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**COURSE TITLE: STRUCTURE COMPUTER PROGRAMMING**

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**SOFTWARE DEVELOPMENT CYCLE**

The software development cycle is a 6 step cycle involved in designing application software. The steps are conceptualization, specification, design, implementation, testing and debugging and release and update. The software development cycle for the building of a web application (app) named **COVID Smart Clinic** is extensively discussed below**.**

1. **CONCEPTUALIZATION**

Building of a web application (app)

This app will give its users a general knowledge of corona virus (COVID19) and a brief understanding of what’s really going on and why we have to be careful and stay indoors. It will also be able to control the pandemic without physical contact but still try as much as possible to be feasible in the design making i.e. to make it realistic as possible with the aim of being able to create awareness, self-preventive measures to build up your immune system.

1. **SPECIFICATION**

The speciation of the web application includes the hardware and software modules.

HARDWARE MODULES

The Hardware modules for the web app are listed below.

* Gps receiver
* Camera
* Compass
* Bluetooth Radio
* Emergency vehicles.

SOFTWARE MODULES

The software modules for the web app are listed below.

* Graphic User Interface (GUI)
* Network and Internet services
* Hardware level of operating system
* Graphics Engines
* Error detection system
* Scanner
* LED display
1. **DESIGN**

The design of the program COVID Smart Clinic has a front and using languages like html, javascript, css in other to make the interface and to add functionalities.

All data would be transmitted to a database, managed and structured like SQL and PHP database.

The interface i.e. the platform for which anyone will be able to log in is shown below. This is basically just showing a pictorial representation of the app.

WELCOME

TO

COVID SMART CLINIC

 LOG OUT

i

I

SELF TEST

INFORMATION PAGE

Q & A

GERM DETECTOR

LOG OUT

The contexts are shown below and the hardware and software features are critically discussed.

**INFORMATION PAGES**

The information pages include awareness, symptoms/ spread of the virus, preventive and measures/ treatment

**AWARENESS**

HISTORY OF COVID 19

What is coronavirus?

The coronavirus family causes illness ranging from common cold, flu And to more severe acute respiratory syndrome (SARS) and the middle East Respiratory Syndrome (MERS). They circulate in animals and have made the jump to humans.

The causative name of the virus is the Severe Acute Respiratory Syndrome 2 (SARS-coV 2) on 11 February 2020. And now referred to as the coronavirus disease 2019 (COVID- 19)

It was first discovered in a wet market in Wuhan city Hubei province, china which both sold dead and live animals including fish and birds. Late December 2019 the first cases in china where gotten from animal to human transmission. Before it was later observed that the virus was transmitted from human to human. This led to the wild spread of the virus.

BIOLOGICAL BACKGROUND

The Animal source of COVID 19 has not yet been discovered but its original host is thought to be bats, bats are not legally sold in Wuhan China but may infected other animal being sold there (intermediate host). Bats are host to a wide range of zoonotic Viruses including ebola, HIV and rabies.

The virus is known to have two stages; mild stages which can be conquer by self-medication and severe stages which leads to severe illness and if fatal death.

DEATH RATE/ MAP LAYOUT

The death rate simply is the total number of deaths recorded daily and it will be updated on the application on a daily basis. The map layout is a world map that shows countries affected with the virus, it will be updated on the app whenever a country has its first case of corona virus

**SYMPTOMS/ SPREAD OF THE VIRUS**

People may be sick with the virus for 1-14 days before developing symptoms.

 Symptoms may include;

* Cough
* Fever
* Tiredness
* Difficulty breathing (severe cases)

Some patients may have pains and aches, nasal congestion, running nose and diarrhea. These symptoms are usually mild and begin gradually.

The virus is mainly transmitted through droplets generated when an infected person coughs, sneezes or speaks. These droplets are too heavy to hang in the air, they quickly fall on floors or surfaces. You can be infected by breathing in the virus if you are within 1 metres of a person who has covid-19 Or by touching a contaminated surface and then touching your eyes, nose or mouth before washing your hands.

**PREVENTIVE MEASURES/ TREATMENT**

Increase personal hygiene by

* Washing your hands regularly for 20 secs with alcohol based hand rub or soap and water.
* Cover your nose and mouth with a disposable tissue or flexed elbow when you cough or sneeze.
* Avoid close contact (1 meter or 3 feet) with people who are on well.
* Stay home and self isolate your self from others in the household if you feel unwell.
* Don’t touch your eyes, nose, or mouth when your hands are dirty.
* Self distancing and 14days isolation

SELF CARE

Practice self-care if you have mild symptoms stay at home until you have recovered. The site will give you tips on a daily basic on how build up your immune system, and also follow up questionnaire to ensure your self care is working for you if not call for emergency vehicle will be sent for you.

