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Implementation of Subscription Management SaaS-based System

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Abstract: ***Btag is a Cloud-Based Web App that is designed to maintain the membership of any subscription-based business. The problem of management is not unknown in the world of business. We have to make sure that such problems are resolved to boost economic growth and to also add more businesses to the grid. Btag software does that for us. We have thought and analyzed through all possible lenses how to build good membership-based software. The member data includes the name, Aadhaar number of the user, Sex, Phone number, Email, and status. There are three different statuses of any member which are Enquiry, Active and Inactive. Each status denotes certain characteristics that help the business in better management. If the user has come for the very first time then the user will be in the Enquiry mode given the member hasn't paid yet. Once the member pays the status changes to Active. If the member has any dues then the status will change to Inactive. One can also search all the different members in the ecosystem based on different criteria which are as follows status, sex, name, phone number, etc. This work also gives us statistics and relevant data which can help a business in driving sales. This will help revolutionize the Khata based business scenario.***

Keywords: Cloud-Based Web App, Status changes such as Active, Inactive and Enquiry, Sales, Stats & Graphs, Payment trends, Khata.

I. INTRODUCTION

Btag is a SaaS-based software application that helps businesses manage, maintain, and track their business activities. It is mainly built for membership-based or subscription-based businesses to keep track of various transactions that go about in any business. The key features and points of the Btag are as follows. Keeps track of all the business-related activities. Provide proper graphs and charts as reports depicting business expenses and sales. Many MSMEs still use offline mode to keep records traditionally known as Khata. These traditional methods not only shunt the growth of these businesses but one also finds it difficult when it comes to scaling. Our software can be revolutionary for such businesses which are trying to get more efficient. Printing reports, bills, and other data are also provided through this software.

A. Btag has Three Major Features

1) Managing all the members and providing the details whenever required.

2) Track all the payments that the companies receive through the members.

3) Display accurate stats and graphs relating to the active members and sales.

a) *Managing Members:* The managing of members deals with all the data and operations related to a member. Here the user can be added. A new user can be created and a check can also be kept on existing users. The search function will allow for a quick search of all the members. All the members will be visible on the home page and to navigate to the inactive members the admin will have to click the inactive button. In this way, all the information about inactive members will be visible.

b) *Track Payments:* The payment tracking function is very much the heart and the sole of the system as it supplies data to the managing members and the stats and graphs function. Once the payment is received we can add the payment under the name of the respective member. One will have to enter the mode of payment and the amount to save the payment in the database.

c) *Stats & Graphs:* Stats and graphs are a very important feature of the system. The admin can take a look at the stats and graphs section and make future business decisions. The graphs will be presented in the reports section. The graphs can be shown on the duration of months and years. The report section also showed which members joined when and a pie chart related to the status of the members.

Btag caters to the requirements of the businesses and we are very optimistic that the proposed system will be very beneficial in the subscription-based system.

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Table 1: Table of Existing Methodology

Work Cited	Year	Author(s)	Overview
[1]	2019	CANG Nai-meng; WU Xiao-yu; YU Wan-jun;Zi-chen; Huai-lin;	This paper combines the benefits of cloud functionality with mobile games, and designs and develops game management software. It is based on the SaaS cloud platform. In accordance with business requirements measurement indicators, in order to complete a basic performance evaluation module. The results showed that the system improved sales performance in the sector, and improved employee participation.
[2]	2018	Isaac Oduh, Sanjay Misra, Robertas Damaševičius, Rytis Maskeliūnas	This paper aims to design and implement a simple prototype of cloud-based SME applications to manage their human resource challenges. The choice of the Employee Information Management System (EIMS) is due to the fact that one of the key challenges for SMEs is human resource management and how to effectively manage job information. The prototype developed in this study is based on the Software as a Service (SaaS) layer framework.
[3]	2018	Passapong Jittavani,WeerapharKhunrattanasiri,Sukamal Kitis	The system was designed and developed to replace the normal task allocation process and as a tool to track tasks assigned to each task.
[4]	2017	Mr. Akshay Sambare1, Dipali Bondre1, Sachin Thorat1, Miss Archana Vishe1, Prof. Ankit Sanghavi2	A system designed to manage membership data files, employee records, and their related functions. Increasing efficiency and efficiency, automation, accuracy, easy-to-use interface, access to information, communication capabilities, care, and cost reduction make the system smarter than the existing system.
[5]	2015	Mingxing Shao; Long Peng; Yafang Li	In this paper, empirical research has been done on key factors influencing the enterprise's technology adoption of SaaS by expanding classic TOE(Technology-Organization-Environment) and with enterprises as the object of study.
[6]	2013	Chia Hung Kao*, Shin Tzu Liu	This Project aims to provide users in the organization with an easy and effective way to access, manage and share their information. It provides deceptive base documentation, synchronization, and sharing functionality, and looks for support for various client devices. This greatly facilitates the management of personal documents and improves the efficiency of collaboration between users.
[7]	2012	Jie Song, Zhenxing Yan, Feng Han Yubin Bao	This paper analyzes and addresses the new challenges of SaaSifying web applications, creating SaaSified Command series to introduce SaaS capabilities into existing web-based applications automatically; and proposes the SaaSified Command Set and the rules harmonize the variety of both real and SaaSified applications.

