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Real Time City Cab Sharing System

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Abstract: *The cab booking service plays a crucial role in the transportation sector, offering convenience and efficiency to customers in need of daily transportation. With the growing demand for integrated taxi booking systems, taxi companies are increasingly adopting such solutions to streamline their operations. This project aims to provide a comprehensive cab booking system that offers competitive rates for both intra-city and interstate travel. The system emphasizes the selection of well-educated, courteous, and trustworthy cab drivers who are also trained to handle emergency situations. By allowing passengers to specify their pick-up location and destination, the system facilitates a seamless booking process. This project aims to enhance the overall cab booking experience for customers and simplify operations for taxi companies.*

Keywords: Cab booking service, Transport operators, Integrated taxi booking systems, Online cab booking systems

I. INTRODUCTION

The cab booking service has become an integral part of the transportation sector in many cities, providing a convenient and reliable means of transportation for people's daily commuting needs. With the increasing demand for efficient and user-friendly solutions, taxi companies are now focusing on integrated taxi booking systems to enhance their services and improve customer satisfaction. This introduction provides an overview of the cab booking service and highlights the importance of integrated booking systems in the current market. In today's fast-paced world, where time is of the essence, people rely on cab services for their daily transportation requirements. Whether it's commuting to work, running errands, or traveling to different parts of the city, cabs offer a flexible and convenient mode of transport. Recognizing the need for a seamless and hassle-free booking process, taxi companies are adopting integrated booking systems to simplify the customer experience and streamline their operations. Most of the existing online cab booking systems employ a centralized approach, where customers can search, find, and book cabs through a single platform. This centralized model provides a one-stop solution for customers, allowing them to compare prices, select suitable vehicles, and make reservations effortlessly. By leveraging technology and connectivity, these systems have revolutionized the way people book and use cab services. One of the key advantages of integrated taxi booking systems is the ability to provide the best rates tailored to the services offered. By analysing various factors such as distance, time, and demand, these systems can generate optimized pricing for different types of cab services. Whether it's an interstate trip or a local intra-city ride, customers can benefit from competitive and transparent pricing, ensuring that they receive value for their money. Additionally, these integrated systems prioritize the quality and professionalism of cab drivers. With the aim of providing a safe and comfortable journey, taxi companies carefully select drivers who are well-educated, courteous, and trustworthy. Extensive background checks and training programs ensure that customers can rely on the drivers not only for their driving skills but also for their ability to handle emergency situations with calmness and efficiency. This focus on driver quality instils confidence in passengers and establishes a higher level of trust in the cab booking service. The convenience and ease of use offered by integrated taxi booking systems extend to the booking process itself. Passengers can simply indicate their pick-up location and destination, and the system will display available cabs and estimated fares. This eliminates the need for phone calls or hailing taxis on the street, allowing customers to book a cab from the comfort of their homes or offices. Moreover, these systems often provide additional features such as real-time tracking, allowing customers to monitor the cab's location and estimated time of arrival. In conclusion, the cab booking service plays a vital role in modern urban transportation, providing a reliable and

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convenient mode of travel for people's daily commuting needs. With the advent of integrated taxi booking systems, taxi companies are able to enhance their services and improve customer satisfaction. By offering competitive rates, prioritizing driver quality, and simplifying the booking process, these systems revolutionize the way people access and utilize cab services. As the demand for efficient and user-friendly solutions continues to grow, integrated booking systems will play an increasingly important role in shaping the future of the cab booking industry.

