

Course:

**Information Systems Development Project
CIS 9590 – S3EA [7201] – Summer 2021**

Project Phase 2 Report

“VacLife – Bridging Gaps Between COVID-19 Demand & Supply”

Professor:

Rudolph Brown

Authors:

Team Crocagile

Aarif Munwar Jahan (ammunwar.jahan@baruchmail.cuny.edu)

Jason Sinchi (jason.sinchi@baruchmail.cuny.edu)

Jing Chen (jing.chen11@baruchmail.cuny.edu)

Kristin Singh (kristin.singh@baruchmail.cuny.edu)

Yun Chen (yun.chen4@baruchmail.cuny.edu)

July 18th, 2021

Table of Contents

Executive Summary	3
Section A: Project Information	4
Background.....	4
Assumptions	4
Constraints.....	4
Risks	5
Section B: Analysis.....	6
Decomposition Diagram	6
Business Requirements Document (BRD)	7
Requirements Traceability Matrix (RTM)	11
Section C: Design	12
Architecture Design.....	12
User Interface (UI)	13
Dynamic Model.....	14
Structural Model	15
Section D: Test Cases	20
Section E: Citations/References.....	20
Section F: Appendices	21
Appendix A – Status & Progress Report	21
Appendix B – Lessons Learned Report.....	23
Appendix C – Requirements Traceability Matrix (RTM)	24
Appendix D – Test Cases	25
Appendix E – Project Plan Updates	26
Section G: Integrity Statement & Signature	27
Section H: Meeting Minutes	29

Executive Summary

This report covers documentation for all necessary deliverables for Phase 2 of the CIS 9590 Group Project. The primary objective of this document is to provide include analysis and design documentation for our projects. The report is divided into eight sections as follows:

1. Section A
Covers the project information that includes the project background, assumptions revisions, constraint revisions and risk revisions.
2. Section B
Covers the analysis documentation that includes a decomposition diagram, business requirements document (BRD) and a requirements traceability matrix (RTM)
3. Section C
Covers the design documentation that includes the architectural design, user interfaces (UI), dynamic model and structural model
4. Section D
Lists all test cases for the project requirements
5. Section E
Lists any citations for utilized resources
6. Section F
Appendix section that contains status and progress report, lessons learned report, the details about RTM and test cases and project plan updates
7. Section G
Includes the signed integrity statement from the group
8. Section H
Includes all meeting minutes

Section A: Project Information

Background

Crocagile Inc.'s primary business goal is to provide effective solutions to trending problems. The firm has initiated a project to solve the logistical issues surrounding COVID-19 vaccine demand and supply by creating an all-inclusive platform that allows scheduling vaccine appointments, storing resident information, and managing vaccine inventory. Crocagile's strategic goals include pioneering timely software solutions that generate growth and profits. The VacLife database system project will support these goals by providing a highly on-demand platform at this point of the virus outbreak as vaccine distribution plans are starting to roll out. In addition, a positive outcome in this project will attract significant exposure to the company that will fuel future endeavors.

With no current solutions in the market, the VacLife system has the potential to be one of the firm's greatest successes, especially with big clients like NYC DOH being interested in such a system. The firm is leveraging prior experience in building schedule appointment systems for commercial use and best-in-class project management practices to implement this system successfully.

Assumptions

There have been no revisions to the assumptions log for this phase and the existing assumptions are given below:

1. The market must desire the proposed database platform.
2. The system must pay for itself within the next three quarters from direct revenue growth.
3. The engineering and PMO office must work together as well as with external vendors when necessary.
4. The new system must run on existing hardware and software.
5. The QA team needs to be aware of all technical support requirements.

Constraints

There have been no revisions to the project constraints log for this phase and the existing constraints are given below:

1. The project has an aggressive timeline.
2. The project has a fixed budget that cannot be overrun.
3. The scope of the project is fixed and cannot be reduced further.

Risks

There has been one additional risk added to the project. This risk is a hardware Sourcing risk and is added to number four in the existing risks catalog below:

1. **Technology risk:** Even though the team has prior experience with this technology, the robust project timeline will pose a technology risk. Especially from the testing perspective.
2. **Resource risk:** The project would need immediate and complete focus from the top resources in the firm. Without this allocation, the project would suffer.
3. **Business risk:** The primary business risk is investing time and money into this project and not realizing the projected benefits.
4. **Sourcing risk:** Due to supply chain interruption due to COVID-19, any replacement hardware for the project would see extended lead times. This is currently an industry wide standard risk.

Section B: Analysis

Decomposition Diagram

The following page will contain the decomposition diagram.

VacLife Database System Decomposition Diagram

Crocagile Inc.



Business Requirements Document (BRD)

Requirements document for VacLife

Date: 07/15/21

Revision History

Revision number	Date	Reason for revision	Revised by
1	07/12/21	Initial Draft	K.Singh
2	07/13/21	Add in decomposition diagram	K.Singh
3	07/16/21	Rev1 approved and released	A. Jahan

1. Scope statement

- 1.1. Have ability to search for appointments
- 1.2. Have ability for users to register
- 1.3. Have ability for users to update user information
- 1.4. Have ability for users to create appointments
- 1.5. Have ability for users to change appointments
- 1.6. Have ability for users to cancel appointments
- 1.7. Have ability to suggest appointments to user
- 1.8. Have ability for users to view appointments
- 1.9. Have ability for users to add appointments to system
- 1.10. Have ability for users to delete appointments from system
- 1.11. Have ability for users to view inventory
- 1.12. Have ability for users to edit inventory
- 1.13. Have ability to provide reports for users
- 1.14. Have ability to send reports to users
- 1.15. Have ability for users to view reports

2. Out of scope

- 2.1. There will be no ability to verify insurance information for residents.
- 2.2. There will be no ability for send receive push notifications to users for available appointments.

3. Goals

- 3.1. The goal is to become the best vaccine portal on the market.

4. Objectives

- 4.1. Build a scalable user-friendly website that is simple, secure, and has the ability to handle an infinite number of vaccine appointments.
- 4.2. Build a database system that can handle near real time reporting of vaccination metrics.
- 4.3. Improve the vaccine appointment and inventory process for patients and hospitals.

5. Risks

- 5.1. **Technology risk:** Even though the team has prior experience with this technology, the robust project timeline will pose a technology risk. Especially from the testing perspective.
- 5.2. **Resource risk:** The project would need immediate and complete focus from the top resources in the firm. Without this allocation, the project would suffer.
- 5.3. **Business risk:** The primary business risk is investing time and money into this project and not realizing the projected benefits.
- 5.4. **Sourcing risk:** Due to supply chain disruption due to COVID-19, any replacement hardware for the project would see extended lead times. This is currently an industry wide standard risk.

6. Constraints

- 6.1. The project has an aggressive timeline and needs to finish within three months of initiation
- 6.2. The project has a fixed budget of \$ 80,000 that cannot be overrun.
- 6.3. The scope of the project is fixed and cannot be reduced further

7. Functional requirements

7.1. Registration

- 7.1.1. The system requires the user to enter application information
- 7.1.2. The system will validate the user's application information against existing user information in the system via email address.
- 7.1.3. The system will validate the user's existence via email.
- 7.1.4. The system will create a user account once the user is validated.

7.1.5. The system will allow the user to edit the following account information: username, address, email address, insurance information, and phone number.

7.2. Appointment Search

7.2.1. The system will allow users to enter search terms that contain numbers and letters.

7.2.2. The system will return valid search results related to the search term.

7.2.3. The system will allow users to filter results by vaccine type category.

7.3. Appointment Management

7.3.1. The system shall allow users to add appointments to their account.

7.3.2. The system shall allow users to view appointments and cancel appointments to their account.

7.3.3. The system shall allow users to view appointments and modify appointments to their account.

7.3.4. The system shall suggest appointments to the users based on existing appointments.

7.4. Inventory Management

7.4.1. The system shall allow users to view inventory.

7.4.2. The system shall allow users to add inventory.

7.4.3. The system shall allow users to update inventory.

7.4.4. The system shall allow users to search inventory by entering a search term containing letters and numbers.

7.4.5. The system shall allow users to filter inventory by vaccine type and batch lot.

7.5. Reporting

7.5.1. The system shall create inventory reports.

7.5.2. The system shall create vaccination metric reports.

7.5.3. The system shall allow users to view the reports.

7.5.4. The system shall allow users to send the reports.

7.6. Vaccine Information

7.6.1. The system shall present all eligibility information.

7.6.2. The system shall present all available vaccine information.

8. Nonfunctional requirements

8.1. Response time

8.1.1. The system shall have industry standard response time of less than 5 seconds

8.2. Security

8.2.1. The system shall encrypt all personal information

9. Stakeholders:

9.1. Aarif Jahan – CEO, Project Sponsor

9.2. Kristin Singh – PMO Director, Project Manager

9.3. Jing Chen – Product Designer, Team Member

9.4. Jason Sinchi – Engineer, Team Member

9.5. Yun Chen – Engineer, Team Member

Requirements Traceability Matrix (RTM)

