# CHAPTER I

# INTRODUCTION

## Project Context

In the advent of an ongoing pandemic, several steps are made in the insurance of life preservation. The practice of preserving life comes in different ways, manners, and constraints, this may take range from the act controlling the population affected by the pandemic up to finding means through breakthroughs in science and/or information technology. In this context, the steps in preserving life during a pandemic can also pave more challenges and in the conduct of preservation. This might overwhelm the process, causing the negation of facts and circumstances that are considered but ill willingly attended.

The probability of more factors that might jeopardize the conduct of life preservation is always an inevitable state affair, likewise so; in the current outburst of the COVID-19 Pandemic, the discoveries and distribution of vaccines for Covid-19 have been implemented in different countries and of different governments. Breakthroughs in science have been the biggest factor in the success of implementing mass vaccination for COVID-19 Pandemic, in adjacency with this endeavor, governments have integrated the use of information systems in managing the distribution of COVID-19 vaccines.

In line with these steps in addressing the issue, the Local Government Unit of Sogod Southern Leyte has adapted and taken part in the mass vaccination of its populace. However, the implementation of the vaccination has raised the challenge of keeping the candidates controlled and the prevention of crowd fluctuation has not quite been observed. Thus, the proponents aim to address this problem by developing a web-based automated scheduling system for Covid-19 Vaccination.

## Purpose and Description of the Project

The creation of the project aims to have a systematic approach to the implementation of mass vaccination in Sogod Southern Leyte. Currently, the implementation of mass vaccination for Covid-19 in Sogod lacks effectiveness in the prevention and/or avoidance of crowd fluctuation in the vaccination site, Thus the purpose of the project is to address this issue by developing an automated scheduling for vaccination system.

This project will be a web-based application and will be developed using laravel 8 framework and will be used in scheduling for Covid-19 vaccination and will follow the rules of first come first serve principle and will consider the priority eligibility of vaccine aspirants in its scheduling process. In addition, the project will also utilize QR code scanning in validating; said aspirants upon scheduled vaccination date.

## Objectives of the Project

To design, develop and test a Web-based Automated Scheduling System for Covid-19 Vaccination for Sogod Southern Leyte. Specifically, it aims:

1. To prevent, mitigate the chances of crowd fluctuation in the conduct of mass vaccination in Sogod Southern Leyte vaccination site.
2. To determine the advantages of having a localized automated scheduling system in the town of Sogod, Southern Leyte.
3. To propose, develop and test a system that will cater the automated scheduling for COVID-19 Vaccination for Sogod Southern Leyte.

## Scope and Limitations of the Project

The proposed project can only be accessed by those who aspire to be to participate in the COVID-19 Mass Vaccination. The proposed project will be tested in the town of Sogod Southern Leyte for scheduling, archiving, and retrieval of a scheduled individual for vaccination. The project will be limited

to; being an online platform for scheduling aspiring COVID-19 Vaccine Recipients.

The following capabilities for the aspirant's side:

- Accept and validate Covid-19 Vaccination aspirant information.
- Avail and validate request for Covid-19 Vaccination Schedule.
- Automate or set and validate aspirant's vaccination schedule date.
- Set priority for scheduling for those that are under must-be prioritized persons.
- Determine priority eligibility of the aspirant.
- Generate Tracing number based on the aspirant's provided information and scheduled vaccination date.
- Generate corresponding QR Code based on the tracing number of the scheduled vaccination date of the aspirant.
- Allow the aspirant to search/check schedule using tracing number if forgotten.
- Save all information and/or data to the database.

The following capabilities for the authorized personnel's side:

- Set or open up for a Covid-19 Vaccination date.
- Allow or open up slots for vaccination.
- View or monitor vaccine stock for both first dose and second dose.
- Store and trace details regarding the vaccine recipient.
- Scan, validate QR Code of the aspirant upon scheduled date.
- Accept, validate schedule tracing number of the aspirant.
- Update data or information of an aspirant.
- Save all information to the database.

In addition, the project will be limited to the following conditions:

- The project will be a web-based automated scheduling system, and will only be effective and useful so long as internet connectivity is sufficient.
- The project will only monitor the vaccine availability. Thus it won't estimate the effectiveness of any brand of vaccine based on vaccine recipient status.
- Maintenance of the system will need developer's interaction.
- It can only be used by bona fide Sogodnons.

CHAPTER II

# REVIEW OF RELATED LIRERATURE

## Related Literature / Theoretical Background

Since the start of the pandemic, the conduct of finding means to mitigate further victims has been implemented, stricter community lockdowns have been established to avoid further COVID-19 Infections (DW.com, 2020). Along with this, the effort to ensure the minimum public health standards was observed to prevent the spread of the virus (doh.gov.ph, 2021). In the light of the event, the issuance of social distancing protocol lacks uniformity in enforcing social distancing rule in the Philippines (pna.gov.ph, 2020). Of all the possible reasons for infecting COVID-19, scientist say that the biggest risk of infecting the virus is from inhaling what someone else's exhaling, whether it's a tiny aerosol or a large droplet (Dana G Smith, 2020). This brings us to the urge of the people to be vaccinated, however this has caused for many individuals to arrive at any vaccination sites that leads to crowd fluctuation. Currently the implementation of COVID-19 Vaccination by the LGU of Sogod Southern Leyte is ongoing and is fruitful, however the manner in which its implemented doesn't provide means to prevent or minimize the populace arriving to the vaccination site thus resulting uncontrolled population density, high risk of COVID-19 infection. With this, the emphasis on prioritizing the observation of social distancing in implementing mass vaccination in Sogod Southern Leyte must be addressed.

Studies shows that, health care is a pivot is/are integral part of human lives. Any committed error made in health care services might lead to defect and/or termination of life (Akinode, et al 2017). The use of information and communication technology has been made extensively to improve the various operations and services in the field of health care (Akinode, et al 2017). Having said that, the utilization of having scheduling system has proven effective and vital to the smooth process of hospitals' service delivery (Kyambille &

Kalegele, 2015). Scheduling or appointment systems have been recommended for use in the health sector in order to improve the workflow and resulted in enhanced scheduling of patients based on their priorities (Kyambille & Kalegele, 2015). Also scheduling system can be an effective medium in managing the available vaccination doses, because Scheduling Systems have been a great help in the utilization in human resource or health care workers in health establishments (Hylton III & Sankaranarayanan, 2012). Also, scheduling system has paved the means for administrators and staff to conduct their designated task more efficiently and accurately (Akinode, et al 2017).

**Related Studies**

Back in 2019 in the country of Ethiopia, there was a proposal entitled Development of Automate text-message reminder system to improve uptake of child vaccination in Ethiopia, which was proposed by Zeleke Abebaw Mekonnenm, Fedlu Nurhussien Hussien, Binyam Tilahum, Kassahun Alemu Gelaye and Adane Mamuye. The objective of this proposal was to develop and test an automated mobile text message reminder system in the local context of Ethiopia. The automated system has been developed based on requirements. The automated system has been developed based on requirements. The text message reminder system has two components: 1. Web based application for client registration and automatic reminder scheduling; 2. SMS application for automatic SMS text messaging. In the pilot testing, all the text messages (100%) were dispatched from the automated system to the respective participants. Finally, the system has shown a notification that the text messages have been sent successfully.

On the other hand, in the year 2015. Cut Fiarnia, Arief Samuel Gunawanb, Rickyc, Herastia Maharanid, Heri Kurniawan proposed an Automated Scheduling System for Thesis and Project Presentation Using Forward Chaining Method with Dynamic Allocation Resources. This study is

recommendation system that is developed as a web-based program using PHP. This proposed system consists of several modules. The first module is document management, which is checked for all required documents of each presentation session. Project and Thesis scheduling system contains the recapitulation of presentation session documents. Next module is data input module, which stores all of the data for the constraint parameters in rational database. The other module is the schedule recommendation. Lastly, the report module, which would print the final schedule.

In the study of, The Development of text-messaging intervention to improve treatment adherence and post-treatment review of children with uncompleted malaria in western Kenya. Which was proposed by, Sophie Githinji, Caroline Jones, Josephine Malinga, Robert W. Snow, Ambrose Talisuna and Dejan Zurovac. The study was initialized to address the low adherence of patients' to artemisinin-based combination therapy which has been reported in areas of Kenya bordering the Lake Victoria region. This study also concluded that, text message interventions should be carefully developed, tested and refined before implementation to ensure they are written in the most appropriate way for their target population. SMS distribution systems should be rigorously tested to ensure efficient delivery of the messages before they are deployed.

CHAPTER III

# TECHNICAL BACKGROUND

## Technicality of the Project

This system will be a web-based application for automated scheduling. This structure has proven to effective in administering appointment management. This has also paved the means for an effective transaction and resources management. Which has been used several in healthcare establishments in conducting day to day task. And it would be prudent to have a web-based application to handle scheduling appointment needs because unlike scheduling system made locally for certain devices, updates can take large memory consumption, maintenance can get taxing because each devices has their own specifications. Likewise, it will be an advantage to having system that only demands for internet connectivity but transcends to any platform that has browser access, regardless of the device type.

## Details of the Technologies to be used

The project is a web-based application, in order for this project to reach realization several technologies, packages, framework will be used:

- Laravel version 8 – a PHP framework for web development
- PHP – a web development programming language
- Bootstrap – a web development front - end designing framework
- AJAX – a synchronized JavaScript and XML
- jQuery – a JavaScript library or framework.
- CSS & SCSS – a web development designing tool.
- Google Charts – for the data analysis visualization.
- MySQL Database – will be used in storing and archiving data.

In addition, the system will be programmatically structured with RESTful API. In the accomplishment of the project, essential packages, framework and libraries will be installed tested in order to support the suitable needs in automation of schedules for COVID – 19 vaccine recipients.

**How the project will work.**

Figure 1 shows the big picture of the project. The proposed project will have the capabilities to accept inputs and request from two main users and/or sides; (1) Aspirant's side and (2) Admin Side or the authorized personnel. The (1) Aspirant's side will accept and process requests from those who'd want to get vaccinated, this side of the system will validate request(s) from the aspirants. On the other hand, the (2) admin side, will be accept and process inputs and changes made by admin or the authorized person.

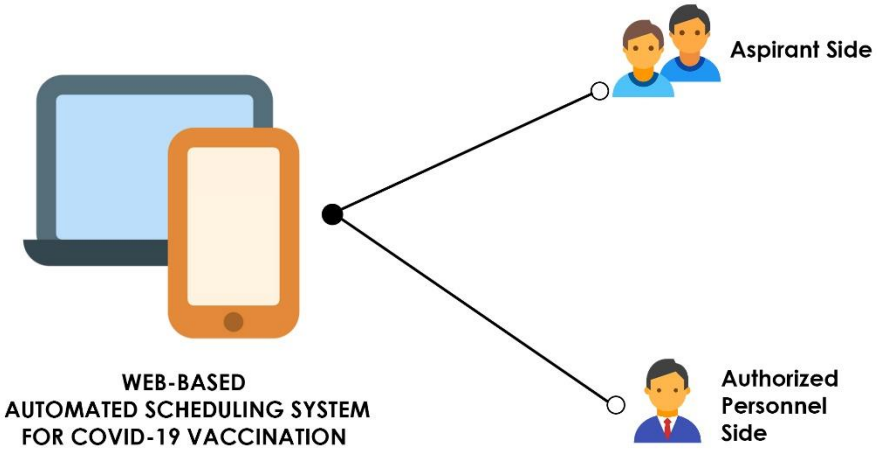



Figure 1. The Big Picture of the Project.

Figure 2 shows the general description for the Aspirant side of the project. The project will be able to accept, handle, validate and store inputs from

the Covid-19 vaccination aspirant. The project will work as follows, [1-2] The project will allow access to the aspiring vaccine recipient using any preferred device (desktop, mobile phone, tablets, etc.). [3] After accessing the web-based application, the aspirant can opt to either avail for a reservation slot for COVID - 19 Vaccination or view his/her scheduled vaccination date if already availed. If the aspirant opted to avail, [4.1] the aspirant must provide his/her full name, address, contact information, valid ID(s), age, comorbidities; if any, to a registering portal, the scheduling of aspirant will be determined once the respond from the admin side will be initiated. [5.1] The data provided by the aspirant will be processed and will be saved to the database along with a generated tracking number and/or QR Code which will be used upon the day of vaccination. [6] If all constraints are met, the data concerning the aspirant will be prompted by the web-based application. On the other hand, if the aspirant opted to proceed to knowing his/her reserved schedule in the [3] Registration/Validation stage, the aspirant will be re-routed to inputting his/her generated tracing code, which then will be used in the [4.2] checking of tracing number, and if all constraints are met, [5.1] the system will request and fetch the scheduled date concerning the aspirant from the database, which will be displayed in a schedule list view. [6] this will also be sent as prompt for the aspirant with in the website.

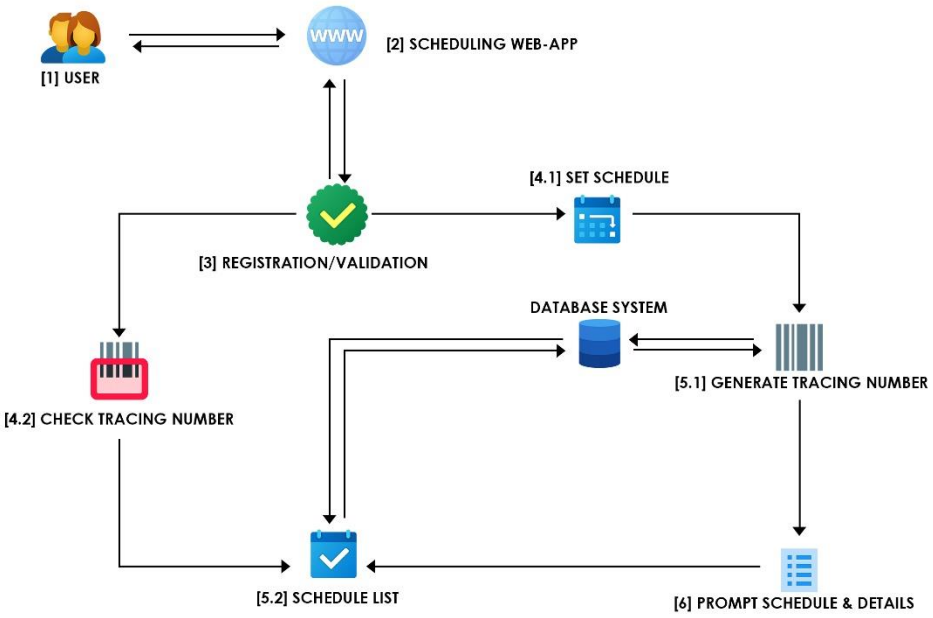



Figure 2. General Description for the Aspirant's Side

Figure 3 show the general description for the authorized personnel's side of the project, this side of the project, deals with the actions that must be made by an authorized personnel within the scope of validating the request sent from the aspirant's side. This side of the project works as follows, [1-2] the project will enable access for the authorized personnel using any preferred device and/or platform (desktop, mobile phone, tablets etc.). Once the authorized personnel have accessed the scheduling web-application, the authorized personnel will be able to do several task, [3] the authorized personnel can opt to decide how many slots can be opened for vaccination either basing from the number of available Covid-19 vaccine or based on a targeted quota. The project can also [4] generate charts based on the vaccination based on record. The authorized personnel can [5] deny or grant the request made by the aspirant from the aspirant side of the system. This will also prompt the authorized personnel to [6] determine and set priority of eligibility (Priority Eligible A, B and C) of the aspirant which then will be the bases for the [7]

schedule list. In the course or during the actual day of vaccination, to make the confirmation that the person entitled to a schedule is present, the integration of [8] QR Code scanning is implemented to hasten things and prevent possible delays or to simple input the aspirant's tracing number. And if the need should arise, the authorized personnel can also view [9] the list of vaccinated individuals, here the authorized personnel can check the details regarding a person's vaccination details as well as the data analysis result regarding the percentage of vaccinated individuals over the total population per category or eligibility. Lastly, all actions data and/or information will be stored to the [10] database system.

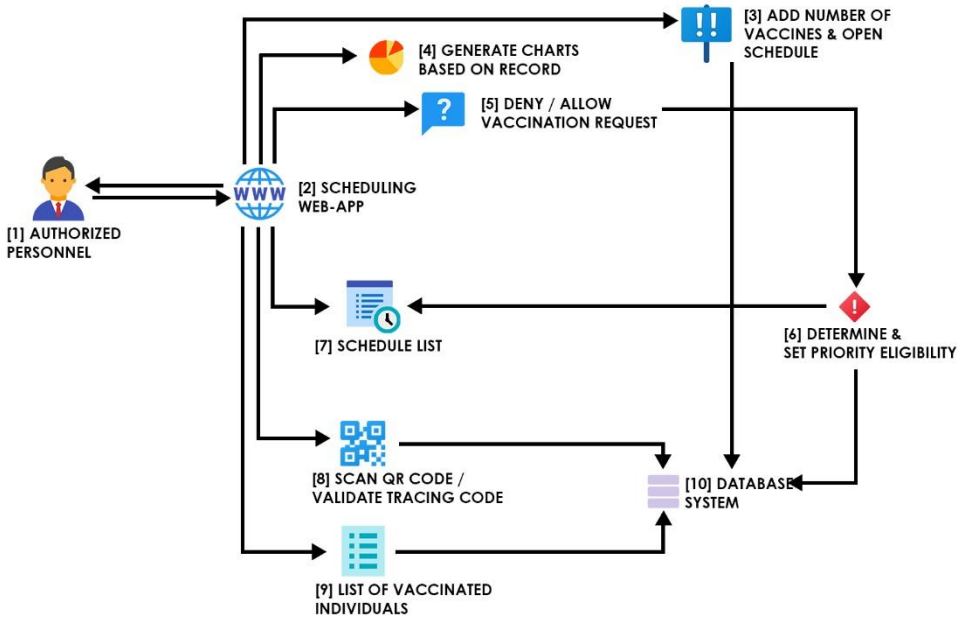



Figure 3. The General Description for the Authorized Personnel.

