Result	Report successful Create

Use Case 15
Check Team Work

Table 15 Use Case 15 Check Team Work

Use suite ID	S0015
Use Case ID	C0015
Actor	Admin
Use Case Summery	To verify that Check Team Work functions correctly.
Related Requirement	None
Prerequisites	Admin must be login
Test Procedure	Open Check Team Work activity from navigation menu All Team Work One Team Work
Test Data	
Expected Result	All Team Work One by One Team Work
Actual Result	Team Work Check successful

Use Case 16

Assign Team Work

Table 16 Use Case 16 Assign Team Work

Use suite ID	S0016
Use Case ID	C0016
Actor	Admin
Use Case Summery	To verify that Assign Team Work functions correctly.
Related Requirement	None
Prerequisites	Admin must be login
Test Procedure	Open Assign Team Work activity from navigation menu One by one Assign Area wise Assign All Team Assign Specific Hospital
Test Data	Team ID: 123456 Hospital: ABC Area: XYZ
Expected Result	IF Team || Hospital || Area Find Then Assign the work otherwise message show “Result Not Found”.
Actual Result	Report successful Create

Use Case 17
Polio Campaign

Table 17 Use Case 17 Polio Campaign

Use suite ID	S0017
Use Case ID	C0017
Actor	Admin
Use Case Summery	To verify that Polio Campaign functions correctly.
Related Requirement	None
Prerequisites	Admin must be login
Test Procedure	Open Polio Campaign activity from navigation menu Sort by Date Sort by Area
Test Data	
Expected Result	If the Polio Campaign is found Show the list If not found message show “Result Not Found”.
Actual Result	Polio Campaign successful View.

Use Case 18
Add New Polio Campaign

Table 18 Use Case 18 Add New Polio Campaign

Use suite ID	S0018
Use Case ID	C0018
Actor	Admin
Use Case Summery	To verify that Add New Polio Campaign functions correctly.
Related Requirement	None
Prerequisites	Admin must be login
Test Procedure	Open add new Polio Campaign activity from navigation menu
Test Data	Polio Campaign id: 123456 Date: 2 Jan to 5 Jan 2020 City: Lahore
Expected Result	Enter All data and click on publish button If data store in database message show “New Campaign Publish”, otherwise message show “Campaign Not Publish”.
Actual Result	Add new Polio Campaign successful.

Use Case 19
All Team Info

Table 19 Use Case 19 All Team Info

Use suite ID	S0019
Use Case ID	C0019
Actor	Admin
Use Case Summery	To verify that All Team Info functions correctly.
Related Requirement	None
Prerequisites	• Team must be login
Test Procedure	1. Open Team Info activity from navigation menu 2. Search Team ID 3. Search Area 4. Search Hospital
Test Data	
Expected Result	➢ Admin view all Team information. ➢ Admin view specific Team Information ➢ Admin Area Team Information
Actual Result	All Team Info Activity Work successful

Chapter 4

System Design

Chapter 4: System Design

This chapter describes about the system design of our app. This will include the different types of diagrams. These are eleven different types of diagrams of software engineering which we are using for detailed design of our app project “Polio Protection”.

