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An Android based Real-Time Fitness Tracker and Diet Suggester

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Abstract: ***"Age is just a number," a quotation that demonstrates that if one maintains a healthier lifestyle, they will never grow old. People of all ages, from teenagers to adults, college students to senior citizens, are becoming health freaks and becoming more concerned with their diets and fitness. In the development of a healthy and more balanced lifestyle, fitness and physical activity are favoured. The number of smartphone apps correlated with the idea of physical fitness and the aim of achieving a healthy everyday routine is growing. The paper suggests a fitness tracking smartphone application that will help consumers become more mindful of their health. The application keeps the count of the number of steps and correspondingly shows the number of calories burnt. This application also helps users to know how many calories (Kcal) the user consumes throughout a day by entering the food that he/she consumes throughout the day. The user of the app can also manually enter the number of calories consumed if that particular food item is not present in the app. The most unique functionality of this application is a water tracker. According to the BMI, the daily workout time, and the sleep time, it suggests the daily requirement of water for your body. It also provides the user with certain recommendations for the best YouTube videos for various types of workouts. This service would save users time by allowing them to complete all of their tasks on their device rather than contacting a dietitian.***

Keywords: Health, Fitness, Diet, Workout, BMI, SQLite.

I. INTRODUCTION

Physical activity and exercise, according to scientific research, can help to relieve some of the symptoms of mild to moderate depression. As a result, we need innovative approaches to facilitate physical exercise and improve wellness and well-being. As a result, the aim of this study is to create a solution that combines mobile computing technology with physical activity to promote a less sedentary lifestyle. Since the majority of the population owns a mobile computer, mobile apps are becoming more important in assisting with this form of issue. With the exponential rise of mobile use in recent years, a new method of tracking and encouraging people to participate in health and wellness activities is emerging. StayFit is an android application that provides its users with a generic diet based on several parameters. It functions as a diet consultant in the same way that a true Dietitian does. In order for a dietitian to determine a person's health status, he or she must provide the dietitian with information such as body shape, weight, height, operating hours, and the foods consumed on a particular day. Similarly, this application identifies which nutrients are in short supply and recommends the appropriate food to meet the requirement. As a result, the user does not need to see a dietitian, which saves time, because the user can get the diet plan, they need with only one click. The machine can have more reliable outcomes when it embraces the user's data and processes it based on certain metrics already known to the application, which are then used to produce a diet schedule. This app not only gives the customer a proper and balanced diet, but it also gives them the best YouTube videos of almost all workouts. Water helps with weight loss. Water keeps you fuller for longer without adding calories to your diet. That's why water tracking is also an important feature in this application. It suggests the daily requirement of water for your body according to BMI index and sleeping time. Fitness applications are one of the newer types of apps. These applications can be used to stay in shape at any time and from everywhere. The majority of people rely on these applications because they enable them to access them at any time. Setting wellness targets, offering exercise tips, recording calories consumed, fitness recipes, and providing success maps are all things that apps can assist with.

II. LITERATURE REVIEW

Aashita Chhabra and Chitrank Tyagi proposed a model called FitKit Android Application [1]. This model is designed to cater to all the demands related to fitness like workout routines, diet allotment, and tracking fitness activities like steps counter. This model generally focuses more on developing core strengths by giving every individual the required maintenance range for calories on the basis of their BMI categories. Another work related to this field was contributed by Prof. Prajkta Khaire, Rishikesh Suvarna, and Ashraf Chaudhary. Virtual Dietitian: An Android-based Application to Provide Diet [2] is an android application built for some diet-related functionalities. Some features of this application are the BMI calculator, the maintenance calories which are calculated with the help of height weight and BMI index. Once the calories are calculated then the system decides if the user is in the underweight, healthy, or overweight category. The User is then suggested which type of diet program he/she should start for maintaining good health. Home Workout—Daily Fitness [3] is an application hosted on the play store that includes several types of training, with several levels of difficulties.