II. LITERATURE SURVEY

A. *Survey Of Existing System*

Membership management software allows you to create an employees/clients database without paperwork and accelerates growth by helping businesses find the right software.

Whether you run a yoga studio or a non-profit organization, tracking membership is a problem you're likely to face. Filling out all the paperwork for each new member, sorting members, and maintaining spreadsheets to store information can be tedious. Due to such reasons, there are existing systems that have developed membership management system software. There are health and fitness studio software and other software that provide staff scheduling, class scheduling, online payment options, event management, and attendance tracking.

There is much such software that is used in different companies. Growth is one of the key measures in any company. Every startup or any organization that is running a business needs to keep track of its employees, workers, or customers so to see how the organization is running and where it can improve upon in its business.

Other software systems help to manage communication and events. This software helps you create custom forms for member applicants. You can also use the software to launch social media campaigns to start a member movement**.** There are also non-profitable membership management tools that allow you to set benchmarks for success by allowing you to host and schedule productive meetings and create future tasks.

Some systems are cross-platform compatible because today there are users who access things from different devices, as technology has increased the number of devices that can be used is also increased eg, mobile, tablet, or desktop. This thing is necessary as, without cross-platform compatibility, one may fail their user's expectations, and one may choose to unsubscribe from their system.

Some systems provide access and privacy control flexibility, down to the most granular level, where you can determine who can access or edit which fields, listens, and profiles based on role, membership type, or permission level.

B. *Limitations Existing System Or Research Gap*

1) There is no feature to check whether the organization is making a profit or is in a loss.
2) No charts or graphs to show the state of members each month.
3) There are no automated emails or messages sent to members associated with the organization when one enrolls for the first time and even there is no biometric authentication for admin in any membership management system.

III. PROPOSED SYSTEM

A. *Details of the Hardware and Software Components*

1) Hardware Requirements

Table 2: Hardware Configuration

Parameter	Value
Processor (CPU)	Processor: Intel Core i3+ or AMD Ryzen 3+
Memory	4 gigabytes or higher
Disk Requirements	256Gb of SSD for storing application.

2) Software Requirements

a) Web Server.
b) Browser. (Google Chrome, Microsoft Edge, Mozilla Firefox)
c) Operating System that supports modern web browsers(Linux)

3) Technologies Used

a) Angular 8
b) Angular Material
c) HTML5
d) CSS3
e) JavaScript ES6
f) Java 8
g) JPA
h) REST API
i) MYSQL

B. Design Details

The usage case diagram represents the user's status and interaction with the user and the system that follows its relationship between the user and the various opportunities in which the user participates.

