How Fitness Impacts Quality of Modern Life

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ABSTRACT

Health and fitness are an essential part of life. Nowadays, people come across a lot of fitness web applications that provides many diets and workout plans separately. This project is about the combination of workout and diet instruction for each member. First, a person must log in to this application by providing their name, mobile, email, height, weight, age, and gender. members can get memberships by registering, there will be a variety of memberships called as Gold, Silver, and Platinum under the price rate and time durations. Members can request an instructor. When members login into their individual user log they will be given a planned workout plan and a diet plan, which is provided by the instructor. Those workout and diet schedules for members were updated from the instructor login accordingly. For better service and ease, there is an online store for buying products related to maintaining health and diets. Users can do payments online. Members or customers can buy products from the online store by adding to the cart. This fitness training center is equipped with all the modern types of machinery and provides information about machinery data stored in the center. Services provided by the fitness training center are handled by the system administrator.

Keywords— Fitness, Modern Life, Products, Health

I. INTRODUCTION

Health is a valuable asset, as we all know. We don't need a smart vehicle, a large apartment, or a doctorate if we aren't healthy. First and foremost, we should think about our health. Our attitude is frequently influenced by our feelings. We have the energy to do anything when we are healthy and fit. A healthy and stress-free existence depends greatly on physical fitness. Diet, exercise, and sleep are all parts of being physically fit. Everybody should be aware of these three fundamentals for a healthy existence since they each have their own significance in each person's life. This system is about fitness training management system.

There are three main user roles called admin, instructor, and member. All functions in the system are handled by the system administrator. There is main five functions in the system called user management, store management, member management, instructor management, and equipment management. There are login and registration functions. Users can register to the system by providing their name, email address, mobile number, birthday, gender, password, height, and weight. After registering, the user will login into the system successfully by providing their registered username and password. Let us talk about user management, here admin can add a new user to the system. When the admin adds a new user admin cannot see the login credentials, those details will send to the user's mobile provided mobile number. After that the user can log in to the system by using the details received on the mobile. Admin can update and delete existing user details. There is a report generated the get user details. There will be a user profile for all registered users. Members' diet plans and workout plans given by instructors are displayed on their profiles, they can get reports of their diet plan and workout plan through the user profile. Also, members can request any instructor to get their diet plans, workout plans, and instructions.

The membership management, there are main memberships called Gold, Silver, and Platinum. That

memberships are categorized underprice rates and time durations. Members can choose their membership as they need. The system admin can add a new membership category to the system. Also, the admin can update and delete the existing membership details. There is a report generated the get membership details. There is equipment management for handling equipment. The system admin handles the equipment details. Admin can add new equipment details to the system also admin can update and delete the existing equipment details. There is a report generated for the get equipment details.

Shopping store management is one of the main functions of this system. This was developed for better service and convenience. With the modern lifestyle, people are not able to shop every time get their needs regarding diet and workout plans. This store sells fitness products. Members can buy products online. They must add products to the cart and continue to do their payments. Members can do their payments online through the system. This store's products are handled by the admin. Admin adds new products to the system by providing details of the product and an image of the product. Admin can update and delete the existing product details. There is a report generated for the get store products details.

Instructor management also handles the system admin. Admin can add new instructors to the system. Otherwise, instructors can register to the system. Instructors provide diet plans and work plans for the relevant members by checking their health. Instructors can view the specific request received from the members. Instructors can add new diet plans and workout plans to the members' profiles. Also, an instructor is able to update and remove those plans according to the member's fitness. There is a report generated for the get workout plan and diet plan.

This is the overall of this system. Any person can use this fitness training management system for keeping their health properly without physical participation. For the system implementation, we used technology as the MERN stack. For the frontend implementation React, for the backend implementation Node is. MongoDB is used as the database. For the managing works of our project, we used tools such as Git hub, Azure Board, SonarQube, and Selenium.

