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Multifaceted Reminder

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Abstract: ***The rising work-load in one's life and declining capability of an individual to remember the work to be carried out in a day, has led to unsuccessful task achievement. Hence this gave rise to devise a mobile application called Multifaceted Reminder that is nothing but a location-based reminder with add on functionalities. This application runs on a mobile device which may act as a reminder with additional built-in facilities depending on its usage. We have proposed a system which aims to resolve the issues in contemporary life of a person that might be forgetting a task to accomplish while going or being at a particular place. It provides the user with variety of options and acts as a location-based recommender, reminder, and task assigner by which a person is able to carry out his tasks efficiently. We have also explored different scope of this application, thus reducing the time and efforts and increasing the productivity. Furthermore, with the help of dynamic allocation the application makes the overall process hassle free by making it more machine dependent.***

Keywords: location-based reminder, task assigner, mobile application, multifaceted reminder.

I. INTRODUCTION

In today's world, where life is so fast and hectic, there is a requirement for an assistant that helps in scheduling day to day tasks and also help in effectively completing those tasks. Due to improper scheduling of tasks, missing reminders, and choosing an inefficient way to complete these tasks leads to unnecessary delaying its completion and involves needless human efforts. Some activities may be strictly bounded by time, like paying bills, visiting a bank, seeing a doctor, while other tasks may not have strict time restrictions like visiting a grocery store.

No doubt, there are a lot of applications available in the market that helps in scheduling tasks and give reminders. However, they fail to incorporate the two most important factors, which are time and location together. When we consider these two factors together, we can schedule the tasks effectively and also help in providing recommendations so that the user can complete all the tasks in minimal time and efforts. In our proposed system, we have considered all the factors discussed previously. When the user feeds the activities with their time and location, he gets the option to set priorities for those activities. Post prioritization of activities, the user schedules the tasks. In this paper, we have proposed the use of the geo-fencing technique, which creates the virtual boundary around the point using the Global Positioning System (GPS). Once the user's device enters into the radius of the location of the task to be accomplished according to schedule, the user will get the notification, and the app will guide him to reach his destination using Directions API. The next task scheduled will be tracked after the completion of the current activity.

Apart from this, we have considered real-time issues too. For instance, if a user wants to visit the grocery store as per his schedule that is closed, then he will get the recommendation of another grocery store using the Places API and will be guided to that store.

II. LITERATURE SURVEY

In [1] Existing System has some pitfalls which can be altered and improved with the help of geofencing methodology, it virtually creates boundary around the specific region using Global Positioning System (GPS). Whenever user steps into that region it will generate reminder. This would be very helpful in generating more user specific reminders.

The System described in [2] makes use of additional information such as nearby places and keeps on suggesting user as well as generate more information. But this is achieved with a heavy cost of computing and tracking location continuously and collecting irrelevant information this will cause heavy load on the mobile as well as data usage.

In [3] users are provided with pictures to get gist of their interests depending on their picture selection. This activity will carried out intrepidly in the background. After this it will generate reminder patterns to user and continuously monitor activities to get insight of user preferences. This will not be viable solution considering commercial purpose where task needs to be completed irrespective of their interests.

One application which is currently developed and in use is Place-Its this application provides user the provision to drop a pin and set reminder on that particular location. This application will generate reminder whenever a user enters into that zone. But there are some de-merits involved it makes use of low-accuracy GPS which will exacerbate situation by providing nuance differences in locations [4].

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Google Keep is another application developed by googe which serves this purpose to certain extent. It allows reminders of one type at a time i.e. Time based Reminders or Location based Reminder both cannot be assigned at same time. Drawbacks with google keep is it does not allow user to set radius on their preference and there is no recommendation provided if the place we are visiting is closed[5].

GeoMinder[6] uses mobile network's cell id information to track the users location where as we use GPS technology to track location. So, the accuracy of GPS location will be more than that of mobile network's cell id information.

E-Graffiti [7] allows the users to track their current location but there is not map support in it for entering giving the input location which makes the task much more tedious for the user.

III.PROBLEM DEFINITION

Due to the surge in day to day chores, people are undergoing the problem of not recollecting the task. There are many pieces of work that a person has to do that might be buying something from a shop or going somewhere to collect or deliver a parcel. Hence it gets difficult for an individual to remember each and every task without missing on it.

If it continues then it becomes monotonous for a person to go again at the same place, travel long distance and carry out the task that he would have done previously.

However, by undertaking all these elements we have come up with the solution that serves to resolve this problem by developing an application that would help user to list down their tasks based on the specified location and get the reminder of all the listed down tasks whenever they visit the location or are in that particular radius.