II. LITERATURE REVIEW

[1]Car pooling is an effective transportation solution implemented by large companies to reduce the number of private cars commuting to and from their sites. The car pooling problem involves optimizing the allocation of employees into shared cars and determining the most efficient routes for the drivers, aiming to maximize sharing among employees and minimize the total travel costs. This problem can be modeled as a Dial-a-Ride Problem, particularly when all cars are identical. In this paper, we present both an exact and a heuristic method for addressing the car pooling problem, utilizing two integer programming formulations. The exact method proposed in this research employs a bounding procedure that combines three lower bounds derived from different problem relaxations. [3]By leveraging these lower bounds, the algorithm is able to find an optimal or near-optimal solution for the car pooling problem. Additionally, we introduce a heuristic method that transforms the solution of a Lagrangean lower bound into a feasible solution, providing a valid upper bound.To assess the effectiveness of the proposed methods, we conducted computational experiments. The results demonstrate the efficiency and accuracy of both the exact and heuristic approaches in solving the car pooling problem. By employing these methods, companies can significantly enhance the utilization of shared transportation resources, reduce commuting costs, and promote a more sustainable commuting culture.[2]Public transportation systems often face challenges in meeting the diverse transportation needs of passengers. To address this issue, innovative mobility services such as car pooling have emerged. Car pooling services operate on the principle that car owners with similar travel destinations can share their vehicles, optimizing resource utilization and reducing congestion. However, the effectiveness of these services has been limited by the lack of efficient information processing and communication support. In this study, we present an integrated system for organizing a car pooling service that leverages various Information and Communication Technologies (ICTs) including web, Geographic Information System (GIS), and Short Message Service (SMS). The core component of the system is an optimization module that utilizes heuristic algorithms to solve the specific routing problem inherent in car pooling.[4]The system has been developed and tested in a real-life case study, demonstrating its practical application and effectiveness. By integrating web, GIS, and SMS technologies, the system enables efficient information sharing, route optimization, and communication between car owners and passengers. This comprehensive approach enhances the functionality and usability of the car pooling service, making it more accessible and attractive to users.The results of the case study validate the efficiency and effectiveness of the integrated system. The optimized routing solution generated by the system contributes to reducing travel costs, minimizing congestion, and promoting sustainable transportation practices. The successful implementation of the system highlights the potential of leveraging ICTs to address transportation challenges and improve the overall efficiency of car pooling services

III. FARE CALCULATION

The fare calculation module is an essential component of the cab booking system, as it determines the cost of the ride based on the source and destination specified by the driver. This feature ensures transparency and accuracy in fare calculation, providing both drivers and passengers with a clear understanding of the costs involved.When a driver creates a journey in the system, the fare calculation module comes into play. It takes into account various factors such as distance, time, and any additional charges or surcharges applicable. By considering these variables, the module calculates the total fare for the ride. The integration of a car monitoring feature in the system is highly valued and recognized worldwide. This feature enhances the safety aspect of the cab booking service. In the event of an emergency, such as an accident, the tracking device installed in the car will activate an alarm. Simultaneously, it will notify the attendants or relevant authorities about the occurrence, enabling them to provide immediate assistance. This real-time monitoring capability adds an extra layer of security for both passengers and drivers. The cab booking system is designed as a web-based Android application, ensuring accessibility over a wide area. It serves as an internet-based

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solution that enables people to travel safely and conveniently from one destination to another. By utilizing this application, consumers can book a car based on their current location and specific preferences. This eliminates the need for them to search for a vehicle manually, saving time and effort, especially in unfamiliar locations.The administration aspect of the application is controlled by the admin, who has full authority to manage and monitor the system. The admin can add, remove, and manage vehicles and drivers' rides effectively through the admin control panel. This centralized control allows for efficient management and ensures smooth operations of the cab booking service.With the fare calculation module and the overall cab booking system in place, customers can experience a seamless and user-friendly booking process. They can easily specify their source and destination, and the system will calculate the fare accordingly. This eliminates any ambiguity or confusion regarding the cost of the ride, providing customers with a transparent and fair pricing structure. In conclusion, the fare calculation module is a crucial component of the cab booking system, ensuring accurate and transparent pricing for rides. Alongside features like car monitoring and administrative control, this module contributes to the overall safety and convenience of the cab booking service. By simplifying the booking process and providing real-time tracking capabilities, the system enhances the travel experience for both passengers and drivers. The integration of such features in a web-based Android application facilitates seamless and secure transportation, allowing people to travel from one destination to another with ease.

IV. PURPOSE

The purpose of this project is to develop an online Android application that operates on a wide area network. The application aims to provide users with a safe and convenient solution for their transportation needs, allowing them to easily book cars based on their location and preferences.

Secure and Faster Sharing of Sensitive Information:
The project focuses on ensuring the secure and efficient sharing of sensitive information related to the car booking process. By implementing robust security measures and protocols, the application aims to protect user data and provide a reliable platform for sharing personal information during the booking process.

Verification of Customer Records:
The project also aims to facilitate the verification of customer records for both customers and business institutions. Through the application, customers can have their records verified, enhancing their credibility and trustworthiness. Similarly, businesses can verify customer information to ensure a safe and reliable service.

