SHAREDWHEELS

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Abstract - *It is arduous to spend more money on travelling. SharedWheels is an innovative platform that enables people to save money on travelling by facilitating ride sharing. This platform utilizes location tracking and requires users to input their destination to identify potential ride companions along the similar routes with same destination. SharedWheels uses data to match people with similar travel plans saving money and building social connections. It tracks user's locations and analyses their travel patterns. This platform suggests potential travel companions to the user or driver based on their destination, making ride sharing easy to evaluate. It cuts travel expenses by sharing the ride and promotes sustainable transportation by optimizing vehicle occupancy to reduce congestion and emissions. SharedWheels track location and user-friendly interfaces with a focus on user privacy, security through anonymized location sharing. Users can explore shared interests, potentially create new friendships during shared trips. It is a smart solution that reduces financial burden for solo travellers, encourages sustainable transportation, fosters social connections. SharedWheels uses real time location tracking and analysis. It enhances travel experiences.*

Key Words: Ride-Sharing, Travel Cost Reduction, Sustainable Transportation, Same Destination, Privacy and Security

1.INTRODUCTION

In an era marked by growing environmental consciousness shifting transportation paradigms, and a burgeoning desire for cost effective mobility solutions, the emergence of SharedWheels represents a compelling breakthrough. SharedWheelsis an innovative platform that harnesses the power of technology to transform the way we think about solo travel. By facilitating ride sharing among individuals, this pioneering initiative not only promises to revolutionize the transportation industry but also offers an exciting opportunity for people to save money while contributing to a more sustainable future. The expenses associated with owning a car from purchasing and maintaining the vehicle to fuel, insurance, and parking can add up to a considerable burden on one's finances. Moreover, the ecological footprint left by each car on the road, in terms of emissions and resource consumption, poses a grave threat to our planet's well-being. SharedWheels steps in as a game changer by re-imagining the way we get from point A to point B. This platform serves as a dynamic and user friendly intermediary that connects individuals with similar travel routes and preferences. By fostering ride sharing,SharedWheels not only offers sustainable cost savings for users but also addresses the pressing issues of congestion and pollution in urban environments. It is a win-win solution that has the potential to alter the urban landscape in remarkable ways. In this exploration of SharedWheels, we will delve into the key features and benefits of this innovative platform. We will discuss how it works, the advantages it offers to both riders and the community at large, and it is potential to shape the future of transportation, Join us on this journey to discover how SharedWheels is turning the tide on solo travel, making it not just an economical option but also a sustainable one.

2.LITERATURE SURVEY

2.1 Dynamic Ride-Sharing: a Simulation Study in Metro Atlanta:

Niels Agatz, Alan L.Erera stated that Smartphone Technology enables dynamic ride-sharing systems that bring together people with similar itineraries and time schedules to share rides on short-notice.'In Optimization for dynamic ride-sharing research article published by European Journal of Operational Research. [1]

2.2 Why continue ride-share

Rocio Artega-Sánchez, Maria Belda-Ruiz conclude that 'The aim of this to understand consumer motivations to be satisfied and continue using Sharedwheels services. This also have economic benefits to customer affectcontinuance intention directly or indirectly through

satisfaction.' in determinants of behaviour in ridesharing services research article published by Sage Journals. [2]

2.3 Optimization of Vehicle Routing Problem for Ride-sharing

Yeqian Lin, Wenquan Li concluded that 'It is necessary to carry out ride-sharing strategy which contributes, it is necessary to carry out ridesharing strategy. Minimization of cost and maximization of customer satisfaction and travel mileage, waiting time and extra riding time quantify them.' in Research on Optimization of Vehicle Routing Problem for Ridesharing research article published by ProcediaSocial and Behavioural Sciences. [3]

2.4 Analysis of online ride-sharing platforms – A sustainability perspective

Yuhan Guo, Yu Zhang stated that 'By directly connecting passengers and transportation service providers, online ride sharing platforms reduce the number of intermediaries and improve the utilization of transportation resources. In addition to economic benefits, ridesharing could provide environmental and social advantages.' in Modelling and analysis of online ridesharing platforms a sustainability perspective research article published by European Journal of Operational Research. [4]

2.5 Ride solo or pool: Designing price-services for a ride-sharing platform

Jagan Jacob Racky Roet-Green defined that 'The RSP offers ride-pooling, whereby a passenger can reduce ride fare and save money by choosing to share the ride with a fellow passenger. Pooled rides allows the RSP to increase occupancy per vehicle. With capacity constraints, the increased volume of passengers served via pooling could offset the decrease in price per ride, leading to an overall increase in platform revenue.' in ride solo or pool, designing price service menus for a ridesharing platform research article published by European Journal of Operational Research. [5]