4.1. Architecture Diagram

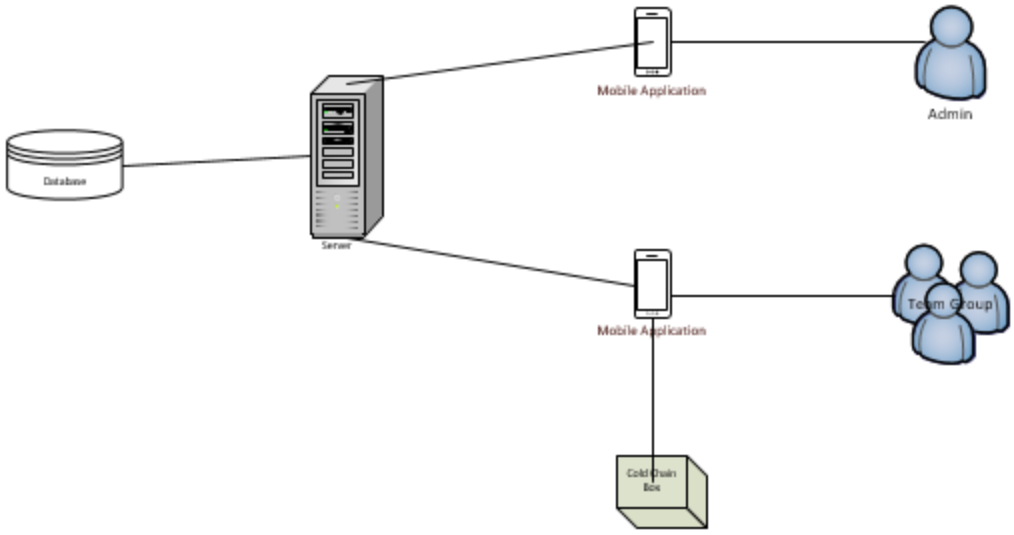

Figure 5 4.1: Architecture Diagram

4.2. Domain Model

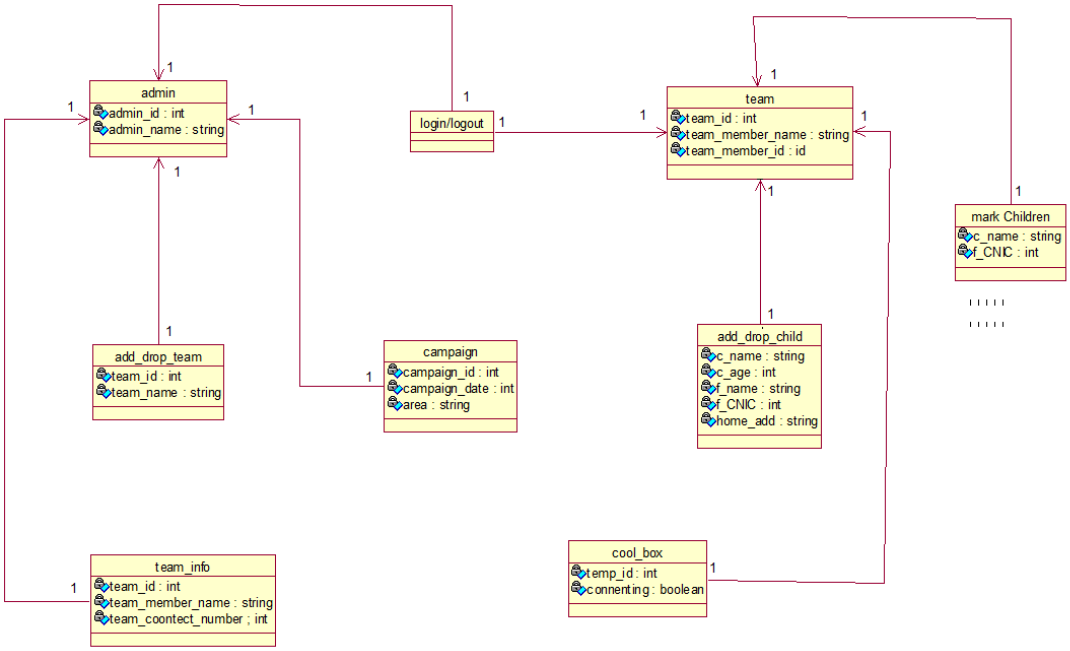

Figure 6 4.2: Domain Model

4.3. Entity Relationship Diagram with data dictionary

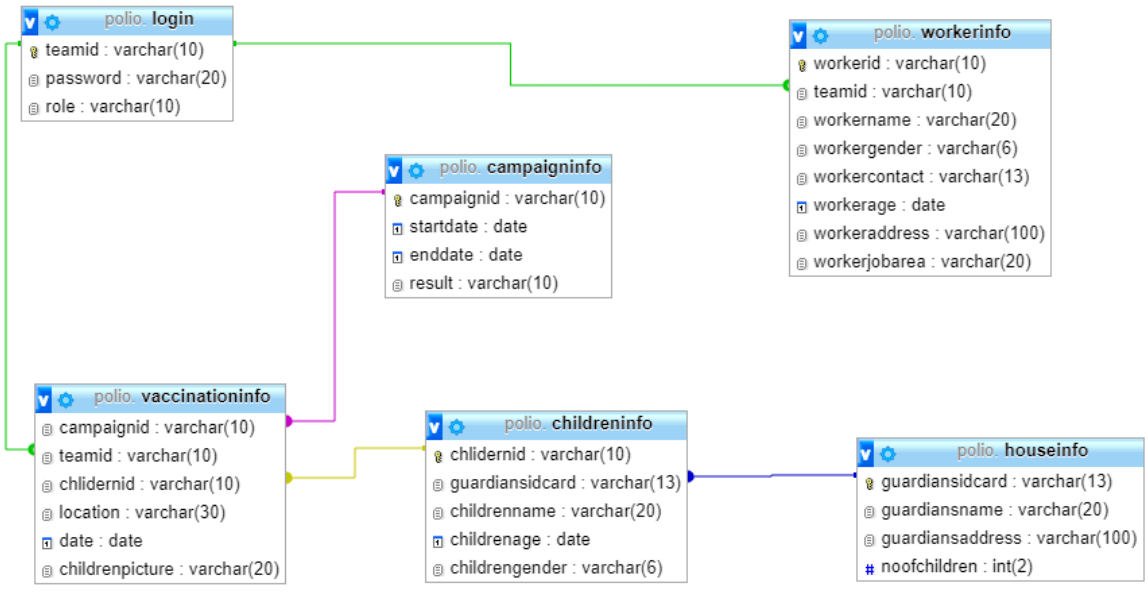

Figure 7 4.3: ERD Diagram

4.4. Class Diagram

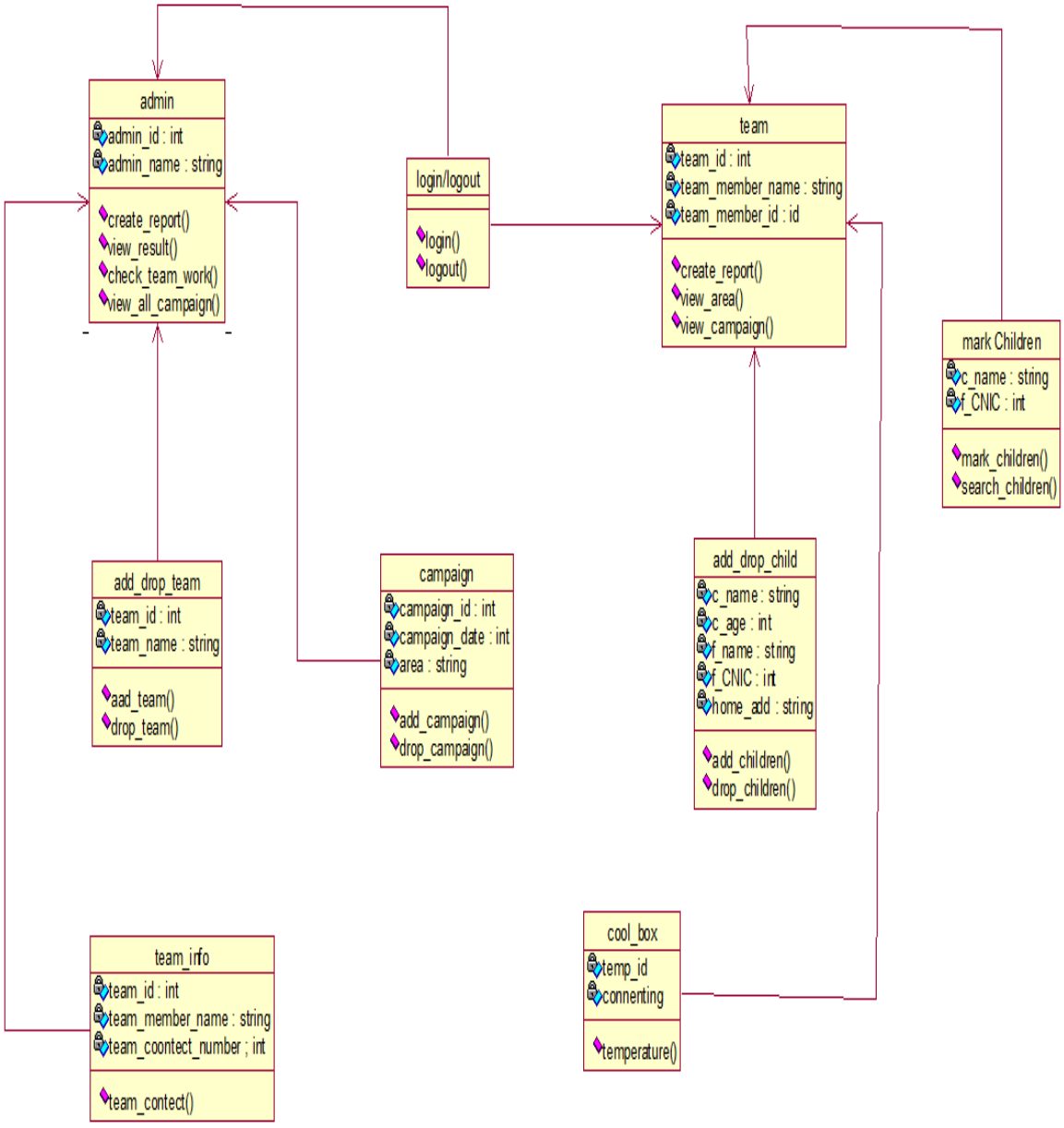

Figure 8 4.4: Class Diagram

4.5. Sequence / Collaboration Diagram

Team:

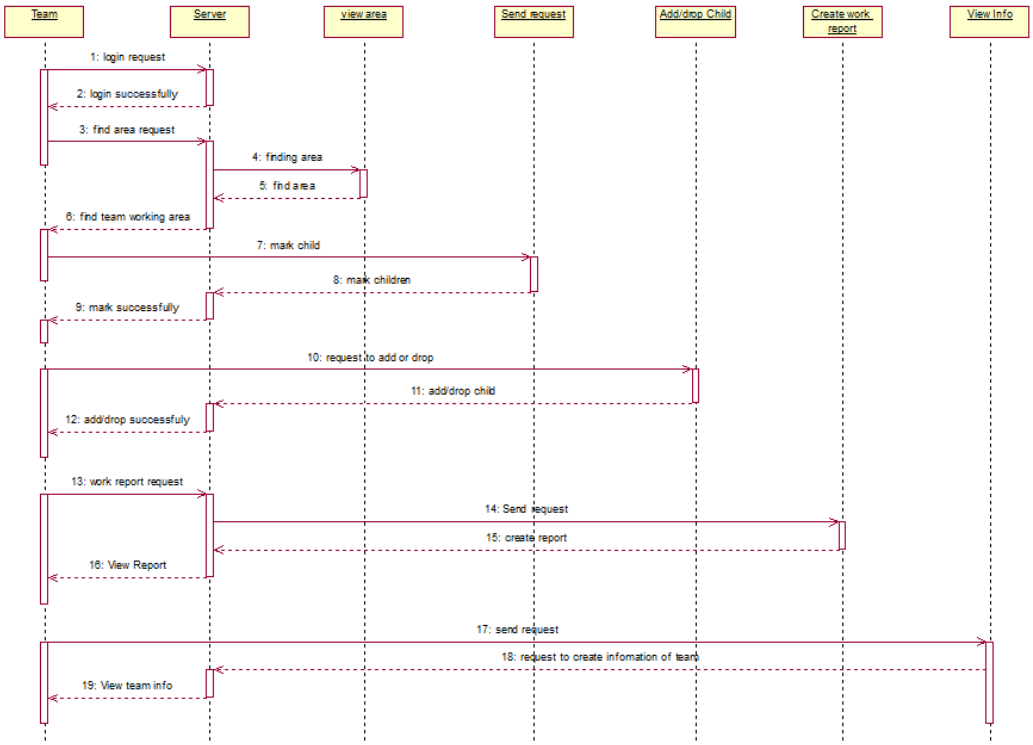

Figure 9 4.5.1: Sequence Diagram

Cold Chain:

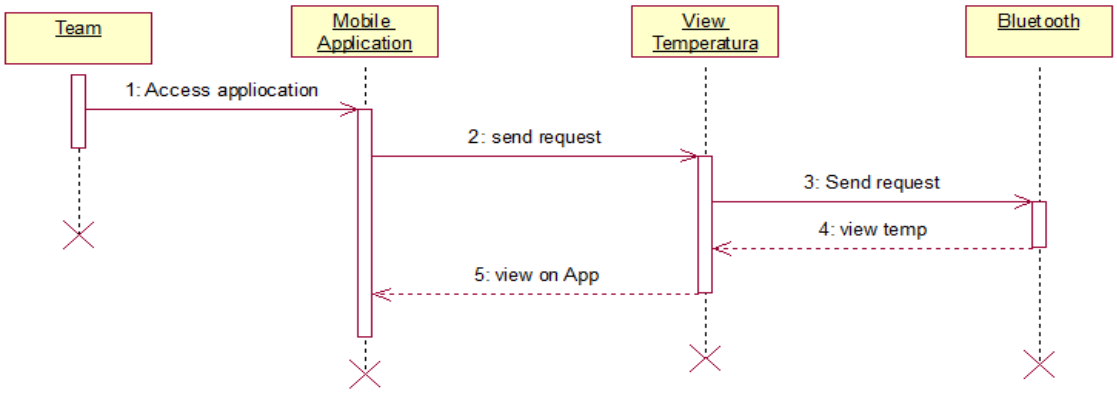

Figure 10 4.5.2: Sequence Diagram

Admin:

