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MATRIC NUMBER: 18/ENG05/048

DEPARTMENT: MECHATRONICS ENGINEERING

COURSE TITLE: STRUCTURED COMPUTER PROGRAMMING

COURSE CODE: ENG 224

QUESTION: As an Engineer working in a multi-national health company, you're tasked with the responsibility of designing a web-based application that detects the rate and degree of spread of Corona Virus. The following steps should be followed:

1. Design the application following the software development cycle
2. Critically describe the hardware and software features
3. Support your answer with a flowchart and an algorithm
4. Draw the top-down or bottom-up approach of applications

SOFTWARE DEVELOPMENT CYCLE

1. **Conceptualization:** The software to be developed is to be of use in detecting which user has Corona virus like symptoms, identify the person by accessing user data (i.e name, age, location and travel details) and then transmit the data obtained to the National Centre for Disease Control(NCDC) database. This way, it will be easier for the health workers to identify potential threats and pick them up to get them tested and isolated for treatment to prevent further spread of the virus and also communicate with users of the application on how to prevent themselves from contracting the virus.

2. Specification:

a. Proposed Application Name: COVID1-9 UPDATE

b. Search engine optimization: The website should be available to search engine spiders and be coded with good on-page search engine optimization using HTML and JavaScript framework.

c. User Sign up or Sign in: When the application is run, existing users have to fill in their usernames and password while new users have to register their username and password.

d. List of pages: (i) Homepage: This page gives an overview of the services rendered.

(ii) Complaint Page: This page enables a user to communicate with a healthcare professional or explain the symptoms observed whether in the user or in another person. On this page, the professional accesses the symptoms and tells the user if he is a threat or not.

(iii) Learn More Page: This page provides a detailed explanation of the virus. It gives details on its symptoms, number of infected people, infected areas, number of deaths, location of isolation centres in each state and the number of isolation centres.

(iv) Patient Review Page: This page is to display testimonies and rating of the application to the new users to provide added comfort to prospective patients and create an additional level of credibility to the application and healthcare provider.

(v) Contact us page: This page contains full contact details including a map to direct you to the nearest treatment centre.

The application should have an overall backend development to maintain the communication between the database and application constantly.

e. Style and layout: The application should incorporate a recognizable logo, high quality imagery and informative videos.

