Car Hailing Provider Apps and User Behavior

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Abstract

Mobile applications are essential in modern daily life. They are at the very center of human activities, clearly, an indispensable need and they have made life somewhat easier. Ride-hailing apps have gained popularity among the general public in recent years, furthering the concept of shared mobility to the general public. By boosting the use of mobile phones to access the internet, technology has altered consumer behavior. The way goods and services are distributed and provided to customers has evolved as a result of changes in consumer behavior around the world. Consumers now have more internet access and interaction options thanks to mobile applications.

In the transportation industry, there has been a subtle shift in human travel behavior. People now use their smartphones to order rides where the various apps match them to drivers who pick them up and drop them at their desired points. This has led to a gradual shift from public transport towards a more comfortable way of transport. Ride-hailing is common amongst the younger generation population, often as a replacement for self-driving options when going to parties.

This research article seeks to examine the user behavior while using the different ride-hailing apps there are globally. Additionally, it interrogates how effective a single app that manages all the other car-hailing apps would be, putting into consideration the solutions it would offer, problems, and bottlenecks it would encounter.

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1. Introduction

Urban mobility and traffic issues are going to be prioritized as fundamental issues in any program aimed at raising living standards. Gridlock traffics, atmospheric and sound pollution, energy consumption, accidents, excessive use of public land by cars, unequal distribution of the increase in costs and benefits, and wanton use of private cars are the issues that make our cities unlivable. These negative effects are due to an inefficient organization of the transport system and a distorted development of mobility (Migliore et al., 2020).

The practice of using a service that links clients and drivers through online platforms and mobile applications is known as ride-hailing. It is similar to the traditional taxi service industry, with the major difference being that it uses the internet as a medium to match user profiles (Luo & Jia, 2022), that is, a passenger's information with that of the driver, and a vehicle in real-time while accounting for each individual's preference. This practice has gone by several other synonyms such as car-hailing, ride-sourcing, or car-sharing. While car-sharing at times can be used to mean an entirely different thing (Wu et al., 2020), all the above have one thing in common; they all entail a form of shared mobility that allows a user to access a vehicle they do not own for a relatively shorter period, usually in minutes or hours as opposed to days as in the case of car rentals. This has led to a decrease in the number of private vehicles on the road, and is termed as being generally environmentally friendly- the number of vehicles is lower (Shaheen et al., 2019).

The ubiquitous presence of drivers who use their personal vehicles for on-demand transport services is perhaps among the most impressive innovations in the global transportation sector. Drivers and passengers are matched in real-time by firms that make use of mobile phone apps that are internet-connected (Beojone & Geroliminis, 2021).

The exponential advent of smartphones with GPS, the internet, and digital route maps has made it possible for ride-hailing services to be provided through ride-hailing apps (RHAs). To link clients and transport operators, making it

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easier for them to match, and improve communication, RHAs have been designed as an online platform (Phun et al., 2020). This has grown into a multi-billion industry, with projections of even higher and further growth. More people are turning to apps and online-enabled platforms to get rides to move and about cities in which they live and work. These platforms have offered users convenience through transparent and convenient fare prices that are computed on the apps (Chung & Al-khaled, 2020).

To address issues with transportation such as traffic congestion, shortage of parking, climate change (Ashkrof et al., 2020), hyper-urbanization, as well as demographic and societal changes, technology development in the transportation sector has changed the mobility boundaries and introduced new transportation possibilities. The field of shared mobility has seen the emergence of ride-sourcing businesses, commonly referred to as "Transportation Network Companies (TNCs)," which can transform mobility from a car ownership paradigm to service-based operations.

Car-hailing provider apps have revolutionized public transport over the past decade or so. You can now travel with comfort and style thanks to these apps. The industry is fast evolving globally and more participants are entering the market offering a competitive edge over the others. Uber was the pilot company to implement the notion of ride-hailing back in 2009 as UberCab (Konoplenko, 2022).