A stopwatch was depicted with each type of exercise. A graph was used to represent the data, which included the milestones accomplished, the outcomes for the day, week, month, or year, the calories consumed, and the weight statistics. Another application that is hosted on the play store is Dr. Training—Fitness e Bodybuilding Gym Workouts [4]. This application allows its users to choose the type of objective, the type of goal, and the muscle to be trained to obtain a list of the exercises. It included animations that showed how to complete the exercise. It also has a screen that tells its users which is the best meal to obtain results quickly. Finally, the user had a BMI calculator to know the physical condition themselves. Gym Workout Plan for Weight Training [5] is an application hosted on the play store containing a workout plan in which it shows a list of exercises for each activity. There were some photographs with a short explanation next to them, as well as the muscle to be worked on. There were various different forms of training programmes available, based on the user's goals. The application Gym App Workout Log and Tracker for Fitness training [6] launched in January 2018 had a list of exercises of possible choice to perform the training. There were also educational programmes in place to encourage beginners to get started. For each activity, the user had two photographs that exemplify the movement and show the trained muscles. It has a description to know what to do more in detail. Other essential parts were nutrition and also a graph that showed the progress.

III. METHODOLOGY

This section explains the implementation of the proposed model.

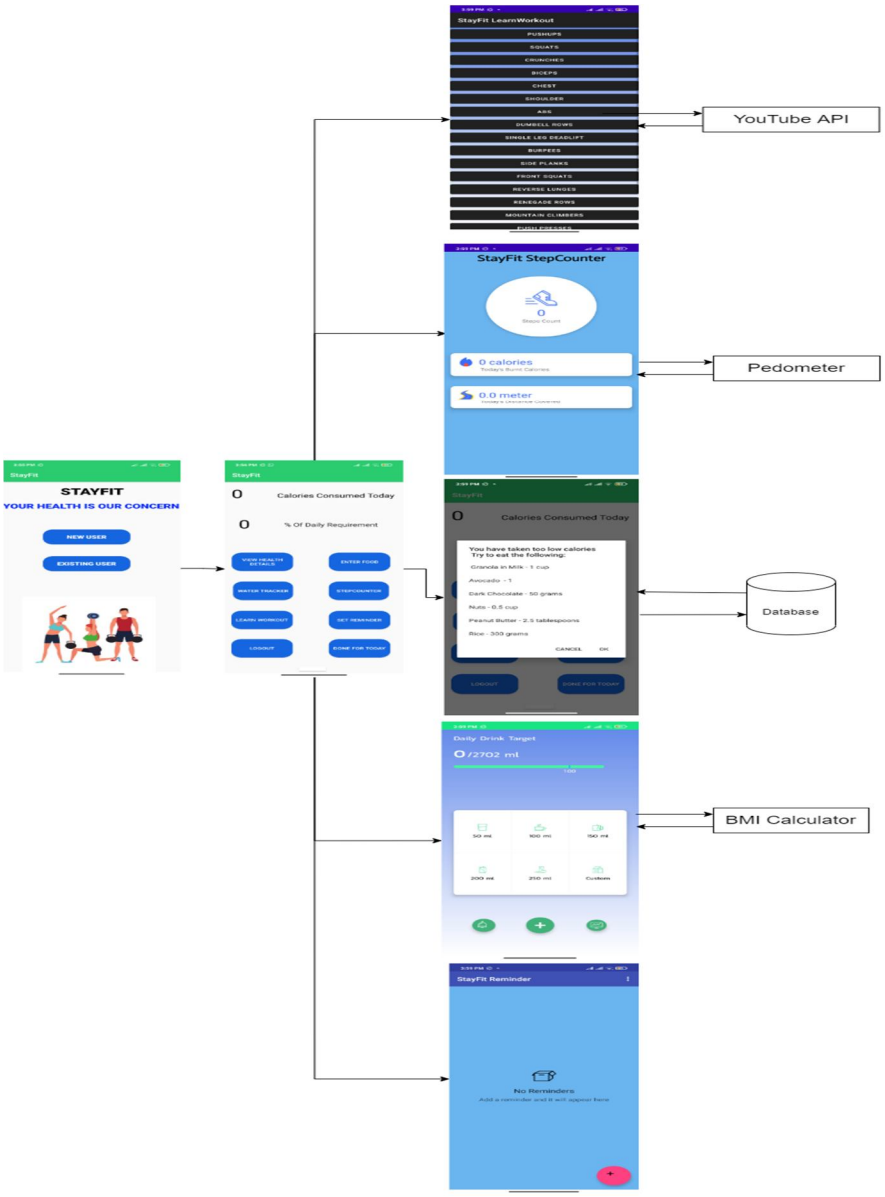

Fig 1: Proposed Model Flow Diagram

The first step in the flow diagram starts with registering for access to the application. The user needs to register to the app by providing several credentials like name, username, password, email, contact number, the city where the user resides, height (in cm), weight (in kg), and gender. After successful registration, the user has to log in with the help of the username and password provided at the time of registration. After successful login, the user will be able to access the dashboard. In the dashboard, the user will be able to configure his/her daily calories consumed as well as how much % of the daily calorie intake has been consumed. The calorie requirement of the user is calculated by taking BMI based on height, and weight, age, and gender input. The calorie requirement varies from person to person depending upon their BMI and the gender. For the proposed system, the calorie requirement [7] is already specified in the database. Graph of calorie requirement for different age groups for males is given in figure 2 and that for females is given in figure 3.

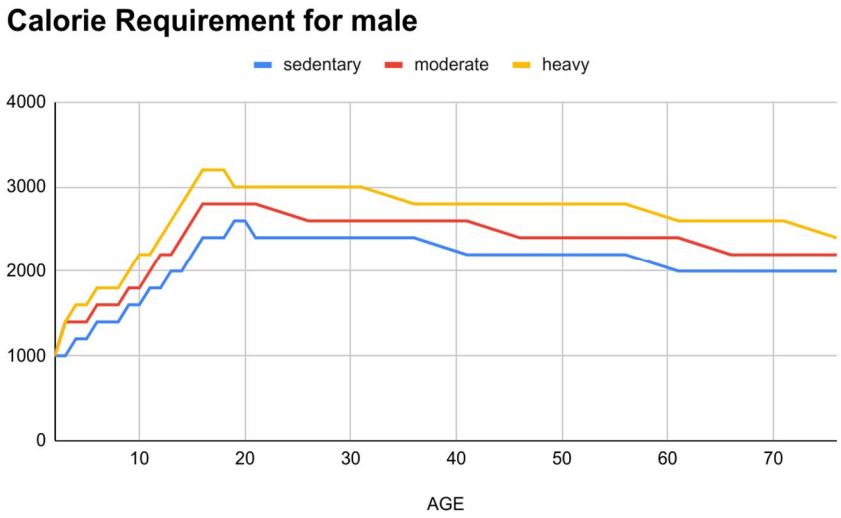

Fig 2: Calorie Requirement for Male [7].

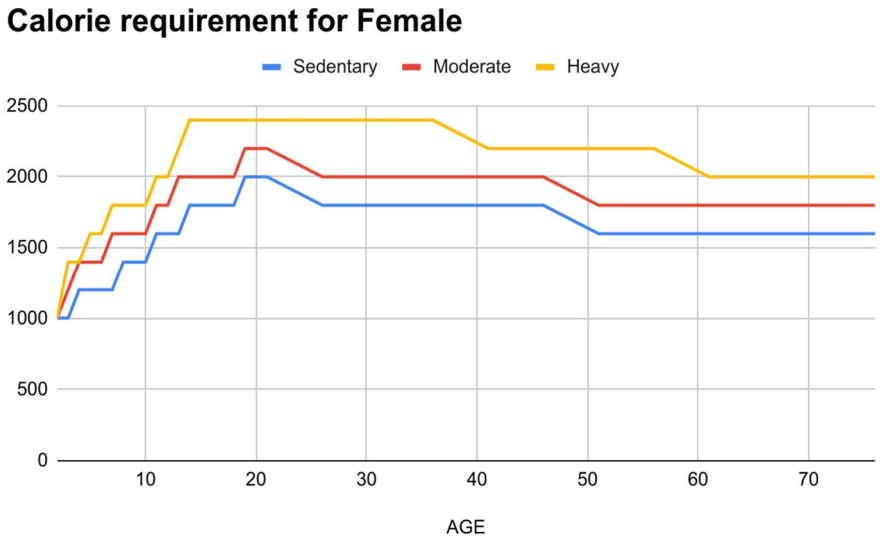

Fig 3. Calorie Requirement for Female [7].

