

Digital Polio Vaccination System

Final Year Project



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Digital Polio Vaccination System

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Abstract

Pakistan is one of the unfortunate countries in the world where polio is still to be eradicated. Information technology has revolutionized the health care sector over the last two decades. While other countries are integrating advanced technologies into their health care system; Pakistan is lagging and making very little progress in adapting to this change. The Pakistani dilemma over poliovirus is a mixture of mismanagement, illiteracy, and rigid public behaviors. Polio seems to be a typical Pakistani problem that tends to fade away from time to time but isn't going anywhere soon.

With guidelines to solve our local problems (From FCCU CS Department & HEC), we decide to approach this local problem head-on and come up with a solution that is just the right fit for the general dynamics of Pakistan. The Digital Polio Vaccination System seeks to mitigate the mismanagement problem of the poliovirus dilemma of Pakistan moreover it seeks to eliminate outdated practices like wall chalking and paper-based record-keeping with more advanced practices like QR tags/stickers and digital record-keeping. The result will be a better overall system that can help us eradicate the poliovirus from Pakistan.

Acknowledgement

Part of the journey is the end! The success and outcome of this project required a lot of guidance and assistance from many people and we are extremely privileged to have got this all along with the completion of this project. All that we have done is only due to such supervision and assistance. We would like to thank God for giving us the strength to make it this far. We express our sincere gratitude towards our Parents, Teachers, Friends, and the whole FCCU community who made it possible for us to reach our destination. We are grateful to Miss Samia Asloob Qureshi and Dr. Nosheen Sabahat for their enthusiasm, patience, kindness, practical advice, and constant support amid the Covid-19 pandemic which kept us focused and gave us great assurance that we are not alone in this time of suffering and uncertainty.

We had many ideas in our minds that we wanted to implement but due to the pandemic we were not able to turn them into reality but still we were able to complete this project with all the functional requirements mentioned in the SRS.

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Revision History

Name	Date	Reason For Changes	Version

Chapter 1. Introduction

1.1 Introduction

Information technology has revolutionized the health care sector over the last two decades. While other countries are integrating advanced technologies into their health care system; Pakistan is lagging and making very little progress in adapting to this change. Medical records are still kept bundled in paper files rendered to very little use. It is safe to say that we live in the age of data and human beings are producing tons of tons of data as compared to the late 1900s and early 2000s. One must understand the digitalization of data management can be used to obtain useful insights and analytics for the betterment of Pakistan's health care system. Polio, or poliomyelitis, is a disabling and life-threatening disease caused by the poliovirus. The virus spreads from person to person and can infect the spinal cord of an individual, causing paralysis. For most countries, polio is a thing of the past but Pakistan along with Afghanistan and Nigeria is still fighting this disease due to improper record-keeping, a paper-based vaccination system, ineffective tracking of positive cases, incomplete/incorrect record of non-compliant families and no use of contact tracing. The above-mentioned is a result of negligence from the government but other factors such as Conspiracy Theories, Religious/Tribal Values, and High-Risk areas are also responsible for non-eradication of the Polio-Virus from Pakistan. Although Pakistan has been blessed with an abundance of polio vaccines, the vaccination process itself is ineffective and outdated. The vaccination is carried out by polio teams that comprises 2-3 people sometimes accompanied by police or other law enforcement personals, These teams are managed and overlooked by an area in-charge for a particular UC (Union Council), District or City. Every team is given a paper sheet in which data is recorded once an individual of age 5 or younger is vaccinated; moreover a certain Alpha-Numeric code is also chalked on the wall or gate of every household in the area.

1.2 Objectives

- The primary goal of planning this venture is to make Pakistan a POLIO FREE Country.
- This will enhance the whole vaccination process and maximize the productivity of polio teams.
- The reason behind this undertaking is to make everything controlled and refreshed with the assistance of Information Technology while utilizing techniques of modern problem-solving.
- The framework that we will present depends on Databases, Web Application and Mobile Application.

1.3 Problem Statement

Wellbeing data innovation reformed the world with its incredible development and inescapable use in the area of medical care frameworks. A large portion of the created nations received trend setting innovation in their inoculation frameworks. Immunization frameworks of many non-industrial nations actually do not have the utilization of innovation ultimately making botch and defilement happen in inoculation crusades.

Issues like fumble and debasement influence immunization crusades as well as motivation further dispersion of an illness. Pakistan is additionally one of such nations where the immunization framework is inclined to these and numerous different issues and consequently it doesn't help in infection annihilation. For instance, polio stays alive in Pakistan since Pakistan's Polio inoculation framework is confronted with numerous issues.

These issues include, Corruption, mismanagement, unawareness of the public, lack of facilities, lack of knowledge about the system, security, life-threat to the vaccination teams etc. These issues are not only destroying the system but also helping to increase the disease rate in the country as well. As we all know about the current situation of our Polio Vaccination System. It contains a lot of issues that have to be resolved.

1.4 Scope

- The Digital Polio Vaccination focuses on reducing the ratio of Polio cases in the region that can make a Polio free Pakistan in future. The proposed system will be providing the data regarding the current polio situation. It will trace all the team members. It will have the functionality for generating QR tags that will help accessing the data safely and securely.
- In our proposed system all the information will be shown in the application(Mobile application) under the Dashboard tab. Where they can see the details regarding their team.
- Polio workers will be able to enter the data of the house where the child is being vaccinated through scanning the QR code. All the data of the campaign will appear after completing the vaccination process.

Chapter 2. Requirements Analysis

2.1 Literature Review

Information technology has revolutionized the health care sector over the last two decades ([2] Afzal et al., 2017). While other countries are integrating advanced technologies into their health care system([3] Umar et al, 2020); Pakistan is lagging and making very little progress in adapting to this change . Medical records are still kept bundled in paper files rendered to very little use. It is safe to say that we live in the age of data and human beings are producing tons of tons of data as compared to the late 1900s and early 2000s. One must understand the digitalization of data management can be used to obtain useful insights and analytics for the betterment of Pakistan's health care system. Polio, or poliomyelitis, is a disabling and life-threatening disease caused by the poliovirus. The virus spreads from person to person and can infect the spinal cord of an individual, causing paralysis. For most countries, polio is a thing of the past but Pakistan along with Afghanistan and Nigeria is still fighting this disease due to improper record-keeping, a paper-based vaccination system, ineffective tracking of positive cases, incomplete/incorrect record of non-compliant families and no use of contact tracing. The above-mentioned is a result of negligence from the government but other factors such as Conspiracy Theories, Religious/Tribal Values, and High-Risk areas are also responsible for non-eradication of the Polio-Virus from Pakistan. Although Pakistan has been blessed with an abundance of polio vaccines, the vaccination process itself is ineffective and outdated. The vaccination is carried out by polio teams that comprises 2-3 people sometimes accompanied by police or other law enforcement personals, These teams are managed and overlooked by an area in-charge for a particular UC (Union Council), District or City. Every team is given a paper sheet in which data is recorded once an individual of age 5 or younger is vaccinated; moreover a certain Alpha-Numeric code is also chalked on the wall or gate of every household in the area.

Progress was made by accomplishing over 95% inclusion in strengthening vaccination exercises, which was beforehand only 30% in enormous zones of the country . There was a reformist decrease in new polio cases from an expected 20,000–30,000 cases each year years and years prior to only 40 cases in 2006. Once dislodged, they may convey the infection to other upset zones of the world, where they went to join the battling. The causative strain was WPV1 – hereditarily like that coursing in Pakistan.

Hereditarily, the causative viral strain had come from Pakistan. Back in Pakistan, 2014 was the most exceedingly terrible year in its set of experiences for polio annihilation – maybe in light of the fact that inoculation laborers were associated with being unfamiliar specialists in camouflage and were assaulted and murdered in extraordinary numbers. Thus, Pakistan turned into the focal point of the proliferation of poliovirus. The continuous influx of psychological oppression, trailed by military activity in the Federally Administered Tribal Areas , prompted the uprooting of in any event 1,000,000 tribesmen, ladies and youngsters.

Anybody conveying the immunization risked having their hand cleaved off, and there are reports of individuals concealing the antibody in a cup and overseeing it to their kids. This brought up issues about the virus chain upkeep and consequently the viability of the immunization. Not many offspring of uprooted families have gotten the immunization and they presently should be explicitly focused on. An instance of crippled polio is only a hint of something larger, as it could be joined by many asymptotically contaminated individuals, who discharge the infection in their excrement.

In the sewage of metropolitan regions, WPV-1 – alongside two strains of immunization determined poliovirus – were found with expanding recurrence. Clearly the principle upsurge of polio cases was found in the FATA – the fundamental center of psychological militant camps and framework – the Pakistan military dispatched definitive activity in June 2014 and the zone was freed from fear based oppressors.¹³ This has clearly brought about the control of polio, as the immunization arrived at the region after rebuilding of lawfulness. Also, the inside uprooted individuals got an opportunity to inoculate their kids, which had not been conceivable in the regions under assailant control.

Furthermore, a portion of the fear mongers spread all through the country and kept on focusing on polio immunization laborers across Pakistan. At present, no zone in Pakistan is under assailant occupation, except for a couple of dispersed pockets of impact and sleeper cells. Now come to the main point regarding our proposed system that will be effectively helpful for the Polio vaccination system. The system that exists in this era is not much advanced for dealing with the current situation of the Polio vaccination system. In the current system there is no record keeping database system that would help to find some records if needed in the future. For instance, if a user wants to check the details of last year's data for a specific location. Then he/she must need to coordinate with the relevant authorities to find it but in the backend nobody knows that data will be available or not because it's in the physical form like on registers, hardcopies etc. So the system that we are going to propose will be able to store the data in a professional manner using some databases so that data can be retrieved easily and anytime by the user.

The second main point that we are going to discuss here is that there is no tracking system. For instance, if the supervisor is supposed to complete the task in specified time and he/she wants to check the status out. He/she will not be able to find this because there is no tracking system in our current polio vaccination system. This thing sets us in trouble that nobody knows how many children are being vaccinated at the specified time or how many children are left. So we are going to develop a tracking system for our proposed system.

There is another problem occurring in the current system. The problem is the user does not know about the positive cases in a specified location until and unless some official lets him know about the situation.

Some research has been done on this topic and some have proposed various solutions to solve some parts of this jigsaw puzzle. Some have even taken inspiration from the systems other third-world countries like India and Nigeria implemented to eradicate polio ([2] Afzal et al., 2017). Even in certain parts of Pakistan, some sort of digital system has been tested for a small-time span; take for

instance the electronic immunization information system that was tested in Sindh (Sullivan et al., 2020, #) yet no one has come up with a simple yet effective system that can deal with most aspects of this jigsaw puzzle. We ought to change this and introduce something that is simple, effective and is substantial in our fight against the poliovirus in Pakistan ([1] Afzal et al, 2021). Our system does not just deal with one piece of the puzzle but it tries to solve the whole puzzle simultaneously. It not only provides digitization of the information/records but also includes features like campaign planning to ensure discipline and proper management of personnel and resources at disposal over time, digital maps as a substitute to hand-drawn or printed maps that can increase the vaccination miss rate in a rapidly developing country like Pakistan where population and infrastructure are growing day by day, smart QR Tags that are a substitute of the annoyingly old-fashioned wall chalking that quickly dulls out in the sun and washes away in the rain, GPS tracking that will help monitor the workers and teams on the ground and give us insight to their work ethic while potentially increasing their productivity, heat maps to visualize data of vaccinated and unvaccinated areas in the region or on the map to help plan both short term and long term campaign as per the circumstances of that specific area, smart reports to present data in form of tables that can be interpreted and used for strategic planning and evaluation, volunteer registration to put our energetic youth to work in our fight against poliovirus, news and updates to educate and update the general public, complaints and suggestions to keep general public engaged and solve their problems, database access for polio workers to ensure accurate record keeping and better immunization, mobile application for the use of general public and polio workers and web application for administrator and general public ([4] Gates, 2012).

Features	Current System	Proposed System
Digital Record Keeping	No	Yes
GPS Tracking (Team)	No	Yes
Area on Map	No	Yes
Volunteer Registration	No	Yes
QR- Tags (Alternative to Chalking)	No	Yes
Daily Reports	No	Yes
Active Polio Cases Tracker	No	Yes

Table 1 : System Features

2.2 User Classes and Characteristics

User: CNIC represents the national identity information. Users have to provide the valid CNIC in order to register him/herself. **Email:** Email is required for the registration and other specific credentials. **Password:** Password is required to access their account and to the registration process.

UserType: These are the following user types Admin, Polio Workers and General Users. **Login:** Login is required to access the control on the panel. **Logout:** If the user wants to end the session he/she will log out their accounts. **Register:** Registration is required for authorization of the user.

Admin has total control on the system. Admin can create **Teams**. In order to create teams Admin will input all the necessary information. After the creation of Teams Admin can edit them and delete them as well. Moreover Admin can Create **Workers** and after creation he/she can edit and delete workers as well. Admin can create **Campaigns** and after creation he/she can edit and delete them as well. Admin can view all the details of workers, teams and campaigns. Admin can generate reports which include active cases vaccinated and unvaccinated cases. There are some other functionalities like generating QR codes, adding news updates, updating and answering complaints. Admin is responsible for adding volunteer opportunities so that users can apply for the volunteer position.

Users (General Public): As users are the actors so they also have to perform **LOGIN** and **LOGOUT** functions. User must have to be registered already so that he can access the user panel dashboard. Users can file **Complaints**. They can check the status of that filed complaints like if the complaint is read by the team or answered or resolved etc. Moreover Users can **Apply** for the volunteer positions that are available on the user panel. Users can also see the news/updates to keep themselves updated for the upcoming events.

Polio Workers: Polio workers have complete control on the system but the Admin is Dominant here. Polio Workers have to follow the same process for the login and logout sessions. Only **Admin** can add Polio Workers. After the successful login Polio worker can view teams in the specific areas. Polio Workers can update the records like if the house is vaccinated then Polio Worker will update the record on the application. They can also search the previous record. The polio workers also can see the maps like how many cases in the specific area and they can also see the active teams on the maps. They can generate **QR codes** for the house geographical data.

2.3 Design and Implementation Constraints

This system is going to be a cross-platformed system. The web application is coded in Bootstrap and Laravel frameworks paired with MySQL database whereas the mobile application is coded in Ionic (Angular, Cordova). The web application will serve the Administrator and General Public; The mobile application will serve the Polio Worker and General Public. We are using google maps APIs for worker tracking in real-time and heatmaps to indicate vaccination status on a colored spectrum. The Database will store all the information regarding the general public, polio workers, and vaccination campaigns. The information stored in the database will be accessible over encrypted protocols to ensure security.

2.4 Assumptions and Dependencies

- **Internet Services**
- **Web Hosting**
- **Frameworks**
- **APIs**

2.5 Functional Requirements

Our system includes a web application and a mobile application. The web application will serve the Admin and User (General Public) whereas the mobile application will serve the Polio Worker and User (General Public). This system seeks to digitalize the current polio management framework and its aspects like record-keeping, complaints, tracking reports, etc.

Web Application (Admin Side)

- **Log In :** Every administrator will have to login into the system using their unique login credentials.
- **Admin Panel :** From the admin panel the administrator can view reports, important statistics, see active immunization campaigns, teams, area map, active cases, non-complaint cases etc.
- **Search Record :** The admin should be able to look for records from the database for instance family records, team records etc.
- **Create/Edit/Delete Team :** The admin should be able to create teams and assign them a specific area (union council) and tasks moreover the admin should also be able to edit and delete teams.
- **Complaints :** The admin should be able to view complaints filed by the general public, The admin can also reply to complaints and change their status.
- **Volunteer :** The admin should be able to see volunteer applications and can contact them by using the provided contact information.
- **Print QR Tags :** The admin should be able to print QR Tags generated by the polio workers.
- **GPS Tracking :** The admin can track the on ground team in real-time via google maps

Web Application (User/Client Side)

- **Registration/Signup :** The general public can register to the system in order to file complaints and apply for volunteer opportunities in their area.
- **Login :** The client should be able to login into the app and perform different actions like file complaints, check complaints, view updates/news etc.
- **File Complaint :** The registered users can file complaints regarding the issues in their areas. If someone makes a complaint about not being vaccinated then the complainer should also enter their address as no data points are fetched for the person who makes a complaint and shown on the Map.
- **Volunteer Application :** The registered users can apply for volunteer opportunities in their area.
- **Vaccination Campaigns :** The registered users can view all the active and upcoming vaccination campaigns in their area.
- **Updates/News :** The registered users can see news and updates regarding polio virus.

Mobile Application (Polio Worker Side)

- **Login :** Polio workers should be able login to the application with the provided login credentials.
- **View Team :** Polio workers should be able to view their team members and team roles.
- **Household Search :** Polio workers can lookup a household in the database using the CNIC of any household member.
- **Update Household Record :** Polio workers should update record of the household (vaccination status, vaccinated/unvaccinated members, comments etc)
- **Area Map :** Polio workers can see the area map, Can see the vaccinated/non vaccinated areas and relevant stats. The color Spectrum in our heat Map is between Red and green for example if a large area has been vaccinated it will be shown as Red on the heat map and if you Zoom in on the Specified area than we would be able to see all the Individual household that have been vaccinated as individual green dots on the Map.
- **Generate QR Tags :** Polio workers should be able to generate QR tags (will contain household's vaccination status)
- **Scan QR Tags :** Polio workers should be able to scan QR-Tags to retrieve information.

Mobile Application (User/Client Side)

- **Registration/Signup :** The general public can register to the system in order to file complaints and apply for volunteer opportunities in their area.
- **Login :** The client should be able to login into the app and perform different actions like file complaints, check complaints, view updates/news etc.
- **File Complaint :** The registered users can file complaints regarding the issues in their areas.
- **Volunteer Application :** The registered users can apply for volunteer opportunities in their area.
- **Vaccination Campaigns :** The registered users can view all the active and upcoming vaccination campaigns in their area.
- **Updates/News :** The registered users can see news and updates regarding polio virus.

2.2.1 Login (UC-1)

Identifier	UC-1	
Purpose	For User Authentication	
Priority	High	
Pre-conditions	User must be registered	
Post-conditions	Start user session and redirect to user home page	
Typical Course of Action		
S#	Actor Action	System Response
1	Enters login credentials	Checks the entered credentials
Alternate Course of Action		
S#	Actor Action	System Response
1	Enters login credentials	Checks; If wrong returns error message along with forgot password
2	Forgot password	Verifies the user and provide the option to reset
3	See Active Campaigns	User can see the active campaigns in a specific area
4	Volunteer Registration	User can register himself as a volunteer in his desire team and area
5	News/Updates	User can see the recent news and Updates regarding the Vaccination System
6	Complaints & Suggestions	User

Table 2.1: UC-1

2.2.2 Logout (UC-2)

Identifier	UC-2	
Purpose	logging out the user and destroy current session	
Priority	High	
Pre-conditions	User must be logged in	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	User Press LogOut Button	Destory's current session and sends user back to the login page

Table 2.2: UC-2

2.2.3 Registration (UC-3)

Identifier	UC-3	
Purpose	For user registration (gen public only)	
Priority	High	
Pre-conditions	N/A	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	User navigates to registration page	Display's form
2	User enters data and press submit	validates form data and adds the user to the database then redirects the user to login page
Alternate Course of Action		
S#	Actor Action	System Response
1	User enters invalid data	Highlight the invalid data field along with the error
2	User corrects the invalid data	validates form data and adds the user to the database then redirects the user to login page

Table 2.3: UC-3

2.2.4 Dashboard (UC-4)

Identifier	UC-4	
Purpose	To view the main page of user Panel	
Priority	High	
Pre-conditions	user type must be gen public	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “Dashboard”	Display the list of all the data on dashboard including images and active campaigns
2	Press”Volunteer”	Go to the Volunteer Page
3	Press “News/Updates”	Go to the News/Updates Page
4	Press”Complaints”	Go to the Complaints page

Table 2.4: UC-4

2.2.5 Volunteer (UC-4a)

Identifier	UC-4a	
Purpose	To See Volunteer Opportunities and Registration	
Priority	High	
Pre-conditions	Active user must be admin and can access this through admin	

	panel	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “Volunteer”	Takes to the Volunteer page and apply for volunteer from the given list
2	Press “Volunteer”	Ask for details and register a Volunteer.

Table 2.5: UC-4a

2.2.6 News/Updates (UC-4b)

Identifier	UC-4b	
Purpose	To See News/Updates	
Priority	High	
Pre-conditions	Active users must be registered.	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “News/Updates”	Takes to the News/Updates page
2	Press “News/Updates”	See the latest News and Updates

Table 2.6: UC-4b

2.2.7 Complaints & Suggestions (UC-4c)

Identifier	UC-4c	
Purpose	To file a complaint	
Priority	High	
Pre-conditions	User must be registered	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “Complaints”	Takes to the Complaints page
2	Press “Complaints”	Ask for details and file a Complaint.

Table 2.7: UC-4c

2.2.8 Admin Panel / Area (UC-5)

Identifier	UC-5
Purpose	To serve the admin with admin panel
Priority	High
Pre-conditions	Authenticating user must be admin
Post-conditions	N/A

Typical Course of Action		
S#	Actor Action	System Response
1	Admin Logins	Takes to Admin Panel

Table 2.8: UC-5

2.2.9 Manage Campaigns (UC-6)

Typical Course of Action		
S#	Actor Action	System Response
1	Press “Manage Campaigns”	Expands Sub Menu
2	Press “Create Campaign”	Asks for details and creates a campaign
3	Press “Remove Campaign”	removes the selected campaign
4	Press “Edit Campaign”	takes to edit campaign page for the selected campaign

Table 2.9: UC-6

2.2.10 Create Campaigns (UC-6a)

Typical Course of Action		
S#	Actor Action	System Response
1	Press “Create Campaigns”	Takes to the create campaigns page
2	Press “Create Campaign”	Asks for details and creates a campaign.

Table 2.10: UC-6a

2.2.11 Edit Campaigns (UC-6b)

Typical Course of Action		
S#	Actor Action	System Response
1	Press “Edit Campaigns”	Takes to the edit campaigns page
2	Press “Edit Campaign”	Asks for details and edits a campaign.

Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “Edit Campaigns”	Takes to the Edit campaigns page
2	Press “Edit Campaigns”	Ask for details and Edit a campaign.

Table 2.11: UC-6b

2.2.12 Delete Campaigns (UC-6c)

Identifier	UC-6c	
Purpose	To Delete Campaigns	
Priority	High	
Pre-conditions	Active user must be admin and can access this through admin panel	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “Delete Campaigns”	Takes to the Delete campaigns page
2	Press “Delete Campaign”	Select the Campaign and Delete it.

Table 2.12: UC-6c

2.2.13 Manage Teams (UC-7)

Identifier	UC-7
Purpose	To Manage Teams
Priority	High
Pre-conditions	Active user must be admin and can access this through admin panel

Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “Manage Teams”	Takes to the teams page
2	Press “Create Team”	Asks to select existing users or add new users and then ask for other info and creates a team
3	Press “Edit Team”	Takes to the edit team page for the selected team
4	Press “Delete Team”	Select the team and Delete it.

Table 2.13: UC-7

2.2.14 Create Teams (UC-7a)

Identifier	UC-7a	
Purpose	To Create Team	
Priority	High	
Pre-conditions	Active user must be admin and can access this through admin panel	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “Create Team”	Takes to the create Team page
2	Press “Create Team”	Asks for details and creates a Team.

