

SMART INDIA HACKATHON

WORLD'S BIGGEST HACKATHON



TEAM

**VISVESVARAYA
NATIONAL INSTITUTE OF TECHNOLOGY**

NAGPUR, MAHARASHTRA



Hawk**Eye**

An affordable mobile application camera system to monitor
residential societies' vehicle activity

MixORG
people and ideas

PROBLEM STATEMENT

BACKGROUND

Many residential society administrations in India face an impending problem of illegal vehicle parking inside their societies and theft of the vehicles.

This issue is not bounded to just vehicles, but also add to other security concerns inside the residential societies.



PROBLEM STATEMENT

There are solutions that exist in the market for monitoring through cameras and software system but are expensive and the affordability comes into the question.

Requirement of an affordable and innovative solution that caters to the Indian market.



SOLUTION

HawkEye

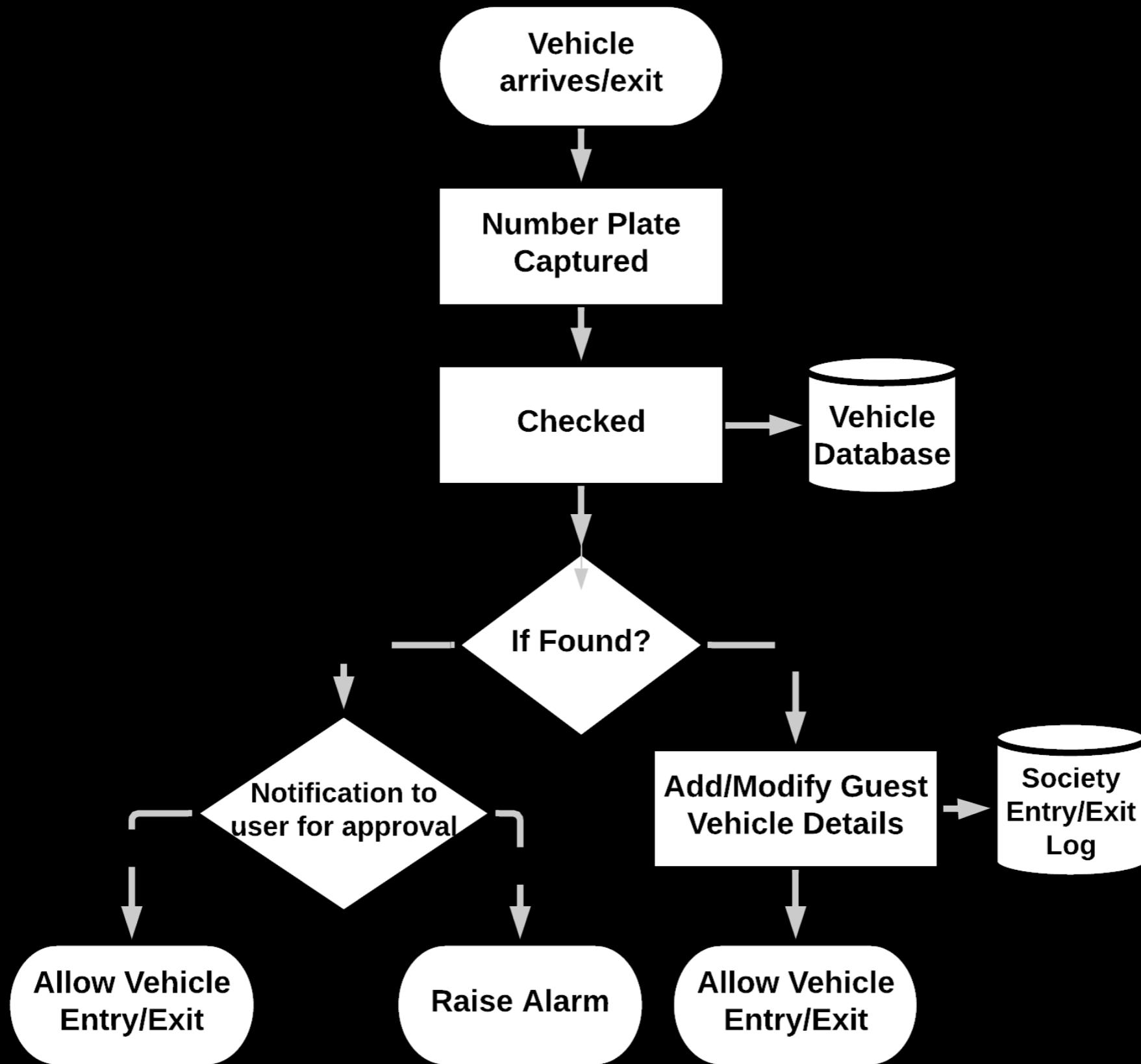
Affordable mobile application camera system to monitor residential societies' vehicle activity.

IDENTIFY : Image processing techniques to identify and monitor vehicles entering and leaving a residential society passing through the entry/exit gate.

SEND : A notification to be sent to the vehicle owner and the security via a mobile application.

SECURE : Improve the overall security of the resident society, convenience to residents and analytics to the security/management of the residential society.