The rest of the paper is organized as follows, In Related Work section review information suggestion research from the past and how it relates to our system in a concise manner. In methodology section we explain what technologies and tools we are used for the develop and implementation for the system. Also, in there explain the back-end processes related to the main functions of the proposed system. In the proposed system section, we discuss main functions in the system including the user interfaces. In the Discussion the testing techniques used to test the primary functions and the analytical data were presented in a logical manner. In Conclusion section we discuss conclusions and both negative and positive ways of the system.

II. RELATED WORK/ LITERATURE REVIEW

Fitness hub is an online tool that customers, administrators, and instructors can use to manage their activities at the gym. Customers have access to a variety of membership options through our application, each of which offers a variety of benefits. Administrators may control every aspect of the gym's operations using this application from their computer. They can handle their duties in the gym considerably more easily. Furthermore, instructors can quickly connect with every one of their customers. By using this program, they can all make their work simpler.

According to the related research paper [8] Development of Fitness Management System Application paper. In their system they added fitness types that users can follow them. That feature has some drawbacks like every customer doesn't know what they should follow or the right way to do those fitness types. In our system we modified it with workout plans. In that feature customers can select an instructor from the system. Then that instructor will check the customer information and make a new workout plan just for the exact customer. Also, they will make a diet plan too. Then those plans will be added to customer, and they can download them as pdf format. In our system we have developed that feature to make our system more user friendly and easy to user for customers.

According to the research [9] Design of physical fitness training management system based on smart bracelet paperwork. They have developed an smart bracelet that can record real-time data such as exercise, sleep, Diet and heart rate in their daily lives. They can manage their work with this bracelet. For our system we are going to develop a feature like this to improve the customer interaction with the system. We have designed a mobile app where customer can use to monitor their workout plans and diet plans. With that mobile app customer can message with their instructor and get more advice and solve their problems by talking to the instructors.

The Administrators of this system can handle everything in the system. As mentions in the [10] Gym Management System research paper. Their system can handle all the features in the system. They only have limited managements in their system. In their system they did not create memberships for users to buy with additional features. That is a drawback of the system. To maintain a system that needs to earn money from that

system to do that they should provide best features for reasonable prices. In our system customers can register in a membership and use the additional features of that membership.

Overall, this tool makes it simple to run a gym. With user-friendly UIs, all this system's users may manage their responsibilities with ease.

III. METHODOLOGY

To develop the web application, we used MERN stack. We utilize MongoDB as our database and Node JS as the backend to build this system. (Figure 1) We use React JS, Bootstrap, and Material UI for front-end development.

Figure 1: Used technology MERN

For the code editor we use Visual Studio Code. It is a simplified code editor that supports development activities including task execution, debugging, and version management. It tries to give developers only the tools they require for a short cycle of code-build-debugging and leaves more sophisticated processes to IDEs with more features, like Visual Studio IDE.

For the test and modify the APIs we used Postman. Postman users may start accessing APIs fast and successfully because to the platform's extensive support for all conceivable HTTP methods. Multiple testing environments, test checkpoints, and schedule options are supported by Postman's robust testing features.