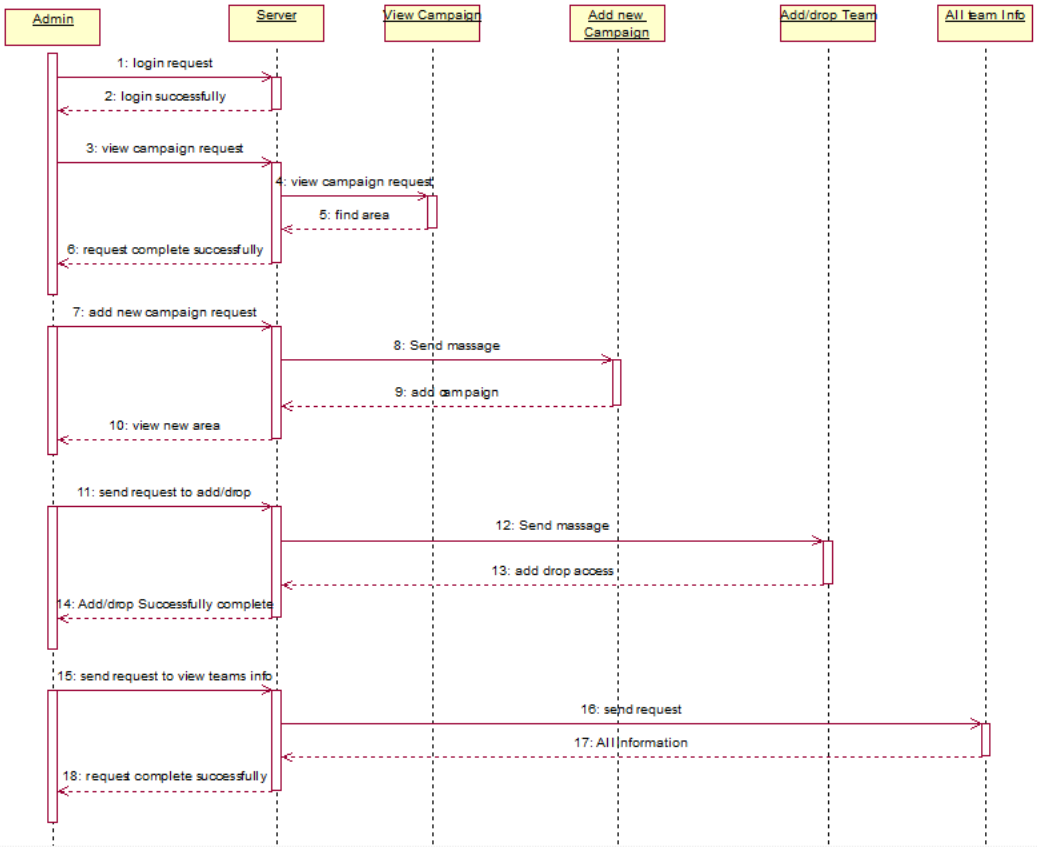

Figure 11 4.5.3: Sequence Diagram

4.6. Activity Diagram

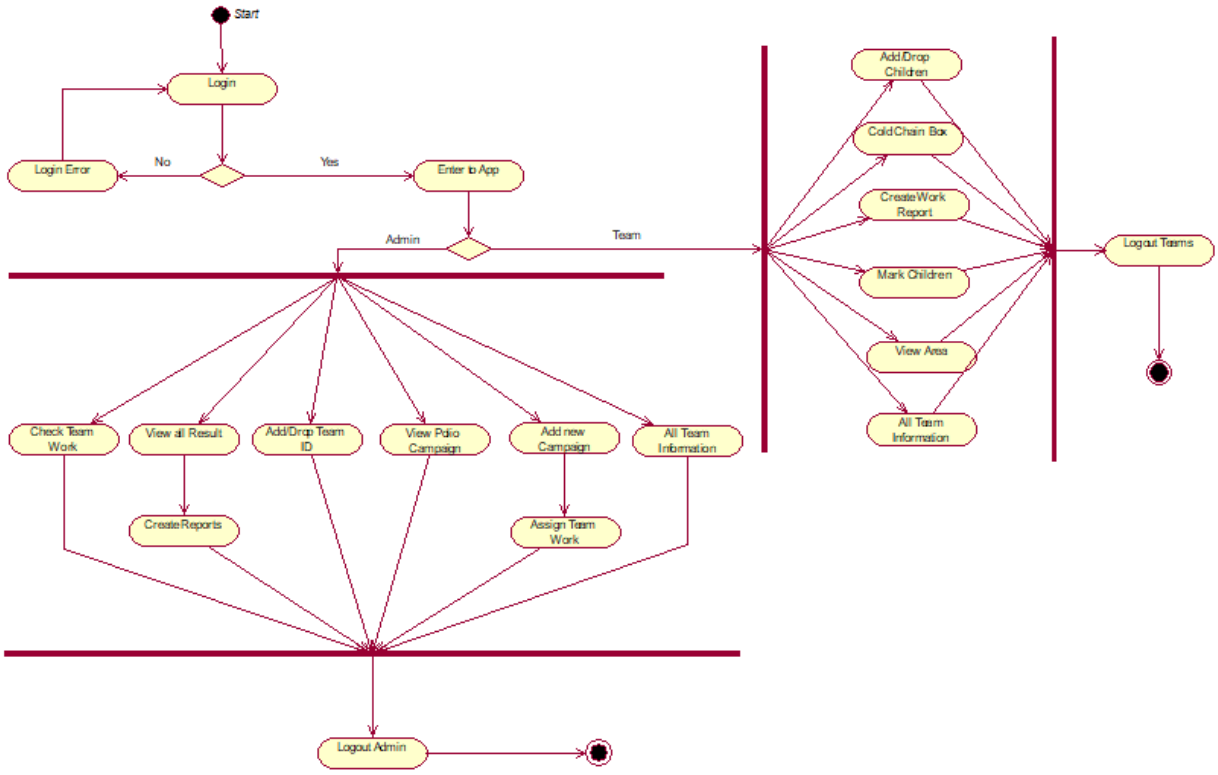

Figure 12 4.6: Activity Diagram

4.7. State Transition Diagram

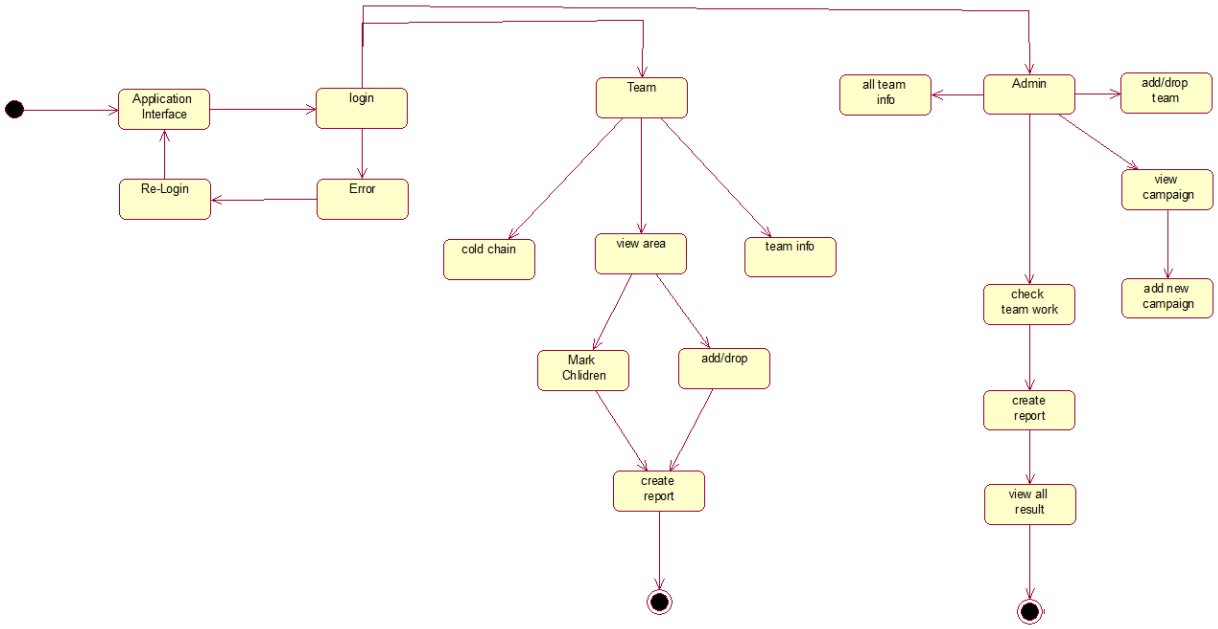

Figure 13 4.7: State Transition Diagram

4.8. Component Diagram

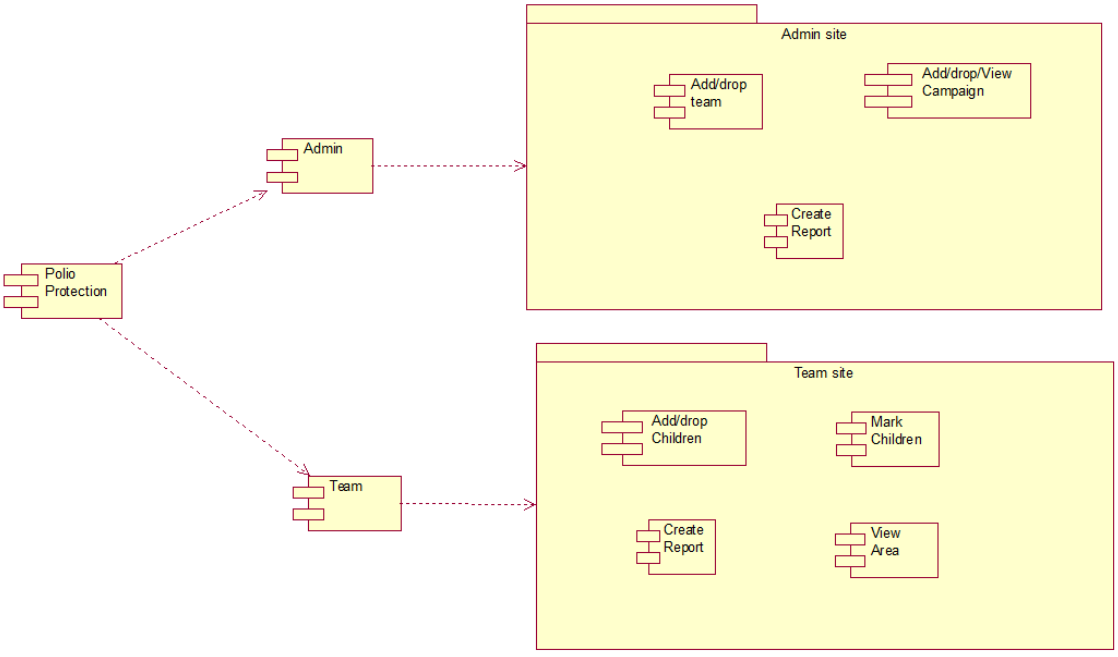

Figure 14 4.8: Component Diagram

4.9. Deployment Diagram

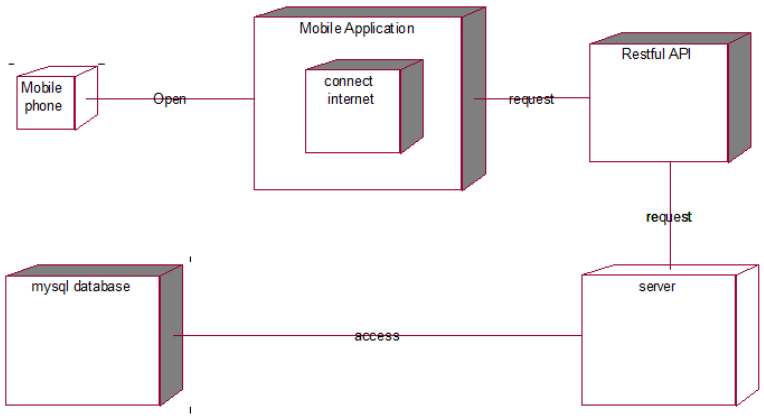

Figure 15 4.9: Deployment Diagram

4.10. Data Flow diagram [*only if structured approach is used - Level 0 and 1*]

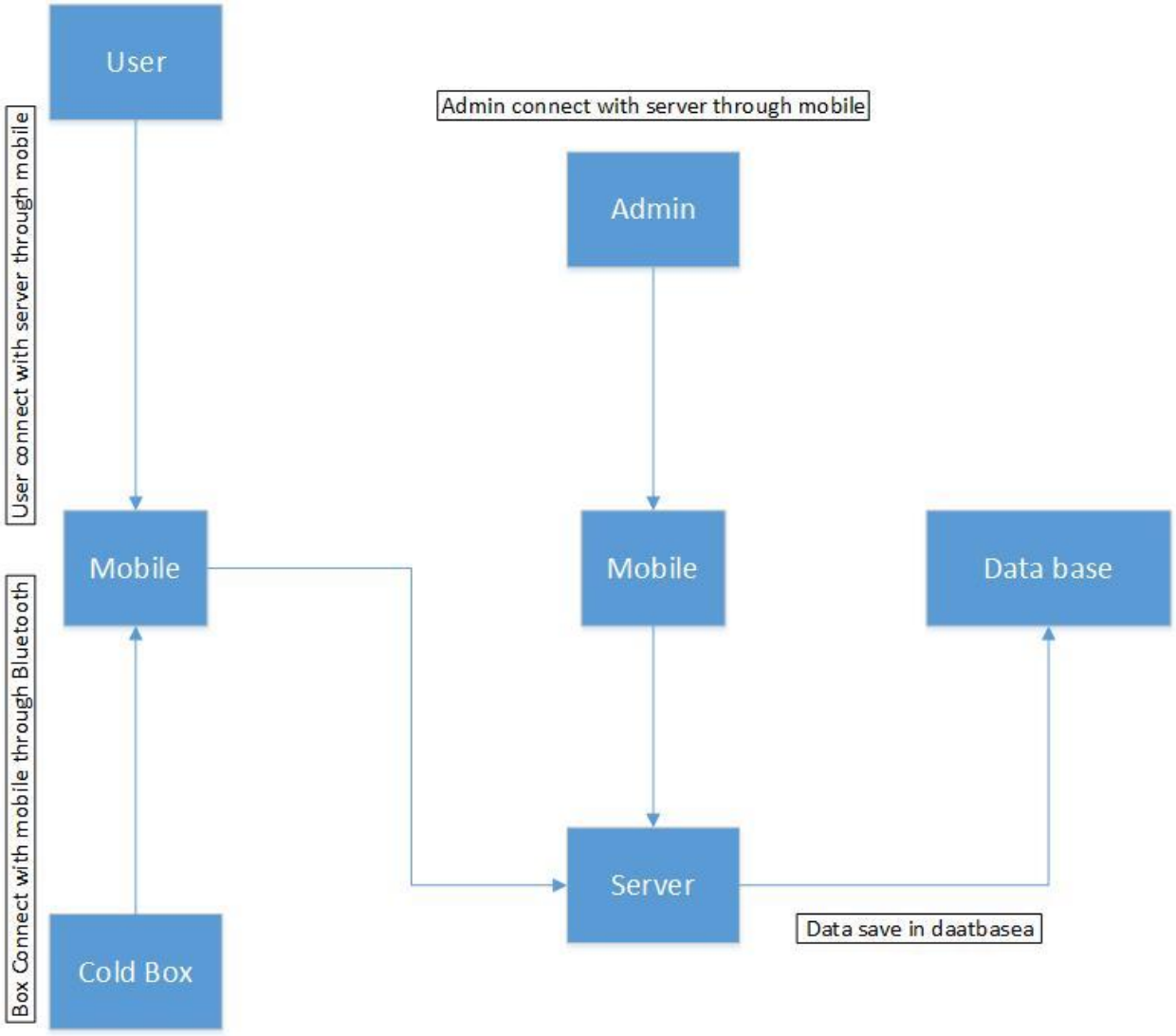

Figure 16 4.10: Data Flow Diagram

Chapter 5
Implementation

Chapter 5: Implementation