Table 2.14: UC-7a

2.2.15 Edit Teams (UC-7b)

Identifier	UC-7b
Purpose	To Edit Team
Priority	High
Pre-conditions	Active user must be admin and can access this through admin panel

Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “Edit Team”	Takes to the Edit Team page
2	Press “Edit Team”	Ask for details and Edit a Team.

Table 2.15: UC-7b

2.2.16 Delete Teams (UC-7c)

Identifier	UC-7c	
Purpose	To Delete Team	
Priority	High	
Pre-conditions	Active user must be admin and can access this through admin panel	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “Delete Team”	Takes to the Delete Team page
2	Press “Delete Team”	Select and Delete the required Team.

Table 2.16: UC-7c

2.2.17 Manage Workers (UC-8)

Identifier	UC-8
Purpose	To Manage Workers
Priority	High
Pre-conditions	Active user must be admin and can access this through admin panel
Post-conditions	N/A
Typical Course of Action	

S#	Actor Action	System Response
1	Press “Workers”	Takes to the Worker page
2	Press “Create Worker”	Ask for details and Create a Worker.
3	Press “Edit Worker”	Ask for details and edit the worker
4	Press “Delete Worker”	Select and Delete the Worker

Table 2.17: UC-8

2.2.18 Create Workers (UC-8a)

Identifier	UC-8a	
Purpose	To Create Worker	
Priority	High	
Pre-conditions	Active user must be admin and can access this through admin panel	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “Create Worker”	Takes to the Create Worker page
2	Press “Edit Team”	Ask for details and Create a Worker

Table 2.18: UC-8a

2.2.19 Edit Workers (UC-8b)

Identifier	UC-8b
Purpose	To Edit Worker
Priority	High
Pre-conditions	Active user must be admin and can access this through admin panel
Post-conditions	N/A
Typical Course of Action	
S#	

	Actor Action	System Response
1	Press “Edit Worker”	Takes to the Edit Worker page
2	Press “Edit Worker”	Ask for details and Edit a Worker.

Table 2.19: UC-8b

2.2.20 Delete Workers (UC-8c)

Typical Course of Action		
S#	Actor Action	System Response
1	Press “Delete Worker”	Takes to the Delete Worker page
2	Press “Delete Worker”	Select and delete the Worker

Table 2.20: UC-8c

2.2.21 Manage Complaints (UC-9)

Typical Course of Action		
S	Actor Action	System Response

#		
1	Press “ Complaints”	takes to the complaints page
2	Press “ Status “	changes the complaint’s status accordingly

Table 2.21: UC-9

2.2.22 Complaints’ Status (UC-9a)

Identifier	UC-9a	
Purpose	To Check the status of Complaint	
Priority	High	
Pre-conditions	Active user must be admin and can access this through admin panel	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “Status”	changes the complaint’s status accordingly

Table 2.22: UC-9a

2.2.23 Search Records (UC-10)

Identifier	UC-10	
Purpose	For searching records	
Priority	High	
Pre-conditions	User type must be admin or worker	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “Search Record”	Asks for info regarding the record and display all the relevant records

Table 2.23: UC-10

2.2.24 Report (UC-11)

Identifier	UC-11	
Purpose	For Report	
Priority	High	
Pre-conditions	User type must be admin or Worker	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “ Reports”	Takes to the Reports Page

2	Press “Select Duration”	Specific Duration to Generate the Report
3	Press “Generate and Download”	Generate and Download the Report

Table 2.24: UC-11

2.2.25 Vaccinated Status (UC-11a)

Identifier	UC-11a	
Purpose	For Report Vaccinated Status	
Priority	High	
Pre-conditions	User type must be admin	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “ Reports”	Takes to the Reports Page
2	Press “Vaccinated Status”	See the vaccinated cases in the report

Table 2.25: UC-11a

2.2.26 Unvaccinated Status (UC-11b)

Identifier	UC-11a	
Purpose	For Report Unvaccinated Status	
Priority	High	
Pre-conditions	User type must be admin	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “ Reports”	Takes to the Reports Page
2	Press “Unvaccinated Status”	See the unvaccinated cases in the report

Table 2.26: UC-11b

2.2.27 Active Campaigns (UC-11c)

Identifier	UC-11c	
Purpose	For Report Active Campaigns	
Priority	High	
Pre-conditions	User type must be admin	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “ Reports”	Takes to the Reports Page
2	Press “Active Campaigns”	See the Active campaigns in the report

Table 2.27: UC-11c**2.2.28 Maps (UC-12)**

Identifier	UC-12	
Purpose	See Maps	
Priority	High	
Pre-conditions	User type must be admin or Worker	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “Maps”	Takes to the Maps Page
2	Press “Maps”	See active campaigns, active workers, active cases and vaccinated areas on maps
3	Press “Maps”	See heat map for the maximum cases with red zone, average cases with yellow zone and null cases with green zone.
4	Press “Maps”	See real time tracker to track the teams, workers and campaigns.
5	Press “Maps”	See the current information about Polio in Pakistan.

Table 2.28: UC-12**2.2.29 News/Updates (UC-13)**

Identifier	UC-13	
Purpose	To Manage News/Updates	
Priority	High	
Pre-conditions	Active user must be admin and can access this through admin panel	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “News/Updates”	Expands Sub Menu

2	Press “add news”	Asks for details and add a news
3	Press “edit/delete news”	edit/delete the selected news

Table 2.29: UC-13

2.2.30 QR Code (UC-14)

Identifier	UC-14	
Purpose	To Generate the QR code	
Priority	Low	
Pre-conditions	Active user must be admin	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “QR code”	take to the page of QR code Generator
2	Press”Select Campaign”	Select the Campaign to generate QR code
3	Press “Generate and Download”	Generate and Download QR code.

Table 2.30: UC-14

2.2.31 Worker Panel (UC-15)

Identifier	UC-15	
Purpose	For Polio Worker Panel	
Priority	High	
Pre-conditions	User type must be worker	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Logs In	Takes to the worker panel
2	Press “View Team”	Takes to View team page

3	Press “Polio Map”	Takes to the Polio Map page
4	Press “Heat Map”	Takes to the heat map page
5	Press “Household Record ”	Takes to Household record page
6	Press “QR Code”	Takes to the QR Code page

Table 2.31: UC-15

2.2.32 View Team (UC-15a)

Typical Course of Action		
S#	Actor Action	System Response
1	Press “View Team”	Takes to View team page
2	Press “View Team”	See the team members on Map

Table 2.32: UC-15a

2.2.33 Polio Maps (UC-15b)

Typical Course of Action		
S#	Actor Action	System Response
1	Press “Polio Map”	Takes to the Polio map page
2	Press “Heatmap”	See the number of cases with the frequency in areas.

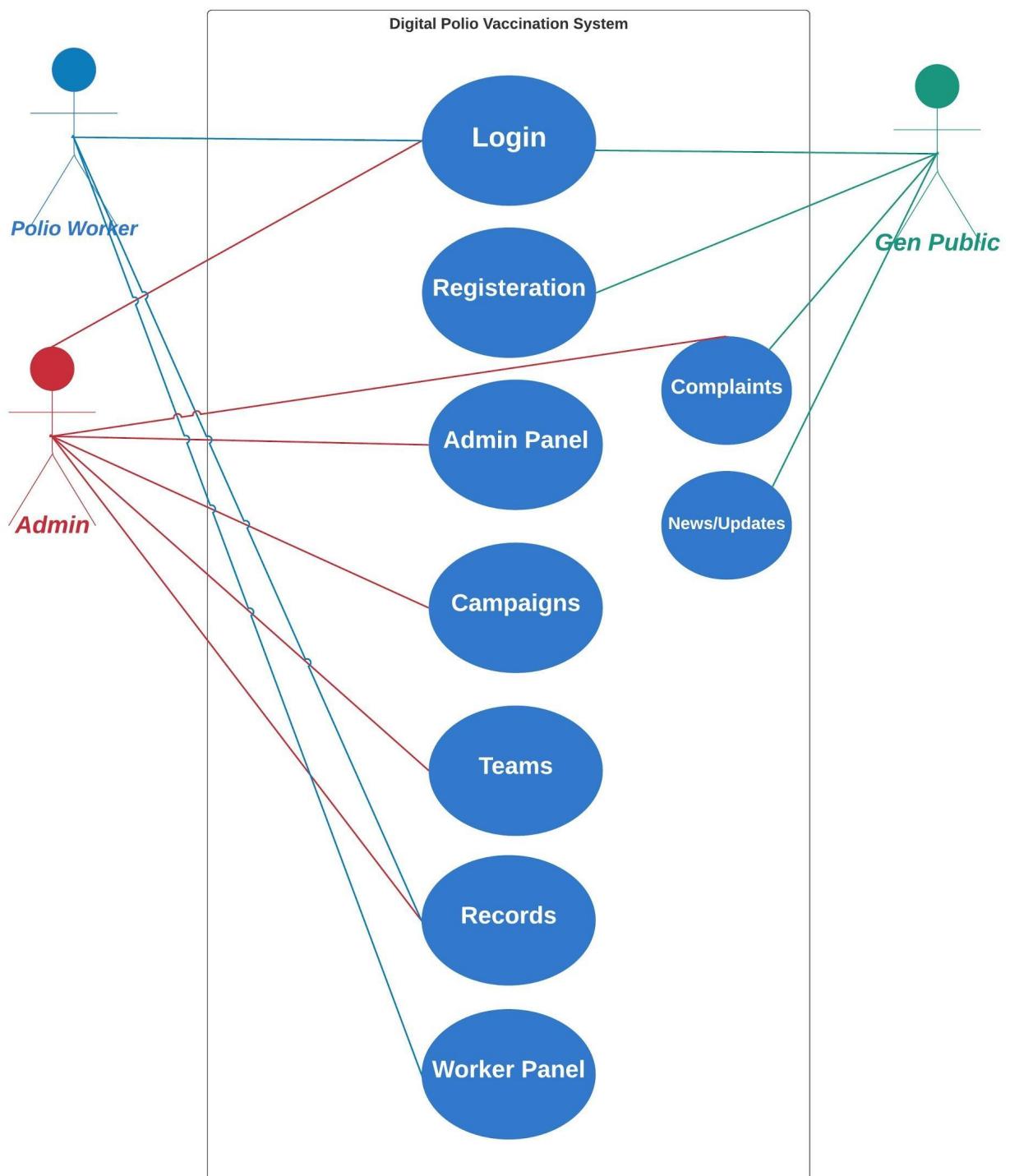
Table 2.33: UC-15b**2.2.34 Household Record (UC-15c)**

Identifier	UC-15c	
Purpose	To view the household record of house that is being vaccinated	
Priority	High	
Pre-conditions	User type must be worker	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “Household Record”	Takes to the Household record page
2	Press “Household Record”	Update the household record accordingly.

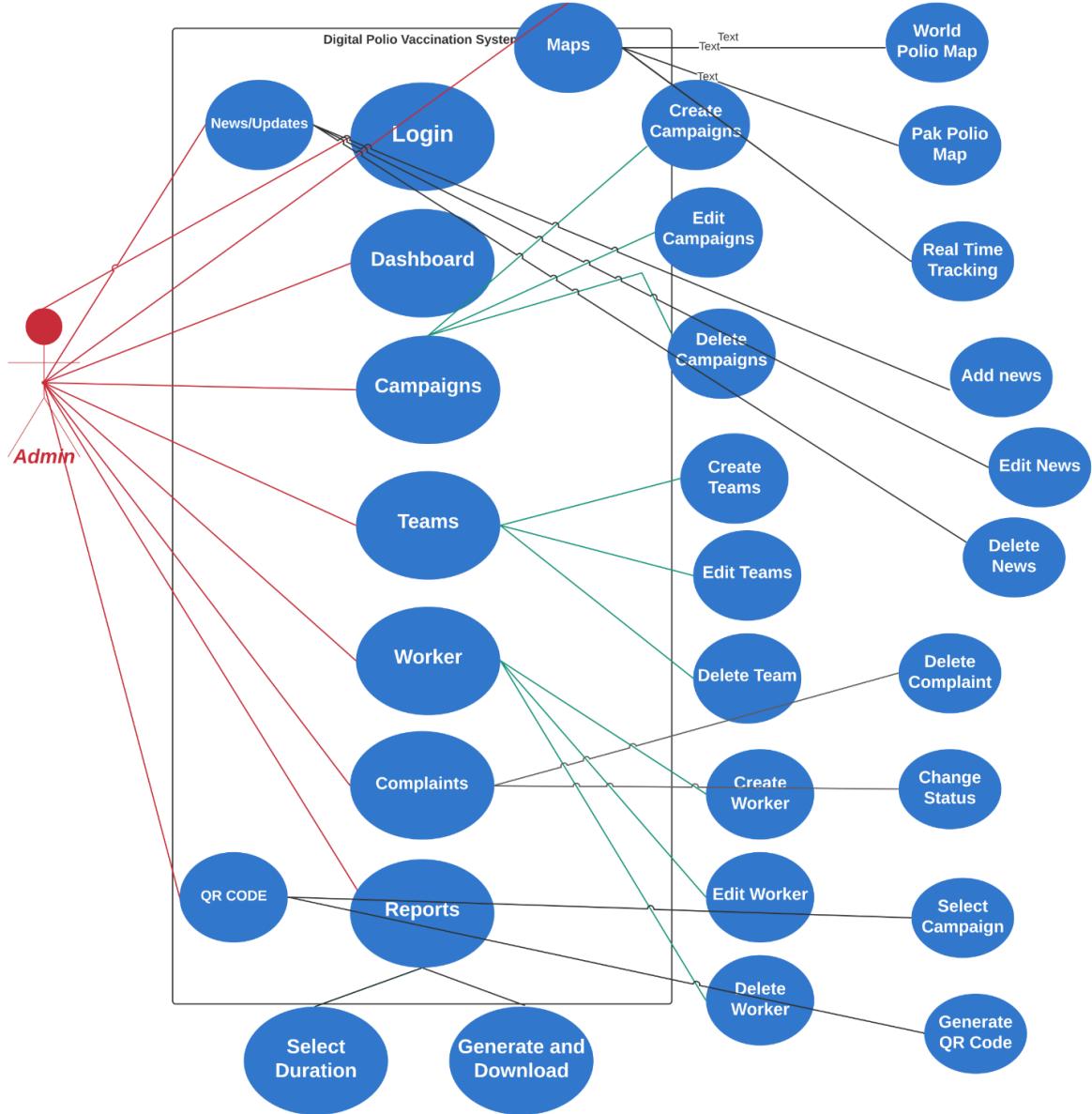
Table 2.34: UC-15c**2.2.35 QR Code (UC-15d)**

Identifier	UC-15d	
Purpose	To Generate the qr code	
Priority	High	
Pre-conditions	User type must be worker	
Post-conditions	N/A	
Typical Course of Action		
S#	Actor Action	System Response
1	Press “QR Code”	Takes to the qr code page
2	Press “QR Code”	Generate and download the qr code.

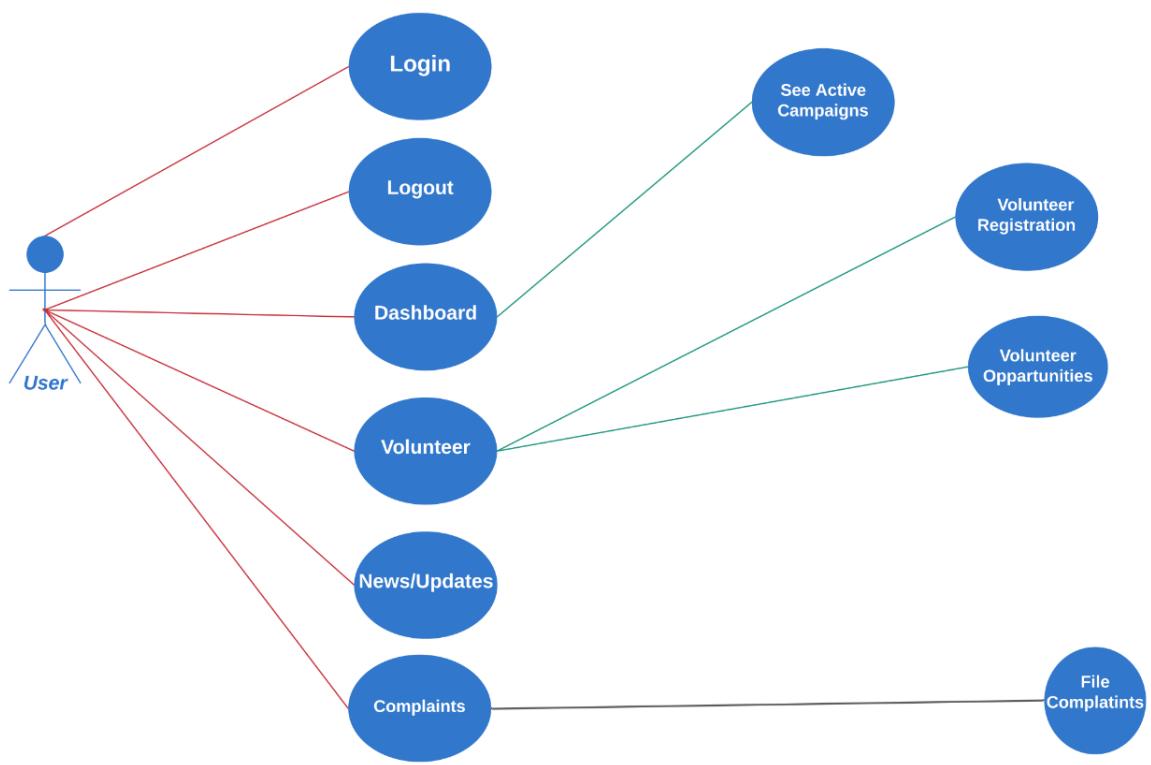
Table 2.3: UC-15d**2.3 Use Case Diagrams**



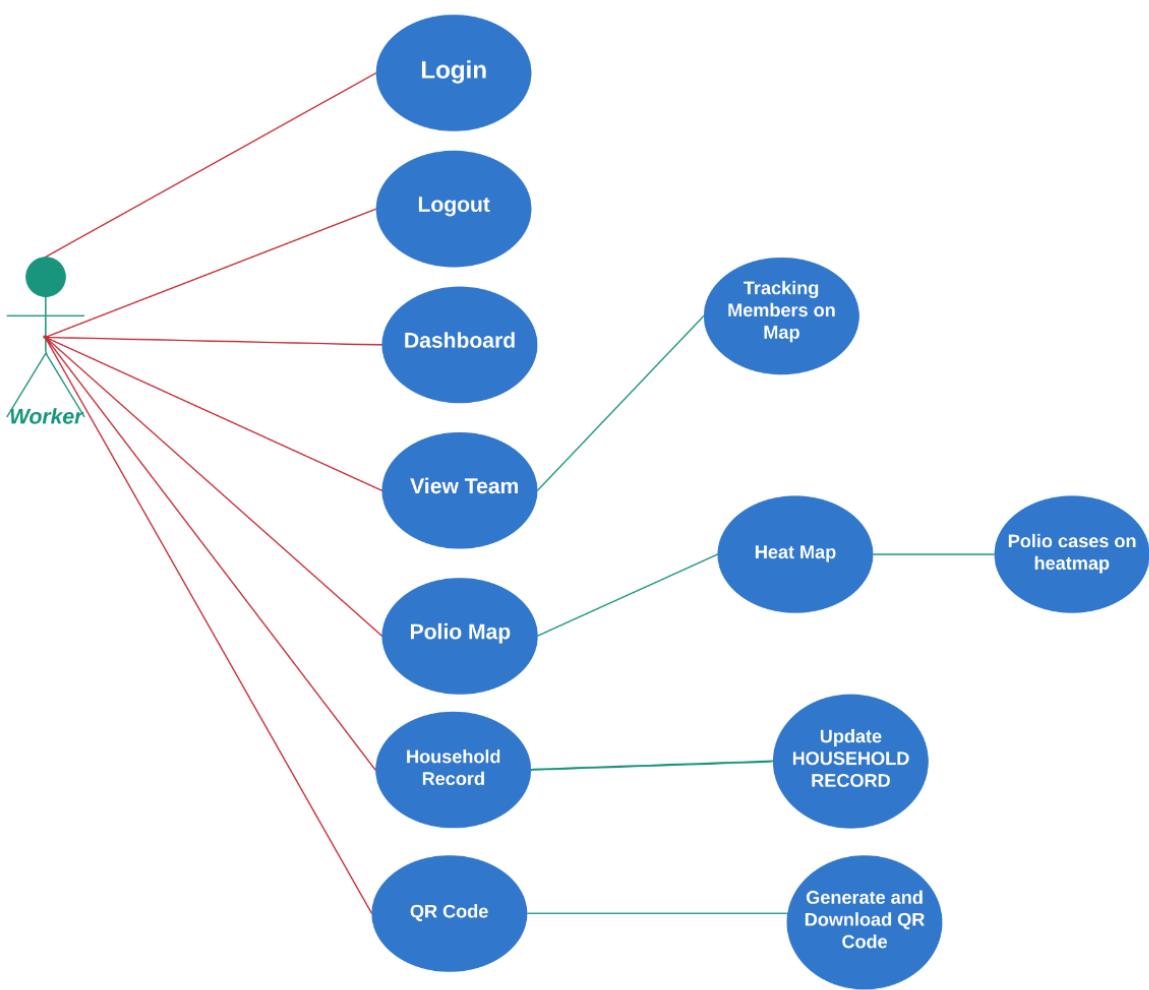
Use case Figure 1.1



Use case Figure 1.2



Use case Figure 1.3



Use case Figure 1.4

2.4 Nonfunctional Requirements

2.4.1 Performance Requirements

Performance requirements involve fluency of Data generation and the efficient working of both the Apps. A strong network connection makes it reliable and coherent to use while optimizing the desired results from the Apps. The apps are designed to function in such a way that each user has got his own convenience of maneuvering through the app and data generation is set accordingly so that no loss in data occurs.

2.4.2 Safety Requirements

The safety requirements involve the protection of the apps network which will be protected through a strong firewall so that no loss of confidential information or data loss occurs, Moreover authorized personnel will be the only one allowed to access the mainframe through the use of their specified ID and Passcode.

2.4.3 Security Requirements

The requirements for the security involve the database and the server to be accessed only by the authorized person. In addition, the data loss or data damage can occur and for that purpose a backup should be generated. Moreover, the mapping data should be updated efficiently with end to end encryptions to prevent system failure and data loss.

2.4.4 Additional Software Quality Attributes

In this project we have considered the problem of the old polio vaccination system and found the solution for them. It is important to note that the proposed system motivates in application of Polio Vaccination System, the utilized technologies, database, data generation, Mapping and data generation of Non-vaccinated Individuals.

2.5 Other Requirements

We have tried to cover each and everything related to this project of ours in this report.