2.6 Environmental benefits of taxi ride sharing

Hua Cai a b, Xi Wang , Peter Adriaens d e f, Ming Xue defined that Although ride sharing as a way to improve transportation efficiency is not new, the scale of ride sharing has historically been limited due to safety concerns and logistics challenges. Recent developments in information and communications technology (ICT) enable real-time sharing of individual geographical information, allow for easier participation in the "sharing economy", and present opportunities for implementing ride sharing at a largescale. This research aims to quantify the environmental benefits of ride sharing using shared taxis in Beijing as a case study.[6]

2.7 Wheels in the Head:RideSharing

Donald Nathan Anderson, University of Arizona - Surveillance & Society, 2016 - ojs.library.queensu.ca. states that Ridesharing services offer ondemand rides much like taxicabs, but distinguish themselves from cabs by emphasizing the friendly, social aspect of the in-car interaction. Crucial to the ability of these companies to distinguish themselves from cabs has been the insertion of smart phones as "social interfaces" between drivers and passengers.[7]

2.8 Smart Phone Controls for Ride-share

Roger Ball, Xiaoyu Chen, Wei Wang & Heidi Overhill states that in an era of rising urban density, innovative solutions are needed to facilitate shortdistance "last mile" personal transportation. One new solution for last mile transportation is ride-share electric motorcycles (REMs) A preliminary review of the operation of REMs identified a problem with the dual control systems, which use both mechanical and digital interfaces. To overcome that problem, this design study explored a new mechanical control unit to provide control over a smart phone during riding.[8]

2.9 Privacy-Preserving for Ride-Sharing Services:

Yuanyuan He; Jianbing Ni; Xinyu Wang; Ben Niu; Fenghua Li; Xuemin Shen, states that Ride-sharing services (RSSs) have revolutionized transportation by helping drivers find suitable riders for vacant seats. However, selecting partners based on trip data exposes both drivers and riders' future locations. This paper proposes a privacy-preserving ride-matching scheme for selecting feasible partners in RSSs. The scheme uses a spatial region based selection mechanism, allowing the Ride-Sharing server to pre choose riders without revealing their sources and destinations. The server then selects potential partners based on travel time saving (TTS) and time schedule feasibility. The proposed scheme ensures strong privacy guarantees for both riders and drivers while maintaining RSS efficiency and practicality. Published in IEEE Transactions on Vehicular Technology (Volume:67,Issue:7,July2018)[9]

3.EXISTING SYSTEM

3.1 Waiting Times and Inefficiencies: Public Transit Delays: Public transportation systems often suffer from delays due to factors like traffic congestion, maintenance issues, or schedule inaccuracies. Passengers are forced to wait for extended periods, impacting their daily schedules and causing frustration. Rideshare Wait Times: Rideshare services, while convenient, can have fluctuating wait times, especially during peak hours or in areas with limited driver availability. Passengers may experience longer than expected wait times, leading to inconvenience.

3.2 Higher Costs for Individuals: Ownership Costs: Owning a personal car involves significant expenses, including purchasing the vehicle, insurance, maintenance, fuel, and parking. These costs can be a financial burden for many individuals. Rideshare Expenses: While rideshare services offer flexibility, the cumulative cost of frequent rides can add up, making it an expensive option for daily commuting, particularly for people with limited budgets.

3.3.Inconvenient Commutes: Stressful Commutes: Daily commutes in crowded urban areas can be stressful and time consuming. Traffic jams, long wait times, and crowded transportation can negatively affect people's well-being and overall quality of life

3. 5 Limited Accessibility:

In some areas, there may be a lack of convenient transportation options, making it difficult for people to access jobs, education, healthcare, and other essential services. This can lead to disparities in mobility and quality of life.

4. PROPOSED SYSTEM

The proposed system, "SharedWheels," is an innovative platform designed to address the challenges of costly traveling while promoting ride sharing and fostering social connections. The platform's key features and content include:

- **Geographic Proximity Rule**: When two passengers are traveling to the same destination and one is within 5 Kilometers of the other, only the driver can pickup that passenger.
- **Cost-Saving Approach**: SharedWheels intends to reduce the financial burden of travel by facilitating RideSharing. It promotes users to share transportation with others who are traveling along similar routes and to the same destination, resulting in lower individual travel expenses.
- **Recommended Travel Partners**: Based on the user's or driver's destination, SharedWheels proposes prospective travel partners. This tool makes it easier to evaluate ride-sharing prospects.
- **Reducing Congestion and Emissions:** SharedWheels supports minimize traffic congestion and greenhouse gas emissions by optimizing vehicle occupancy through ride sharing, supporting sustainable and ecofriendly transportation.
- **User Privacy and Security:** By adopting anonymised location sharing, SharedWheels promotes user privacy and security. This allows users to communicate their location with confidence.
- **Social Connections**: Beyond cost savings, the platform encourages users to explore shared desires and maybe create new friendships during shared travels. Its goal is to make travel more social.

