

NAME : UGBECHIE VALENTINE CHINONSO  
MATTIC NUMBER: 18/ENG08/023  
DEPARTMENT: BIOMEDICAL ENGINEERING  
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COURSE CODE: ENG 224

## INTRODUCTION

**COVID-19** is the most recent pandemic in the world. Which is caused by a virus called **CORONA VIRUS**. A pneumonia of unknown cause detected in Wuhan, China was first reported to the WHO Country Office in China on 31 December 2019.

People may be sick with the virus for 1 to 14 days before developing symptoms. The most common symptoms of coronavirus disease (COVID-19) are fever, tiredness, dry cough and difficulty in breathing (in severe cases). Most people (about 80%) recover from the disease without needing special treatment.

More rarely, the disease can be serious and even fatal. Older people, and people with other medical conditions (such as asthma, diabetes, or heart disease), may be more vulnerable to becoming severely ill.

The new coronavirus is a respiratory virus which spreads primarily through droplets generated when an infected person coughs or sneezes, or through droplets of saliva or discharge from the nose. To protect yourself, clean your hands frequently with an alcohol-based hand rub or wash them with soap and water.

## CONCEPTUALIZATION

The biggest problem about this deadly virus is the rate at which it's spreads with so much ease. At the time of writing this report the world recorded 1,805,367 active cases, 110,936 deaths and 412,789 recovery. Medical personals such as doctor, nurses are having restless days and sleepless nights to manage the pandemic and ensure that the spread of the virus doesn't escalate. This has resulted us to rely on Computer Technology to make life easier and less complicated for us. The **COVID-DETECTOR KIT (CDK)** which consists of a **SMART THERMOMETER AND A WEB BASED APPLICATION** which is intended to collect a patients data and approves on who gets tested and treated.

The **CDK** is designed to perform the following functions;

The **SMART THERMOMETER** is paired with a **WEB BASED APPLICATION**, which aggregates a persons temperature and symptoms data. To determine if an individual could be positive for the virus by looking out for the major infection symptoms such as difficulty in breathing, tiredness, pressure in the chest and so on.

The data gathered from its **smart thermometer** could help to predict future **COVID-19** outbreaks by relying on the data it has collected for years to determine what can be expected from a normal cold and flu season. The model takes what is currently being seen — a spike in illness — and subtracts the "norm." What they're left with is an anomaly, which can be correlated to coronavirus.

The system is not saying, 'This is COVID'; it's saying, This outbreak isn't normal. therefore, the test kits (**CDK**) should be sent in.

The mission is to curb the spread of infectious illness through early detection. The smart thermometer is a means to an end,

If you want to know where disease is spreading, you have to know the symptoms. The best way was to piggyback off a tool [people] already had. However, when it comes to identifying infectious disease outbreaks, more information is always better. I think the more information we have that can raise potential flags for the public health system to respond to, the better off we'll be. Given the severity of the consequences of this infection and the

spread of this pandemic, it's important to err on the side of caution and try to investigate clusters of fevers.

The model **CDK** uses to predict coronavirus outbreaks tracks the proportion of the population that is susceptible, and infected, respectively over time. It then looks at the corresponding rate at which individuals transition from being susceptible to becoming infected, and the rate at which they recover or are removed from the infected state.

Using that model, **CDK** predicts a flu outbreak 20 weeks in advance and on a city-by-city basis, which could be a game changer in the fight against coronavirus. Based on the fact that We have limited tests, we have limited ICU beds; we have limited ventilators. The point here is that we need to triage, we need to allocate resources where they're most needed. If you see fever clusters rising, that's where you send test kits. By doing this, there is a considerable reduction in the pressure in hospitals. As people around the country stay home and practice social distancing, **CDK** is just another tool health-care officials can use in the fight to minimize an outbreak.