Third-Party Verification:
In addition to customer record verification, the project incorporates third-party verification mechanisms. This enables a higher level of security and reliability by involving trusted third-party entities in verifying customer information. This verification process adds an extra layer of confidence for both customers and service providers.

Enhanced Security:
The project emphasizes the implementation of advanced security features to ensure the privacy and safety of users' personal information. Robust encryption techniques, secure authentication protocols, and data protection measures are employed to safeguard sensitive data from unauthorized access or breaches.

Automation of Automobile Reservations:
The main goal of the project is to automate the process of automobile reservations. By developing an intuitive and user-friendly interface, customers can easily reserve their preferred vehicles without the need for time-consuming manual processes. This automation streamlines the reservation process, saving time and effort for both customers and service providers.

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V. OBJECTIVES OF THE SYSTEM

Cost Effectiveness:

The primary objective of the system is to provide users with a cost-effective transportation solution. By streamlining the booking process and optimizing pricing strategies, the system aims to offer competitive rates that are affordable for customers. This objective ensures that users find the service economically viable and beneficial compared to other alternatives.

Smoother Process for Customers:

Another objective of the system is to ensure a smooth and hassle-free process for customers. By implementing user-friendly interfaces, intuitive navigation, and efficient booking workflows, the system aims to enhance the overall experience for customers. This objective focuses on minimizing complexities and reducing any friction points in the booking process, making it easier and more convenient for customers to use the system.

Efficient Resource Management:

The system also aims to optimize resource management for the service provider. By utilizing advanced algorithms and intelligent scheduling mechanisms, the system aims to maximize the utilization of available resources such as vehicles and drivers. This objective ensures that the service provider can efficiently allocate resources based on demand, resulting in improved operational efficiency and cost savings.

Timeliness and Reliability:

Timeliness and reliability are key objectives of the system. The system aims to provide accurate and reliable information regarding estimated arrival times, ensuring that customers can rely on the service for timely transportation. This objective includes real-time tracking of vehicles, efficient routing algorithms, and effective communication channels to minimize delays and provide a dependable service.

Enhanced Customer Satisfaction:

The ultimate objective of the system is to achieve a high level of customer satisfaction. By focusing on cost-effectiveness, smooth processes, efficient resource management, and timely service, the system aims to meet and exceed customer expectations. This objective encompasses aspects such as prompt customer support, personalized experiences, and continuous improvement based on customer feedback.

Scalability and Flexibility:

The system aims to be scalable and flexible to accommodate future growth and adapt to changing needs. This objective includes the ability to handle a growing user base, expand service coverage to new areas, and integrate additional features or services as required. Scalability and flexibility ensure that the system remains robust and adaptable in a dynamic market environment.

VI. PROPOSED SYSTEM

The proposed system aims to provide a comprehensive and user-friendly platform for taxi booking and ride-sharing services. It consists of several main modules that work together to offer a seamless experience for both drivers and riders.

Module 1: Authentication Module

The authentication module ensures secure access to the application. Users can log in to the app using their email and password. To ensure the authenticity of the users, a verification code is sent to their registered email address. Once the verification is completed, users can access the app and utilize its services.

Module 2: Driver Register Module

This module enables taxi drivers who wish to register their vehicles for ride-sharing to create an account and register through the app. It provides the following functionalities:

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- Create Journey: Drivers can create a journey by specifying their current location, destination, and available seats.
- View Current Journey Passengers: Drivers can view the passengers who have booked their journey and manage their ride accordingly.

Module 3: Rider Request Module

The rider request module allows riders to request a taxi by entering their source and destination locations, along with the number of passengers. The module includes the following features:

Search Journey: The system performs a location-based analysis to allocate the most suitable taxi for the ride based on availability and proximity.

Book Journey: Riders can select and book a journey from the available options. They can view details such as the driver's information, vehicle type, and estimated fare.

View Own and Driver Location on Map: Riders can track their own location as well as the driver's location on a map, ensuring transparency and real-time updates.

Module 4: Online Auto Booking Service

The proposed system includes an online auto booking service, which allows individuals to book a cab for their preferred location and vehicle. Users have the option to make online payments for the services, and in some cases, they may even receive promotional offers or discounts. The system functions as an online Android application that enables any registered car driver to become a member and actively participate in the service.The proposed system aims to simplify the process of taxi booking and ride-sharing by providing an intuitive and efficient platform. By incorporating modules for authentication, driver registration, rider requests, and online booking services, the system ensures a seamless experience for both drivers and riders. It promotes convenience, transparency, and ease of use, making it an ideal solution for individuals seeking reliable and efficient transportation services.