ADVANTAGES



**FAST AND
SECURE**

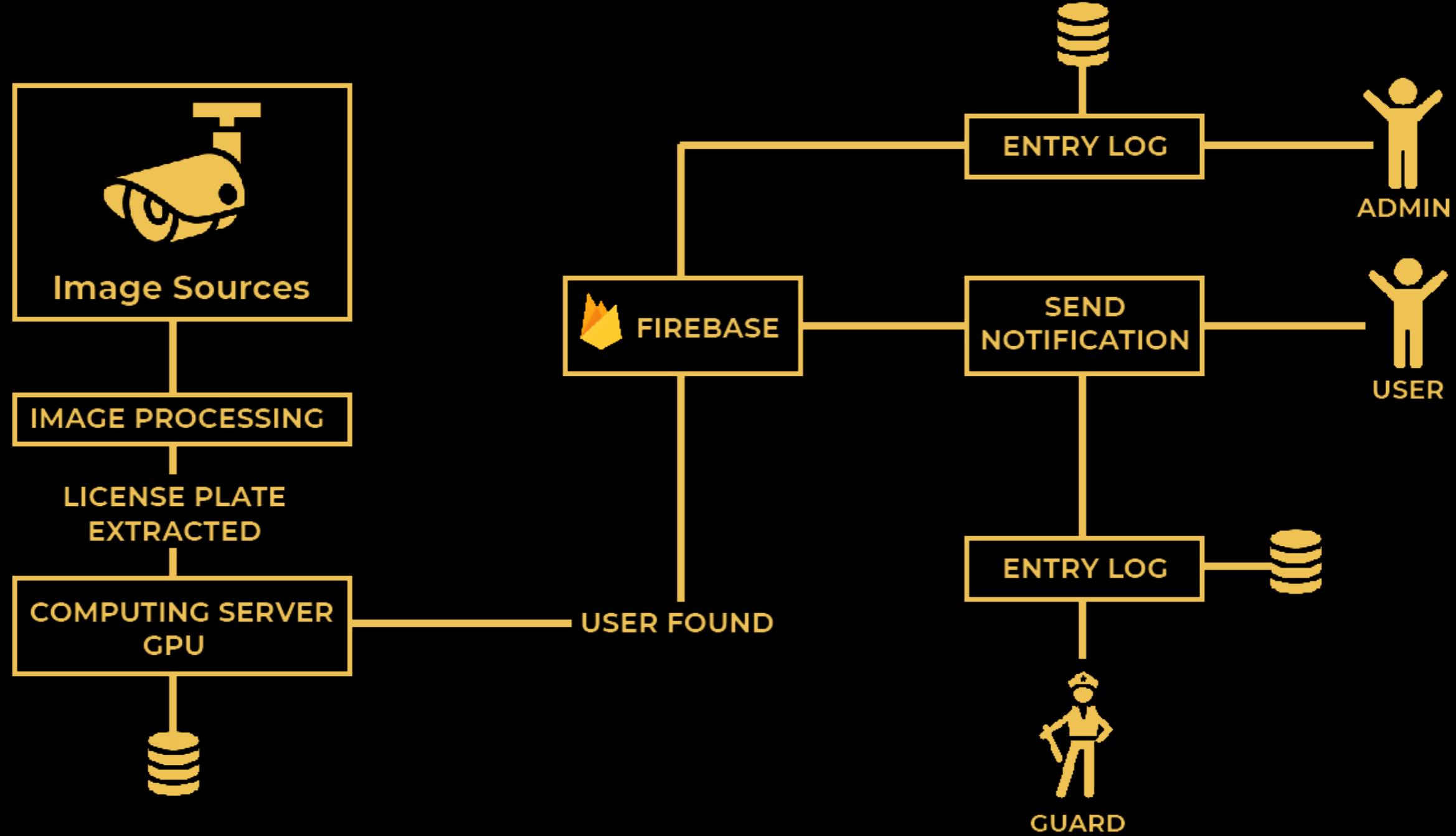


**EFFICIENT
VEHICLE
IDENTIFICATION**

