Challenges on Taxi Management in Kathmandu Valley: Taxi Drivers Perspectives

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Abstract

Taxi as a means of transportation has been emerging as a handy option for people of any age for any occasion if they need to travel. Thus, this study aims to analyze challenges on taxi management in Kathmandu valley, Nepal, from the perspective of taxi drivers. A descriptive method is applied in the survey, and qualitative analysis is made among 386 taxi drivers of Kathmandu valley. The study's findings revealed that 77% of taxi drivers face challenges in the valley. Significant challenges arise from increasing private vehicles and easy access to public transportation, emergence of online vehicle service providers, government rules and regulations, and parking difficulties. Therefore, the study concludes that policymakers and responsible authorities should consider the strategy to improve the overall taxi management system in the valley. This study can be useful to concerned authorities in taxi management services to make strategies for the betterment and to mitigate the challenges in the field. If the taxi management system got effective, that would be encouragement for other vehicle management.

Key Words: Taxi service, Digital service, Taxi drivers, Taxi management

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1. Introduction

In big cities and towns, people's mobility is constantly increasing, but the resources are limited, demanding to maximize the use of resources (Król & Król, 2019). Transportation is any medium through which we can reach from place to place. Mass public transport has been the subject for many years. Still, its drawbacks, such as inflexibility, long total travel time, overcrowding and inadequate service coverage, mean that the taxi industry continues to play a significant role (Oliver, 2013). Taxis are an essential means that offer a fast, convenient and direct transport service in most urban areas (Yang & Wong, 1998). Taxis provide timeliness, door-to-door service, safety, convenience, high city space coverage and daytime availability and are now an inevitable part of any big city's communication system. This is due to the above-described advantages, despite the higher travel costs (Flores-Sanchez et al., 2011).

Thus, today, taxi information management has started to develop (Martinez & Viegas, 2017). The popularity of taxi applications is an advanced technology and a pricing strategy (Wang et

al., 2016). The expected profit that the taxi driver expects to receive from meeting a client in a particular area or place greatly influences the choice of a taxi driver for a location in the search for clients (Yang & Wong, 1998). A taxi passenger is looking forward to spending a few or a dozen minutes waiting for an empty taxi at the fast pace of life today (Cervero & Golub, 2007). Therefore, taxi companies are actively working to improve the vehicle distribution system so that taxis can drive the shortest possible route by carrying as many passengers as possible.

Nevertheless, it could easily lead to increased road traffic, thus leading to traffic congestion (Delli Carpini, 2000). Therefore, for any taxi company, the issue of deciding an appropriate number of taxis in disposal seems to be crucial. It should be a trade-off between the passengers waiting for a taxi and the income earned (Król & Król, 2019).

We all know that the population pressure on the road is increasing day by day, and it is inevitable that in the future, matters will worsen, affecting people's daily lives. Thus, taxi management and its study have massive importance for people of the city and to authority holders as well (Janeiro et al., 2011). One thing is for sure that in the future, more vast management planning will be required for effective road management and the benefit of people in Kathmandu (Ibrahim et al., 2018). Though studies have been conducted in the area in different parts of the globe, it is still not observed in Kathmandu Valley.

It is generally accepted that the taxi market is unique and requires restrictions that few other markets do. But many markets have particular problems, and few have draconian entry and price rules considered necessary (Are et al., 2006). To improve the taxi fleet service performance, ideally, we should simultaneously and optimally assign a taxi to service all customers' orders that are made within the time frame (Seow et al., 2010). Workplace hazards were a primary concern in the taxi industry, and management was actively involved in reducing the dangers faced by taxi drivers (Machin & De Souza, 2004). To simulate this transportation problem, three main actors in the primary operations of the system, namely: passengers, a service provider, and a road transportation network, are involved (D' Orey et al., 2012).

Taxi management means the proper organization of the road transportation system (Logan & Molotch, 2013). To be specific, taxi management would suggest utilizing the least resources in a sustainable process to bring proper management procedures in the transportation management sector. Time is also saved, and all available resources are used effectively and efficiently. Therefore, widespread problems in transportation are solved (Wong & Evers, 2010). The consequences of transportation mismanagement would lead to excess and unwanted resources, increase in accidents, traffic jams, environmental, noise pollution, etc. Hence, it is essential to learn about traffic management needs in the Kathmandu valley (Newman & Kenworthy, 1996).