VII STEP OF WORK OF THIS SYSTEM

The system follows several steps to facilitate the taxi booking and ride-sharing process. Here are the main steps of work for this system:

1. User Authentication:

- Users access the system through the authentication module by providing their email and password.
- A verification code is sent to the user's email for authentication purposes.
- Once the verification is completed, users gain access to the application and its features.

2. Driver Registration:

- Taxi drivers who wish to offer their services for ride-sharing register through the driver registration module.
- They create an account and provide necessary details such as their vehicle information, license, and contact information.
- Upon successful registration, drivers become active members of the system.

3. Rider Request:

- Riders enter their source and destination locations along with the number of passengers for their desired ride.
- The system performs a location-based analysis to match riders with available taxis in proximity to their location.
- Riders can view a list of available journeys that match their criteria.

4. Journey Selection and Booking:

- Riders can browse the available journeys and select the one that suits their preferences.
- They can view details of the journey, such as the driver's information, vehicle type, and estimated fare.
- Once the rider selects a journey, they confirm the booking and proceed with the payment process, if applicable.

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5. Journey Tracking:

- After booking a journey, riders can track their own location and the driver's location in real-time on a map within the app.
- This tracking feature provides transparency and allows riders to stay updated on the journey's progress.

6. Ride Completion and Payment:

- Once the journey is completed, riders and drivers mark the ride as completed within the app.
- Riders have the option to rate and provide feedback on the driver and the overall experience.
- Payment for the ride can be processed through the app, either with online payment methods or cash, depending on the preferences and options available.

7. Driver Management:

- Drivers can manage their journey schedules, including creating new journeys and updating available seats.
- They can view the list of passengers who have booked their journeys and make any necessary adjustments.

8. System Administration:

- The system includes an administration module that allows administrators to manage the overall operation of the platform.
- Administrators can add or remove drivers, monitor system performance, handle customer support, and implement any necessary updates or enhancements

VII ALGORITHM

1. User Authentication:

- Prompt the user to enter their email and password.
- Send a verification code to the user's email.
- Verify the entered code with the one sent to the email.
- Grant access to the application if the verification is successful.

2. Driver Registration:

- Allow drivers to create an account by providing necessary details such as vehicle information, license, and contact information.
- Verify the provided information and validate the driver's eligibility.
- Upon successful verification, register the driver as an active member of the system.

3. Rider Request:

- Prompt the rider to enter the source and destination locations, along with the number of passengers.
- Perform a location-based analysis to match riders with available taxis near their location.
- Display a list of available journeys that match the rider's criteria.

4. Journey Selection and Booking:

- Allow the rider to browse through the available journeys.
- Display detailed information about each journey, including driver details, vehicle type, and estimated fare.
- Prompt the rider to select a journey that suits their preferences.
- Confirm the booking and proceed with the payment process if required.

5. Journey Tracking:

- After booking a journey, enable the rider to track their own location and the driver's location in real-time on a map within the app.
- Continuously update the locations to provide accurate tracking information to the rider.

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6. Ride Completion and Payment:

- Once the journey is completed, prompt both the rider and driver to mark the ride as completed within the app.
- Allow the rider to rate and provide feedback on the driver and the overall experience.
- Process the payment for the ride through online payment methods or cash, based on the selected payment option.

7. Driver Management:

- Enable drivers to manage their journey schedules.
- Allow drivers to create new journeys, specifying the current location, destination, and available seats.
- Provide the ability for drivers to view the list of passengers who have booked their journeys and make any necessary adjustments.