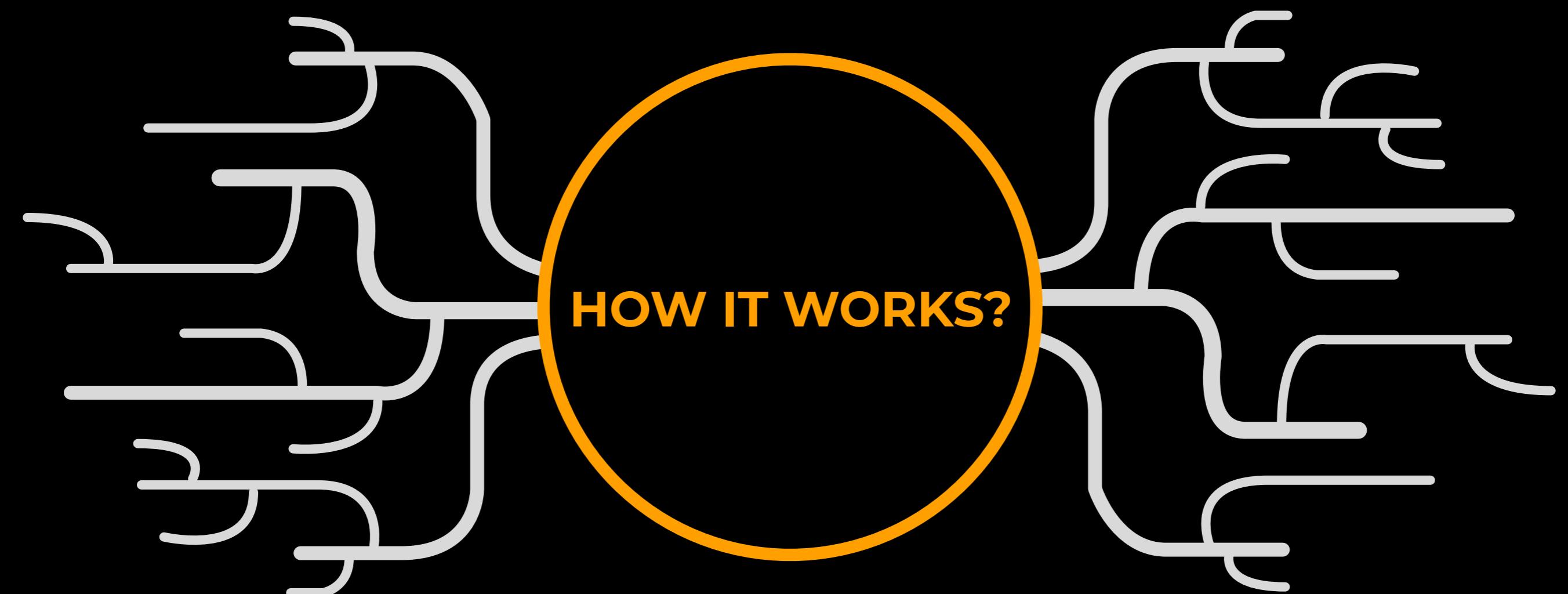


**COST
EFFECTIVE**

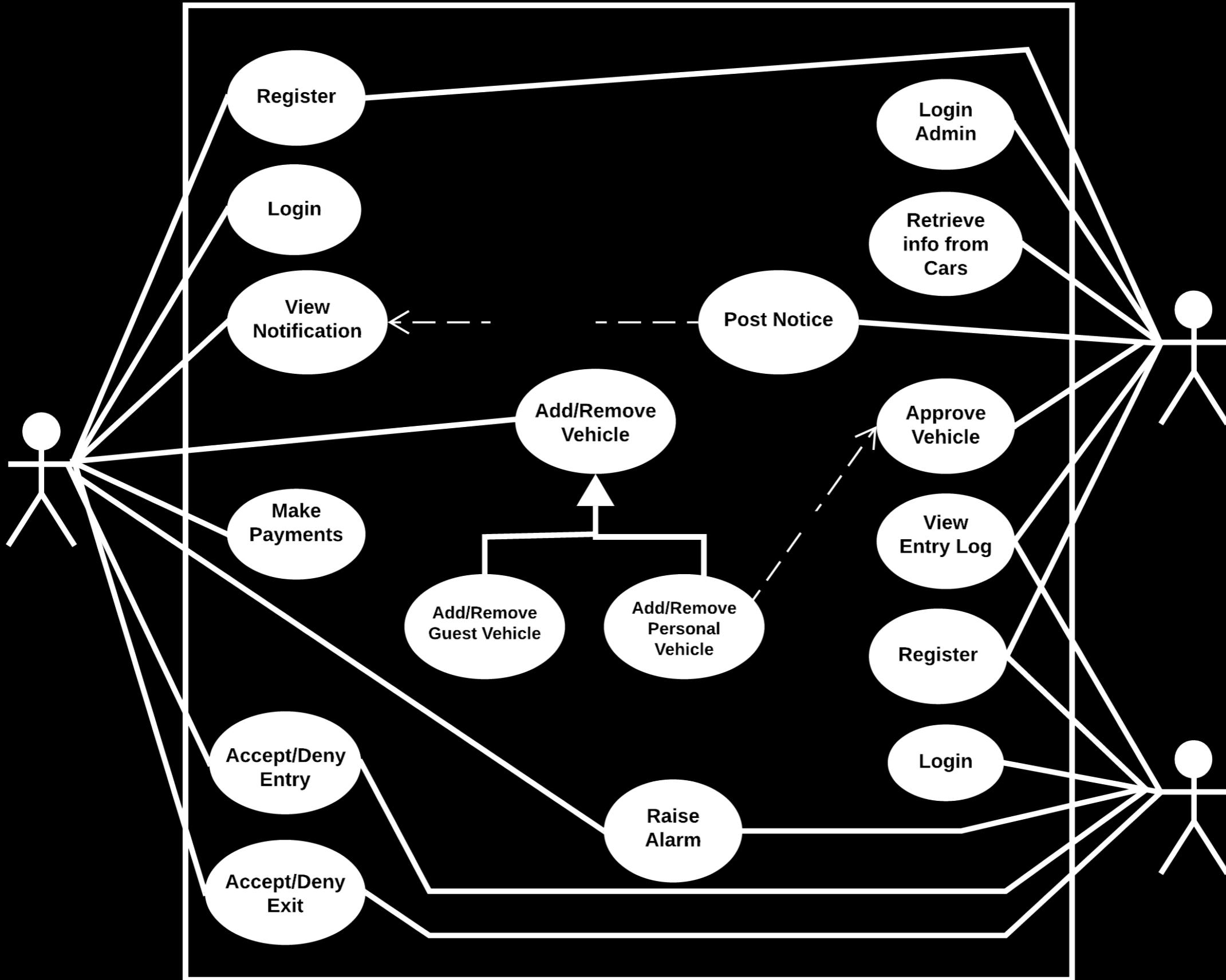
SYSTEM DESIGN



USE CASE



HOW IT WORKS?