Taxis fill an essential hole by offering transportation when riding or whilst other public transit modes are generally unavailable. As a result, it serves as supplementary public transit and as an alternative for public transit. Taxi services can pick up passengers precisely where they are standing and drop them off precisely at the desired destination without being bound to a predetermined path. This indicates that Taxi services are flexible in terms of route operation and easy accessibility. However, taxi drivers these days are facing issues due to

various advancement acquired by customers from various sources such as Pathao, Tootle and similar service providers. Thus this study tries to portray the picture about the current scenario of taxi drivers identifying the gaps existing in the market. Likewise, awareness of taxi drivers on taxi management is crucial for effective functioning of the service thus it is analyzed in this study to highlight whether taxi drivers are aware or not on taxi management in valley. Therefore this study aims to analyze challenges on taxi management in Kathmandu valley from the perspective of taxi drivers. Likewise awareness level of taxi drivers on taxi management, managerial solution to overcome the challenges are also identified.

The other part of this study is organized as the second section includes literature review. Third section comprise of research methodology, followed by results in the fourth part and finally last section concludes the study.

2. Literature Review

2.1. Opportunities and Challenges on Taxi Drivers

The combination of factors indicated that at least 13,000 jobs or 26,000, using existing taxi numbers could be created at minimum cost to the country. Lowitt conclusions emphasize that opportunities to generate appointments with little effort and cost in a country with high unemployment rates are rare. Still, the metered taxi industry offers such an option (Facey et al., 2016). Feasible and appropriate improvement measures to broaden the taxi trade's business opportunities, and at the same time, benefit the public through the provision of competitive taxi services in Hong Kong, China (Mueller et al., 2015). Cities comparable to Hong Kong in economic activities, such as Singapore, Tokyo, London and New York, were visited to study their regulatory mechanisms for taxi services and learn how their taxi systems are operated. On the operators' side, entrepreneurial opportunities, particularly for minorities and immigrants, were emphasized. On the other hand, an argument favoring government regulation is that it is necessary to correct market imperfections. Among the market imperfections that would require code are, for example, economies of scope and scale that lead to uncompetitive conditions in the dispatch market (Schaller, 2007).

Even though being a taxi motive force is simple in concept – day-to-day power a car and pick out-up passengers, drivers' customary working conditions can be unreliable. There are some key issues that taxi drivers around the sector face. Taxi drivers don't earn an ordinary wage or fee a set hourly charge. Alternatively, they're paid day-to-day on the range of fares they get; therefore, the intention is daily getting as many fares as feasible (Laurier, 2004). Drivers usually use a meter daily to charge passengers primarily based on time and distance travelled and some other days, just like the day they are driving. Taxi drivers are sufferers of crime more often than the average man or woman daily the character in their paintings – they paintings in all parts of a town, often late at night, and pick up random folks who may be inebriated, on pills or simply searching out hassle. Taxi drivers often work 8-12-hour shifts or longer, and they're sitting off their cabs for a great deal of this time. Taxi drivers can be everyday health troubles due to their limited movement day-to-day being in the sitting function for hours on giving up and their diets. They regularly devour numerous speedy meals at the run (Yuan et al., 2011). Taxi drivers face the similar everyday problems that all automobile drivers face – day-to-day, ruin downs, awful weather and different day-to-day

associated issues and fines. Those issues are amplified for taxi drivers as they're in their motors and a good deal more on the road than the joint driving force (Yuan et al., 2013).

2.2. Roles of Government in Taxi Management

The persistent public transportation syndicate has suffered significant setbacks. However, the current administration has taken a number of aggressive steps to end delivery entrepreneurs' monopoly. With the commitment of the transport minister to stop the syndicate existing in a taxi and a similar approach of travel, the high-quality message has been circulated amongst the general public. Based on the cutting-edge progress of the government, it will be wise to trust that the state of affairs can exchange for other sectors too. In fact, that is the maximum seen sign proven using the existing government to deliver in movement what it has promised indeed. At the same time as the past governments had also reiterated the significance of finishing syndicate, no concrete actions had been taken. Even the superb court docket's choice some 18 years in the past had ordered to eliminate this system.

Furthermore, in rare situations when the bureaucracy improved to punish the dishonest transport marketers, political patronage always came to their rescue. On the contrary, the proper coordination among the bureaucrats and the authority's ministers has borne visible culmination. With the branch leader of the shipping control publicly lauding the prevailing cabinet for lending help, in his flow of bringing the monopolists under the area of the countrywide regulation, the authorities' intention has come to be apparent (Shrestha et al., 2013).

Taxi management solution propels entries operation of Taxi Fleet any point of contact whether its customer, driver, process, dispatch, job handling and execution, vehicles tracking, maintenance, call center, payment collection, account every one catches a significant shift in reducing mishandling and overall delivery time. Taxi Ride fleet management software offers a set of comprehensive solutions to meet all of your fleet management needs. From reservations to tracking to driver payments, Taxi Ride gives you the tools you need to operate efficiently and effectively. It is a powerful tool that can streamline your business processes, increase profits and tips, and boost both rider and driver satisfaction, all while saving you hard-earned money (Pillac et al., 2013).

