PERSONALIZED HEALTH AND WELLNESS ASSISTANT

DATA FLOW DIAGRAM

Course Title – Software Engineering

Slot – G2 + TG2

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Introduction –

The ‘Personalized Health and Wellness Assistant’ will serve as a new generation mobile application that will include artificial intelligence and machine learning components to suggest a recommended health and wellness plan based on data inputted by the user. This is a new concept which will include a chatbot and will assist the users with medication and prescription guidance; therefore, the usage of the app will be enhanced while appropriate health support will be provided. The most important one is to educate and give specific recommendations concerning the state of one’s health and help to make the right decision.

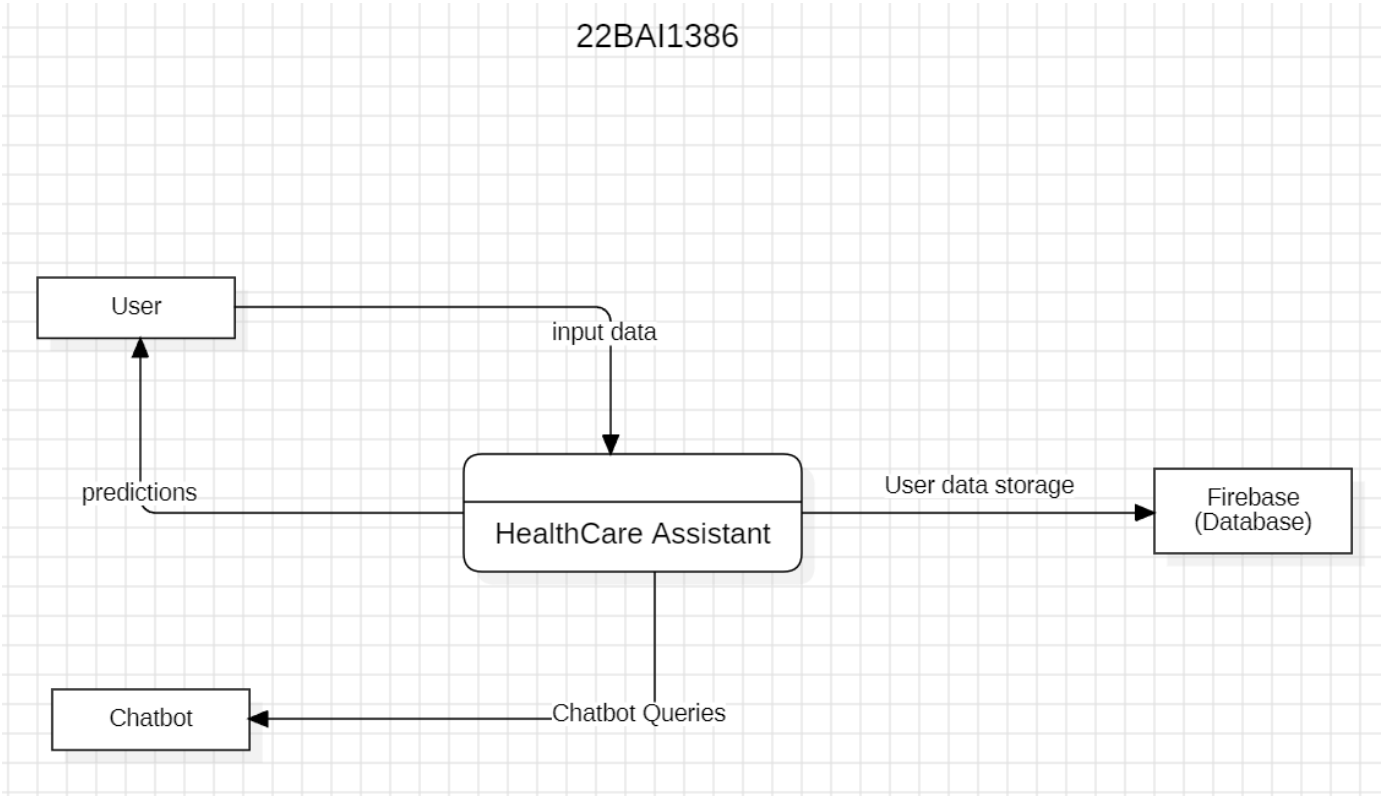
To accomplish the mentioned above proposed objective of a well-structured and efficient manner of development, Software Development Life Cycle, namely the Incremental Model has been chosen. This way the application is develop in phases including this feedback of users and can be improved gradually by incorporating more features. Thus, when realizing the project in stages, it is also possible to ensure that each of the elements is functional and the final outcome is a usable application that will meet the needs of end-users. It also shows the concrete description of Incremental Model in the framework of the ‘Personalized Health and Wellness Assistant’, as well as naming all the activities of each phase and their outcomes.

