

# Hydrofit Application

## Final Project Report: Group 53

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**Abstract**—Hydrofit is a health and hydration-promoting python based web server accompanied by an application. Docker supplies the containers for backing up the server, the start and stop server commands as well as test suites. It's also accompanied by an android-based mobile app that has a Profile page, fit and hydration log files as well as time warnings. Installation processes are comprised of APK's installation to android devices or running it through the Studio, Android. This involves creating permission levels, putting up direct input for the testing data and simulating the impact on the server's output in the testing guideline. Among those important traits of Kotlin code is HydroFitApplication for management of the application level components, NotificationReceiver for managing the broadcast notifications, and NotificationScheduler to set up the daily and hourly. A word of warning warns against employing a camera on a simulator. The above highlights include hydro fit which uses server integration for comprehensive wellness and hydration management in totality.

### I. INTRODUCTION

HydroFit Application Suite is a new approach that represents an innovative mix of technologies for self-care in regard to physical activity and drinking water. In its essence, HydroFit uses highly developed client-server architecture where a Python-based backend server hosted inside a Docker container combines with an easy-to-use Android app. The synergistic provision of service ensures deployment consistency and reliability, which is crucial for providing an inclusive health-related platform. A hydrofit mobile application serves as the user interface providing an easy dashboard, professional profile page with extensive fitness and hydration record options. The main feature that sets HydroFit apart is it's active customer engagement approach which utilizes the powerful Notification System controlled by the Notification Scheduler. The feature's notifications come at hand towards ensuring that users adhere to their respective workout regimes as well as hydration goals.

With regards to our growing concern about the issue of health and wellness, HydroFit becomes a dependable and restructuring instrument for the people interested in achieving

general well being. Compatibility of the application to different gadgets that run on android, thorough testing procedures, and real time updates are indicators of reliability and efficiency of use. The hydrofit fits perfectly in the current health conscious society where individuals require a smooth and enjoyable experience while navigating through their individual health and fitness paths. That is why its innovative traits and people oriented design make it top health management application that reflects current reality with regard to need of combined pro active treatment options.

### II. ARCHITECTURE

Based on the client-server architecture, Hydrofit has an android based mobile application (client) interacting with Hydrofit Server that runs on docker container in a python environment. The backend runs on a reliable Docker container that provides an assuring uniform environment, making it easy to deploy. HydroFit API Service provides a main function for the backend that supports requests made via the mobile application. Though it is not stated explicitly but the system depends on some kind of database where the data can be stored and retrieved at the back end. In this case, an android app will work as the user interface that communicates with a backend server via api calls to provide smooth communication among a user's device and the back end server.

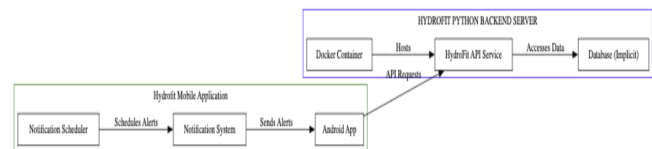


Fig. 1. Architectural Diagram

The Hydrofit Mobile Application has an embedded notification system that facilitates key user engagement. The Notification Scheduler is a component of this system that allows the issuance of notifications reminding its users

to either update their logbooks or achieve specific fitness goals that contribute towards overall hydration. However, the Notification Scheduler then schedules these alerts. This brings them together to make a well-organized and prompted reminders. This architecture can be summed up as an organized system integrated of the Docker container with back end consistency, hydrofit api service on the data and feature rich mobile app with notifications to keep people involved in the fitness and hydration endeavor.

#### A. Explanation of the diagram:

- Docker Container: Runs the backend server on the host in a constant manner.
- HydroFit API Service: A central back-end service for processing request from an app mobile. To store and retrieve information, it is most likely that it will interplay with a database (implied in this context).
- Database (Implicit): Though unmentioned, is in effect the “storage” of data for the server.

#### B. Hydrofit Mobile Application:

- Android App: Hydrofit system installed in an android device and its user interface. It uses API requests in communicating with the backend server.
- Notification System: Displays and generates notifications to the user as a result of alerts from the Notification scheduler.
- Notification Scheduler: It schedules daily and hourly reminders to keep track of user’s physical activity, as well as hydrating levels.

#### C. Interactions:

This implies that in the hydrofit system a client server model is established with the android app acting as the client to the hydrofit api service within container providing a controlled environment to ensure consistency server operation. Information is exchanged between the Android App and the HydroFit API Service via API requesting. On its part, the HydroFit API service communicates with a passive Database which performs functions such data processing and storage.

The Notification Scheduler generates alert that is fed into the Android App’s Notification System which actively engages users. The Scheduler prompts the user to keep up with log updates and to attain their physical fitness as well as drinking needs on time. In summary, this is an integrated system that works smoothly across the board—a solid client-server construct, one robust Docker container on the backend serving as a backbone, and a high performing mobile app complete with a powerful notification platform.