CHAPTER IV

# Methodology

## Environment

### *Locale*

The proposed project was conducted only in Sogod, Southern Leyte and will only serve in the town of Sogod. Sogod is located along the Southern Leyte section of the Pan-Philippine Highway, 126 kilometers (78 miles) south of Tacloban City, the regional center of Eastern Visayas.

### *Population of the Study*

The population of the study is mainly bona fide residents of Sogod Southern Leyte and those that within the age that are allowed to partake in Vaccination for COVID-19 and also the health workers and staff of the Rural Health Unit of Sogod. Hence, the population of Sogod are the prime data samples.

### *Organizational Chart/Profile*

The figure below shows the system's organizational chart; it depicts the system's backbone in demonstrating its function from an overall standpoint. It illustrates how the system is curated to meet the required facts in handling the process of creating the system as well as its functionalities, limits, capabilities.

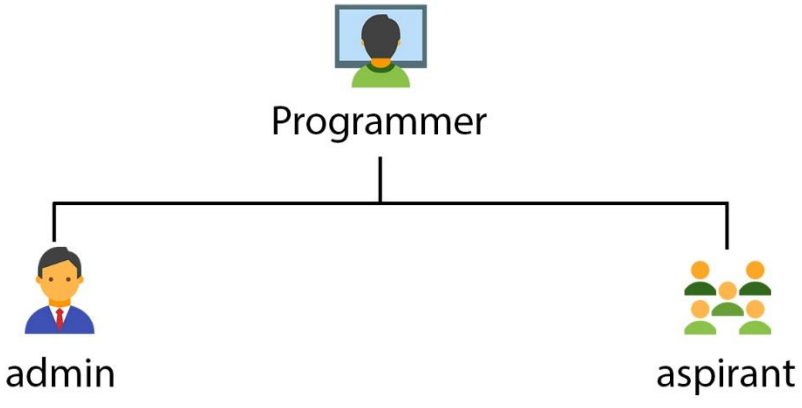


Figure 4. Organizational Chart

## Requirement Specifications

### *Operational Feasibility*

*Fishbone Diagram*

The system's fishbone diagram shows what are the factors that were deemed contributing to the bigger problem that the study is aiming to address. The following facts are stated in each branch with its corresponding sub-contributory factors that leads to the bigger problem.

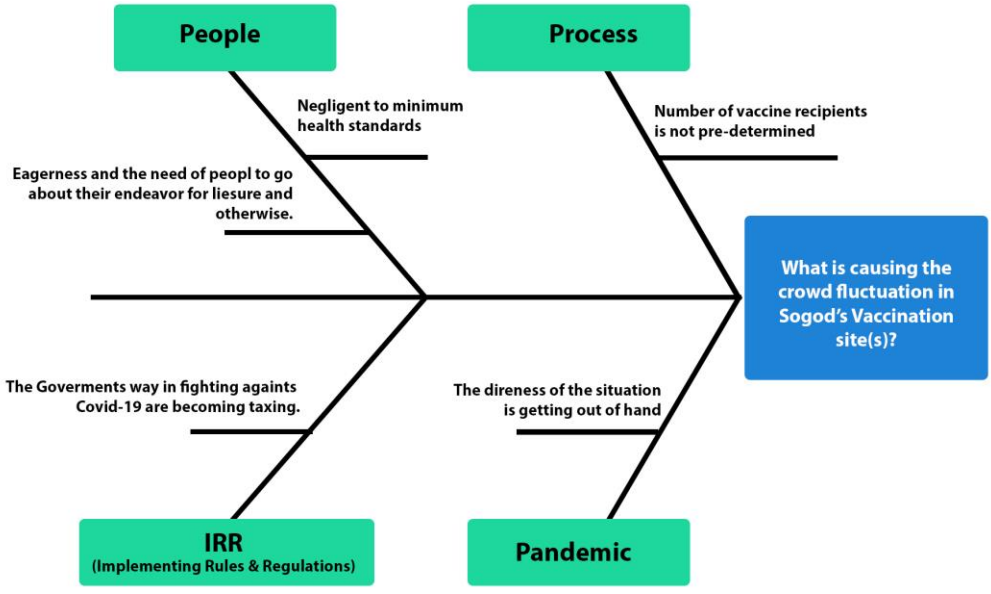



Figure 5. Fishbone Diagram

*Functional Decomposition Diagram*

The diagram bellow shows the functional decomposition diagram. Here the researchers categorized the features and functionality of each side of the scheduling system; the admin side and the aspirant's side. Each features plays

and important role in achieving the overall aim of the project and is deemed important in order to achieve the said goal and purpose of the study.

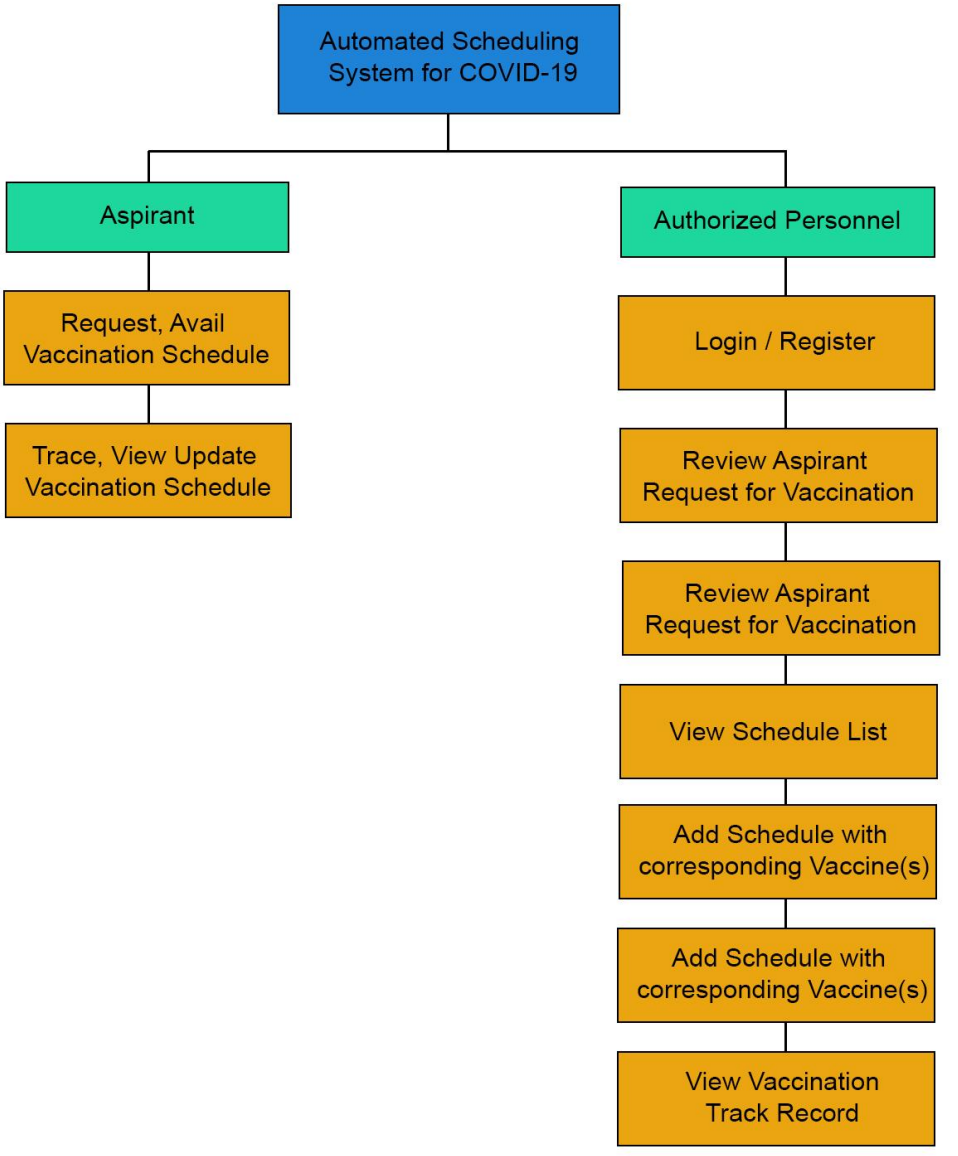



Figure 6. Functional Decomposition Diagram

***Technical Feasibility***

*Compatibility Checking*

The diagram below shows the compatibility checking of the project. The project's web/application server is based on Laravel 8, which uses PHP as its programming language. The project also utilizes Boostrap, CSS, SCSS, jQuery for its front end designing. Also, the system generates tracing number based on the aspirant's details. With this, the project can also function with the following operating systems Android, Windows, Mac, Linux iOS. The system is also compatible with the following browsers, Google, Microsoft Edge, Opera Mini and lastly, Mozilla Firefox. The system can also function with devices such as Smart Phone, PCs but as far as working is concerned, it works best using PC. Lastly, the system uses MySQL database.

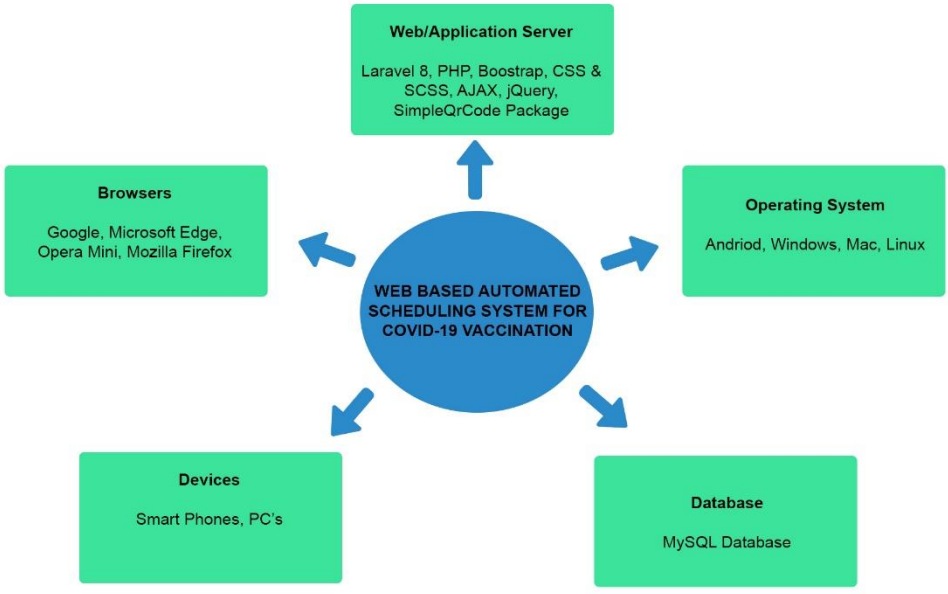



Figure 7. Compatibility Checking

*Relevance of the Technologies*

The technologies that researchers utilized in the creation of the project contributed to have seamless system. The technologies incorporated have paved means in order for the system to generate reports that the system is intended to

generate. In addition, the technologies also enabled the system to organize and validate data from the database.

***Schedule Feasibility***

*Gantt Chart*

The following chart lists out the dates that the researchers finished their task. The chart lists what took place and what moment. In addition, it also demonstrates the dates how each task required to finished its implementation.

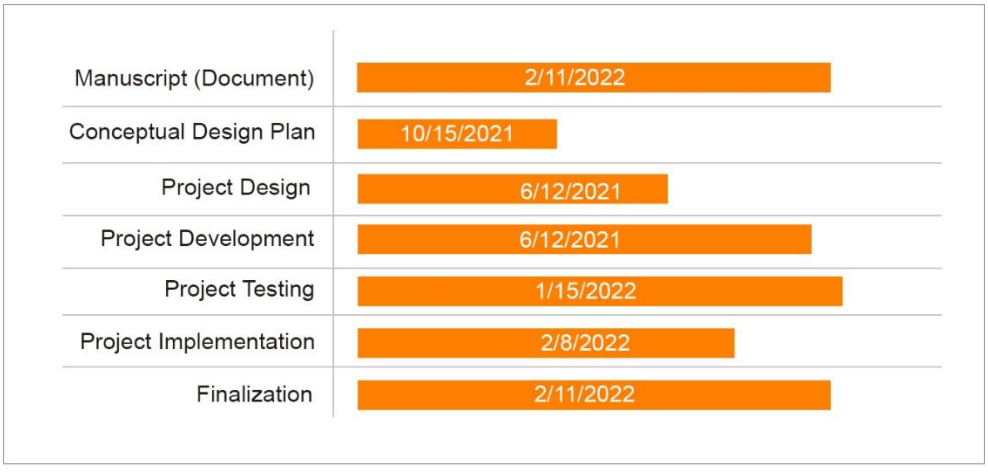



Figure 8 Gantt Chart

***Economic Feasibility***

*Cost and Benefit Analysis*

The table below shows the Cost and Benefit Analysis of the project. The table lists out the essential matters that he proponents needs in order to the accomplish the project. The table shows the internet expense has accumulated most of the expenses because the proponents need to access the internet whilst working on the project.

Table 1. Cost and Benefit Analysis

| Benefit | Cost |
|---|---|
| **Internet** | 2,000.00 PHP |
| **Paper and Photocopy** | 1,000.00 PHP |
| **Transportation** | 500.00 PHP |

| | |
|---|---|
| **Miscellaneous** | 500.00 PHP |
| **Total** | 4,000.00 PHP |

*Cost Recovery Scheme*

The table below shows the Cost and Recovery Scheme of the project. The table shows the division of the expenses in each month as the proponent's finishes the project. The also shows that the expenses for each month grows increasingly because the project requires excessive expenses as it reach its pinnacle.

Table 2. Cost Recovery Scheme

| Expenses | Aug | Sept | Oct | Nov | Dec |
|---|---|---|---|---|---|
| **Internet Expenses** | 400 | 400 | 400 | 400 | 400 |
| **Paper and Photocopy** | 200 | 0 | 0 | 300 | 500 |
| **Transportation** | 100 | 100 | 100 | 100 | 100 |
| **Miscellaneous** | 100 | 100 | 100 | 100 | 100 |
| **Total** | 800 | 600 | 600 | 900 | 1,100 |

***Requirements Modelling***

*Inputs*

The following are the required inputs for aspirant's side of the project:

- Aspirant must enter personal data upon requesting of schedule for vaccination.
- Aspirant can only select vaccination schedule that are available at the time.
- Aspirant must agree to have his/her personal information be collected by the website.
- In tracing his/her information and/or vaccination request details, the aspirant must enter his/her tracing number.

The following are the required input for the authorized personnel's side of the project:

- The authorized personnel must first register for an account using his/her credentials upon first time interaction of the website.
- The authorized personnel must always login using his/her registered credentials, if not register first to the website.
- When setting up a vaccination schedule, the authorized personnel must enter the Vaccine Type, Manufacturer, Number of Vaccines, the Number of Shots for that vaccine, Type of Dosage, Vaccination Date, details of the vaccination venue.
- During validation of the vaccination request from the aspirants, the authorized personnel must grant or deny the aspirant request for vaccination, if the authorized personnel will grant the vaccination request, the authorized personnel must select the eligibility of the aspirant based on the aspirant details and/or information.
- If the aspirant's request has been granted. The authorized personnel can now verify the aspirant upon vaccination date using the aspirants tracing number.
- Upon verifying the aspirant(s) during any scheduled vaccination date. The authorized personnel must enter the aspirant's tracing number then the authorized personnel must verify that the aspirant has "Arrived for Vaccination", "Been Vaccinated", or "Got Rejected".

*Processes*

The following are the processes for the Aspirant's side of the project:

- Upon requesting for COVID-19 Vaccination the Automated Scheduling System for Covid-19 Vaccination must generate a tracing number for each of the aspirant.

- The Automated Scheduling System for Covid-19 must update the aspirant's request and vaccination details on real-time.
- The Automated Scheduling System for Covid-19 must always check for availability of Vaccination Schedule.
- In the event that the aspirant checks for update regarding his/her vaccination request and/or details. The Automated Scheduling System must fetch and display the intended aspirant's details based on provided tracing number.

The following are the processes for the Authorized Personnel's side of the project:

- The Automated Scheduling System must validate the Authorized Personnel's Login credentials.
- Upon adding the details for Vaccination Schedule the inputs from the Authorized Personnel must be validated by The Automated Scheduling System.
- Whenever an authorized personnel will grant or deny an aspirant request for vaccination, the Automated Scheduling System must update the aspirant details.
- The Automated Scheduling System must analyze the data regarding the vaccination record in order to generated visual presentation.
- Whenever an authorized personnel will verify an aspirant during the scheduled vaccination date, the Automated Scheduling System must update aspirant vaccination status to "Arrived for Vaccination", or "Been Vaccinated", or "Got Rejected".
- The Automated Scheduling System must have data segregation for further data analysis and representation.

*Outputs*

The following are the processes for the Aspirant's side of the project:

- The Automated Scheduling System must validate and display the information provided by the aspirant.
- The Automated Scheduling System must generate and display the tracing number that corresponds to the aspirant.
- The Automated Scheduling System must provide an updated information regarding an aspirant's vaccination request and vaccination status.

The following are the processes for the Authorized Personnel's side of the project:

- The Automated Scheduling System must generate and display graphs based on the latest updates regarding vaccination track record, the aspirant gender, the number of vaccinated individuals per eligibility, and the number of vaccines.
- Generate data table summary based on the recorded schedule of vaccinations, vaccinated individuals, pending aspirant request for vaccination.
- Display a detailed report on each of aspirant's detail, this will include the aspirant's vaccination request details and the aspirant's vaccination record details.

*Performance*

The following are the performance list which applies for both aspirants and authorized personnel's side of the project.

- The Automated Scheduling System must support multiple login and interaction for both aspirants and authorized personals.
- The response time of the Automated Scheduling System must not take long.

