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BIOMEDICAL ENGINEERING

Covid-19 has caused a serious pandemic across the world, with serious impacts been felt in all areas of humanities. As a young engineer working with a multi-national health company, you are saddle with a huge responsibility of designing web-based application that can detect, display, rate (degree of infection), store, transmit data obtained wirelessly and access the data via the web together with other features which the boards of directors allow you to come up with.

- 1. Design the application following the software development cycle.*
- 2. Critically discuss the hardware and software features.*
- 3. Support your answer with a flowchart and an algorithm.*
- 4. Draw the Top-down or Bottom-up design approach of the application.*

ANSWER

1.CONCEPTUALIZATION

COVID-19 is spreading so fast, we have to take initiative to help fight the virus and ensure we humans are safe. Hence the main concept for The Surveillance Outbreak Response Management and Analysis system(SORMAS) which is a web based health care management system that enables health workers to notify health departments about new cases of epidemic-prone diseases, detect outbreaks and manage outbreak responses.. For an efficient COVID-19 healthcare, a network system observing or checking one's health conditions and that also keeps update about their health is highly necessary..

2.SPECIFICATION

In scheming this we embraced a platform-independent web based system for its easy use. The security and privacy were also considered because the personal data were handled via the internet. We also considered that the users were able to check the analyzed reports and their vital signs and also get a feedback.

Hardware specifications: Compatible and sometimes incompatible hardware devices for a particular operating system or application were tested. The various aspects of hardware requirements include: i3 as the processor of the os, the sensor, the Intel dual core, internet connection.

Software specifications: are the requirements needed to be installed on a computer to provide optimal functioning of application. They include:

- Data management: allows medical practitioners to add and store patient information electronically and allows physicians to view it.*
- Video recording and Two-way video connection: allows patients to explain what's happening to them, their triggers and what*

happened afterwards and also allow patients to see the doctors they communicate with.

- Patient history: stores the history of the patients with existing problems such as allergies, current medications e.t.c
- E-prescribing: it allows doctors to send prescriptions directly to pharmacies electronically. It sends accurate and understandable prescriptions, considerably improving the quality of patient care.

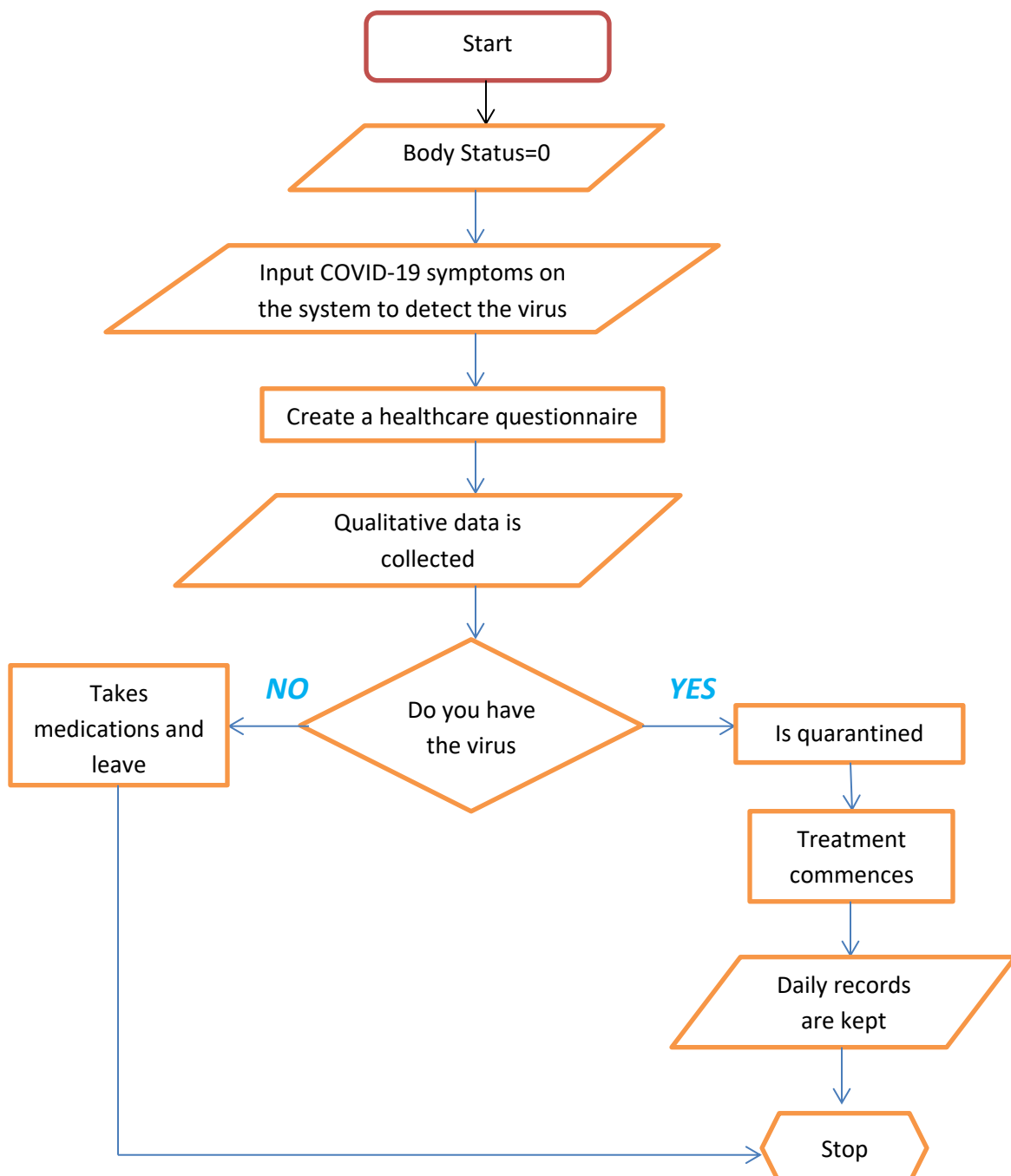
Design

A well-defined algorithm for SORMAS

STEPS

1. Start
2. Body status to the virus=0
3. Add COVID-19 symptoms in the system
4. Input the software involved
5. Collect qualitative data
6. Analyze data
7. Body status positive
8. Display Feedback
9. Stop

Flowchart



Implementation

From the above design specifications, we implement a prototype which consists of:

- a. Web server with Apache,
- b. Application server with Tomcat

Testing and Debugging

The SORMAS app needs to be error free which is why testing and debugging the app and their functionalities becomes so important. Testing can also be done with different operating systems, internet connections and hardware.

Release and Update

This application is being released to detect, display the rate of virus, store, transmit and access data through the web together and its update when necessary based on the health center feedback.

Top-down design approach of the application