Azure Board for feature tracking (Figure 2). It provides a set of predefined work item types to support tracking features, user stories, bugs, and tasks. We can quickly get up and running by using your (Figure 3) product backlog or Kanban board. Whatever Agile method we use, Azure Boards supports us with the tools we need to implement that method. (Figure 5) SonarQube and (Figure 4) Selenium are the tools we use to test the application. SonarQube empowers all developers to write cleaner and safer code. Selenium is well known for providing quick, repeatable web application testing, which enables developers to deliver new versions more quickly and confidently.
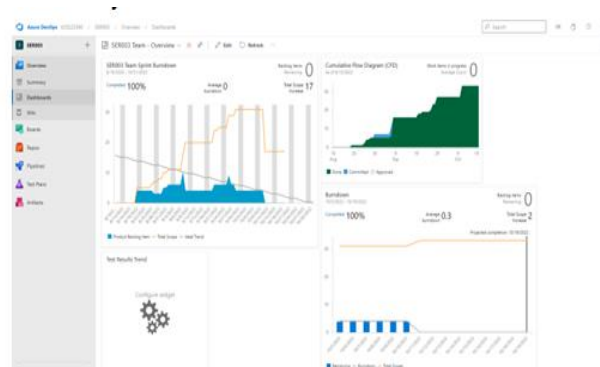
Figure 2: Azure board dashboard
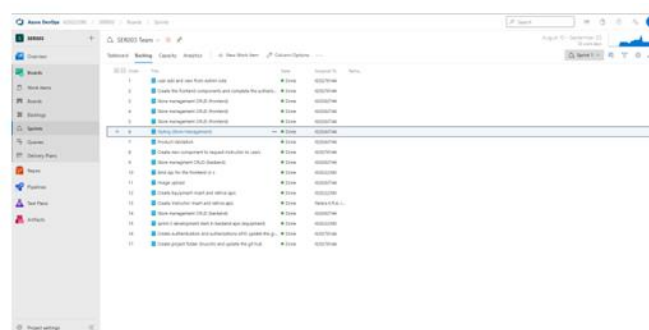
Figure 3: Azure board backlog example
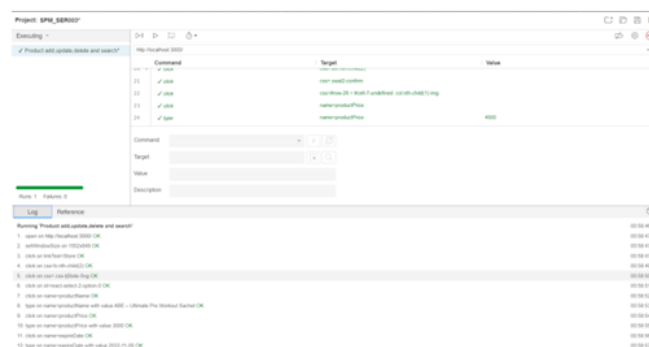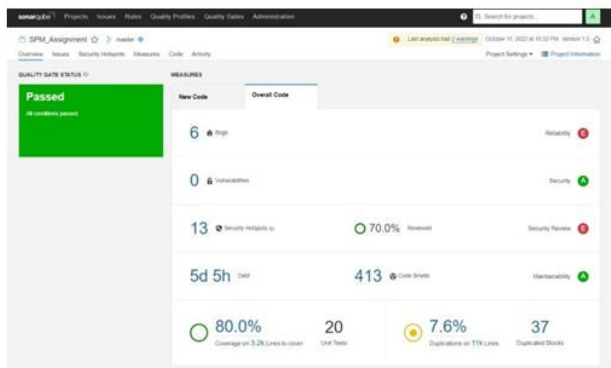

Figure 4: Selenium IDE example

Figure 5: SonarQube overview

Git Hub is used for version control. The following two images show the Git Hub repositories of the (Figure 6) backend and (Figure 7) frontend in the application, as well as how version control was implemented throughout sprints one and two.
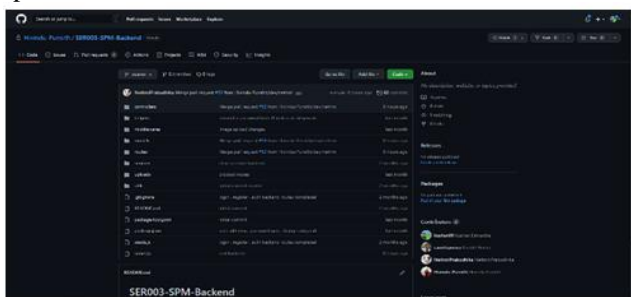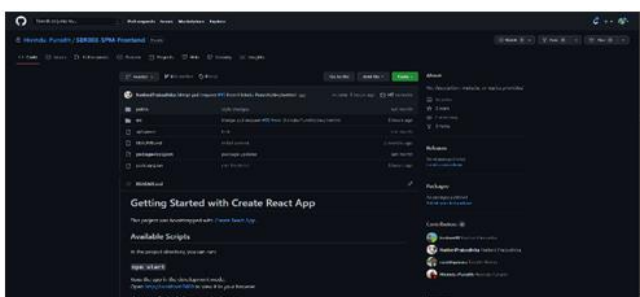