Additionally, it also helps commercially by assigning a missed task to the other person who is later on going to visit that place, thus reducing the effort of a person to visit that place again.

Not only this, but whenever the user searches for a specific shop, and if the shop is unfortunately not available or is closed then the user will receive the recommendations similar to that shop. With this technique a user will be able to achieve all his tasks effectively.

IV. OBJECTIVE

The prime objective of our proposed work is to devise a mobile application that provides the user with the optimal solution to determine the day to day tasks and to achieve them at.

With the rise in the number of users and their tasks it becomes a feasible option for a person to use this mobile application. The main goal of our project is to assess the user reminding him the work to be carried out, assigning the task to the next person if missed by the previous one and also recommending the user for the nearby similar places or shops that he searches for. This will reduce the efforts, travel cost and difficulty in traveling to various places for the work and can be done in one go.

V. MOTIVATION

The prime objective of our proposed work is to devise a mobile application that provides the user with the optimal solution to

Increasing jobs and other responsibilities in an individual's life has led to the accomplishment of many tasks in a day, which becomes a bit challenging for a person to remember all of them. Also, people are quite hasty nowadays by which they are able to complete a task but forget to do another task from the same place which they later realize. We often ignore such issues and it ultimately increases the work-load. In order to complete that task a person has to again visit the same place that might be far away or nearby from his place.

Example: In this fast-paced lifestyle it is hard for people to spare their time for these tedious tasks and to complete them. Not only has this but to add some extra hours in your schedule and achieve it become very difficult. Considering all these issues we have tried to resolve all problems by our research work.

VI.METHODOLOGY

A. System Architecture

The system architecture of our proposed location-based reminder consists of a mobile application, Google's Firebase stored in the cloud, a navigation system, Google Maps API, Directions API, and Places API.

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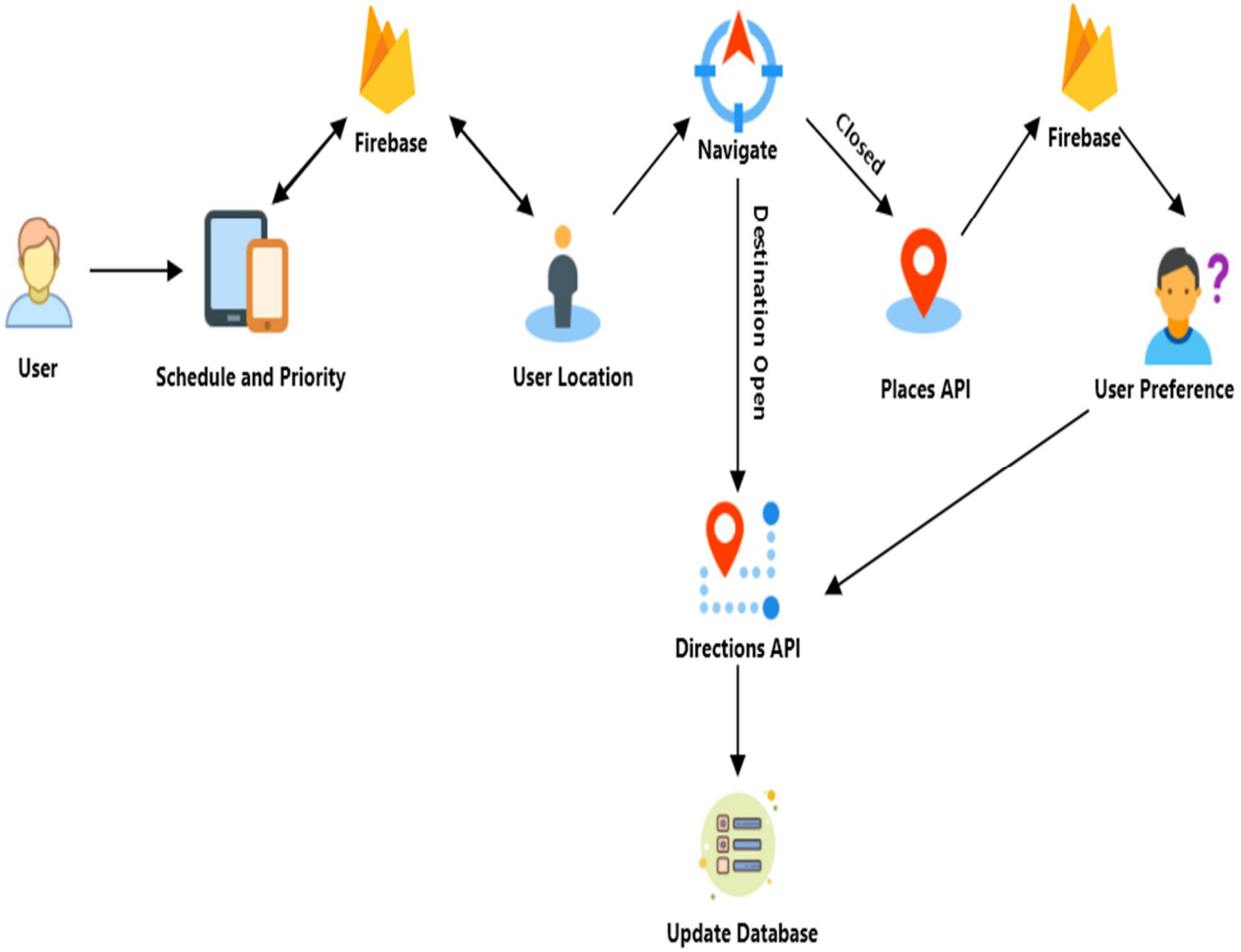