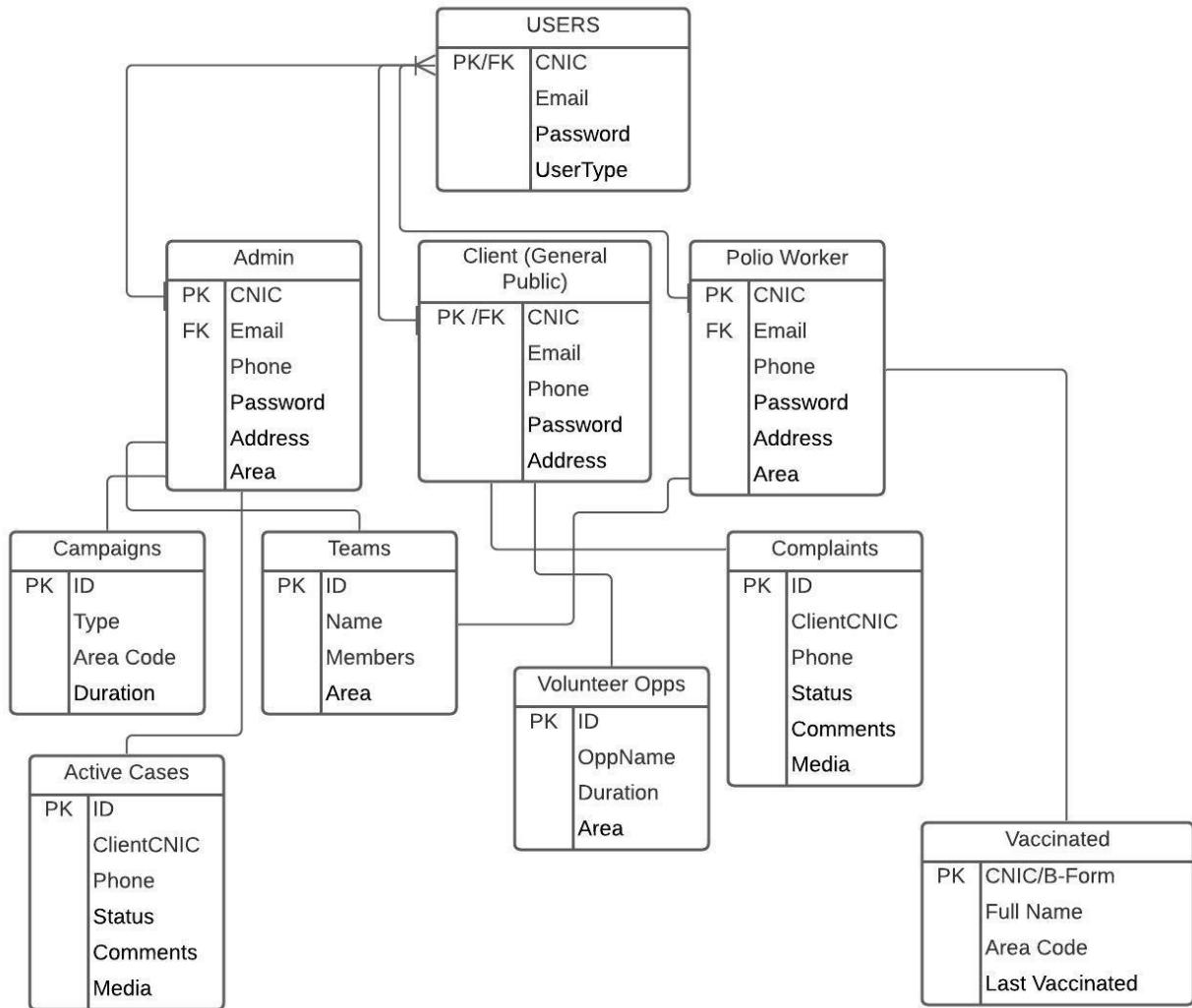
Chapter 3.

System Design

3.1 Application and Data Architecture

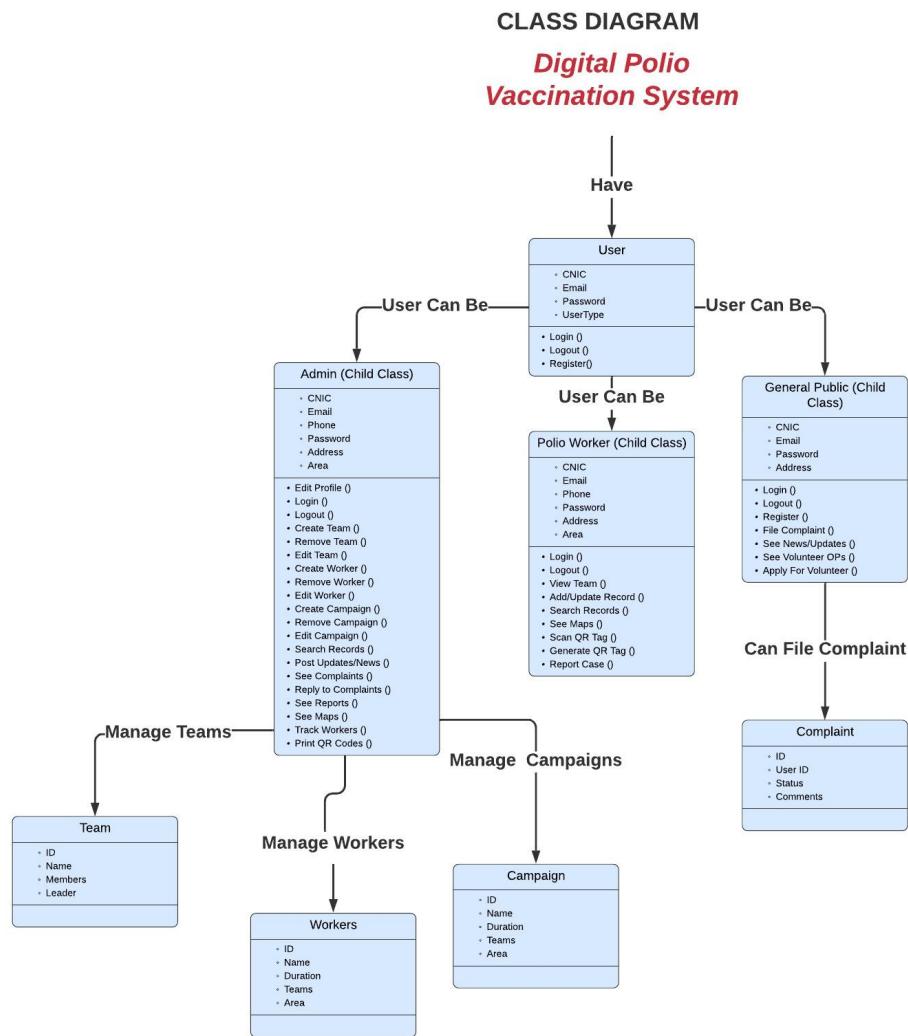
Entity-Relationship-Diagram showing database tables, their rows, their keys and relationships

ERD



ERD Figure 2.1

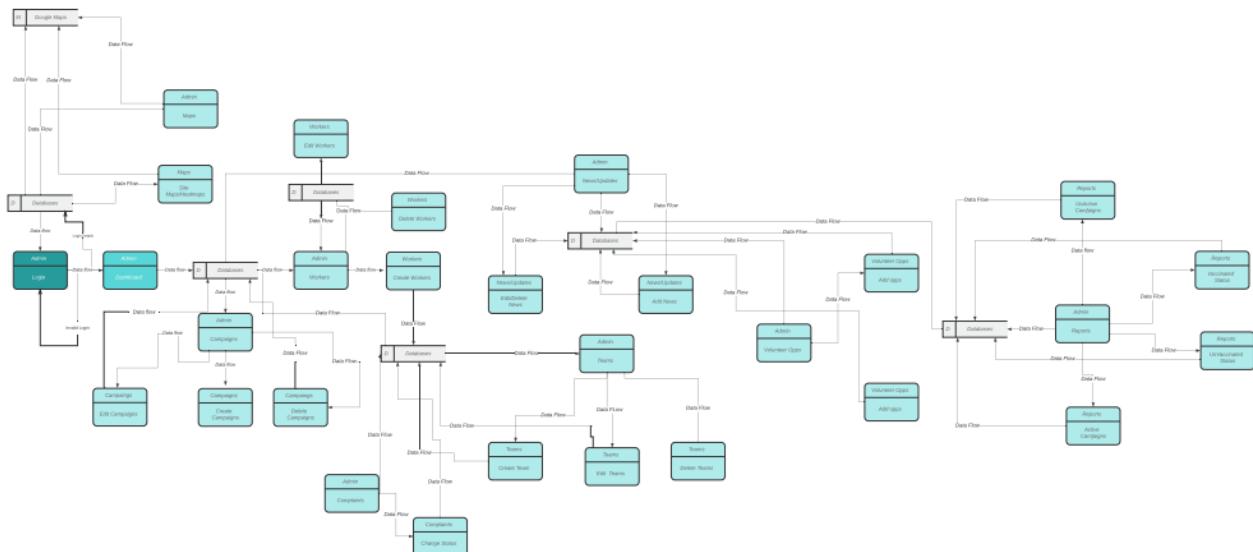
Class diagram showing classes, their relationships, their functions and attributes



Class Diagram Figure 2.2

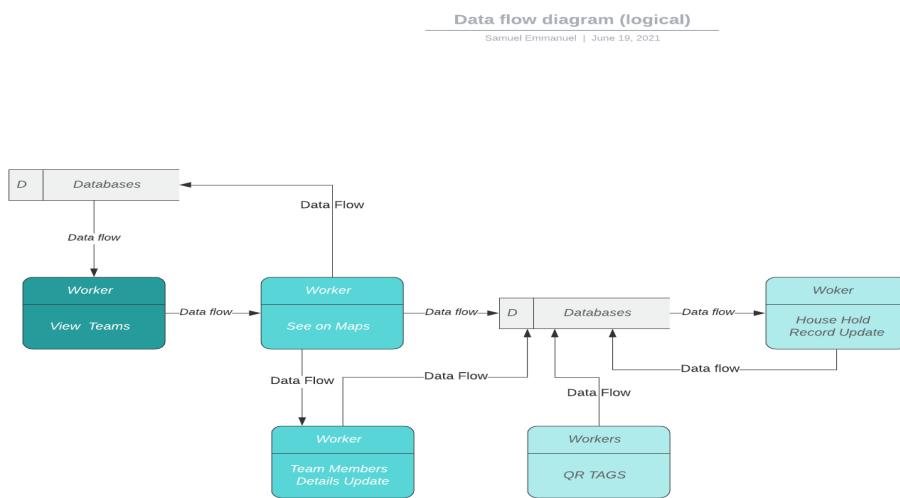
3.1 Component Interactions and Collaborations

Admin Data Flow Diagram: Showing the flow of data for the actor “Admin”



Admin- Data flow Figure 2.3

Worker Data Flow Diagram: Showing the flow of data for the actor “Worker”

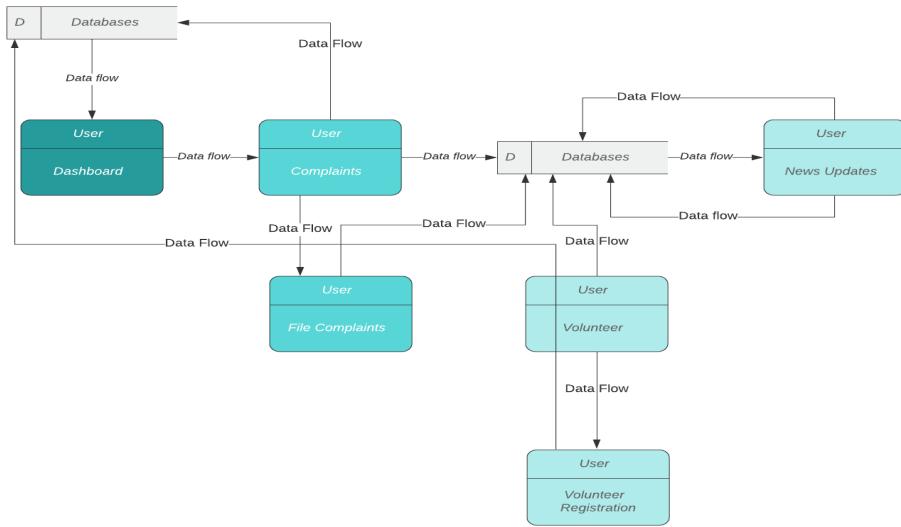


Worker- Data flow Figure 2.4

User Data Flow Diagram: Showing data flow for the actor “User/General Public”

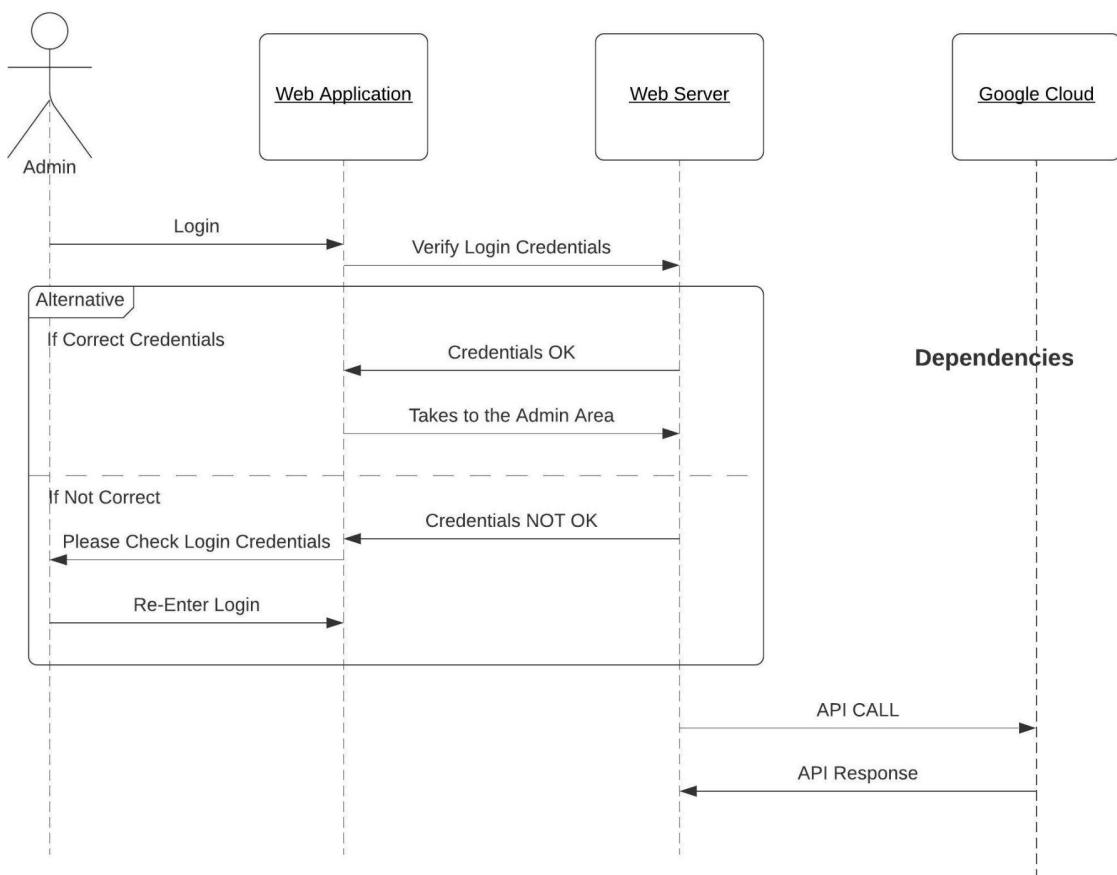
Data flow diagram (logical)

Samuel Emmanuel | June 19, 2021



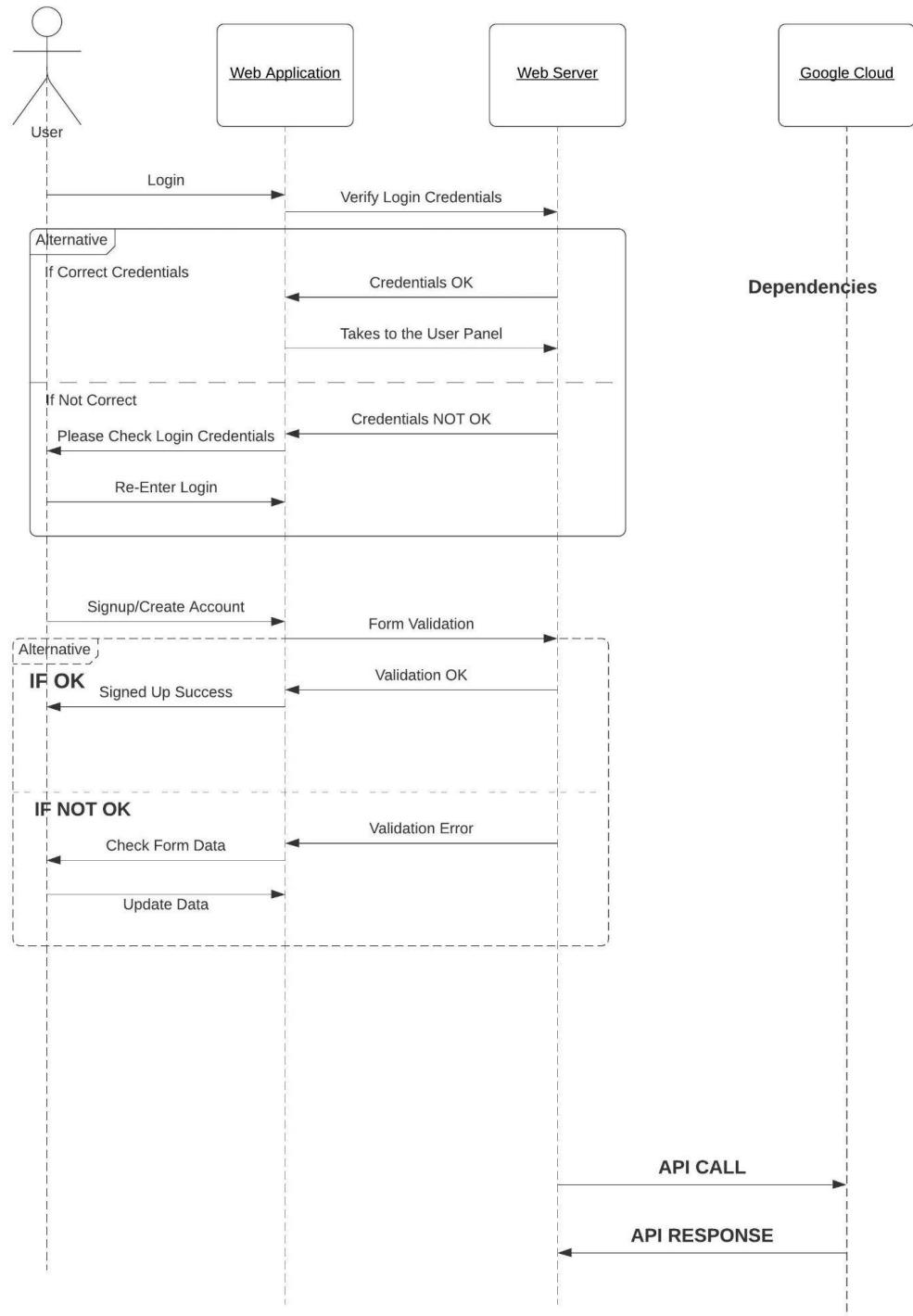
User- Data flow Figure 2.5

Admin Sequence Diagram: Showing sequence of events/actions for the actor admin



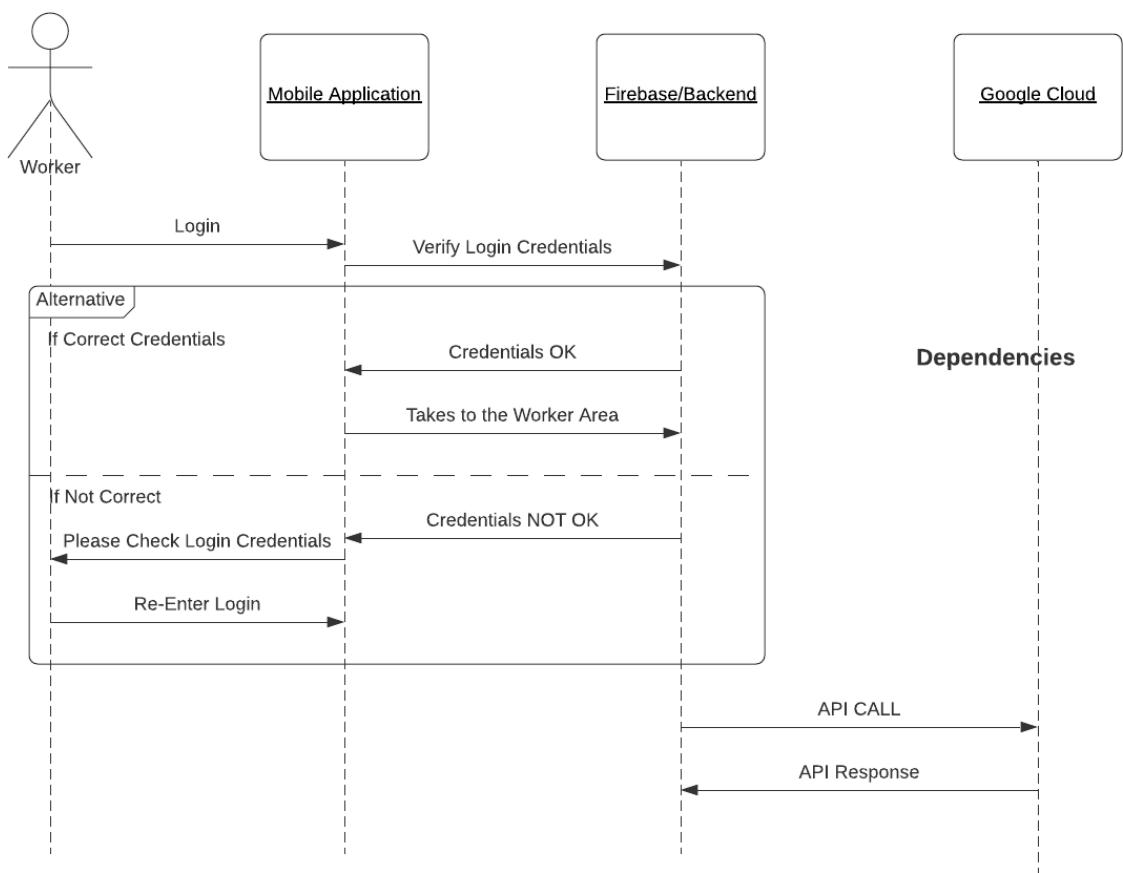
Admin- Sequence Diagram Figure 2.6

User Sequence Diagram: Showing sequence of events/actions for the actor “User”



User- Sequence Diagram Figure 2.7

Worker Sequence Diagram: Showing sequence of events/actions for the actor “Worker”



Worker- Sequence Diagram Figure 2.7

3.2 System Architecture

3.2.1 Web Application

- Coded in HTML(Bootstrap 5), PHP(Laravel), MYSQL, and Javascript
- Using a Client-Server approach over a LAMP Stack(Linux, Apache, MySQL, PHP)
- Google Maps API (For Location Services)
- MySQL as Database

3.2.2 Mobile Application

- Coded in Ionic (Angular, Cordova)
- We are using a client-server approach with Firebase (JSON APIs)
- Angular HTTP
- Google Maps API (For Location Services)