5. METHODS

The shared wheels' fundamental characteristics and functionalities are represented by the techniques listed below:

5.1.Class Identification and Refinement:

- Review the class diagram to identify and refine the core classes: `Driver`, `Vehicle`, `Ride`, and `User`.
- Clarify the relationship between the `Driver` class and the `License` class to ensure it's well-defined.

5.2. Attributes and Methods:

- For each class, create a detailed list of attributes and methods based on the class diagram.
- Define the purpose and functionality of each attribute and method. This should include input parameters, return values, and any side effects.

5.3. Class Relationships:

- Define the relationships between classes, including associations, aggregations, and compositions.
- Specify the multiplicity of relationships to clarify how many instances of one class are related to instances of another class.

5.4. Database Design:

- Create a database schema based on the class diagram to store the project's data. Define tables, columns, and relationships in a relational database.

5.5. User and Driver Registration:

- Implement the `createUser` and `registerDriver` methods to allow users and drivers to register in the system.
- Define validation rules for user and driver registration, such as unique email addresses and password strength requirements.

5.6. Driver Functionality:

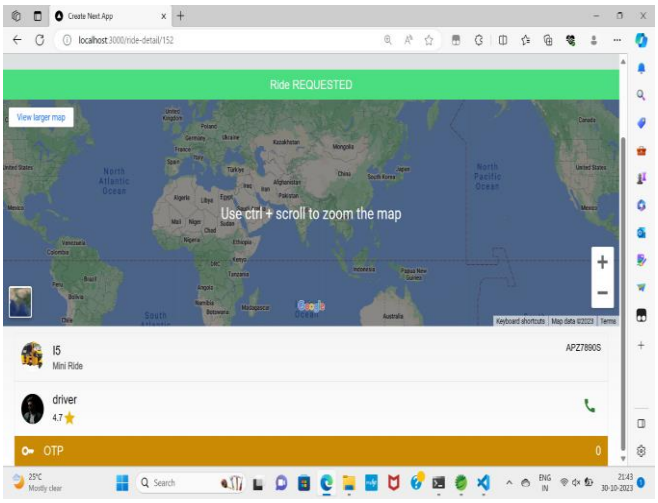
- Implement methods like `getAvailableDrivers`, `getDriverProfile`, and `findNearestDriver` to support driver-related operations.
- Develop the driver's ability to create and decline. rides.

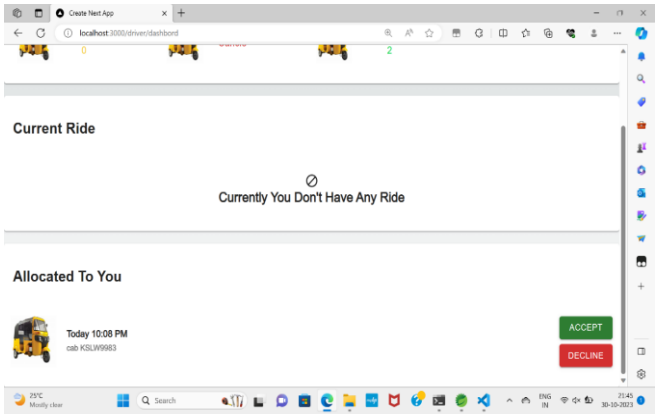
7. User Functionality:

- Implement methods like `findUserById`, `findUserByEmail`,and `findUserByToken` to support user-related operations.
- Allow users to request and interact with rides using the `createRide` and `declineRide` methods.

9. Security and Authentication:

- Implement user authentication and authorization mechanisms to secure user and driver accounts.
- Protect sensitive user data, such as passwords and tokens.





6.RESULT AND DISCUSSION

6.1 RESULT:

6.1.1 User Request a Ride:

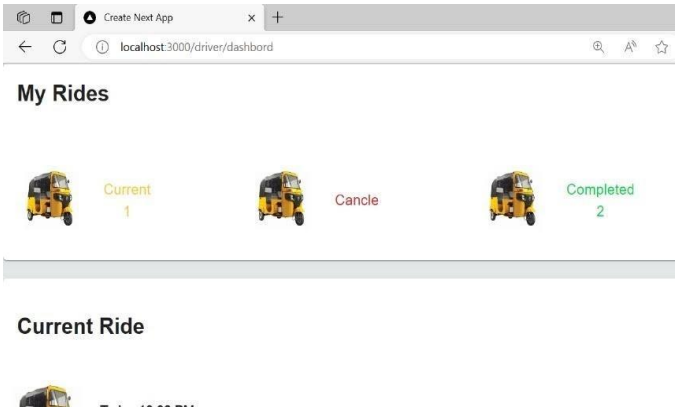
After the user logs in and the destination area is shown. The driver has been notified of the ride request.