Fig. 1 System Architecture for the proposed system

1) *User Registration and Verification:* When the user launches the application, he will have to register himself using Firebase Authentication. Post successful registration, the user will have to verify his mobile number using OTP which will be implemented using the Firebase Phone Authentication Service. Now the user details are mapped into the Firebase and can now explore the application.
2) *Feeding Tasks and its Schedule:* The user will have to enter complete details of all the tasks along with its time, location taking input from Google Maps and using Places API's which will be able to get precise location, and the estimated time to complete the tasks. He will now have to prioritize the tasks. The details get saved in the Firebase.
3) *Storing Data on Firebase:* The input provided by the user will be stored on online database – Firebase which will help in reduction in consumption of mobile storage. This will also be helpful for keeping the track of previous tasks history.
4) *Navigation to the Destination:* The user be able to navigate to the task with the help of Direction API which will give multiple routes and suggestion according to user's convenience and also be able to suggest routes using different mode of transport.
5) *Notifying User:* The user's location will get continuously tracked using Location Manager and Last-Known-Location of the user, and once he/she enters the radius of the scheduled task, user will get the notified and will get directed to the desired destination. Here, the user will get the option to reschedule this task. If he/she does so, the task details will get updated into the Firebase.
6) *Task Recommendation:* If the shop where the user wants to head is closed, some mishap has occurred near the shop; the user will get a recommendation of a similar shop using Places API and will get directed to the same. The user can also set the preference for this task. The name, location of the store, and preference of this task will get updated into the Firebase.