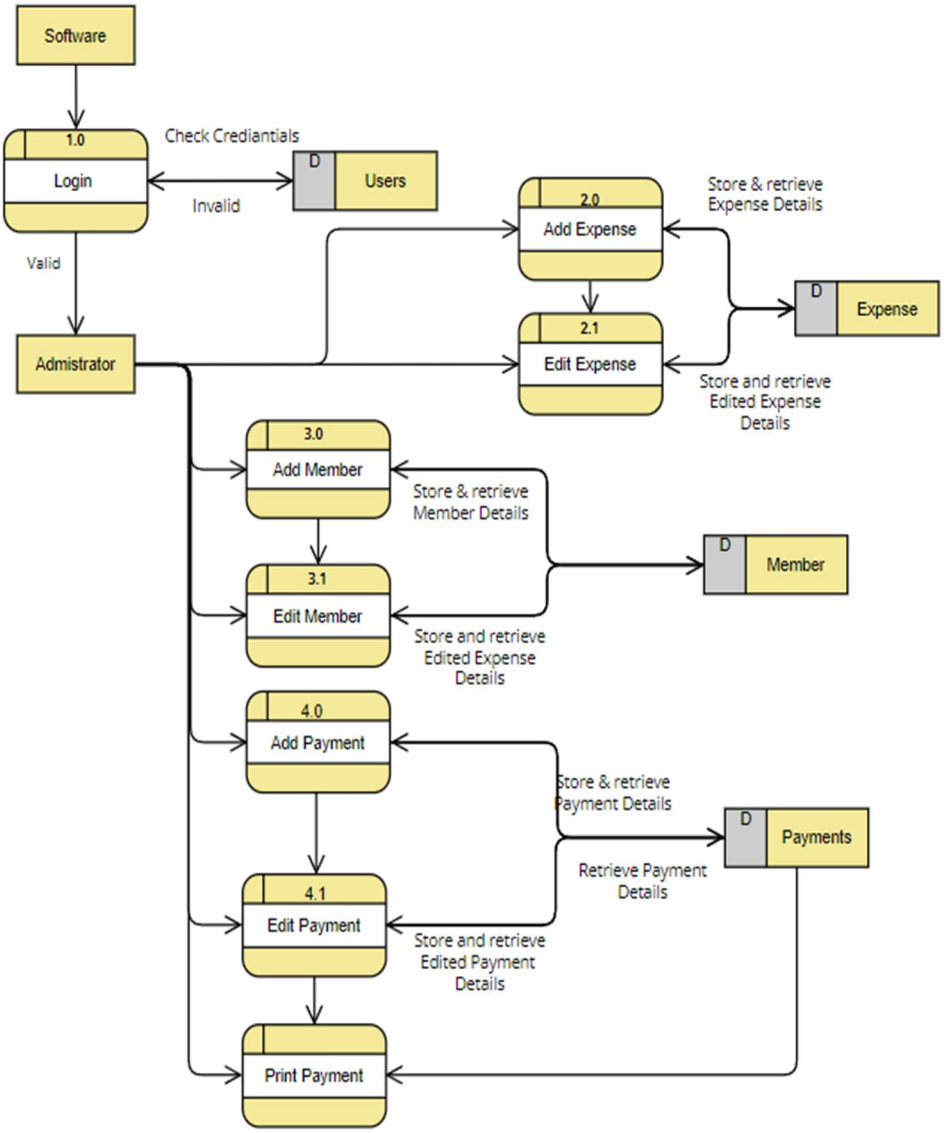


Figure 1: Data Flow Diagram

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Figure 2: Use Case Diagram

The proposed system aims to apply the principles of the standard method and provide a simple, intermediate, and default method. Therefore, minimizing various factors such as data duplication, inactive communication, and individual-based error. To understand the system, we can break it down into various modules :

1) *Database:* Database is the most fundamental part of the application as the entire record maintenance will take place on the cloud, more precisely a centralized cloud. The database architecture for each operating company is different, with a few exceptions. Now from the above description, one can easily conclude one or both of two things:

a) The database would be huge.

b) How the analysis will be performed ?

Considering the above points, the database technology that shall be implemented is SQL or simply relational databases as this stores the data in the form of documents storing and analyzing both becomes relatively easy and simple. As well as giving us the benefits we need, it is easy to measure and relatively easy to work with once the engine is properly configured. With features like consistent, isolated, durable transaction support; multi-version transaction support; And unrestricted row-level locking, it is the well-known solution for complete data integrity.