6.1.2 Driver Response :

The driver has the option to accept or reject the request after it has been sent.

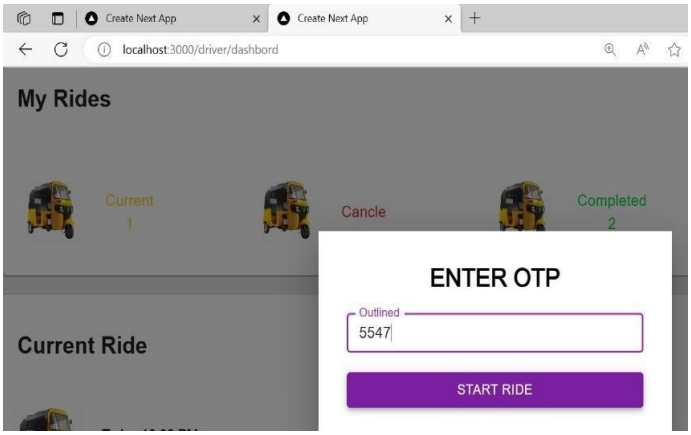
6.1.3 Start the Ride:

The driver has accepted the ride, and their current ride count is 1. The driver can begin the ride by entering the OTP now.



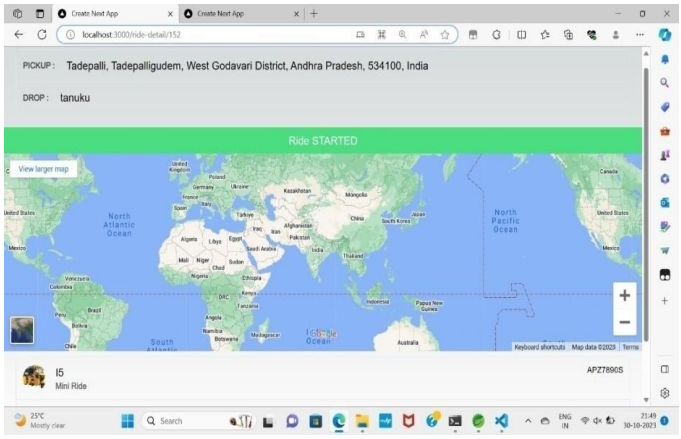
6.1.4 OTP Verification:

The user have given some random OTP and the driver has enter the same otp and start the ride.



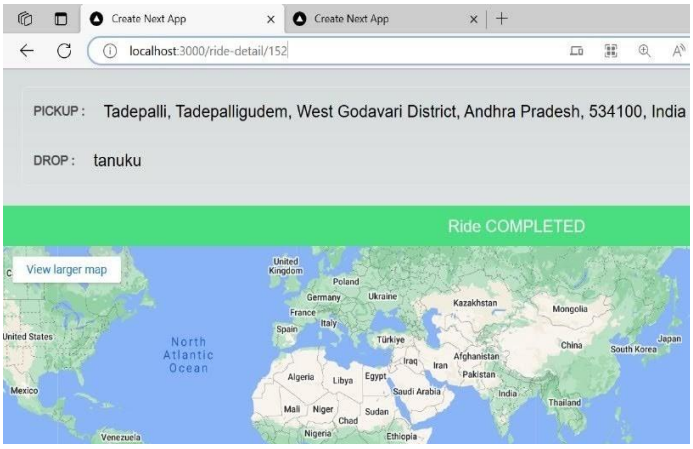
6.1.5 During the Ride

After successfully entering the otp by driver.The ride has been started.



6.1.6 Completion of Ride

After reaching the destination the driver complete the ride and the user has reached to their destination.



6.2 DISCUSSION

Users begin their ride-sharing trip by requesting a ride, indicating their current position and desired destination. Drivers in the area can either accept or deny the request, with the app automatically rerouting to an available driver if necessary. Users receive driver information and an approximate arrival time once a driver accepts the request. The ride begins when the user meets the driver at the designated pickup location or, if necessary, after a mutual OTP verification. Users can watch their progress in real time and speak with the driver during the ride. When the driver arrives at the destination, the ride is completed on the app, presenting users with a summary of the route, including fare details and distance traveled.

7.CONCLUSION

The SharedWheels project is a cutting-edge platform created using Spring Boot that enables ride-sharing, lowers travel expenses, and supports environmentally friendly transportation. It also features a social media component and a backend REST API. Users can enter their travel information, and it matches them with possible travel partners on comparable itineraries. To sum up, SharedWheels offers a thorough response to a number of important issues:

- Lower travel expenses while travelling alone.
- Security and privacy.

Moreover, it might be expanded to: We could incorporate an online payment mechanism in SharedWheels that bills users based on the distance they have travelled. When a ride is finished, we can add a driver rating system to further ease user input.

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