Figure 6: Git hub backend file setup

Figure 7: Git hub front-end file setup

We employ Node JS and MongoDB for this system's backend and database, respectively. JSON web tokens will be used to validate all users. They all receive a gym id to identify them specifically when the user registers in the system or the administrator adds a new user or instructor. Users receive a JSON web token each time they log into the system, and that token serves as their session-long authentication mechanism. The system's primary functionalities are all secured through authentication. When the backend receives a request, it retrieves the JSON web token from the header and checks to see if it is valid

before continuing with the remainder of the process. If not, it notifies the frontend that the user has not been authorized. We employ this procedure to validate the user for all the key application features. Since the format of every response sent from the backend is the same, we can quickly spot changes and problems. The Following (Figure 8) image describes the flow of the request validation in the backend.
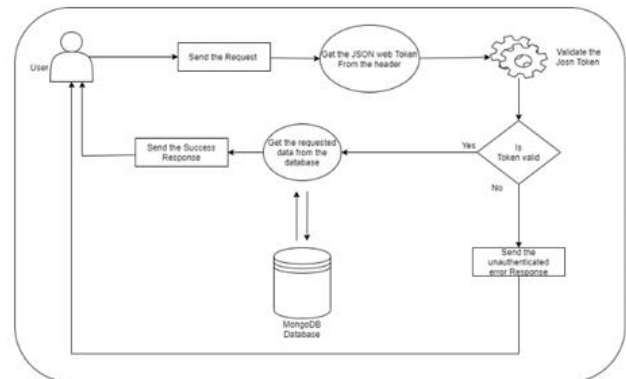
Figure 8: System backend process

The management of all activities in a gym is handled by the web application Fitness Hub. Three primary user roles are present in this program. Customer, Instructor, and Admin are their names. Admin is in charge of overseeing the application procedure. New instructor information will be entered to the program when the admin hires a new instructor for their gym. The new instructor can log in to the system using the email address and password that was supplied to them via (Figure 9) message. Customers can be added by the administrator, and they receive a password via the message service.
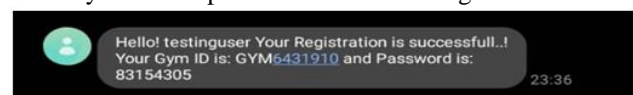

Figure 9: password sends as OTP

Furthermore, users can register in the system, update their profiles, request an instructor, and receive diet and exercise recommendations from them. Their most recent diet and exercise schedules are available for download as PDFs from their profile. Customers and instructors can purchase workout gear, vitamins, accessories, and protein products from the online store. Customers can sign up for memberships and then access the options available to them. These are the system's primary operations.

IV. PROPOSED SYSTEM

User Management
        User management is the main function in this

system. From this part we handle all the user's login and registration. In every time customer or instructor is registered or added by admin, they will get a gym id to uniquely identify them through the process. When customers register in the system by themselves, they can insert a password as they wish. When the customer or instructor is added by the admin, they will not get chance to insert any password. The system will generate a unique password and send the generated password to their mobile number via message.

In the customer profile page, they can update their (Figure 13) personal details in any time. The latest workout and diet plan is displayed in the customer profile page and customer can download them as (Figure 13) pdf format. In the customer side they can access all the customer features like store, instructor request and memberships. In the login process we identify the logged user's user role. To identify the logged user, we generate a JSON web token from the backend and store it in the local storage to access easily anywhere in the frontend. According to that user role they only can see specific routes in the front end. Also, from the backend all requests are validated as mentioned in the methodology. The following (Figure 10), (Figure 12) images show the nav bar difference according to the logged user's user role.