Ride-sharing apps do provide a number of economic advantages because they can instantaneously match drivers and riders. Since passengers who pay for transportation share the cost of automobile ownership, ride-sharing is a business model that adheres to the sharing economy. The sharing economy serves to reduce the inefficiencies caused by travelers who might otherwise drive alone or infrequently use their own car at a time when autos are only used 4% of the time (Hu, 2020).

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One of the key factors propelling the market expansion for ride-hailing services is the growing custom of online on-demand transportation services. Due to an increase in venture capitalist investments, major market companies have been able to enter unexploited fully developed, and developing markets. Players have many options to boost their overall revenue thanks to this. Rapid urbanization in developing nations is driving up demand for on-demand transportation service providers (Technavio, 2020).

2. Literature Review

Numerous studies have been conducted on ride-hailing and ride-sharing systems, and many different aspects of these platforms have been examined. They have interrogated and examined user behavior, both from the consumers' (passengers') perspective and from the drivers' perspective too. The majority of academic studies on shared mobility so far have concentrated on the adoption and effects of carsharing programs due to the recent development of ride-hailing services (Uber, Lyft) (Clewlow & Mishra, 2017).

One of the most significant study areas in the development of transportation systems and the supply of related services relates to vehicle use. Administrators must have fast and efficient ways to build customer satisfaction and boost consumer trust as information technology develops to compete and draw in customers (Mai et al., 2021). The success of public transportation rests on its ability to keep and draw in a large enough customer base, therefore the standard of service has become an important benchmark (Shah & Kubota, 2022).

Ride-hailing has gradually over the years come to replace the demographic constitution of those who formerly used car-sharing in America. The primary factor that urban ride-hailing users cite as an alternative to driving themselves is parking. Americans with college degrees and high incomes have joined ride-hailing services at a rate that is twice that of people with lower incomes and less education (Clewlow, 2017).

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Cab-hailing companies have engaged autonomous contractors to procure vehicles reducing their overheads quite significantly. The saved expenditure is injected into innovative and integrative mapping and billing technologies that enhance their general efficiency (Ang'asa, 2017).

2.1 Impact of TNCs

They expedite and make the connection between drivers and passengers through mobile applications easier. Passengers also have access to the best real-time transportation services, with e-payment being made available, driver performance reviews, and selection of the class of the vehicle they want to use (Tarnovetckaia & Mostofi, 2022). The different studies on the impacts of the TNCs analyzed have shown that ride-hailing has brought about a new dependency, with people using public transport less. The amount of car usage has also dropped courtesy of this.

2.2 The theory of planned behavior

The theory is based on the assumption that people are bound to act after making the best use of the information available to them. They assess all opportunities and resources at their disposal, inclusive of money, time, knowledge, and cooperation from others (Nazir et al., 2021).

Behavioral intention is linked to the likelihood of an individual being engaged in a specific behavior or activity. It is quite important as it allows for the likely prediction of the customers' future behavior (Imhimmed et al., 2018).

2.3 Theory of Technology Acceptance Model (TAM)

Researchers have employed TAM to forecast people's propensity to adopt specific technologies. It has been used to test people's willingness to use and accept technology before it is fully launched into a market (Suhud et al., 2020). Access to a stable internet connection hugely influences how people will take to using ride-hailing apps since they all require one to be connected. The perceived usefulness (PU) and perceived ease of use (PEOU) are key factors that influence a user's adoption of technology and innovation (Cheah et al., 2022).

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2.4 Intended use and Travel motivation

Intention includes factors of motivation that influence a person's behavior. How an intent is executed is dependent on the end goal, which defines the place, time, and method applied to achieve the goal. An intention to perform a task is used as a predictor or is a prerequisite of the actual task. The theory of planned behavior (TPB) further compounds this, in that awareness of behavioral control and intent are predictors of the actual behavior (Passafaro, 2020).