The BMI is calculated using the formula – [8]

$$BMI = Weight(kg) / (Height\ in\ meters)^2$$

After login into the system, the user will get access to various options in the dashboard like the view health details, enter food, water tracker, step counter, learn workout, and set reminders.

A. Food Activity

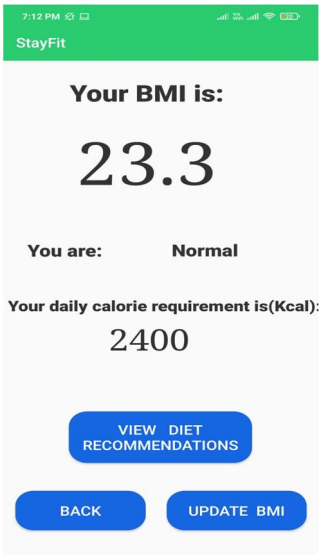

Fig 4. View Health Details Functionality.

For the food activity, there will be several functionalities related to health. In view of health details functionality, (figure 4) the user will be able to see his BMI index, and accordingly, he/she can check his health status whether his/her health is normal, overweight, or underweight. Along with the BMI index, the daily calorie requirement (in KCAL) will be displayed for the user according to the data given by him/her. The user can get some diet recommendations in order to maintain their health. If the user wants to update the BMI index, they will have an option to do it by providing new height (in cm) and weight (in kg).

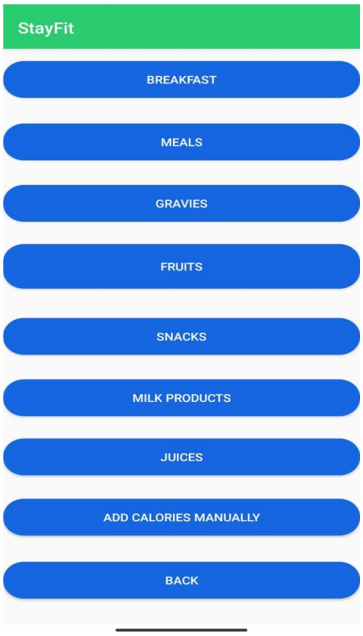

Fig 5. Enter Food Functionality.

In the enter food functionality, (figure 5) the user is supposed to enter which type of food he/she has consumed in breakfast, lunch, and dinner. [11] When the user selects what food he/she has consumed, the query for retrieving the data about calories will get fired towards the database. The SQLite database returns the results back towards an application. Depending upon the food, appropriate calories will get added. If a certain food item is not present in the database the user will have the chance to add the calories manually by roughly estimating the calories count of that item.

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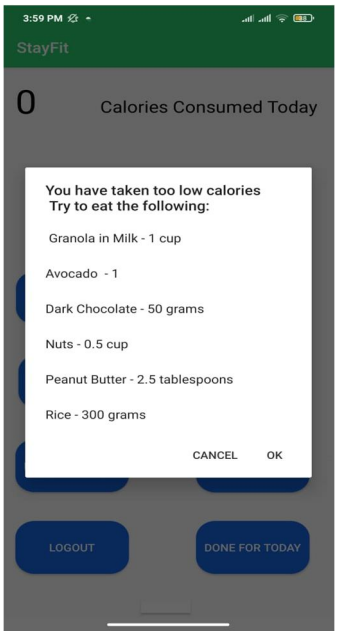

Fig 6. Done for Today Recommender

When the user completes all of the food-related tasks for a day, he/she should press the "Done for Today" button. It will make an appropriate recommendation based on whether the user has consumed too many or too few calories as shown in figure 6. If the consumer meets the calorie requirement, the application will suggest foods that the user can include in his/her diet. If the user goes over the daily calorie limit, the application will remind the user that he/she needs to do a workout to get back on track. Under the “Learn Workout” portion, the user can practice the prescribed exercise.