Figure 10: Customer navbar

Figure 11: Admin navbar
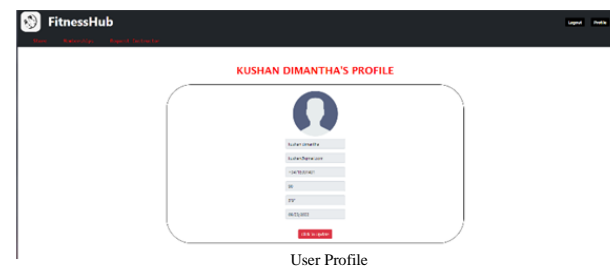
User Profile

Figure 12: User Profile

Figure 13: Workout plan and diet plan display in profile

In every system admin can manage all the processes in the system. Same the other systems from the administrative side they can manage all customers, they can add new user to the system, delete existing user from the system, update user details and view all the users (Figure 14). They can also download all the user details into one excel file.
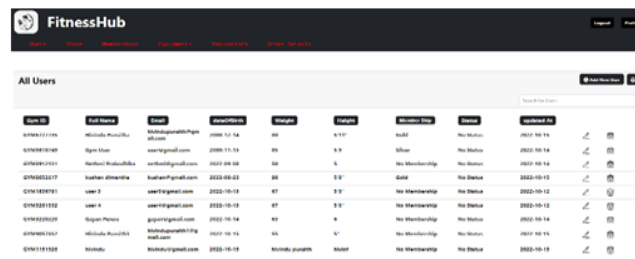
Figure 14: Users display to admin side

Administrative Functions,
- View All customers functionality.
  - ➢ When a user logs in as the administrator, the administrator can view all customers that are in the system.
- Add new customer functionality.
  - ➢ When a user logs in as the administrator, the administrator can add a new customer to the system.
- Edit existing customer functionality.
  - ➢ When a user logs in as the administrator, the administrator can edit existing customer details that are in the system.
- Delete customer functionality.
  - ➢ When a user logs in as the administrator, the administrator can delete the record of customer that is in the system.

Store Management

There is an online shopping store. Users can buy products as they need or according to the workout plans and diet plans. Shopping store handle by the admin (Figure 15). Admin can add new products to the store by providing category, product name, price (LKR), stock-expiration date and image of product. Admin can update and delete existing products. There is a report generated to get all details of the products in the store. Admin can view the orders of customers and get report of that.

Functions,
- View All products functionality.
  - ➢ When a user logs in as the administrator, the administrator can view all products that are in the system.
- Add new product functionality.
  - ➢ When a user logs in as the administrator, the administrator can add new products to the system.

- Edit existing product details functionality.
  - ➢ When a user logs in as the administrator, the administrator can edit existing product details that is in the system.
- Delete product functionality.
  - ➢ When a user logs in as the administrator, the administrator can delete the record of product that is in the system.
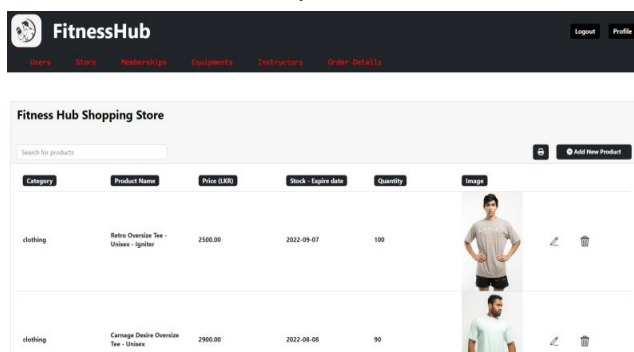

Figure 15: Items in shopping store display to admin side

Functions,
- View All orders functionality.
  - ➢ When a user logs in as the administrator, the administrator can view all order details of the customers (Figure 16)
- Get report functionality.
  - ➢ When a user logs in as the administrator, the administrator can get reports of all order details.