2.5 Perceived constraints and risks

Privacy and security concerns are at the top of the risks that car-hailing application users perceive as most crucial in the hierarchy. These platforms store data such as your phone number and banking details at times, which are at a risk of theft, loss, and misuse. The satisfaction of users and subsequent continued use is hugely influenced by the risks they have to undertake (Preciado-Ortiz, 2021).

Those choosing the carpooling ride-hailing option, in which they were hailing the same vehicle with strangers, particularly women, felt emotions of insecurity. This suggests that passengers' perceptions of situational security may be influenced by the sort of ride-hailing service (Liu et al., 2022).

2.6 Brand engagement

How a brand engages with its customers has a very huge impact on its ability to retain its existing clientele and attract new ones. RHAs often engage their customers on social media platforms and use the analytical data from these platforms to generate consumer perceptions and opinions. The key element in every company's development is brand recognition. For instance, there is a strong brand awareness of Uber in about 83 countries and 670 cities. The creation and promotion of a popular cab app hastened the company's global expansion (Sudra, 2021).

2.7 Ride-hailing applications' usefulness and consumer intention on using them

The majority of prior empirical studies on this matter have concentrated on the variables influencing consumers' intentions to engage in sharing economy activities. Consumers are shown to be drawn to mobile ride-hailing services

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by elements including utility, usability, and social influence. Self-efficacy, functional value, and emotional value are additional significant variables that influence consumers' willingness to participate in the ride-hailing market. Consumers' concerns about using mobile ride-hailing services were found to be influenced by performance, privacy and security, and conflict risks. This in turn influences their subsequent behavior and intention of purchase (Al-Masaeed et al., 2022).

The RHAs mainly serve people who do not own a vehicle, helping them enjoy mobility with comfort and reassurance of getting to their destinations faster as compared to when public means of transportation are used (Shaheen et al., 2017).

2.8 Consumer behavior and ride-hailing apps

Data collected through mobile apps is used by companies to analyze the specific behavior of customers. This being said, the analysis offers incredible insight into the prediction of consumer behavioral patterns, which in turn translates to the improved quality provision by the companies. While the biggest motivator while choosing a ride-hailing app to use is price, the notion from customers that ride-hailing is more personalized when compared to public transportation prompts the consumer to pay more (Ponder, 2019).

RHAs like Uber are viewed as a transportation innovation and option that satisfies an unmet necessity quick, dynamic, and efficient mobility in a metropolitan setting (Cheah et al., 2022).

2.9 Competitive advantage and strategy

The greatest way to be competitive is to offer products and services for customers that not only outperform the competition but also help the company establish a distinctive brand identity in the market (Mustafa et al., 2015).

The various existing companies have all employed means of getting a competitive edge over one another to retain their customers. Uber for instance has its competitive advantage solely based on economic benefits accrued both to

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the company and the drivers rather than any social advantage that presents itself. The drivers are able to deliver better services with a higher rate of benefits as compared to their competitors, that is, other ride-hailing companies and traditional cabs (Atemie & Hart, 2021).

3. Methodology

The research was undertaken solely based on secondary data from previous studies on the same topic or closely related topics. Various academic articles and papers, research journals and articles, user statistics, and consumer insight reports written on the topic have been examined throughout this article. Thus, it can be said that a case study approach was used to undertake this research paper.

4. Results and Discussion

Using ride-hailing apps has several advantages for customers. First, the customer need not know the route to their destination. The GPS allows the driver to follow the route. Secondly, the customer is able to save time and money. Getting a traditional taxi can sometimes prove somewhat difficult for people due to issues with price variation, and a lot of customers among other things. The RHAs allow one to request a ride and get matched to the closest driver to pick you up from your desired location and drop you off at your destination with minimal to zero stress. This is the third advantage, ensuring that both users (driver and passenger) undergo minimal stress in getting to one another (Times of Startups, 2018).

Customers' decision on the choice of ride-hailing app is influenced by several factors. Among them are the professionalism, transparency, and dependability of the drivers (Shah & Kubota, 2022).