Please refer to Appendix C

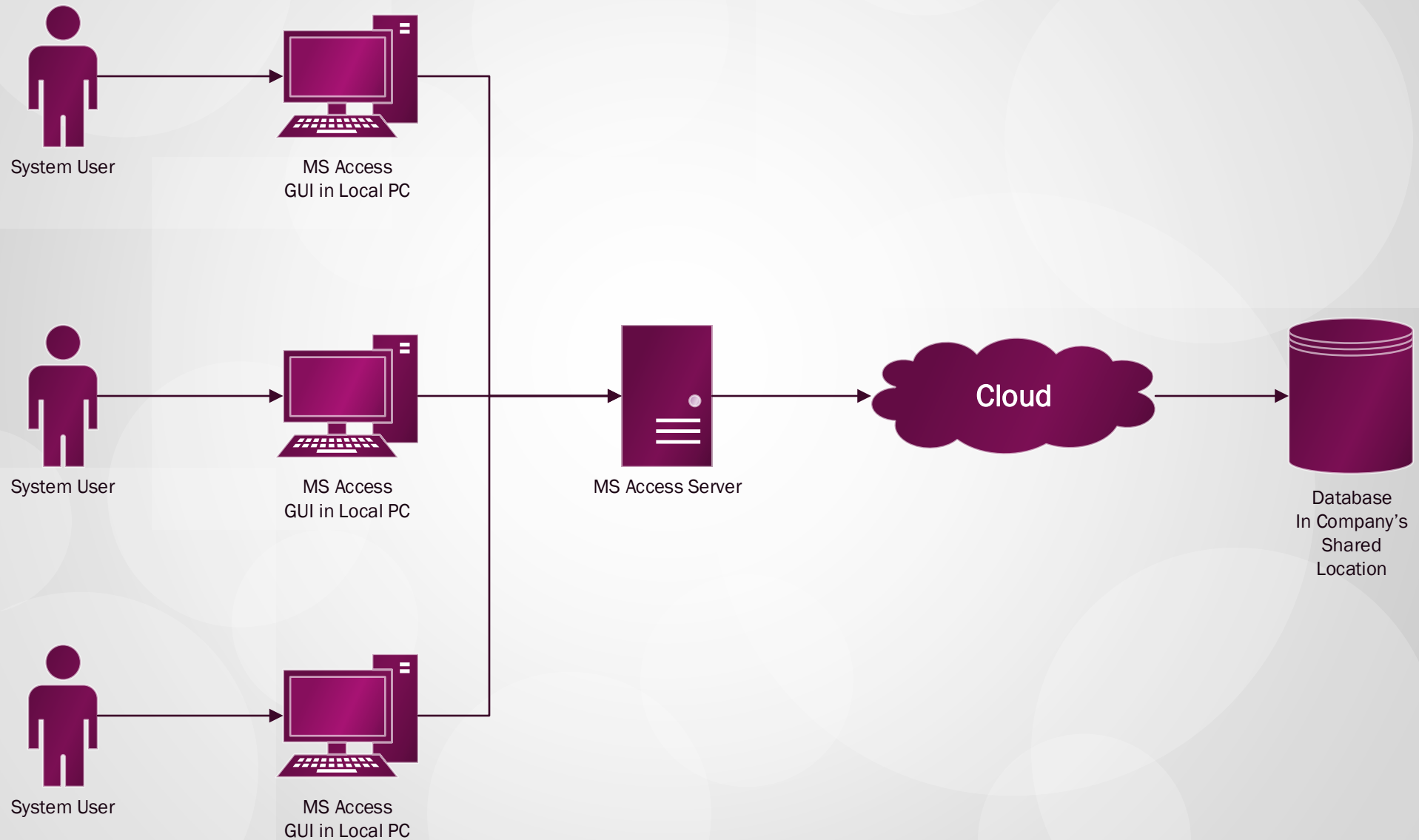
Section C: Design

Architecture Design

The following page will display the network diagram for the VacLife system architecture.

VacLife Database System Network Diagram

Crocagile Inc.



User Interface (UI)

There will be four kinds of forms for the system. They are as follows:

1. **Schedule New Appointment Form** – Single form that allows scheduling of a new appointment. System users add resident, vaccine information and then pick an available appointment slot.
2. **Data Entry Forms** – Multiple supplemental forms corresponding to data entry for resident, vaccine, centers, insurance etc. They follow the same format with all the data entry fields on the left side and a data navigation panel on the right side. An example of a data entry form (Resident Information) is shown as a wireframe later on this section.
3. **Data Selection Forms** – Multiple supplemental forms corresponding to data selection. For example, picking a resident and then picking their insurance or picking a resident and then picking their eligibility criterion. They follow the same format with all the data selection fields on the left side and a data navigation panel on the right side. An example of a data selection form (Resident Insurance Information) is shown as a wireframe later on this section.
4. **Database System Homepage** – This is the homepage of the entire system. The homepage is setup in a navigation form format where the left panel will contain all the different forms divided into appropriate sections and the right panel will display the form that is actively selected from the navigation panel. In addition, the navigation panel will also contain reports generated by any user queries.

The UI wireframes for each of these categories are provided in the following pages in the order of the list above.

Schedule New Vaccine Appointment

<error text>

Appointment Information:

Appointment ID

Select Resident

Select Center

Select Appt. Date

Select Appt. Time Slot

Select Vaccine Type

Select Vaccine Dose

Data Entry Form - Resident Information

<error text>

Resident ID

7

First Name

Elon

Last Name

Musk

Date of Birth

06/28/1971



Gender

Male



Zip Code

17234



Email Address:

elon.musk@tesla.com

Phone Number:



(123)-456-7890

Data Navigation

Add New Resident

Find Resident

Go To Next Record

Go To Previous Record

Submit

Cancel

Data Selection Form - Resident Insurance Selection

<error text>

Select Resident

7

▼

Elon Musk

Select Insurance

3

▼

AETNA PPO

Data Navigation

Make New Selection

Go To Next Record

Go To Previous Record

Submit

Cancel

Navigation Menu

Appointment Forms

Schedule New Appointment

Appointment History

Data Entry Forms

Resident Info

Eligibility Criterion Info

Insurance Info

Vaccination Info

Vaccination Center Info

Inventory Info

Appt. Date Info

Data Selection Forms

Resident Insurance Selection

Resident Eligibility Selection

Reports

Query Report 1

Query Report 2

Schedule New Vaccine Appointment

<error text>

Appointment Information:

Appointment ID

Select Resident

Select Center

Select Appt. Date

Select Appt. Time Slot

Select Vaccine Type

Select Vaccine Dose

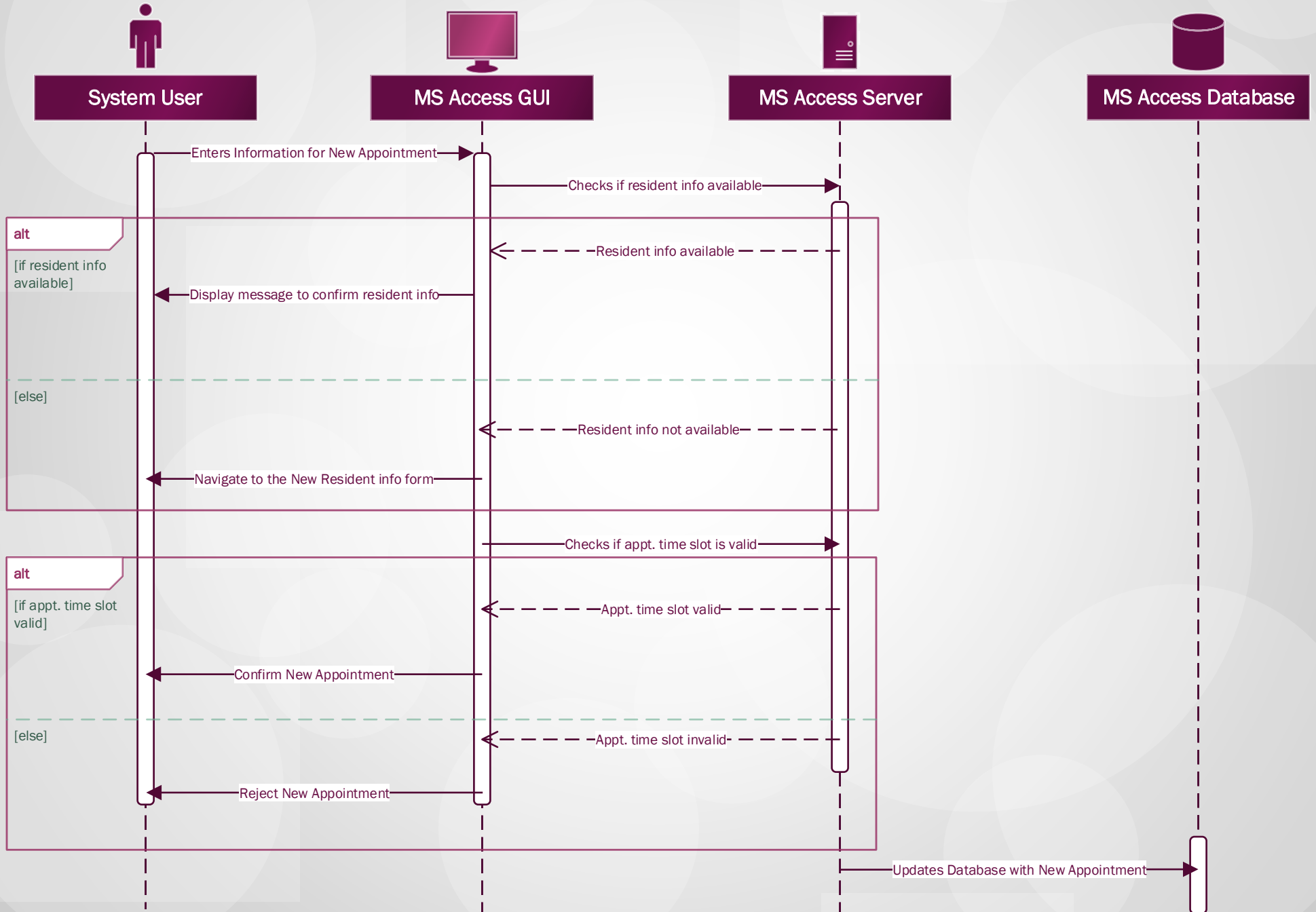
Dynamic Model

The sequence diagrams in the following pages show the high-level logic flow between the subsystems within the three main types of forms in the system:

1. **Schedule New Appointment Form** – Single form
2. **Data Entry Forms** – Multiple forms. “Resident Information” form shown as an example.
3. **Data Selection Forms** – Multiple forms. “Resident Insurance Selection” form shown as an example.

