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Sushil Urs B J[1], Sai Chethan R[2], C R Mahanth[3], Vishal R K[4], Asst. Prof. Priyanka D[5]
Computer Science Engineering, JSS STU , Mysore, India.

Abstract: ***A lot of problems comes associated with rapid increase in population one such major problem is traffic congestionandotherproblemscausedduetoit.Ithasbecome a major problem in many metropolitan areas. During peak hourthiscongestionissomethingeveryonehastoexperience due to the way the current society operates. There are many solutions to the problem but one effective solution is carpooling. Carpooling is a system in which car owners will sharethereprivatelyowned vehicletoothertravelertraveling on the same route. This will decrease the empty seats which would result in lesser cars on road. The current carpooling systemisnotmuchdeviatedfromcabsystemwhichisalsonot soefficient. Thisservicewillgreatly benefitpeoplewhotravel on same routes on daily basis such as working people, students.Itwillalso helpthe ownerwith affordabilityoffuel cutting the cost.***

Keywords: Carpool, Traffic Congestion, Ride, Sharing, Affordability

I. INTRODUCTION

InapopulationdensecountrysuchasIndia,connectivityisa majorfactorforgrowthofanation.Duetothenationhaving large population it arises lots of problems one such concerning issue is traffic. The amount of privately owned vehiclehaveskyrocketedandgivesriseto problemssuchas traffic congestion, air pollution, sound pollution, fuel inefficiency and many more.

There are solutions to overcome these problems one such solutionisusingpublictransportbutabettermoreefficient way is carpooling.

Carpoolingissharingofprivatelyownedvehiclewithoneor more people travelling on the same route on occasional or dailybasis.Thiswillnotonlyeliminatetheproblemoftraffic congestionbutalsogreatlybenefitboththetraveleraswell as car owner. The distribution of fuel cost among all the traveler will benefit the car owner greatly.

Awebsitewillactasacommunicationlinkbetweentravelersearchingforrideandcarownerssearchingfortraveler[3].

Thecarownerwillposttheoriginofthejourney andtheend destination and traveler can communicate accordingly.

A. Advantages of using Carpooling

1) Costefficient:Duetosplittingthecostofthetravel along with other user it makes it cost effective.
2) Environment Friendly: As more number of people willtravelinsamecaronaverageitwillreducethe number of vehicle on road hence decreasing the carbonemissions.
3) Traffic : Lesser cars will run on road making the problem of traffic congestion less hectic.
4) Socializing:Carpoolingprovidesanopportunityto meet new people, socialize and make new friends which will open new opportunities.
5) Improve productivity: Commuters can use their traveltimeinproductiveworksuchasreadingbook orworking.

B. Drawbacksofcurrentsystem

1) Safety is a major concern when it comes to carpooling.Duetodigitalmodeofregistrationit may lead to fake profiles being created[4].
2) Carpooling may lead to conflicts between passengers over issues that they don't agree on making it an unpleasant experience for other passengers.
3) Time flexibility is an issue as commuters not reaching on time on required destination may leadtolossoftimeforpotentiallyallthetraveler

II. SUGGESTED IMPROVEMENT

1) Seat availability feature to ensure the traveler is informed about the number of preoccupied space.
2) Estimatethecostoftravel beforethejourneystarts
3) Addafeatureof live location thatcan besharedwith family/friends in case of emergency or unwanted situations.
4) Allowing passengers to provide feedback of the experience and write review about the same on either car owner or passenger.

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III. DETAILS RELATED TOP ROPOSED SYSTEM

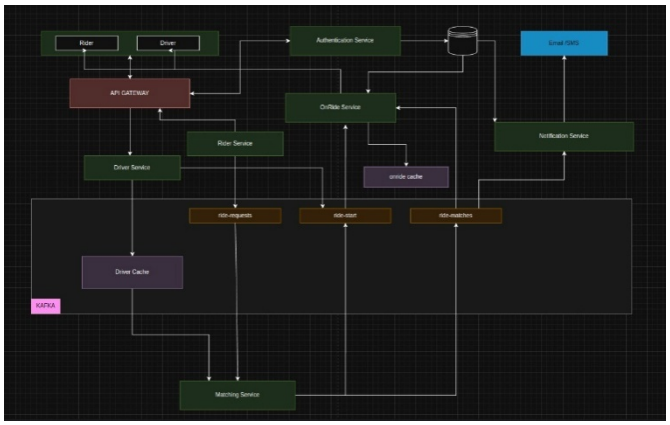


Fig-1:Methodologyofsystem

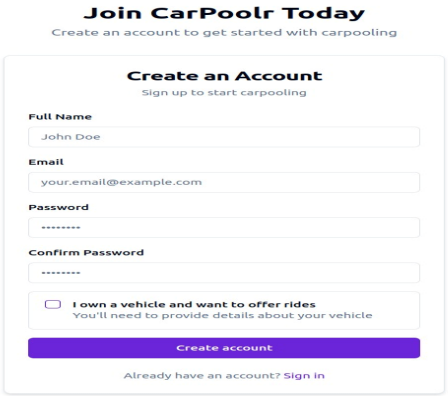
The different modules of carpooling are:

1) *Userregistrationandauthentication:* Thisisthemostcriticalmoduleofcarpooling.Thiswillhave twotypes ofuserwhicharecarowner andtraveler. Thecar owner is the one that provides the vehicle whereas the traveler is the one who want to use the service for the specified route.While the process of registration, authentication is very important to provide a safe as well as secure environment for the users. This can be ensured by asking the user to providedocumentthatensuretheuniqueidentitywhichcan be vehicle documents, car registration and other details in case of car owner and Aadhar card or pan card in case of traveler.
2) *Routecreationandmanagement:* The car owner will decide and post the origin and the end destinationofthejourneythisdatawillthenbestoredinthe database and shown to traveler. The traveler can then choose and provide the pickup and drop off spot to car ownerconsideringtheyareonthesamerouteandnotmuch deviated. Differentalgorithmscan be usedto matchthe travelerand carownersuchask-nearestneighbors(knn)whichcanfind similarity in car owner provided path and traveler path to group them together.Afterthecarownerchecksthepickupanddropoffspotscan confirm the ride and proceed with the journey
3) *Communication:* The car owner and traveller should have a way to communicate with each other. A messaging chat can be integrated that allows both parties to communicate effectivelyandsharerequiredinformation.Otherthanchat theycanbeprovidedwithcontactinformationforthesame.
4) *Paymentandreimbursement:* Afterthejourneyiscompletedthetravellerwillpayforthe amount for the distance travelled which will be pre- estimated.Travellercanpayusinganymodeoftransaction credit or debit or online or cash. For online mode of transaction the traveller will be redirected to payment portal[3].
5) *Ratingandfeedback:* After the completion of the journey the traveller as well as the car owner both can post rating and feedback based on theexperience.Thiscanthen betakenintoconsideration by future traveller and car owner for their journeys.

IV. USER INTERFACE

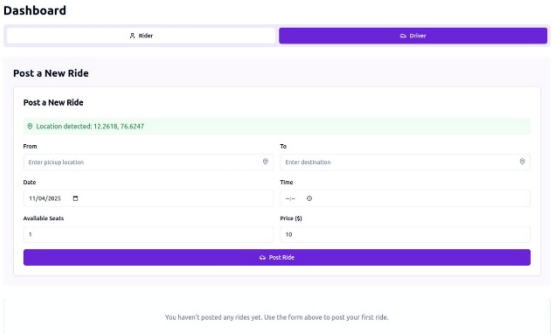
1) *Login/Register*

Iftheuseralreadyhasanaccount,theycanloginorelse opt for registration to create a account.



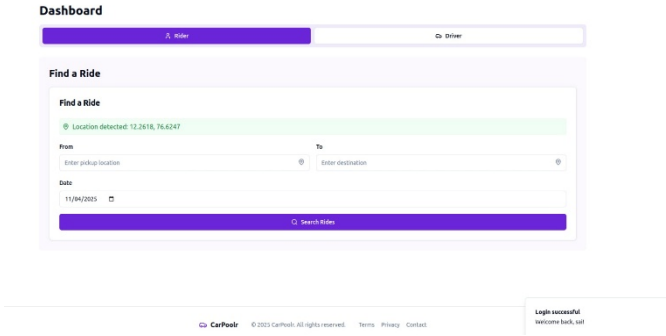
2) Dashboard

There are 2 dashboard user and car owner which will display their account information.



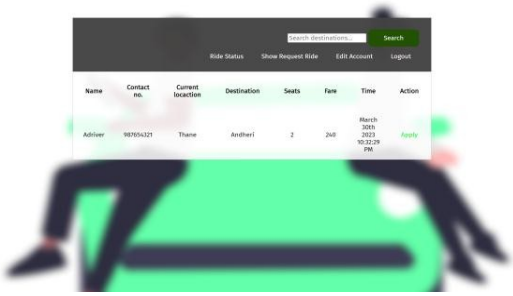
3) Postride

The car owner can provide required information for the ride.



4) Applyride

The traveler can the apply for the ride in available rides page. This page also shows other relevant information about the ridesuch as the estimated fare, available seats etc.



5) Ridestatus

This will show us the current status of the ride which is accepted.Oncecompleted theuserwill click completeto officially end the trip.

V. FUTURE SCOPE

As part of future scope, many additional features can be addedsuchasGPStrackingsystemforrealtimeupdatingof information, SOS feature that would alert required authorities in case of emergency[3].

Advancedmatchingalgorithmspairedwithselfdrivingcars could lead to convenient and efficient way to car pool. Self driving car could pickup multiple people on shared path, reducing the need of personal vehicles.