DEPLOYMENT STRATEGIES

HYBRID CLOUD

WHY?

- Cost savings.
- Flexibility in resource management.
- Allows balance in keeping non-sensitive data on public cloud and sensitive data on private cloud.

ADVANTAGES

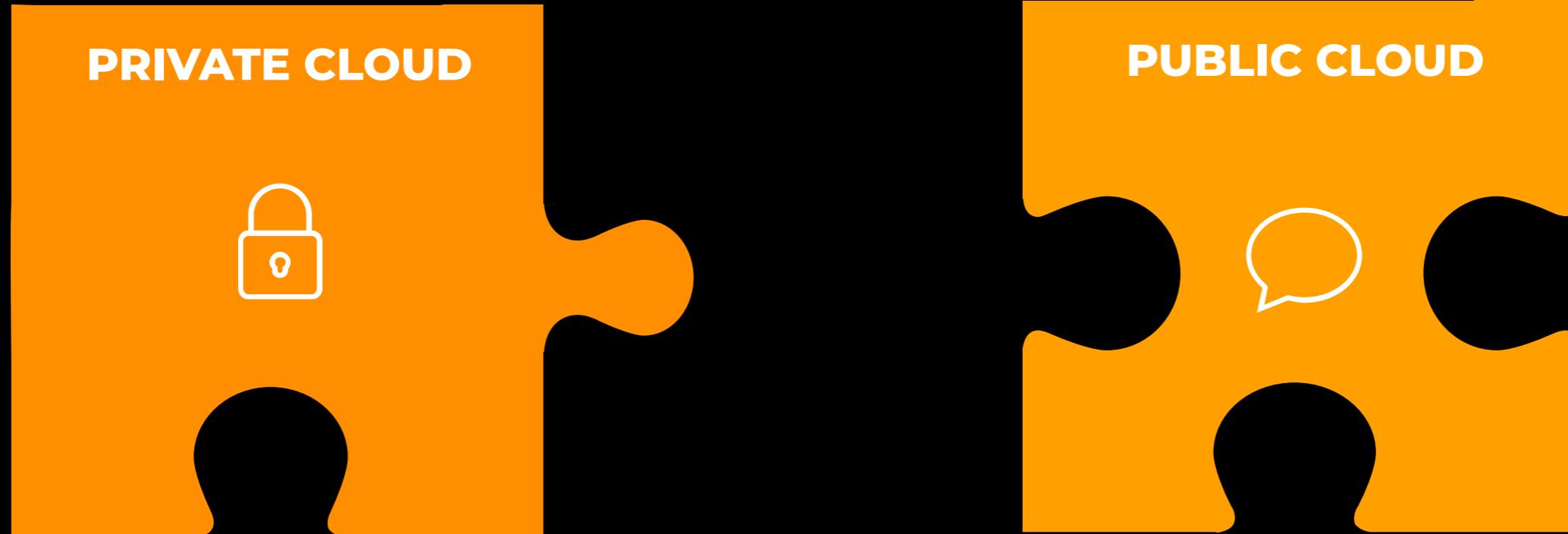
- Fewer outages and less downtime.
- Scalability.



DISADVANTAGES

- Involvement of public and private cloud makes networking complex.

HAWK EYE



USER SENSITIVE DATA

User credentials.
Resident details.

VEHICLE DATA

Vehicle video and
processing.

NON-FUNCTIONAL ASPECTS

PERFORMANCE

- Process transactions per second.
- User/event response time.
- Screen refresh time.

DEPLOYMENT

- On premise
- Cloud

HIGH AVAILABILITY

- 1+N Availability.
- Each site will host two deployments and load will be distributed by load balancers across/within site(s)
- Deployment on geographically separated sites

EASE OF USE

- Training time.
- Number of help frames.