This chapter covers the implementation of our project features and implementation flow control of our app. This chapter also describes the components, libraries and web services used in our app project. The deployment environment, tools and techniques and coding standards are explained in this chapter that we are using in our app project.

5.1. Important Flow Control/Pseudo codes

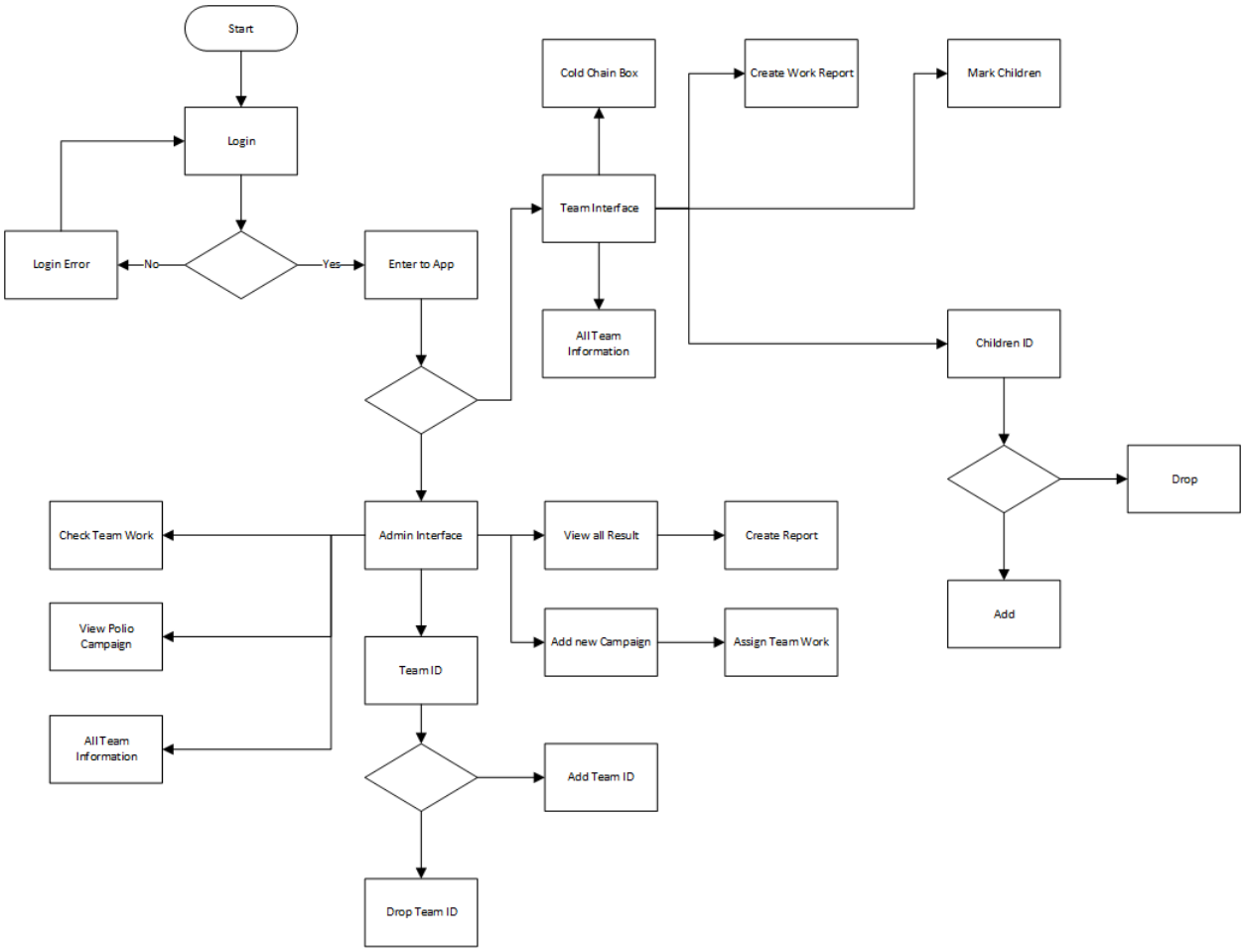

Figure 18 5.1: Flow Control

5.2. Components, Libraries, Web Services and stubs

- Google Firebase database

5.3. Deployment Environment

- Window

5.4. Tools and Techniques

- Android Studio

5.5. Best Practices / Coding Standards

- Testing
- Use java language
- Use xml language

5.6. Version Control

Now we just working on version 1 after the passage of time we changed the version.