Figure 16: Display order history to admin side

Users can buy (Figure 17) products by adding to the cart. They can manage their cart by updating and remove added products. (Figure 18) Also, users can do online payment through the system. It can be card payment or cash payment. Users have to fill in the billing details by

providing name, delivery address, email address, mobile number and payment method.

Functions,
- View All products functionality.
  - ➢ When a user logs in as the member or instructor, the member or instructor can view all products that are in the shopping store.
- Add new product to cart functionality.
  - ➢ When a user logs in as the member or instructor, the member or instructor can add product to the cart by clicking add to cart button.
- Remove product from cart functionality.
  - ➢ When a user logs in as the member or instructor the member or instructor can remove the added products from the cart.
- Add billing details functionality.
  - ➢ When a user logs in as the member or instructor the member or instructor have to provide billing details according to the purchases.
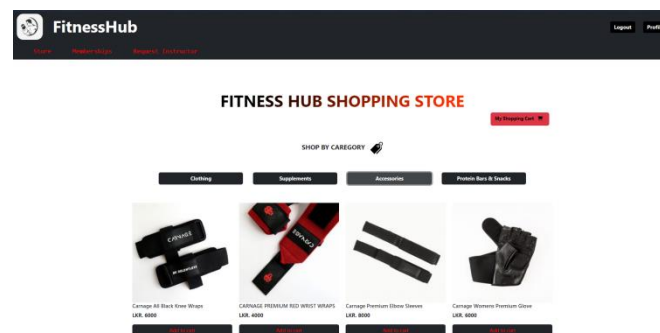
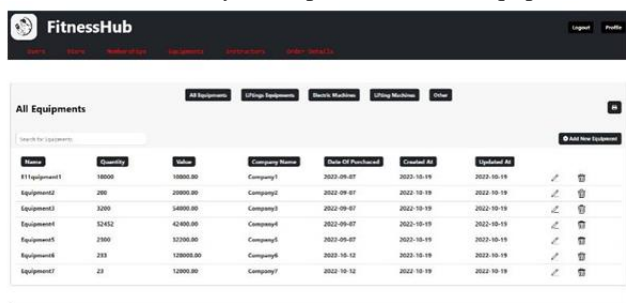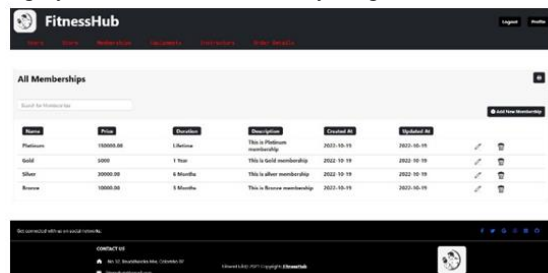**Figure 17:** Shopping Store
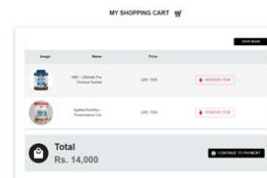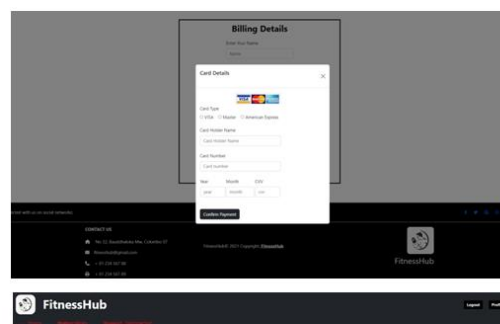
Figure 18: Shopping cart and Billing details for orders - Customer

Equipment Management

In traditional gyms they maintain physical books or something to keep the records and details of the equipment's that have in the gym. Now in the current world keeping those physical records is not a reliable way. By using this system, the user can keep the digital records of the equipment (Figure 19). This provides a more secure and more reliable way to keep the records of equipment.