* Rest and sleep
* Keep warm
* Drink plenty of liquid
* Use a room humidifier and take hot showers to help ease a sore throat and cough.
* Take vitamin c to boost your immune system.

MEDICAL CARE

There is no specific treatment for diseases caused by coronavirus, however many of the symptoms can be treated and therefore treatment based on the patient’s clinical conditions. Moreover supportive care for infected person’s can be highly effective.

**SELF TEST:**

QUESTIONNAIRE

Various questions will be asked based on the symptoms of the virus to know your health condition.

The site will be able to tell you If its a common cold, flu or a likely COVID -19 case if so it should be able to tell you what stage you’re in

Stage one being a mild stage, the web app will help in your self-care medication (I.e. give your health care tips on what to do) on your 14days isolation. It will follow you up daily with more questionnaires to see if you are recovering or getting worst.

The severe situation i.e. stages two (where you have shortness in breathing or extreme symptoms). This is where medical care is needed immediately the web app will send an alert to the web controller which serves as a hotline and an emergency vehicle will come to your aid. If you don’t check in for follow up question for two conservative days, it will send an automatic message for check up to the web controller with an emergency vehicle sent to your location.

Examples of the questions in the questionnaire include;

1. Do you have difficulty breathing if yes for how long does it occur and when did it start?
2. Do you have dry coughs often?
3. Do you feel feverish if yes have when did it start and for how long?

LUNGS/THROAT SCANNER

 It would be able to detect how much virus is located in the lungs/ throat and determine how severe or mild your case is.

RESULTS

That is result for the self Test taken. Result will be available for printing and to save all results will be sent to the website control and the one’s indicating a likely coronavirus case will be starred to read first.

GERM DETECTOR

This would be able to scan the environment, surfaces, and doorknobs to check the amount or germ on them before any contact is made

**QUESTION AND ANSWERS (Q&A)**

This platform will give room for questions to be asked by the user’s relating to the coronavirus and an answer is given. This way the user can ask any questions that’s bothering them.

1. **IMPLEMENTATION**

When the web app is working and fully functioning, it is open out for testing and when logged in it’s tested to see if its actually working before open for public usage

1. **TESTING AND DEBUGGING**

For testing, an infected individual in stage one of coronavirus, another in stage two of coronavirus and a non- infected individual are needed. These three persons will go through the site’s self test and see if the site can adequately detect the infected and the non- infected individual. This will show a result that will detect infection and show as positive in the infected individuals while the non-infected person, it will not detect an infection and show a negative result.

As for the infected one’s it should be able to tell if it’s a stage one case or a stage two case. Theses infected cases are already know and the condition of the patients are known, this analysis is done to see if the site can accurately detect different stages of infection to give correct results.

Then someone that their condition is not known can also. They will go through the self-test to get a result and this result will be confirmed by through the normal medical test procedure and see if the results tally. Using the app first is done to check the reliability & correctness of the site.

DEBUGGING

While the errors could be human errors since its working as a survey, it will ask questions that needs feedback, so if the answers aren’t genuine it can affect the reliability, accuracy and adequacy of the result.

It could also be a design error that is a programming fault, coding error. For example it could call a stage one a stage two case and therefore create errors. The debugging will be used to manage these listed errors.

**6. RELEASE & UPDATE**

The release is making the web app 100% live and out there, managing the traffic load, receiving feedbacks and allowing the users to rate the web app.

The web app will update/ refresh itself daily to add new cases on the death rate and world map, more information on coronavirus itself and the safety measures to follow.

**ALGORITHM FOR COVID Smart Clinic**

STEP 1: start

STEP 2: Input Login

STEP 3: view home page

STEP 4: Read information pages awareness , spread, symptoms, preventive measures of corona virus

STEP 5: Enter self-Test

STEP 6: If positive with stage one

 Print result with self-care medication/follow up

Else

 If positive with stage two

 Print result with medical care procedure

Else

 If negative with another illness detected

 Print result

Else

 If negative with no illness detected print result

STEP 7: Stop

**FLOWCHART**

Below is the flowchart showing COVID Smart Clinic

Awareness

Self-Test

Information page

Home

Login

Updates

Symptoms

 No

Preventive measures/Treatment

 Yes

 Positive Negative

Print Result

Print Result and give self or medical care procedures

**THE TOP DOWN DESIGN APPROACH**

COVID SMART CLINIC

Login

Information page

Self-Test

Question & Answer

 sss

Lung/throat scanner and germ detector

Questionnaire

&Result

Preventive measure/ Treatment

Symptoms/

spread

Awareness