B. Water Tracker

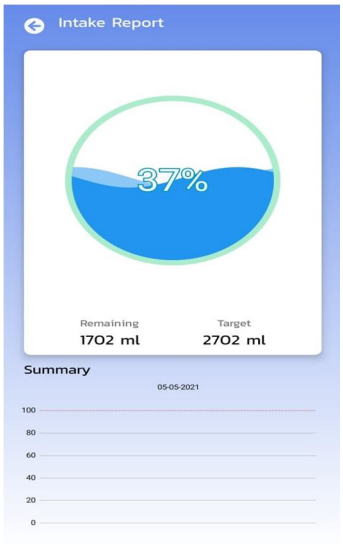

Fig 7. Water Tracker.

The water tracker segment (figure 7) displays the body's water requirements (in ml) depending on the span of the exercise, [9] the weight of the user and the span of sleep. Once the user drinks water, he/she should add that much millilitre of water in the application. The user can set a reminder/alarm of 30 minutes for drinking water. The graph displays a clear summary of the daily water intake. As in figure 7, the application will show how much percentage of the user's daily water requirement has been consumed.

C. Step Counter

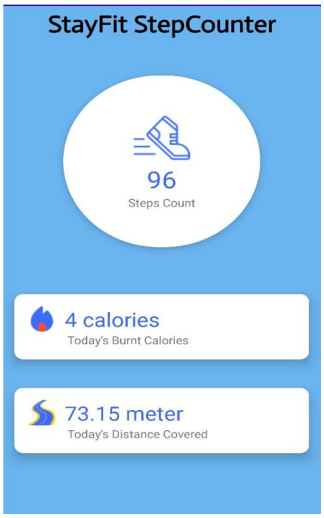

Fig 8. Step Counter.

The Step counter functionality (figure 8) works on an inbuilt sensor "Pedometer". If the user wants to calculate the calories burnt and the distance covered during the walk, he/she should always keep the mobile phone with him/her. When the user walks certain distances, the pedometer calculates the steps walked by the user and sends the data to the application as shown in figure 8. According to the steps walked by the user the application calculates the calories burnt (20 steps walked = 1 burnt calorie).
A tool or arm on a spring is located within the pedometer. [10] By measuring the up and down motion of the user's hips, the spring moves up and down as the user walks. When the user moves, the mobile phone detects the user's movement and unlocks.

D. Learn Workout

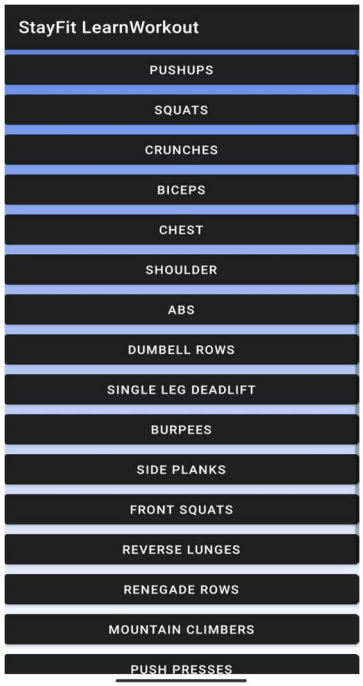

Fig 9. Learn Workout.

In the learn workout section, the application provides a list of various types of workout activities as shown in figure 9. Users need to select the workout activity as per their requirement, after the selection of workout activity, the user will get redirected to the YouTube video for the same. It helps the user to learn their required workout type with expert coaching.

Users can set a reminder for a particular workout. The user just needs to provide the description of the reminder, the date, and the time for the same. The user will get a notification about the reminder. It also allows the user to edit or delete the note as per their will and wish.

IV. FUTURE SCOPE

Any application or business practice carried out around the world has room for improvement; however, the goal should be to keep the practice as simple as possible so that even a non-technical consumer with no technical knowledge of the field may follow it.
This application can be further improved by feedback suggestions from the users. In the future, we can implement the concept of workout songs playlists in StayFit so that the retention of our app can improve. As we know, nowadays people love to listen to music, so by adding this feature users will spend more time on this application. Also, we can implement sharing options so that he/she can compare their progress with others like the percentage of water they drink or calories consumed.