- The Automated Scheduling System must generate graphs abruptly.
- The Automated Scheduling System must support access simultaneously for both aspirants and authorized personals.

*Controls*

The following are the controls list which applies for both aspirant's and authorized personnel's side of the project.

- An aspirant's vaccination request can only be granted or denied by an authorized personnel.
- An aspirant's can only be verified during an scheduled vaccination date by an authorized personnel using the aspirant's tracing number.
- Scheduled Vaccination can only be canceled, updated added by an Authorized Personnel.

*Data and Process Modelling*

The diagram below shows the overall context of the project. The diagram depicts what are the essential reports, capabilities and/or functions for the aspirants and for the authorized personnel side of the project.

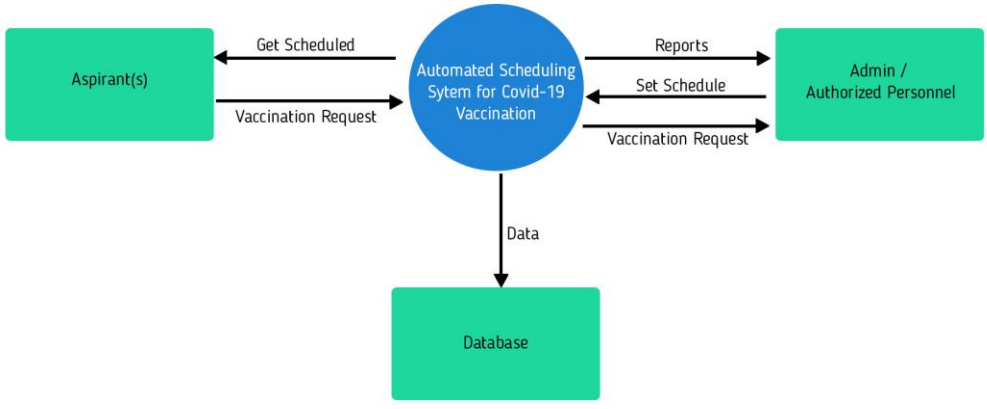



Figure 9. Context Diagram

The following diagrams shows the data flow for each side of the project. Each diagram depicts how data flows for the aspirant's side of the project and also, how data flows for the authorized personnel side of the project. In addition, the diagrams also show the general reports that each side of the project generates and displays.

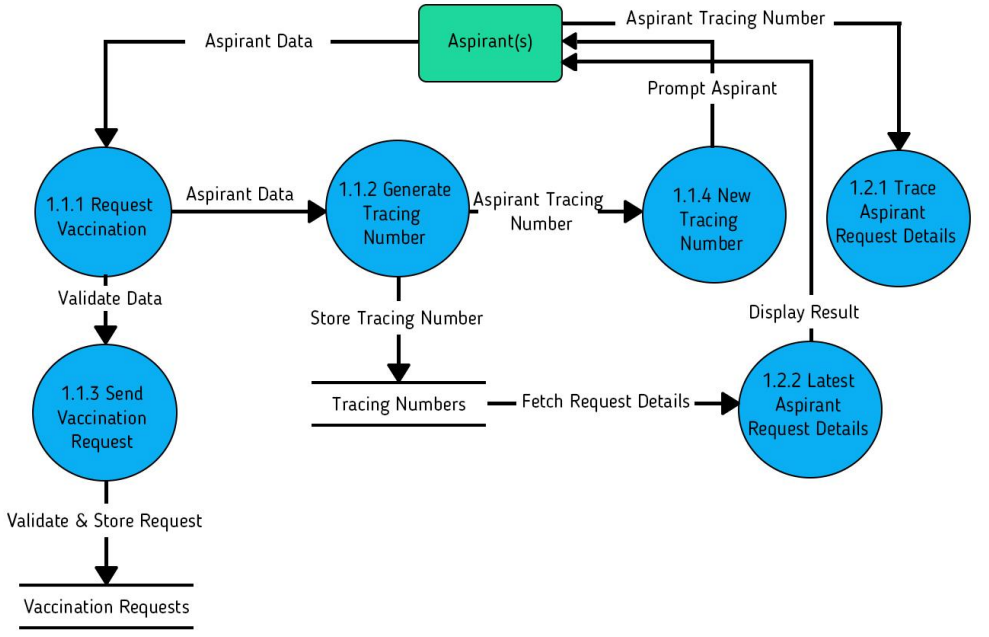



Figure 10. Data Flow Diagram for The Aspirant's Side.

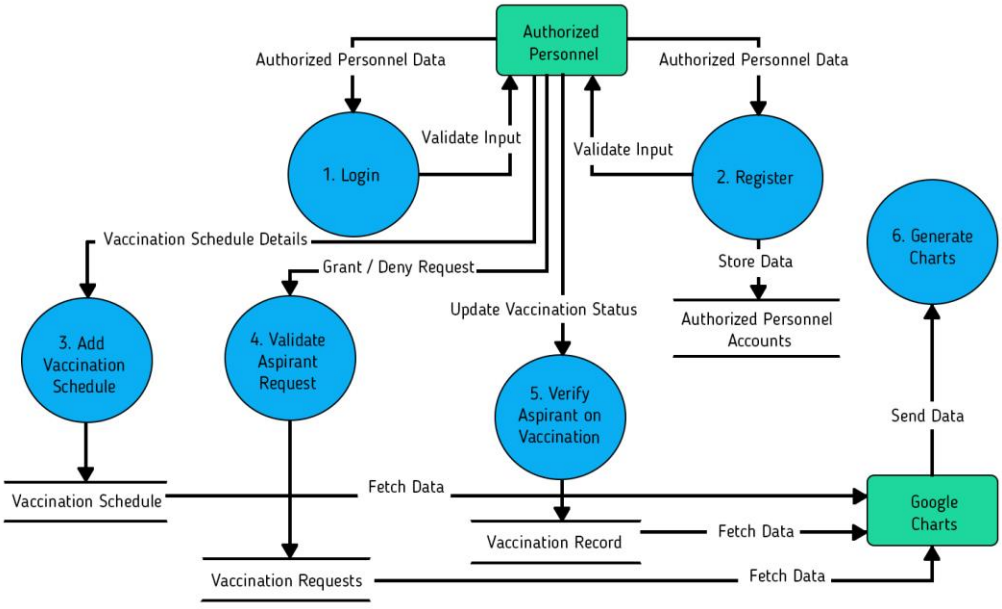



Figure 11. Data Flow Diagram for The Authorized Personnel Side

The diagram below shows the overall concept of how the system handles inputs and displays reports. The diagram shows what are the condition that the system considers in each task and/or functionalities for both the Aspirants side and for the Authorized Side.

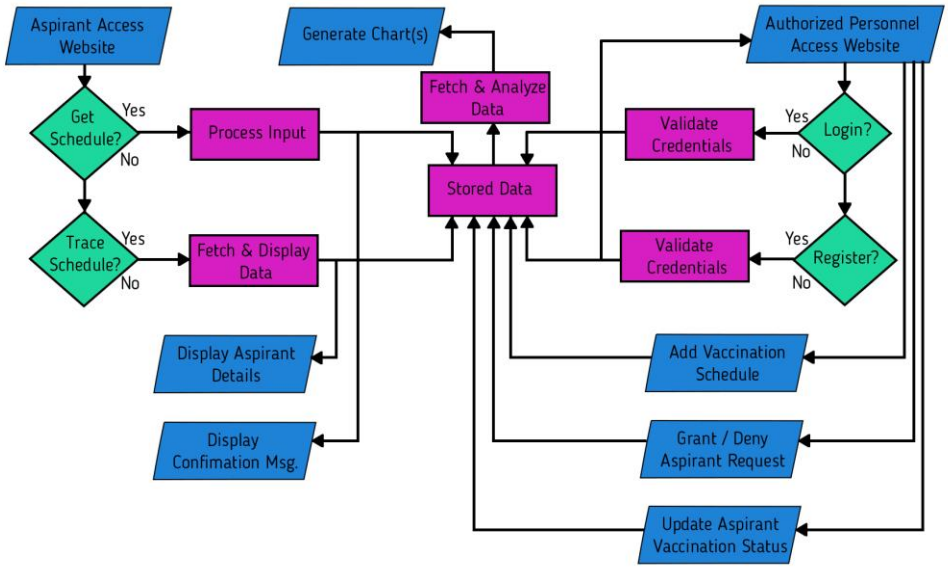



Figure 12. System Flow Chart

The following diagrams depicts that Program Flow Chart for the Aspirant's side and for the Authorized Personnel side of the project. The diagram shows the highlights of how the project deals with inputs and displays reports that are essential for the accomplishment of the project.

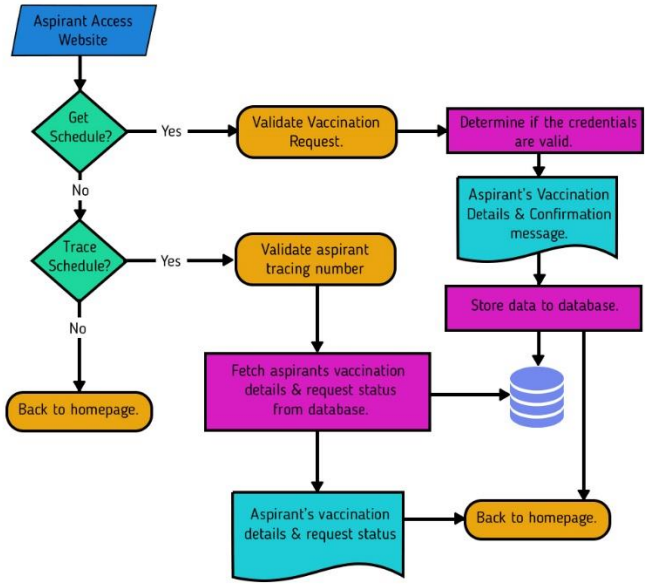



Figure 13. Program Flow Chart for The Aspirant Side

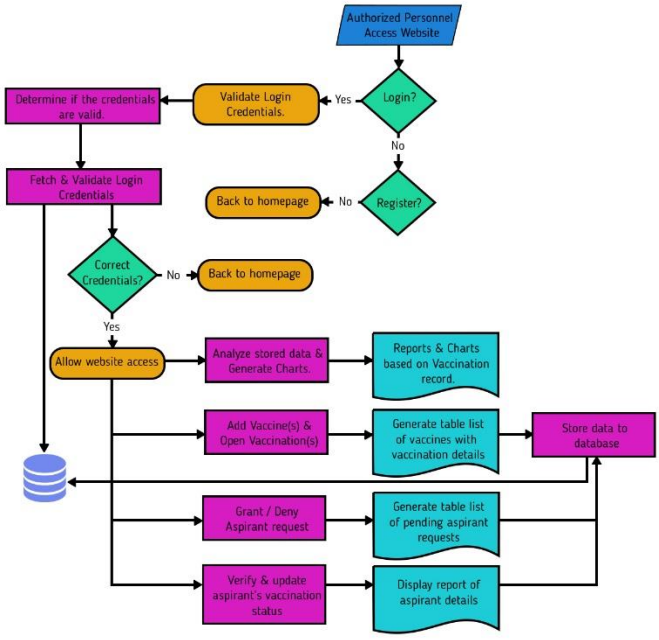



Figure 14. Program Flow Chart for The Authorized Personnel Side

The following table is the Risk Assessment/Analysis of the project. The table also represents the risk analysis that the researchers intends to follow in order for the project to function as intended. The table also holds the possible hindrances that the system will encounter upon project implementation and project deployment. The preventive measures that the researchers will follow will be determined using the table below.

Table 3. Risk Assessment/Analysis

| Threat | Vulnerability | Asset | Impact | Likelihood | Risk | Control Recommendation |
|---|---|---|---|---|---|---|
| **System Failure** High | Sudden internet connection loss High | Servers Low | All services will be unable Critical | Medium | High Data will not be stored | Choose a will trusted cloud service provider |
| **Power interruption** Medium | Server firewall will be breached Low | Servers Low | Data loss Critical | Medium | Low Data will not be stored | No actions. |

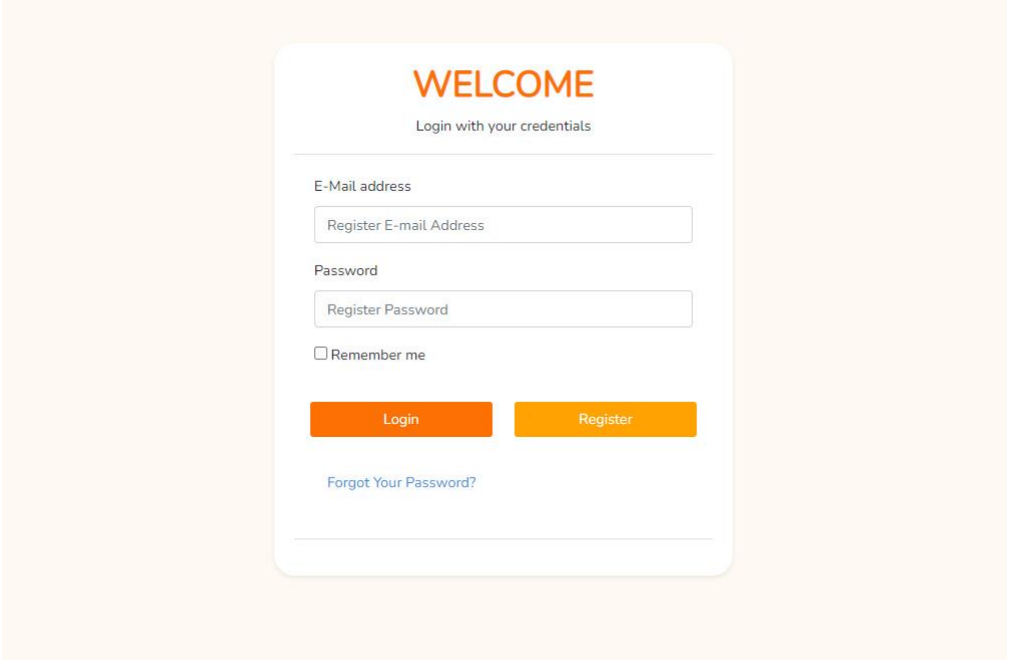
| | | | | | | |
|---|---|---|---|---|---|---|
| **Malicious Human Interference (DDOS Attack) High** | Cloud server provider has Good Firewall Low | Website Critical | Process will be compromised Critical | Low | Low Services and Data breached | No actions. |
| **Accidental Human Interference – Data Deletion** | Permissions and prompts is configured properly. Medium | Website, data on share. Critical | Services and functionalities will not be implemented properly. | Medium | Medium | Permissions and confirmations should be properly developed. |

## Design

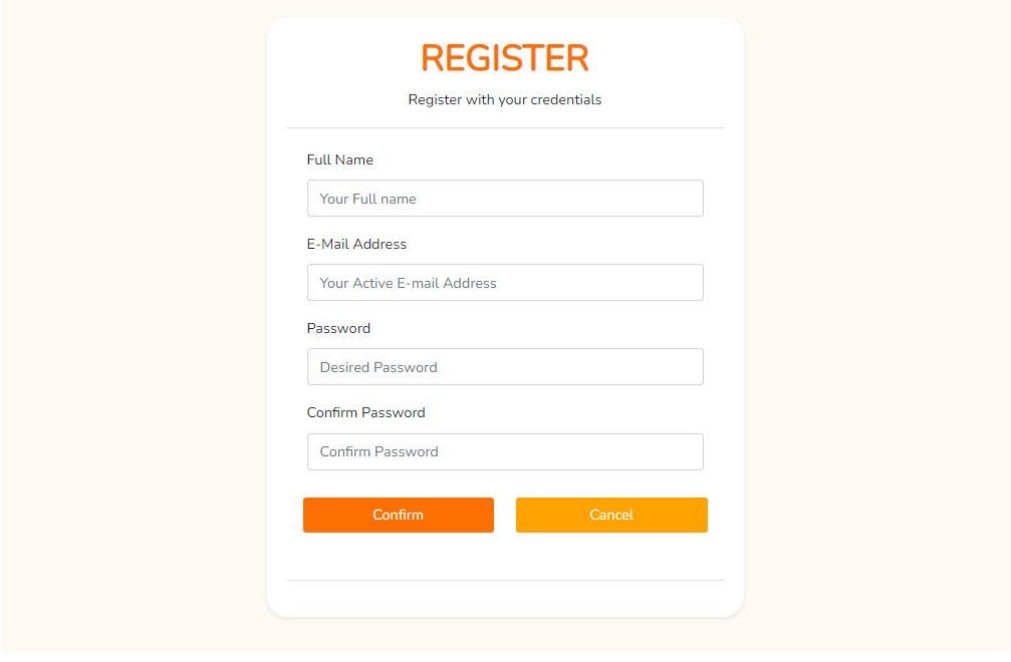
### *Output and User-Interface Design*

*Forms*

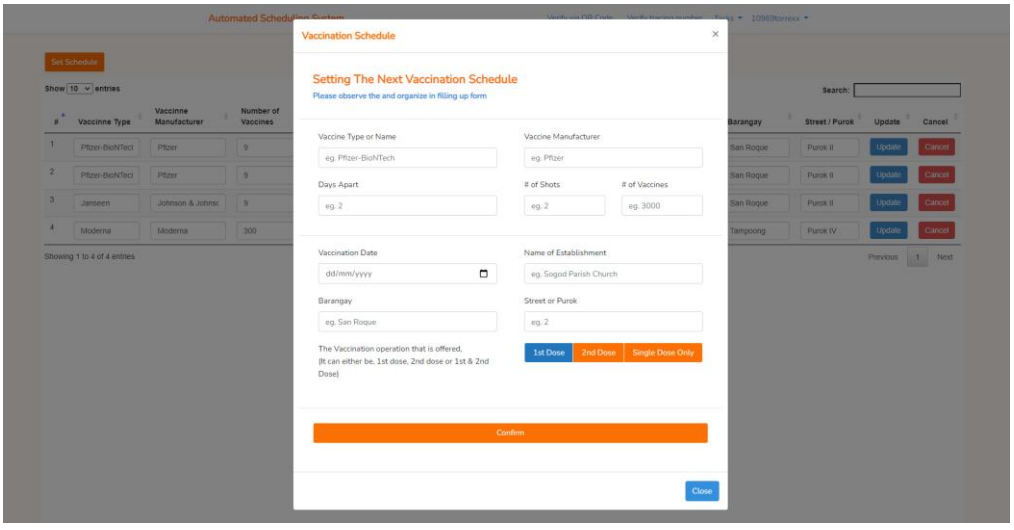
The following images that the system utilizes in order to gather and required input from both sides of the project, the Aspirant's side and the Authorized Personnel side of the project. The forms also show what are the required input in order for it to do its task, thus it shows what are the intended inputs from both sides of the project to produce reports and outputs.



