

CDAP | Project Proposal Presentation

+Go : Intelligent Complementary Ride-Sharing System

Group :19-055

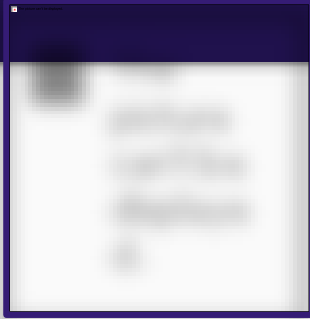
Our Team



Viraj
Wickramasinghe

IT16030190

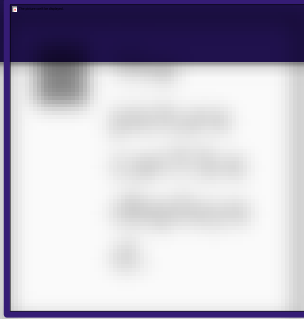
Mobile : (+94) 76 692 53 32
vjanuradhawick@gmail.com



Ashane
Edirisinghe

IT16025936

Mobile : (+94) 71 993 33 60
ashane.edirisinghe@gmail.com



Surath
Gunawardena

IT16011380

Mobile : (+94) 77 459 96 78
surathruwan@gmail.com



Athrie
Gunathilake

IT16033474

Mobile : (+94) 77 926 77 95
athrienathasha@gmail.com



Supervisor
Dr. Janaka Wijekoon



Co-Supervisor
Dr. Dharshana Kasthurirathna

Background



Rs. 500m loss incurred daily from traffic congestion – transport authorities observe

Written by Mayooraan Kantharvel
16 Mar, 2017 | 9:22 AM

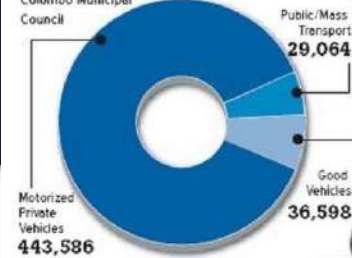
Share:



Rise of the city traffic

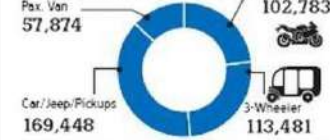
Average daily Traffic

(24 hour, 2 way) Flow on Major Entry Corridors to Colombo Municipal Council

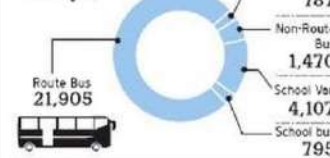


The traffic jams in the Colombo Municipality is on the rise day by day due to the number of vehicles entering through 12 routes has increased to 500,000 a day. A majority of these vehicles come into the city from the suburbs.