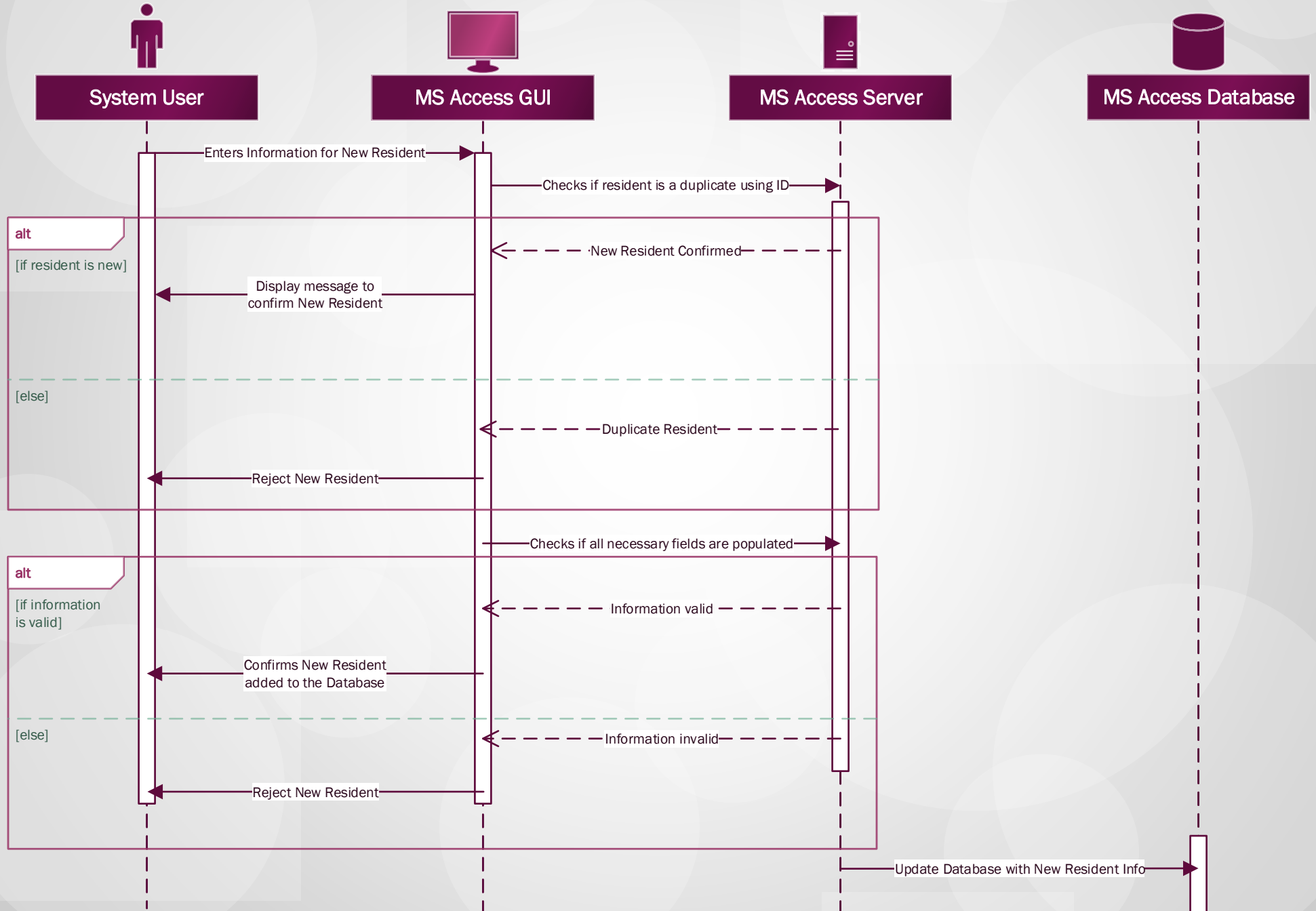
VacLife Database - Sequence Diagram for Scheduling New Appointment

Crocagile Inc.



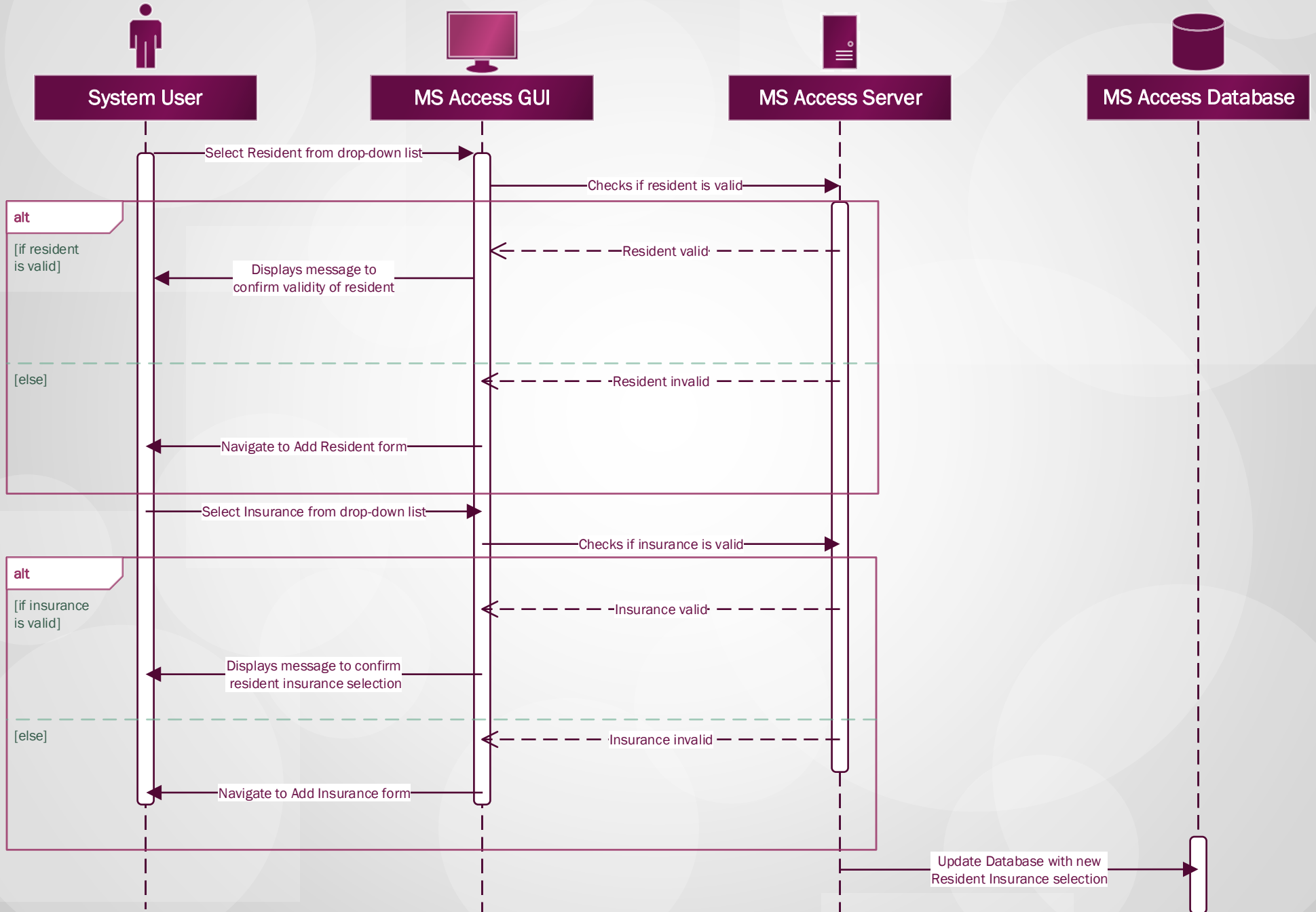
VacLife Database - Sequence Diagram for Data Entry Forms e.g. Resident Information

Crocagile Inc.



VacLife Database - Sequence Diagram for Data Selection Forms e.g. Resident Insurance Selection

Crocagile Inc.