## **SPECIFICATIONS**

### ➤ **User Registration**

1. Personal data input
  - Full name
  - Sex
  - Age
  - Phone number
  - Resident Address
  - Identification document (e.g National ID)
2. E-mail address input field
3. Password input field
4. Accept Terms & Conditions checkbox
5. Submit button
6. Save user to database

### ➤ **Login**

1. Phone number / E-mail address input field
2. Password input field
3. Login button
4. Load user from database
5. Log user into system

### ➤ **Logout**

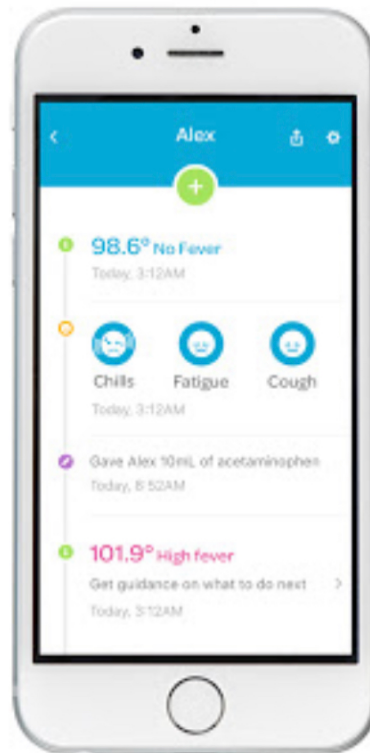
1. Logout Button
2. Clear session
3. Prevent account theft

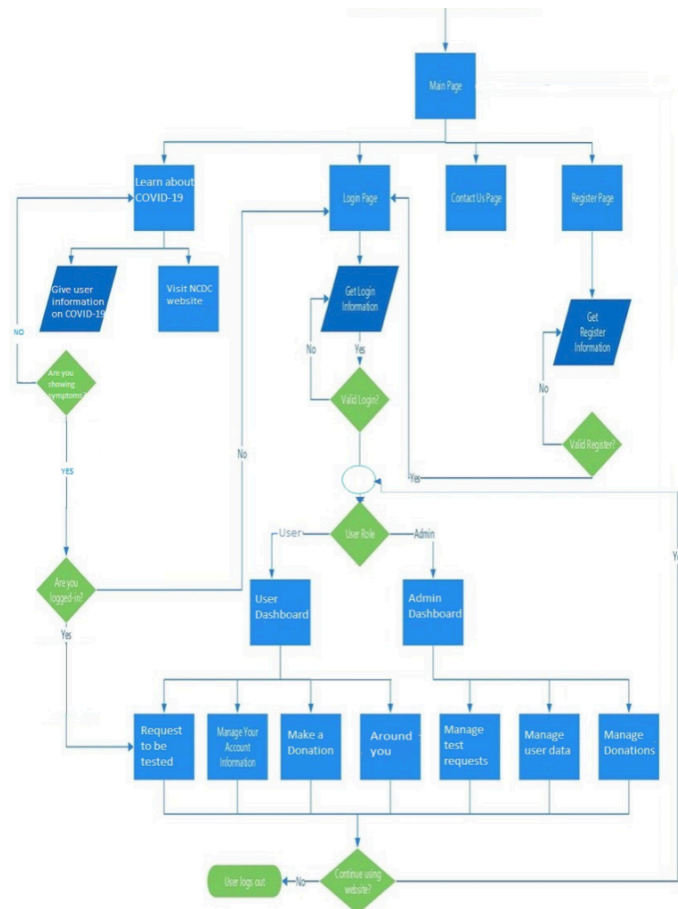
### ➤ **Dashboard**

1. Main home page
2. New users should redirect here
  - Upload medical data (sex, genotype, blood type, genetic diseases, disabilities, medical history)
  - Notification settings (request to receive COVID-19 news and updates)
  - Existing users should redirect here after login
  - Request for COVID-19 test (where users take the COVID-19 symptoms survey)
  - Learn about COVID-19

- How to prevent infection
- Around you (gives notifications on new cases, etc and displays cases in your immediate surroundings, country or the world)
- Contact emergency hotline
- Donate to combat the pandemic
- Update profile

APPLICATION LOGO DESIGN of **CDK**





**Design:**

*Algorithm (to be tested):*

1. START,
2. LOGIN,
3. DASHBOARD,
4. REQUEST FOR TEST,
5. ANSWER SURVEY,
6. IF POSITIVE,
7. PRINT "Your request has been processed and you are a candidate for COVID-19. Emergency services have been contacted and will shortly arrive at your address"
8. ELSE,