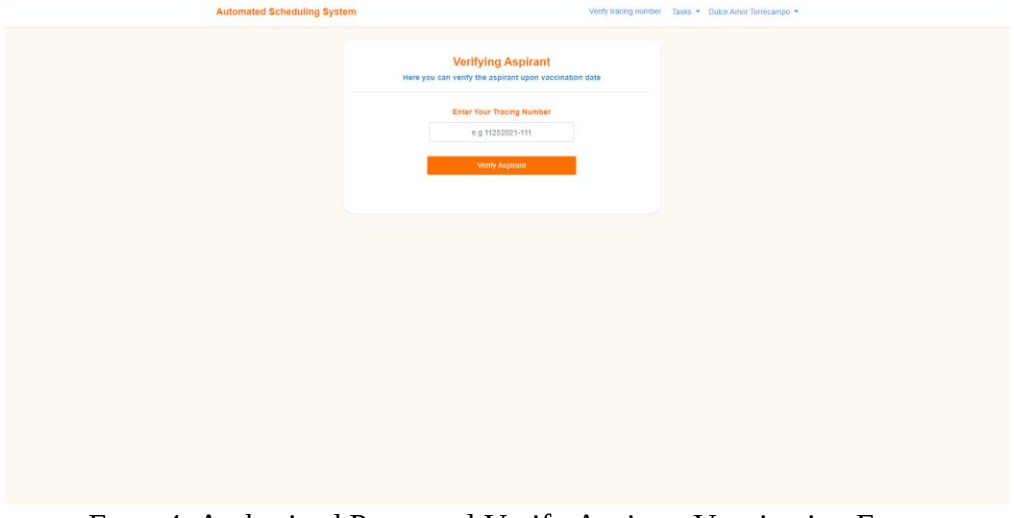

Form 1. Authorized Personnel Login Form



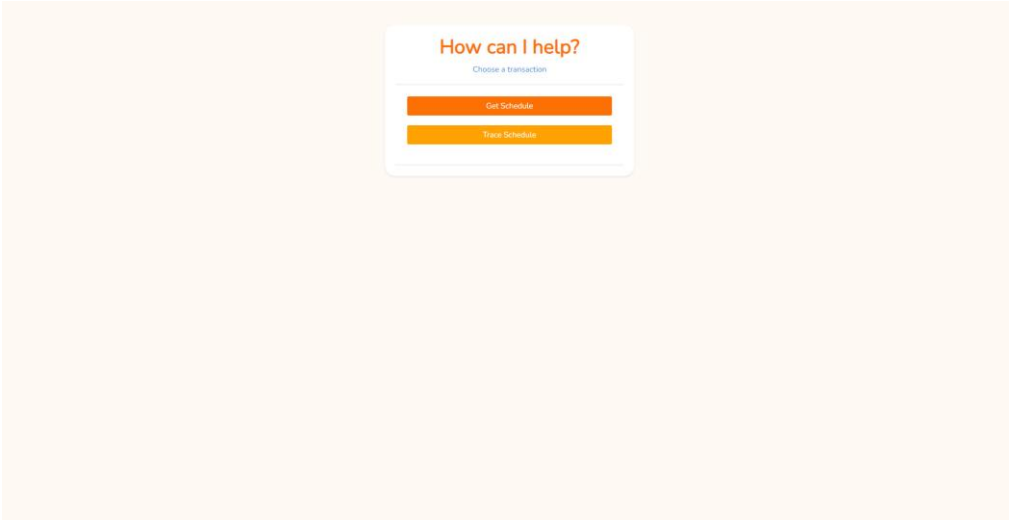

Form 2. Authorized Personnel Register Form



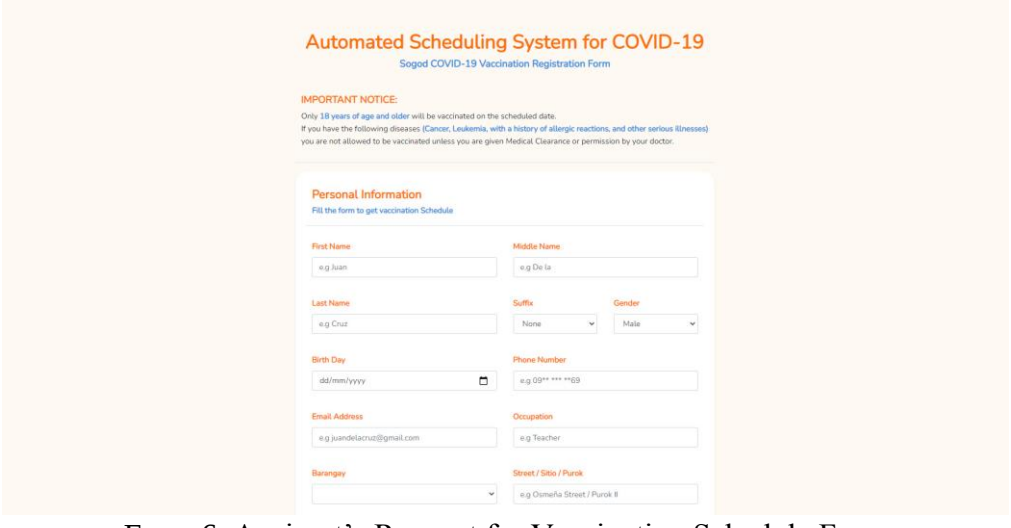

Form 3. Authorized Personnel Set Vaccination Schedule



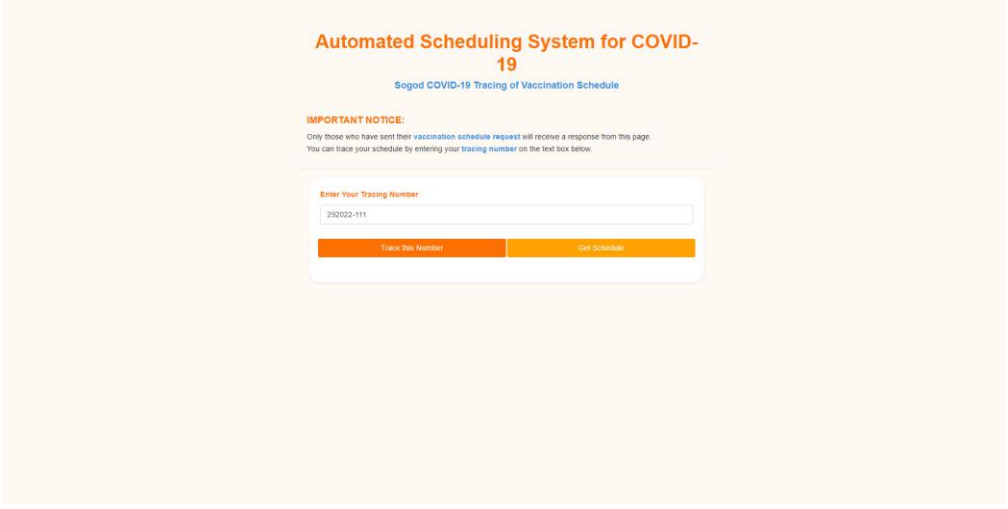

Form 4. Authorized Personnel Verify Aspirant Vaccination Form




Form 5. Aspirant Landing Page



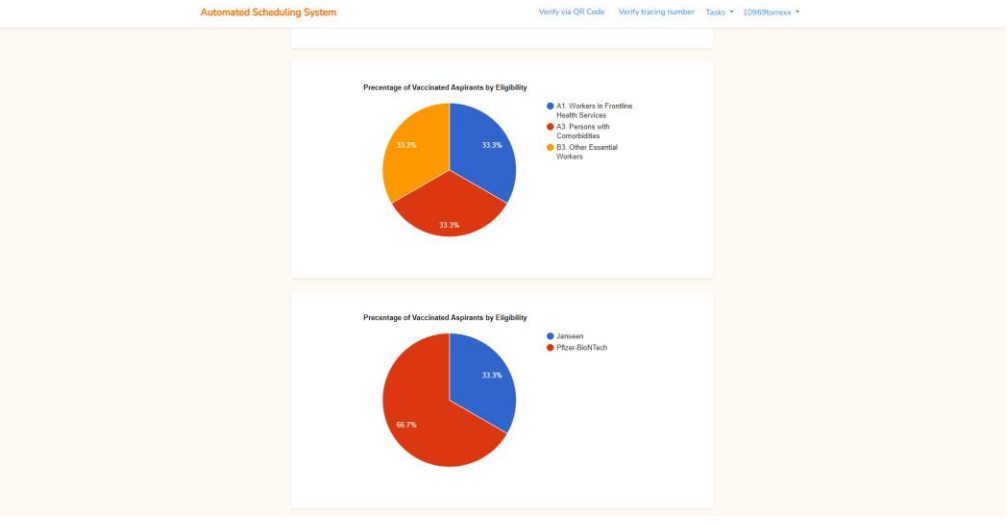

Form 6. Aspirant's Request for Vaccination Schedule Form



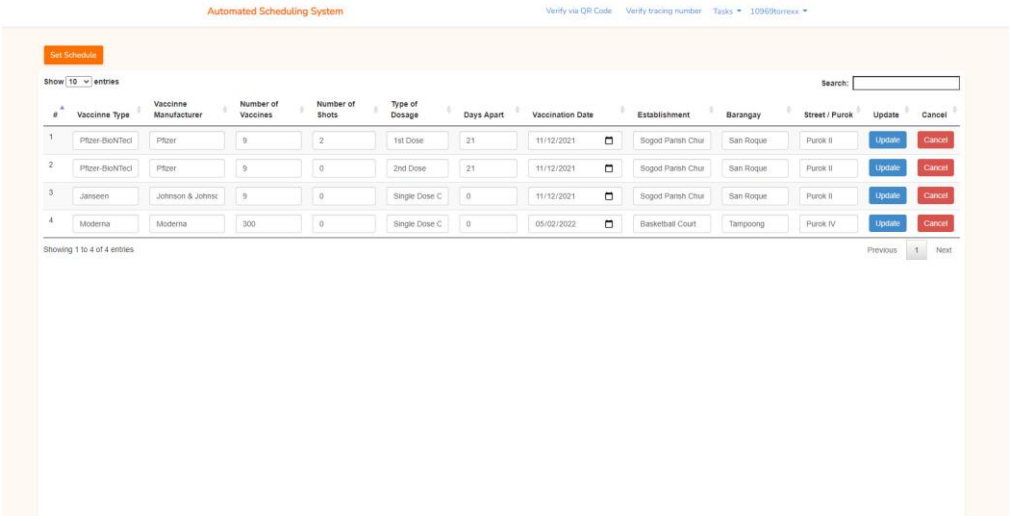

Form 7. Aspirant Trace Vaccination Request Status Form

*Reports*

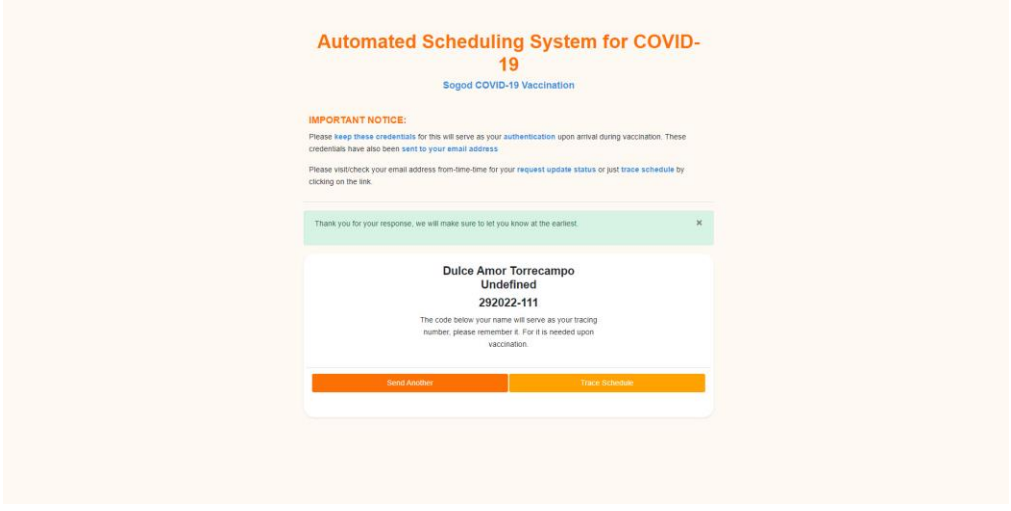
The following images are the reports that the system generates from the required inputs from the Aspirant's side of the project and from the Authorized Personnel side of the project. These reports are the result of system's capability to analyze, process and validate data from the inputs provided from both sides of the project.




Report 1. Generated Chart Based Recorded Data

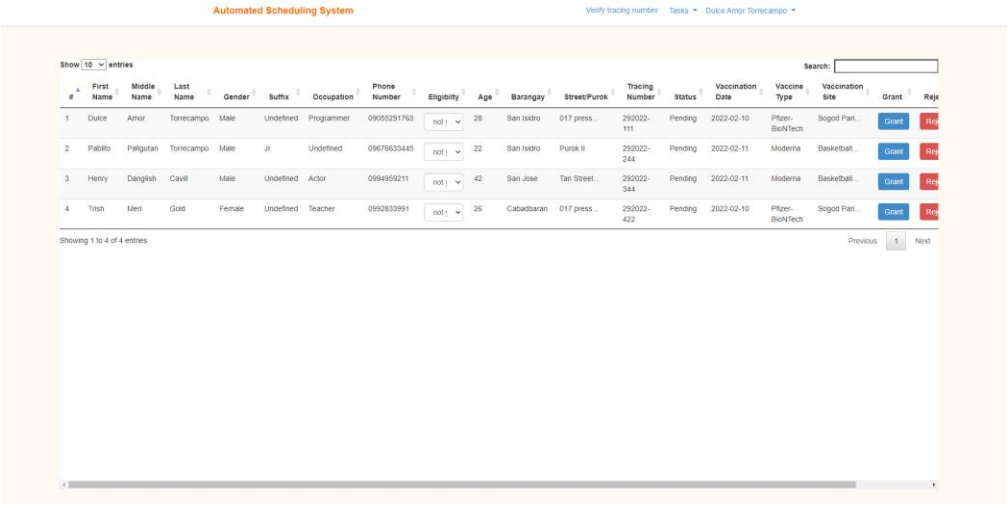



Report 2. Table Representing the Vaccination Schedule

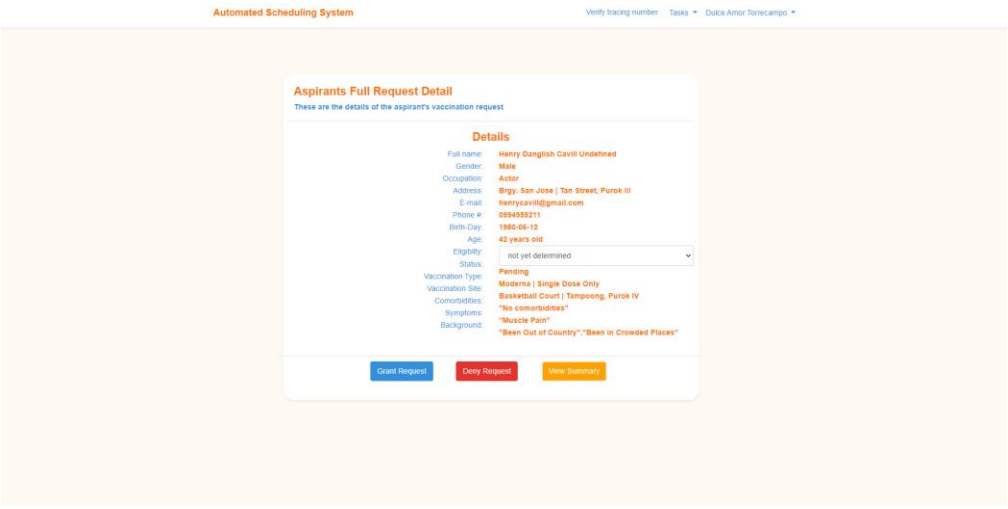



Report 3. Aspirant Vaccination Request Sent Confirmation

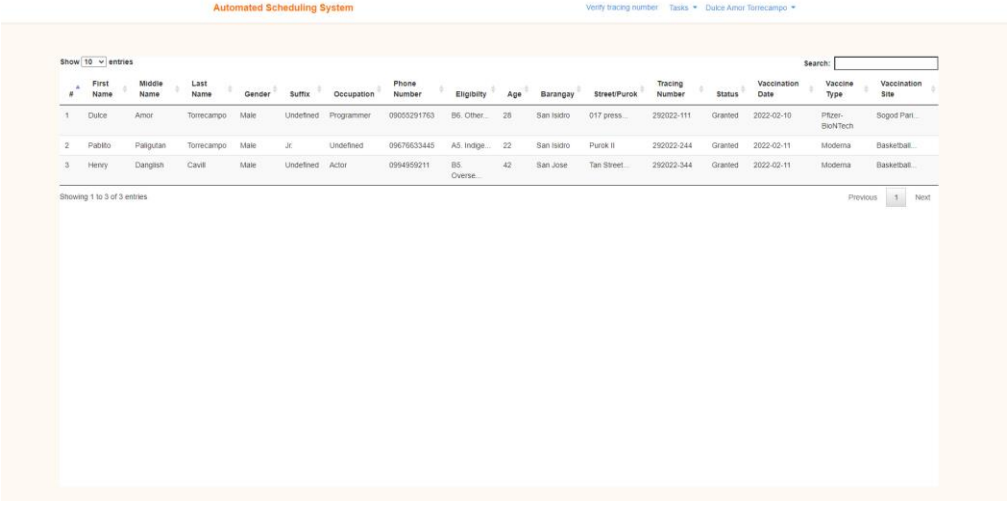

Report 4. Aspirant Trace Vaccination Request Status




Report 5. Table Representing the Aspirant Vaccination Request




Report 6. Aspirant Full Request Detail




Report 7. Table Representing Record of Vaccination

## ***Data Design***

### *Entity Relationship Model*

The diagram below is the system's Entity Relation Diagram. The diagram shows what are the entities that the system used in order to generate the appropriate outputs and do task which are essential to meet the project objective. The entities represent the kinds of data that the system validates and analyze as means to do what is intended for this project.