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B. Flowchart

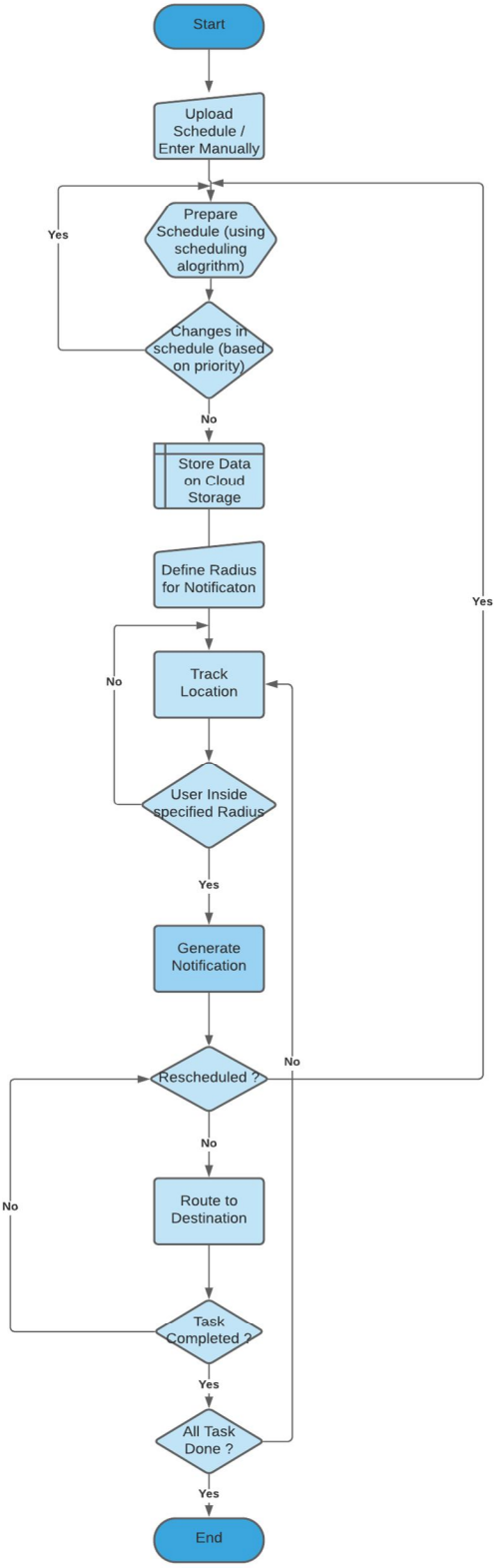

Fig. 2 Flowchart of proposed system

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Once the user has provided all the details, then the app will calculate the route depending upon all the above-mentioned factors and using Travelling Salesman Problem algorithm which will help to save the user's time. Then the data of the task location will be stored in the cloud storage which helps in tracking the user. Also, the user needs to define a radius in which when user will enter, he/she will get notified about it.

When the route is generated and radius is defined, we conduct following steps:

1) After starting the task, when user will enter in that specified radius around the destination, he/she will get notified about it.
2) Once the task is completed, user needs to update that in the application and then we will checkout that task and notify him/her about the next task.
3) In case the user skips that task or is not able to complete that task at that very moment so user can mark that task as incomplete and that task will be rescheduled and a new route will be generated for all the remaining tasks.
4) This will continue till the entire tasks are not completed.

C. Proposed Algorithm

Task Name	Task Priority	User Location	Task Location	Estimated Arrival Time

Fig. 3 Real-time Database Structure

1) To Overcome Scheduling Job we Propose Algorithm which takes into Consideration following Parameters
a) Task Name: To provide user relevant information about task.
b) Task Priority: To provide user how he/she should approach.
c) User Location: To get an Estimated Arrival Time and provide suggestions.
d) Task Location: To get an ETA and also provide information about opening hours if any specified.
e) Estimated Arrival Time: To provide proper scheduling considering all the above factors this will play major role.

2) Working of Algorithm
a) User will be entering / uploading task schedule.
b) After uploading he will specify task priority.
c) At the end all this data will be fed into the above table structure.
d) Based on ETA (Estimated Arrival Time) :
- It will arrange task based on priority and ETA which is generated by location.
- It will make changes in schedule if user changes priority or follows another approach.
- It will generate suggestions if ETA > opening hours and provide user alternative options.

e) After all the tasks are done table for that particular user will get empty and this algorithm will work on real-time to keep a track on user.

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D. Recommendation System

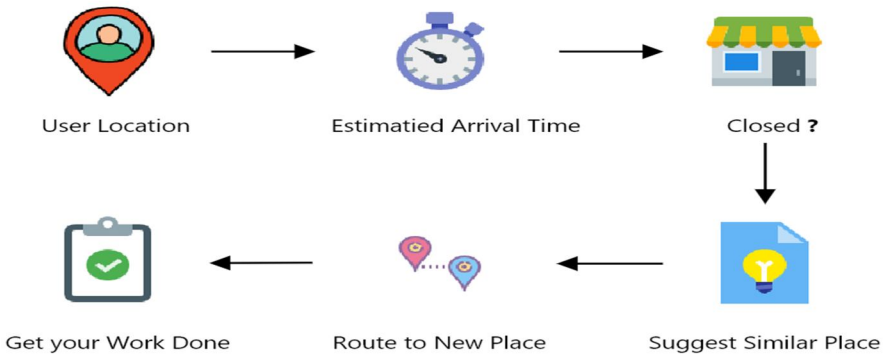

Fig. 4 Working of Recommendation System

Individuals have tendency to reach place late reasons might originate from various sources such as traffic, procrastination and many more. But it becomes inevitable to face the consequences particularly when there is fixed opening hours.
To overcome this situation, we propose a system which will take into account user's current location and estimate amount of time to reach the destination with the help of maps. Based on the outcome, if the user will reach the place beforehand then no actions needs to be taken but if there is a possibility that user might get late then depending on user preference our system will generate suggestions of similar places and if user wishes to go that place and will get route to that place and get their task done.

E. Working

If Estimated Arrival Time < Closing hours

- No Changes needs to be done but will keep track continuously.

Else

- Provide User Suggestion of Similar places if he/she wishes to change.

F. Applications

1) Going out for dinner but due to traffic got late and restaurant got closed.
2) Going out for shopping to buy a shirt user will get suggestion of various other shops.
3) In case of emergency, user can use this feature to locate similar places.

VII. FUTURE SCOPE

A. Parking Assistance

In our proposed system, we are assisting the user to reach the destination but what if he's traveling in his private vehicle? We can provide the locations where he can park his vehicle.

B. Recommendation of Similar Places

Using AI we can also recommend him similar places in his route which will save user's time.