Structural Model

Conceptual Model – Entity Relation Diagram

ERD Statements

(1) Residents – Insurances (**Many to Many**)

- One **Resident** may (0) be insured by one or many (*) **Insurances**
- One **Insurance** must (1) insure one or many (*) **Residents**

(2) Residents – EligibilityCriteria (**Many to Many**)

- One **Resident** may (0) be eligible with one or many (*) **EligibilityCriteria**
- One **EligibilityCriterion** may (0) qualify one or many (*) **Residents**

(3) Residents – Appointments (**One to Many**)

- One **Resident** may (0) obtain one or many (*) **Appointments**
- One **Appointment** must (1) belong to one and only one (1) **Resident**

(4) Appointments – AppointmentDates (**One to Many**)

- One **Appointment** must (1) have one and only one (1) **AppointmentDate**
- One **AppointmentDate** may (0) belong to one or many (*) **Appointments**

(5) Appointments – TimeSlots (**One to Many**)

- One **Appointment** must (1) have one and only one (1) **TimeSlot**
- One **TimeSlot** may (0) belong to one or many (*) **Appointments**

(6) Appointments – Vaccinations (**One to Many**)

- One **Appointment** must (1) provide one and only one (1) **Vaccination**
- One **Vaccination** may (0) belong to one or many (*) **Appointments**

(7) VaccinationCenters – Appointments (**One to Many**)

- One **VaccinationCenter** may (0) provide one or many (*) **Appointments**
- One **Appointment** must (1) be located at one and only one (1) **VaccinationCenter**

(8) VaccinationCenters – Vaccinations (**Many to Many**)

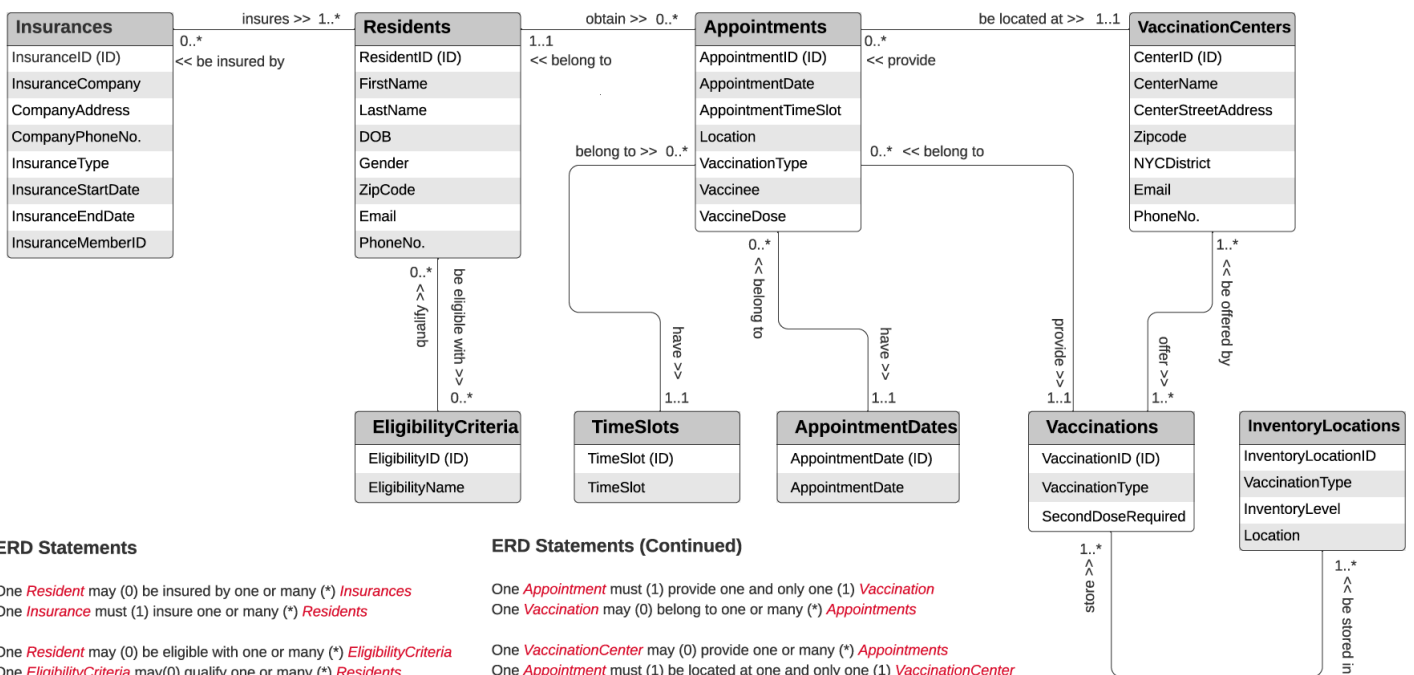
- One **VaccinationCenter** must (1) offer one or many (*) **Vaccinations**
- One **Vaccination** may (0) be offered by one or many (*) **VaccinationCenters**

(9) Vaccinations – InventoryLocations (**Many to Many**)

- One **Vaccination** must (1) be stored in one or many (*) **InventoryLocations**
- One **InventoryLocation** must (1) store one or many (*) **Vaccination**

Entity-Relationship Diagram

"VacLife - Bridging gaps between COVID-19 vaccine demand and supply"



ERD Statements

One **Resident** may (0) be insured by one or many (*) **Insurances**
 One **Insurance** must (1) insure one or many (*) **Residents**

One **Resident** may (0) be eligible with one or many (*) **EligibilityCriteria**
 One **EligibilityCriteria** may(0) qualify one or many (*) **Residents**

One **Resident** may (0) obtain one or many (*) **Appointments**
 One **Appointment** must (1) belong to one and only one (1) **Resident**

One **Appointment** must (1) have one and only one (1) **AppointmentDate**
 One **AppointmentDate** may (0) belong to one or many (*) **Appointments**

One **Appointment** must (1) have one and only one (1) **TimeSlot**
 One **TimeSlot** may (0) belong to one or many (*) **Appointments**

ERD Statements (Continued)

One **Appointment** must (1) provide one and only one (1) **Vaccination**
 One **Vaccination** may (0) belong to one or many (*) **Appointments**

One **VaccinationCenter** may (0) provide one or many (*) **Appointments**
 One **Appointment** must (1) be located at one and only one (1) **VaccinationCenter**

One **VaccinationCenter** must (1) offer one or many (*) **Vaccinations**
 One **Vaccination** may (0) be offered by one or many (*) **VaccinationCenters**

One **Vaccination** must (1) be stored in one or many (*) **InventoryLocations**
 One **InventoryLocation** must (1) store one or many (*) **Vaccinations**

Logical Model – Conversion to Relational Model and Normalization

Converting to Relations (1NF)

Method:

- One to Many Relationships
 - Primary key of entity on the 'One' side is copied to the entity on the 'Many' side as Foreign key
- Many to Many Relationships
 - A new associative relation is created with the primary keys of both entities. This allows for the breakdown of the 'Many to Many' relationship into multiple 'One to Many' relationships
- One to One Relationships [Not present in our ERD]
 - Primary key of one entity is copied to the other entity as Foreign Key. The decision is generally arbitrary but might be based on repeating business rules

Using the method and the ERD statements from Section C, the conceptual model is converted into a logical model with the created relations as follows:

- 1) **Residents** (*ResidentID (PK), FirstName, LastName, DateOfBirth, Gender, ZipCode, Email, PhoneNo*)
Primary Key ResidentID
- 2) **Insurances** (*InsuranceID (PK), InsuranceCompany, InsuranceCompanyAddress, CompanyPhoneNo., InsuranceType, InsuranceStartDate, InsuranceEndDate, InsuranceMemberID*)
Primary Key InsuranceID
- 3) **Appointments** (*AppointmentID (PK), AppointmentDateID (FK), TimeSlotID (FK), VaccinationID (FK), VaccineDose, CenterID (FK), ResidentID (FK)*)
Primary Key AppointmentID
Foreign Key CenterID **references** VaccinationCenter(CenterID)
Foreign Key ResidentID **references** Residents(ResidentID)
Foreign Key VaccinationID **references** Vaccinations(VaccinationID)
Foreign Key AppointmentDateID **references** AppointmentDates(AppointmentDateID)
Foreign Key TimeSlotID **references** TimeSlots(TimeSlotID)
- 4) **VaccinationCenters** (*CenterID (PK), CenterName, CenterStreetAddress, ZipCode, NYCDistrict, Email, PhoneNo*)
Primary Key CenterID
- 5) **Vaccinations** (*VaccinationID (PK), VaccinationType, SecondDoseRequired?*)
Primary Key VaccinationID
- 6) **InventoryLocation** (*InventoryLocationID (PK), InventoryLevel, Location*)
Primary Key InventoryLocationID
- 7) **EligibilityCriteria** (*EligibilityID (PK), EligibilityName*)

Primary Key EligibilityID

8) **AppointmentDates** (AppointmentDateID (PK), AppointmentDate)

Primary Key AppointmentDateID

9) **TimeSlots** (TimeSlotID (PK), TimeSlot)

Primary Key TimeSlotID

10) **Residents_Insurances** (ResidentID (PK) (FK), InsuranceID (PK) (FK))

Primary Key ResidentID, InsuranceID

Foreign Key ResidentID **references** Residents(ResidentID)

Foreign Key InsuranceID **references** Insurances(InsuranceID)

11) **Residents_EligibilityCriteria** (ResidentID (PK) (FK), EligibilityID (PK) (FK))

Primary Key ResidentID, EligibilityID

Foreign Key ResidentID **references** Residents(ResidentID)

Foreign Key EligibilityID **references** EligibilityCriteria(EligibilityID)

12) **InventoryLocation_Vaccinations** (InventoryLocationID (PK) (FK), VaccinationID (PK) (FK))

Primary Key InventoryLocationID, VaccinationID

Foreign Key InventoryLocationID **references** InventoryLocations(InventoryLocationID)

Foreign Key VaccinationID **references** Vaccinations(VaccinationID)

13) **VaccinationCenters_Vaccinations** (CenterID (PK) (FK), VaccinationID (PK) (FK))

Primary Key CenterID, VaccinationID

Foreign Key CenterID **references** VaccinationCenters(CenterID)

Foreign Key VaccinationID **references** Vaccinations(VaccinationID)

1NF achieved: Converting all entities into relations and verifying consistent data types, unique rows and other 1NF conditions ensures that the data has achieved 1NF.