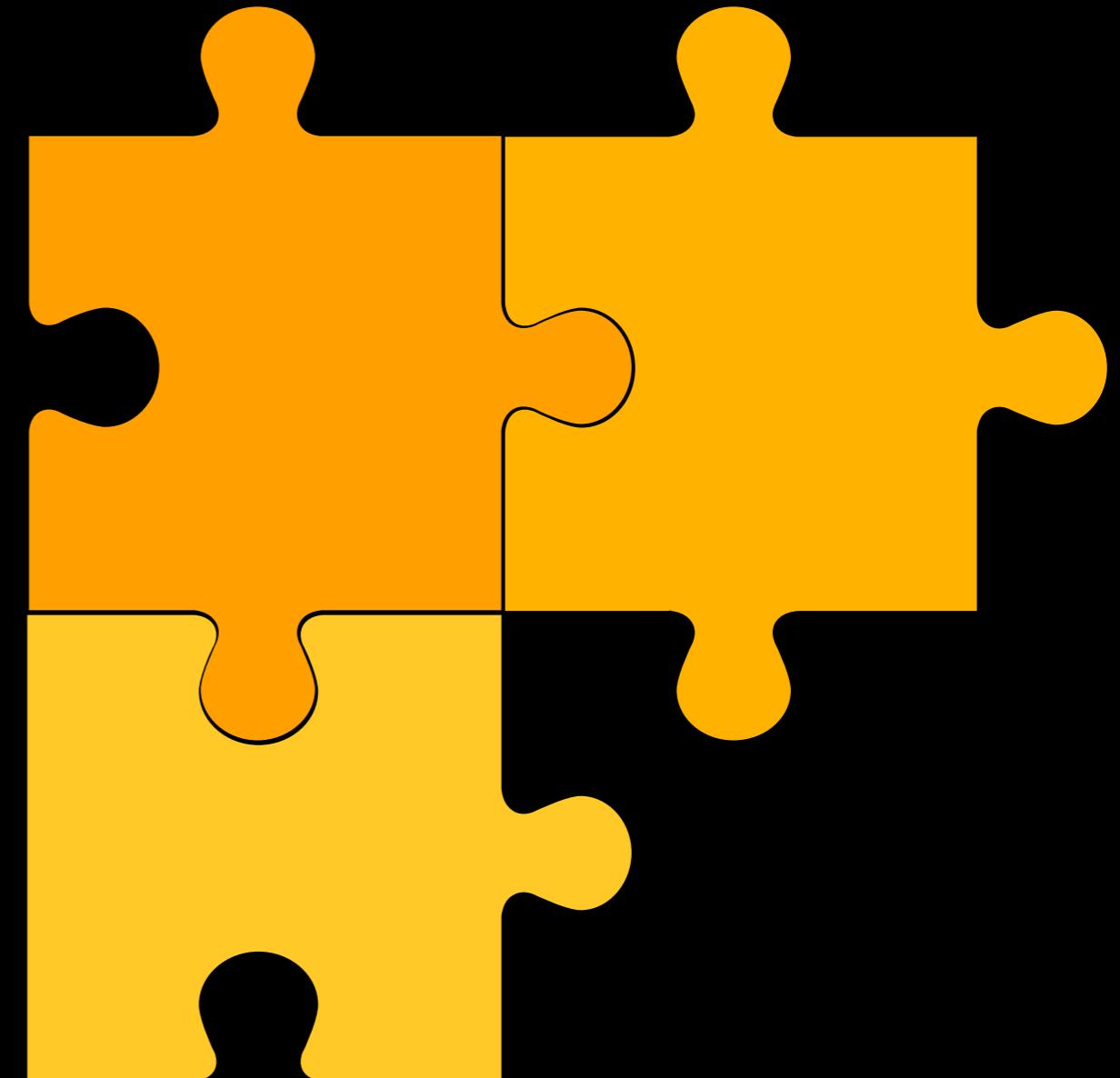
SCALABILITY

- Handle huge traffic in the form for sending notifications.
- Vertical Scaling
- Horizontal Scaling

FAULT TOLERANCE & ROBUSTNESS

- Monitoring by industry standard tools/frameworks like nagios
- Component Clustering