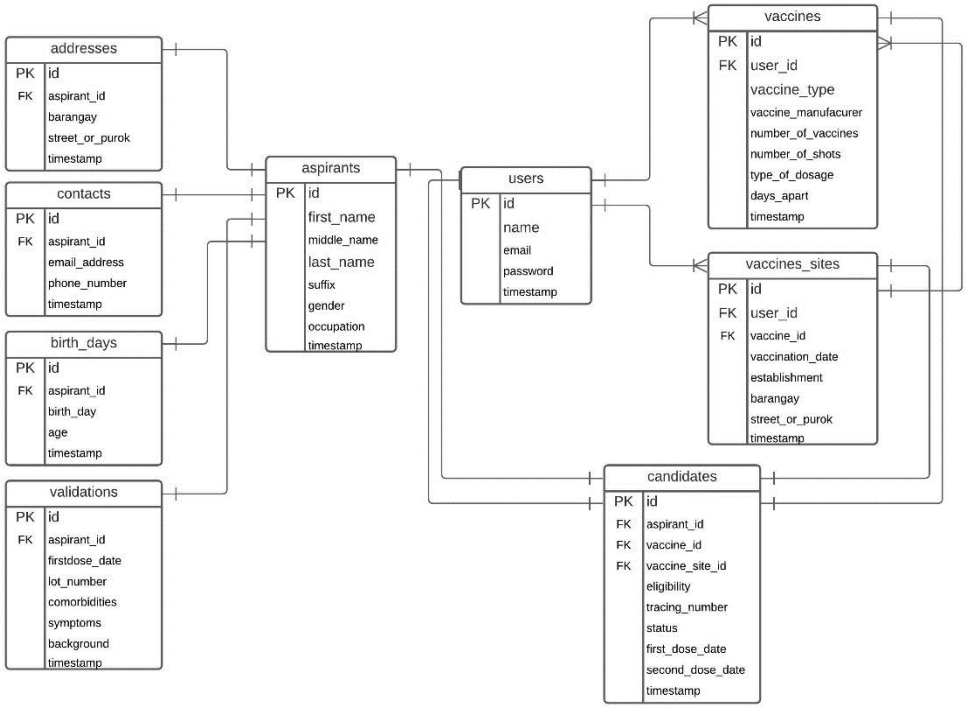



Figure 15. Entity Relationship Diagram

*Data Dictionary*

The following table shows the projects data dictionary. It reflects the kind of data that the system handles, validates, store and prints. The data dictionary is based on the Entity Relationship diagram provided prior to this section.

Table 4. Data Dictionary for the Aspirants Table

| Field Name | Data Type | Field Size | Description | Example |
|---|---|---|---|---|
| **Id** | Big Int | 10 | Unique Primary Key for each aspirant | 1 |
| **First name** | VarChar | 255 | First name of each aspirant | Clark |
| **Middle name** | VarChar | 255 | Middle name of each aspirant | Joseph |
| **Last name** | VarChar | 255 | Last name of each aspirant | Kent |

| | | | | |
|---|---|---|---|---|
| **Suffix** | VarChar | 255 | Suffix of each aspirant | Jr. |
| **Gender** | VarChar | 255 | Gender of each aspirant | Male |
| **Occupation** | VarChar | 255 | Occupation of each aspirant | Teacher |
| **Timestamp** | DataTime | | Timestamp for each aspirant data | 022-02-09 01:38:17 |

Table 5. Data Dictionary for the Addresses Table

| Field Name | Data Type | Field Size | Description | Example |
|---|---|---|---|---|
| **Id** | Big int | 10 | Unique primary key for each address | 1 |
| **Aspirant Id** | Int | 11 | Unique foreign key from aspirants table for each address | 1 |
| **a barangay** | Var char | 255 | Barangay for each address | San Isidro |
| **a street or purok** | Var char | 255 | Street or purok for each address | Tan Street or Purok II |
| **Timestamp** | Date time | | Timestamp for each address | 022-02-09 01:38:17 |

Table 6. Data Dictionary for the Contacts Table

| Field Name | Data Type | Field Size | Description | Example |
|---|---|---|---|---|
| **Id** | Big int | 10 | Unique primary key for each contact | 1 |
| **Aspirant id** | Int | 11 | Unique foreign key from aspirants | 1 |

| | | | | |
|---|---|---|---|---|
| | | | table for contact data | |
| **Email address** | Var char | 255 | Email address for each contact | clarkkent@dailyplanet.com |
| **Phone number** | Var char | 255 | Phone number for each contact | 09565684457 |
| **Timestamp** | Data time | | Timestamp for each contact | 022-02-09 01:38:17 |

Table 7. Data Dictionary for the Birthdays Table

| Field Name | Data Type | Field Size | Description | Example |
|---|---|---|---|---|
| **Id** | Big int | 10 | Unique primary key for each birth day | 1 |
| **Aspirant id** | Int | 11 | Unique foreign key from aspirants table for each birth day | 1 |
| **Birth day** | Date | | Birth day information | 000-03-06 |
| **Age** | Int | 11 | Age that corresponds to each birth day | 21 |
| **Timestamp** | Date time | | Timestamp for each birth day | 022-02-09 01:38:17 |

Table 8. Data Dictionary for Validations Table

| Field Name | Data Type | Field Size | Description | Example |
|---|---|---|---|---|
| **Id** | Big int | 10 | Unique primary key for each validation data | 1 |

| | | | | |
|---|---|---|---|---|
| **Aspirant id** | Int | 11 | Unique foreign key from aspirants table for each validation data | 1 |
| **First dose date** | Date | | Null able first dose date for each validation data | 2022-03-07 |
| **Lot number** | Var char | 255 | Lot number for each recorded validation data | 02463325 |
| **Comorbidities** | Long text | | Comorbidities for each validation data | “No comorbidities” |
| **Symptoms** | Long text | | Symptoms for each validation data | “Muscle Pain” |
| **Background** | Long text | | Background information for each validation data | “Been out of Country” |
| **Timestamp** | Date time | | Timestamp for each birth day | 022-02-09 01:38:17 |

Table 9. Data Dictionary for Users Table

| Field Name | Data Type | Field Size | Description | Example |
|---|---|---|---|---|
| **Id** | Big int | 10 | Unique primary key for each user data | 1 |
| **Name** | Var char | 255 | Name for each user | Clark Kent |

| | | | | |
|---|---|---|---|---|
| **Email** | Var char | 255 | Email for each user | clark@gmail.com |
| **Password** | Text | | Encrypted password for each user | 2y$10$7hpeY3xKvfNUYXk8tu.. |
| **Timestamp** | Date time | | Timestamp for each user | 022-02-09 01:38:17 |

Table 10. Data Dictionary for Vaccines Table

| Field Name | Data Type | Field Size | Description | Example |
|---|---|---|---|---|
| **Id** | Big int | 10 | Unique primary key for each user data | 1 |
| **User id** | Int | 11 | Unique foreign key from users table for each vaccine data | 1 |
| **Vaccine type** | Var char | 255 | Name of the Vaccine | Pfizer |
| **Vaccine manufacturer** | Var char | 255 | Manufacturer of the Vaccine | Pfizer-BionTech |
| **Number of vaccines** | Int | 11 | Number of available vaccines | 300 |
| **Number of shots** | Int | 11 | Number of of shots intended for that vaccine | 2 |
| **Type of dosage** | Var char | 255 | Dosage type of the vaccine | 1st Dose |
| **Days apart** | Int | 11 | Number of days apart for each vaccine shots | 21 |
| **Timestamp** | Date time | | Timestamp for each user | 022-02-09 01:38:17 |

Table 11. Data Dictionary for the Vaccines Sites Table

| Field Name | Data Type | Field Size | Description | Example |
|---|---|---|---|---|
| **Id** | Big int | 10 | Unique primary key for each user data | 1 |
| **User id** | Int | 11 | Unique foreign key from users table for each vaccine data | 1 |
| **Vaccine id** | Int | 11 | Unique foreign key from vaccines table for each vaccine data | 1 |
| **Vaccination date** | Date | | Scheduled date for vaccination | 2022-02-10 |
| **Establishment** | Var char | 255 | Name of the establishment for the vaccination venue | Basketball Court |
| **Barangay** | Var Char | 255 | Barangay name of the vaccination venue | San Isidro |
| **Street or purok** | Var Char | 255 | Street or purok of the vaccination venue | Purok II |
| **Timestamp** | Date time | | Timestamp for each user | 022-02-09 01:38:17 |

Table 12. Data Dictionary for the Candidates Table

| Field Name | Data Type | Field Size | Description | Example |
|---|---|---|---|---|
| **Id** | Big int | 10 | Unique primary key | 1 |

| | | | | |
|---|---|---|---|---|
| | | | for each user data | |
| **Aspirant id** | Int | 11 | Unique foreign key from aspirants table for each candidate data | 1 |
| **Vaccine id** | Int | 11 | Unique foreign key from vaccines table for each candidate data | 1 |
| **Vaccine site id** | Int | 11 | Unique foreign key from vaccine sites table for each candidate data | 1 |
| **Eligibility** | Var char | 255 | Priority Eligibility of each candidate | B5. Overseas Filipino Worker |
| **Tracing number** | Var char | 255 | Tracing number of each candidate | 292022-422 |
| **Status** | Var char | 255 | Vaccination status of each candidate | "Been Vaccinated (1st Dose)" |
| **First dose date** | Date | | Date of the candidate's first dose | 2022-02-09 |
| **Second dose date** | Date | | Date of the candidate's second dose | 2022-02-09 |

| | | | | |
|---|---|---|---|---|
| **Timestamp** | Date time | | Timestamp for each user | 022-02-09 01:38:17 |

***System Architecture***

*Network Model*

The following image shows the project network model. It shows how each actions and/or process is related for both aspirant side of the project and for authorized personnel side of the project. This model was used to visualize how objects and processes relate to each side of the project.

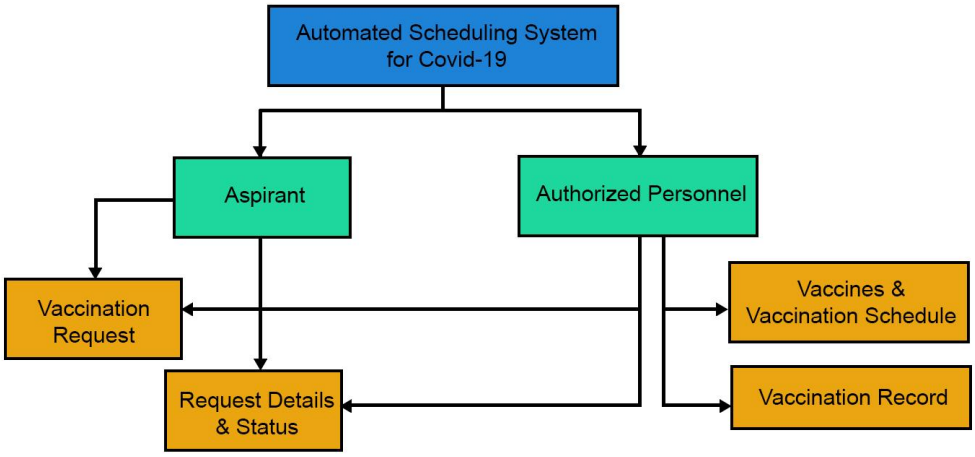



Figure 16. Network Model

*Network Topology*

The diagram below depicts how the interactions from both sides of the system take course over the internet. This also shows the general outlook of how the interaction between the aspirants and authorized personnel takes in effect.

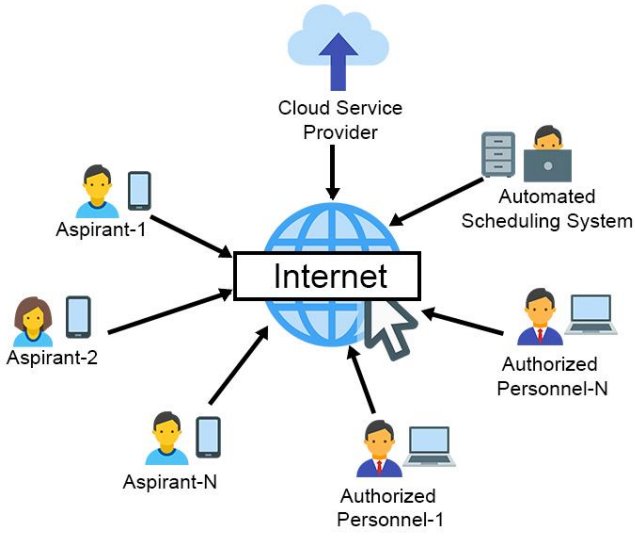



Figure 17. Network Topology

*Security*

The following diagram show how the researcher have conceptualized the security implementation and protocol of the project. The diagram shows how and where the security planning and implementation take place within the scope implementation of the system. This diagram however does not represent the specific implementation of security protocols but rather, it provides the general overview of the system security implementation and maintenance procedure.

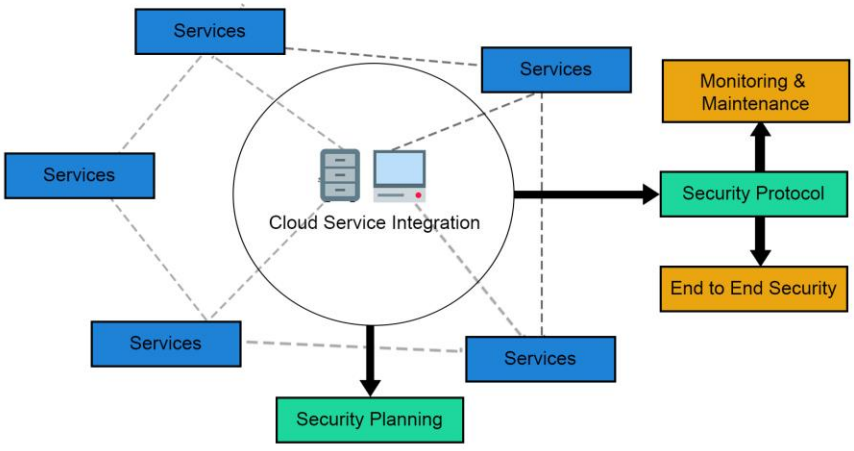



Figure 18. Security Implementation

**Development**

***Software, Hardware, Program Specification***

The following table shows the project specifications for Software, Hardware and Program. This also holds the minimum requirements for each category in order for the project to function as seamless as possible and as intended.

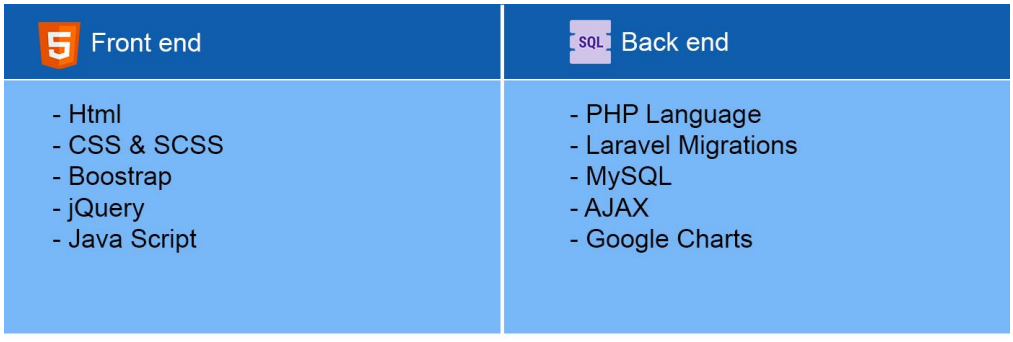
Table 13. Software, Hardware, Program Specification

| Software Specification | Hardware Specification | Program Specification |
|---|---|---|
| **Operating System**<br>• **Windows 7-11**<br>• **Latest android versions**<br>• **Mac OS**<br>• **Linux**<br>• **iOS** | RAM<br>• 2 GB and above | Programming Language Support<br>• PHP Programming Language |
| **Browser**<br>• **Google Chrome**<br>• **Microsoft Edge**<br>• **Opera mini**<br>• **Mozilla Firefox** | CPU<br>• At least Intel Xeon CPU | |

| | | |
|---|---|---|
| **Browser Extension and Tools**<br>• **Adobe Flash**<br>• **Java Development Kit** | | |

***Programming Environment***

The following diagram shows the front end and back component of the project. This shows what are the utilized front end and back end tools for the development of the system. The following listed tools were used by the researcher in order for the project to reach its completion.




Project Programming Environment

***Deployment Diagram***

The diagram below shows the project deployment diagram. It depicts how researchers initiated the deployment of each classes object, functionalities and capabilities for both aspirants and authorized personnel that interacts with the system. The diagram also represents the overview on how the system's complexities should be interpreted.