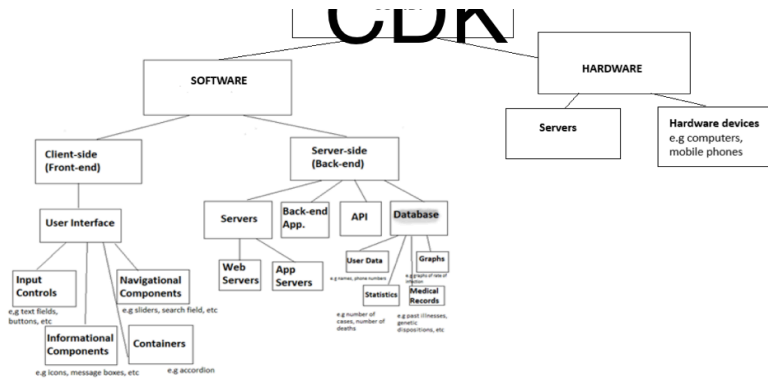
9. PRINT "Your request has been processed and there is a high possibility you are negative to the virus. For more info, visit our main page."

10. STORE DATA

11. TRANSMIT TO MAIN DATABASE

12. END

## TOP-DOWN DESIGN



## Implementation

### 1.) Physical Hardware

Supported Client Devices:

The CDR web app supports all types of mobile phones, tablets, laptops and desktops across all popular operating systems.

### Server

Supermicro 820J 20 DP SuperBlade



## Specifications

8U 20 Blade,  
Dual Xeon Scalable,  
16 DIMMs,  
SBI-4129P-T3N (2x 2.5" NVMe+ 1 SATA or 3 SATA), SBI-4129P-C2N (2 NVMe/SAS/SATA) Dual 10G NIC ports,  
8 2200W power supply

### ➤ User Interface Design

The user interface will be designed using HTML and JavaScript on SublimeText

### ➤ Backend Design

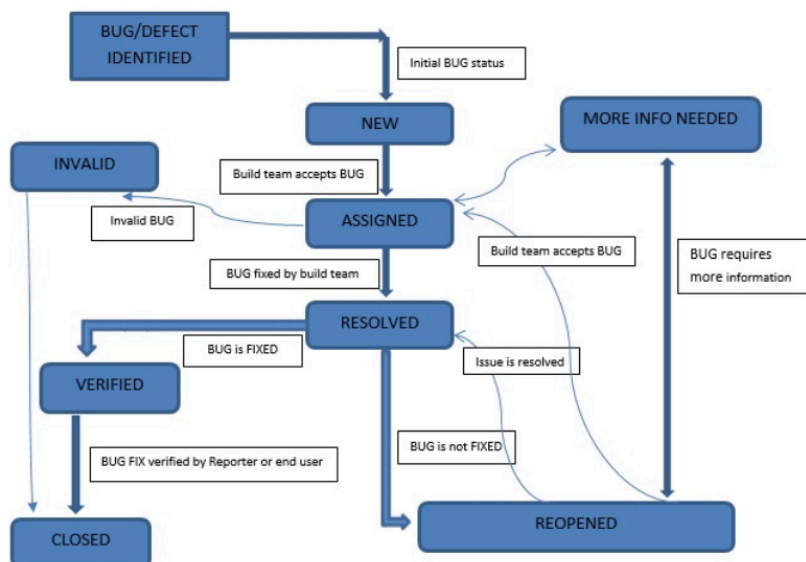
The backend will be coded using Python on Pycharm and the Database Management System (DBSM) will run on SQL with adequate security measures and restrictions put in place.

## Testing and Debugging

After development and servers and databases have been set up and hosted locally, the app is then extensively tested for breaches in security and privacy, errors and bugs in code to ensure that all functionalities work as expected and validate that all requirements and specifications have been met.

All this will be done using the bug life cycle.

**BUG LIFE CYCLE Diagram:**



**Release and Update**

CDK is expected to be deployed and hosted on the proposed URL (<http://www.CDK.com>) a month after the development starts.

It is intended to be maintained and monitored frequently. User complaints and issues will also be attended to and resolved with little delay.