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FairShare - A MERN Stack Solution for Ride Sharing

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Abstract- The cost of commuting to and from school is a burden for many people, especially in urban areas. While ride-hailing services are popular worldwide, most students face issues with accessibility and convenience. The aim of this work is to create and use fairShare. A web platform that allows students to connect and share rides, thereby reducing transportation costs and reducing the environment around them. Users can register, post trips,and compete with other students using the same route. Early tests of the platform have shown that it reduces student travel costs and provides a good user experience. The platform also promotes sustainable practices for students. fairShare demonstrates the potential of student-friendly carsharing to reduce transportation costs and improve social interaction. The platform has the ability to measure a broader and more effective way for students to take action.

Index Terms- Ride Sharing, MERN Stack, Sustainable commute, Carpooling

I. INTRODUCTION

Smartphones and app services have transformed the way people move around the city, making transportation easier through ridesharing. Companies Like Uber and Lyft have proven that instant connections between passengers and drivers can be easy and affordable. However, current service faces persistent issues such as high operating costs, environmental concerns, and user safety.

Addressing these limitations through new technologies and effective algorithms can improve reliability and user satisfaction. The goal is to reduce waiting times, increase fuel efficiency, and improve safety. Theapp also uses strict user authentication and instant messaging tools to create a safe and user-friendly experience while traveling in the city.

Car sharing platforms have great potential to transform urban transportation, especially in solving problems such as traffic congestion and carbon emissions. However, achieving these goals requires a clear focus on the specific needs of users, combined with an optimization process. Targeting Underserved segments such as students and through cost-sharing strategies can make travel easier and more balanced. In addition, integrating sustainable measures such as electric vehicle compatibility and road optimization can help reduce the environmental footprint of urban transportation.

Despite these benefits, existing platforms often struggle to meet the unique needs of certain populations, such as students who face unique challenges such as limited budgets and different schedules. A customized approach can bridge these gaps by providing a platform that values affordability, flexibility, and security.

Another challenge is measuring scalability through user satisfaction. As platforms continue to evolve to serve larger audiences, self-management and rapid response times will become increasingly difficult. Solving this problem requires scalable backend systems and robust cloud infrastructure to meet high demand while maintaining quality service. Also, adopting local services and providing culture for different regions and user groups. For Example, in areas with a high student population, car sharing services can offer features such as age-specific maps and directions to meet the specific needs of students.

II. LITERATURE SURVEY

Ridesharing has revolutionized urban transportation and solved traffic and environmental problems by promoting shared transportation. The study identified factors such as user characteristics, technology, and efficiency that affect ridesharing decisions. For example, people's willingness to participate in ride sharing is influenced by factors such as convenience, financial benefits, and environmental awareness, as well as safety concerns and regulatory restrictions.

New technologies such as instant messaging and advanced analytics have improved the efficiency and user experience of ridesharing services. To Solve the problems of capacity and performance growth, integration of modern systems such as Node.Js for back-end development and reworkfor instant updates are used.

Car sharing has also been shown to reduce the number of cars on the road and lead to environmental benefits such as lower carbon emissions.However, these benefits are offset by challenges such as the large power consumption required by the system and the need for users to switch to new forms of transportation such as shared electric vehicles (SAVs). It is important to use good policies and provide assistance to address these issues.

Table 1: Literature Survey

Title	Author	Publication	Drawbacks
Value of Information Sharing via Ride-Hailing Apps: An Empirical Analysis	KyungSun (Melissa) Rhee, Jinyang Zheng, Youwei Wang, Yong Tan	2022	The study by Rhee et al. provides valuable insights into information sharing through ride-hailing apps but is constrained by its empirical scope, which may not capture all real-world complexities. Additionally, it focuses heavily on the benefits of information sharing without thoroughly addressing potential privacy concerns or technological limitations.
App-Based, On- Demand Ride Services: Comparing Taxi and Ridesourcing Trips and User Characteristics in San Francisco	Lisa Rayle, Susan Shaheen, Nelson Chan, Danielle Dai, Robert Cervero	2020	The study by Rayle et al. offers useful data on app-based ride services but is restricted to San Francisco, Moreover, it emphasizes trip and user characteristics without extensively exploring wider societal effects, regulatory issues, or future industry trends
Lyft Rides Tripled Last Year, but Remains Far Behind Uber, Forbes Magazine	SolomonB.	2017	Solomon's article discusses Lyft's growth in rides but offers limited analysis of the underlying causes or broader implications. It primarily compares Lyft to Uber, without exploring challenges within the ridesharing industry or evaluating long- term market trends.
Uber Completes 1 Billion Rides, FORTUNE	Kokalitc heva K.	2015	Kokalitcheva's article is a journalistic piece rather than formal research, limiting its depth and academic rigor. It focuses on celebrating Uber's milestone without critically analyzing broader impacts, such as labor issues, regulatory concerns, or market dynamics.
Ridesharing in North America: Past, Present, and Future	Chan N. D., Shaheen S. A.	2012	The study identifies challenges such as inconsistent user adoption, lack of sufficient infrastructure, and limited integration with public transit. Additionally, policy and regulatory hurdles hinder widespread implementation and scalability of ridesharing systems.
An empirical study on travel patterns of internet-based ride-sharing	Y. Dong et al.	2012	Does not explore long-term sustainability or potential regulatory challenges in the rise of such platforms.