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2) *Cloud Computing:* Since the entire application will be automated one major concern would be to make the system responsive, and cost-effective. For that we have used AWS as it benefits By using cloud computing, you can achieve lower cost by yourself due to economies of scale. Because hundreds of thousands of customers' access is aggregated in the cloud, providers like AWS can achieve higher economies of scale, which translates into lower pay-as-you-go prices. The system needs to be fast and agile. In the cloud computing environment, new resources are available at a moment's notice , ie: the time it takes to make those resources available to your developers changes from weeks into minutes. Due to this there is a huge increase in agility for the organization and the cost and time spent on experimentation and development is drastically reduced. Amazon S3 provides a data storage platform in the form of objects . It allows companies to store, analyze and retrieve large amounts of data from a variety of platforms such as websites, mobile apps and corporate customized apps among other tools. The S3 stores items in applications known as buckets. You can store more than one item in a bucket, and at the same time, you can write or delete something in the bucket. Amazon EC2 uses the Amazon S3 to store Amazon images. You are using AMI to introduce the EC2 model. In the event of a failure, you can use the AMI database to launch another instance , which allows for faster recovery and continuity of business.

3) *The Workflow on the B-Tag:* The system flow is going to be entirely automated, and the approach will remain the same as that of the traditional system that is being followed, hence the members will have almost no effort in getting familiar with the application. The different ways in which the application will run are:

a) Every member can see their profile information by clicking on the "Know your information" button and then entering their phone number or name or member id provided. While the admin will log in and have control over different activities as follows:

E.g.:

- The admin can add new members by clicking on "Add new members".
- The admin can also "Search" any of the members by their "Id" as the Id of the member acts here as our primary key.
- He/She can also "Edit" the details of the members such as Phone number, gender, email id,aadhar number, address through the option such as "Edit member info" and then by clicking on "Submit" the information will be updated successfully.