Chapter 6

Testing and Evaluation

Chapter 6: Testing and Evaluation

This chapter includes some test cases of the application to check, the application works properly in various situation. In this whole chapter we check each aspect of application according to its performance and appear. Testing each part of the application give us a detailed report of our application which gives us a better considerate of application and its life cycle

6.1. Use Case Testing

Test Case 1
Login

Table 20 Test case 1 Login

Test suite ID	S001
Test Case ID	C001
Actor	Team
Test Case Summery	To verify that login button functions correctly.
Related Requirement	None
Prerequisites	Team must be registered
Test Procedure	Open application Enter User name and password Click on the login button
Test Data	Login detail Team: team, 12345 Login detail Admin: admin, 12345
Expected Result	If the username and password are valid then the home activity should be opened. When User enters in invalid User Name then message show “Your User Name is invalid Please Enter the correct User Name, Retry option”. When User enters a wrong Password then message show “Your Password is invalid Please Enter the correct Password, Retry option”.
Actual Result	Login successful
Status	Test Successful
Created By	Huzaifa
Date of Creation	03/24/2020

Executed By	Arsalan, Ali Raza

Test Case 2
House No

Table 21 Test Case 2 House No

Test suite ID	S002
Test Case ID	C002
Actor	Team
Test Case Summery	To verify that Mark Children functions correctly.
Related Requirement	None
Prerequisites	Team must be login
Test Procedure	Open Mark Children activity from navigation menu Enter House No Click on the Search button
Test Data	House No: 123456
Expected Result	If the house no is valid then the children data activity should be opened. When team enters in invalid house no then message show “House No Not Found Please Enter the correct House No”.
Actual Result	Find the House and view all children list less than 5 year
Status	Test Successful
Created By	Huzaifa
Date of Creation	03/24/2020
Executed By	Arsalan, Ali Raza

Test Case 3

Mark Children

Table 22 Test Case 3 Mark Children

Test suite ID	S003
Test Case ID	C003
Actor	Team
Test Case Summery	To verify that Mark Children functions correctly.
Related Requirement	None
Prerequisites	Team must be login House no must be valid
Test Procedure	Open Mark Children activity from navigation menu Enter the children name Mark children and enter Ok button
Test Data	Children name: ABC
Expected Result	If the Children find so, click the check box. When Children not found then message show "Children Not Found, Please Add the Children".
Actual Result	Children Mark successful
Status	Test Successful
Created By	Huzaifa
Date of Creation	03/24/2020
Executed By	Arsalan, Ali Raza

Test Case 4

Add Children

Table 23 Test Case 4 Add Children

Test suite ID	S004
Test Case ID	C004
Actor	Team
Test Case Summery	To verify that Add Children functions correctly.
Related Requirement	None
Prerequisites	Team must be login
Test Procedure	Open Add Children activity from navigation menu Enter the children name Enter the children gender Enter the children house no Enter the children guardian ID card no
Test Data	Children name: ABC Children gender: male/female House no: 123456 Guardian ID card no: 1234567890123
Expected Result	If the Guardian ID card no correct then message show “Children Add successful”. When the Guardian ID card no correct then message show “Guardian ID Card No Not Correct”.
Actual Result	Children Add successful
Status	Test Successful
Created By	Huzaifa
Date of Creation	03/24/2020
Executed By	Arsalan, Ali Raza

Test Case 5
Drop Children

Table 24 Test Case 5 Drop Children

Test suite ID	S005
Test Case ID	C005
Actor	Team
Test Case Summery	To verify that Drop Children functions correctly.
Related Requirement	None.
Prerequisites	Team must be login Children must be adding on database
Test Procedure	Open Drop Children activity from navigation menu Enter House No || Guardian ID card no Search the Children from the list Drop the children
Test Data	House no: 123456 Children name: ABC
Expected Result	If the House no || ID card no are valid then the Children List activity should be opened and search the Children if Children is finding so remove the list. If the House no || ID card no are valid then the Children List activity should be opened and search the Children if Children is no found message show “Children Not Found”. If the House no || ID card no are not valid then message show “House No || ID Card no is not found”.
Actual Result	Drop Children successful
Status	Test Successful
Created By	Huzaifa
Date of Creation	03/24/2020
Executed By	Arsalan, Ali Raza

Test Case 6
View Area

Table 25 Test Case 6 View Area

Test suite ID	S006
Test Case ID	C006
Actor	Team
Test Case Summery	To verify that View Area functions correctly.
Related Requirement	None
Prerequisites	Team must be login Polio campaign start
Test Procedure	Open View Area activity from navigation menu
Test Data	Current location of the Arsalan phone
Expected Result	If the Polio campaign start, then show the map. If the Polio campaign Not start then message show “Polio Campaign Not Start”.
Actual Result	Show Map
Status	Test Successful
Created By	Huzaifa
Date of Creation	03/24/2020
Executed By	Arsalan, Ali Raza

Test Case 7

Create Work Report

Table 26 Test Case 7 Create Work Report

Test suite ID	S007
Test Case ID	C007
Actor	Team
Test Case Summery	To verify that Create Work Report functions correctly.
Related Requirement	None
Prerequisites	User must be login
Test Procedure	Open Create Work Report activity from navigation menu Sort by Campaign Sort by Date
Test Data	Campaign 1234567
Expected Result	If the date || campaign is valid then the Report Create. When the date || campaign is Not valid then then message show “Result Not Found”.
Actual Result	Report successful Create
Status	Test Successful
Created By	Huzaifa
Date of Creation	03/24/2020
Executed By	Arsalan, Ali Raza

Test Case 8
Cold Chain Box

Table 27 Test Case 8 Cold Chain Box

Test suite ID	S008
Test Case ID	C008
Actor	Team
Test Case Summery	To verify that Cold Chain Box functions correctly.
Related Requirement	None
Prerequisites	User must be login Cold Chain Box must be on
Test Procedure	Open Cold chain box activity from navigation menu Manage Temperature up/down
Test Data	
Expected Result	If the Cold Chain Box Not on then message show “Please Turn on the Box”. If the Cold Chain Box on then show Temperature and connecting status.
Actual Result	Cold Chain Box Work View successful
Status	Test Successful
Created By	Huzaifa
Date of Creation	03/24/2020
Executed By	Arsalan, Ali Raza

Test Case 9

Team Info

Table 28 Test Case 9 Team Info

Test suite ID	S009
Test Case ID	C009
Actor	Team
Test Case Summery	To verify that Team Info functions correctly.
Related Requirement	None
Prerequisites	Team must be login
Test Procedure	Open Team Info activity from navigation menu
Test Data	
Expected Result	Team view all his information.
Actual Result	Team Info Activity Work successful
Status	Test Successful
Created By	Huzaifa
Date of Creation	03/24/2020
Executed By	Arsalan, Ali Raza