2.3. Taxi Business in Nepal

Taxi cabs play a big characteristic within the transportation enterprise. People choose taxis due to a ramification of motives inclusive of comfort and exclusiveness. Beginning a taxi business enterprise is a completely practical assignment. It is pretty rewarding. The quantity of capital required for starting the taxi business enterprise is predicated upon the dimensions of the commercial organization. It all relies upon what you need to attain and the property that you have (Toiskallio, 2000). While starting a taxi cab commercial enterprise, most of the capital will obtain taxi cabs. You may get a mortgage from the bank, or funding from traders, to use as capital to begin your meter taxi commercial enterprise. The marketplace for taxi cab offerings could be huge. There are a variety of capacity customers for taxi services. Agencies may additionally outsource transportation of their personnel to taxi cab organizations (Schaller, 2007b).

Famous taxi offerings like Uber and Ola are recognized to come to Nepal. In keeping with the latest reviews from different Media, those taxi experience sharing apps and services are eyeing the Nepalese marketplace to avail their services. They're currently studying the feasibility of their taxi cab services in at least the capital metropolis, Kathmandu. And then, Uber Ola taxi carrier may reach right here inside the capital metropolis Kathmandu (Sharma, 2018). We can't tell precisely whilst the Uber, and Ola taxi services will be to be had right here in Nepal. Because the information for the Uber launch in Nepal is older, we can assume they to return right here quickly. But you by no means recognize if Ola from the nearest neighbour India is right here first. Different or much less the equal sort of environment on this a part of the sector may favour Ola cab to regulate their carrier without problems (Keong, 2015). We've already posted or assembled some of the taxi apps, ride-sharing apps right here in Nepal. If Uber or Ola comes right here anytime quickly, it will be a breakthrough inside the current situation of the online taxi cab calling and paying carrier. Among them, Tootle's taxi bike app is quite popular, thinking about the supply of bikes in unique elements of Kathmandu (Hall, Palsson, & Price, 2018).

Taxi management solution propels entries operation of Taxi Fleet any point of contact whether its customer, driver, process, dispatch, job handling and execution, vehicles tracking, maintenance, call centre, payment collection, account every one catches a significant shift in reducing mishandling and overall delivery time. Taxi Ride fleet management software offers a set of comprehensive solutions to meet all of your fleet management needs. From reservations to tracking to driver payments, Taxi Ride gives you the tools you need to operate efficiently and effectively. It is a powerful tool that can streamline your business processes, increase profits and tips, and boost both rider and driver satisfaction, all while saving you hard-earned money (Pillac, et al. 2013).

3. Research Method

3.1. Study Area

The study area for this research is Kathmandu Valley. Being the country's capital city, Kathmandu valley is Nepal's commercial and economic hub. Kathmandu valley lies between the latitude of 27°32'13" and 27°49'10" north and longitudes 85°11'31" and 85°31'38" east (Adhikari et al., 2021). People across the country come to Kathmandu for education, employment, business, official works and many other foreign diplomacies. Also, being only a single international airport located at Kathmandu valley, travelers going abroad for many reasons and coming back home need to first get into Kathmandu valley and then only be allowed to be at their destination. All these activities have increased the demand for transportation in Kathmandu valley. For passengers who want to have a fast and reliable route, a taxi is the most convenient public transportation readily available at their doorstep. In most circumstances, people generally tend to travel via taxi in Kathmandu valley, and taxi affords a safe and handy opportunity for public transportation. As a result, over the last couple of years, a few startups have attempted to capitalize on the cab hailing offerings by making it comfortable and convenient for Kathmandu's commuters.

3.2. Study Population, Sampling Technique and Sample Size Determination

The population for this study is taxi drivers. As this study aims to identify challenges faced by taxi drivers working in Kathmandu valley, the entire taxi drivers' working day and night

are the study population of this study. According to the transport management department, around 10000 taxis operate in Kathmandu valley (Department of Transport Management, 2019). Thus, drivers working on those 11000 taxis are the study population for this research. This study uses a non-probability sampling technique as the drivers' list, name and identities are not well captured and maintained by the department. Since taxi owners decide to appoint and operate taxi in Nepal, it is hard to capture all the taxi drivers, which leads to convenient sampling. Thus, this study follows convenient sampling. The formula used to work out the sample size for the survey is $n = N * X / (X + N - 1)$, where $X = Z_{\alpha/2}^2 * p * (1-p) / MOE^2$, and $Z_{\alpha/2}$ is the critical value of the Normal distribution at $\alpha/2$ (e.g. for a confidence level of 95%, α is 0.05 and the critical value is 1.96) (Paudel et al., 2020), MOE is the margin of error (undertaking for 5%), p is the sample proportion (50%), and N is the population size (11000). Calculating sample size based on this formula is 371. Thus this study has undertaken 386 taxi drivers' responses.