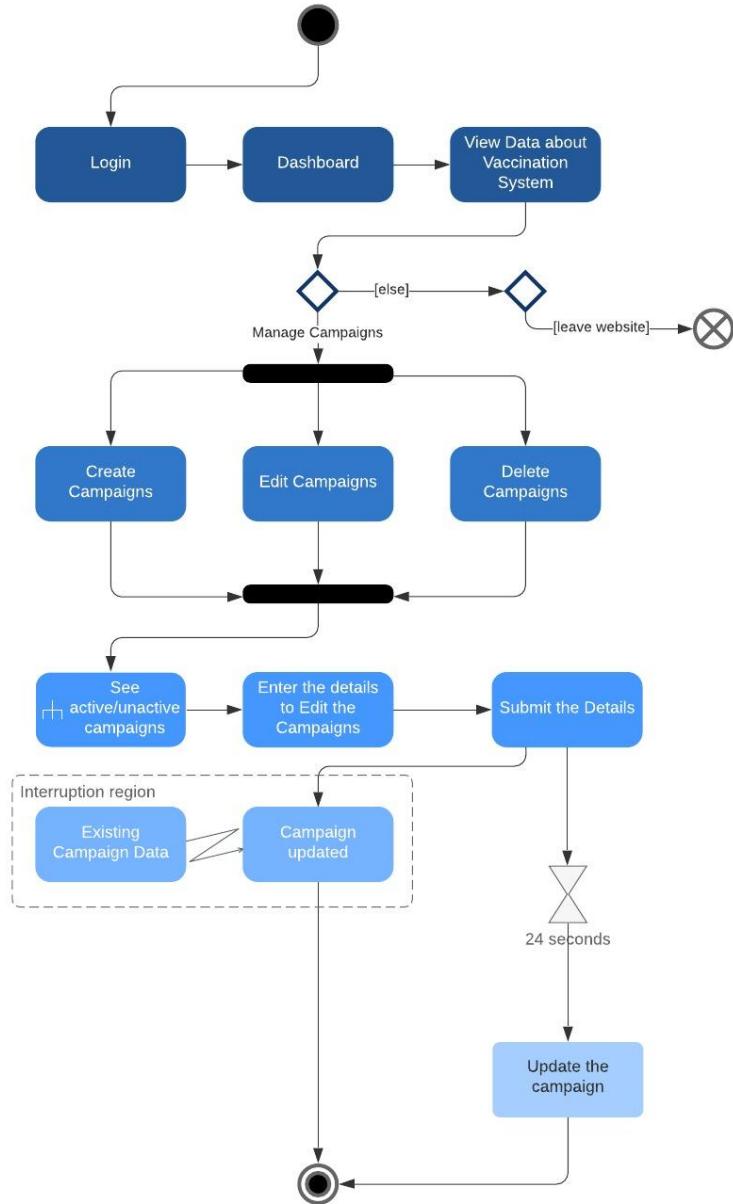
3.3 Architecture Evaluation

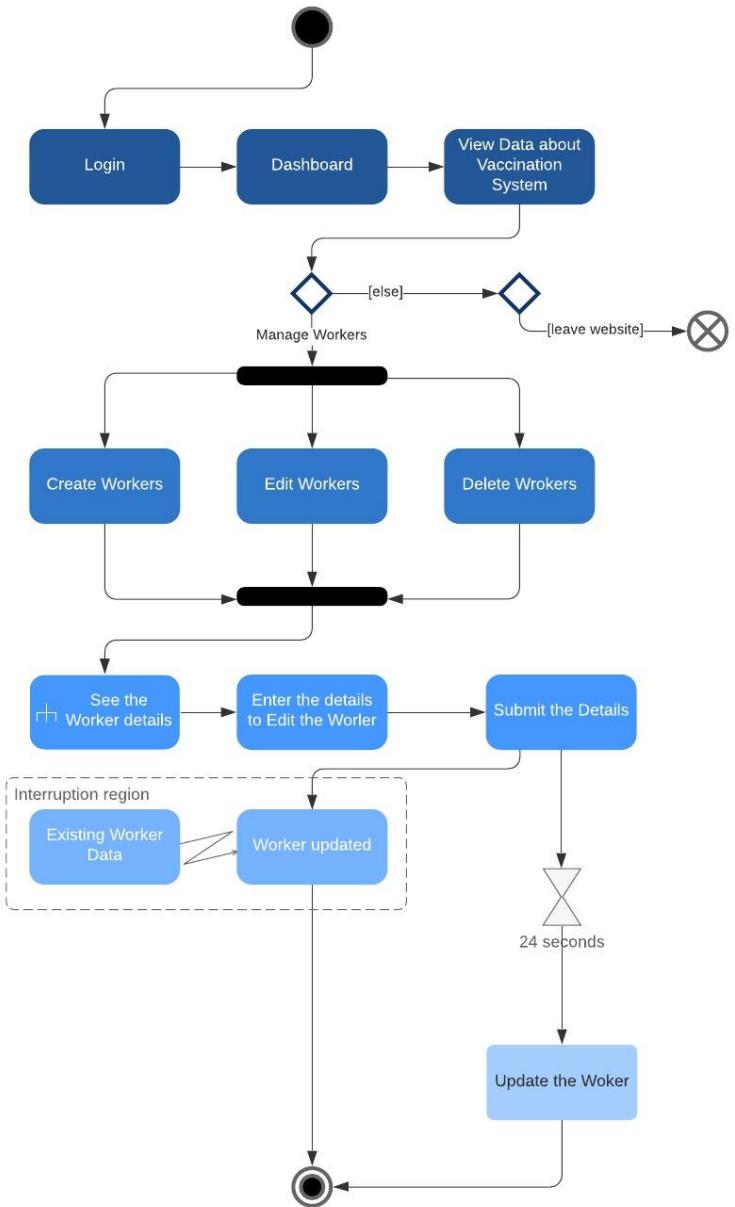
For web development, we used Bootstrap 5 (HTML), Laravel (PHP), MYSQL, and Javascript because we have studied these technologies in our web application course and have some grip on them. We are also familiar with WAMP and LAMP stack as they are the most common stacks for web applications. For location-based services, we used Google API as it is the best one available to us.

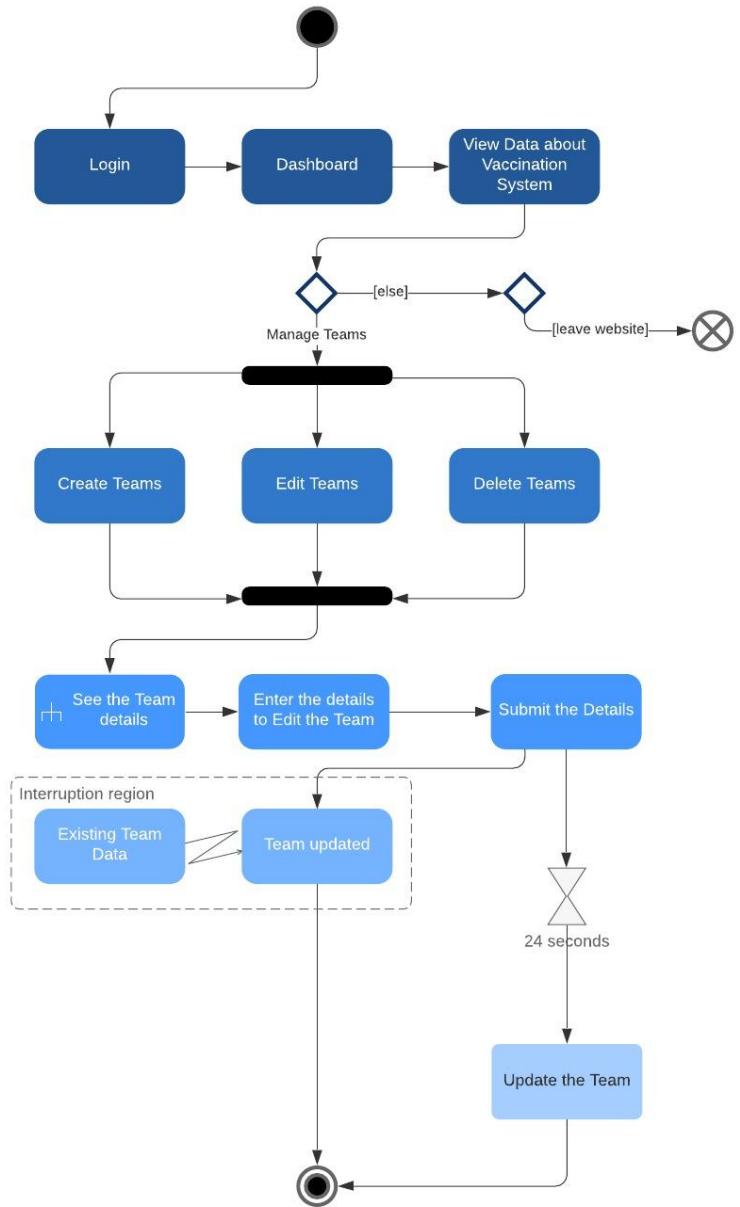
Android is a native language based on Java Programming Language. But we did not use Java because its implementation and its methodology is very complex. But instead of using java we used Ionic Angular Language that is not much popular but it is a hybrid technology based language. Ionic Angular uses a web technology to construct the Mobile Application. It means that the application's code can be executed anywhere like we can construct a web application, an Android application and an IOS application with this one Language. It can also be used to construct other applications like for tablets, watches and much more. The ionic angular Language is really easy to use. The development cost is very low in this Language. Time consumption is at a very low rate that gives a plus point to the developer. This language uses adaptive technology. It can convert the front end with respect to the environment. For example, the same lines of code will be behaving perfectly in different environments (IOS, ANDROID). We are also using CordOVA. Cordova is a separate Platform that is used for creating cross-platform applications. We are using Cordova because firstly we merge Ionic with Angular so that we can use all the web components easily. Also we are using JSON apis to communicate with the database.

3.4 Screenshots/Prototype

3.4.1 Admin Workflow Diagram:

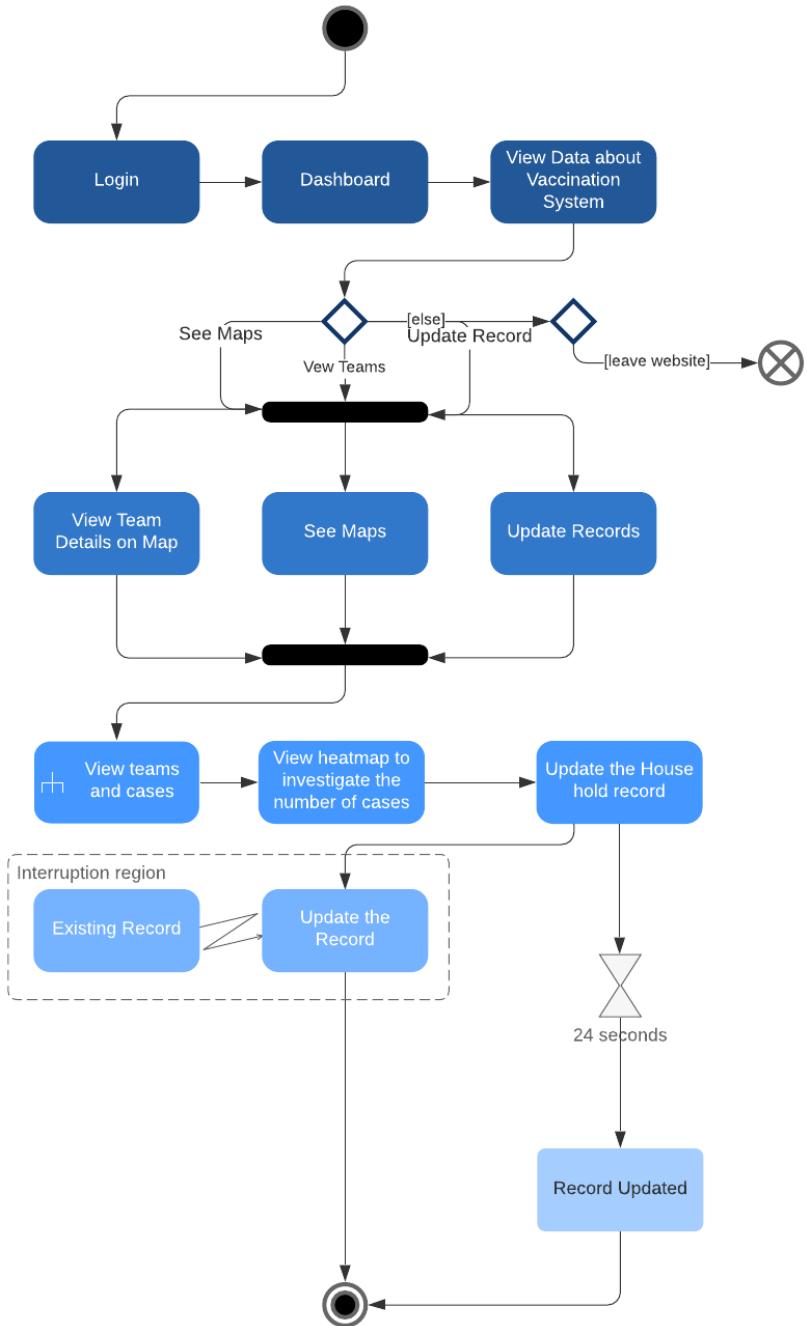






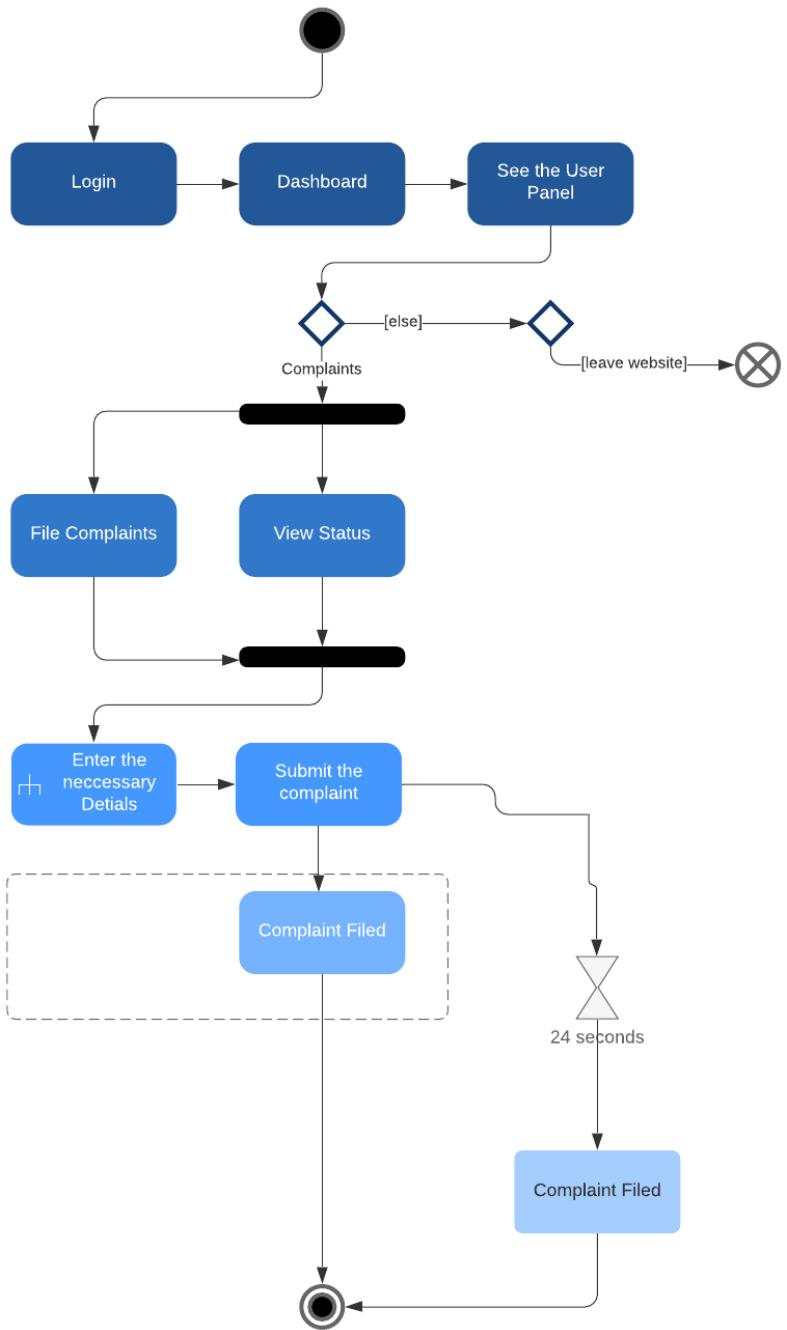
3.4.2 Worker WorkFlow Diagram:

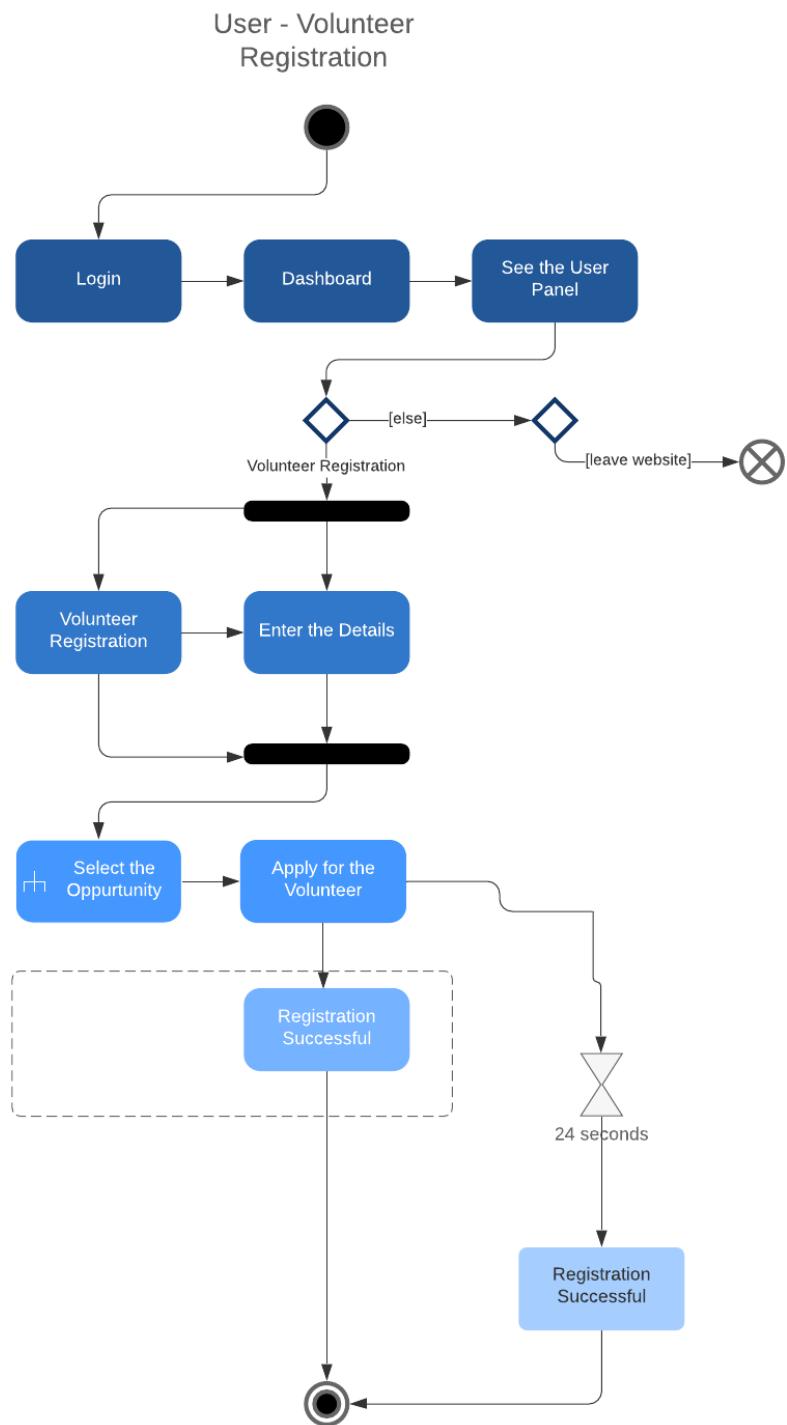
Workers

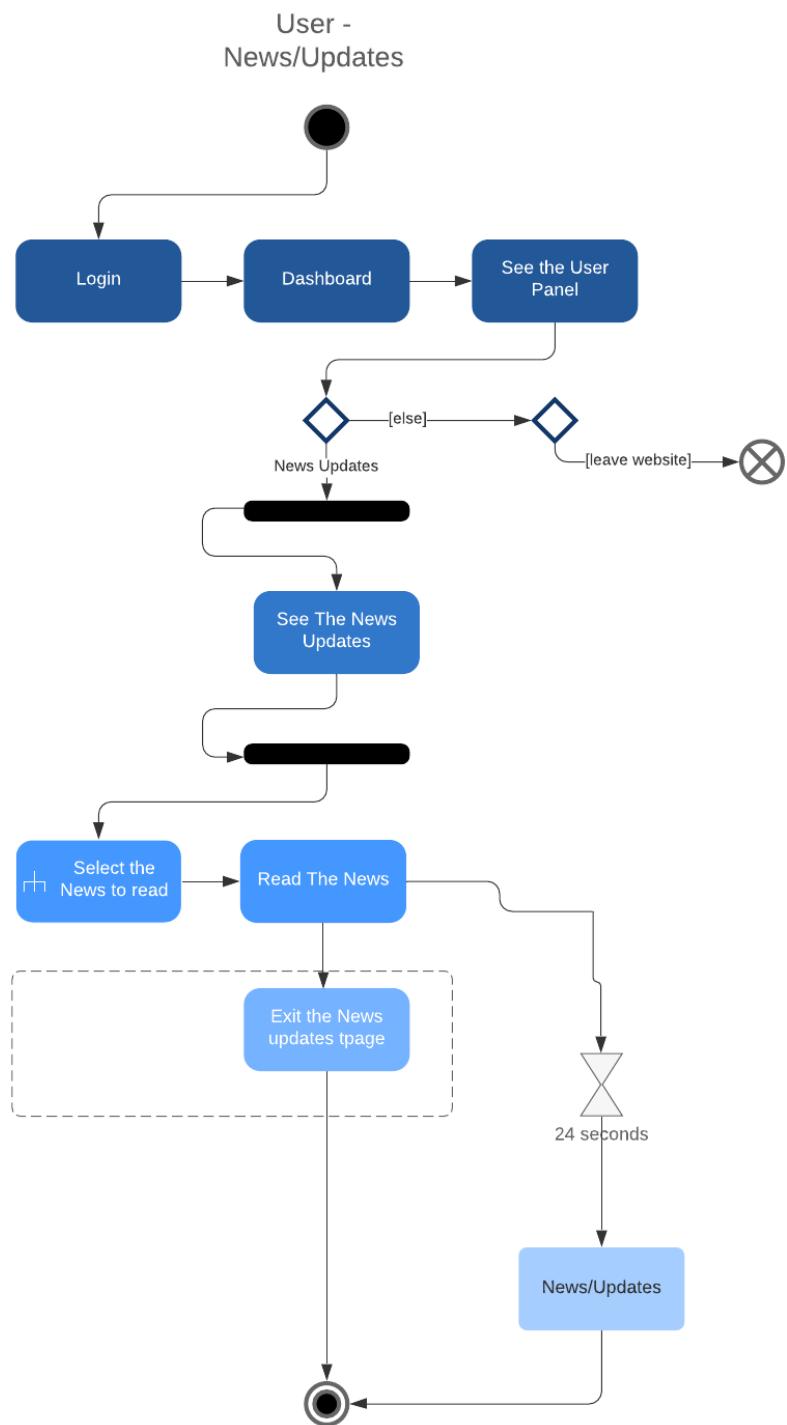


3.4.3 User WorkFlow Diagram:

User - Complaints







3.4.2 Screens

Web Application:



What Is Polio?	^
Polio or Poliomyelitis is a highly infectious disease that most commonly affects children under the age of 5. The virus is spread person to person, typically through contaminated water. It can attack the nervous system, and in some instances, lead to paralysis. Although there is no cure, there is a safe and effective vaccine – one which Rotary and its partners use to immunize over 2.5 billion children worldwide.	
Polio In Pakistan?	▼
How Can I Help?	▼

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Welcome Figure 3.1



This requested URL was not found on this server.