III. PROPOSED SYSTEM

The client starts the process by starting with the React Router, which handles navigation and routing. Through nested React Switchand React Route elements, user requests are routed to the appropriate React elements, ensuring smooth operation

based on useractivity. These calls are converted to HTTP requests that are processed by the Express server. On the server side, operations include user authentication and authorization to ensure security. After validating the input, the server processes the data and interacts with the MongoDB database for data storage and retrieval. The server then generates an API response and sends it back to the client, completing the loop.

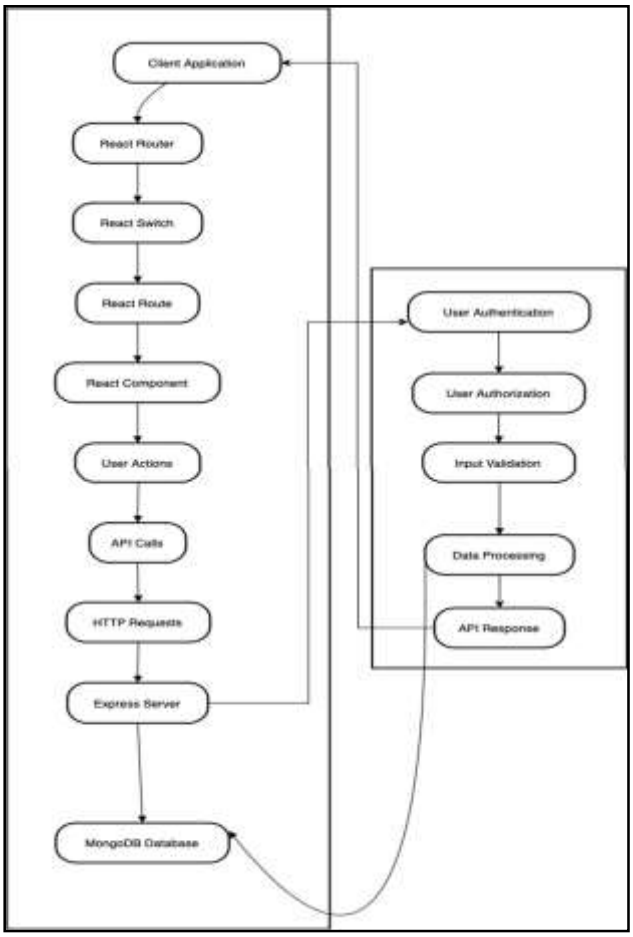

Figure 1: Proposed System Architecture

IV. FLOWCHART

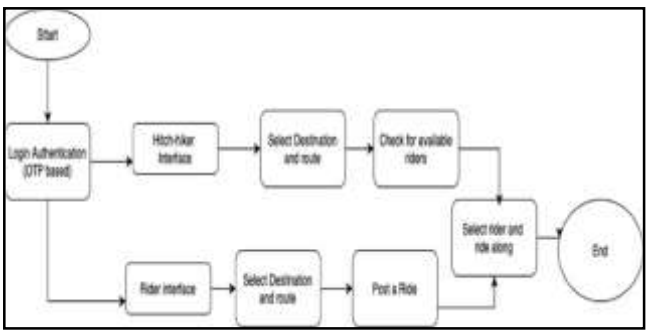

Figure 2: Flowchart

1. Start: User begins the process.
2. Login Authentication: User logs in using OTP-based verification.
3. Hitch-hiker Interface
   - Selects destination and route.
   - Checks for available riders.
   - Chooses a rider to join and completes the ride.
4. Rider Interface
   - Selects destination and route.
   - Posts a ride to make it available for others.
5. End: The process concludes with the ride being completed.

V. CONCLUSION

In conclusion, our project demonstrates the evolution of the MERN group towards creating a more efficient, productive and user-friendly car sharing service. Leveraging the power of MongoDB, Express.js, React and Node.js, we have created a powerful platform that facilitates the interaction between passengers and drivers, ensuring speed, tracking and safety. Our system effectively integrates geolocation services, instant data updates and dynamic matching algorithms to enhance user experience and improve planning. During development, we achieved significant improvements in performance and robustness, allowing applications to efficiently meet current demands while maintaining data consistency and fairness.

Additionally, fairShare fosters a sense of community among students by encouraging shared interests and trust. The integration of secure payment options and transparent user reviews further enhances reliability and increases user trust. Our platform also supports sustainability by encouraging collective action to address environmental issues and reduce carbon footprint. Going forward, the project has great potential, including features such as intelligence-driven optimization, integration with public transportation, and personalized recommendations. This vision reflects our commitment to continuous innovation to ensure fairShare remains a student competition for the future.

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