A case study conducted in Barcelona, Spain determined that in comparison to public modes of transport, ride-hailing is deemed more comfortable and convenient. Users alliterated that they could directly travel to their destinations

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without any transfers, with a seat being guaranteed in their vehicle of choice. Their pick-up and drop-off points were

also deemed closer than those of public transport (Gilibert et al., 2020). Another study conducted by (Alejandro,

2017) found that Uber and Lyft were the most preferred apps in Colorado, with users expressing that expensive

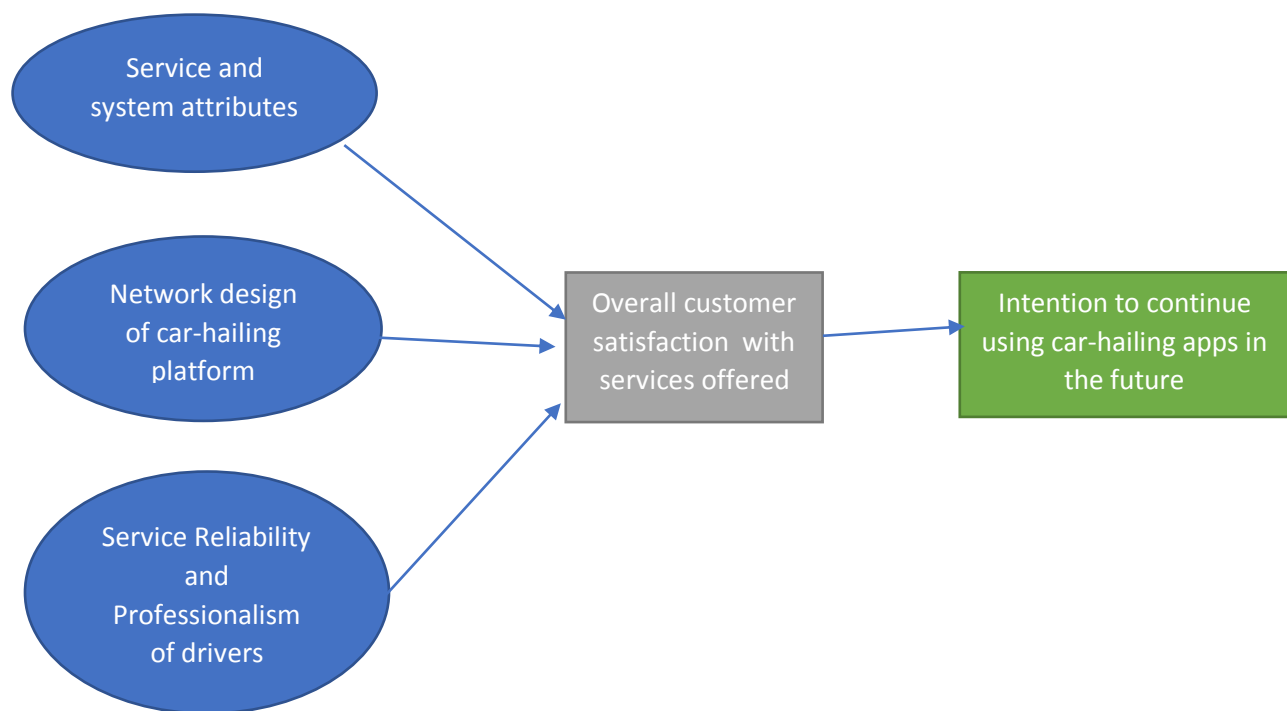parking within the city was among the reasons that they chose car-hailing.

Figure 1 Conceptual framework of customer satisfaction with app-based ride-hailing services. Adopted

from (Shah & Kubota, 2022)

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4.1 Existing car-hailing apps

Uber

Uber has been in the market longer than any other ride-hailing app there is, approximately 13 years since it was

established. It has reached users globally, with a simplistic business model, comprising of drivers and passengers.

The former enjoy profit margins while the latter enjoy affordable and transparent on-demand services that are easy

to control and order through their app (Konoplenko, 2022).