[← Return to Home Page](#)

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404 Figure 3.2

Polio Vaccination System



Please sign in

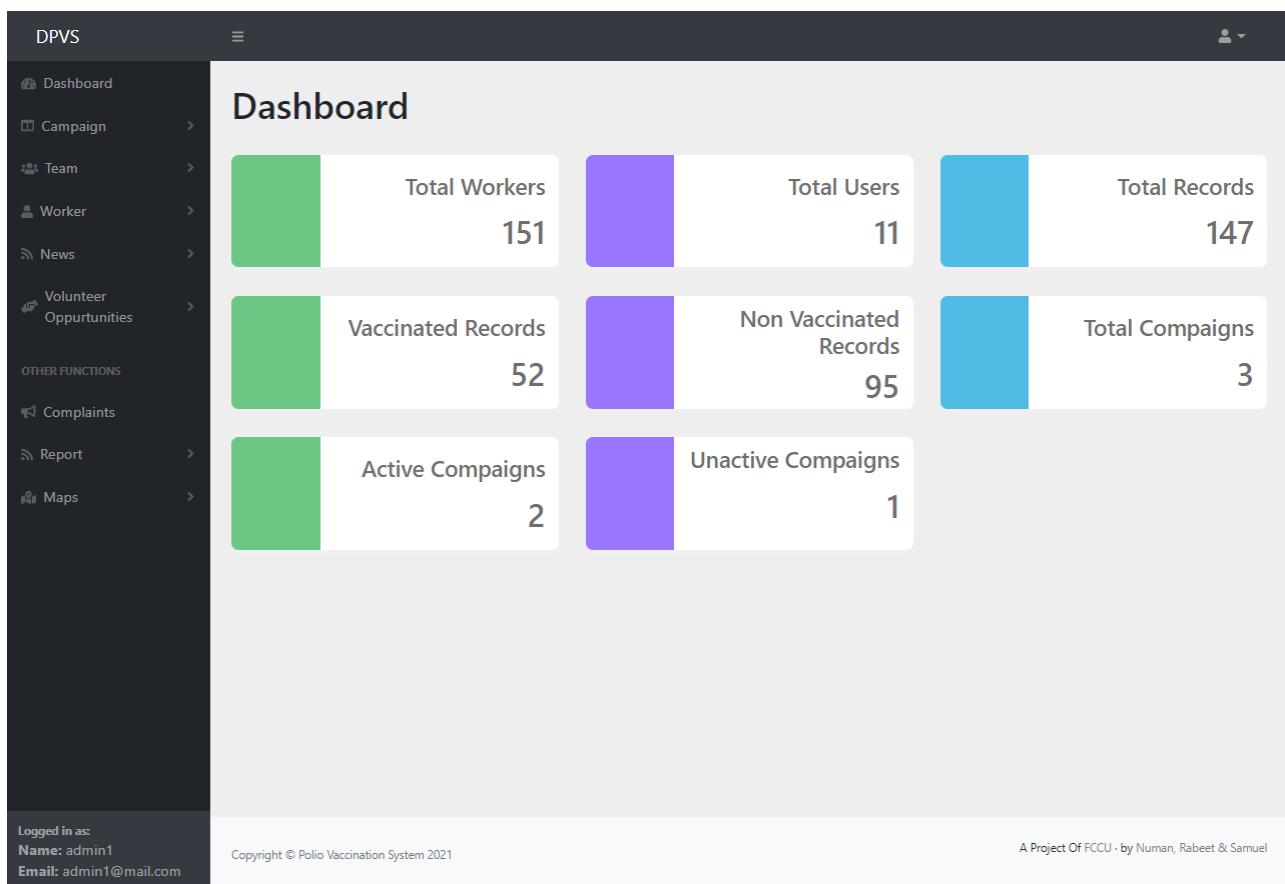
Email address
Password

Remember me

Sign in

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Sign in Figure 3.3



Dashboard Figure 3.4

DPVS

Create Campaign

Campaign Form

Campaign ID	A1-2021
Campaign Name	Name Here
Campaign Type	Type 1
Start	mm/dd/yyyy
End	mm/dd/yyyy

Create

Logged in as:
Admin

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Create-Camp Figure 3.5

DPVS

- Dashboard
- Campaign >
- Team >
- Worker >
- News >
- Volunteer Opportunities >
- OTHER FUNCTIONS
- Complaints
- Report >
- Maps >

Logged in as:
Name: admin1
Email: admin1@mail.com

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Edit/Delete-Camp Figure 3.6

DPVS

- Dashboard
- Campaign >
- Team >
- Worker >
- OTHER FUNCTIONS
- Complaints
- Reports
- Maps
- News/Updates
- QR Code Generator

Logged in as:
Admin

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Create-Team Figure 3.7

All Teams

Sr#	Name	Add Members	View Members	Edit	Delete
1	rabeet	Add Members	View Members	Edit	Delete
2	Test Team	Add Members	View Members	Edit	Delete
3	Samuel Emmanuel	Add Members	View Members	Edit	Delete

Showing 1 to 3 of 3 entries

Edit/Delete-Team Figure 3.8

Create Worker

Worker Form

Worker CNIC
1111111111

Worker Email
xyz@gmail.com

Worker Phone
0300111111

Worker Password

Worker Address

Worker Area

Create

Create-Workers Figure 3.9

DPVS

Workers

All Workers

Name	Email	Phone	CNIC	Address	Area	Edit	Delete
worker	worker@mail.com	123456789	35489662545	address	area	<button>Edit</button>	<button>Delete</button>
worker1	worker1@mail.com	123456789	35489662501	address	area	<button>Edit</button>	<button>Delete</button>
worker2	worker2@mail.com	123456789	35489662502	address	area	<button>Edit</button>	<button>Delete</button>
worker3	worker3@mail.com	123456789	35489662503	address	area	<button>Edit</button>	<button>Delete</button>
worker4	worker4@mail.com	123456789	35489662504	address	area	<button>Edit</button>	<button>Delete</button>
worker5	worker5@mail.com	123456789	35489662505	address	area	<button>Edit</button>	<button>Delete</button>
worker6	worker6@mail.com	123456789	35489662506	address	area	<button>Edit</button>	<button>Delete</button>
worker7	worker7@mail.com	123456789	35489662507	address	area	<button>Edit</button>	<button>Delete</button>
worker8	worker8@mail.com	123456789	35489662508	address	area	<button>Edit</button>	<button>Delete</button>
worker10	worker10@mail.com	123456789	354896625010	address	area	<button>Edit</button>	<button>Delete</button>

Showing 1 to 10 of 151 entries

1 2 3 4 5 6 7 ... 16 >

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Edit/Delete-Workers Figure 3.10

DPVS

User Complain

Complain

Sr#	Name	Complain Subject	Text	Status
1	user	Late Vaccination	Hi this is numan nazir here . I want to let you know that the vaccination process is too slow	Processing
2	Arslan	Mismanagement	kindly check the unvaccinated individuals Properly	unread
3	user	Missed Area	Your team missed area 51	unread

Showing 1 to 3 of 3 entries

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Complaints Figure 3.11

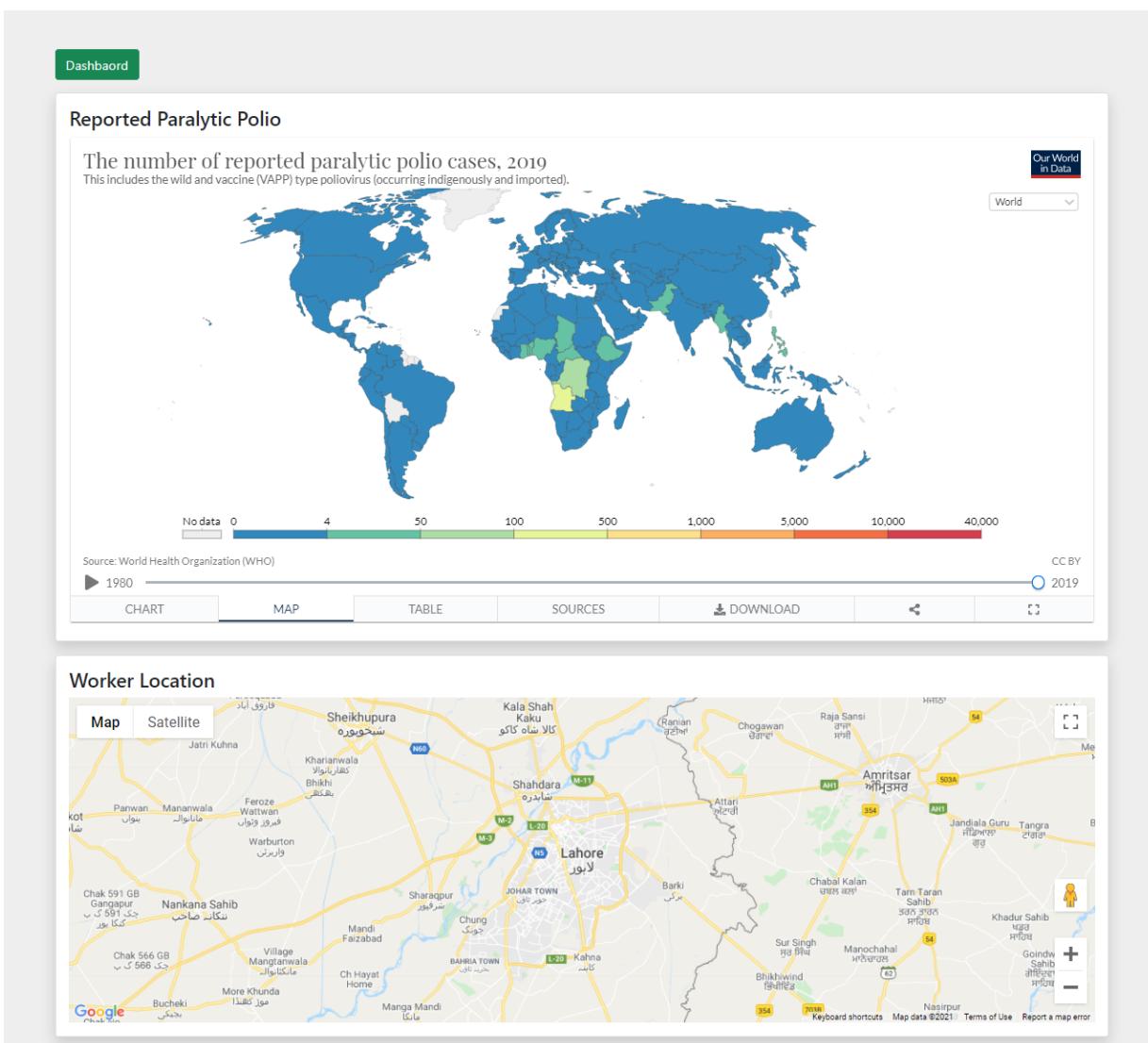
The screenshot shows the DPVS (Digital Polio Vaccination System) application interface. The left sidebar contains navigation links: Dashboard, Campaign, Team, Worker, News, Volunteer Opportunities, OTHER FUNCTIONS (Complaints, Report, Maps), and a user info section (Logged in as: Name: admin1, Email: admin1@mail.com). The main content area is titled "Vaccination Report" and displays a table of vaccination records. The table has columns: Sr#, QR-Code, Name, CNIC, Phone, and Vac Status. The data is as follows:

Sr#	QR-Code	Name	CNIC	Phone	Vac Status
1		Record1	2334451	123456771	Vaccinated
2		Record2	2334452	123456772	Vaccinated
3		Record3	2334453	123456773	Vaccinated
4		Record4	2334454	123456774	Vaccinated
5		Record5	2334455	123456775	Vaccinated

Below the table, it says "Showing 1 to 5 of 52 entries" and there is a pagination control with buttons for 1, 2, 3, 4, 5, 6, 7, ..., 11, >.

At the bottom, there is copyright information: Copyright © Polio Vaccination System 2021 and A Project Of FCCU · by Numan, Rabeet & Samuel.

Report Figure 3.12



Maps Figure 3.13

DPVS

- Dashboard
- Campaign
- Team
- Worker
- News
- Volunteer Opportunities
- OTHER FUNCTIONS
- Complaints
- Report
- Maps

Logged in as:
Name: admin1
Email: admin1@mail.com

News

News

Sr#	Subject	News	Edit	Delete
1	Almost 40 million children in Pakistan did not receive polio vaccinations: UNICEF	Almost 40 million children in Pakistan did not receive polio vaccinations: UNICEF	Edit	Delete

Showing 1 to 1 of 1 entries

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News/Updates Figure 3.14

DPVS

- Dashboard
- Campaign
- Team
- Worker
- News
- Volunteer Opportunities
- OTHER FUNCTIONS
- Complaints
- Report
- Maps

Logged in as:
Name: admin1
Email: admin1@mail.com

Vaccination Report

Vaccination Report

Sr#	QR-Code	Name	CNIC	Phone	Vac Status
1		Record1	2334451	123456771	Vaccinated
2		Record2	2334452	123456772	Vaccinated
3		Record3	2334453	123456773	Vaccinated
4		Record4	2334454	123456774	Vaccinated
5		Record5	2334455	123456775	Vaccinated

Showing 1 to 5 of 52 entries

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QR Code Figure 3.15

The screenshot shows a dark-themed web application interface. On the left, there's a sidebar with navigation links: Dashboard, Campaign, Team, Worker, OTHER FUNCTIONS (Complaints, Reports, Maps, News/Updates, QR Code Generator), and a 'Logged in as: Admin' section. The main content area has a title 'Complaint' and a sub-section 'Active Complaints'. A modal window titled 'Change Status' is open in the center. It contains a dropdown menu set to 'Change Status' and two buttons: 'Close' and 'Save changes'. Below the modal is a table with three rows of data. The columns are labeled: Comp. Code, ID, Name, Comments, Phone, Status, and Action. The first row (C001) has a 'Status' button in the Action column. The second row (C002) also has a 'Status' button in the Action column. The third row (C003) has a 'Status' button in the Action column.

Comp. Code	ID	Name	Comments	Phone	Status	Action
C001	ID1	Name1	<p>Lore ipsum dolor sit amet, consectetur adipiscing elit. Cras vel sollicitudin lacus. Vivamus eros ex, fringilla ac ligula a, mollis eleifend nulla. Curabitur condimentum accumsan ex id varius. Nam eget mi a ipsum tincidunt pretium non eu nisi. Curabitur bibendum iaculis urna, a volutpat quam interdum quis. Ut maximus felis vitae ligula vehicula, et iaculis mauris consequat. Nam ut velit iaculis, eleifend augue eu, efficitur dui. Quisque maximus varius libero, et pharetra ante cursus vel. Pellentesque ut mauris est. Fusce placerat, nisi eget sollicitudin viverra, felis velit hendrerit est, vitae euismod elit justo eget nisi.</p>	03244895247	Initiated	Delete Status
C002	ID2	Name2	<p>Lore ipsum dolor sit amet, consectetur adipiscing elit. Cras vel sollicitudin lacus. Vivamus eros ex, fringilla ac ligula a, mollis eleifend nulla. Curabitur condimentum accumsan ex id varius. Nam eget mi a ipsum tincidunt pretium non eu nisi. Curabitur bibendum iaculis urna, a volutpat quam interdum quis. Ut maximus felis vitae ligula vehicula, et iaculis mauris consequat. Nam ut velit iaculis, eleifend augue eu, efficitur dui. Quisque maximus varius libero, et pharetra ante cursus vel. Pellentesque ut mauris est. Fusce placerat, nisi eget sollicitudin viverra, felis velit hendrerit est, vitae euismod elit justo eget nisi.</p>	03244895247	Initiated	Delete Status
C003	ID3	Name3	<p>Lore ipsum dolor sit amet, consectetur adipiscing elit. Cras vel sollicitudin lacus. Vivamus eros ex, fringilla ac ligula a, mollis eleifend nulla. Curabitur condimentum accumsan ex id varius. Nam eget mi a ipsum tincidunt pretium non eu nisi. Curabitur bibendum iaculis urna, a volutpat quam interdum quis. Ut maximus felis vitae ligula vehicula, et iaculis mauris consequat. Nam ut velit iaculis, eleifend augue eu, efficitur dui. Quisque maximus varius libero, et pharetra ante cursus vel. Pellentesque ut mauris est. Fusce placerat, nisi eget sollicitudin viverra, felis velit hendrerit est, vitae euismod elit justo eget nisi.</p>	03244895247	Initiated	Delete Status

Complaint-Status Figure 3.13.1

The screenshot shows a dark-themed web application interface. On the left, there's a sidebar with navigation links: Dashboard, Campaign, Team, Worker, OTHER FUNCTIONS (Complaints, Reports, Maps, News/Updates, QR Code Generator), and a 'Logged in as: Admin' section. The main content area has a title 'News/Update' and a sub-section 'Recent News/Update'. A modal window titled 'Edit News/Update' is open in the center. It contains fields for 'Category' (with placeholder 'Category Here') and 'Description' (with placeholder 'Description Here'). Below the modal is a table with four rows of data. The columns are labeled: Date Published, Category, and Action. The first two rows have 'Edit' and 'Delete' buttons in the Action column. The last two rows have 'Edit' and 'Delete' buttons in the Action column.

Date Published	Category	Action
Date Published	Category	Edit Delete
Date Published	Category	Edit Delete
Date Published	Category	Edit Delete
Date Published	Category	Edit Delete

News/Updates Figure 3.16.1

The screenshot shows the DPVS application interface. On the left is a sidebar with navigation links: Dashboard, Campaign, Team, Worker, OTHER FUNCTIONS (Complaints, Reports, Maps, News/Updates, QR Code Generator), and a user status bar indicating 'Logged in as: Admin'. The main area has a title 'Edit Team' and a sub-section 'Active Teams' showing 5 entries. A modal dialog titled 'Edit Team' is open, containing fields for 'Team ID' (A1-2021), 'Team Name' (Name Here), 'Area' (Area Here), and 'Members IDs' (ID1, ID2, ID3...). Below the modal is a table listing team members with columns 'Name', 'Accountant', 'Member IDs', and 'Edit' buttons. At the bottom of the page are copyright information (Copyright © Polio Vaccination System 2021) and a footer note (A Project Of FCCU · by Numan, Rabeet & Samuel).

Edit Team

Team ID
A1-2021

Team Name
Name Here

Area
Area Here

Members IDs
ID1, ID2, ID3...

Close **Save changes**

Name	Accountant	Member IDs	Edit
Tiger Nixon		2,3	Edit
Garrett Winters		2,3	Edit
Ashton Cox		2,3	Edit
Cedric Kelly		2,3	Edit
Airi Satou		1,2,3	Edit

Showing 1 to 5 of 13 entries

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Edit Team Figure 3.8.1

User Panel:

**Polio Vaccination
System**



Full Name
CNIC
Email address
Password

Sign up

A Project Of [FCCU](#), by [Numan, Rabeet & Samuel](#) | © 2021-22 FCCU | [Site Map](#)

User-Sign-up Figure 4.1

DPVS

- Dashboard
- Volunteer
- News/Updates

OTHER FUNCTIONS

- Complaints

Logged in as:
User

User Panel

Welcome To Polio Vaccination System

Name	Type	Area	Office	Start date	End Date
Tiger Force	C	Gulberg Lahore	Gulberg Lahore	2011/04/25	2011/06/25
Garrett Winters	Accountant	Tokyo	63	2011/07/25	\$170,750
Ashton Cox	Junior Technical Author	San Francisco	66	2009/01/12	\$86,000
Cedric Kelly	Senior Javascript Developer	Edinburgh	22	2012/03/29	\$433,060
Airi Satou	Accountant	Tokyo	33	2008/11/28	\$162,700

Showing 1 to 5 of 57 entries

1 2 3 4 5 6 7 ... 12 >

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User-Dashboard Figure 4.2

DPVS

- Dashboard
- Volunteer
- News/Updates

OTHER FUNCTIONS

- Complaints

Logged in as:
USER

Volunteer Registration

Team	Postion	Area	Start Date	End Date	Register
Tiger Force	Computer Operator	Gulberg Lahore	2011/04/25	2011/06/25	<button>Apply</button>
Rahbar	Field Officer	Model Town Lahore	2011/04/25	2011/06/25	<button>Apply</button>
End Polio	Feild Worker	Kashmir	2011/04/25	2011/06/25	<button>Apply</button>
Rotary	Videographer	DHA Multan	2011/04/25	2011/06/25	<button>Apply</button>
Rahbar	Feild Worker	Islamabad	2011/04/25	2011/06/25	<button>Apply</button>
Tiger Force	Computer Operator	Gulberg Lahore	2011/04/25	2011/06/25	<button>Apply</button>
Tiger Force	Computer Operator	Gulberg Lahore	2011/04/25	2011/06/25	<button>Apply</button>
Tiger Force	Computer Operator	Gulberg Lahore	2011/04/25	2011/06/25	<button>Apply</button>
Tiger Force	Computer Operator	Gulberg Lahore	2011/04/25	2011/06/25	<button>Apply</button>

Showing 1 to 10 of 13 entries

1 2 >

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Vol-reg Figure 4.3

DPVS
≡
Dashboard
Volunteer
News/Updates
OTHER FUNCTIONS
Complaints

News Updates

Recent News/Update

5
entries per page
Search...

Date Published	Category	Description
Date Published	Category

Showing 1 to 5 of 11 entries

<
1
2
3
>

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News/Updates- User Figure 4.4

69

DPVS

☰

Search for...  