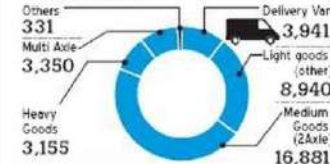
Motorized Private Vehicles



Public/Mass Transport



Good Vehicles

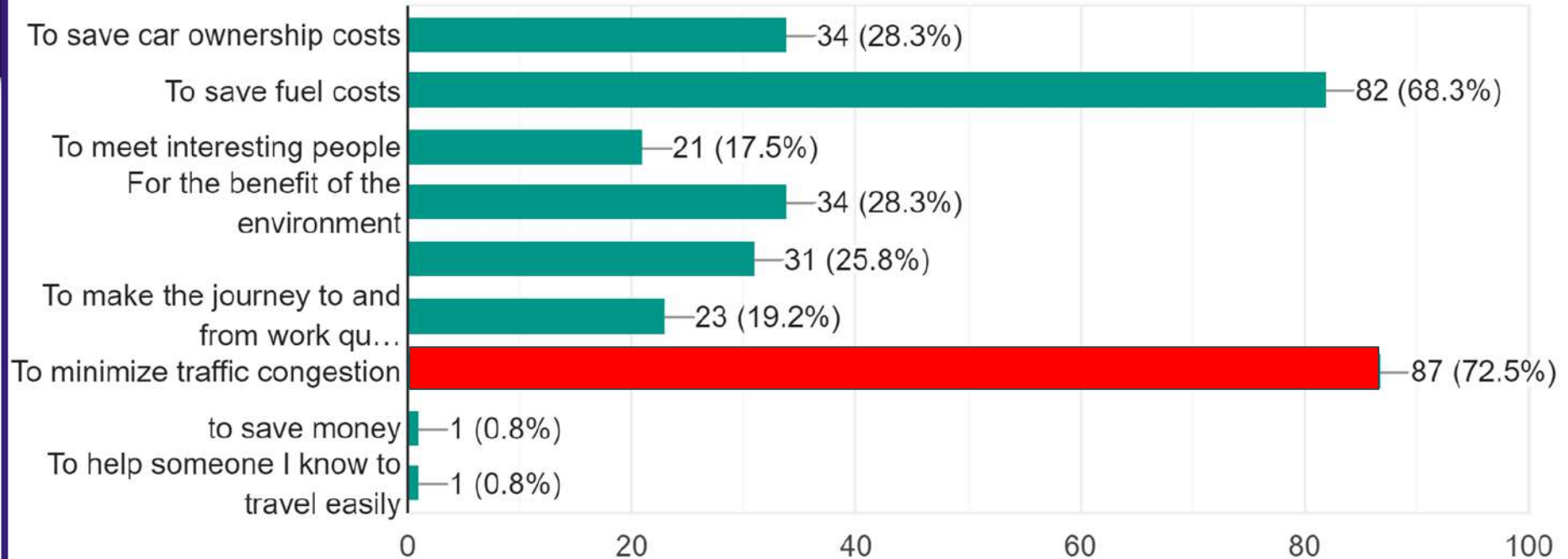




Problem Introduction

**How can we find an
effective solution to
reduce traffic
congestion during
office hours in urban
areas?**

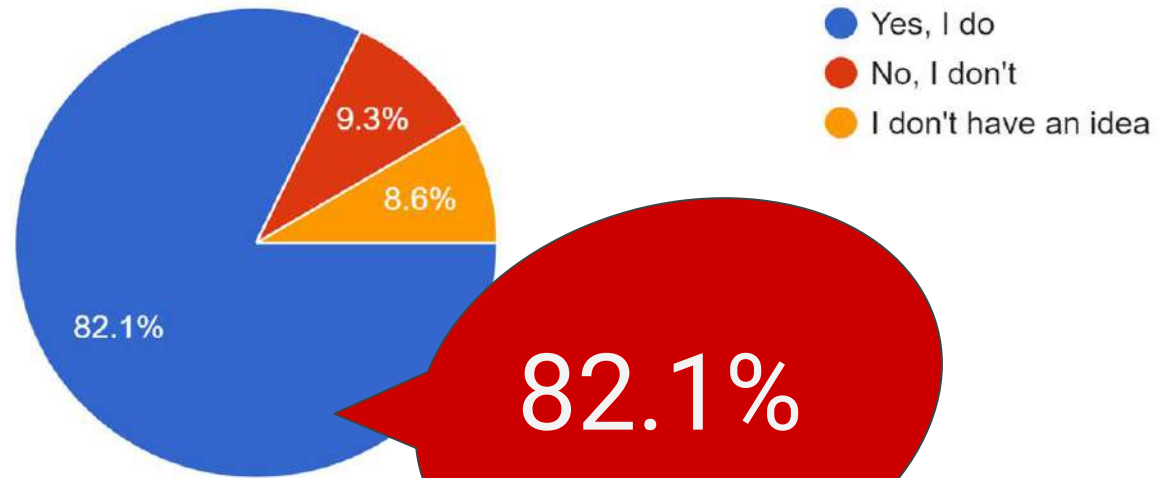
Why Ride-Sharing?



Is it feasible ?

Do you think carpooling is a good option for Sri Lanka?

140 responses



Existing Solutions and Research Gap

Features	UDIO	Carpooling.lk	RideShare.lk	+Go
Matching the passengers' profile with the suitable drivers	X	X	X	✓
Allow the spouse/guardian to check the passenger's trip details	X	X	X	✓
Validating the user by NIC and license by processing the images of them	X	X	X	✓
Allowing the passengers to rate and review on the driver, vehicle and co-passengers separately at the end of trip.	X	X	X	✓
Dynamic cost calculation procedure instead of static pricing	✓	X	X	✓
Crowdsourcing to improve the optimum path by analysing more than one algorithm	X	X	X	✓

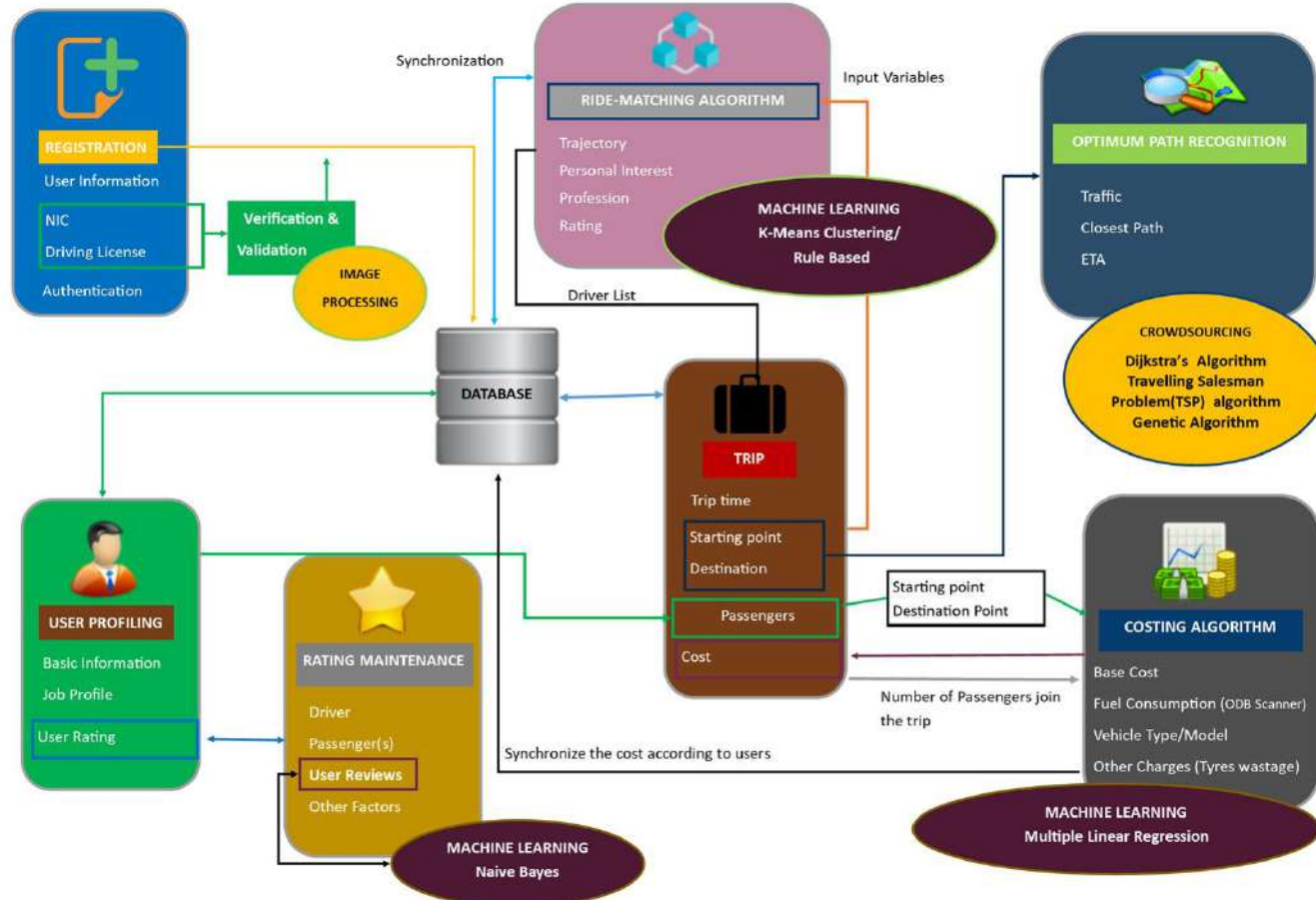


Solution Introduction

Build a **ride-sharing app** for the Office Crowd. In the solution proposed, We came up with **4 research components** to minimize traffic congestion and to provide safer travelling facilities to the users.