Data Flow Diagram –

A Data Flow Diagram (DFD) is a graphical representation used to model the flow of data within a system. It illustrates how information moves through processes, data stores, and external entities, focusing on the flow rather than control logic. A DFD is broken down into levels, each increasing in detail to represent a deeper understanding of the system. DFD Level 0 is the highest level, often called the context diagram, and represents the entire system as a single process with its external entities and data flows. DFD Level 1 expands the system into major subprocesses, showing how the internal components interact with external entities and data stores. DFD Level 2 further decomposes each subprocess from Level 1 into more detailed subprocesses, depicting the system's internal workings at a more granular level, such as the handling of user data, health predictions, and chatbot interactions in your Personalized Health and Wellness Assistant project. Each level enhances clarity on how data moves and transforms within the system.

Level-0 DFD –

- ***Process****:* Health Assistant System (depicts the entire system as one process).
- ***External Entities****:*
    - *User*: Provides input like health data (e.g., age, weight, etc.).
    - *Chatbot:* Queries the system for recommendations.
    - *Firebase (Database):* Stores user data, predictions, health reports.



Level-1 DFD –

Process 1: User Registration and Authentication

- *External Entity:* User
- *Data Store:*
    - *User Data Store (Firebase):* Stores user credentials and details.

Process 2: Input Health Data

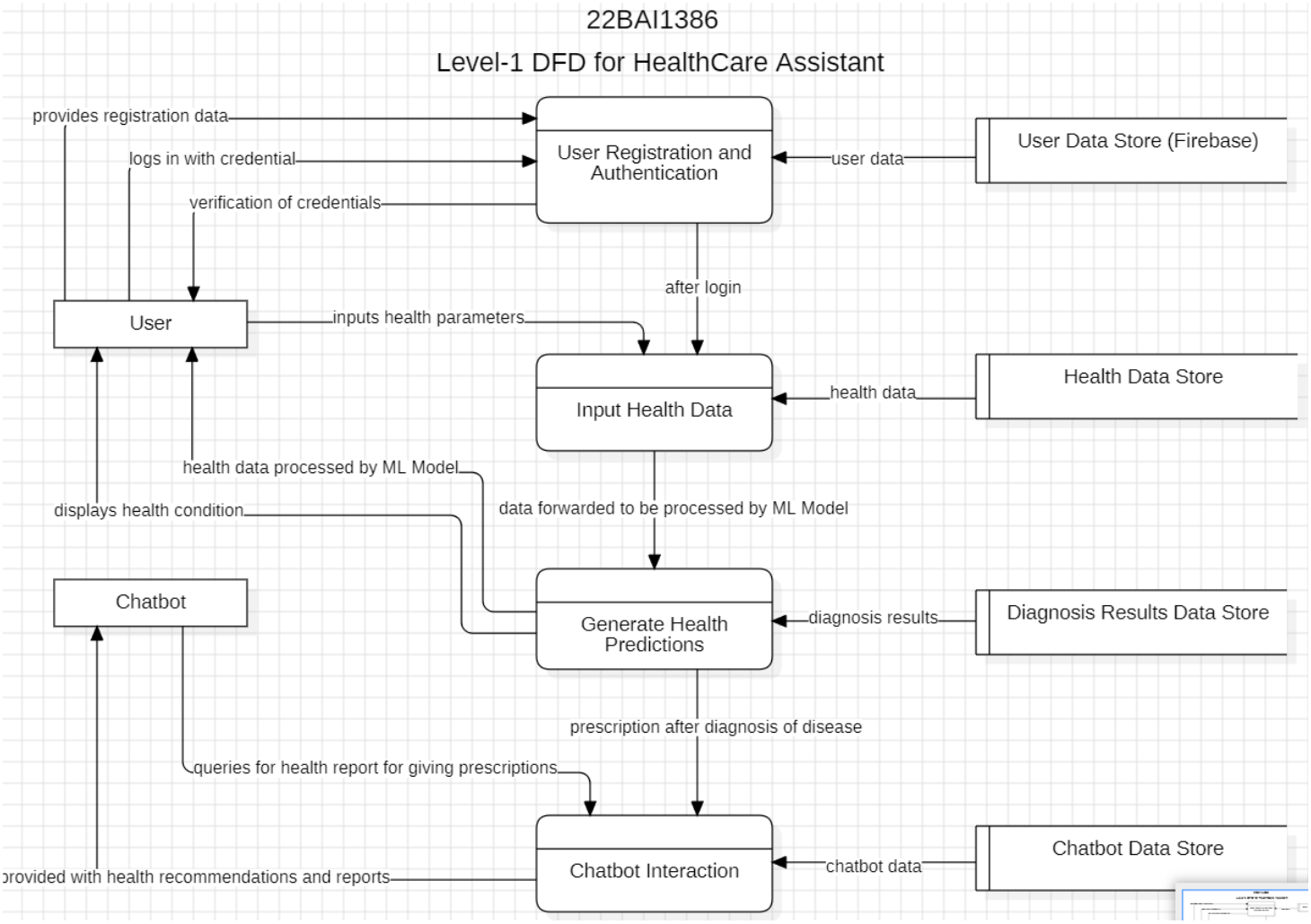
- *External Entity:* User
- *Data Store:*
    - *Health Data Store:* Stores health parameters entered by the user.