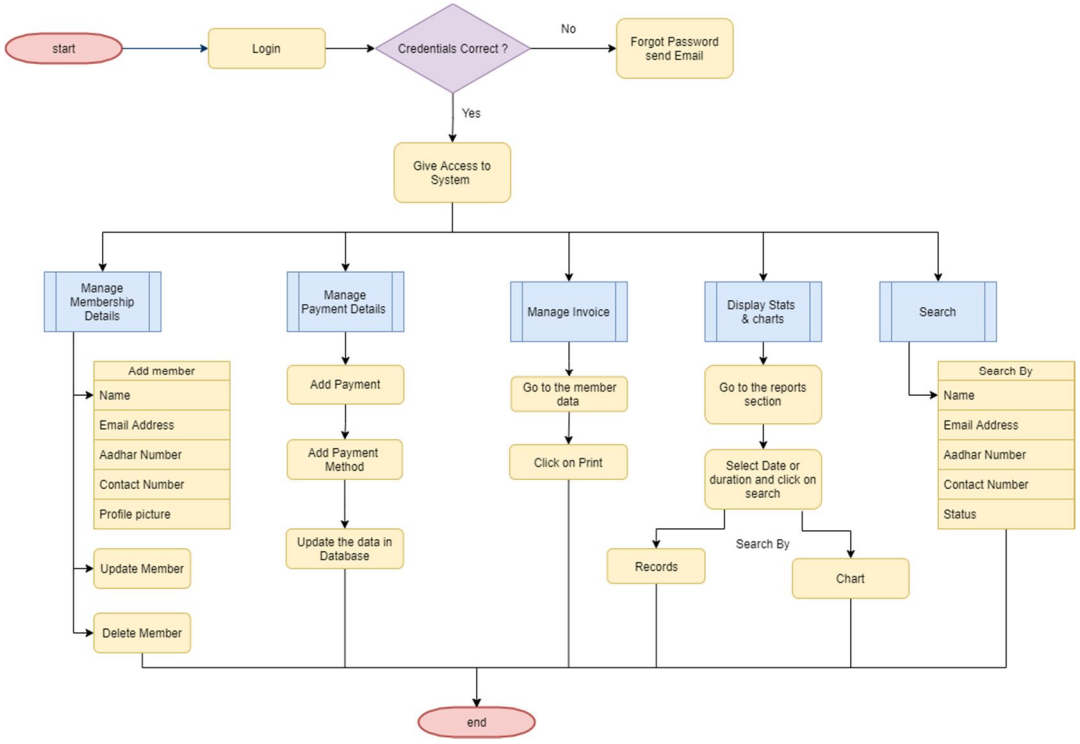


Figure 3: Flow Chart

b) Also, the admin can start a new payment process, which can be done by adding certain details such as "Start date", "Period" which are further categorized as Month, Quarter, Semi-Annual and annual, "Period Count", "Discount %" "Amount to Pay" and "Pay By, where different payment methods include Cash, Card and UPI and then by clicking on submit button the new payment process will be added successfully.

c) B-tag has another section viz. Reports. In this module, the user can see the reports for all the users with no particular duration but if one wants to see the records within a particular duration the user will have to enter the duration of which one have to get a report. The report has been further divided into two sections such as Records and Charts. In the Records section, one can see a table with the columns such as UID (User ID), Name, Phone No., Status, Start Date, End Date, Period, Base Rate, Discount%, Amount paid, Paid By (Payment method), Payment date.

d) Coming In the Charts section one can see three subsections:

- Line graph - Revenue calculated based on the payment date.
- Pie Chart - Displaying the Active and Inactive members.
- Bar graph - Displaying the Activity of members monthly.

e) The FAQ section provides solutions to the questions asked frequently. This section will answer all the frequently asked questions by the customers. We will be explaining the content with the help of the screenshots. This section will be very helpful for the customers.

f) The Notifications Module makes possible communication among fundamental administrators which can maintain the workflow and hence can maximize the productivity. This feature triggers email and web-app notifications of inactive members to business admins. Through this module, it becomes very easy to detect inactive members.

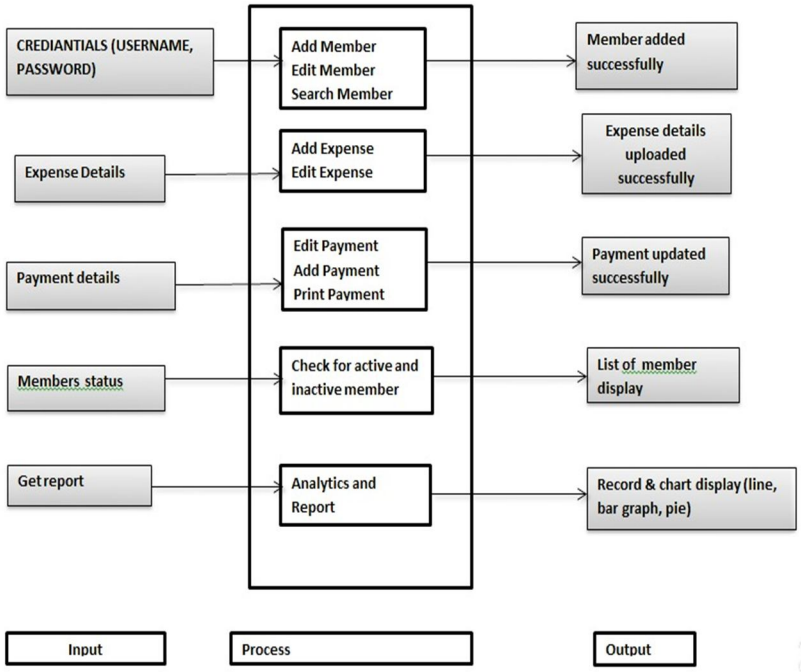


Figure 4: Block Diagram

4) *Security:* After covering all the above points mentioned the question which arises is how one could secure the application .The solution for the question can be provided by implementing certain things in future, including a good firewall ,such as TinyWall,ZoneAlarm ,etc ,providing SSL integration and a secured hosting platform .

Further this application always provide different features such as domain-specific logins , access only to necessary ports, to avoid any data leak that can happen we have to do communication within the application , proper load-balancing for group of people logged in simultaneously , also record of every sent and received to backtrack to the origin of issue if we had any in future, etc depending upon the requirements.