A study conducted in Kenya found that Uber provides transportation services at lower prices by giving discounts

which enables them to attract as many customers as possible (Gitau, 2018). The respondents further alliterated that

the choice of app to use was highly influenced by cheaper prices.

In most cases, when a conflict arises between an Uber driver and rider the company often sides with the rider at the

expense of the driver. This has often led to riders misbehaving with the notion of being "invisible" leading to drivers

being cautious when picking up passengers (Ashkrof et al., 2020).

UberPool is a form of car-sharing that matches a customer to drivers who are headed in the same direction, allowing

them to share the vehicle at a slightly reduced price than other services such as UberX. Users have complained of

safety issues over the years, especially female passengers, with thousands of sexual assault lawsuits lodged against

the platform. Unauthorized drivers have also been on the rise, especially in America and Britain (Rayome, 2020).

Uber is the most preferred for both drivers and riders, with the former benefiting from mindshare and the latter from

the firm's willingness to release safety statistics (Francis, 2022).

Lyft

Lyft is perhaps Uber's biggest competitor in the West and Europe in general. It is based in San Francisco and was

established around the same time as the latter, in 2012. It was however originally established in 2007 as Zimride,

which offered ridesharing services between campuses (Francis, 2022). The competition between the two has not

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been solely to gain more customers only, but also to increase the number of drivers who use the platform. A study by (Shokoohyar, 2018) found that Uber was the most preferred by drivers due to favorable working conditions, with the gap seemingly closing over time.

In December of 2019, Lyft Pink, a monthly subscription of 20 dollars, was introduced aimed at regular riders (at least two to three times per week). The subscription allowed riders to enjoy a 15% discount for each ride, and three free thirty-minute scooters and bike rides each month among several other incentives (Rayome, 2020).

The platform has also had its share of sexual assault lawsuits and has taken measures like uber to combat them including an in-app feature allowing users to dial 911 while being able to convey their location to emergency services.

Curb

Curb was launched in 2007 as Taxi Magic (Helling, 2022), way before Uber by Amos Taman, who revolutionized credit card payment in the New York taxi industry in the early 2000s, well before the advent of smartphones.

He relaunched Curb Mobility in 2018 after the acquisition of VTS from Verifone. The rebranding has made the platform more relevant in the ride-hailing industry. The app has recently introduced a new feature that allows Curb-enabled taxis to accept requests from Uber riders (Tuchman, 2022).

Users have however complained of being charged extra than the estimated amount on the platform and wrong drop-off locations too (Helling, 2022). This has at times led to a decrease in the customer base.

Gett

The platform, previously known as GettTaxi began in 2010 in Israel. It operates in cities across the USA, Israel, Russia, and the United Kingdom. The platform allows customers to order rides through their web platform or mobile app. The platform uses 'black cabs' popular in England (Goren, 2019). The fares are generally similar but users have

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complained that hailing a cab through the app attracts an increase in fare prices which has generally discouraged riders from using the app.

The app partnered with Assist-Mi which aids physically challenged persons in interacting with services and expressing their access needs. This has enabled people in wheelchairs to be matched with more wheelchair-friendly vehicles for their commutes ensuring that there is inclusivity for all.

Another partnership between the app and Citymapper is to create a carpooling service that involves the use of buses that can be booked through the Citymapper app with a 'book with Gett' option being offered. The trip costs are lower than typical UberPool making it attractive to riders using that route (Lomas, 2017).

Didi Chuxing

The app is quite popular in China (Ruff, 2019), beating Uber, the global giant in the industry. It has a suer friendly interface that is quite simple to navigate. It has several key features that Uber does not have, which entice customers. They are;

- Users are able to reserve rides for later, with even a day in advance reservations being possible.

- The premium option allows for customers to get luxury vehicles with refreshments being offered, usually targeting the business class.

- Riders are able to switch payment options, that is between private and corporate payment.

- Users are able to book rides for others, using their own accounts. This has proven useful, especially for people who do not own smartphones.