- ❑ **User Profiling Management**
 - User Profiling
 - Document Validation and Profile Rating
- ❑ **Optimum Path Recognition**
- ❑ **Cost Calculation**

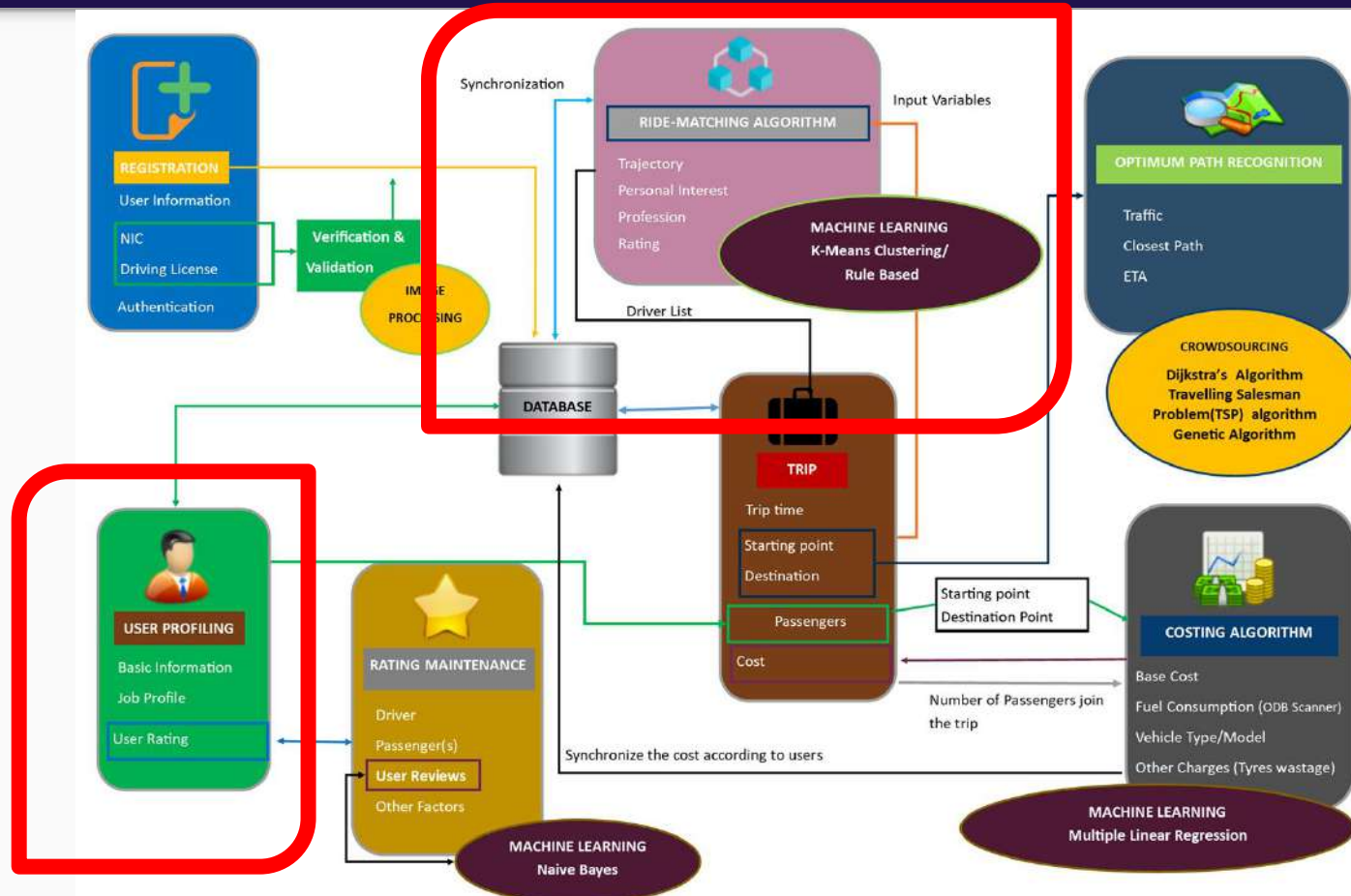
High Level System Diagram



User Profile Management

V.A.WICKRAMASINGHE
IT16030190

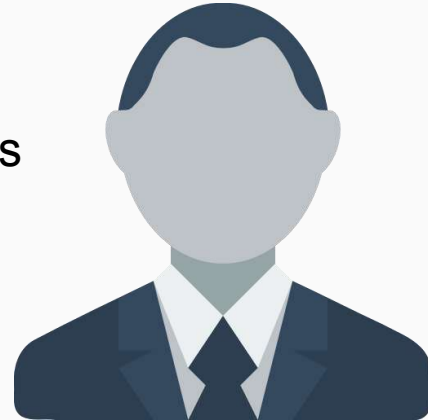
User Profile Management



Solution Breakdown

User Profile Management

- Identifying the drivers who match with the passenger's interests
- Gender Preference Classification
- Profession Based User Profiling Mechanism
- User verification using mobile phone