C. Monitoring and Notifying Activities

We can even continuously notify him regarding activities taking place in the vicinity of his places which can help him to change the place in advance.

D. Track Timings

It would be really great if we can continuously track the opening/closing time of the places that user wants to visit and give him notification if user spends more time completing his current task.

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VIII. CONCLUSIONS

Hence, with our thorough research we believe that our proposed application will not only reduce human intervention and paper work but also provide a sense of automation with the help of proposed algorithm in scheduling task. Earlier systems were providing some features which did not serve whole purpose. Subsequently after identifying such loopholes and some improvements in existing system has ameliorated application. Moreover, after addressing all such factors which are absent in contemporary system, we aim to make this system time efficient and shrewd so that it becomes ideal system with less human intervention.

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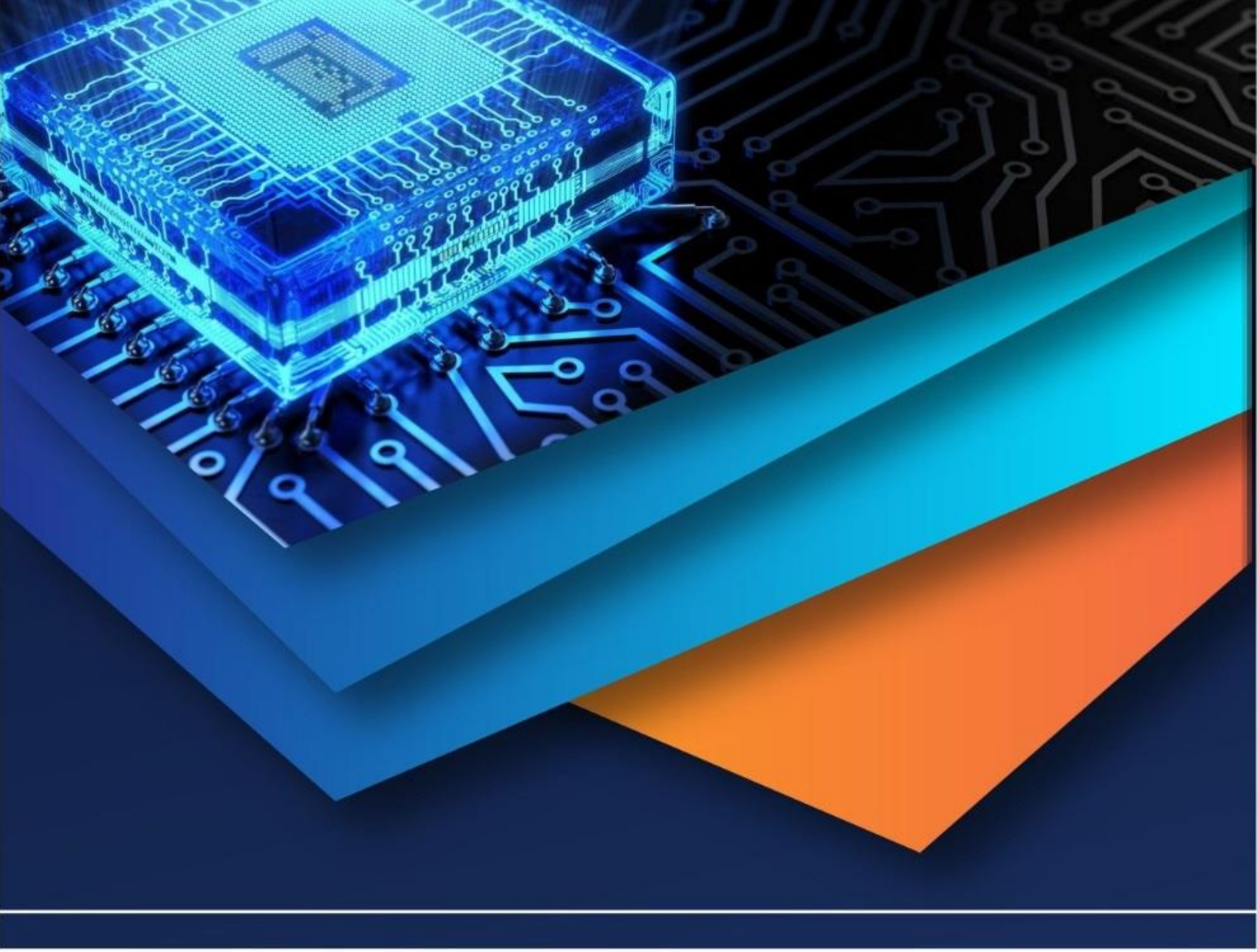

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