**Back End Developer – Final Project Proposal**

**Project Participants:**

David Goldberg

**Title:**

Infectious Diseases – Contact Tracing Interface

**Executive Summary:**

This project is to build an interface for interacting with a public health contact tracing database. The user plays the role of a public health contact tracer in an epidemic, storing data in a database as they conduct interviews and record data. The user will save/read/update/delete Case information, Individual information for personal information, lists of person-to-person Contacts tied to a specific case, as well as a table of Variants and Tests that are referenced in the Case information.

In the course of researching a case, the user will need to record and upload Individual information, and get an ID number in return. Then the user will record Case details, including the patient’s ID number. Then, the user will record the Contact details, the results of phone interviews with people the patient came in contact with.

**Initial Features:**

Table of Variants: (Create, Read)

* Index (Autogenerate) [PK]
* Variant Code
* Disease Name
* Infectious Time Range (days)

Table of Tests: (Create, Read)

* Index (Autogenerate) [PK]
* Test Name
* Variant [FK]
* Valid Exposure Time Range Min (days)
* Valid Exposure Time Range Max (days)

Table of Cases: (Create, Read, Update, Delete)

* Index (Autogenerate) [PK]
* Variant Identified [FK]
* Date Detected
* Date of Exposure (if known)
* Location of Exposure (if known)
* Test Method [FK]
* Patient ID [FK]
* Notes

Table of Individuals: (Create, Read, Update, Delete)

* ID Number [PK]
* Name
* Date of Birth
* Phone
* Home Address

Table of Exposures / Contact Tracing: (Create, Read, Update, Delete)

* Index (Autogenerate) [PK]
* Case Number [FK]
* Date
* Location
* Contact Individual ID Number [FK]
* Notes

### Allow User To: User Stories, example URL endpoints

As a User, I’d like to add case details, and return a case number

/case/add?Variant=%s&Date=%s&PatientID=%s&TestMethod=%s&DateOfExposure=%s&LocationOfExposure=%s&Notes=%s

As a User, I’d like to input a case number, and return case details

/case/view?CaseID=%s

As a User, I’d like to search for cases by Patient ID

/case/view?PatiendID=%s

As a User, I’d like to search for cases by Variant and Date Range, returning results and a count

/case/view?Variant=%s&StartDate=%s&EndDate=%s

As a User, I’d like to add Individual personal details, and get an Individual ID in return

/individual/add?Name=%s&DateOfBirth=%s&Phone=%s&Address=%s

As a User, I’d like to view individual details, inputting an ID number

/individual/view?ID=%s

As a User, I’d like to add Contact details and return a contact ID

/contact/add?CaseNumber=%s&Date=%s&Location=%s&ContactID=%s&Notes=%s

As a User, I’d like to view details for a single contact

/contact/view?ContactID=%s

As a User, I’d like to update details for a contact

/contact/update?ContactID=%s& ((optional parameters depending on what is listed))

As a User, I’d like to delete a contact

/contact/delete?ContactID=%s

As a User, I’d like to return all contacts connected to a Case ID

/contact/search?CaseID=%s

As a User, I’d like to return all contacts connected to a Contact Individual ID (all contacts by an individual.)

/contact/search?ContactIndividualID=%s

As a user, I’d like to Search Contacts – input case number

/contact/search?CaseID=%s

As a user, I’d like to Search Cases – input Patient Number

/case/search?CaseIndividualID=%s

### Minimum Viable Product:

Variants (Read)

Cases (Create)

Individuals (Create)

Contacts (Create, Read, Update, Delete)

1-to-many relationship: Cases – Contacts (One case can have multiple associated contacts)

Many-to-many relationship: Variants – Individuals (Joined by Cases)

### Stretch Goals:

?Should fields be input as Strings and then converted to corresponding types in table? Dates should be stored as dates, so different formats can be interpreted in the interface(?)

?Use Views for protected PII information?

?Should records be allowed to be deleted in the database, or flagged for archive?

### Expand tables to CDC recommendations. They were used as a guide, but the project could be expanded.

### CRUD operations for every table, with rules as to what type of user can access what type of operation.

Table of Authorized Users:

* Access Key
* Access Level
* Per Table Access Level? Limit view access to Individual Info table, for privacy
* Name

Table of Database Transactions:

* Index (Autogenerate)[PK]
* Date
* Access Key
* Valid Access– T/F
* Operation Log

Front-End Web Interface

Contact Tracing Education SQL puzzle – find patient Zero. Prepare sample data set, and additional tables like Interview Responses, and Actual Infections that can be used to act the role of a Contact Tracer and find patient Zero.

Resources

<https://www.cdc.gov/coronavirus/2019-ncov/php/contact-tracing/contact-tracing-plan/data-management.html>