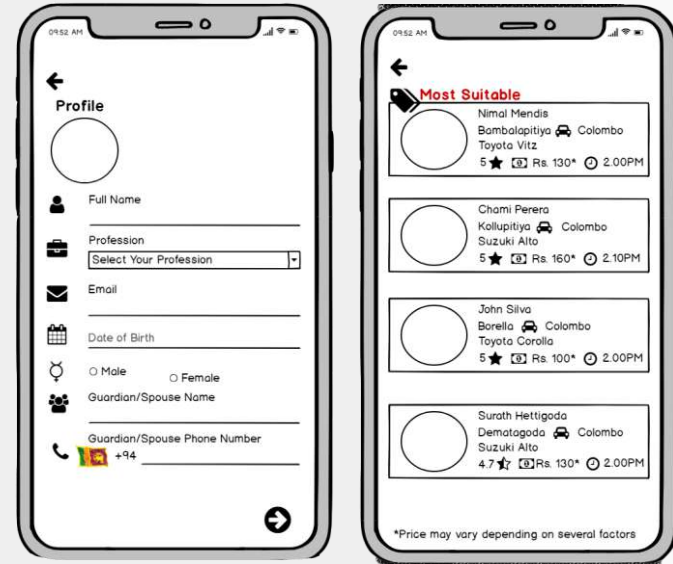
Work Breakdown

User Profile Management

V.A.Wickramasinghe - IT6030190



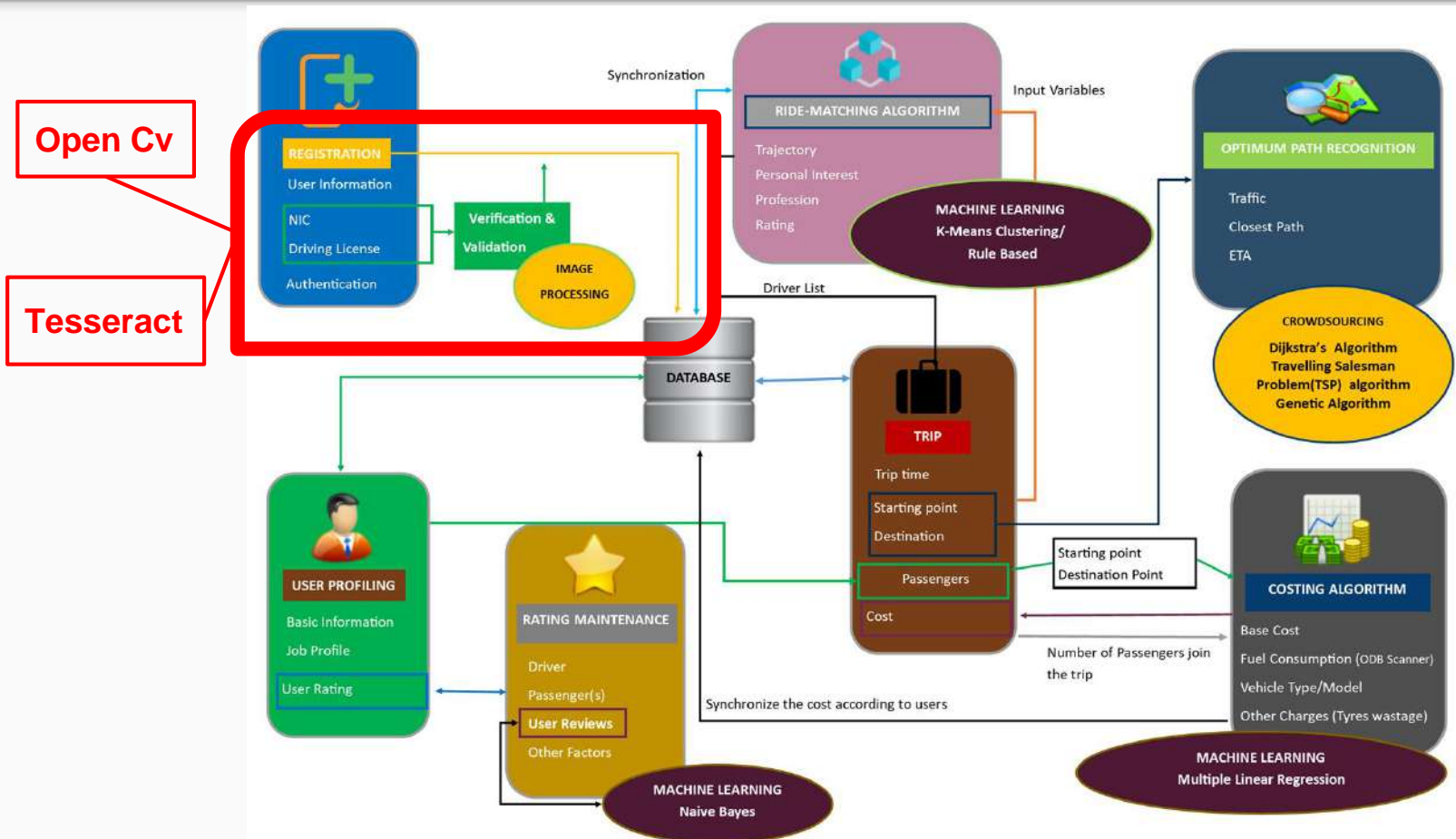
- ❖ Develop a ride matching algorithm
- ❖ Implementation of user interfaces related to user login, profile registration, driver list and payment method
- ❖ Verifying user registration
- ❖ Handling reported set of drivers



Document Validation and Profile Rating Maintenance

A.E.EDIRISINGHE
IT16025936

Document Validation



Solution Breakdown

Document Validation

- User validation and verification
- Elimination of manual validation strategies
- Reduction of fake profile registrations
- Notifications about the expiration dates of the licence provided

