

Academic Paper

Vedant Bhat, Ritvik Bhagawatula, Henna Mian, Shruthi Saravanan, Nishant Thangada

vbhat24@gatech.edu, rbhagawatula3@gatech.edu, hmian31@gatech.edu, ssaravanan9@gatech.edu,
nthangada3@gatech.edu

1.1 Abstract

First discovered in the latter half of the 1900s, Human Immunodeficiency Virus (HIV) is a chronic, life-threatening disease that affects millions of people worldwide. According to the World Health Organization (WHO), there were approximately 38 million people living with HIV at the end of 2019, and 690,000 people died from HIV-related illnesses in that same year. While significant progress has been made in HIV prevention and treatment, there is still no cure for the disease, and individuals with HIV must manage their condition for the rest of their lives. Having a lack of resources and going about one's daily life without direction is a hard task for people living with HIV. There are certain behaviors that would help boost patients' quality of life such as removing certain foods from diets, engaging in certain exercises, and maintaining a proper sleep schedule. In addition to this, patients are directed to take antiretroviral therapy (ART) medication as prescribed; This can pose a challenge for newly diagnosed patients who have never had to be on medications regularly. Our app is made to give HIV patients a thorough manual on how to live with the virus. To help patients adhere to their treatment plan, the app offers daily reminders to exercise, eat healthfully, and take medications as prescribed. Additionally, it offers informational materials and management advice for HIV such as stress reduction techniques. Our app gives HIV patients the resources and assistance they need to have happy, healthy lives.

1.2 Background

The management of HIV goes beyond controlling the condition with drugs and medical appointments. A healthy lifestyle is also crucial for people living with HIV to maintain. Exercise and healthy eating can help improve overall health, boost the immune system, and reduce the risk of developing other health problems, such as heart disease and diabetes. Additionally, staying informed about the disease and any new medical developments is crucial for individuals with HIV to manage their condition effectively.

The management of HIV has evolved significantly with the introduction of antiretroviral therapy (ART) in the mid-1990s. ART suppresses the virus, reduces the amount of HIV in the body, and allows the immune system to recover. Although ART is not a cure, people with HIV can manage their condition by taking medication for the rest of their lives.

Despite the availability of ART, adherence to medication remains a challenge for many people living with HIV. Adherence rates vary depending on the population and the setting, but studies have shown that approximately 50% of people living with HIV have suboptimal adherence to ART. Poor adherence can lead to drug resistance, treatment failure, and disease progression.

1.3 Problem Statement

Even with the advancements in modern HIV treatment, patients still struggle to manage their condition and maintain a healthy lifestyle. Many patients even find it challenging to stay on track with medication schedules, maintain a healthy diet, and manage chronic symptoms, which can lead to their symptoms worsening. Additionally, there is a lack of accessible and reliable resources for patients to learn about their condition and connect with healthcare professionals regularly. As a result, there is a need for an application that provides people with HIV the tools and resources they need to maintain a healthy lifestyle and manage their condition effectively.

1.4 Solution

We suggest creating a web application to help people with HIV manage their illness by giving them resources for diet planning, activity tracking, appointment scheduling, and disease information. The program's user-friendly layout will make it simple for users to keep tabs on their development and health. Additionally, it will provide individualized advice based on preferences and health objectives, offering a whole HIV management solution. Users will be able to create reminders for their doctor and lab appointments using the appointment scheduling function, ensuring that they keep all planned appointments and receive the essential medical care. Users can track their physical activity levels and create unique fitness goals with the exercise tracking tool. Users will also have access to healthy meal options through the meal planning tool, and they may design individualized meal plans depending on their preferences and dietary requirements. There is also the option to delete any appointments, meals, or exercises, in the case of cancellations or mistakenly created entries. In order to effectively manage their illness, people with HIV will benefit from being able to maintain a nutritious diet. Last but not least, the illness education tool will give users the most recent knowledge on HIV and its treatment, enabling them to make wise decisions about their health. One barrier we acknowledge is the fact that there may be individuals who do not have the prior knowledge to use a computer; This has been taken into consideration and we have ensured that our application is accessible to people of varying technical skills. Overall, the HIV Management Web Application will give people with HIV a complete solution for managing their illness and leading healthy lives. The program will enable users to take control of their health and

well-being by providing individualized advice and tracking tools. Along the way, we encountered a few general complexities. We decided to use heroku and firebase to deploy the node application in order to utilize the “light-weight” nature of the hosting services. We had some troubles deploying, and for many of, it was the first time working with frontend code. We also decided to use predefined lists that define healthy choices from vetted sources that have been sourced by renowned scientists. One barrier we ran into in this process was when we needed to retrieve values from the database for a user. This process created some difficulties for us due to the fact that appointments, diets, and exercises are all associated with a specific UID tying it back to the user. This meant that we would have to apply the proper filters to these fields and ensure that error messages were coded in properly if users did not properly submit their entries; Otherwise, the retrieval would fail due to a malformed element being placed in the database.