V. CONCLUSION

This application is designed in such a way that even those having not sufficient knowledge of the domain can easily use it as it has a very simple and easily understandable user interface. This application can successfully calculate the number of steps and accordingly, the calories burnt, and distance covered. It also shows how many calories users have to consume in one day depending on BMI index and also the application suggests food after the user enters consumed food in the application. The application also keeps track of water intake per day and shows the percentage of water he/she has drunk on that particular day. At any point during a workout, if a user is confused about the exercise steps, then the application provides the expert's videos on YouTube for most of the types of exercises. Overall StayFit can guarantee the responsibility of each individual's fitness and healthy lifestyle.

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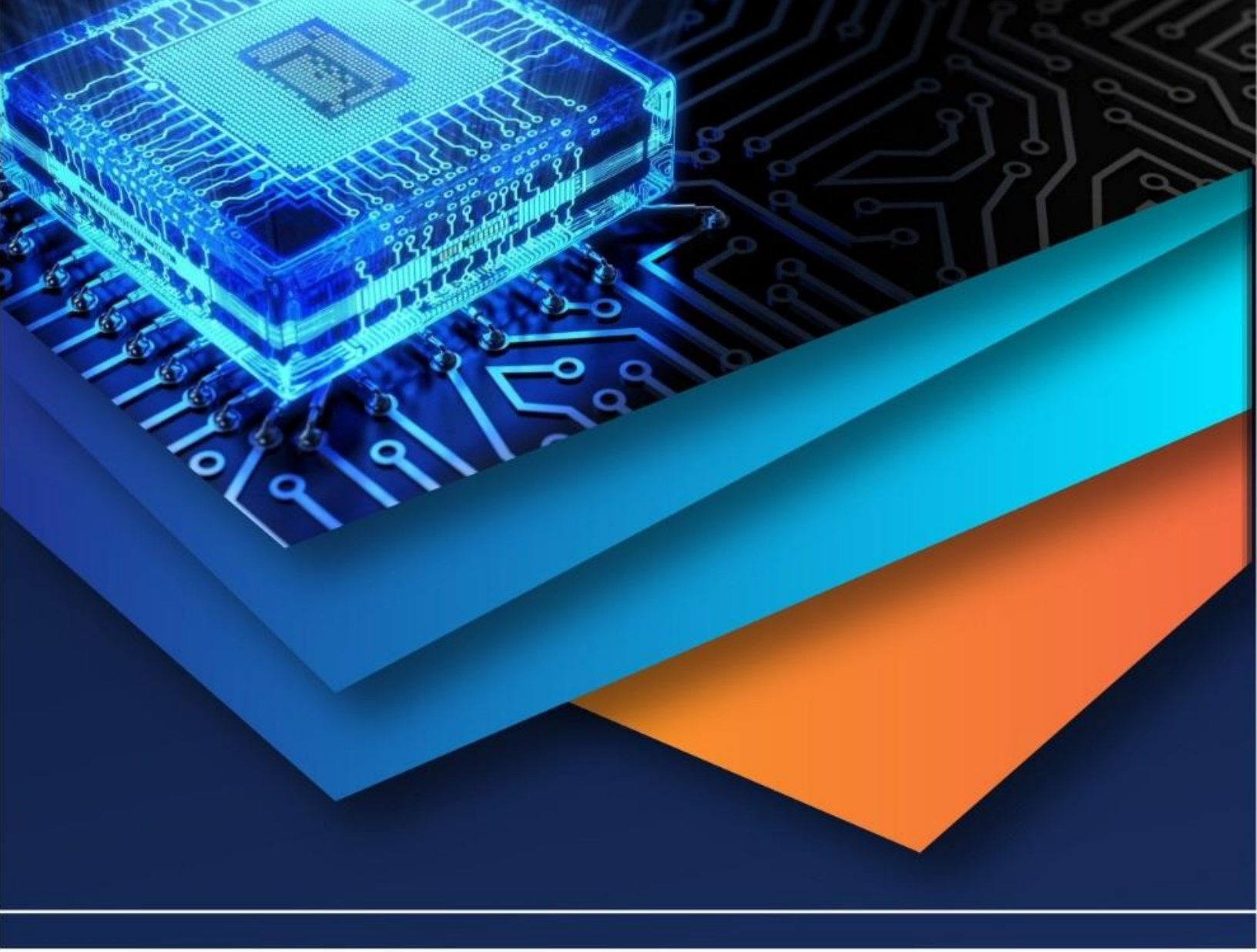

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