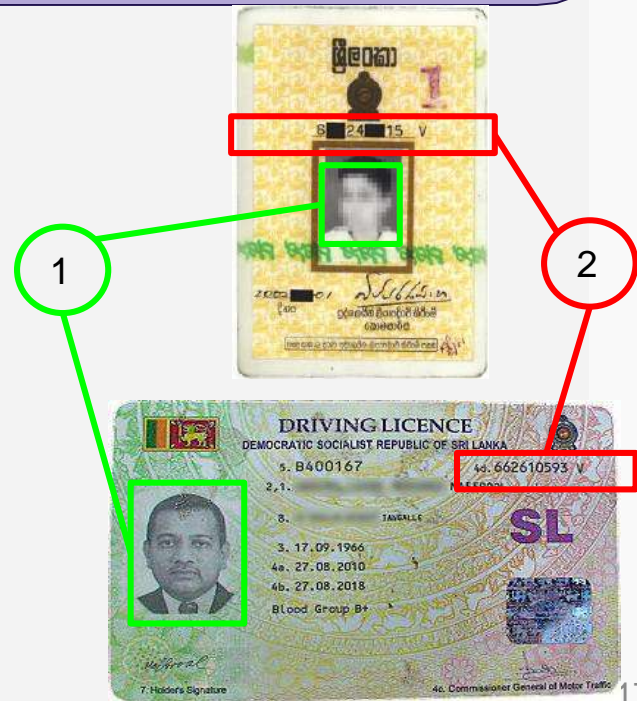


Work Breakdown

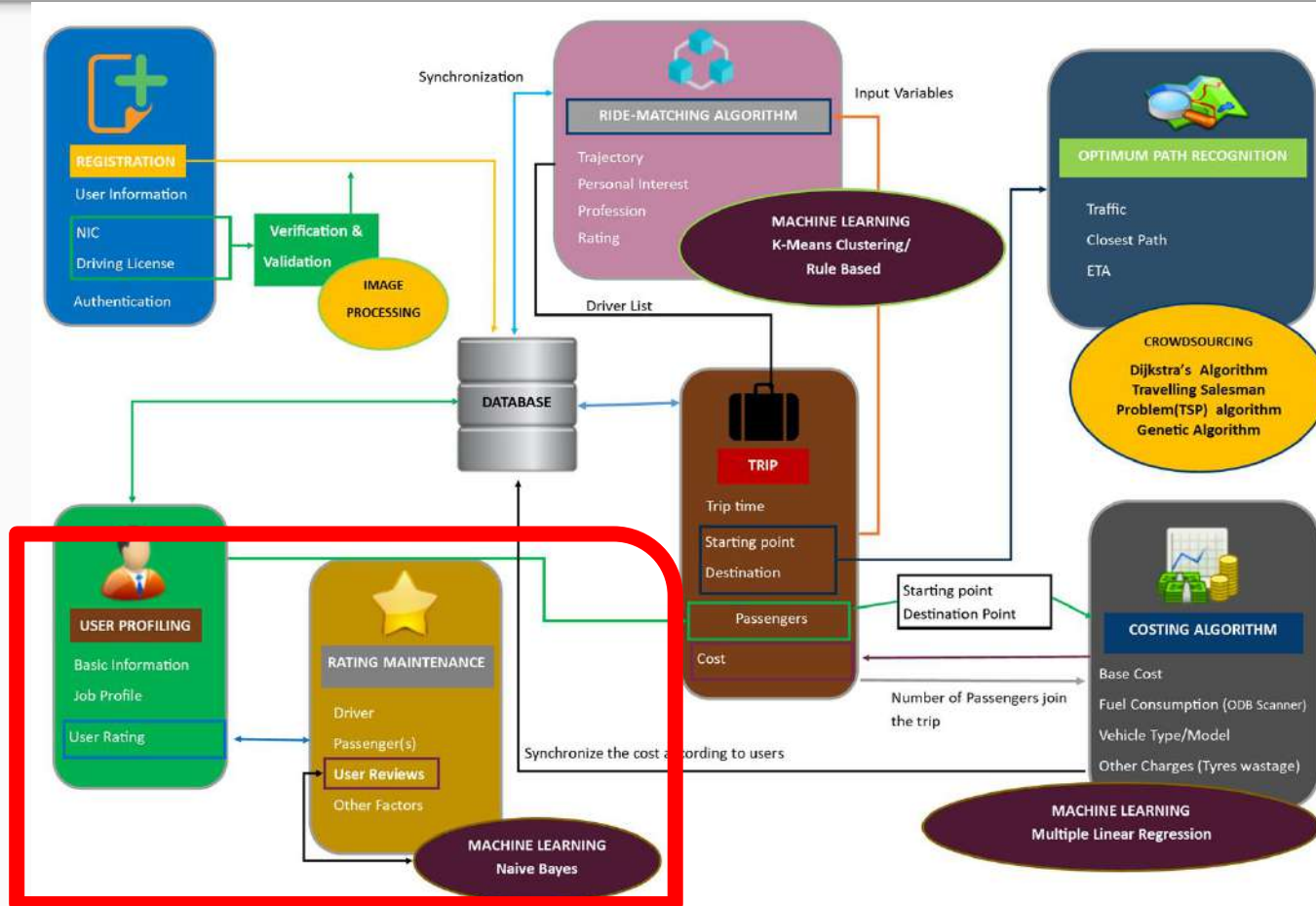
Document Validation

A.E.Edirisinghe- IT16025936

- ❖ Develop the mobile application to capture images of NIC and license
- ❖ Validating the NIC and license by identification of human face in the cards
- ❖ Develop an image processing algorithm to extract information from National Identity Card(NIC card) and license card



Profile Rating Maintenance



Solution Breakdown

Profile Rating Maintenance

- Ensure the safety and experience of users by analysing reviews
- Provide a better service by considering the ride sharing experience of the users
- Letting the users to express their review on the vehicle , driver and the co-passengers
- Rating on vehicle does not affect on the rating given to the behaviour of driver as two seperate ratings are used



Work Breakdown

Profile Rating Maintenance

A.E.Edirisinghe- IT16025936

- ❖ Develop the mobile application user interface for user rating
- ❖ Mobile interface to rate the **vehicle**, **Driver** and **co-passengers** separately
- ❖ Develop a sentiment analysis algorithm to analyse the reviews of users and generate the rating accordingly

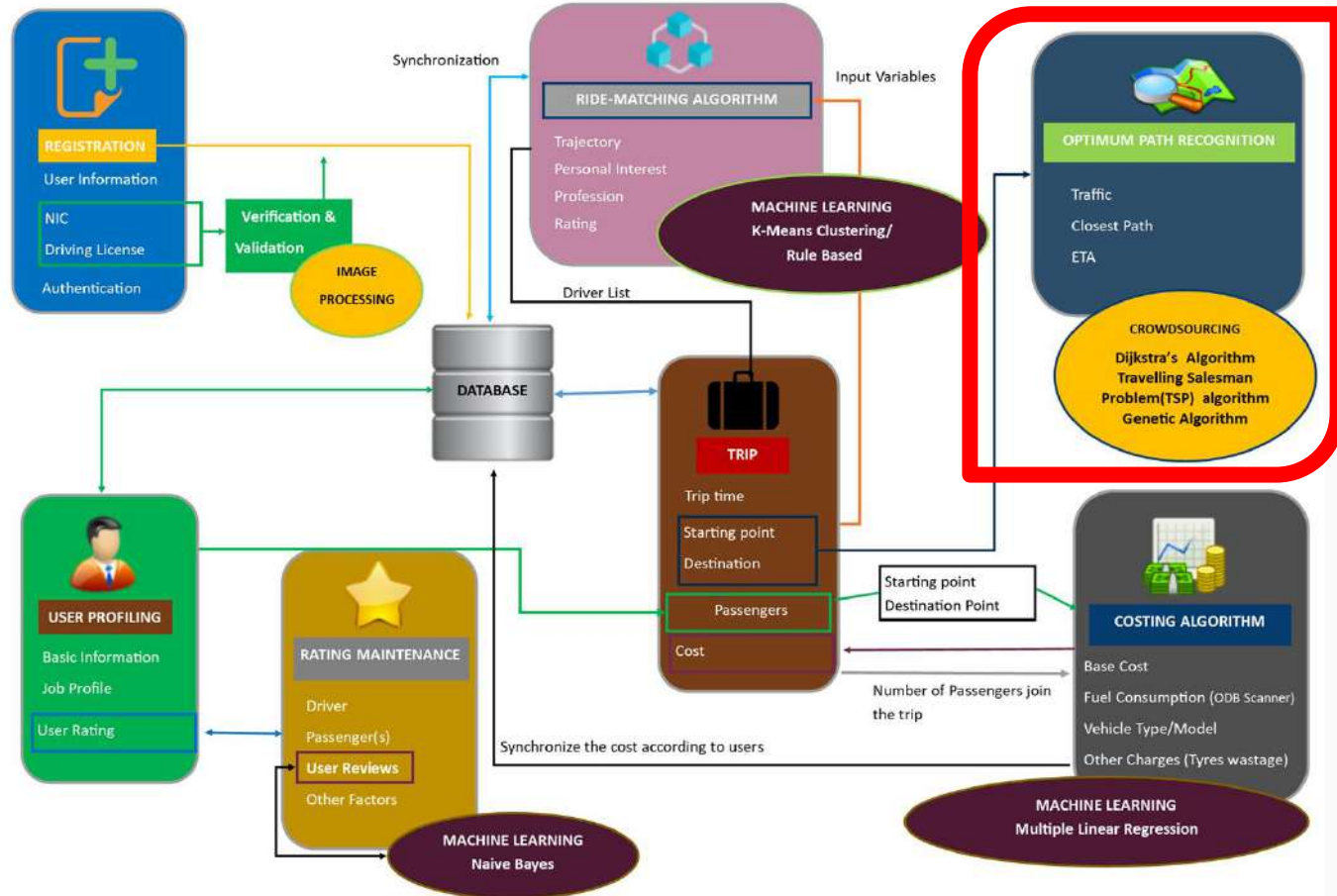
The image displays three sequential mobile application screens for a rating system. Each screen has a status bar at the top showing '09:52 AM' and various icons.