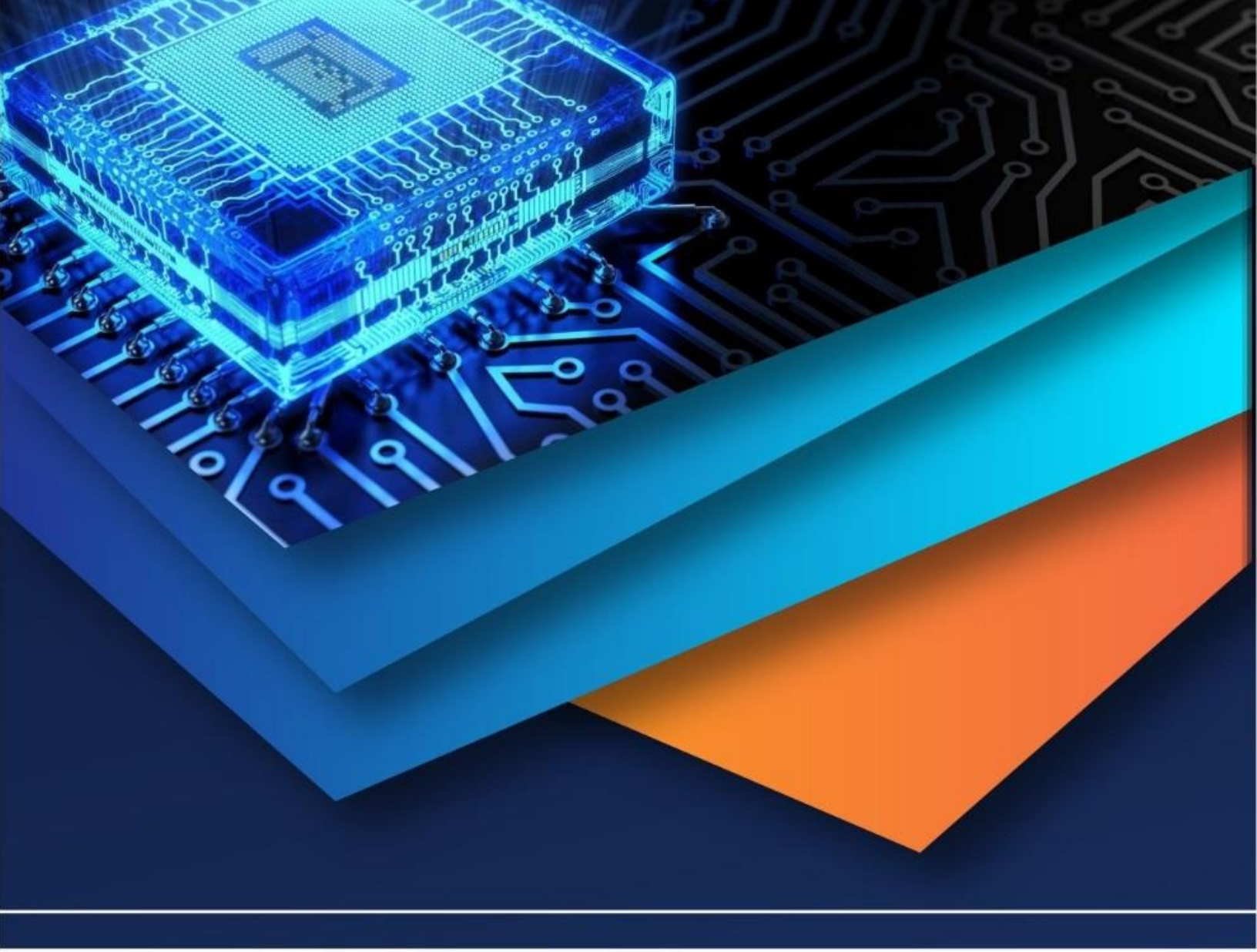
IV. CONCLUSION

We summarized the entire workflow of the functioning of the application and started implementing modules required throughout the application such as logging into the system through admin rights, the dashboard for displaying members of the organization, and the active and inactive tab to watch who are inactive members in that organization. We have implemented the payment module so that everything is online with the receipt of the payment made. The report module and FAQ module are also built to see the current report of the organization and to know how the application works..

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