Dashboard

Volunteer

News/Updates

OTHER FUNCTIONS

Complaints

Complaints & Sugesstions

 Complaints & Sugesstions

CNIC
0000-0000000-0

Full Name
Numan

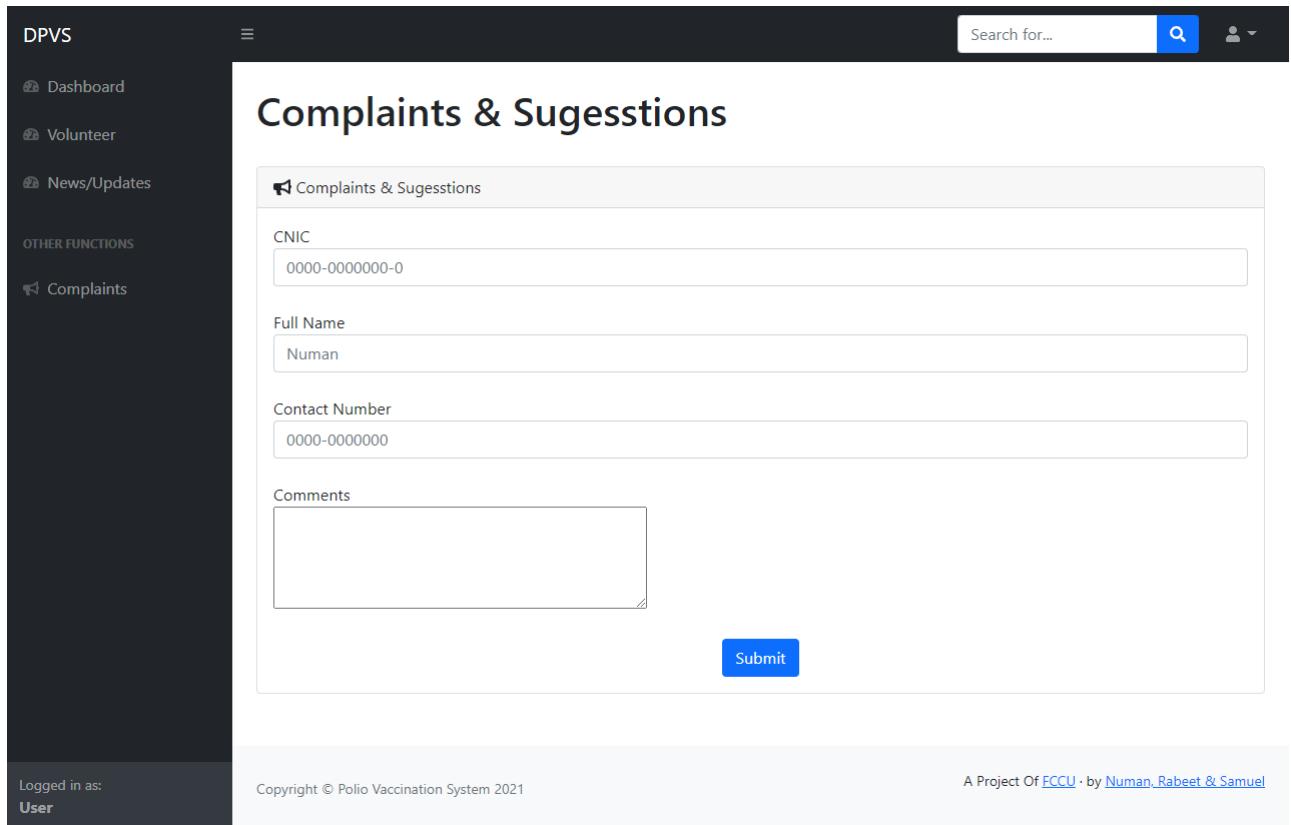
Contact Number
0000-0000000

Comments

Logged in as:
User

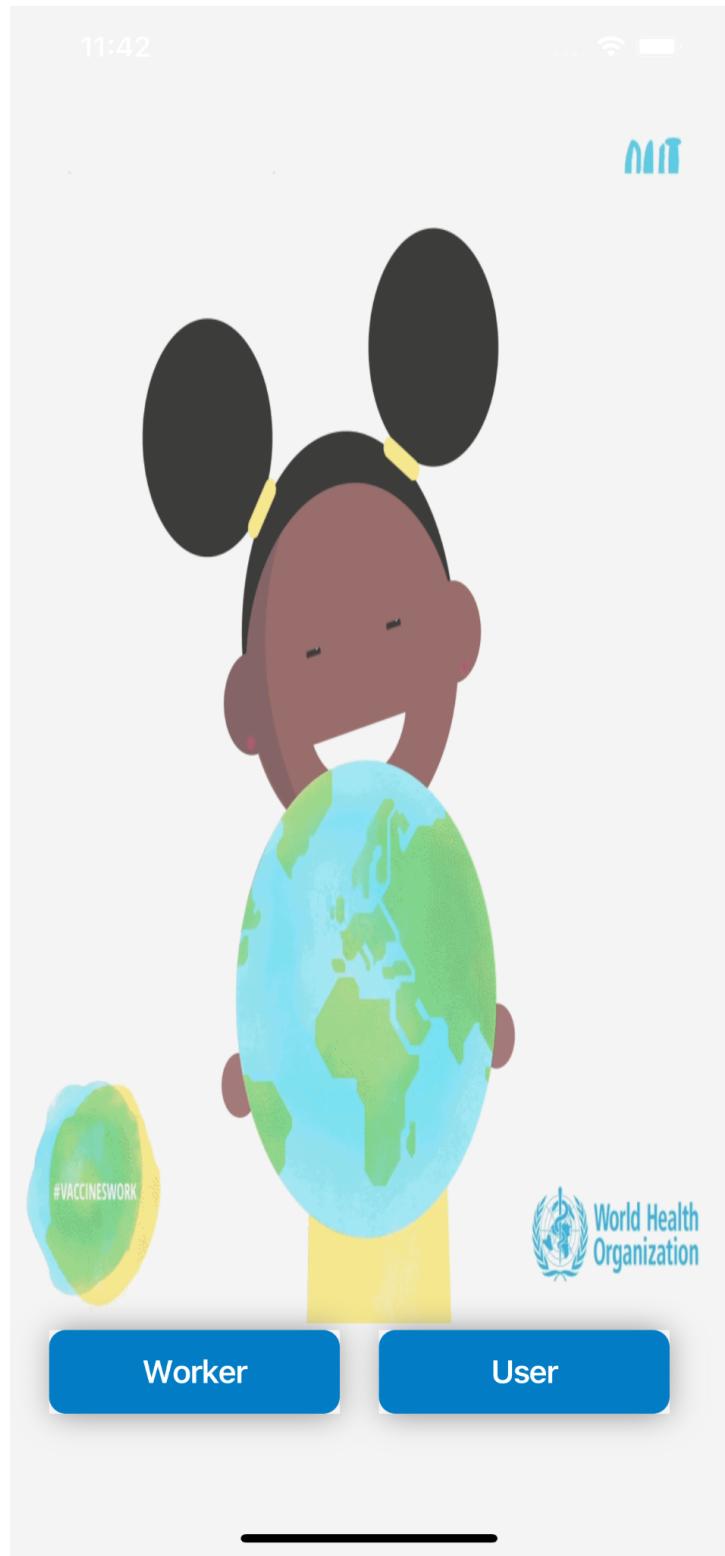
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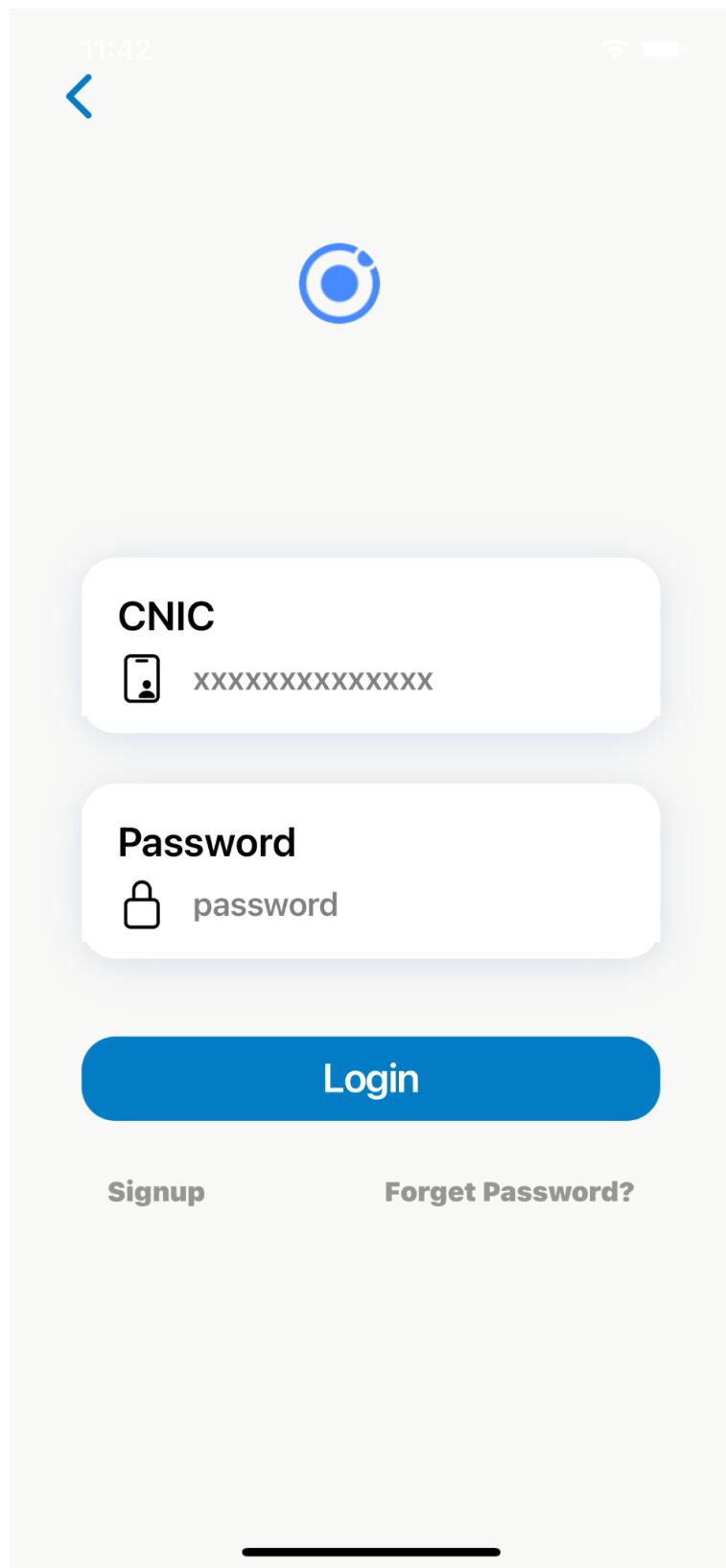


Complaints Figure 4.5

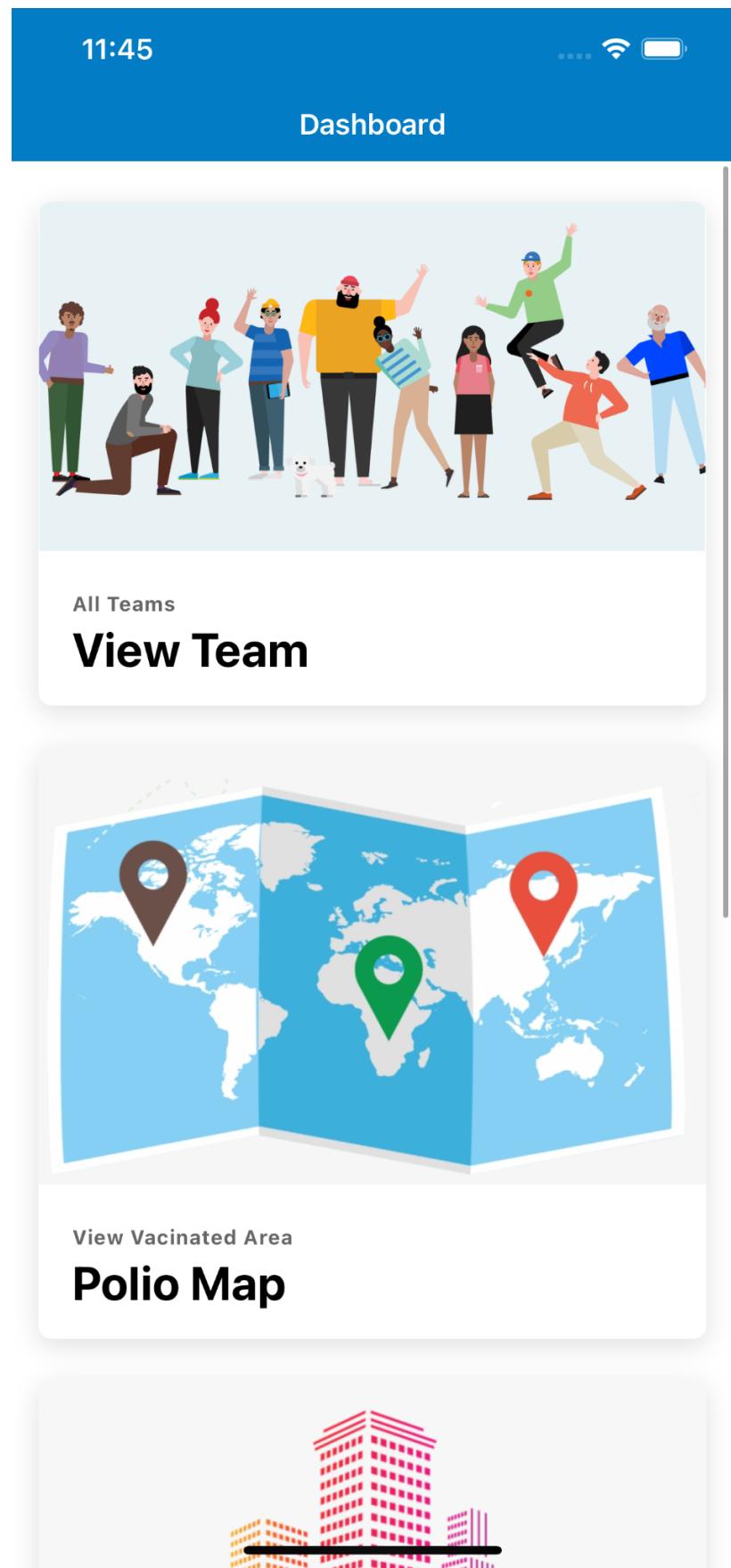
Mobile Application:

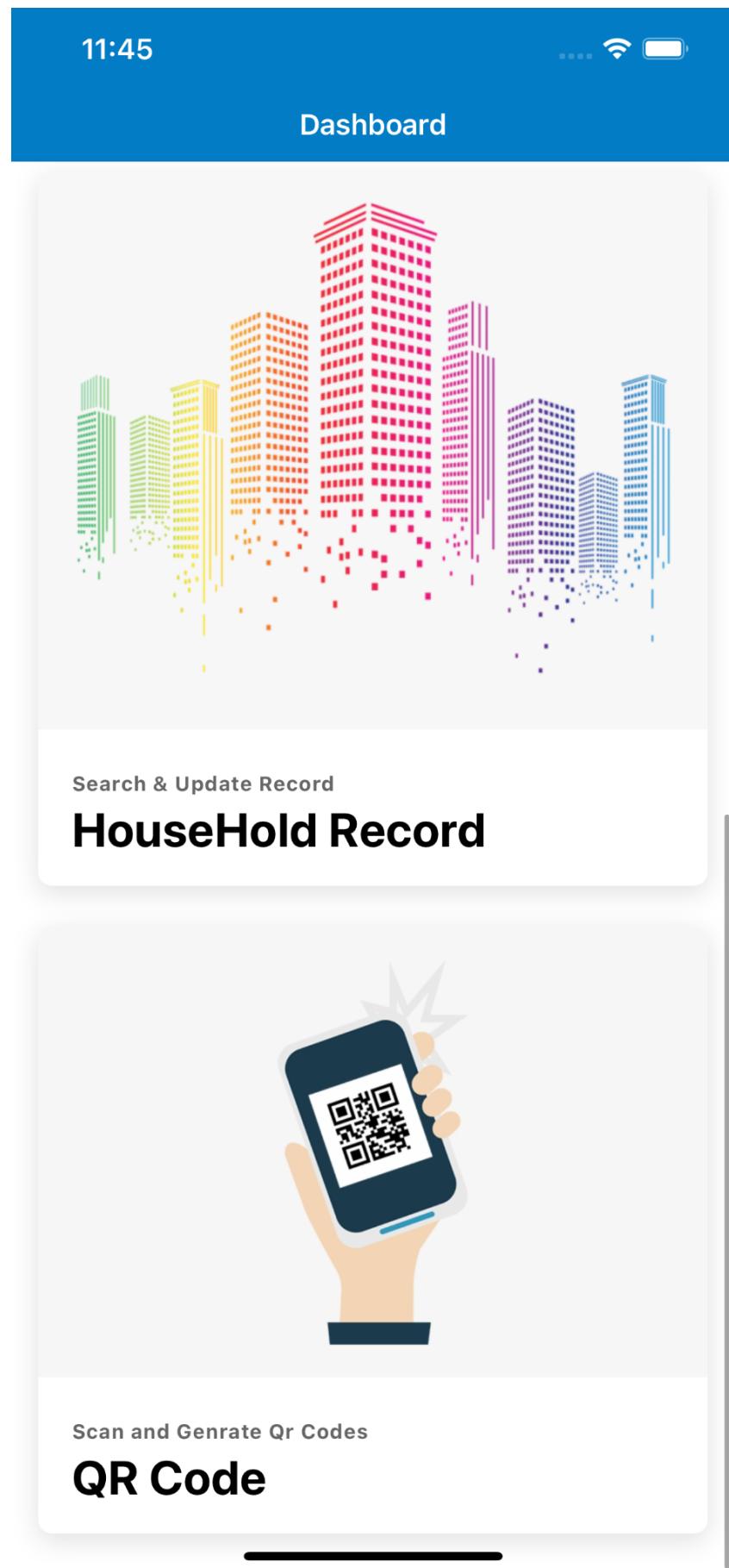


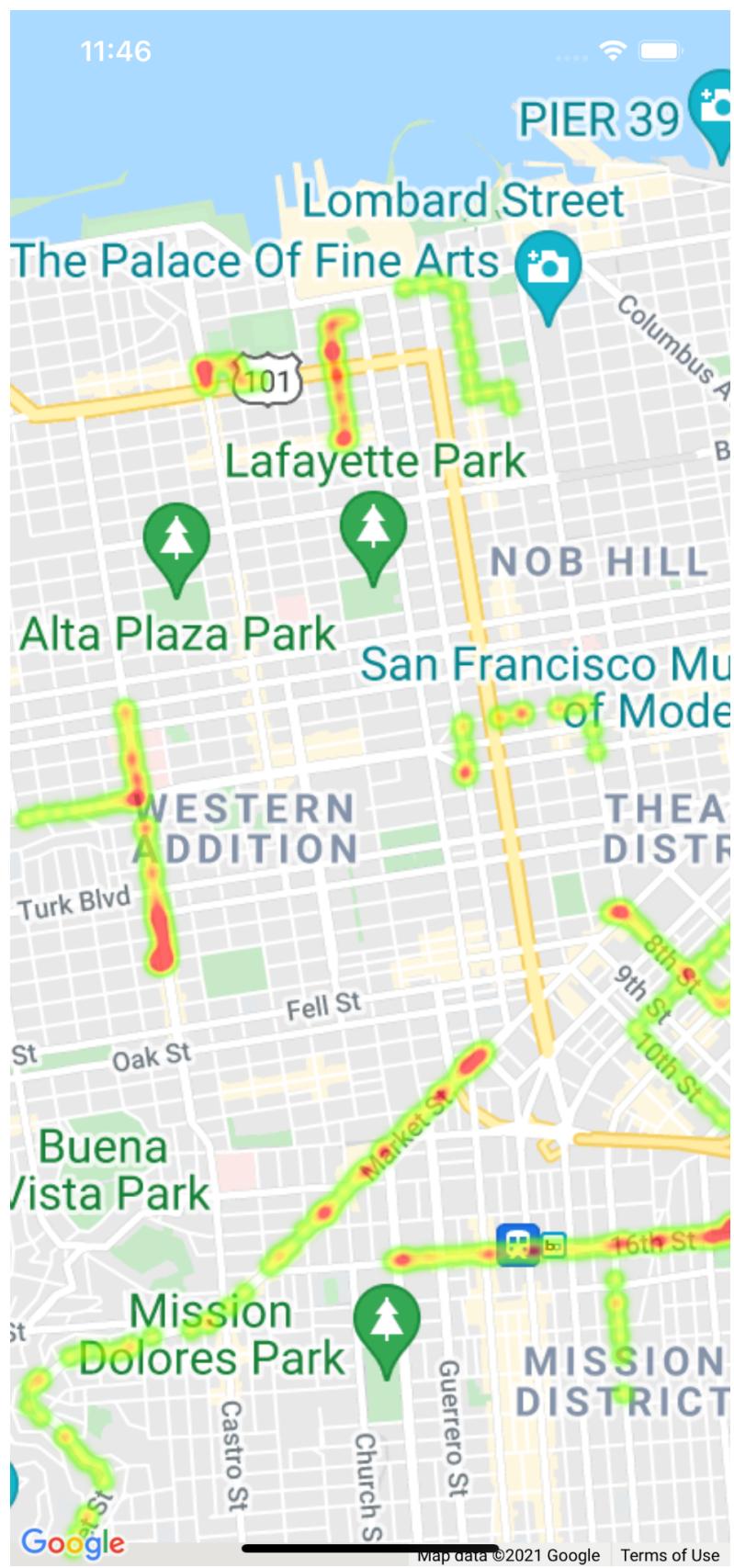
Welcome-Mob Figure 5.1



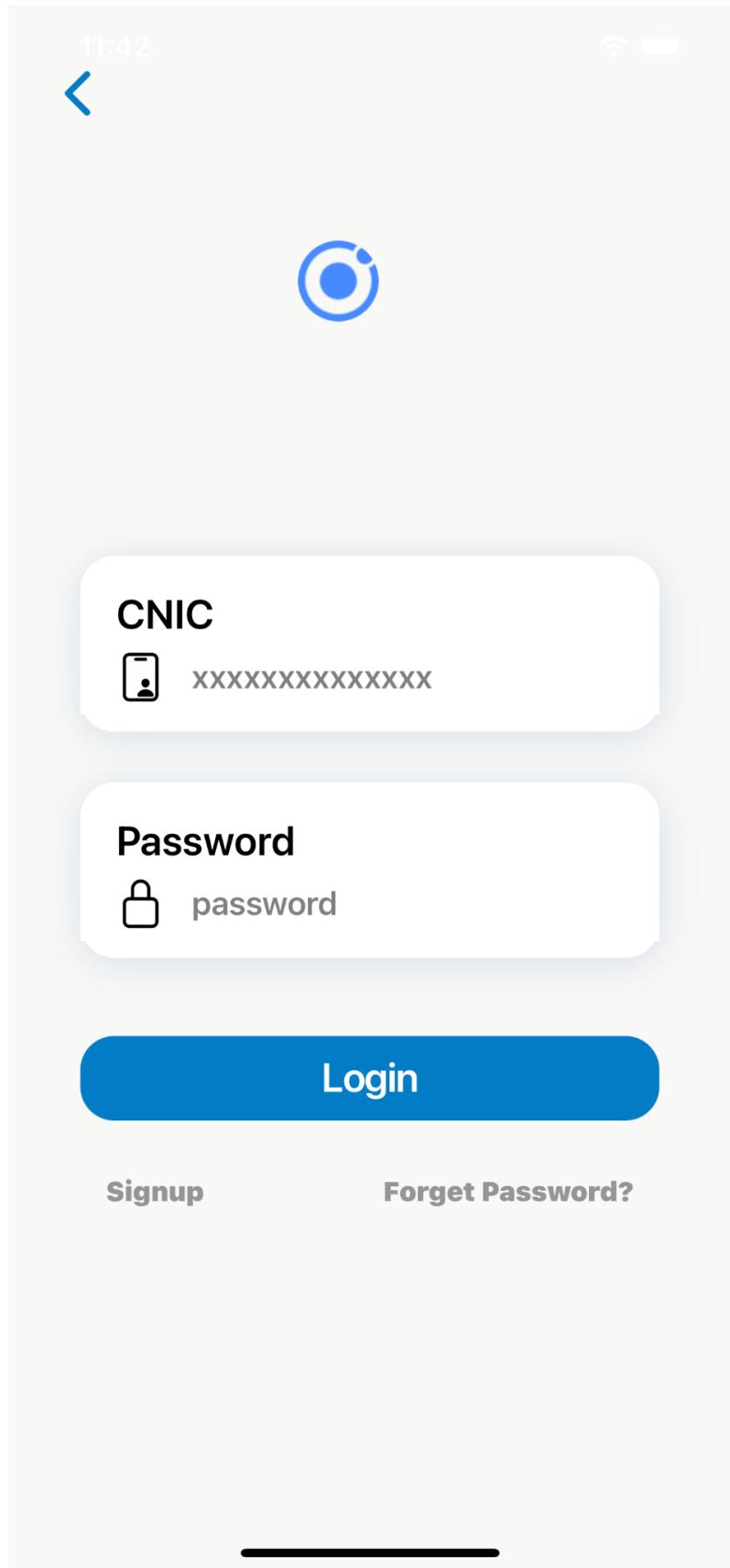
Login-Mob Figure 5.2



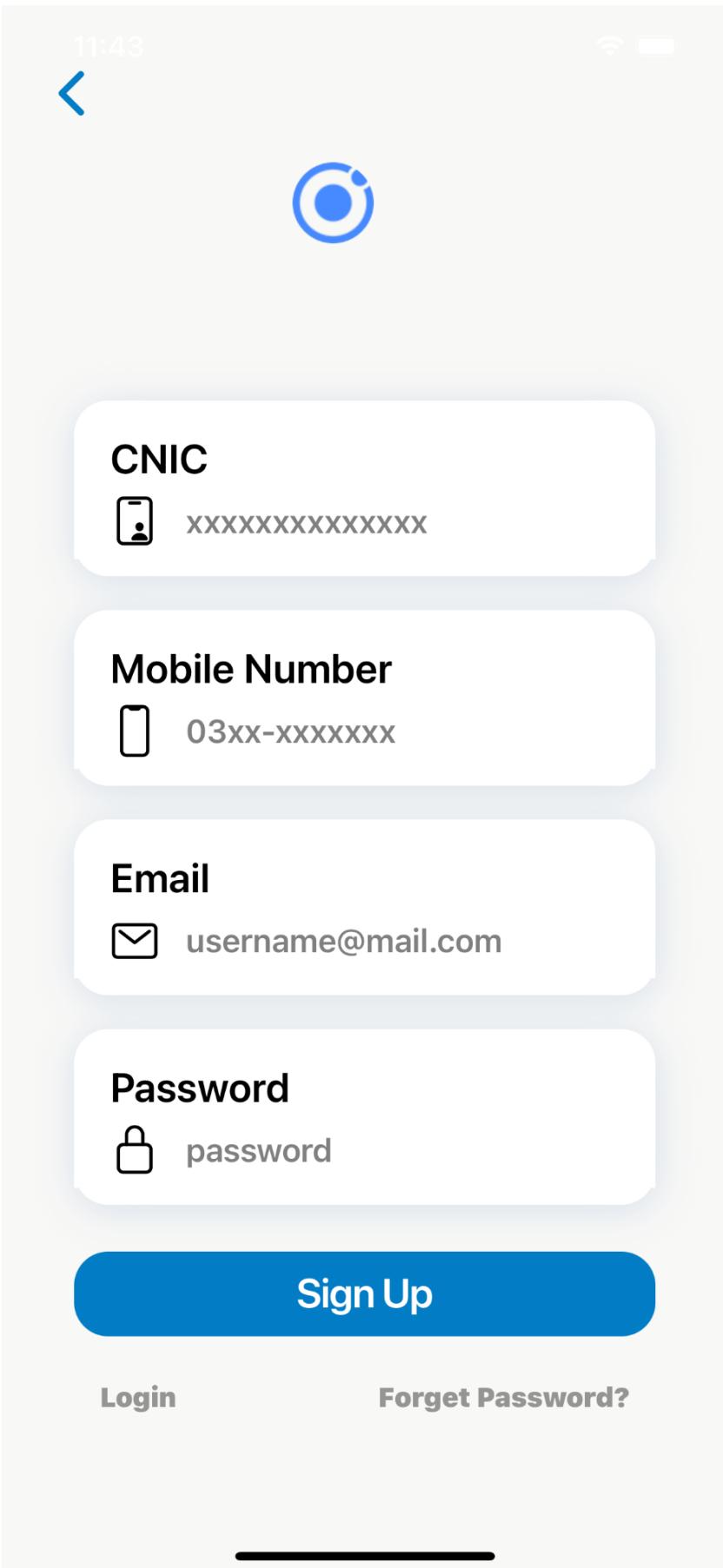


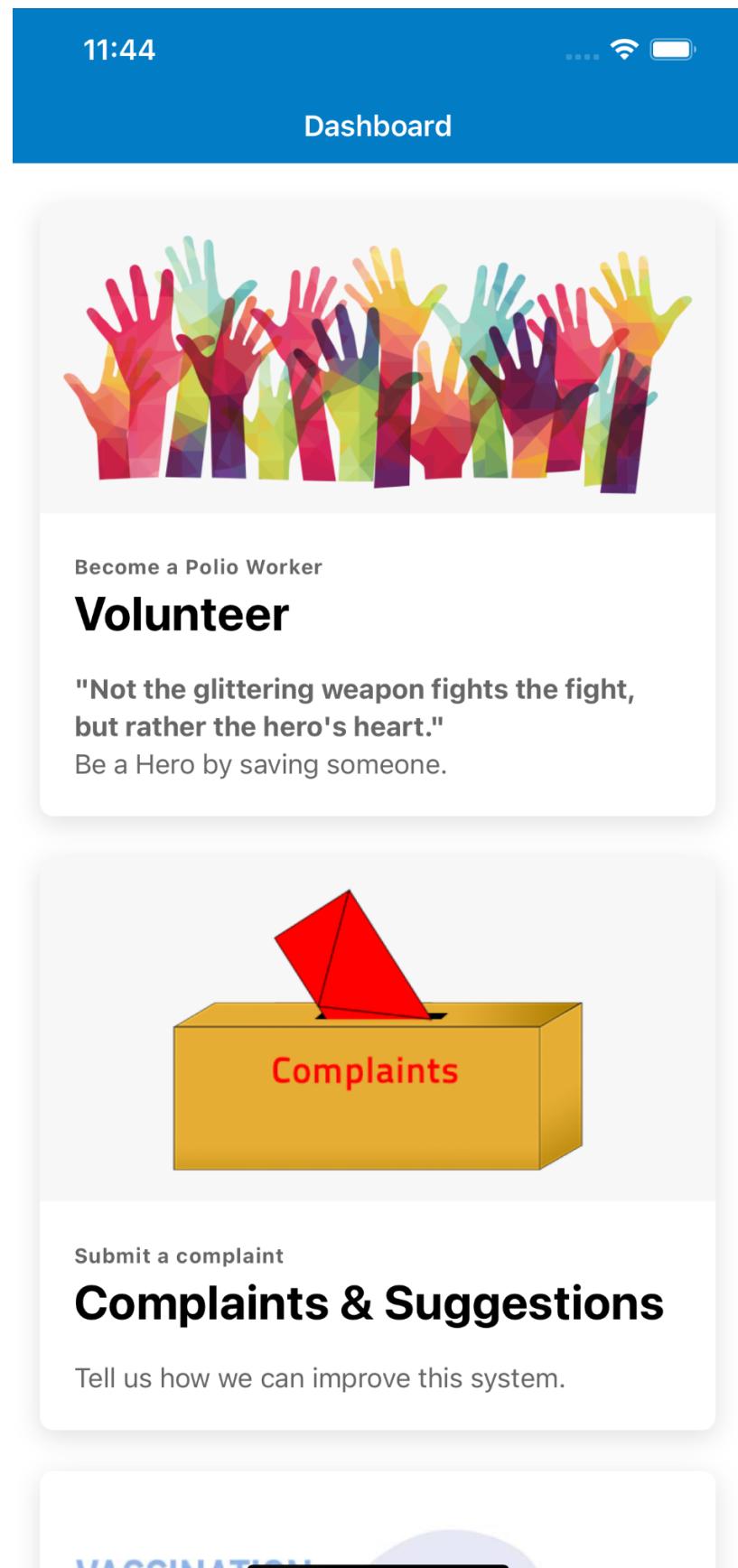


Heatmap-Mob Figure 5.5



Welcome-Mob(user) Figure 5.6





VACCINATION

Dashboard-Mob(user) Figure 5.8

Chapter 4. Test Specification and Results

4.1 Test Case Specification

Identifier	TC-1
Related requirements(s)	UC-1 Document no 2.4.1
Short description	Login Credentials
Pre-condition(s)	User must be registered
Input data	Valid Email and Valid Password(Email: user@gmail.com Password:1234)
Detailed steps	Go to the website or launch the app then click on the sign in button.
Expected result(s)	Go to the User's Dashboard
Post-condition(s)	Start user session and redirect the user homepage
Actual result(s)	User Dashboard will be accessed if the credentials are correct
Test Case Result	Pass

Table 6.1: TC-1

Identifier	TC-2
Related requirements(s)	UC-3 Document no 2.4.3
Short description	Registration for user/ Polio Worker
Pre-condition(s)	User must be registered
Input data	Full Name, CNIC, Email Address, Password, Phone number, City (Ahmed Mehboob, 12344-3456789-1, abc@gmail.com , 0312-1234578, Lahore)
Detailed steps	Go to the website or launch the app, click on user signup and fill the registration form.
Expected result(s)	Registration Successful
Post-condition(s)	Show the popup menu of registration successful.
Actual result(s)	User registration successful
Test Case Result	Pass

Table 6.2: TC-2

Identifier	TC-3
Related requirements(s)	UC-4a Document no 2.4.6
Short description	Volunteer Registration and Opportunities
Pre-condition(s)	User must be registered
Input data	Full Name, CNIC, Email Address, Password, Phone number, City (Ahmed Mehboob, 12344-3456789-1, abc@gmail.com , 0312-1234578, Lahore)
Detailed steps	Go to the website or launch the app, click on user signin after successful login click on volunteer registration and fill the registration form accordingly.
Expected result(s)	Registration Successful
Post-condition(s)	Show the popup menu of registration successful.
Actual result(s)	User registration successful
Test Case Result	Pass

Table 6.3: TC-3

Identifier	TC-4
Related requirements(s)	UC-3 Document no 2.4.3
Short description	Polio Worker
Pre-condition(s)	App must be installed on Phone, Worker must be registered
Input data	Full Name, CNIC, Email Address, Password, Phone number, City (Ahmed Adil, 12344-3456789-1, xyz@gmail.com , 0312-1234578, Lahore)
Detailed steps	Launch the app and then click on the Worker Sign Up.
Expected result(s)	Registration Successful
Post-condition(s)	Show the popup menu of registration successful.
Actual result(s)	User registration successful
Test Case Result	Pass

Table 6.4: TC-4

Identifier	TC-5
Related requirements(s)	UC-3 Document no 2.4.9
Short description	Manage Campaigns
Pre-condition(s)	User must be Admin
Input data	N/A
Detailed steps	Go to the admin panel and click on the campaigns
Expected result(s)	Open the list to manage the campaign accordingly.
Post-condition(s)	N/A
Actual result(s)	Open the sub list to see the other actions for campaigns
Test Case Result	Pass

Table 6.5: TC-5

Identifier	TC-6
Related requirements(s)	UC-3 Document no 2.4.10
Short description	Create Campaigns
Pre-condition(s)	User must be Admin
Input data	Campaign name, campaign type, start date and end date
Detailed steps	Go to the admin panel and click on the campaigns and the click on the create campaigns.
Expected result(s)	Open the form the to create a campaign
Post-condition(s)	Campaign created successfully
Actual result(s)	Campaign Created
Test Case Result	Pass

Table 6.6: TC-6

Identifier	TC-7
Related requirements(s)	UC-3 Document no 2.4.11
Short description	Edit Campaigns
Pre-condition(s)	User must be Admin
Input data	Campaign name, campaign type, start date and end date
Detailed steps	Go to the admin panel and click on the campaigns and the click on the edit/delete and then click on the edit button..
Expected result(s)	A form will be opened for edit a campaign
Post-condition(s)	N/A
Actual result(s)	Campaign updated successfully
Test Case Result	Pass

Table 6.7: TC-7

Identifier	TC-8
Related requirements(s)	UC-3 Document no 2.4.12
Short description	Delete Campaigns
Pre-condition(s)	User must be Admin
Input data	N/A
Detailed steps	Go to the admin panel and click on the campaigns and the click on the edit/delete and then click on the delete button. Confirmation message will be there and then click the delete button.
Expected result(s)	Campaign will be deleted
Post-condition(s)	N/A
Actual result(s)	Campaign will be deleted
Test Case Result	Pass

Table 6.8: TC-8

Identifier	TC-9
-------------------	------

Related requirements(s)	UC-3 Document no 2.4.13
Short description	Manage Teams
Pre-condition(s)	User must be Admin
Input data	N/A
Detailed steps	Go to the admin panel and click on the Teams.
Expected result(s)	Open a sublist to manage the teams
Post-condition(s)	N/A
Actual result(s)	Open a sublist to manage the teams
Test Case Result	Pass

Table 6.9: TC-9

Identifier	TC-10
Related requirements(s)	UC-3 Document no 2.4.14
Short description	Create Teams
Pre-condition(s)	User must be Admin
Input data	Team name
Detailed steps	Go to the admin panel and click on the Teams. click on create Team and then enter the name of team and submit it.
Expected result(s)	Team created Successfully
Post-condition(s)	N/A
Actual result(s)	Team created Successfully
Test Case Result	Pass

Table 6.10: TC-10

Identifier	TC-11
Related requirements(s)	UC-3 Document no 2.4.15
Short description	Edit Teams
Pre-condition(s)	User must be Admin
Input data	Team name
Detailed steps	Go to the admin panel and click on the Teams. click on edit/delete teams. and then click on the edit button.
Expected result(s)	Team edited Successfully
Post-condition(s)	N/A
Actual result(s)	Team edited Successfully
Test Case Result	Pass

Table 6.11: TC-11

Identifier	TC-12
Related requirements(s)	UC-3 Document no 2.4.16

Short description	Delete Teams
Pre-condition(s)	User must be Admin
Input data	Team name
Detailed steps	Go to the admin panel and click on the Teams. click on edit/delete teams. and then click on the delete button.
Expected result(s)	Team deleted Successfully
Post-condition(s)	N/A
Actual result(s)	Team deleted Successfully
Test Case Result	Pass

Table 6.12: TC-12

Identifier	TC-13
Related requirements(s)	UC-3 Document no 2.4.17
Short description	Manage Workers
Pre-condition(s)	User must be Admin
Input data	N/A
Detailed steps	Go to the admin panel and click on the Workers.
Expected result(s)	Open a sublist for worker's action
Post-condition(s)	N/A
Actual result(s)	Open a sublist for Worker actions
Test Case Result	Pass

Table 6.13: TC-13

Identifier	TC-14
Related requirements(s)	UC-3 Document no 2.4.18
Short description	Create Workers
Pre-condition(s)	User must be Admin
Input data	name, cnic, email, phone password, address, area
Detailed steps	Go to the admin panel and click on the Workers. then click on the create workers.
Expected result(s)	Worker created successfully
Post-condition(s)	N/A
Actual result(s)	Worker created Successfully
Test Case Result	Pass

Table 6.14: TC-14

Identifier	TC-15
Related requirements(s)	UC-3 Document no 2.4.19
Short description	Edit Workers

Pre-condition(s)	User must be Admin
Input data	name, cnic, email, phone password, address, area
Detailed steps	Go to the admin panel and click on the Workers. then click on the edit/delete workers. click on the edit workers. enter the details
Expected result(s)	Worker edited successfully
Post-condition(s)	N/A
Actual result(s)	Worker edited Successfully
Test Case Result	Pass

Table 6.15: TC-15

Identifier	TC-16
Related requirements(s)	UC-3 Document no 2.4.19
Short description	Delete Workers
Pre-condition(s)	User must be Admin
Input data	N/A
Detailed steps	Go to the admin panel and click on the Workers. then click on the edit/delete workers. click on the delete.
Expected result(s)	Worker deleted successfully
Post-condition(s)	N/A
Actual result(s)	Team deleted Successfully
Test Case Result	Pass

Table 6.16: TC-16

Identifier	TC-17
Related requirements(s)	UC-3 Document no 2.4.19
Short description	Delete Workers
Pre-condition(s)	User must be Admin
Input data	N/A
Detailed steps	Go to the admin panel and click on the Workers. then click on the edit/delete workers. click on the delete.
Expected result(s)	Worker deleted successfully
Post-condition(s)	N/A
Actual result(s)	Team deleted Successfully
Test Case Result	Pass

Table 6.16: TC-17

Identifier	TC-18
Related requirements(s)	UC-3 Document no 2.4.21
Short description	Complaints
Pre-condition(s)	User must be Admin

Input data	N/A
Detailed steps	Go to the admin panel and click on the Complaints. then click on the status button to change the status of that complaint
Expected result(s)	Status successfully changed
Post-condition(s)	N/A
Actual result(s)	Status successfully changed
Test Case Result	Pass

Table 6.17: TC-18

Identifier	TC-19
Related requirements(s)	UC-10 Document no 2.4.23
Short description	Search Record
Pre-condition(s)	User must be Admin
Input data	worker2
Detailed steps	Go to the admin panel and click on the Workers. then click on the edit/delete button. then click on the search button to search the record
Expected result(s)	Record fetched successfully
Post-condition(s)	N/A
Actual result(s)	Record fetched successfully
Test Case Result	Pass

Table 6.17: TC-19

Identifier	TC-20
Related requirements(s)	UC-11 Document no 2.4.24
Short description	Report
Pre-condition(s)	User must be Admin
Input data	N/A
Detailed steps	Go to the admin panel and click on the Report. then click on the edit/delete button. then click on the search button to search the record
Expected result(s)	Record fetched successfully
Post-condition(s)	N/A
Actual result(s)	Record fetched successfully
Test Case Result	Pass

Table 6.17: TC-20

4.2 Summary of Test Results

Module Name	Test cases run	Number of defects found	Number of defects corrected so far	Number of defects still need to be corrected

Module 1 (User Registration)	TC-1	1	0	1
Module 2(Polio Worker Registration)	TC-3	1	0	1
	...			
Complete System	TC-2, TC-3	2	0	2

Table 6.5: Summary of All Test Results

Chapter 5. Conclusion and Future Work

5.1 Project summary

DPVS is a complete Environment that provides various features like GPS tracking, generating QR codes, generating Reports etc. The main purpose of constructing the DPVS is to make a Polio Free Pakistan. This system consists of Two major Parts. First one is Web Application and Second one is Mobile Application. The system contains three different interfaces. First one is the Admin Panel and the second one is the User Panel and the third one is the Polio Worker Panel. Admin Panel contains a Dashboard which contains all the charts and the data related to the Polio situation in Pakistan. Using Admin Panel admin can create campaigns, edit campaigns and delete campaigns.

Admin can create a team, edit team and delete team. Admin can create a worker, edit the worker and can delete the current worker. Admin can see the complaints coming from users and give the response accordingly. Either he can change the status of that complaint or delete that complaint. Admin can generate QR code to get the Quick Response. Admin can add news for the user. Admin can generate Reports. In the user panel users can see the Active campaigns on the dashboard. He/She can register to volunteer, and can see the volunteer opportunities. Users can file the complaints if they are facing any Problem. Users can also see the upcoming events and other things in the News/Updates section. In the Polio worker panel the worker can view the teams that are working in their areas. Workers will also be able to update the vaccinated record in the system. Workers can see maps to trace the active cases. They can also get the number of cases using heatmap. Workers can generate the QR Codes for getting the quick response.

5.2 Problems faced and lessons learned

While testing our system we saw that the system is not functioning properly right now because of the missing requirements. We are working on it and we will make sure it will become a reliable and proper system so that it may work as intended.

5.3 Future work

Although we have tried to cover most functionalities that can solve the problems surrounding the current polio vaccination system. We believe this system is far from being perfect and has huge potential when paired with larger databases like NADRA and it can also be integrated with different AI algorithms for different functions such as predictions, data analytics, and data visualization.

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Appendix A Glossary

DPVS: Digital Polio Vaccination System

API : Application Programming Interface

UI: User Interface

UX: User Experience

Dashboard: A dashboard, in website administration, is typically the index page of the control panel for a website's content management system. ... A dashboard typically indicates items which require urgent actions at the top of the page, moving into less important statistics at the bottom.

Admin: Admin can manage the workspace for our DPVS. Admin can create Campaigns, Teams, Workers and he can also modify all of these. He can generate reports, QR Codes and can see the complaints filed by the user.

User: Users can be a general Public and can use the DPVS for getting news/updates, register to volunteer with the opportunities and can see active campaigns.

Polio Worker: Polio workers are the officials of our system. They can view their team on Map. Basically they will be going to vaccinate the children. They can see the map to trace the active cases in specific areas. They can also trace the most infected areas using Heatmap.

Heatmap: Heatmap is basically a customized map that can be used for some purposes like to display something or to convey information. In our DPVS Heatmap will tell you how many cases or tell the ratio of active cases in specific areas.

QR Code: Quick Response Code..

Volunteer: Volunteer means a person who wants to join the system without getting any pay. Only general users can register as a volunteer.

CNIC: Computerized National Identity Card.

GPS: Global Positioning System

Database : A database is an organized collection of data, generally stored and accessed electronically from a computer system

ERD: Entity Relationship Diagram.

CD: Class Diagram

FCCU: Forman Christian College University.

XML: Extensible Markup Language.

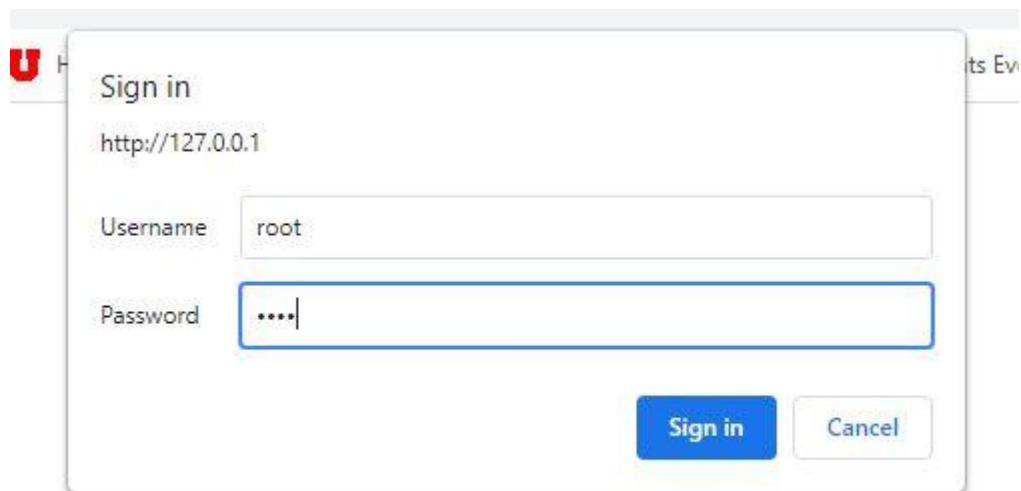
Immunized: Vaccinated.