- Screen 1 (Left):** Titled 'Please rate your experience', it features a five-star rating system with three stars filled and two empty. Below this, it asks 'What made you dissatisfied?' and provides three buttons: 'Vehicle', 'Driver', and 'Fellow Passengers'.
- Screen 2 (Middle):** Titled 'Please select the keywords which explain your experience', it shows a grid of six empty rectangular boxes for keyword selection. Below the grid is an 'OR' option and a text input field labeled 'I will write my own review'. A 'Done' button is at the bottom.
- Screen 3 (Right):** Titled 'Please rate your experience', it shows the same five-star rating system. The 'Vehicle' button is now selected, indicated by a checkmark in a box. Below the buttons is a 'Submit' button.

Optimum Path Recognition

R.M.A.N.GUNATHILAKE
IT16033474

Optimum Path Recognition



Solution Breakdown

Optimum Path Recognition

- Provide the optimum path with least traffic and the shortest distance to the destination
- Enable registered users to facilitate to enter live updates(about accidents,obstacles,delays,services) on the relevant path
- Display custom map with all the routing information
- Provide best service to the users by optimizing the traffic



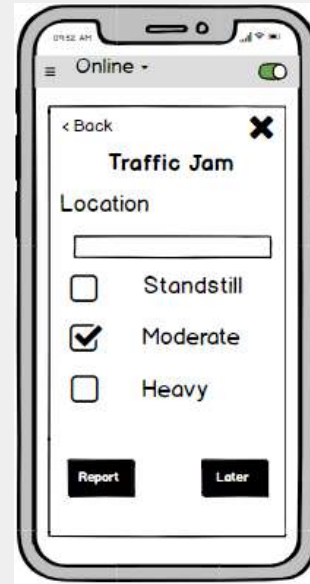
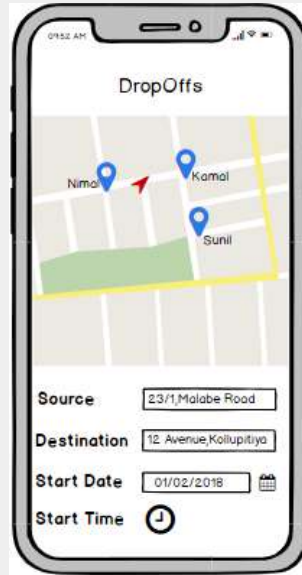
Work Breakdown