Test Case 10
Logout

Table 29 Test Case 10 Logout

Test suite ID	S0010
Test Case ID	C0010
Actor	Team
Test Case Summery	To verify that logout button functions correctly.
Related Requirement	None.
Prerequisites	Team must be login
Test Procedure	Click Logout from navigation menu
Test Data	a@gmail.com t@gmail.com
Expected Result	User logout
Actual Result	Logout successful
Status	Test Successful
Created By	Huzaifa
Date of Creation	03/24/2020
Executed By	Arsalan, Ali Raza

Test Case 11
Add Team

Table 30 Test Case 11 Add Team

Test suite ID	S0011
Test Case ID	C0011
Actor	Admin
Test Case Summery	To verify that Add Team functions correctly.
Related Requirement	None
Prerequisites	• Admin must be login
Test Procedure	Open Add Team activity from navigation menu Team ID auto generate Enter the Team Area Enter the Team info
Test Data	Children ID auto generate: 123456 Team City: Lahore Team Hospital: XYZ Team Area: EFG
Expected Result	Check Team City & Team Hospital & Team Area IF Not Found then message show "Team Add successful". Check Team City & Team Hospital & Team Area, Already Exist Team on Same Information then message show "Team Already successful".
Actual Result	Team Add successful
Status	Test Successful
Created By	Huzaifa
Date of Creation	03/24/2020
Executed By	Arsalan, Ali Raza

Test Case 12
Drop Team

Table 31 Test Case 12 Drop Team

Test suite ID	S0012
Test Case ID	C0012
Actor	Admin
Test Case Summery	To verify that Drop Team functions correctly.
Related Requirement	None.
Prerequisites	Admin must be login Team must be adding on database
Test Procedure	Open Team Children activity from navigation menu Search the Team from the Database Drop the Team
Test Data	Team id: 123456
Expected Result	If Team ID are valid then the Team remove the list. if Team is no found message show “Team Not Found”.
Actual Result	Drop Team successful
Status	Test Successful
Created By	Huzaifa
Date of Creation	03/24/2020
Executed By	Arsalan, Ali Raza

Test Case 13
View All Result

Table 32 Test Case 13 View All Result

Test suite ID	S0013
Test Case ID	C0013
Actor	Admin
Test Case Summery	To verify that View All Result functions correctly.
Related Requirement	None
Prerequisites	Admin must be login
Test Procedure	Open View all result activity from navigation menu
Test Data	
Expected Result	All Result View In graphics
Actual Result	Report successful Create
Status	Test Successful
Created By	Huzaifa
Date of Creation	03/24/2020
Executed By	Arsalan, Ali Raza

Test Case 14
Create Report

Table 33 Test Case 14 Create Report

Test suite ID	S0014
Test Case ID	C0014
Actor	Admin
Test Case Summery	To verify that Create Work Report functions correctly.
Related Requirement	None
Prerequisites	Admin must be login
Test Procedure	Open Create Report activity from navigation menu Sort by Campaign Sort by Date Sort by Team Sort by Area
Test Data	Campaign 1234567
Expected Result	If the date || campaign || Team || Area is valid then the Report Create. When the date || campaign || Team || Area are Not valid then then message show "Result Not Found".
Actual Result	Report successful Create
Status	Test Successful
Created By	Huzaifa
Date of Creation	03/24/2020
Executed By	Arsalan, Ali Raza

Test Case 15

Check Team Work

Table 34 Test Case 15 Check Team Work

Test suite ID	S0015
Test Case ID	C0015
Actor	Admin
Test Case Summery	To verify that Check Team Work functions correctly.
Related Requirement	None
Prerequisites	Admin must be login
Test Procedure	Open Check Team Work activity from navigation menu All Team Work One Team Work
Test Data	
Expected Result	All Team Work & One by One Team Work
Actual Result	Team Work Check successful
Status	Test Successful
Created By	Huzaifa
Date of Creation	03/24/2020
Executed By	Arsalan, Ali Raza

Test Case 16
Assign Team Work

Table 35 Test Case 16 Assign Team Work

Test suite ID	S0016
Test Case ID	C0016
Actor	Admin
Test Case Summery	To verify that Assign Team Work functions correctly.
Related Requirement	None
Prerequisites	Admin must be login
Test Procedure	Open Assign Team Work activity from navigation menu One by one Assign Area wise Assign All Team Assign Specific Hospital
Test Data	Team ID: 123456 Hospital: ABC Area: XYZ
Expected Result	IF Team || Hospital || Area Find Then Assign the work otherwise message show "Result Not Found".
Actual Result	Report successful Create
Status	Test Successful
Created By	Huzaifa
Date of Creation	03/24/2020
Executed By	Arsalan, Ali Raza

Test Case 17
Polio Campaign

Table 36 Test Case 17 Polio Campaign

Test suite ID	S0017
Test Case ID	C0017
Actor	Admin
Test Case Summery	To verify that Polio Campaign functions correctly.
Related Requirement	None
Prerequisites	Admin must be login
Test Procedure	Open Polio Campaign activity from navigation menu Sort by Date Sort by Area
Test Data	Campaign 1234567
Expected Result	If the Polio Campaign is found Show the list If not found message show “Result Not Found”.
Actual Result	Polio Campaign successful View.
Status	Test Successful
Created By	Huzaifa
Date of Creation	03/24/2020
Executed By	Arsalan, Ali Raza

Test Case 18
Add New Polio Campaign

Table 37 Test Case 18 Add New Polio Campaign

Test suite ID	S0018
Test Case ID	C0018
Actor	Admin
Test Case Summery	To verify that Add New Polio Campaign functions correctly.
Related Requirement	None
Prerequisites	Admin must be login
Test Procedure	Open add new Polio Campaign activity from navigation menu
Test Data	Polio Campaign id: 123456 Date: 2 Jan to 5 Jan 2020 City: Lahore
Expected Result	Enter All data and click on publish button If data store in database message show “New Campaign Publish”, otherwise message show “Campaign Not Publish”.
Actual Result	Add new Polio Campaign successful.
Status	Test Successful
Created By	Huzaifa
Date of Creation	03/24/2020
Executed By	Arsalan, Ali Raza

Test Case 19
All Team Info

Table 38 Test Case 19 All Team Info

Test suite ID	S0019
Test Case ID	C0019
Actor	Admin
Test Case Summery	To verify that All Team Info functions correctly.
Related Requirement	None
Prerequisites	Team must be login
Test Procedure	Open Team Info activity from navigation menu Search Team ID Search Area Search Hospital
Test Data	
Expected Result	Admin view all Team information. Admin view specific Team Information Admin Area Team Information
Actual Result	All Team Info Activity Work successful
Status	Test Successful
Created By	Huzaifa
Date of Creation	03/24/2020
Executed By	Arsalan, Ali Raza

6.2. Equivalence partitioning

Using the Equivalence Partitioning method test cases can be divided into three sets of input data that is classes. Each test case is representative of a respective class. We can divide our test cases into three equivalence classes of some valid and invalid inputs.