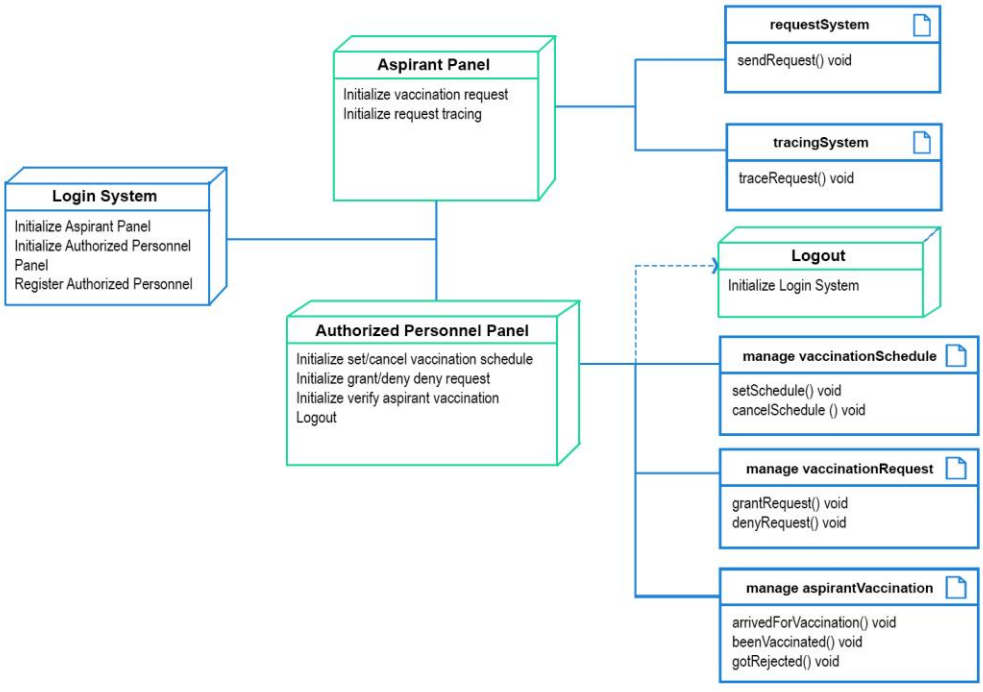



Figure 19. Deployment Diagram

***Test Plan***

The following Table represent the test plan that the proponents intends to follow in order to have a well-developed system. The following stated test cases are the general matters that the researchers deemed essential in the testing the system, and the whole project as a whole.

Table 14. Test Plan

| Test Case Type | Description | Test Step | Expected Result | Status |
|---|---|---|---|---|
| **Functionality** | Every capability and function of the system. | Inputs, reports can be made simultaneously for both side of the project. | Request details should be exact. Task and capabilities should function w/o errors. | Pass or Fail |

| | | | | |
|---|---|---|---|---|
| **Response Time** | The amount of time it takes for the system to generate report, process and validate data. | Users will be able to receive reports as fast as possible. | Response is fast, this will include the generated reports and input validation. | Pass or Fail |
| **Security** | Ensure Login Credentials checking. | Should be able to login according to user's login credentials. | Data, input are secured from unwanted parties. | Pass or Fail |
| **Usability** | The accessibility of the system for both aspirants and authorized personals | Aspirants can send and trace request. Authorized Personnel can do task seamlessly. | Every function, forms can accessed seamlessly. | Pass or Fail |

## Testing

### *Unit Testing*

The following tables and images are some of the results of the Unit testing implemented by the researchers

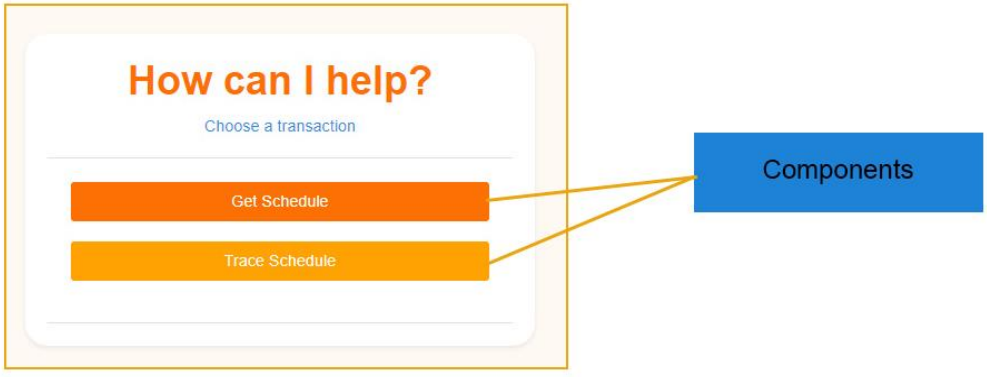



Table 15. Unit Testing 1.

| Field | Event | Failed | Success |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **Get Schedule** | Button Click | No implemented action. | Initialize get schedule panel |
| **Trace Schedule** | Button Click | No implemented action. | Initialize trace schedule panel |

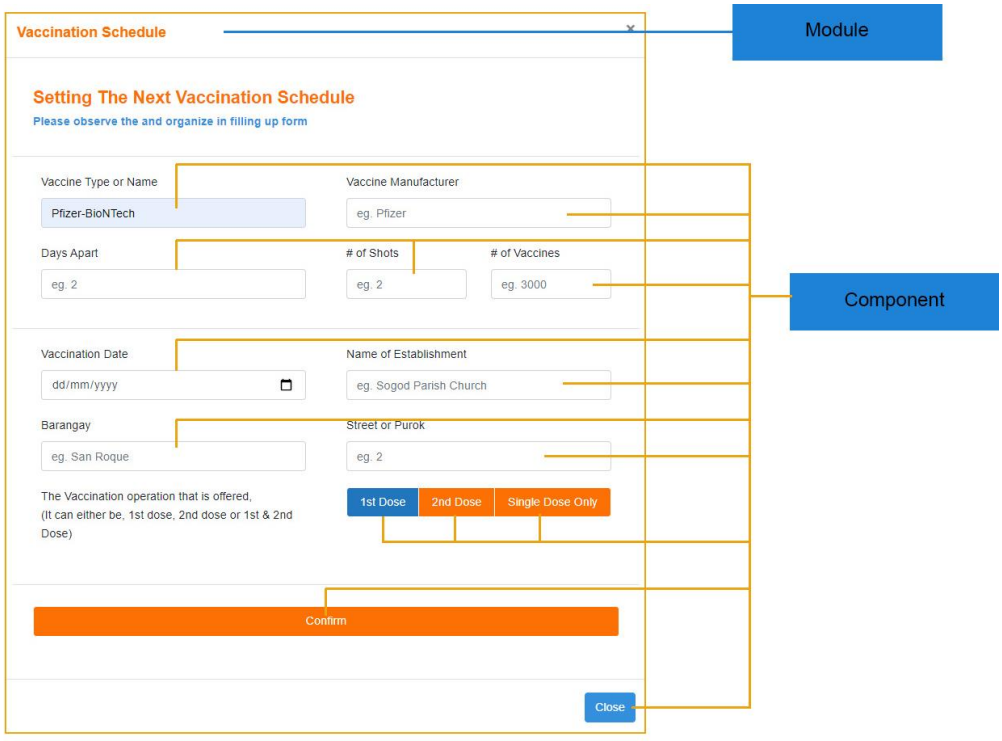



Table 16. Unit Testing Result 2.

| Field | Event | Failed | Success |
|---|---|---|---|
| **Vaccine Type or Name** | Text change | Error message – " Please fill the form accordingly." | Validate input |
| **Vaccine Manufacturer** | Text change | Error message – "Please fill the form accordingly." | Validate input |
| **Days Apart** | Text change | Error message – "Please fill the form accordingly." | Validate input |
| **# of Shots** | Text change | Error message – "Please fill the form accordingly." | Validate input |

| | | | |
|---|---|---|---|
| **# of Vaccines** | Text change | Error message – "Please fill the form accordingly." | Validate input |
| **Vaccination Date** | Select Date | Error message | Validate input |
| **Name of Establishment** | Text change | Error message – "Please fill the form accordingly." | Validate input |
| **Barangay** | Text change | Error message – "Please fill the form accordingly." | Validate input |
| **Street or Purok** | Text change | Error message – "Please fill the form accordingly." | Validate input |
| **1st Dose** | Check Box | No implemented action. | Initialize trace schedule panel |
| **2nd Dose** | Check Box | No implemented action. | Initialize trace schedule panel |
| **Single Dose Only** | Check | No implemented action. | Initialize trace schedule panel |
| **Confirm** | Button Click | No implemented action. | Send Request |

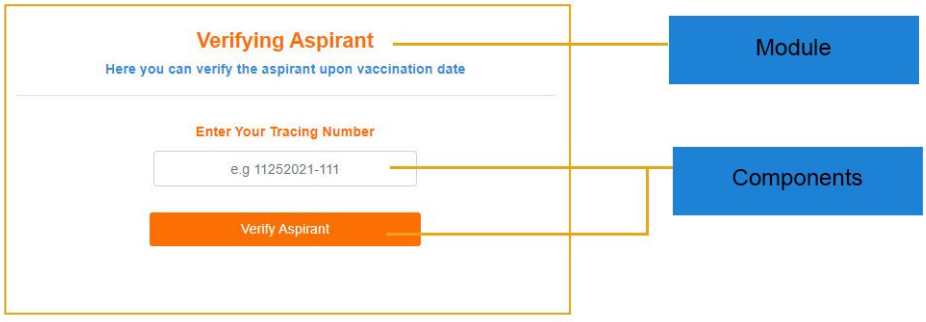



Table 17. Unit Testing Result 3.

| Field | Event | Failed | Success |
|---|---|---|---|
| **Enter Your Tracing Number** | Text change | Error Message | Validate input |
| **Verify Aspirant** | Button Click | No implemented action. | Validate input, send request. |

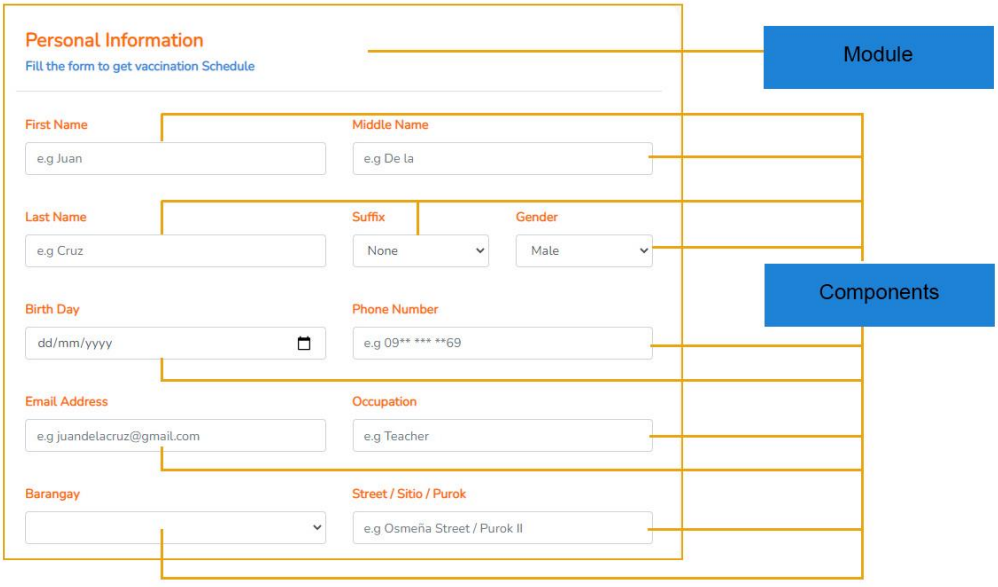



Table 18. Unit Testing Result 4.

| Field | Event | Failed | Success |
|---|---|---|---|
| **First Name** | Text change | Error Message – "Please provide appropriate input" | Validate input |
| **Middle Name** | Text change | Error Message – "Please provide appropriate input" | Validate input |
| **Last Name** | Text change | Error Message – "Please provide appropriate input" | Validate input |
| **Suffix** | Item Select | None | Validate Input |
| **Gender** | Item Select | None | Validate Input |
| **Birth Day** | Date Select | Error Message – "Please provide appropriate input" | Validate Input |
| **Phone Number** | Text Change | Error Message – "Please provide appropriate input" | Validate Input |
| **Email address** | Text Change | Error Message – "Please provide appropriate input" | Validate Input |

| | | | |
|---|---|---|---|
| **Occupation** | Text Change | Error Message – "Please provide appropriate input" | Validate Input |
| **Barangay** | Text Change | Error Message – "Please provide appropriate input" | Validate Input |
| **Street / Sitio / Purok** | Text Change | Error Message – "Please provide appropriate input" | Validate Input |

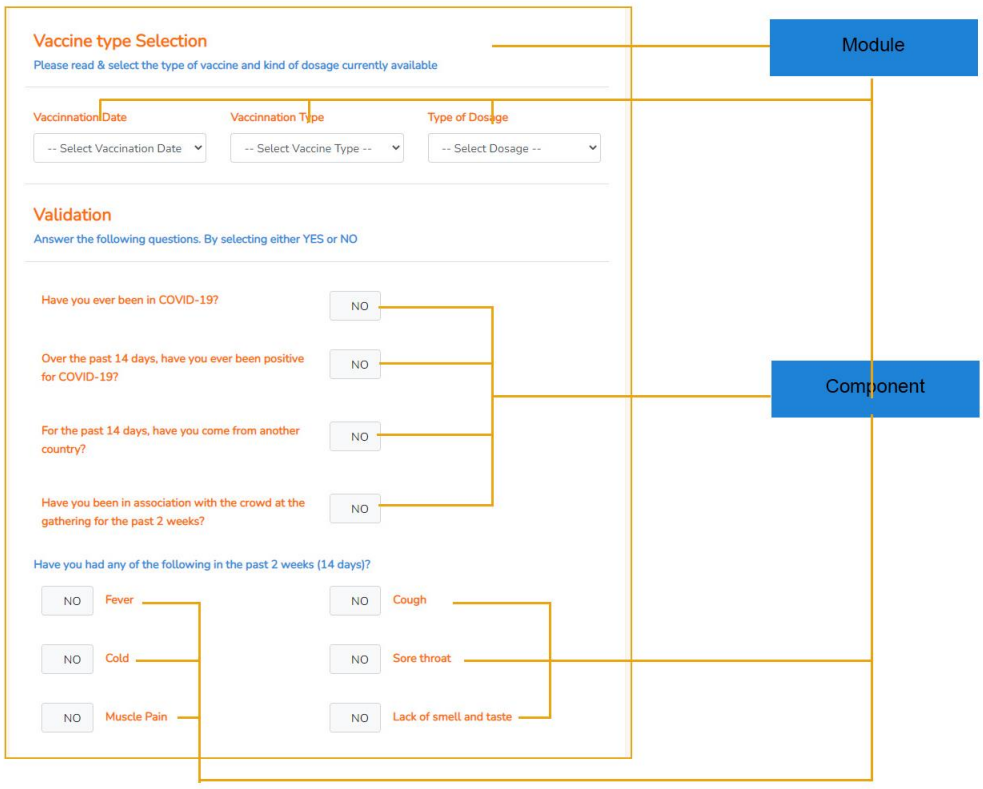



Table 19. Unit Testing Result 5.

| Field | Event | Failed | Success |
|---|---|---|---|
| **Vaccination Date** | Date Select | Error Message | Validate input |
| **Vaccination Type** | Text Change | Error Message – "Please provide appropriate input" | Validate input |
| **Type of Dosage** | Item Select | None | Validate Input |

| | | | |
|---|---|---|---|
| **Have you ever…** | Check | None | Validate Input |
| **Over the past 14 days…** | Check | None | Validate Input |
| **For the past 14** | Check | None | Validate Input |
| **Have you been…** | Check | None | Validate Input |
| **Fever** | Check | None | Validate Input |
| **Cold** | Check | None | Validate Input |
| **Muscle Pain** | Check | None | Validate Input |
| **Cough** | Check | None | Validate Input |
| **Sore throat** | Check | None | Validate Input |
| **Lack of Smell and tast** | Check | None | Validate Input |

***Integration Testing***

The following diagram is the integration testing implemented by the researchers. The diagram represents a top-down module by module checking made for the entirety of the project/system. It also signifies that for compatibility testing, the project's performance testing, stress testing and load testing went the same concept of testing; meaning it all started from modules that handles the very first data entry or input down up the final module of handling the data input.

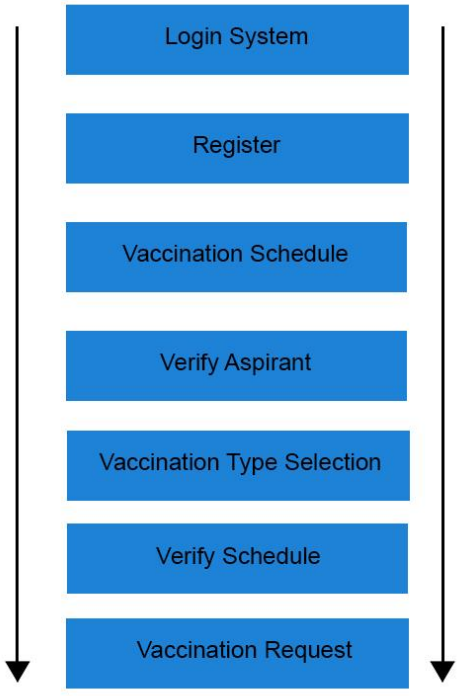



Figure 20. Integration Testing

***System Testing***

The following diagram and table shows the system of the project that has been implemented by the researcher. The foundation for the project's system testing is Block by Block system testing, which entails that the system testing starts by validating the input given to the system and verifying if it is the expected output or otherwise. In addition, the table also shows the tested Test case; also the description, expected result/action, test data, pass/fail.