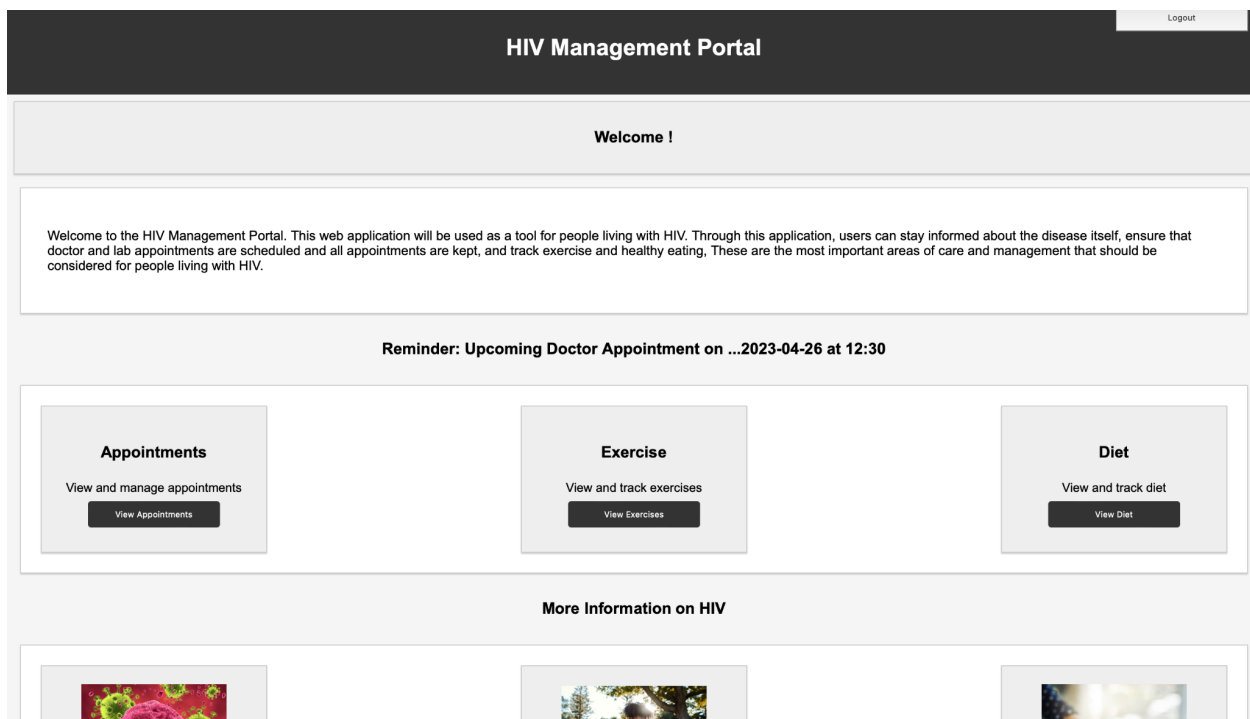


Figure 1: Screenshot of HIV Management Portal Dashboard

1.5 Outcome and Further Work

Overall, this project has yielded a working hosted web application that serves to assist people with HIV by giving them the know-how to navigate their condition. It is a successful product that will enable many HIV patients to start living healthier lives. One area that may require

more work in the future is to develop 1st party alerts on iOS and Android and integrate notifications to remind about appointments, exercise, sleep, etc.. This would serve a greater user base since most individuals refer to their phones for any sort of reminders or quick utilization. Another extension would be to implement TTS (Text to speech) and add accessibility features in order to allow individuals with disabilities the option to utilize the application as well.

1.6 References

1. World Health Organization. (2020). HIV/AIDS.
<https://www.who.int/news-room/fact-sheets/detail/hiv-aids>
2. Ware, N. C., Wyatt, M. A., & Tugenberg, T. (2011). Development of a decision-making tool to facilitate HIV disclosure for women. *Journal of the Association of Nurses in AIDS Care*, 22(1), 37–49.
<https://doi.org/10.1016/j.jana.2010.05.002>
3. Simoni, J. M., Kutner, B. A., Horvath, K. J., & Orellana, E. R. (2006). Counselor-delivered prevention interventions for HIV positive individuals. *Current HIV/AIDS Reports*, 3(4), 171–179.
<https://doi.org/10.1007/s11904-006-0015-5>