Functional Dependencies

2NF achieved: Since sequential primary keys were used for all relations, there are no partial functional dependencies among these relations. Therefore, the data has automatically achieved 2NF.

1) **Residents** (ResidentID (PK), FirstName, LastName, DateOfBirth, Gender, ZipCode, Email, Phone.No.)

Primary Key ResidentID

i) FD1: ResidentID → FirstName, LastName, DateOfBirth, Gender, ZipCode, Email, PhoneNo.
(Full FD)

2) **Insurances** (InsuranceID (PK), InsuranceCompany, InsuranceCompanyAddress, CompanyPhoneNo, InsuranceType, InsuranceStartDate, InsuranceEndDate)

Primary Key InsuranceID

i) FD1: InsuranceID → InsuranceCompany, InsuranceType, InsuranceStartDate, InsuranceEndDate (Full FD)

- ii) FD2: InsuranceCompany → InsuranceCompanyAddress, CompanyPhoneNo (Transitive FD)
- 3) **Appointments** (AppointmentID (PK), AppointmentDateID (FK), TimeSlotID (FK), VaccinationID (FK), VaccineDose, ResidentID (FK), CenterID (FK))
 - Primary Key** AppointmentID
 - Foreign Key** CenterID references VaccinationCenter(CenterID)
 - Foreign Key** ResidentID references Residents(ResidentID)
 - i) FD1: AppointmentID → AppointmentDateID, TimeSlotID, VaccinationID, Vaccine Dose, CenterID, ResidentID (Full FD)
- 4) **VaccinationCenter** (CenterID, CenterName, CenterStreetAddress, ZipCode, NYCdistrict, Email, PhoneNo)
 - Primary Key** CenterID
 - i) FD1: CenterID → Center Name (Full FD)
 - ii) FD2: CenterName → CenterStreetAddress, ZipCode, Email, PhoneNo (Transitive FD)
 - iii) FD3: ZipCode → NYCdistrict (Transitive FD)
- 5) **Vaccinations** (VaccinationID (PK), VaccinationType, SecondDoseRequired?)
 - Primary Key** VaccinationID
 - i) FD1: VaccinationID → VaccinationType (Full FD)
 - ii) FD2: VaccinationType → SecondDoseRequired? (Transitive FD)
- 6) **InventoryLocation** (InventoryLocationID, VaccineType, InventoryLevel, Location)
 - Primary Key** Inventory LocationID
 - i) FD1: InventoryLocationID → VaccineType, InventoryLevel, Location (Full FD)
- 7) **EligibilityCriteria** (EligibilityID (PK), EligibilityName)
 - Primary Key** EligibilityID
 - i) FD1: EligibilityID → EligibilityName (Full FD)
- 8) **AppointmentDates** (AppointmentDateID (PK), AppointmentDate)
 - Primary Key** AppointmentDateID
 - i) FD1: AppointmentDateID → AppointmentDate (Full FD)
- 9) **TimeSlots** (TimeSlotID (PK), TimeSlot)
 - Primary Key** TimeSlotID
 - i) FD1: TimeSlotID → TimeSlot (Full FD)

Final Tables in 3NF (No Partial Dependencies, Removing all Transitive Dependencies)

- 1) **Residents** (ResidentID (PK), FirstName, LastName, DOB, Gender, ZipCode, Email, PhoneNo)
 - Primary Key** ResidentID
- 2) **Insurances** (InsuranceID (PK), InsuranceCompany (FK), InsuranceType, InsuranceStartDate, InsuranceEndDate, InsuranceMemberID)
 - Primary Key** InsuranceID
 - Foreign Key** InsuranceCompany references InsuranceCompany(InsuranceCompany)

- 3) **InsuranceCompany** (InsuranceCompany(PK), InsuranceCompanyAddress, CompanyPhoneNo)
Primary Key InsuranceCompany
- 4) **Appointments** (AppointmentID (PK), AppointmentDateID (FK), TimeSlotID (FK), VaccinationType (FK), CenterID (FK), ResidentID (FK))
Primary Key AppointmentID
Foreign Key CenterID **references** VaccinationCenter(CenterID)
Foreign Key ResidentID **references** Residents(ResidentID)
Foreign Key VaccinationType **references** VaccinationType(VaccinationType)
Foreign Key AppointmentDateID **references** AppointmentDates(AppointmentDateID)
Foreign Key TimeSlotID **references** TimeSlots(TimeSlotID))
- 5) **AppointmentDates**(AppointmentDateID (PK), AppointmentDate)
Primary Key AppointmentDateID
- 6) **TimeSlots**(TimeSlotID (PK), TimeSlot)
Primary Key TimeSlotID
- 7) **VaccinationCenter** (CenterID (PK), CenterName (FK), ZipCode (FK))
Primary Key CenterID
Foreign Key CenterName **references** VaccinationCenterName(CenterName)
Foreign Key ZipCode **references** ZipCode(ZipCode)
- 8) **VaccinationCenterName** (CenterName (PK), CenterStreetAddress, Email, PhoneNo)
Primary Key CenterName
- 9) **ZipCode** (ZipCode (PK), NYCdistrict)
Primary Key ZipCode
- 10) **Vaccinations** (VaccinationID (PK), VaccinationType (FK))
Primary Key VaccinationID
Foreign Key VaccinationType **references** VaccinationType(VaccinationType)
- 11) **VaccinationType** (VaccinationType (PK), SecondDoseRequired)
Primary Key VaccinationType
- 12) **InventoryLocation** (InventoryLocationID (PK), InventoryLevel, Location)
Primary Key InventoryLocationID
- 13) **EligibilityCriteria** (EligibilityID (PK), EligibilityName)
Primary Key EligibilityID
- 14) **Residents_Insurances** (ResidentID (PK) (FK), InsuranceID (PK) (FK))
Primary Key ResidentID, InsuranceID
Foreign Key ResidentID **references** Residents(ResidentID)
Foreign Key InsuranceID **references** Insurances(InsuranceID)

15) **Residents_EligibilityCriteria** (*ResidentID (PK) (FK), EligibilityID (PK) (FK)*)

Primary Key ResidentID, EligibilityID

Foreign Key ResidentID **references** Residents(*ResidentID*)

Foreign Key EligibilityID **references** EligibilityCriteria(*EligibilityID*)

16) **InventoryLocation_Vaccinations** (*InventoryLocationID (PK) (FK), VaccinationID (PK) (FK)*)

Primary Key InventoryLocationID, VaccinationID

Foreign Key InventoryLocationID **references** InventoryLocations(*InventoryLocationID*)

Foreign Key VaccinationID **references** Vaccinations(*VaccinationID*)

17) **VaccinationCenters_Vaccinations** (*CenterID (PK) (FK), VaccinationID (PK) (FK)*)

Primary Key CenterID, VaccinationID

Foreign Key CenterID **references** VaccinationCenters(*CenterID*)

Foreign Key VaccinationID **references** Vaccinations(*VaccinationID*)

3NF achieved: After removing all the transitive dependencies from the dataset by splitting relations where necessary, the data has achieved 3NF and is ready for physical model in this project.

Section D: Test Cases

Please refer to Appendix D

Section E: Citations/References

Schwalbe, K. (2019). *Information technology project management*. Course Technology, Cengage Learning.

Jahan, A. M., Wong, E., Chen, S. F., Worotikan, G., & Chen, K. Y. (2021). (rep.). *Final Report - VacLife*. New York, New York: Self.

Section F: Appendices

Appendix A – Status & Progress Report

Project Title:	VacLife - Phase II	Reporting Period Start Date:	7/8/2021
Project Team:	Crocagile	Reporting Period End Date:	7/18/2021
Prepared by:	Jason Sinchi	Date prepared:	7/18/2021

Project Status				
Indicate status of each project metrics				
Metrics	Green (On-track)	Yellow (At risk)	Red (Off-track)	Comment
Scope	Yes			At this point we don't predict any changes to our scope
Schedule	Yes			Future processes captured accurately and have not changed since Phase I
Cost	Yes			Funds accurately allocated and have not changed since Phase I; positive Cost Variance
Quality	Yes			Clear quality assurance definitions to ensure best quality product

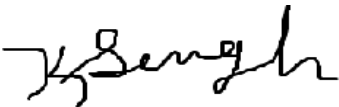
Tasks completed this reporting period				
Indicate all tasks completed during the reporting period.				
Team Member	Tasks Completed	Date Completed	Number of Tasks	% of Total Tasks
Aarif Munwar Jahan	Design Docs Create Presentation	7/17/2021	3 (2 with Jason)	30%
Jason Sinchi	Design Docs	7/17/2021	2(with Aarif)	20%
Jing Chen	Test Cases	7/17/2021	1(with Yun)	10%
Kristin Singh	Analysis Docs	7/17/2021	3	30%
Yun Chen	Test Cases	7/17/2021	1(with Jing)	10%
Total Tasks			10	100%

Tasks planned for next reporting period
Indicate all tasks planned for the next reporting period.
For the next phase we will begin the process to implement our system.