Optimum Path Recognition

R.M.A.N.Gunathilake - IT16033474



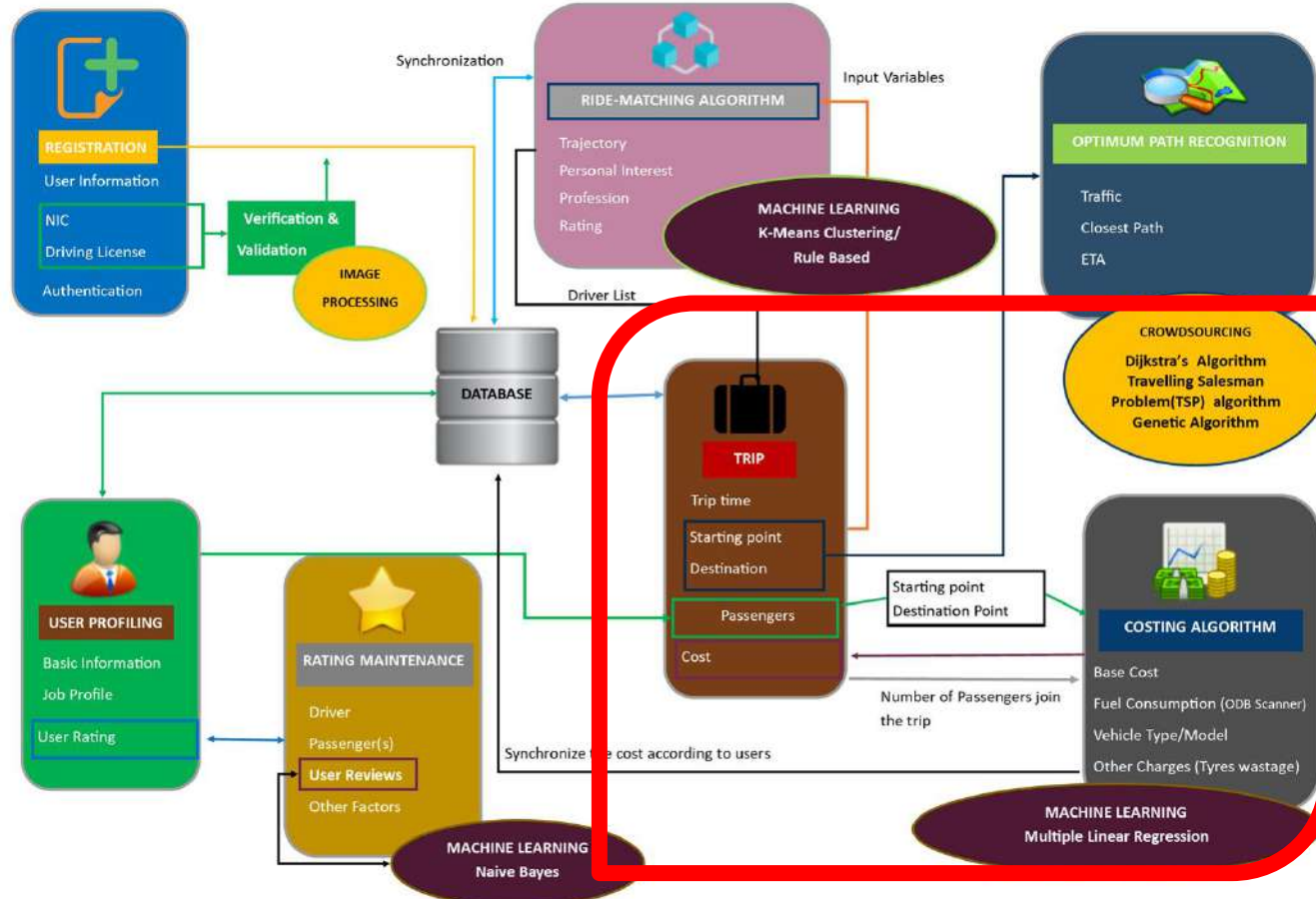
- ❖ Development of an algorithm to identify the optimum path suitable in the journey
- ❖ Implementation of crowdsourcing to predict the most efficient route
- ❖ Development of user interface to generate the optimum path visible in the system



Price Calculation

G.L.S.R.GUNAWARDENA
IT16011380

Price Calculation



Solution Breakdown

Price Calculation

- Predict the fuel consumption according to the vehicle
- Display Estimate Cost before the ride
- Compensation fee on both the passenger and driver for any delay other than the specified waiting time interval



Work Breakdown

Price Calculation

G.L.S.R.Gunawardena - IT16011380

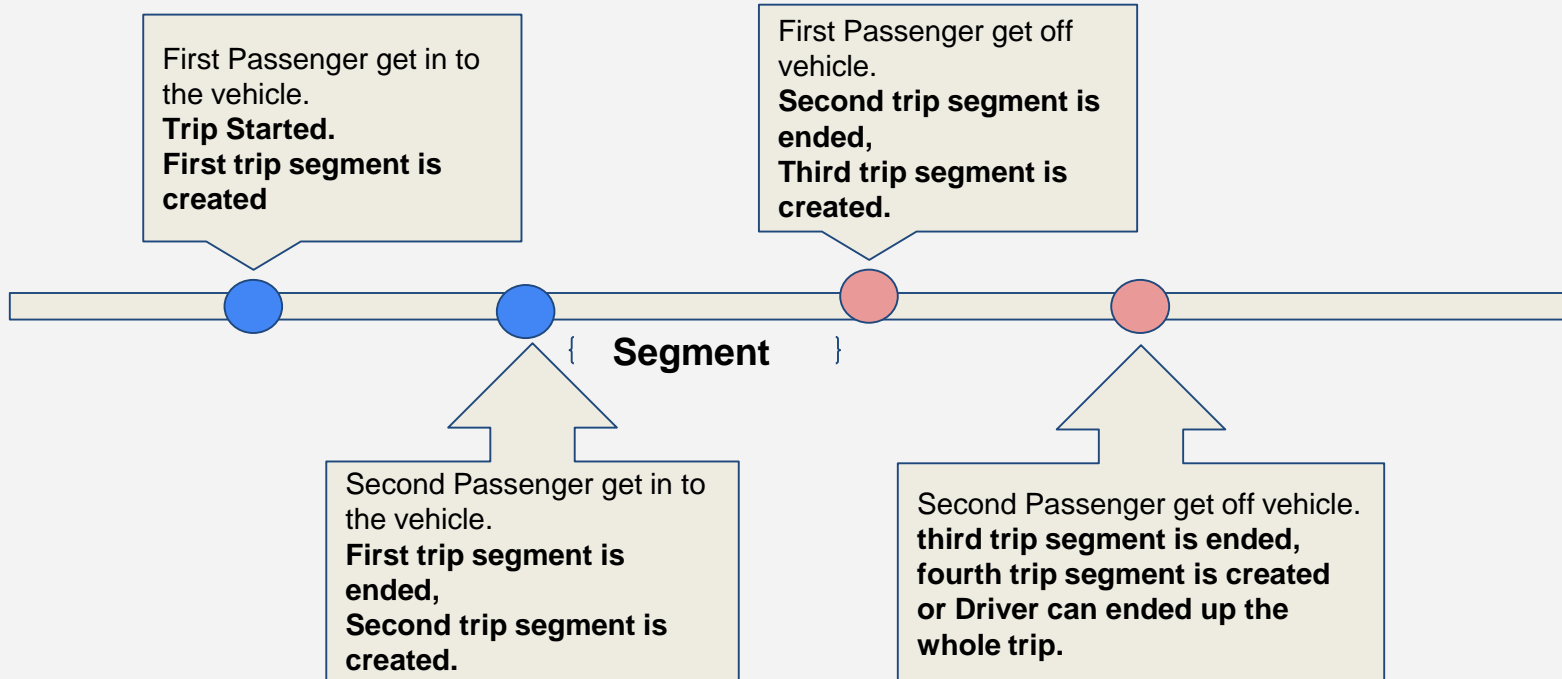
- ❖ Development of an algorithm to predict the estimated cost of the journey
- ❖ Calculating the actual cost of the journey
- ❖ Implementation of user interface related to cost calculation and interfaces accessed by the spouse/guardian of the passenger