Firebase push notification reminders play a crucial role in enhancing user engagement and fostering healthy habits. By leveraging Firebase Cloud Messaging (FCM), the system can deliver timely reminders to individuals encouraging them to

stay hydrated through scheduled water intake notifications. These push notifications serve as gentle prompts for desk-bound individuals to prioritize their well-being by taking breaks for hydration. The seamless integration of FCM ensures that users receive these reminders even when the app is not actively in use, providing a continuous and unobtrusive means of promoting optimal water intake. This not only contributes to physical health but also demonstrates the versatile utility of Firebase in creating a connected and supportive ecosystem for maintaining wellness in a technology-driven lifestyle.

### III. THE APPLICATION SUITE

Providing users with a convenient method of managing fitness and hydration is what the Hydrofit application suite achieves through its highly intuitive design that targets a wide user base. The suite’s user interface, which forms part of the Android App, makes it convenient for people looking for easy to use software that monitors and helps to improve their fitness levels. At a glance details about status on fitness and hydration are provided in Dashboard for easy comprehension of progress made. The Profile page allows users to store and easily manage their health records; the Fitness and Hydration logging pages track users’ exercise schedule and water consumption.

An interesting characteristic enhancing the application suit’s usability is the advanced Notification System. The Notification System relies mainly on the engaging UI, which gives timely alerts, smartly provided by the Notification Scheduler. These are only reminders which act like motivation for users to remain committed in relation to their workout regimes as well as hydration. A well-designed user interface allows for easy navigation hence making the interaction feel real.

Also, the suitability of the suite is improved by its ability to work with different Android devices in the market that makes it available for a wide range of users. The Hydrofit application suite is designed to provide a flexible experience to meet a user’s choice whether to download it on their phones or use emulators to run it. Essentially, the interface of the hydrofit application suite was designed with the goal of assisting people in managing their health through a convenient, engaging, informational platform.

Training application: A user needs to add his personal information & height, weight, step length & counter. He will then be commended water intake based on the entered information & then he’ll be send push notification so that he follows the same. Then he can manually update the water Information and step count. Here are the screenshots attached:

### IV. IMPLEMENTATION

HydroFit has been programmed in Python which is then containerised for Docker allowing reliable and independent work. The Hydrofit mobile application (developed in Kotlin for Android) interacts with the HydroFit API Service at the

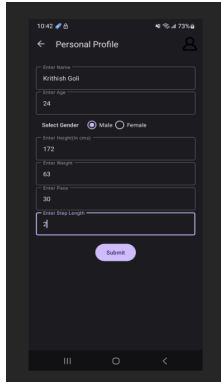


Fig. 2. Application Input

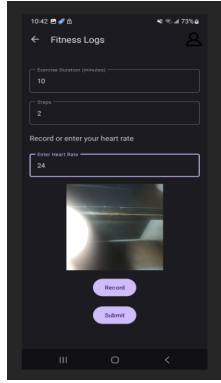


Fig. 3. Application Input

backend to enable data exchange. The app contains a dashboard, profile page, fitness logging page, hydration logging page that makes navigating the process simple for users. The Notification System that is worth mentioning and activated through Notification Schedule ensures timely alarms about the goals reminder. Although details about database interaction are implied; they could probably be handled by the HydroFit API service. This whole architecture follows a client-server model while docker container ensures consistent deployment

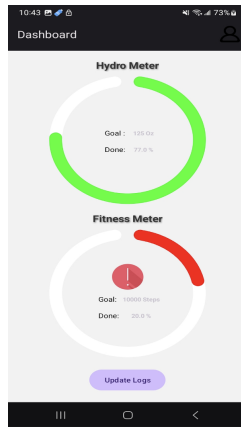


Fig. 4. After updating logs

and mobile app helps to engage users into meaningful fitness journeys through easily navigable and flexible interface. This comprehensive testing process signifies an emphasis on dependability, usability, and good health management throughout its operations.

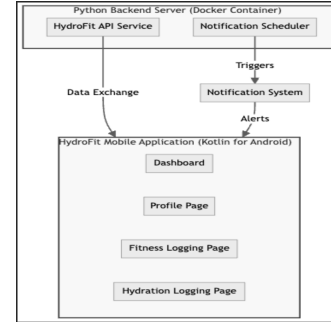


Fig. 5. Implementation

## V. DEMONSTRATION

Demonstration of the Python backend server (hosted inside the Docker container) integration with the Android app. Key features include; exchange of information, real-time data refreshing and interactive user experience. It shows smooth connection between the apps and servers as well as efficiency of Notice System and Schedule that sends necessary notifications and reminders in time for users. Moreover, it presents the adaptability of the HydroFit Mobile Application for different types of Android phones with uniform utilization of this application.

## VI. CONCLUSION

HydroFit Application Suite is an all encompassing end user friendly fitness and hydration solution. Adopting a containerized rear-end server that connects with a high quality smartphone app reflects a sense of reliability, accessibility and community engagement. Deploying a health app using the client-server model embedded within a Docker container guarantees consistent deployment, and the intuitive user interface and proactive notifications contribute positively to the management of healthy lifestyles of consumers. Its rigorous testing process and seamless integration with an implicit database emphasize this system's reliability and market worthiness. The HydroFit system offers the complete package, making it essential for anyone who has ever felt inspired to get in shape and stay there.

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