Change Control		
Indicate any major change planned and/or completed during the reporting period.		
Change Description/Impact	Responsible Person	Completion Or Due Date
N/A		

Issues Log				
List any issue impacting the project during the reporting period.				
#	Description/Impact	Status	Assigned to	Date Resolved
		1. Open 2. Work in Progress 3. Resolved 4. No Action Needed		
	N/A			

Project Team Members Names and Digital Signature:

Name (print)	Signature	Date
Jason Sinchi	Jason Sinchi	7/18/2021
AARIF MUNWAR JAHAN	ammunwarjahan	7/18/2021
Kristin Singh		7/18/2021
Yun Chen	Yun Chen	7/18/2021
Jing Chen	Jing Chen	7/18/2021

Appendix B – Lessons Learned Report

#	Statement
	<p>What things the team did well?</p> <p>Similar to the previous Phase, we communicated effectively and answered any questions that other group members had.</p>
2.	<p>What things the team did not do well and why?</p> <p>We had a lot more work to do, in terms of the deliverable, in a shorter amount of time. This was because we were also focusing on other class deliverables and started to work on Phase II afterwards.</p>
3.	<p>What things and how the team plans to improve for the next deliverable?</p> <p>For the next deliverable we hope to communicate even more often, just to maintain the consistency that we currently have.</p>

Complete the table with the most appropriate responses.

Appendix C – Requirements Traceability Matrix (RTM)

Requirements Traceability Matrix (RTM)

Req.ID	Requirement Name	Requirement Type	Priority	WBS ID	Test Case ID	Estimation	Status	Assigned To	Implemented? (Yes/No)
FR 8.1	Resident Registration	Functional	High	31, 36	801.1 to 801.5	2.5	Not Started	Engineer	No
FR 8.2	Appointment Lookup	Functional	High	30, 36	802.1 to 802.3	2.5	Not Started	J. Sinchi	No
FR 8.3	Appointment Scheduling	Functional	High	30, 36	803.1 to 803.4	2.5	In Progress	J. Sinchi	No
FR 8.4	Inventory Management	Functional	High	33, 36	804.1 to 804.5	2.5	Not Started	Y. Chen	No
FR 8.5	Reporting	Functional	High	34, 36	805.1 to 805.4	2.5	Not Started	J. Sinchi	No
FR 8.6	Vaccine Information	Functional	High	32, 36	806.1, 806.2	2.5	Not Started	Y. Chen	No
NFR 9.1	Response Time	Non-functional	High	29, 35	901.1	3	Not Started	Engineer, Y.Chen	No
NFR 9.2	Security	Non-functional	High	37	902.1	2	Not Started	Engineer	No

Appendix D – Test Cases

Test Cases Table

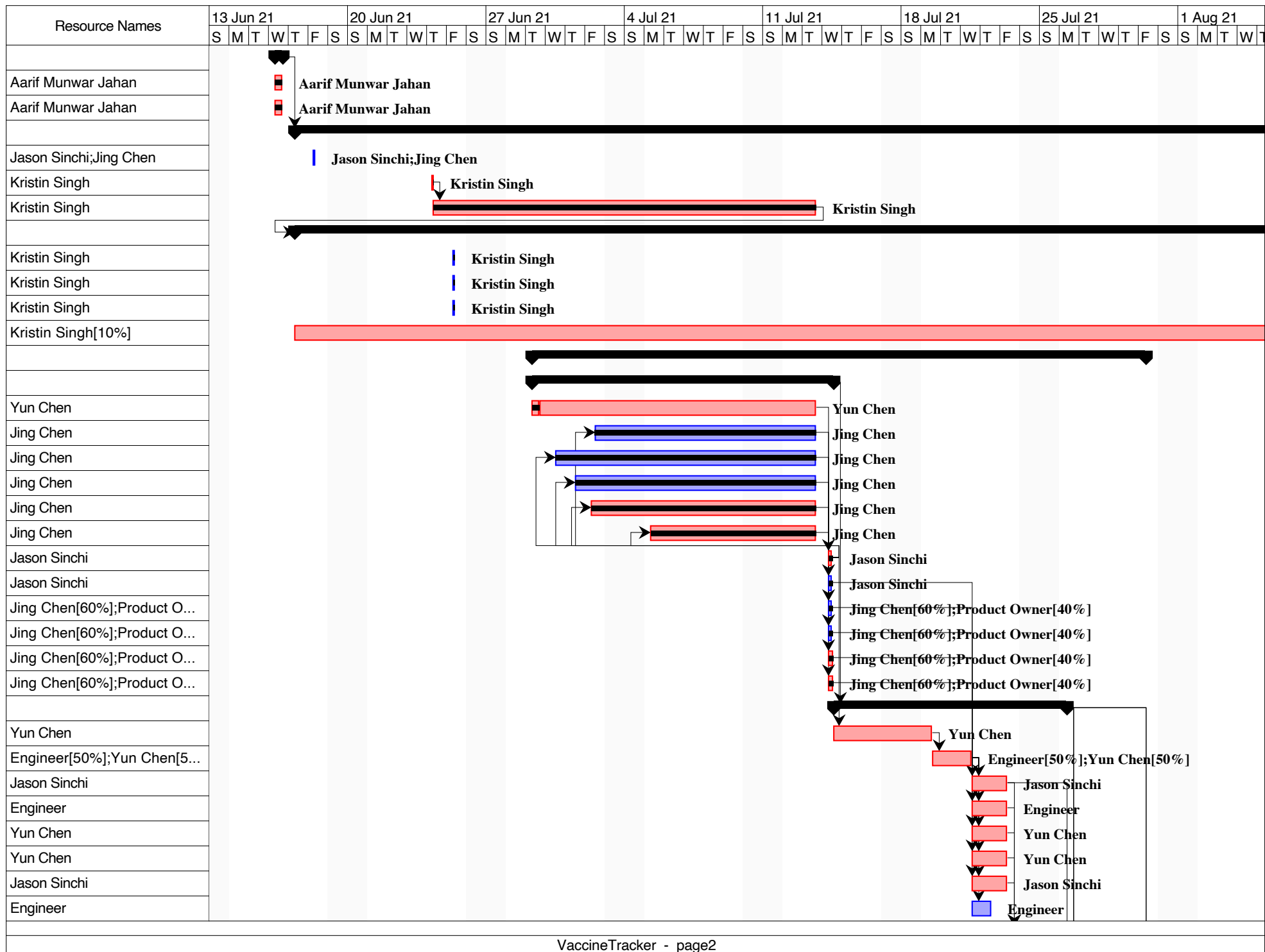
Test Case ID	Test Element	Test Case Description	Req. ID
TC801.1	Registration - Application Information & Account Information	Checking and validating the system allows the user to enter application information	FR 8.1.1
TC801.2		Checking and validating the system validating the user's application information against existing user information in the system via email address.	FR 8.1.2
TC801.3		Checking and validating the user's existence via email.	FR 8.1.3
TC801.4		Checking and validating the system creating a user account once the user is validated	FR 8.1.4
TC801.5		Checking and validating the system allowing the user to edit the following account information: username, address, email address, insurance information, and phone number.	FR 8.1.5
TC802.1	Appointment Lookup - Search Term & Vaccine Type Category	Checking and validating the system allowing users to enter search terms that contain numbers and letters.	FR 8.2.1
TC802.2		Checking and validating the system returning valid search results related to the search term	FR 8.2.2
TC802.3		Checking and validating the system allowing users to filter results by vaccine type category	FR 8.2.3
TC803.1	Appointment Scheduling - Appointment Editing	Checking and validating the system allowing users to add appointments to their account	FR 8.3.1
TC803.2		Checking and validating the system allowing users to view appointments and cancel appointments to their account.	FR 8.3.2
TC803.3		Checking and validating the system allowing users to view appointments and modify appointments to their account.	FR 8.3.3
TC803.4		Checking and validating the system suggesting appointments to the users based on existing appointments	FR 8.3.4
TC804.1	Inventory Management - Inventory	Checking and validating the system allowing users to view inventory	FR 8.4.1
TC804.2		Checking and validating the system allowing users to add inventory	FR 8.4.2
TC804.3		Checking and validating the system allowing users to update inventory	FR 8.4.3
TC804.4		Checking and validating the system allowing users to search inventory by entering a search term containing letters and numbers.	FR 8.4.4
TC804.5		Checking and validating the system allowing users to filter inventory by vaccine type and batch lot	FR 8.4.5
TC805.1	Reporting - inventory report & vaccination metric report	Checking and validating the system creating inventory reports	FR 8.5.1
TC805.2		Checking and validating the system creating vaccination metric reports	FR 8.5.2
TC805.3		Checking and validating the system allowing users to view the reports	FR 8.5.3
TC805.4		Checking and validating the system allowing users to send the reports	FR 8.5.4

TC806.1	Vaccine Information	Checking and validating the system presenting all eligibility information	FR 8.6.1
TC806.2		Checking and validating the system presenting all available vaccine information	FR 8.6.2
TC901.1	Response Time	Checking and validating the system having industry standard response time of less than 5 seconds	NFR 9.1.1
TC902.1	Security	Checking and validating the system encrypting all personal information	NFR 9.2.1