Work Breakdown

Price Calculation

G.L.S.R.Gunawardena - IT16011380



Work Breakdown

Price Calculation

G.L.S.R.Gunawardena - IT16011380

$$C_i = \frac{D_i \times f}{\sum p}$$

$C_i \rightarrow$ Cost for D_i

$D_i \rightarrow$ Distance of Segment i

$f \rightarrow$ Cost for fuel Consumption

$\sum p \rightarrow$ Total Number of Passengers join in for current segment

Total Cost of the Ride = $\sum_{i=Start\ point}^{end\ point} (C_i) + \text{Waiting Cost} + \text{Other Cost (Tyres Wastage)}$

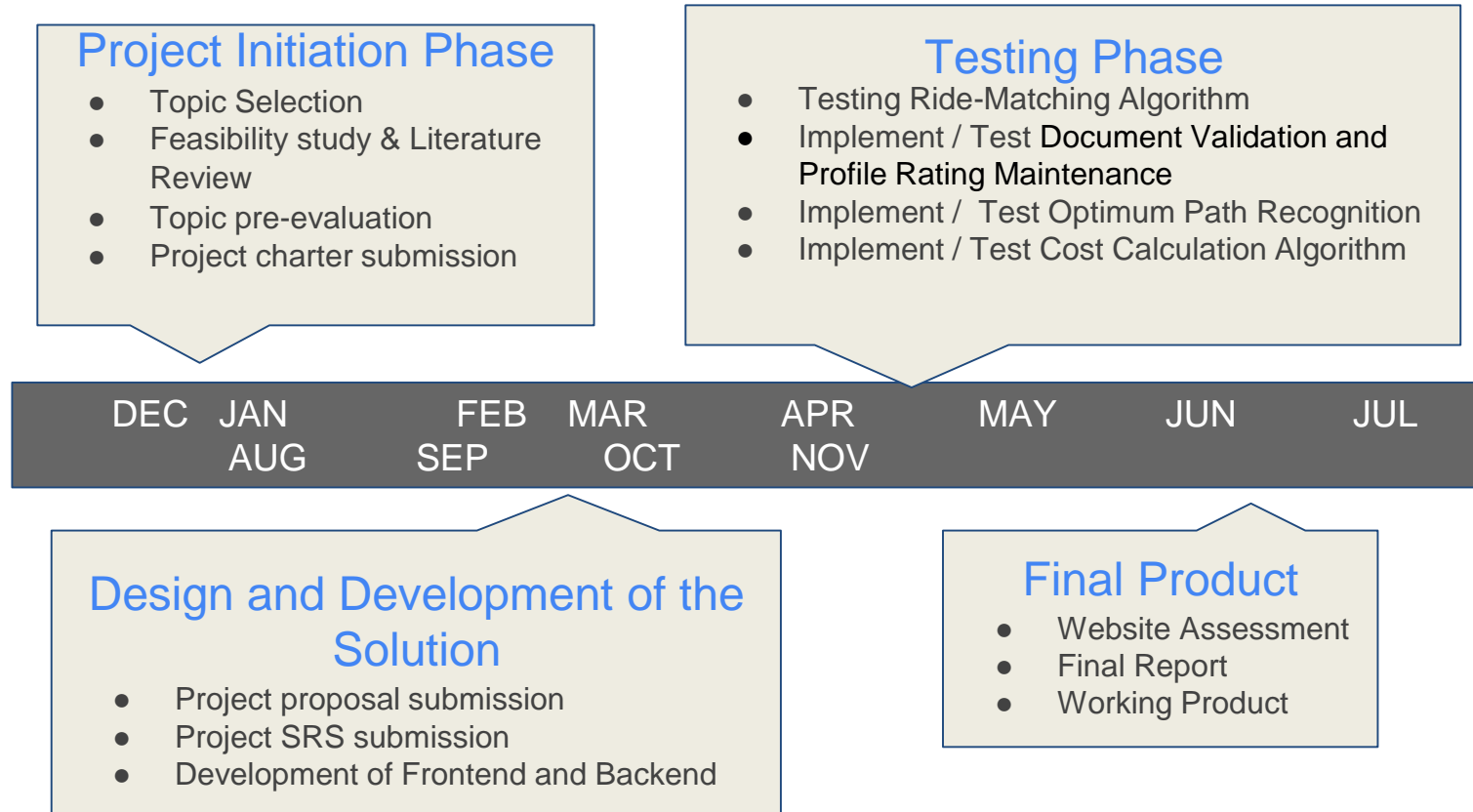


Technology Stack



Tools and IDEs'	Technologies and Services
<ul style="list-style-type: none">● Pycharm 2018.3.4● Android Studio 3.3.0● Jupyter Notebook	<ul style="list-style-type: none">● Python 3.7.2● Android 4.4 upwords● Google API
Libraries	Database Engine
<ul style="list-style-type: none">● OpenCV● PIL● Tesseract● Pandas● Matplotlib● Numpy● Sklearn	<ul style="list-style-type: none">● SQLite● MySQL● Firebase

Project Milestones in High Level



Tentative Budget Allocation

Required Resources	Unit Cost in LKR	Unit Cost in US Dollars
ODB2 Scanner (2 units)	Rs.2321.82	\$12.94
Web Server	Rs.5358.34	\$29.97
Total	Rs.7680.16	\$42.91

References

- [1] Fagin, R. and Williams, J. (1983). A Fair Carpool Scheduling Algorithm. IBM Journal of Research and Development, 27(2), pp.133-139.
- [2] Ketchen Jr DJ, Shook CL. The Application of Cluster Analysis in Strategic Management Research: An Analysis and Critique. Strategic Management Journal. 1996; p. 441-458.
- [3] P. Baid, A. Gupta and N.Chaplot, “Sentiment Analysis of Movie Reviews using Machine Learning Techniques”, 2017.
- [4] <https://tradingeconomics.com/sri-lanka/co2-emissions-metric-tons-per-capita-wb-data.html>
- [5] Dechuan Kong ,Yunjuan Liang, Xiaoqin Ma, Lijun Zhang “Improvement and Realization of Dijkstra Algorithm in GIS of Depot”
- [6] Aleksandar, P., Silvana, P. and Pancovska Valentina, Z. (2015). Multiple Linear regression model for predicting bidding price.
- [7] O. Santos, D. and C. Xavier, E. (n.d.). Dynamic Taxi and Ridesharing: A Framework and Heuristics for the Optimization Problem. Eduardo C. Xavier, p.1.

Questions ?