FRAMEWORKS, APIs AND DATABASE



FRAMEWORKS

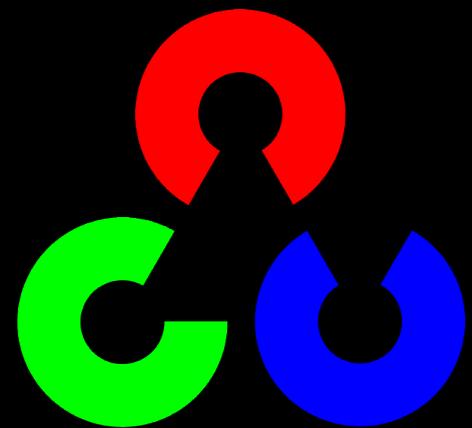


Android Studio



Firebase

APIs AND EXTERNAL LIBRARIES



OpenCV



TensorFlow

python
Libraries

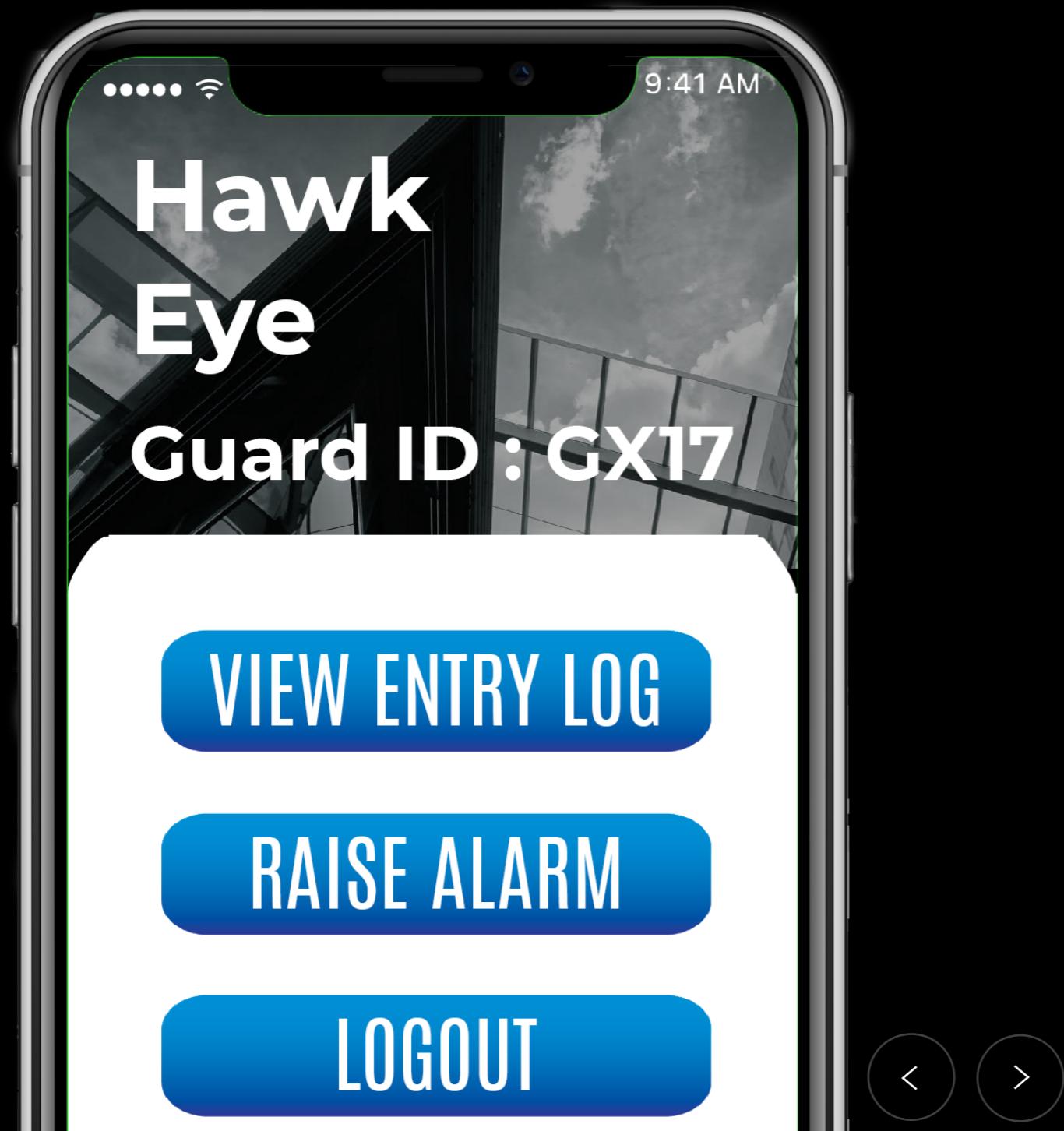
python libraries



Tesseract OCR

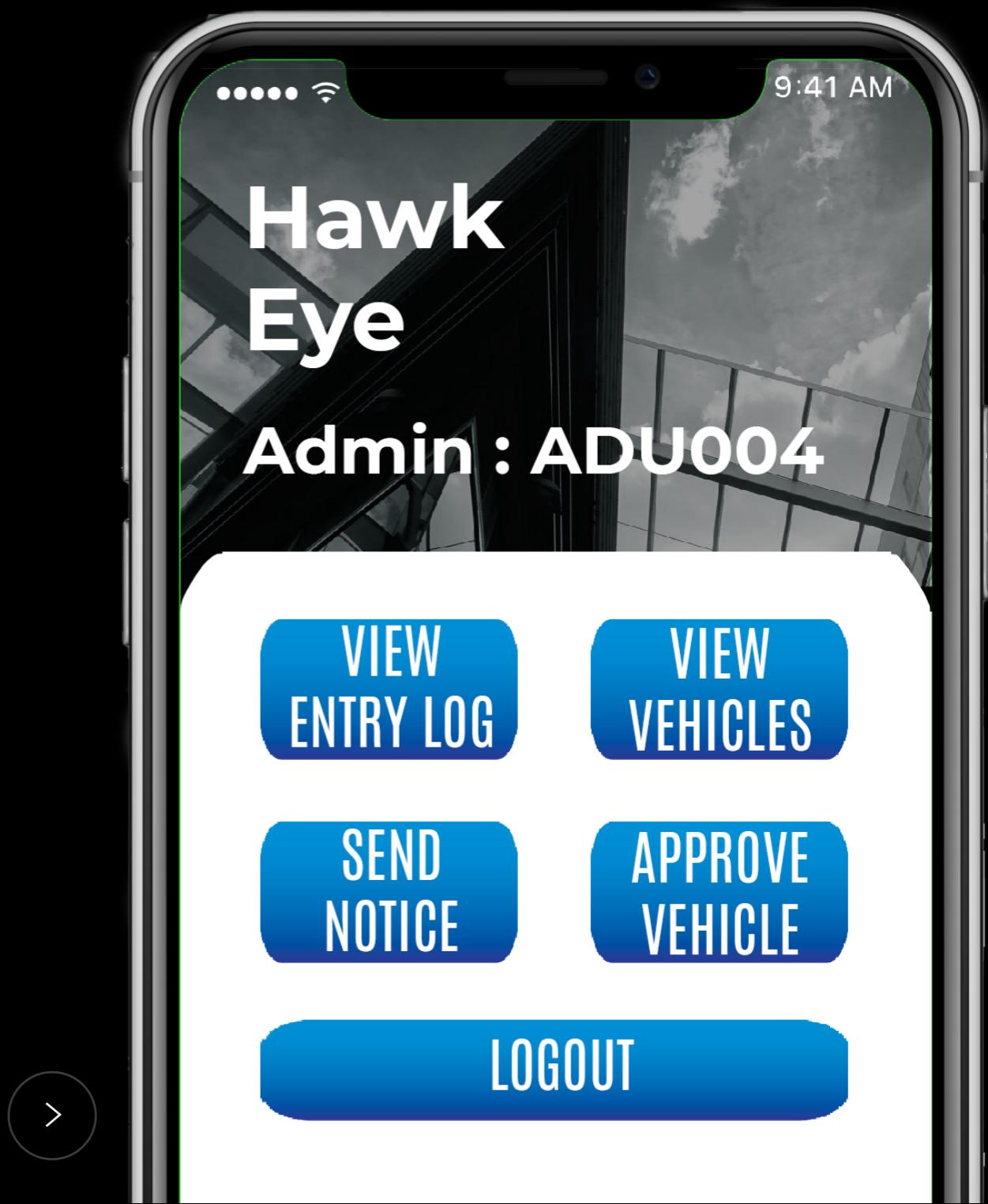
THE PLATFORM

GUARD DASHBOARD

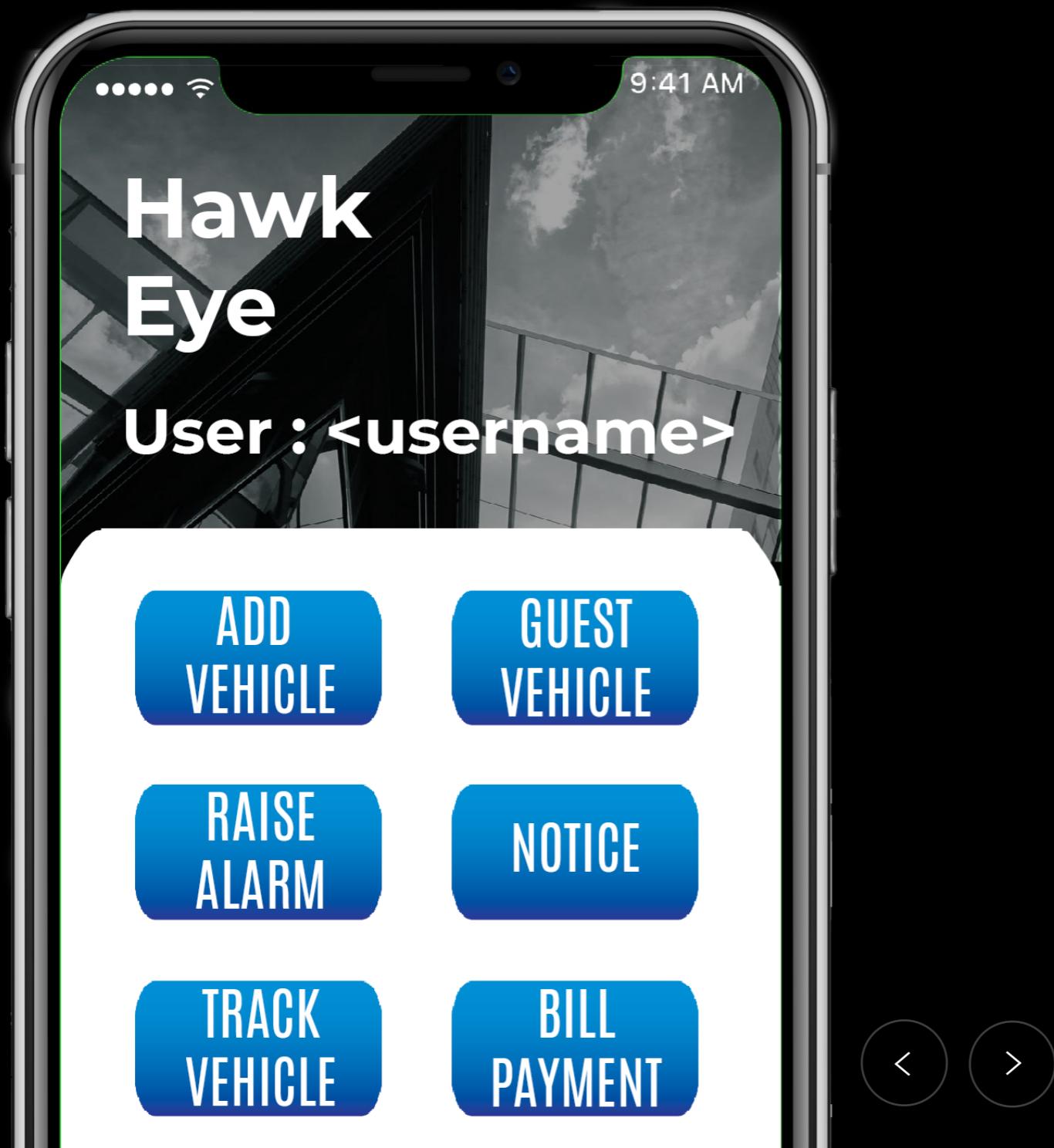


ADMIN DASHBOARD

BITWISE



USER DASHBOARD



FOR HAWKEYE

1. Maintenance from society fund.
2. Charging for parking more than the duration specified by society.
3. In-app Advertising.
4. Collecting and selling user vehicle data.
5. Freemium Model

FOR SOCIETY

1. Charges imposed on exceeding number of vehicles of registered user.
2. Collaborating with apps like Airbnb to acquire a share of their revenue as parking charges.

Revenue

LIMITATIONS

Physical

- Cooperation and acceptance by society.
- Guards capable of reading and operating the application.

Software

- Accuracy of OCR.
- Processing time of number plate and user identification.

Hardware/Computing Services

- CCTV Camera
- Smartphone with internet connection.