3. DESIGN

ALGORITHM

1. Start

2. Read admin details (username and password)

3. If details do not exist {

    Ask user to create an account

4. If details = true {

    Open Admin Home page

    Edit profile option pops up

    If Admin edits profile {

        Save and Exit

            }

Else If details = False {

    Return to Step 2

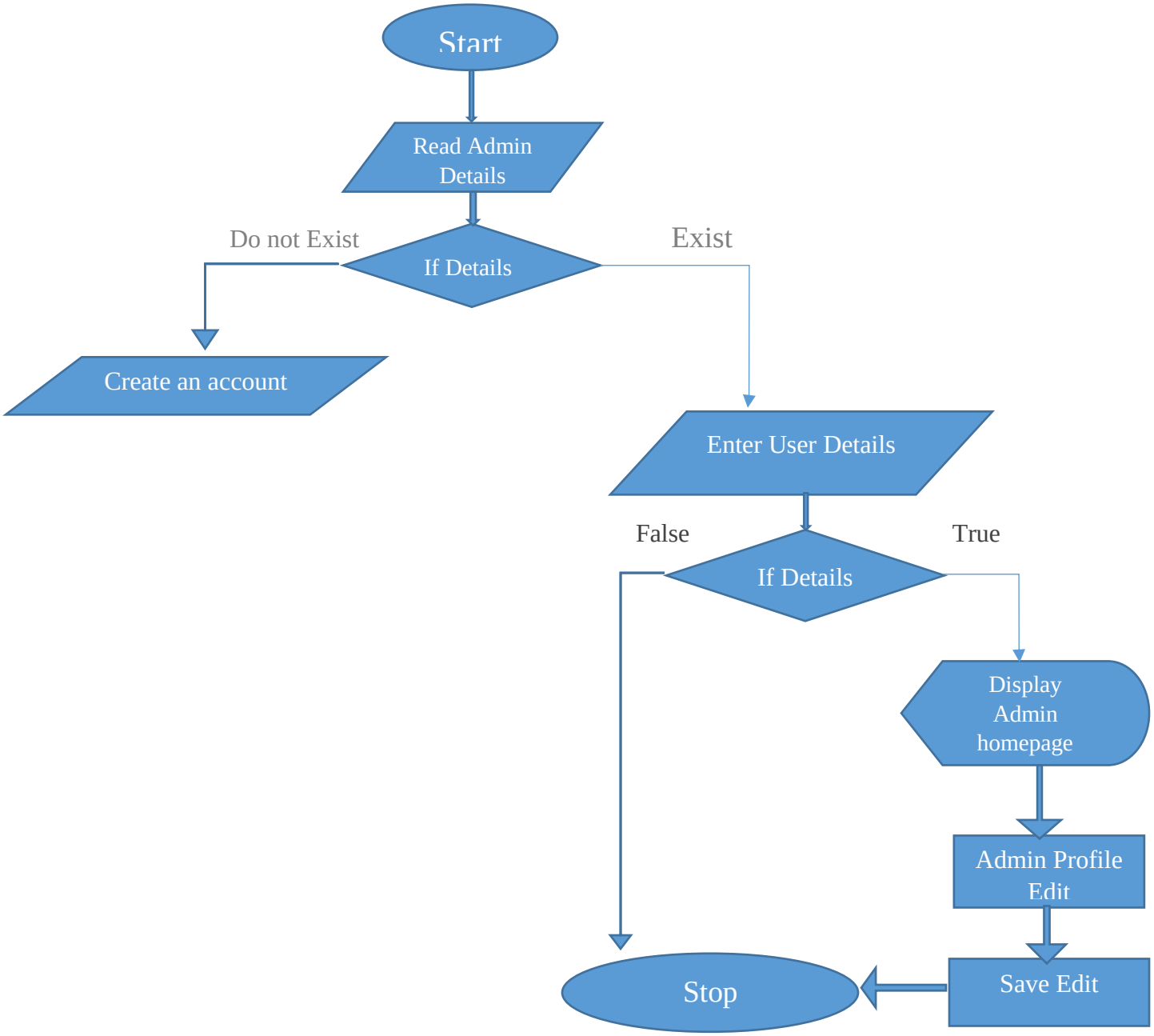
}

}

5. Else Open Admin Home page

6. Stop

FLOWCHART



4. Implementation: For users to view and interact with the available data, Front-end development is applied for converting data to a graphical interface. The Front-end development is achieved through the use of JavaScript, Hypertext Markup Language(HTML) and Cascading Style Sheets (CSS) which is a cornerstone technology of the World Wide Web alongside HTML and JavaScript. Back-end development codes which communicate the database information to the browser is implemented into the application using languages such as Java and PHP(Programming Home Page) which is a script language.

5. Testing and Debugging: This is one of the most crucial part for success of a web application. It is done prior to the release. Testing and debugging is done using automated testing tools such as Ranorex, Sahi, Watir, ToscaTestsuite, Telerik TestStudio, Katalon Studio, Selenium etc.

6. Release and Update: The application is released into stores such as Google Play Store and IOS stores so it will be available for download by the required users. The application store can optimize the availability of the application by making it pop up when various users open their application stores to search for applications to download. The application is updated regularly when changes that will make it more accessible and easier to use are available.

HARDWARE AND SOFTWARE FEATURES

SOFTWARE FEATURES

- A profile page which contains all users' details which comes up after successfully logging in.
- A page that displays the extent of spread of Corona Virus in users' geographical area
- An interface that shows the number of recorded cases, deaths and number of people discharged in Nigeria and in the world.
- Easy to comprehend pop up questions to identify users with symptoms and to aid faster testing of the users' status.
- An interface that displays contact details of healthcare works to people whose symptoms have proved them to be potential threats.
- An interface which immediately displays preventive measures for users that have registered accounts.

HARDWARE FEATURES

The application will be accessible using devices that can access the internet e.g mobile phones, ipads, laptops. These devices should have a processor speed of at least 1.6GHz to enables smooth running of the program.

Top-Down Design