Blockchain technology could be used to develop a carpooling platform as it will lead to secure and decentralizednetwork,whereuserscouldsharetheredata and make payments without the need of any third partyinvolvement.

Overallcarpoolingisasustainablemodeoftransportwhich shouldbe promotedand usedmorewidely by thepopulation that also benefits the individuals involved as well as environment.

VI. CONCLUSION

Carpoolingisavery effectivesolutiontosomeofthemajor problem faced by commuters as well as private vehicle owners, with the help of carpooling the car owner can cut down their cost of fuel for travelling the same distance by sharing vehicle with other commuters. This will also help withtrafficcongestionwhichwillincreasethefuelefficiency in general as fuel is a depleting resource in nature. It does not only benefit the user but also benefit the concerning environmental issue such as global warming, carbon emission, sound pollution. This can make a significant change in the well being of society.

By sharing rides, users can make new friends meet new people and develop connections which can change into meaningful opportunities.

However, carpooling can also come with its own set of problems such as safety and security of user, privacy, management of payments, conflicts in interests of other commuters and many more.

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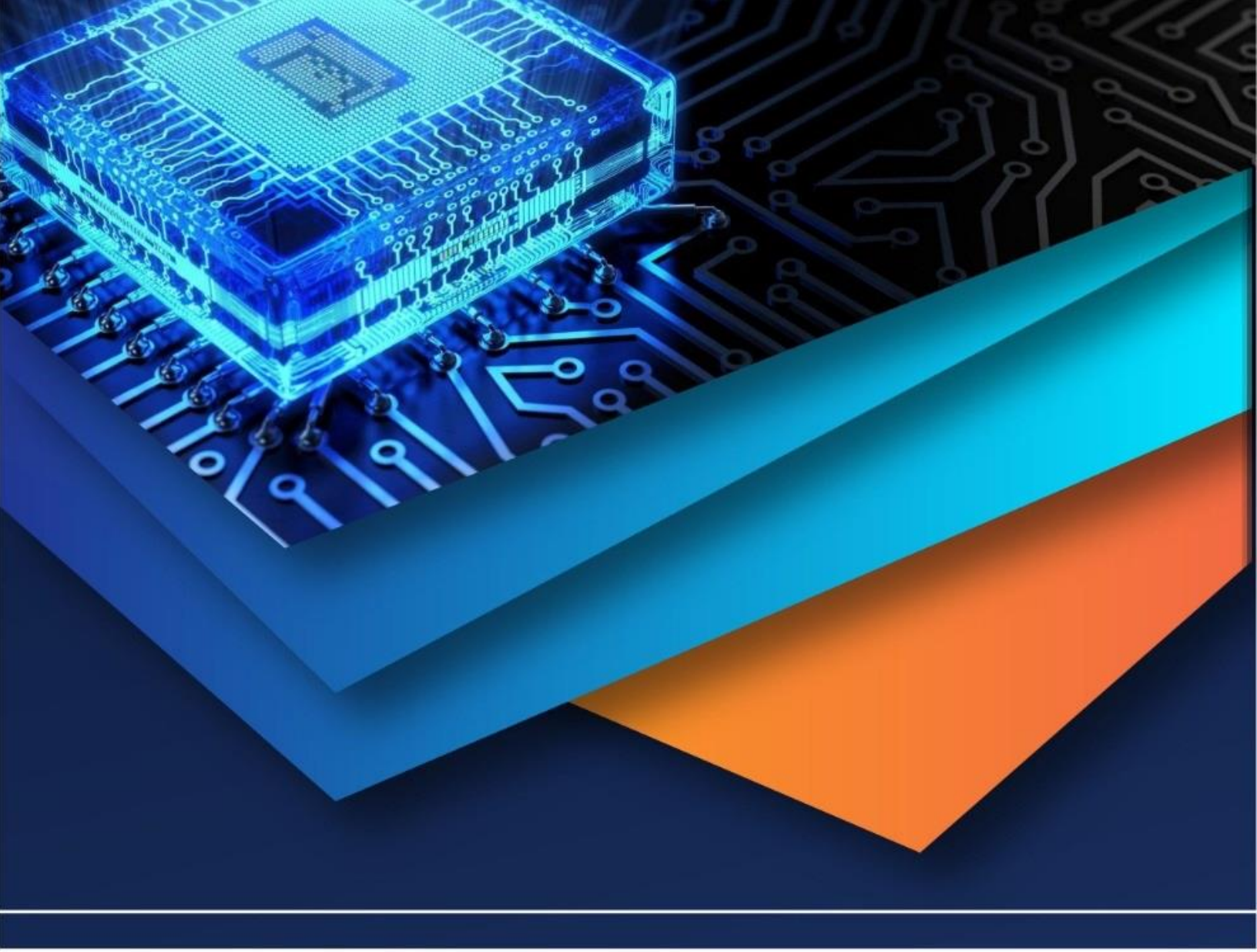

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