FUTURE PROSPECTS



1. Can be implemented in shopping complexes, corporate offices, universities etc.
2. Using RFID for vehicle identification.
3. Robust API for automatic parking system.
4. Entry/Exit Log made available to law enforcement agencies for identifying suspicious activities.
5. Monthly Bill Payment, Society notices, important local news etc.
6. Support for both English and Hindi.
7. Automate the process of guard shifts management.

FUTURE PROSPECTS

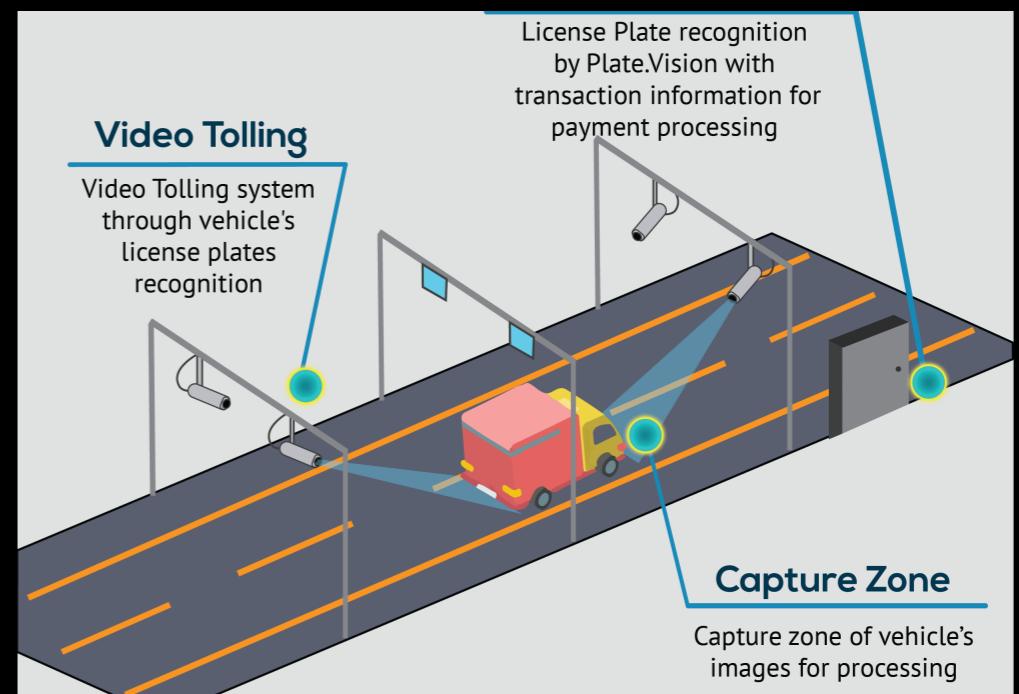


LAW ENFORCEMENT

Use in ANPR Police Interceptor vehicle to catch high speed violators.

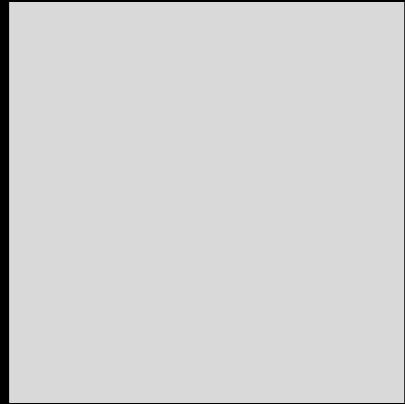
ELECTRONIC TOLL

A combination of ANPR and radio transponders to toll vehicles entering and exiting the road.



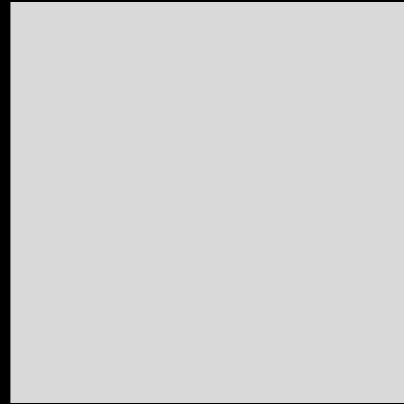
THE TEAM

TEAM MEMBERS - BITWISE



CHAITYA

3RD YEAR, CSE



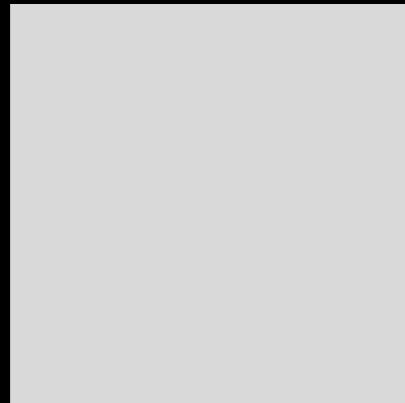
AYUSH

3RD YEAR, CSE



DEVAL

3RD YEAR, CSE



KAPEEL

3RD YEAR, CSE



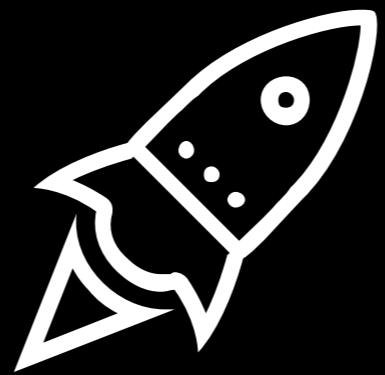
RITWIK

3RD YEAR, CSE



SHALAKA

3RD YEAR, CSE



THANK YOU

QUESTIONS?