Appendix E – Project Plan Updates

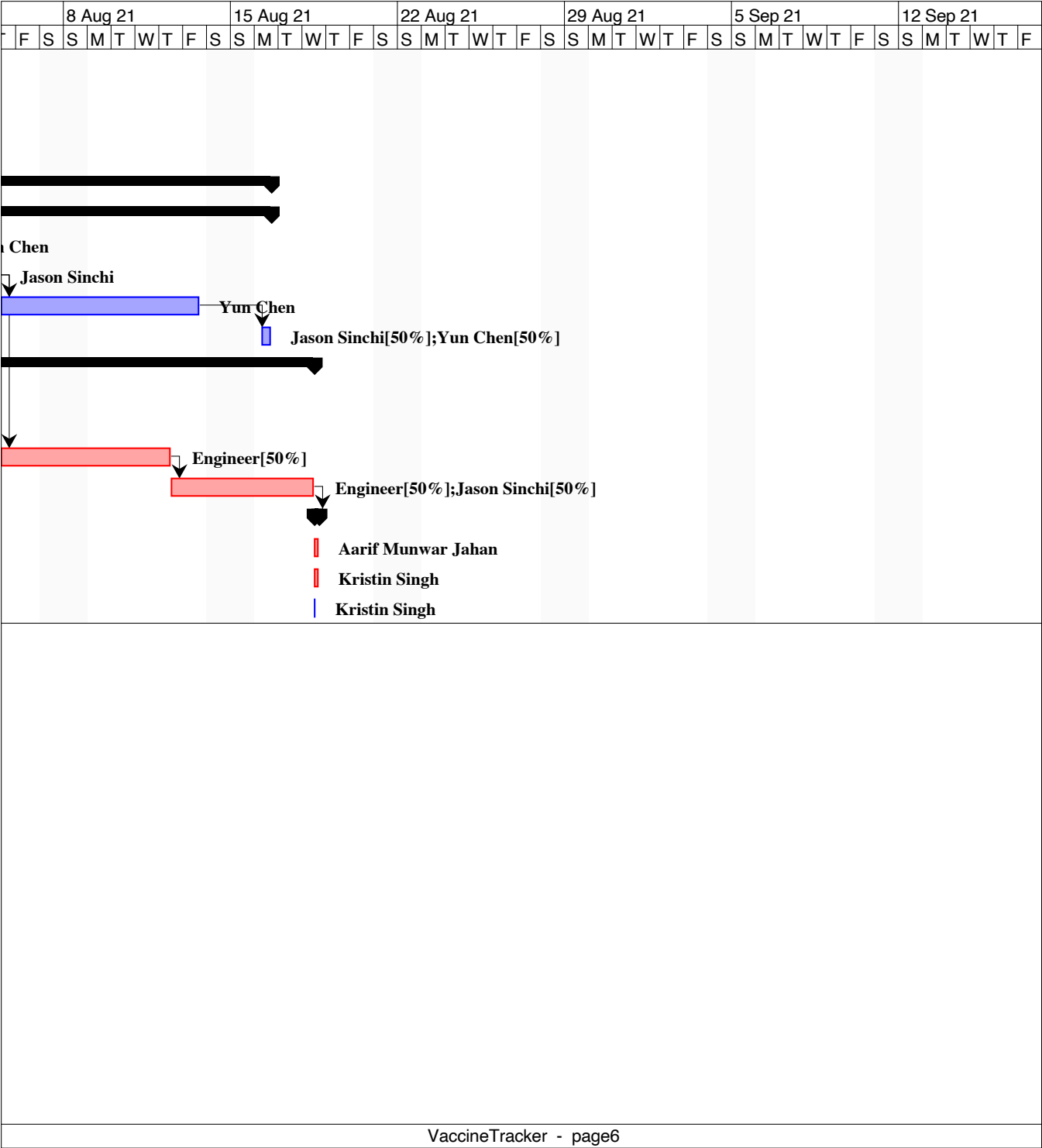
The following pages contain updates to the project plan and Gantt charts.

		Name	Duration	Start	Finish	Predecessors
1	 	Initiation	1 day?	6/16/21 8:00 AM	6/16/21 5:00 PM	
2	 	Stakeholder Identification	1 day?	6/16/21 8:00 AM	6/16/21 5:00 PM	
3	 	Project Charter	1 day?	6/16/21 8:00 AM	6/16/21 5:00 PM	
4		Planning	40 days?	6/17/21 8:00 AM	8/11/21 5:00 PM	1
5		Project Management Plan	0.02 days?	6/18/21 8:00 AM	6/18/21 8:09 AM	
6	 	Team Planning Meeting	0.062 days?	6/24/21 8:00 AM	6/24/21 8:30 AM	
7		Scope Statement	13.938 days?	6/24/21 8:30 AM	7/13/21 5:00 PM	6
8		Schedule and Cost Ba...	40 days?	6/17/21 8:00 AM	8/11/21 5:00 PM	7
9	 	Task Resources	0.25 days?	6/25/21 8:30 AM	6/25/21 10:30 AM	
10		Task Durations	0.25 days?	6/25/21 8:30 AM	6/25/21 10:30 AM	
11		Task Dependencies	0.25 days?	6/25/21 8:30 AM	6/25/21 10:30 AM	
12		Risk Prioritization	40 days?	6/17/21 8:00 AM	8/11/21 5:00 PM	
13		Executing	23.1 days?	6/29/21 8:00 AM	7/30/21 8:48 AM	
14		Design	11.6 days?	6/29/21 8:00 AM	7/14/21 1:48 PM	
15		Design Data Architecture	11 days?	6/29/21 8:00 AM	7/13/21 5:00 PM	
16	 	Design Scheduling Portal	7.5 days?	7/2/21 12:00 PM	7/13/21 5:00 PM	21
17	 	Design Resident Portal	9.5 days?	6/30/21 12:00 PM	7/13/21 5:00 PM	21
18	 	Design Vaccine Inform...	8.5 days?	7/1/21 12:00 PM	7/13/21 5:00 PM	21
19	 	Design Vaccine Invent...	8 days?	7/2/21 8:00 AM	7/13/21 5:00 PM	21
20	 	Design Report Portal	7 days?	7/5/21 8:00 AM	7/13/21 5:00 PM	21
21		Approve Data Architec...	0.5 days?	7/14/21 8:00 AM	7/14/21 1:00 PM	15
22		Approve Scheduling Po...	0.5 days?	7/14/21 8:00 AM	7/14/21 1:00 PM	16
23		Approve Resident Port...	0.5 days?	7/14/21 8:00 AM	7/14/21 1:00 PM	17
24		Approve Vaccine Infor...	0.5 days?	7/14/21 8:00 AM	7/14/21 1:00 PM	18
25		Approve Vaccine Inve...	0.6 days?	7/14/21 8:00 AM	7/14/21 1:48 PM	19
26		Approve Report Portal...	0.6 days?	7/14/21 8:00 AM	7/14/21 1:48 PM	20
27		Build	7.5 days?	7/14/21 1:48 PM	7/26/21 8:48 AM	14
28		Build DDL	3 days?	7/14/21 1:48 PM	7/19/21 1:48 PM	21
29		Build Data Processes	2 days?	7/19/21 1:48 PM	7/21/21 1:48 PM	28
30		Build Scheduling Portal	1.5 days?	7/21/21 1:48 PM	7/23/21 8:48 AM	22;29
31		Build Resident Portal	1.5 days?	7/21/21 1:48 PM	7/23/21 8:48 AM	23;29
32		Build Vaccine Informati...	1.5 days?	7/21/21 1:48 PM	7/23/21 8:48 AM	24;29
33		Build Vaccine Inventor...	1.5 days?	7/21/21 1:48 PM	7/23/21 8:48 AM	25;29
34		Build Report Portal	1.5 days?	7/21/21 1:48 PM	7/23/21 8:48 AM	26;29
35		Unit Testing Data	1 day?	7/21/21 1:48 PM	7/22/21 1:48 PM	29



8 Aug 21							15 Aug 21							22 Aug 21							29 Aug 21							5 Sep 21							12 Sep 21								
F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
<div><div></div><div></div><div>Kristin Singh[10%]</div></div>																																											
VaccineTracker - page3																																											

		Name	Duration	Start	Finish	Predecessors
36		Unit Test Portal	1 day?	7/23/21 8:48 AM	7/26/21 8:48 AM	30;31;32;33;34
37		Security Feature	1 day?	7/14/21 1:48 PM	7/15/21 1:48 PM	
38		Testing	4 days?	7/26/21 8:48 AM	7/30/21 8:48 AM	27
39		Test Portal Integration...	4 days?	7/26/21 8:48 AM	7/30/21 8:48 AM	30
40		Deployment	11.9 days?	7/30/21 8:48 AM	8/16/21 5:00 PM	27
41		Full Rollout	11.9 days?	7/30/21 8:48 AM	8/16/21 5:00 PM	27
42		Deploy Data Architecture	2 days?	7/30/21 8:48 AM	8/3/21 8:48 AM	38
43		Implement Portals	2 days?	8/3/21 8:48 AM	8/5/21 8:48 AM	42
44		Monitoring Usage	6.9 days?	8/5/21 8:48 AM	8/13/21 5:00 PM	43
45		Analyze Performance	1 day?	8/16/21 8:00 AM	8/16/21 5:00 PM	44
46		Support	17.4 days?	7/26/21 8:48 AM	8/18/21 1:00 PM	27
47		Technical Documentation	2 days?	7/26/21 8:48 AM	7/28/21 8:48 AM	
48		Training	1 day?	7/28/21 8:48 AM	7/29/21 8:48 AM	47
49		User Support	5.4 days?	8/5/21 8:48 AM	8/12/21 1:00 PM	43
50		Enhancements	4 days	8/12/21 1:00 PM	8/18/21 1:00 PM	49
51		Closing	0.5 days?	8/18/21 1:00 PM	8/18/21 5:00 PM	50
52		Final Project Report	0.5 days?	8/18/21 1:00 PM	8/18/21 5:00 PM	
53		Final Project Presentation	0.5 days?	8/18/21 1:00 PM	8/18/21 5:00 PM	
54		Final Project Retro	0.125 days?	8/18/21 1:00 PM	8/18/21 2:00 PM	



Section G: Integrity Statement & Signature

Project Name: VacLife – Bridging Gaps Between COVID-19 Vaccine Supply and Demand	Project Team: Crocagile
---------------------------------------------------------------------------------------------------	------------------------------------------

Code of Conduct: As a project team, we will:

- Work together, prevent any problems, and constructively and respectfully resolve any differences.
- Keep all team members fully informed of any project related information.
- Always consider what is within the best interest of the entire project team.
- Prepare and submit all work in a neat, organized, and professional manner, and will represent work performed by the team, and not copied or done by other people.
- Conduct all project work in an ethical and honest manner, and not place the project and team members at risk with any preach in policies on academic dishonesty.