Figure 19: Display equipment - admin side

Functions,
- View All equipment functionality.
  - ➤ When a user logs in as the administrator, the administrator can view all equipment that is in the system.
- Add new equipment functionality.
  - ➤ When a user logs in as the administrator, the administrator can add new equipment to the system.
- Edit existing equipment functionality.
  - ➤ When a user logs in as the administrator, the administrator can edit existing equipment details that is in the system.
- Delete equipment functionality.
  - ➤ When a user logs in as the administrator, the administrator can delete the record of equipment that is in the system.

Membership management

Normally gyms maintain their memberships to purchase by the customers. In the traditional manner members get membership card or something physical thing. Using gym management software allows you to manage your members effectively (Figure 20).

Figure 20: Display all memberships - admin side

Functions,
- View All membership functionality.
  - ➤ When a user logs in as the administrator, the administrator can view all memberships that are in the system.
- Add new membership functionality.
  - ➤ When a user logs in as the administrator, the administrator can add new membership to the system.
- Edit existing membership functionality.
  - ➤ When a user logs in as the administrator, the administrator can edit existing membership details that are in the system.
- Delete membership functionality.
  - ➤ When a user logs in as the administrator, the administrator can delete the record of membership that is in the system.
- Members side update membership.
  - ➤ When a user logs in as a member, the member can view the available membership (Figure 21) and member can update their membership.
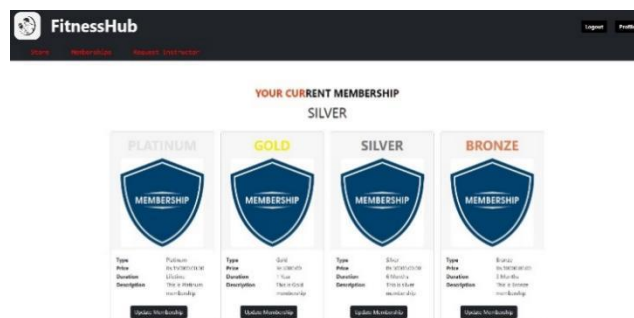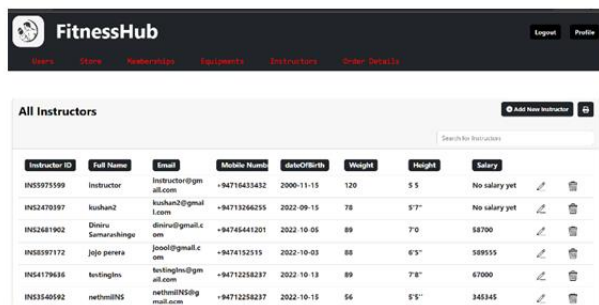

Figure 21: Memberships– Customer view

Instructor Management

In this system, administrators can access all of the instructors (Figure 22) and investigate each individual's details, as well as obtain a comprehensive report of the instructors' data in the system. Administrators can also add new instructors to the system. Admin can also change the instructor's information, including his or her compensation. An administrator can also remove a teacher. Administrators can look up instructors by name or email address. Finally, clients select their chosen instructors from among those who are available, and the system alerts the instructor.
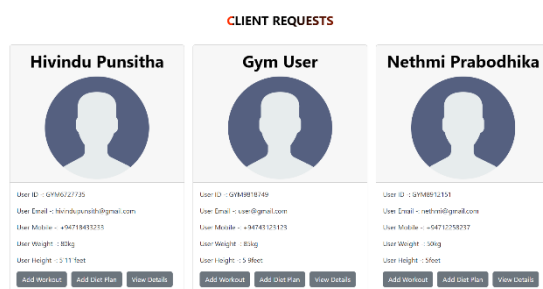
Figure 22: all instructors - admin side