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The app redesigned some key features on Hitch to tackle safety concerns for users. These key features include (DiDi, 2019);

- Apart from the information required for ride-matching and ride etiquette evaluations, there is very little personal information visible on the interface.

- A two-way confirmation system with improved anti-gender selection in which customers receive several ride choices that have been approved by DiDi's ride-matching algorithms and drivers are expected to pre-plan their routes.

- Through the Check-In Card, the rider-driver safety is checked. An in-app pop-up that presents important information enables users to confirm the identities of the drivers and passengers they are sharing a vehicle with

- Enhanced control elements to maintain Hitch's P2P character, such as a cap on the number of orders any car owner can place, the removal of the "selecting nearby orders" feature, and the requirement that car owners pre-set their frequently used routes, etc.

- Greater user vetting and more verification procedures

- Other safety and security elements from DiDi's ride-hailing products will be incorporated into Hitch. One-Tap Police Assistance, Share Status, En-Route Safety Monitoring, etc. are a few examples.

Ola

The most popular service in India, Ola, entered the ridesharing market in Australia in 2018 with affordable rates and free trip promotions. Both give first-ride discounts in exchange for referrals. Didi is the undisputed winner when it comes to sign-up promotions because it provides a greater referral discount and enables users the opportunity to earn free trips by referring others (Yip, 2020). In terms of fare prices, Ola is the cheapest when compared to Uber with Didi being the most expensive. This helps them to attract more clientele (Nagel, 2019).

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Grab

The platform is Singapore-based and was established in 2012. It is predominantly used in South East of Asia such as Singapore, Vietnam, Philippines, Cambodia, Myanmar, Japan, Thailand, and Malaysia (Belleghem, 2021). A study conducted at Universiti Utara Malaysia (UUM) found that users were generally satisfied with how easy it is to use the app with a few complaints about high prices (Hussain et al., 2018).

Currently, the platform has added GrabCar (tailored for private automobiles), GrabBike (for motorbike taxis), which users prefer for short distances that need a quick arrival, GrabExpress (delivery), and GrabHitch to its list of services (carpooling). Along with enhanced tracking, an auto-retry feature, and a flash to automatically scan all ride types in the vicinity to discover vehicles faster, GrabTaxi also contains these features (KONSTANT INFOSOLUTIONS, 2022).

Bolt

The platform was founded in Estonia and began expanding its market to African countries in 2016. In Kenya (Ponder, 2019), it took advantage of a price row between Kenya's uber and Little Taxi, recruiting drivers who were unsatisfied with both platforms. It has had a competitive advantage over other platforms in terms of lower fares. The app has however been faced with sexual assault claims from its female users, leading to more female users shying away from using it.

In Nigeria (Idris, 2022), issues of criminal activity within the platform have been rampant. Drivers have been allowed to sign up without vehicles to register with, and others have sold their accounts to shady persons, putting unsuspecting riders at risk of mugging, kidnapping, and even sexual harassment. This has caused a serious breach of trust between the platform and its riders, causing a general decline in the number of customers who use it.

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4.2 A single car-hailing app to manage all others

Would a single app managing all existing and future car-hailing apps be effective? What are some of the issues that this would cause? This section of the article seeks to answer these and some other questions on the topic.

AutoNavi, a mapping and navigation platform owned by Alibaba is a super-aggregator app that allows riders to request rides from a wide pool of apps, including Didi Chuxing, in a bid to reduce waiting times for the customers (Liao, 2019). It has primarily stuck to its core navigation features, such as lane-level precision navigation and augmented reality route functions. In the past year, the company has increased its ride services, working with regional taxi organizations to transport customers in Tianjin, Beijing, Kunming, and Shenzhen (KrASIA Connection, 2021).