Table 20. System Testing

| Test case | Description | Expected result/Action | Test data | Pass/Fail |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| **Text input** | All input entered via text box field found in forms | Validate data | First name, occupation etc. | Pass |
| **Select item** | All input entered via drop down | Validate data | Vaccination date | Pass |
| **Confirm action** | All input entered via button click | Validate action, store/update data | | Pass |
| **Fetched data** | Data coming from database system | Validate generate appropriate report | Chart and graph, vaccination summary | Pass |

***Acceptance Testing***

The following table shows the projects acceptance testing. It holds the essential matters that the system needs to test, and check accurately determine that all major factors of the project meets the bare minimum requirement for the overall functionality of the project.

Table 21. Acceptance Testing

| Test case | Effectivity<br>High \| Med \| Low | Impact<br>High \| Med \| Low | Description |
|---|---|---|---|
| **Input validation** | High | High | The ability of the system to validate and process input. |
| **Output / Report** | High | High | The ability of the system to generate outputs and/or reports based inputs. |

| | | | |
|---|---|---|---|
| **Module Integration** | Med | High | The modules that the system has is able to interact provide effective processes. |
| **Responsiveness** | High | High | The ability of the system to respond. |

## Conclusions

Based on the findings and the data gathered, the researchers concluded that:

1. The system helps in mitigating the crowd fluctuation in vaccination sites.
2. The system bodes advantageous for the Municipality of Sogod in the conduct of COVID-19 mass vaccination.
3. The system fully functions as intended and meets the required standards in helping the COVID-19 mass vaccination.

## Recommendations

This project is useful and provides advantages in the conduct of COVID-19 mass vaccination in Sogod, Southern Leyte. However, the researchers have recognized the limitations of the project, thus, the researchers recommend the following:

1. The system will be of much use by the authorized personnel's task if accessed using laptop, desktop computers.
2. The location of the vaccination site should be in places where strong internet connection is helpful.
3. Constant updating of vaccination schedule causes data integrity and vulnerability.

4. The data displayed through charts should be flexible and can also handle random input.

## Implementation Plan

### *Project Implementation Plan*

The table below is the implementation checklist that the researcher intends to follow upon project implementation phase. The table is listed out tasks that the researchers needs to accomplish in the course of the project implementation phase.

Table 22. Project Implementation Checklists

| # | Tasks | Status |
|---|---|---|
| **1** | Project implementation meeting. | |
| **2** | System presentation planning. | |
| **3** | Field Interview / Data gathering Procedure | |
| **4** | Vaccination site visitation and vaccination process observation. | |
| **5** | Deployment Procedure planning. | |
| **6** | System Testing. | |
| **7** | System Validity Checking | |
| **8** | Project Finalization | |

### *Implementation Contingency*

The table below shows the project's implementation contingency plan. The following listed tasks and contingencies are the researchers intended contingency implementation for each possible scenario that would hinder the completion of the project.

Table 23. Implementation Contingency

| # | Task | Contingency |
|---|---|---|
| **1** | System presentation meeting | During the meeting, the system presentation plan should have back up and be double checked for possible overlooked matters. |
| **2** | Field Interview / Data gathering | If the site or the project benefactor is not valid, gather data based on the vaccination process. |

| | | |
|---|---|---|
| **3** | System Testing | During the system testing. The system source code should have back up. Create adjustments to the source code that would make it testable and refactored for testing. |
| **4** | Data recovery strategies | Identify possible causes and mitigate. Store and document all resources concerning the system's data storage procedure, review any possible loophole. |

***Infrastructure/Deployment***

The following diagram shows the overall infrastructure of the project. This entails how the project will be deployed infrastructure wise. This also shows how the system will manage if the connection or server fails, how the project will deal with server failure in order for the system to still be functional even if the occurrence of failure in the server.

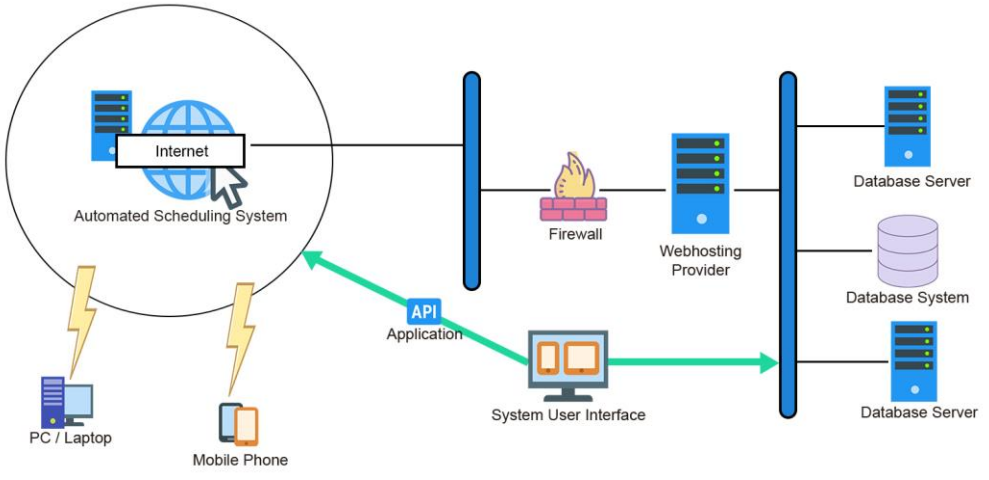



Figure 21. Infrastructure/Deployment

**Bibliography**

[1] Philippine News Agency, 2020 "Implement social distancing or face arrest, PRRD warns mayors" pna.gov.ph

[2] Akinode, John Lekan, Oloruntoba S.A, 2007 "Design and Implementation of a Patient Appointment and Scheduling System", International Advanced Research Journal in Science, Engineering and Technology.

[3] Godphrey G. Kyambille & Khamisi Kalegele, November 2015 "Enhancing Patient Appointments Scheduling that Uses Mobile Technology" International Journal of Computer Science and Information Security.

[4] Arthur Hylton III and Suresh Sankaranarayana, August 2012 "Application of Intelligent Agents in Hospital Appointment Scheduling System", International Journal of Computer Theory and Engineering.

[5] Zeleke Abebaw Mekonnen, Fedlu Nurhussien Hussien, Binyam Tilahun, Kassahun Alemu Gelaye and Adane Mamuye, 2019 "Development of automated text-message reminder system to improve uptake of child vaccination in Ethiopia" Online J Public Health Inform.

[6] Dana G Smith, 2020 "The Most Likely Way You'll Get Infected with the Coronavirus"

[7] Allison Lynch,2021,"Program Flowchart Examples and Templates", edrawsoft

[8] "System Flowcharts", bbc.co

[9] Allison Lynch,2021,"What's a Program Flowchart?| Definition and Example", edrawsoft

[10] "What is Data Dictionary",tutorialspoint

[11] "What is System Network Architecture",ibm

[12] 2001, "Network Models",informit

[13] "What is Network Topology",omnisci

[14] "What is Security Architecture? ",techslang

[15] 2020 ,"Tips to Write a Technical…",wishdesk

[16] AndrewBurak,"How to Write Software Requirements…",relevant.software

[17] "Program Specification",oxfordreference

[18] "Deployment Diagram for a typical Web-based application", researchgate

[19] “What is unit Testing?..”software quality.techtargt

[20] 2020,“Integration Testing”,u-tor

[21] Satyabrata_Jena,2021,“Compatibility Testing in Software Engineering”geeksforgeeks

[22] “What is Integration Testing (Tutorial with Integration Testing Example)”,google

[23] Thomas Hamilton,2021,”TEST PLAN:What is,How to Create(with Example)”,gu

[24] “Identity Management Infrastracture Deployment Planning”,docs.oracle

[25] Thembani Thembani,“Requirements+ Modeling”,studylib

[26] Alexander S. Gillis,“What is Performance Testing?”,hsoftwarequality.techtarget

[27] Austin Miller,2021,“Performance Testing, Load Testing & Stress Testing Explained”,bmc

[28] Thomas Hamilton,2021,“Performace Testing Tutorial:What is, Types,Metrics & Example”,guru99

[29] Thomas Hamilton,2021,“What is System Testing? Types & Definition with Example”,guru99

[30] “System Testing”,javapoint

[31] Adam Hayes,2020,“Acceptance Testing”,Investopedia

[32] “User Acceptance Testing…”,performancelabus

[33] 2019,“What is Acceptance Testing? Types and Example-W3Softech”,w3softech

[34] 2020,“Acceptance Testing in Software Engineering”,prepinsta

[35] Team Asana,2021,“What is an Implementation plan?6 steps to create one”,asana

[36] “Implemantation Checklist”,learn.nes.nhs.scot

[37] “Project Implemantation Checklist”,google

[38] Clive Longbottom, Stephen J. Bigelow,“What is Infrastructure…”,earchdatacenter.techtarget

[39] “Deployment Infrastructure”,ibm

# APPENDICES

# APPENDIX A

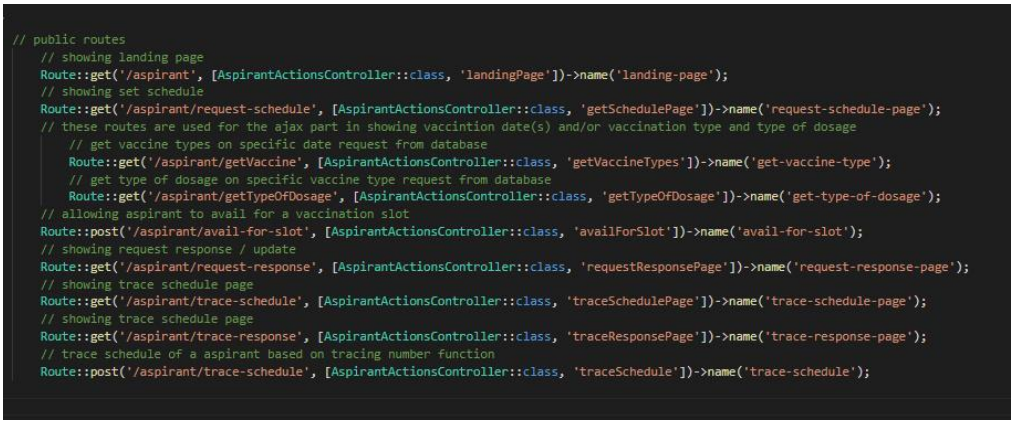
## Relevant Source Code

```
# changing candidate status to "Been Vaccinated" from verify via tracing number
    public function beenVaccinated($tracing_number) {
        # checking current date if it exists in vaccination date schedules…
        # getting the vaccination date of the aspirant based on the set schedule…
        # getting the days apart assingend or incorporated based on the vaccine…
        # getting the type of dosage based on the aspirant's vaccination request…
        # getting the aspirants vaccination details …
        /** Determing the type of dosage
         * if it is first dosge calulate the date of second dose date
         * else leave the second dose as null
         */
            if ($type_of_dosage == "1st Dose") {
                // updating status of aspirant in the candiadates table
                    (new CandidatesController)->update($tracing_number, 'Been Vaccinated (1st Dose)');
                // updating the aspirants first dose date in the candidates table
                    (new CandidatesController)->first_dose($tracing_number, $new_vac);
                // updataing the aspirants second dose date in teh candiates table
                    (new CandidatesController)->second_dose($tracing_number, $v->addDays((int)$days_apart));
                // deducting number of vaccine per vaccine type
                    (new VaccinesController)->deductVaccineNumber($aspirant_vaccine_id, ((int)$number_of_vaccines -= 1));
            } else {
                // updating status of aspirant in the candiadates table
                    (new CandidatesController)->update($tracing_number, 'Been Vaccinated');
                // updating the aspirants first dose date in the candidates table
                    (new CandidatesController)->first_dose($tracing_number, $new_vac);
                // updataing the aspirants second dose date in teh candiates table
                    (new CandidatesController)->second_dose($tracing_number, null);
                // deducting number of vaccine per vaccine type
                    (new VaccinesController)->deductVaccineNumber($aspirant_vaccine_id, ((int)$number_of_vaccines -= 1));
            }

        return back()->with([
            'success'   =>  'Candidate Status Changed to Been Vaccinated'
        ]);
         /* e…
    }
```

Aspirant Update Vaccination Status

```
# changing candidate status to "arrived for vaccination" from verify via tracing number
    public function arrivedForVaccination($tracing_number) {
        # checking current date if it exists in vaccination date schedules
        $current_date = Carbon::tomorrow(); // get current date
        $myDate = $current_date->month .'/' . $current_date->day .'/'. $current_date->year;
        $new_current_date  = Carbon::createFromFormat('m/d/Y', $myDate)->format('Y-m-d');
        $vaccination_date =
            Vaccine_sites::join('candidates', 'candidates.vaccine_site_id', '=', 'vaccine_sites.id')
            ->where('candidates.tracing_number', $tracing_number)
            ->where('candidates.status', '!=', 'Rejected')
            ->where('candidates.status', '!=', 'pending')
            ->value('vaccination_date');
        $v = new Carbon($vaccination_date);
        $myDate2 = $v->month .'/' . $v->day .'/'. $v->year;
        $new_vac  = Carbon::createFromFormat('m/d/Y', $myDate2)->format('Y-m-d');

        // updating status of aspirant in the candiadates table
            (new CandidatesController)->update($tracing_number, 'Arrived for Vaccination');
            return back()->with([
                'success'   =>  'Candidate Status Changed to Arrived for Vaccination'
            ]);
        /*…
    }
```

Aspirant Update Vaccination Status



```php
// public routes
    // showing landing page
    Route::get('/aspirant', [AspirantActionsController::class, 'landingPage'])->name('landing-page');
    // showing set schedule
    Route::get('/aspirant/request-schedule', [AspirantActionsController::class, 'getSchedulePage'])->name('request-schedule-page');
    // these routes are used for the ajax part in showing vaccintion date(s) and/or vaccination type and type of dosage
        // get vaccine types on specific date request from database
        Route::get('/aspirant/getVaccine', [AspirantActionsController::class, 'getVaccineTypes'])->name('get-vaccine-type');
        // get type of dosage on specific vaccine type request from database
        Route::get('/aspirant/getTypeOfDosage', [AspirantActionsController::class, 'getTypeOfDosage'])->name('get-type-of-dosage');
    // allowing aspirant to avail for a vaccination slot
    Route::post('/aspirant/avail-for-slot', [AspirantActionsController::class, 'availForSlot'])->name('avail-for-slot');
    // showing request response / update
    Route::get('/aspirant/request-response', [AspirantActionsController::class, 'requestResponsePage'])->name('request-response-page');
    // showing trace schedule page
    Route::get('/aspirant/trace-schedule', [AspirantActionsController::class, 'traceSchedulePage'])->name('trace-schedule-page');
    // showing trace schedule page
    Route::get('/aspirant/trace-response', [AspirantActionsController::class, 'traceResponsePage'])->name('trace-response-page');
    // trace schedule of a aspirant based on tracing number function
    Route::post('/aspirant/trace-schedule', [AspirantActionsController::class, 'traceSchedule'])->name('trace-schedule');
```

Public Web Routes for Aspirant Side

```php
// private routes
    # actions that are for showing, adding, setting, updating, deleting of vaccines, vaccination types on the admin side of the system.
        // showing set schedule page
        Route::get('/set-schedule', [AdminActionsController::class, 'setSchedulePage'])->middleware('auth')->name('set-schedule-page');
        // set vaccination schedule schedule function
        Route::post('/set-schedule', [AdminActionsController::class, 'setSchedule'])->middleware('auth')->name('set-schedule-function');
        // showing the list of vaccines and vaccination sites and scedules
        Route::get('/schedule', [AdminActionsController::class, 'schedulelist'])->middleware('auth')->name('schedule-list-page');
        // delete schedule feature
        Route::delete('/schedule/delete', [AdminActionsController::class, 'deleteSchedule'])->middleware('auth')->name('delete-schedule');
        // update schedule feature
        Route::put('/schedule/update', [AdminActionsController::class, 'updateSchedule'])->middleware('auth')->name('update-schedule');

    # actions that are for showing, adding, setting, updating, deleting of aspirant's request for vaccination on the admin side of the system.
        // showing the vaccination request page
        Route::get('/vaccination-request-list', [AdminActionsController::class, 'vaccinationRequestPage'])->middleware('auth')->name('vaccination-request-page');
        // showing the list of vaccination request from aspirants to the admin side of the project -- this will apear in the website via Iframe element.
        Route::get('/request-list', [AdminActionsController::class, 'requestList'])->middleware('auth')->name('vaccination-request-list');
        // rejecting the aspirant vaccinatiion request
        Route::put('/request-list/reject={tracing_number}', [AdminActionsController::class, 'rejectRequest'])->middleware('auth')->name('reject-request');
        // granting aspirant vaccination request
        Route::put('/request-list/grant={tracing_number}', [AdminActionsController::class, 'grantRequest'])->middleware('auth')->name('grant-request');
        // showing aspirant vaccination request details
        Route::get('/request-list/detail={tracing_number}', [AdminActionsController::class, 'detailRequest'])->middleware('auth')->name('detail-request');
```

Private Web Routes for Authorized Personnel Side

**APPENDIX B**

**Evaluation Tool**

**System Evaluation (ISO 9126**

**Instructions:** Please evaluate the "Automated Scheduling System for COVID-19 vaccination" using the scale shown below. Check(/) the appropriate score. Thank you.

| Pablito P. Torrecampo Jr. | James Brian Flores |
|---|---|
| Programmer | Adviser |

---

**Qualitative Description per Functionality Indicator**

| Limits of Scale | Qualitative Description |
|---|---|
| 4.21 – 5.00 | Fully Functional |
| 3.21 – 4.20 | Mostly Functional |
| 2.61 – 3.20 | Functional |
| 1.81 – 2.60 | Slightly Functional |
| 1.0 – 1.8 | Not Functional |