Login:

Only registered user can login to their accounts otherwise system generate a message “Email and Password is incorrect”

Equivalence Partition	
Incorrect	Correct
admin@gmail,com	admin@gmail.com

Add Campaign:

Only Admin can add the Campaign according to the rules of that entity

Equivalence Partition	
Incorrect	Correct
ADGGHNB	1234567

Add Children:

Only team can add the children by adding the father CNIC

Equivalence Partition	
Incorrect	Correct
35202-798XXXX-X	35202798XXXXX

6.3. Boundary value analysis

- Mark child
- Add new child
- Add new campaign
- Cold chain box temperature measurement
- Capture the current location of team
- Daily/weekly progress report

6.4. Data flow testing

Data flow testing is used to analyze the flow of data in the program. It is the process of collecting information about how the variables flow the data in the program. It tries to obtain particular information of each particular point in the process Dataflow Testing focuses on the points at which variables receive values and the points at which these values are used.

In which we describe how the data is flowing in our application.

In our Application have two main flow one is for Team and other is for Admin.

Team data Flow:

Teacher firstly login then he can access the other feature after login he/she can mark the child, add new child, can view the team info and after this he/she can logout from application.

Admin data flow:

Admin also login into the application then he perfumes the further Activity After Login he can view the team progress report, add new campaign, add new team and after he/she can logout from application.

6.5. Unit testing

Unit testing is about testing the working of individual components of an application.

Team Login:

Team can login in the application by entering the valid email and password

Team logout:

The team can logout from application.

Team Mark Children:

After login the team can mark the child in the house by entering the ID card of the Father

Team Add Children:

The team member can add the new children in the database.

Team Cold Chain box:

The team can control the temperature of the cold chain box.

Team location:

The team current location during the marking the student capture and store in the system.

Admin Login:

Admin can login the application by applying the valid email and password.

Admin Logout:

Admin can logout from the application.

Admin Add Campaign:

Admin can add the new campaign form the vaccination.

Admin Close Campaign:

Admin can close the campaign.

Admin view reports:

The admin can see the progress report of the team on daily, weekly and monthly bases.

Admin New team:

The admin can add the new team and assign the area.

6.6. Integration testing

Integration Testing is a level of software testing where individual units are combined and tested as a group. Integration testing is done to confirm if the different modules work as expected, when integrated together.

In Integration Testing we use two methods or technique is Top to Bottom and Bottom to Top

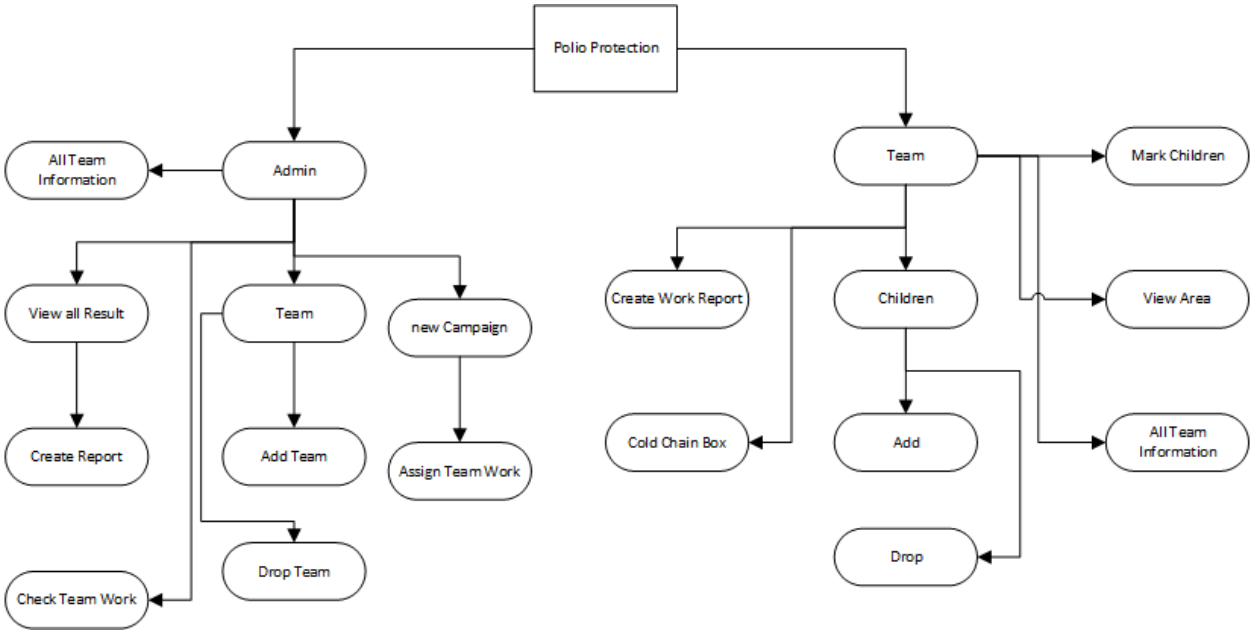

Figure 19 6.6: Top to Bottom Integration testing

6.7. Performance testing

Performance testing is the process of determining the speed, responsiveness and stability of a Mobile Application, network, software program or device. Performance testing can involve measurable tests done in a lab. Performance of a software is determined by three factors:

- Speed
- Scalability
- Stability

Application has started working and its performance is according to the expectations, all the components are working properly. Data can be added easily. All the validations and verifications are working efficiently. We perform the load testing in our application and it work properly its peak value is 700 users.

6.8. Stress Testing

Stress testing is defined as type of software testing that verify the stability and reliability of the system. This test mainly determines the system on its robustness and error handling under extremely heavy load conditions. Polio protection application working properly under stress condition and working correctly. In tool we perform stress testing in our system and its work properly after extreme point its work moderately and its extreme point is 1500 user.

Chapter 7

Summary, Conclusion and Future Enhancements

Chapter 7: Summary, Conclusion & Future Enhancements

7.1. Project Summary

This application will be helpful for the children, parents and as well as for the Government of Pakistan. The vaccination done to the children monitor by the Government. Through this many of the children missed by the incorrect data and management of data will be abandoned. The team can mark the children and take the picture of the children with the house number and upload in the dashboard. The new entry of the children can be entered by the team of the relevant area team. The team can also create the work report and submit it online. The team can check the temperature of the cold chain through this application. The hardware component will also helpful for the irrelevant wastage of the vaccinations. The solar plate umbrella provide help to give energy to the box.

7.2. Achievements and Improvements

Effectively, the application has been designed in response it the system analysis. All possible error of the program has been eliminated. Essential validation techniques have been used and abnormal and extremely data was used to test the system. However, doing this project which boost our confident as the future IT member of our global village. In future we will try to develop our project in that way to improve the precision and users can login through the fingerprint sensor as well. When a team vaccine the child the approval alert sent to the cell phone.

7.3. Critical Review

The polio protection application is used to help the government to control in the polio in current era. Due to this application the irrelevant data in detached and the exact number of the children are vaccine. The admin can also monitor the teams work on the daily base by clicking on the daily progress of team in his/her dashboard.

7.4. Lessons Learnt

- Making IoT based application
- Connecting different sensors
- Meeting deadlines
- Making a smart solution by connecting things to the internet
- Self-study
- Problem solving
- Effective communication management
- Risk and conflict management
- Project documentation
- Android application development - java programing
- Team Work

7.5. Future Enhancements/Recommendations

- Increased accuracy
- Fingerprint security system
- Alert via SMS
- Web application development

Appendices

Appendix A: Information / Promotional Material

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A.1. Broacher

A.2. Flyer

A.3. Standee

A.4. Banner

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A.5.1. Second level heading [14 pt., Calibri, Bold, Left aligned]

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A.1.1.1. Third level heading [12 pt., Calibri, Bold, Left aligned]

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Reference and Bibliography

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[1] M. Sher, M. Rehman, "*Title of the Paper*" Conference name/Journal Name, Edition, Volume, Issue, ISBN/ISSN, PP, Publisher/City-Country, Year.

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