The app allows one to choose from over 60 one-stop taxi-hailing platforms with no need for users to enter the starting point. Without having to manually enter the pick-up location, the "one-click ride-hailing" feature will suggest pick-up places and communicate the location with the driver so they can make the pick-up. The user can specify the drop-off location after the driver arrives, and at the conclusion of the trip, they can opt to pay in cash or another form of payment. This is especially useful for people who find themselves in an unfamiliar place and the elderly who might not be tech-savy (Mandal, 2021).

A platform such as AutoNavi will help reduce the wait times for riders since they have a pool of ride-hailing apps to choose from, thus, saving time and money. This owes to the fact that all the RHAs will be hosted by a single app, ensuring that riders are matched to the nearest and most affordable platform.

As per the narrative, first-mile/last-mile mobility of RHAs refers to the idea of providing individuals with quick and economical transportation to and from transit terminals or mobility hubs. This is true in theory. But in reality, I

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suppose it's just wishful thinking. Many cities' public transit systems are reporting falling ridership numbers (Jones, 2019).

With unprecedented growth in cybercrimes, hacking such a platform would leave many people stranded. The loss of sensitive data that is often stored in ride-hailing platforms would be quite detrimental to both users, that is, customers and drivers as well as the aggregator app. Additionally, the conservative nature and regulation of the current governments in place on online car-hailing and the lack of vigor for the development of online car-hailing companies are major contributors to the bottleneck stage in which the industry is currently experiencing development. Fees for ride-hailing services are frequently increased, and the usage of part-time online car-hailing drivers is growing. The industry is uncrowded, and online car-hailing companies' oversight organizations are weak. The reputation has suffered as a result of repeated violent episodes that have been experienced through multiple platforms to date (Luo & Jia, 2022).

The never-ending debate on the effectiveness of car-hailing apps in the reduction of traffic congestion and the consequent carbon emission might also prove to be a hurdle. The aggregator app will be combining all other platforms hence attracting an upward surge in the number of vehicles for ride-hailing. This would increase the carbon footprint that has been a bone of contention for environmentalists globally(Migliore et al., 2020).

4.3 Limitation of the study and further areas of research

There have not been many studies conducted on the suitability of having a single car-hailing app to manage all others. This huge gap has made the research on the topic a bit problematic because there are very few reference articles and papers to compare with. The area needs further research to clearly understand the implications of this shift in the industry.

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Additional studies are needed to interrogate whether car-hailing drivers are safe, well-rested, and sober as compared to their customers as well as whether their convenience induces people to use them more. The argument that the RHAs drivers are better suited at getting people from one point to another is moot since most drivers are tired from working throughout the larger part of the day.

5. Conclusion

Ride-hailing apps are here to stay and satisfy the needs of their users and they have definitely revolutionized the public transportation sector. Car-hailing appears to be a supplement to regular trips and an alternative to unsafe driving habits, that is, driving while intoxicated. It thus fails to offer any functional alternative to a commute to places of work or learning which can be termed as the major reason people move about. Carpooling and ride-sharing may replace ride-hailing in the shared mobility industry due to their numerous advantage, both environmentally and economically speaking.

These platforms and especially the companies that own them should give the security and safety of its users more consideration. With huge advances in technology with each passing day, RHAs are susceptible to hacking. A lot of loopholes however exist in their control and the risk of client data misappropriation exists. Although users believe using sharing economy services to be more affordable, convenient, and pleasant, potential dangers like privacy and security threats have discouraged users from using such services. For instance, taking part in the sharing economy frequently necessitates users entering extensive personal data that may be exploited for unintended commercial purposes. Riders are also cautious about using them for fear of harassment from drivers especially when they disagree on minor issues like differences in fare prices and a change in destinations as a result of previous cases.

An improvement in accessibility and network coverage, the accuracy of pick-up locations, and offering incentives to both customers and drivers help to ensure the satisfaction of customers while attracting future prospective

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customers. Further development and innovation of car-hailing platforms is often met with the government's conservative attitude and regulations. Political goodwill from those in power will go a long way in ensuring that the ride-hailing industry achieves even bigger milestones through technological innovation. This is because governments are in charge of policy making which directly affects any industry in existence.

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