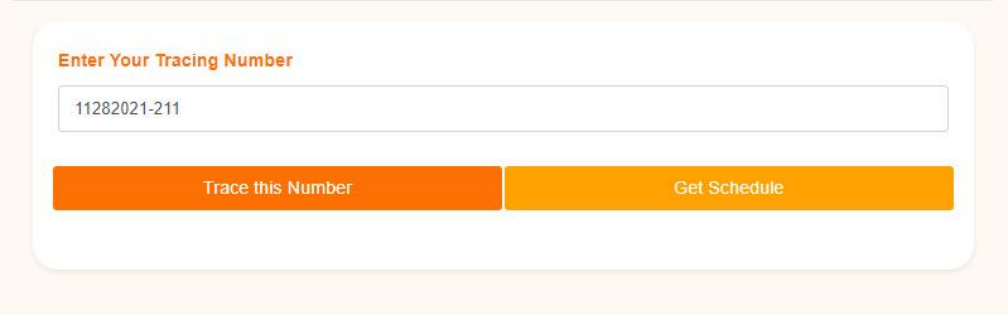
**Qualitative Description per Usability Indicator**

| Limits of Scale | Qualitative Description |
|---|---|
| 4.21 – 5.00 | Fully Usable |
| 3.21 – 4.20 | Mostly Usable |
| 2.61 – 3.20 | Usable |
| 1.81 – 2.60 | Slightly Usable |
| 1.0 – 1.8 | Not Usable |

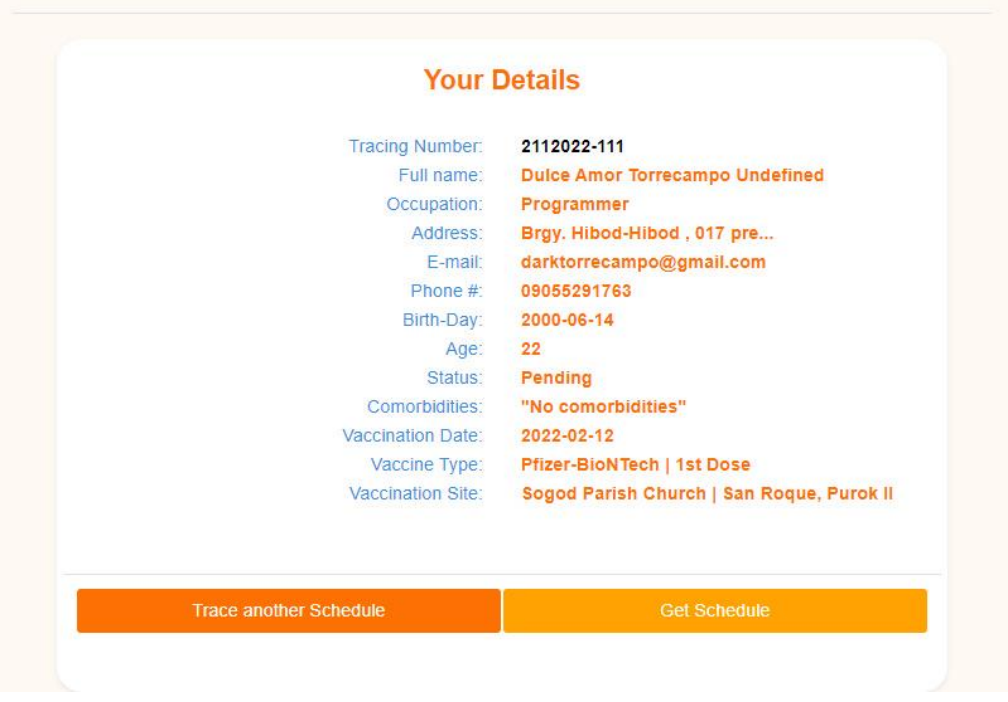
| **Criteria** | | **Score** | | | | |
|---|---|---|---|---|---|---|
| *Characteristics* | *Sub Characteristics* | **1** | **2** | **3** | **4** | **5** |
| Functionality | The application performs the required functionalities | | | | | |
| | The application provides the expected result | | | | | |
| Usability | The graphical user interface of the application is easy to use or navigate | | | | | |
| | The displayed results of the system are understandable | | | | | |

# APPENDIX C

## Sample Input and Output




Sample Input



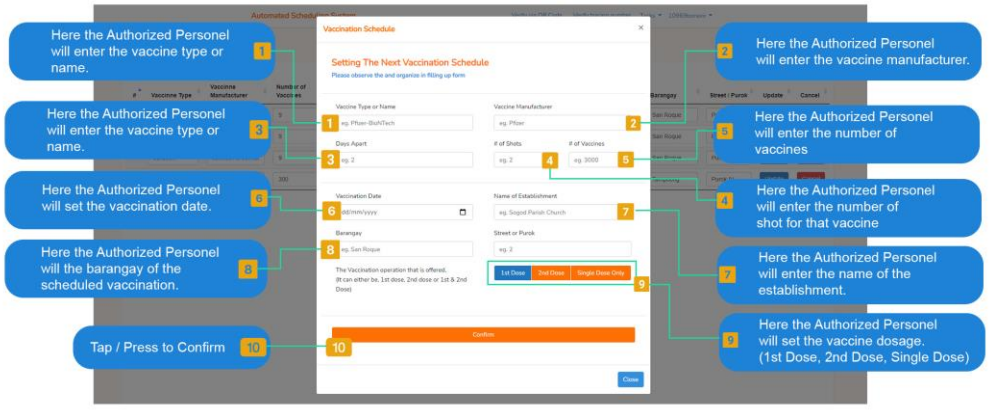

Sample Output

# APPENDIX D

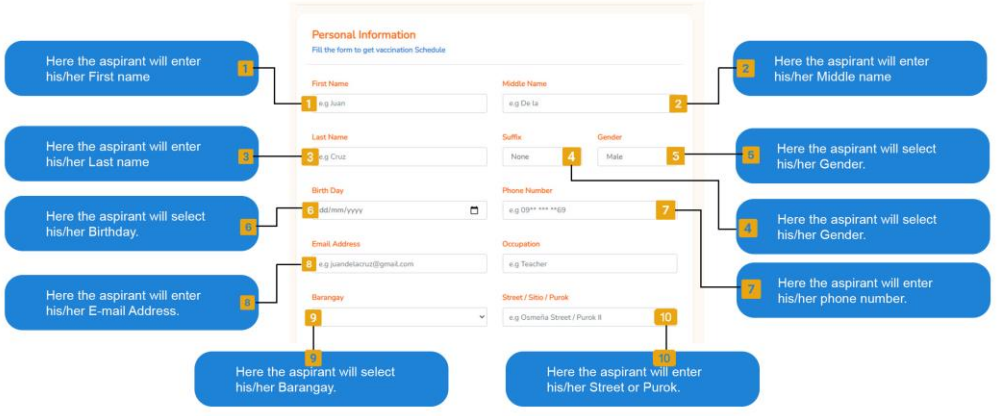
## User's Guide


Authorized Personnel Login Form


Authorized Personnel Register Form



Authorized Personnel Set Vaccination Schedule Form




Aspirant Send Vaccination Request A.


Aspirant Send Vaccination Request B.

# APPENDIX E

## Other Relevant Documents

Api.php

routes > api.php

```php
<?php

use Illuminate\Http\Request;
use Illuminate\Support\Facades\Route;

/*
|--------------------------------------------------------------------------
| API Routes
|--------------------------------------------------------------------------
|
| Here is where you can register API routes for your application. These
| routes are loaded by the RouteServiceProvider within a group which
| is assigned the "api" middleware group. Enjoy building your API!
|
*/

Route::middleware('auth:sanctum')->get('/user', function (Request $request) {
    return $request->user();
});

```

ForgotPasswordContoller.php

app > Http > Controllers > Auth > ForgotPasswordController.php

```php
<?php

namespace App\Http\Controllers\Auth;

use App\Http\Controllers\Controller;
use Illuminate\Foundation\Auth\SendsPasswordResetEmails;

class ForgotPasswordController extends Controller
{
    /*
    |--------------------------------------------------------------------------
    | Password Reset Controller
    |--------------------------------------------------------------------------
    |
    | This controller is responsible for handling password reset emails and
    | includes a trait which assists in sending these notifications from
    | your application to your users. Feel free to explore this trait.
    |
    */

    use SendsPasswordResetEmails;
}

```

VerificationController.php

app > Http > Controllers > Auth > VerificationController.php

```php
<?php

namespace App\Http\Controllers\Auth;

use App\Http\Controllers\Controller;
use App\Providers\RouteServiceProvider;
use Illuminate\Foundation\Auth\VerifiesEmails;

class VerificationController extends Controller
{
    /*
    |--------------------------------------------------------------------------
    | Email Verification Controller
    |--------------------------------------------------------------------------
    |
    | This controller is responsible for handling email verification for any
    | user that recently registered with the application. Emails may also
    | be re-sent if the user didn't receive the original email message.
    |
    */

    use VerifiesEmails;

    /**
     * Where to redirect users after verification.
     *
     * @var string
     */
    protected $redirectTo = RouteServiceProvider::HOME;

    /**
     * Create a new controller instance.
     *
     * @return void
     */
    public function __construct()
    {
        $this->middleware('auth');
        $this->middleware('signed')->only('verify');
        $this->middleware('throttle:6,1')->only('verify', 'resend');
    }
}

```

# APPENDIX F

## Working Title Form

Republic of the Philippines
**SOUTHERN LEYTE STATE UNIVERSITY**
Sogod, Southern Leyte
Website: www.slsuonline.edu.ph
Email: slsumaincampus@gmail.com
op@slsuonline.edu.ph Telefax No. (053) 382-3294
***College of Computer Studies and Information Technology***

**Proponents/Researchers:**

| |
|---|
| **1.)** Omatang, Roxanne I. |
| **2.)** Torrecampo, Pablito Jr. P. |
| **3.)** Madora, Jamela O. |
| **4.)** Espultero, Zidric C. |
| **5.)** Tibon, Franzel L. |

**Proposed Project Title:**

**Automated Scheduling for Covid-19 Vaccination in Sogod Southern Leyte**

| | |
|---|---|
| **Submitted by:**<br><br>**Omatang, Roxanne I.**<br>(Signature of Project Manager over printed name)<br><br>Date: **July 4, 2021** | **Noted:**<br><br>**James Brian Flores, PhD, TM** SGD<br>(Signature of Adviser over printed name)<br><br>Date: **July 4, 2021** |
| **Recommending Approval:**<br><br>(Signature of Patent Searcher over printed name)<br><br>Date: **July 4, 2021** | **Approved:**<br><br>**Alex C. Bacalla, DIT**<br>(Signature of Dean over printed name)<br><br>Date: **July 4, 2021** |

# APPENDIX G
## Grammarians' Certification

Republic of the Philippines
**SOUTHERN LEYTE STATE UNIVERSITY**
Sogod, Southern Leyte
Website: www.slsuonline.edu.ph
Email: slsumaincampus@gmail.com, op@slsuonline.edu.ph
Telefax No. (053) 382-3294

***College of Computer Studies and Information Technology***

Date: _____

**G R A M M A R I A N ' S  C E R T I F I C A T E**

This is to certify that the undersigned has reviewed and went through all the pages of the proposal project study / research entitled "Image-Based Baybayin to Tagalog Translator using Deep Learning Algorithm" as against the set of structural rules that governs the composition of sentences, phrases and words in the English language.

Signed:

_____
Grammarian

Conforme:

**Omatang, Roxanne I.**
Project Manager

**APPENDIX H**

**Curriculum Vitae**

**ROXANNE IGAMAO OMATANG**

Ilag, Liloan, Southern Leyte

Cell Number: 09263637235

E-mail Address:

roxanneigamaoomatang@gmail.com

PERSONAL INFORMATION:

| | |
|---|---|
| NICKNAME: | roxy |
| BIRTHDAY: | June 22, 1998 |
| BIRTHPLACE: | Marikina City |
| AGE: | 23 |
| NATIONALITY: | Filipino |
| RELIGION: | Roman Catholic |
| CIVIL STATUS: | Single |
| FATHER'S NAME: | George Runolfo Omatang |
| MOTHER'S NAME: | Marissa Omatang |

EDUCATIONAL BACKGROUND:

| | |
|---|---|
| TERTIARY: | SOUTHERN LEYTE STATE UNIVERSITY |

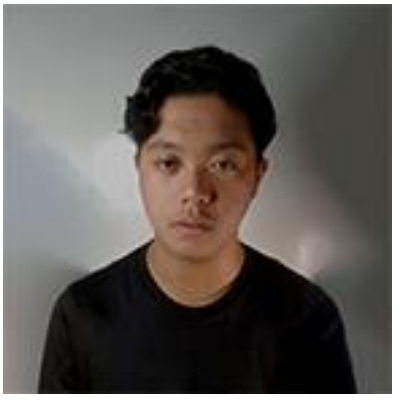
| | |
|---|---|
| | Bachelor of Science in Information Technology |
| | Major in Programming |
| | Sogod, Southern Leyte |
| | Ongoing |
| SECONDARY: | HIMAY-ANGAN NATIONAL HIGH SCHOOL |
| | Himay-Angan, Liloan Southern Leyte |
| | 2014 – 2015 |

**PABLITO TORRECAMPO JR.**

San Isidro, Sogod, Southern Leyte

Cell Number: 0967 563 3445

E-mail Address: pablitojrtorre@gmail.com



PERSONAL INFORMATION:

| | |
|---|---|
| NICKNAME: | Torrexx |
| BIRTHDAY: | March 6, 200 |
| BIRTHPLACE: | Quezon City, NCR |
| AGE: | 21 |
| NATIONALITY: | Filipino |
| RELIGION: | Roman Catholic |
| CIVIL STATUS: | Single |
| FATHER'S NAME: | Pablito E. Torrecampo Sr. |
| MOTHER'S NAME: | Wilma P. Torrecampo |

EDUCATIONAL BACKGROUND:

| | |
|---|---|
| TERTIARY: | SOUTHERN LEYTE STATE UNIVERSITY |
| | Bachelor of Science in Information Technology |
| | Major in Programming |
| | Sogod, Southern Leyte |

Ongoing

SECONDARY: SOUTHERN LEYTE STATE UNIVERSITY

Technical Vocational Livelihood

Information Communication Technology

Sogod, Southern Leyte

2017 - 2018

**JAMELLA O. MADORA**

Dao, Bontoc, Southern Leyte

Cell Number: 09308552120

E-mail Address: jamellamadora018@gmail.com

PERSONAL INFORMATION:

| | |
|---|---|
| NICKNAME: | Jam |
| BIRTHDAY: | May 15, 1999 |
| BIRTHPLACE: | Dao, Bontoc, Southern Leyte |
| AGE: | 22 |
| NATIONALITY: | Filipino |
| RELIGION: | Roman Catholic |
| CIVIL STATUS: | Single |
| FATHER'S NAME: | Abraham F. Banaag |
| MOTHER'S NAME: | Cecelia M. Baaag |

EDUCATIONAL BACKGROUND:

| | |
|---|---|
| TERTIARY: | SOUTHERN LEYTE STATE UNIVERSITY |
| | Bachelor of Science in Information Technology |
| | Major in Programming |
| | Sogod, Southern Leyte |

Ongoing

SECONDARY: SOGOD NATIOAL HIGHSCHOOL

General Academic Strand

2017-2018

**ZIDRIC CAÑON ESPULTERO**

Pangi, Libagon, Southern Leyte

Cell Number: 09355184263

E-mail Address: ziedric121@gmail.com

PERSONAL INFORMATION:

| | |
|---|---|
| NICKNAME: | dingdong |
| BIRTHDAY: | May 28, 1999 |
| BIRTHPLACE: | Pangi, Libagon Southern Leyte |
| AGE: | 22 |
| NATIONALITY: | Filipino |
| RELIGION: | Roman Catholic |
| CIVIL STATUS: | Single |
| FATHER'S NAME: | Lito Espultero |
| MOTHER'S NAME: | Nora Espultero |

EDUCATIONAL BACKGROUND:

| | |
|---|---|
| TERTIARY: | SOUTHERN LEYTE STATE UNIVERSITY |
| | Bachelor of Science in Information Technology |
| | Major in Programming |
| | Sogod, Southern Leyte |

Ongoing

SECONDARY: RITO MONTE de RAMOS SENIOR MEMORIAL NAHAONG NATIONAL HIGH SCHOOL

Nahaong, Libagon, Southern Leyte

2017 – 2018

**FRANZEL LIBAS TIBON**

Pong-on, Bontoc, Southern Leyte

Cell Number: 09362609628

E-mail Address: franzeltibonlibas@gmail.com

PERSONAL INFORMATION:

| | |
|---|---|
| NICKNAME: | Franz |
| BIRTHDAY: | October 05, 1999 |
| BIRTHPLACE: | Pong-on, Bontoc, Southern Leyte |
| AGE: | 22 |
| NATIONALITY: | Filipino |
| RELIGION: | Roman Catholic |
| CIVIL STATUS: | Single |
| FATHER'S NAME: | Francisco Briones Tibon |
| MOTHER'S NAME: | Wilma Libas Tibon |

EDUCATIONAL BACKGROUND:

| | |
|---|---|
| TERTIARY: | SOUTHERN LEYTE STATE UNIVERSITY |
| | Bachelor of Science in Information Technology |
| | Major in Programming |
| | Sogod, Southern Leyte |
| | Ongoing |

SECONDARY: SOGOD NATIONAL HIGH SCHOOL

Zone I, Sogod, Southern Leyte

2017 – 2018

**Glossary**

**Sogodnons –** is the term used when referring to the populace of Sogod, Southern Leyte.

**Priority Eligibility –** is the classification of individuals whom are associated with the COVID-19 Pandemic.

**Pandemic -** a widespread occurrence of an infectious disease over a whole country or the world at a particular time.

**LGU –** Local Government Unit