Participation: We will:

- Participate equally, fully, and honestly in all project activities and duties.
- Always work together to provide the highest quality deliverables, with each member fulfilling their responsibilities and providing the highest quality work.
- Encourage diversity in our work and be open to new ideas and ways of doing things.
- Inform the team in advance when individual members are unable to make a meeting or may have an issue completing a given task on time.

Communication: We will:

- Determine as a team, the best ways, and times to communicate, using the most appropriate effective communication method and meeting options available to all team members.
- Keep all discussions focused on the project and present all ideas and thoughts in a manner that will benefit the entire team.
- Work together to meet our project schedule and deliver all work on time.

Problem Solving: We will:

- Give everyone the opportunity to participate in solving problems.
- Provide constructive feedback, and focus on resolving any issues, and not blame or criticize anyone.
- Aim to build on each other's ideas and suggestions.

Meeting Guidelines: We will:

- Plan to meet as needed, face-to-face or virtual, at a time convenient to each member
- Include all team members in all meetings, and equally and willingly share information and duties during each meeting.
- Record our meeting minutes in a Team Meeting Log and distribute them to the team in a timely manner, clearly identifying the decisions made and action items.

Project Team Members Names and Sign-off:

Name (print)	Sign-off on Team Contract	Date
AARIF MUNWAR JAHAN	ammunwarjahan	07/17/21
JASON SINCHI	Jason Sinchi	07/17/2021
KRISTIN SINGH		07/16/2021
YUN CHEN	Yun Chen	07/17/2021
JING CHEN	Jing Chen	07/17/2021

Section H: Meeting Minutes

Meeting 1

Meeting/Project Title:	VacLife - Phase II	Group Name/No.	Crocagile
Meeting Date: (MM/DD/YY)	07/08/21	Start Time:	10pm
Meeting Type:	Face-to-Face __ / Virtual _X_	End Time:	10:30pm
Facilitator:	Aarif Munwar Jahan	Minutes Taker:	Jason Sinchi
1. Meeting Objective			
<p>For our first meeting our objectives were as follows:</p> <ul style="list-style-type: none"> Go over the deliverable Finish documentation by 7/15 Finish slides by 7/17 Finish presentation by 7/18 <p>We set reasonable dates to complete each of these tasks. We hope to conduct another Zoom call on 6/12 to get a status update on everyone's part.</p>			
2. Attendance			
Name	In Attendance (Y/N)	Reason for Absence	
Jason Sinchi	Y		
Aarif Munwar Jahan	Y		
Jing Chen	Y		
Yun Chen	Y		
Kristin Singh	Y		
3. Agenda, Decisions, Issues			
Discussion Notes			Discussion led by
Discussed action items and set dates for our future meetings.			All group members
4. Action Item/Task Assigned			
Activity	Assigned To	Due Date	
Complete parts assigned to each group member.	All group members	7/15/2021	
5. Next Meeting			
Date:	7/12/2021	Time:	10:15PM
Meeting Type:	Face-to-Face ____ / Virtual _X_		
Objective:	Go over tasks due by the next meeting. Discuss the project deliverables and any questions between our group.		

Project Team Members Names and Signature:

Name (print)	Signature	Date
Jason Sinchi	Jason Sinchi	7/8/2021
Aarif Munwar Jahan	Ammunwarjahan	7/8/2021
Kristin Singh		7/8/2021
Yun Chen	Yun Chen	7/8/2021
Jing Chen	Jing Chen	7/8/2021

Meeting 2

Meeting/Project Title:	VacLife - Phase II	Group Name/No.	Crocagile
Meeting Date: (MM/DD/YY)	07/12/21	Start Time:	10:15pm
Meeting Type:	Face-to-Face ___ / Virtual X	End Time:	10:30pm
Facilitator:	Aarif Munwar Jahan	Minutes Taker:	Jason Sinchi
1. Meeting Objective			
We had a status report for this meeting which was checked to ensure that our information was consistent with each of our parts.			
2. Attendance			
Name	In Attendance (Y/N)	Reason for Absence	
Jason Sinchi	Y		
Aarif Munwar Jahan	Y		
Jing Chen	Y		
Yun Chen	Y		
Kristin Singh	Y		
3. Agenda, Decisions, Issues			
Discussion Notes			Discussion led by
We agreed to have our parts done by the 15th and will hold a Zoom call to go over anything.			All group members
4. Action Item/Task Assigned			
Activity	Assigned To	Due Date	
Executive Summary, Business Case, Project Charter	Aarif Munwar Jahan	7/15/2021	
Project Management Plan	Jing Chen	7/15/2021	
Project Management Plan	Jason Sinchi	7/15/2021	
Stakeholder Register, Stakeholder Management	Yun Chen	7/15/2021	
Project Plan	Kristin Singh	7/15/2021	
5. Next Meeting			
Date:	7/15/2021	Time:	10pm
Meeting Type:	Face-to-Face ___ / Virtual X		
Objective:	To come together as a group and discuss any issues encountered when completing our tasks. Getting ready to discuss how we are going to format our presentation and preparing a date to record our presentation for submission.		

Project Team Members Names and Signature:

Name (print)	Signature	Date
Jason Sinchi	Jason Sinchi	7/12/2021
Aarif Munwar Jahan	Ammunwarjahan	7/12/2021
Kristin Singh		7/12/2021
Yun Chen	Yun Chen	7/12/2021
Jing Chen	Jing Chen	7/12/2021

Meeting 3

Meeting/Project Title:	VacLife - Phase II	Group Name/No.	Crocagile
Meeting Date: (MM/DD/YY)	07/15/21	Start Time:	10pm
Meeting Type:	Face-to-Face __ / Virtual X __	End Time:	10:30pm
Facilitator:	Aarif Munwar Jahan	Minutes Taker:	Jason Sinchi
1. Meeting Objective			
Crocagile met to discuss our next steps in creating our PowerPoint presentation. We were talking about the number of slides needed to present, what to present, and who will present them.			
2. Attendance			
Name	In Attendance (Y/N)	Reason for Absence	
Jason Sinchi	Y		
Aarif Munwar Jahan	Y		
Jing Chen	Y		
Yun Chen	Y		
Kristin Singh	Y		
3. Agenda, Decisions, Issues			
Discussion Notes			Discussion led by
Discuss action items for our PowerPoint presentation.			All group members
Assign presentation roles for each member.			All group members
4. Action Item/Task Assigned			
Activity		Assigned To	Due Date
Populate slides in the PowerPoint		All group members	7/17/2021
5. Next Meeting			
Date:	7/18/2021	Time:	12pm
Meeting Type:	Face-to-Face ____ / Virtual X __		
Objective:	To have our PowerPoint ready to start recording our presentation.		

Project Team Members Names and Signature:

Name (print)	Signature	Date
Jason Sinchi	Jason Sinchi	7/15/2021
AARIF MUNWAR JAHAN	Ammunwarjahan	7/15/2021
Kristin Singh		7/15/2021
Yun Chen	Yun Chen	7/15/2021
Jing Chen	Jing Chen	7/15/2021

Meeting 4

Meeting/Project Title:	VacLife - Phase II	Group Name/No.	Crocagile
Meeting Date: (MM/DD/YY)	07/18/21	Start Time:	12pm
Meeting Type:	Face-to-Face __ / Virtual _X_	End Time:	2pm
Facilitator:	Aarif Munwar Jahan	Minutes Taker:	Jason Sinchi
6. Meeting Objective			
Crocagile met to finalize our PowerPoint and start recording our presentation.			
7. Attendance			
Name	In Attendance (Y/N)	Reason for Absence	
Jason Sinchi	Y		
Aarif Munwar Jahan	Y		
Jing Chen	Y		
Yun Chen	Y		
Kristin Singh	Y		
8. Agenda, Decisions, Issues			
Discussion Notes			Discussion led by
Record our presentation.			All group members
9. Action Item/Task Assigned			
Activity	Assigned To	Due Date	
Record our presentation.	All group members	7/18/2021	
10. Next Meeting			
Date:	N/A	Time:	N/A
Meeting Type:	Face-to-Face ____ / Virtual ____		
Objective:	N/A		

Project Team Members Names and Signature:

Name (print)	Signature	Date
Jason Sinchi	Jason Sinchi	7/18/2021
AARIF MUNWAR JAHAN	Ammunwarjahan	7/18/2021
Kristin Singh		7/18/2021
Yun Chen	Yun Chen	7/18/2021
Jing Chen	Jing Chen	7/18/2021