8. System Administration:

- Implement an administration module for system administrators.
- Allow administrators to manage the overall operation of the platform.
- Provide functionalities such as adding or removing drivers, monitoring system performance, handling customer support, and implementing updates or enhancement

IX ADVANTAGES AND DISADVANTAGES

Advantages of the Taxi Booking and Ride-Sharing System:

1. Convenience and Efficiency: The system provides users with a convenient and efficient way to book taxis and arrange rides. Users can easily access the application, search for available journeys, and book rides with just a few clicks, saving time and effort.
2. Increased Accessibility: The system allows users to access taxi services from anywhere, anytime, as long as they have an internet connection. This increases accessibility, especially in areas where traditional taxi services may be limited.
3. Enhanced Safety: With features such as journey tracking and driver management, the system enhances safety for both riders and drivers. Riders can track their journey in real-time, ensuring transparency and providing peace of mind. Drivers' information and vehicle details are also verified during the registration process, adding an extra layer of safety.
4. Cost-Effectiveness: The system aims to provide cost-effective solutions for users. By optimizing ride-sharing options and matching riders with available taxis in proximity to their location, users can save on transportation costs by sharing rides with others going in the same direction.
5. User Feedback and Ratings: The system allows users to provide feedback and ratings for drivers and overall experiences. This encourages drivers to maintain a high level of service and helps other users make informed decisions when selecting journeys.

Disadvantages of the Taxi Booking and Ride-Sharing System:

1. Reliance on Technology: The system heavily relies on technology infrastructure, such as internet connectivity and mobile devices. Any technical issues or outages can disrupt the service and cause inconvenience for users.
2. Limited Availability in Certain Areas: The availability of taxis and ride-sharing options may be limited in certain areas, especially in remote or less populated regions. This can pose challenges for users in accessing the service.
3. Potential for Pricing Fluctuations: Depending on factors such as demand and surge pricing algorithms, the fare rates for rides may fluctuate. This can result in higher fares during peak times or unexpected increases in prices, which may not be favorable for some users.
4. Safety Concerns: While efforts are made to ensure safety, there is always a possibility of encountering unforeseen circumstances or encountering drivers who do not meet expected standards. Users need to exercise caution and follow safety guidelines when using the service.

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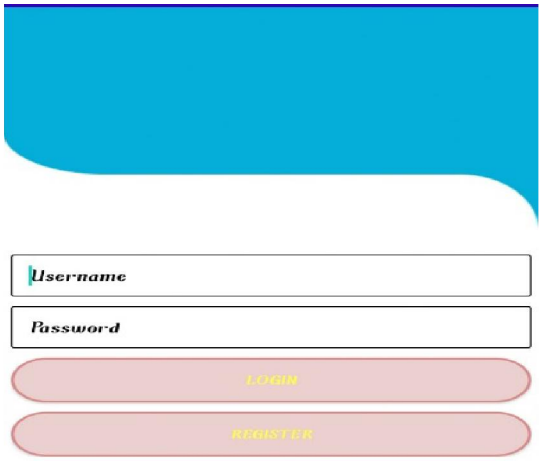
5. Privacy and Data Security: The system collects and stores user data for authentication and booking purposes. It is crucial to implement robust security measures to protect user privacy and ensure the security of their personal and financial information.

X EXPERIENCE RESULTS



XI. CONCLUSION

In conclusion, the taxi booking and ride-sharing system offers numerous advantages to both users and drivers. The system's convenience and efficiency enable users to easily access and book taxis, saving time and effort. The increased accessibility ensures that taxi services are available to users anytime and anywhere, contributing to improved mobility. The enhanced safety features, such as journey tracking and driver verification, provide users with peace of mind and ensure a secure transportation experience. The cost-effectiveness of the system, through ride-sharing options, helps users optimize their transportation expenses However, it is important to acknowledge certain disadvantages associated with the system. Reliance on technology infrastructure may lead to disruptions in service due to technical issues or connectivity problems. Limited availability in certain areas may pose challenges for users seeking taxi services. Pricing fluctuations and safety concerns should also be considered, and measures should be taken to address them appropriately. Privacy and data security should be prioritized to safeguard user information and ensure confidentiality. To mitigate these challenges, continuous monitoring and improvement of the system's performance are essential. Regular updates and enhancements, along with effective customer support, can contribute to the overall success and satisfaction of the users. Collaborations with relevant stakeholders, including local transportation authorities and taxi service providers, can further strengthen the system's reach and effectiveness.Overall, the taxi booking and ride-sharing system presented in this research paper demonstrates significant potential to revolutionize the transportation industry, offering a convenient and reliable solution for users. By leveraging technology and incorporating user feedback, future iterations of the system can address limitations and further enhance the user experience. With the ongoing advancements in technology and increasing adoption of ride-sharing services, the future of taxi booking and ride-sharing looks promising, providing a sustainable and efficient transportation solution for individuals worldwide.

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