Actor: Can be Admin, user or Polio Worker.

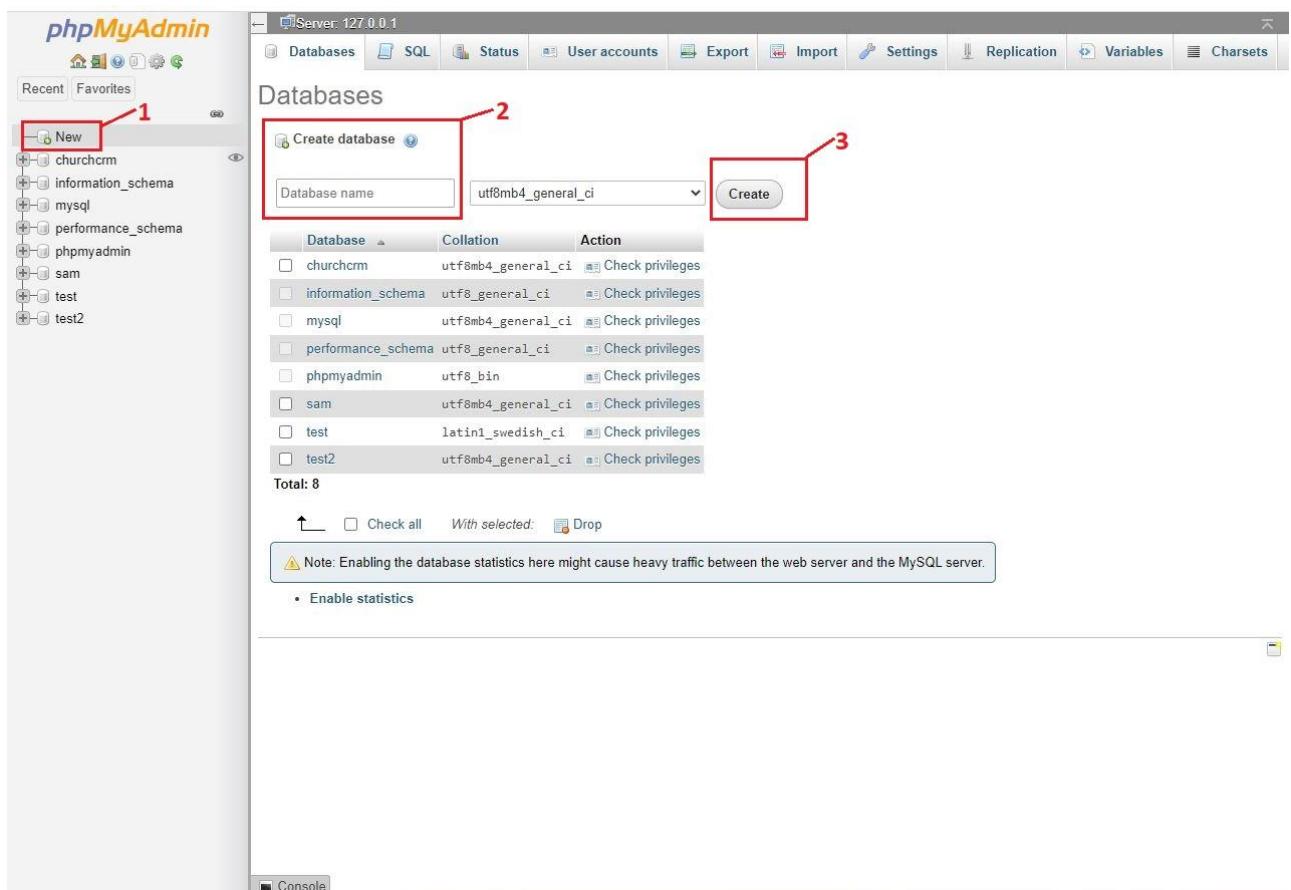
Appendix B Deployment/Installation Guide

Web Application (Cpanel):

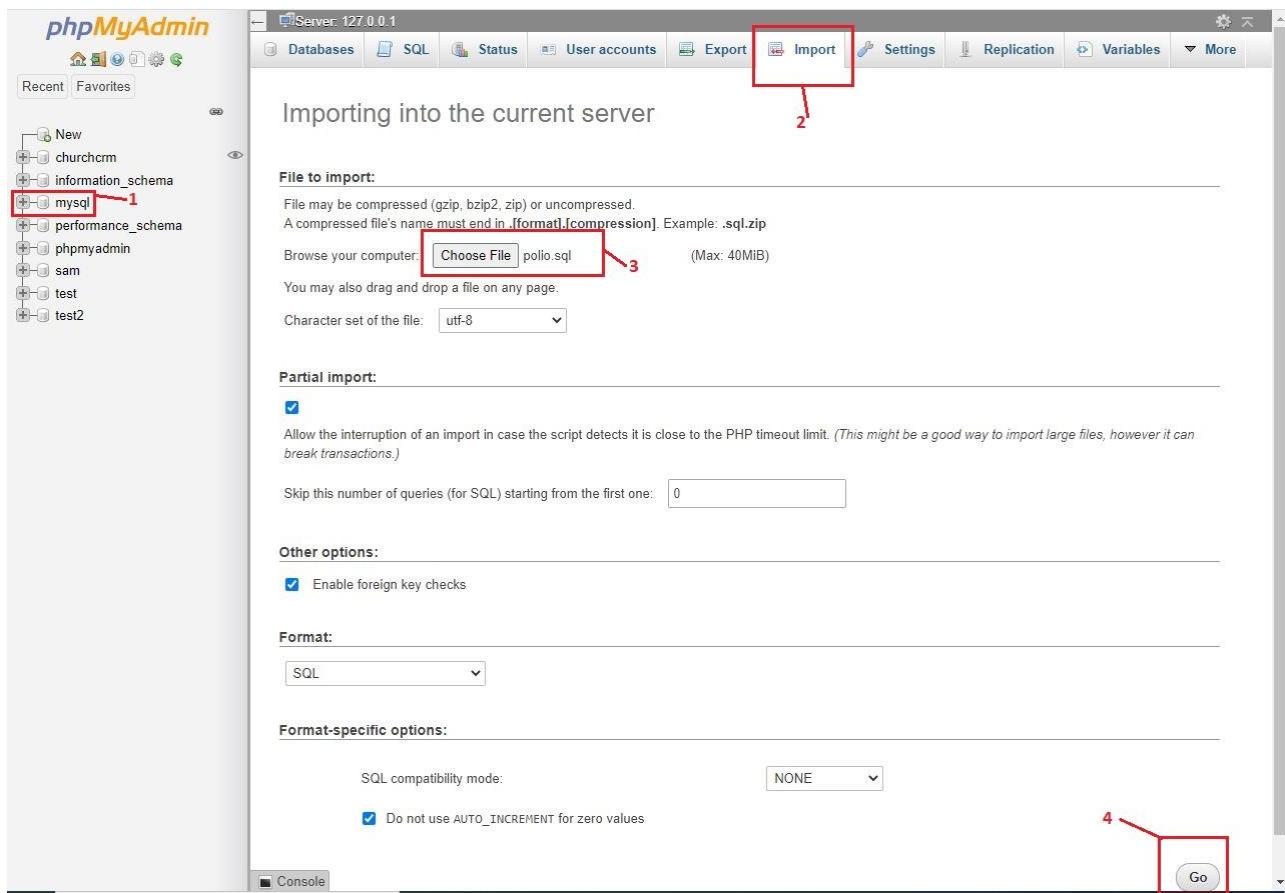
1. Go to your Cpanel; Login to your PHPmyAdmin



2. Create a new database; name it as FYP_DB or whatever you like



3. Select newly created database; click on the import tab; under the File to import section, click Browse and locate the file with the .sql extension you wish to import; click on the Go button.



4. Success! Database Imported

The screenshot shows the 'Query History' page of phpMyAdmin, indicating the import was successful. The database is 'polio'. The history shows the following queries:

```

-- MySQL returned an empty result set (i.e. zero rows). (Query took 0.0004 seconds)

-- phpMyAdmin SQL Dump -- version 5.0.2 -- https://www.phpmyadmin.net/ -- -- Host: 127.0.0.1 -- Generation Time: Jun 05, 2021 at 09:35
-- Server version: 10.4.13-MariaDB -- PHP Version: 7.4.8 SET_SQL_MODE = "NO_AUTO_VALUE_ON_ZERO"

START TRANSACTION
SET time_zone = "+00:00"

-- MySQL returned an empty result set (i.e. zero rows). (Query took 0.0005 seconds)
SET_time_zone = "+00:00"

-- MySQL returned an empty result set (i.e. zero rows). (Query took 0.0003 seconds)
/*140101 SET @OLD_CHARACTER_SET_CLIENT=@CHARACTER_SET_CLIENT */

-- MySQL returned an empty result set (i.e. zero rows). (Query took 0.0003 seconds)
/*140101 SET @OLD_CHARACTER_SET_RESULTS=@CHARACTER_SET_RESULTS */

-- MySQL returned an empty result set (i.e. zero rows). (Query took 0.0003 seconds)
/*140101 SET @OLD_COLLATION_CONNECTION=@COLLATION_CONNECTION */

-- MySQL returned an empty result set (i.e. zero rows). (Query took 0.0003 seconds)

```

5. Once the database is imported; place the server configuration file in your root directory and edit it with your database details.

A screenshot of a code editor showing a PHP configuration file. The file contains the following code:

```
1  $host="localhost";
2  $username="id16206983_root";
3  $password="jq8J-orRwGM=$25";
4
5
6
7
8
9  <?>
```

A red box highlights the database connection details (host, username, password). A red arrow points from the text "Add your database host, username, password" to this highlighted area.

6. Upload the fyp.zip package to your root directory, Unzip the package and then type domain/ip of your server in a new tab. YOU ARE LIVE NOW!
7. You can also deploy this application on the Cloud services like Digital Ocean for that you need to first install the LAMP stack on your server then you need to follow all of the above steps.

Mobile Application:

The data will be uploaded to the Firebase. We are using Firebase because it will show the Polio Teams on Map with the live location in real time. There is no need for PHP or Laravel Framework because every time when we need to perform some task usually it calls every single function or API that can slow down the server due to overload. But on the other hand we are going to use Firebase because when we perform some task it works perfectly without involving functions and modules. Also Firebase can fetch automatically if somewhere data is being changed. So data will automatically be fetched just by one single function. We are using some APIs (Application Programming Interface) to connect our Application to the databases. The medium that is going to be used for connection between Mobile App and Databases is called ANGULAR HTTP REQUEST MODULE. ANGULAR HTTP REQUEST MODULE will fetch the request from APIs and after compiling the data the Module will send the data to the database. ANGULAR HTTP REQUEST MODULE will get some response from the database and will give to the user accordingly. We used Json Programming Language to create a medium between Database and Mobile Application.

Appendix C User Manual

Introduction: DPVS user manual is a simple page-by-page/screen-by-screen manual that will help you navigate and use the application for intended use with little to no effort.

Home Page

- a. Admin Area (Button): Will take you to the admin login page from where you can log in with admin credentials.
- b. User Login (Button): Will take you to the user login page from where you can log in with user credentials.
- c. User Signup (Button): Will take you to the user signup page where you (the general public) can sign up.
- d. Forgot Password (Link): Will take you to a forgot password page where you can request a reset password link.
- e. Footer (Links): Will take you to FCCU Website, About Page, and XML Sitemap.

Admin Pages : Web Application

Admin Login Page

- a. Authentication Form: Will ask for your email address and password.
- b. Remember Me Check-Box: Will remember the session details and the session will not expire automatically.
- c. Sign-in Button: Will validate the form information; check the login credentials with the database. If login credentials are valid then takes to the admin dashboard otherwise gives an error and asks to provide correct login credentials.
- d. Footer (Links): Will take you to FCCU Website, About Page, and XML Sitemap.

User Login Page

- a. Authentication Form: Will ask for your email address and password.
- b. Remember Me Check-Box: Will remember the session details and the session will not expire automatically.
- c. Sign-in Button: Will validate the form information; check the login credentials with the database. If login credentials are valid then takes to the user dashboard otherwise gives an error and asks to provide correct login credentials.
- d. Footer (Links): Will take you to FCCU Website, About Page, and XML Sitemap.

User Signup Page

- a. Registration Form: Will ask for Full Name, CNIC, Email Address, and Password for registration.
- b. Signup Button: Will validate form information and register users by adding data to the database.
- c. Footer (Links): Will take you to FCCU Website, About Page, and XML Sitemap.

Admin Dashboard Page

- a. Header: Includes DPVS heading, admin account setting, and a logout button. From admin accounts settings admin details can be changed/updated and.
- b. Main Menu: Will provide easy navigation to all other pages on the website.
- c. Active Cases Graph: Will show the number of active cases with respect to time.
- d. Immunized Children Graph: Will show the number of immunized children with respect to time.
- e. Polio Workers Table: Will show the polio workers' information and will allow the admin to search data from the database.
- f. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

Create Campaigns Page

- a. Header: Includes DPVS heading, admin account setting, and a logout button. From admin accounts settings admin details can be changed/updated and.
- b. Main Menu: Will provide easy navigation to all other pages on the website.
- c. Create Campaign Form: Will ask for campaign information; validate the form info and create a campaign when the create button is clicked.
- d. Active Campaigns Table: Will show all the active campaigns and will provide the option search records of active campaigns.
- e. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

Edit/Delete Campaigns

- a. Header: Includes DPVS heading, admin account setting, and a logout button. From admin accounts settings admin details can be changed/updated and.
- b. Main Menu: Will provide easy navigation to all other pages on the website.
- c. Active Campaigns Table: Will show all active campaigns and will provide the functionality to edit/delete a campaign. Upon clicking the Edit button a dialogue box will popup from where one can change campaign details, Upon clicking the Delete button selected cam[aig will be deleted from the database.
- d. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

Create Team Page

- a. Header: Includes DPVS heading, admin account setting, and a logout button. From admin accounts settings admin details can be changed/updated and.
- b. Main Menu: Will provide easy navigation to all other pages on the website.
- c. Create Team Form: Will ask for information regarding the team; will validate and then add the information to the database upon clicking the Create button.
- d. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

Edit/Delete Teams Page

- a. Header: Includes DPVS heading, admin account setting, and a logout button. From admin accounts settings admin details can be changed/updated and.
- b. Main Menu: Will provide easy navigation to all other pages on the website.
- c. Active Teams: Will show all the active teams along with options to Add Members, View Members, Edit Team, and Delete Team.
- d. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

Create Worker

- a. Header: Includes DPVS heading, admin account setting, and a logout button. From admin accounts settings admin details can be changed/updated and.
- b. Main Menu: Will provide easy navigation to all other pages on the website.
- c. Create Worker Form: Will ask for worker information; validate the form and add the worker to the database upon clicking on the Create button.
- d. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

Edit/Delete Worker

- a. Header: Includes DPVS heading, admin account setting, and a logout button. From admin accounts settings admin details can be changed/updated and.
- b. Main Menu: Will provide easy navigation to all other pages on the website.
- c. Active Workers Table: Will show all the active workers along with the option to edit and delete workers.
- d. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

Add News Page

- a. Header: Includes DPVS heading, admin account setting, and a logout button. From admin accounts settings admin details can be changed/updated and.
- b. Main Menu: Will provide easy navigation to all other pages on the website.
- c. Add News Form: Will ask for news information; validate the form and post the news upon clicking the Add button.
- d. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

Edit/Delete News Page

- a. Header: Includes DPVS heading, admin account setting, and a logout button. From admin accounts settings admin details can be changed/updated and.
- b. Main Menu: Will provide easy navigation to all other pages on the website.
- c. News Table: Will show all the news from most recent to least recent; provides with the option to edit or delete news.
- d. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

Add Volunteer Opportunities Page

- a. Header: Includes DPVS heading, admin account setting, and a logout button. From admin accounts settings admin details can be changed/updated and.
- b. Main Menu: Will provide easy navigation to all other pages on the website.
- c. Add Volunteer Opportunity Form: Will ask for opportunity details; validate the form and add the opportunity upon clicking on the Add button.
- d. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

Edit/Delete Opportunities Page

- a. Header: Includes DPVS heading, admin account setting, and a logout button. From admin accounts settings admin details can be changed/updated and.
- b. Main Menu: Will provide easy navigation to all other pages on the website.
- c. All Opportunities Form: Will show all the volunteer opportunities along with options to see applicants, edit and delete opportunities.
- d. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

Complaints Page

- a. Header: Includes DPVS heading, admin account setting, and a logout button. From admin accounts settings admin details can be changed/updated and.
- b. Main Menu: Will provide easy navigation to all other pages on the website.

- c. Complaints Table: Will show all the complaints along with the option label/change status of the complaints.
- d. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

Reports Page

- a. Header: Includes DPVS heading, admin account setting, and a logout button. From admin accounts settings admin details can be changed/updated and.
- b. Main Menu: Will provide easy navigation to all other pages on the website.
- c. Generate Reports: You can generate a report with respect to time (7,14,30,60 days) by selecting days and then clicking on the Generate Report button.
- d. All Reports: You can see all the reports that were generated previously.
- e. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

Maps Page

- a. Header: Includes DPVS heading, admin account setting, and a logout button. From admin accounts settings admin details can be changed/updated and.
- b. Main Menu: Will provide easy navigation to all other pages on the website.
- c. Polio World Map: Will show an interactive polio map with various controls that can be used to visualize and understand different statistics.
- d. Polio Heatmap Pakistan: Will show a heatmap of active cases in Pakistan.
- e. Real-Time Worker Tracker: Will show the real-time location of all the workers/teams that are online and working.
- f. Polio Info: Polio infographic Pakistan 2021.
- g. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

QR Codes Page

- a. Header: Includes DPVS heading, admin account setting, and a logout button. From admin accounts settings admin details can be changed/updated and.
- b. Main Menu: Will provide easy navigation to all other pages on the website.
- c. QR Code Generator: Will generate QR Code for the selected campaign.
- d. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

User Pages : Web Application

User Panel Page

- a. Header: Includes DPVS heading, user account setting, and a logout button. From user accounts settings user details can be changed/updated and.
- b. Main Menu: Will provide easy navigation to all other pages on the website.
- c. Slider: Will show logos of associated organizations like Rotary International, Bill and Melinda Gates, End Polio Now etc.
- d. Accordion: Will show general information regarding poliovirus.
- e. Active Campaigns Table: Will show all the active campaigns and relevant information.
- f. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

File Complaint

- a. Header: Includes DPVS heading, user account setting, and a logout button. From user accounts settings user details can be changed/updated and.
- b. Main Menu: Will provide easy navigation to all other pages on the website.
- c. File Complaint Form: Will let you register a complaint by adding relevant information; validate the data and file the complaint upon clicking the File button.
- d. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

Complaint Status Page

- a. Header: Includes DPVS heading, user account setting, and a logout button. From user accounts settings user details can be changed/updated and.
- b. Main Menu: Will provide easy navigation to all other pages on the website.
- c. Complaint Status Table: Will show all the user complaints and their status.
- d. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

Active Campaigns Page

- a. Header: Includes DPVS heading, user account setting, and a logout button. From user accounts settings user details can be changed/updated and.
- b. Main Menu: Will provide easy navigation to all other pages on the website.
- c. Active Campaigns Table: Will show all the active campaigns along with a search bar to search records.
- d. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

Upcoming Campaigns Page

- a. Header: Includes DPVS heading, user account setting, and a logout button. From user accounts settings user details can be changed/updated and.
- b. Main Menu: Will provide easy navigation to all other pages on the website.
- c. Upcoming Campaigns Page: Will show all the upcoming campaigns along with a search bar to search records.
- d. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

Volunteer Opportunities Page

- a. Header: Includes DPVS heading, user account setting, and a logout button. From user accounts settings user details can be changed/updated and.

- b. Main Menu: Will provide easy navigation to all other pages on the website.
- c. Volunteer Opportunities Table: Will show all the available volunteer opportunities along with the option to apply.
- d. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

News/Updates Page

- a. Header: Includes DPVS heading, user account setting, and a logout button. From user accounts settings user details can be changed/updated and.
- b. Main Menu: Will provide easy navigation to all other pages on the website.
- c. News/Updates Table: Will show all the news and updates.
- d. Footer (Links+Copyright Label): Simple copyright label with links to FCCU Website, About Page, and XML Sitemap.

Mobile Application

Main Screen

- a. Worker Button: Will take you to the worker login page/screen.
- b. User Button: Will take to the user login page/screen.

Worker Login Screen

- a. Back Button: Will take you to the home/main screen.
- b. Login Form: Will ask for login credentials; validate the credentials and logs in workers upon clicking the Login button.
- c. Forgot Password Link: Will take you to the forgot password page from where you can reset your password.

Worker Dashboard Screen

- a. View Team: Will take you to the view team page where you can see your team information.
- b. Polio Map: Will take you to the Polio Map where you can see the heatmap.
- c. Household Record: Will take you to the household records page/screen where you can view records.
- d. QR Code: Will take you to the QR Code page from where you can create/view QR Codes for campaigns.

Heat Map Screen

- a. Heatmap: You can view the heat map and also zoom in/zoom out of the heatmap.

User Login Page

- a. Back Button: Will take you to the home/main screen.
- b. Login Form: Will ask for login credentials; validate the credentials and logs in workers upon clicking the Login button.
- c. Forgot Password Link: Will take you to the forgot password page from where you can reset your password.

User Signup Page

- a. Back Button: Will take you to the home/main screen.
- b. Signup Form: Will ask for registration details; validate the information and register the user upon clicking the Signup button.

User Dashboard

- a. Volunteer: Takes you to the volunteer opportunities screen from where you can view and apply for volunteer opportunities.
- b. Complaints and Suggestions: Takes you the complaints and suggestion screen from where you can file complaints/give suggestions and view your complaints/suggestions.
- c. Vaccination Campaigns: Takes you to the vaccination campaigns screen from where you can see active/upcoming campaigns.

Appendix D Student Information Sheet

Roll No	Name	Email Address (FC College)	Frequently Checked Email Address	Personal Cell Phone Number
21-10808	Namain Nazir	21- 10808@formanite.fccollege. edu.pk	21- 10808@formanite.fccoll ege.edu.pk	03062057 571
21-10460	Rabeet Ahmed	21- 10460@formanite.fccollege. edu.pk	21- 10460@formanite.fccoll ege.edu.pk	03481780 742
21-10756	Samuel Emmanuel	21- 10756@formanite.fccollege.e du.pk	21- 10756@formanite.fccoll ege.edu.pk	03244895 247

Appendix E Plagiarism Free Certificate

This is to certify that, I am Rabeet Ahmed S/D/o _____, group leader of FYP under registration no 21-10460 at Computer Science Department, Forman Christian College (A Chartered University), Lahore. I declare that my Final year project report is checked by my supervisor and the similarity index is _____ % that is less than 20%, an acceptable limit by HEC. Report is attached herewith as Appendix F. To the best of my knowledge and belief, the report contains no material previously published or written by another person except where due reference is made in the report itself.

Date: _____ Name of Group Leader: _____ Signature: _____

Name of Supervisor: _____ Co-Supervisor (if any): _____

Designation: _____ Designation: _____

Signature: _____ Signature: _____

Senior Project Management Committee Representative: _____

Signature: _____

Appendix F Plagiarism Report