Process 3: Generate Health Predictions

- *External Entity:* User
- *Data Store:*
    - *Diagnosis Results Data Store*: Stores the results generated by the ML model.

Process 4: Chatbot Interaction

- *External Entity:* Chatbot
- *Data Store:*
    - *Chatbot Data Store*: Stores conversation history and responses between the user and the chatbot.



Level-2 DFD –

Process 1: User Registration and Authentication

Subprocesses:

- ***Subprocess 1.1: Register User***
  - *Data Flow:*
    - User inputs personal details like name, email, password.
    - The system stores user credentials in Firebase.
  - *Data Store:*
    - *User Data Store (Firebase):* Stores user credentials.

- ***Subprocess 1.2: Authenticate User***
  - *Data Flow:*
    - User submits login credentials.
    - The system verifies the credentials through Firebase.
    - Access is granted or denied based on verification.
  - *Data Store:*
    - *User Data Store (Firebase):* Retrieves user credentials for verification.

Process 2: Input Health Data

Subprocesses*:*

- ***Subprocess 2.1: Input Basic Information***
  - *Data Flow:*
    - User inputs basic health information.
    - The system stores this information for further processing.
  - *Data Store:*
    - *Health Data Store*: Stores basic user health information.

- ***Subprocess 2.2: Input Medical Data***
  - *Data Flow:*
    - User enters specific medical data.
    - The system stores this information for processing.
  - *Data Store:*
    - *Health Data Store*: Stores medical data for processing.

- ***Subprocess 2.3: Save Data***
  - *Data Flow:*
    - The system saves all inputted health and medical data in Firebase for processing.
  - *Data Store:*
    - *Health Data Store*: Saves complete health data.

Process 3: Generate Health Predictions

Subprocesses*:*

- ***Subprocess 3.1: Retrieve User Data***
  - *Data Flow:*
    - The system retrieves stored user health data from Firebase.
  - *Data Store:*
    - *Health Data Store*: Retrieves stored health data.

- ***Subprocess 3.2: Process Data with ML Model***
  - *Data Flow:*
    - The AI/ML Model processes the retrieved user health data.
    - The model generates health predictions such as possible diagnoses
  - *Data Store:*
    - *ML Model Data Store*: Contains algorithms and training data used by the AI model.

- ***Subprocess 3.3: Display Predictions and Reports***
  - *Data Flow:*
    - The system displays the generated health predictions to the user.
    - Health reports and recommendations are presented.
  - *Data Store:*
    - Diagnosis Results Data Store: Stores health predictions and recommendations.
    - Health Reports Data Store: Saves downloadable health reports