Functions

- View all instructors functionality
  - When user logs in as an admin, the admin can view all the instructors in the system
- Create new instructor
  - When user logs in as an admin, the admin can create a new instructor
- Update existing instructor
  - When user logs in to the system as an admin, the admin can choose a particular instructor and edit his/her data accordingly
- Delete existing instructor
  - When user logs into system as an admin, the admin can remove an instructor from the system.
- Request instructor
  - When user logs into the system as a client, the client can request a particular instructor for their preference
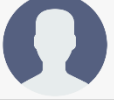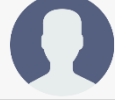

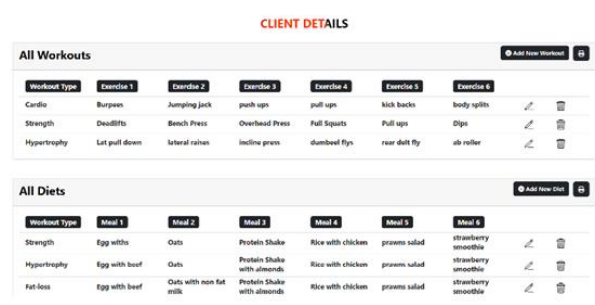**Figure 23:** Display client request

After a client request it, the instructor can view all of their clients in the system (Figure 23). Instructors can customize diet and training programs for each of their clients. In addition, the instructor can alter or eliminate existing fitness and diet regimens based on their preferences (Figure 24).

Figure 24: Display client side

Functions

- View all clients
  - When user logs in as an instructor, the instructor can view all the requested clients and their details.
- Create workout and diet plans
  - When user logs in as an instructor, the instructor can add certain workout and diet plans according to their preference
- Edit workout and diet plans
  - When user logs in as an instructor, the instructor can edit certain workout and diet plan for a particular client
- Delete workout and diet plan
  - When user logs in as an instructor, the instructor can delete certain workout and diet plan for a particular client

V.   DISCUSSION

As the popularity of health and fitness grows, so does the demand for improved gym management systems. A solid gym management system may assist you in keeping track of your members' training habits and progress. It may also aid in the management of your funds, the scheduling of classes and activities, and the tracking of your equipment. Fitness hub is a software tool meant to assist gym management in running their business more efficiently. It can manage scheduling and payments for members, as well as marketing and client retention. Fitness hub is meant to make gym administrators' lives easier, and they may be an excellent tool for increasing your business.

There are many advantages of having a gym management system set up. It, first and foremost, can assist you with monitoring your gym individuals and their exercise routine schedules. This is significant in light of the fact that it permits you to screen their advancement and guarantee that they are meeting their wellness objectives. Furthermore, a gym management system can assist you with dealing with your funds and track your costs. This is useful in light of the fact that it permits you to see where

your cash is going and the amount you are spending on your gym. In conclusion, a gym management system can assist you with showcasing your gym to expected new individuals. This is significant in light of the fact that it permits you to contact a bigger crowd and draw in new individuals to your gym.

VI.   CONCLUSION

Nowadays, everyone desires to work out online, thus this fitness hub is a great service to them. Because of the lockdown during the epidemic situation in the country, most of the people could not come out from their houses. As a result, users may profit from this platform and feel safer utilizing it than they would outdoors. The online store is helpful for fitness hub customers who need to acquire items since it makes such goods readily affordable to everyone. No paperwork is required, and there is no need to keep track of every payment and individual; all of this can be handled by the system utilizing a database, and the fitness hub did a great job of providing us with the great facilities at the gym.

However, when it comes to online use, users will only prefer specifically and maintain the durability. Here, users' top concern is security, so fitness hub will not reveal their users' data and requirements while still providing excellent service to users. In the gym outside, users primarily need proper equipment, maintenance, and structural variety as well as a lack of excessive crowding. As a result, the system reduces costs, time, and effort. Each project must provide application development for future improvement, and the project or system must be sufficiently flexible to permit any necessary adjustments.

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