3.3. Research Instrument

The research instrument for this study is expert opinion and survey through a questionnaire. For an expert interview, a researcher frequently visited the Ministry of Transportation and the Department of Transportation from the beginning to the end of the study. While visiting the ministry, the researcher mainly consulted Kedar Prasad Nepal and Deepak Kumar Bhattarai, who provides necessary information and data and shared their thoughts about taxi management. Similarly, structured questionnaires are prepared to complete the survey, which consists of seven different sections. The questionnaire is designed as per the objective of the study. After the questionnaire was finalized, they were deployed into Kobo toolbox, which is an easy way if filling the questionnaire through mobile. Once the process was done, a Pre-test was done with 20 respondents (5% of the population determined) to confirm whether the given questions provided sufficient information or not. After the pre-test, certain modifications and additional questions were added to obtain more useful information from the respondent, specifically the user. The data collection was made based on face to face interviews. Due to the COVID-19 Pandemic effect, it took three months to collect the data. Data were collected from face-to-face interaction with respondents making necessary precautions suggested by the government.

3.4. Data collection and Analysis Techniques

For this research, descriptive analysis and index were prepared. Descriptive statistics are used to define the collected data's main structures quantitatively and examine the taxi driver's perception of the taxi management. Data were further analyzed and presented with the help of a bar diagram, pie-chart and tables. Similarly, Taxi drivers' perception and readiness index are prepared. To measure the perception of the taxi driver, 10 questions are designed among them emotionally (2), traffic rules related (2), Customers' service-related (2), Government rules related (2) and behavioural related (2) are asked. Similarly, to measure readiness total of 6 questions related to taxi drivers' Experience, attention and health are kept forward. As it is calculated on the Likert scale, they are considered highly aware if score value is more than 80%, knowledgeable if score between 60% to 80%, moderate if score 40% to 60%, less aware if score 20% to 40% and significantly less aware if score less than 20%.

4. Result and Discussion

4.1. Socio-Demographic Characteristics

Among 386 taxi drivers surveyed for the study, 100% of respondents were male, which means most taxi drivers are male to date in Kathmandu valley. 58% of respondents were from Kathmandu valley, 28% from Bhaktapur and 14% from Lalitpur. Maximum respondents' are from age group 35-45 years, i.e. 52.49% and drivers from age group 15-25 years lease, i.e. 2.34%. So, it can be understood that most of the people who drives taxi are in-between age of 35-45.

Table 1 depicts that 49% of taxi drivers have a monthly income of between 20,000 – 30,000 NRs. 12% stated that they earn around 30,000-40,000 monthly, and 6% said they make up to 20,000 monthly. This study revealed that the maximum (49.22%) drivers in Kathmandu valley have 5-10 years of driving experience. There are no such educational requirements for drivers in Nepal. However, they must obtain a drivers' license. When asked about the academic level of drivers for this study, it was unleashed that 61.66% drivers had studied up to intermediate level and 3.11% of drivers hold master's degree.

Table 1. *Socio-Demographic Characteristics*

Socio-Demographic Characteristics	Frequency	Percentage (%)
Gender		
Male	386	100
Female	0	0
Age (in years)		
15-25	9	2.34
25-35	97	25.13
35-45	203	52.49
45-55	77	19.85
Monthly Income (NRs.)		
Up to 20,000	23	6
20,000- 30,000	189	49
30,000 – 40,000	127	33
40,000 – 50,000	47	12
Driver's Experience (in years)		
1-5	47	12.18
5-10	190	49.22
10-15	75	19.43
More than 15	74	19.17
Education		
Illiterate	80	20.73
Intermediate	238	61.66
Bachelor's	45	11.66
Masters'	12	3.11
Others	11	2.85

Source: Field Study

4.2. Status of Taxi Drivers

A taxi driver's shift may be very busy or slow, based on the area in which that driver is working. How active the transformation is and how many fares the driver collects will determine the pay structure for each day. Among 386 taxi drivers, 95% stated that they drive taxis daily, whereas 5% said they don't drive taxis regularly. Those who don't drive a taxi regularly drive it on alternative days, i.e. 50% drives five days a week, 20% drives three days a week, and 30% drive according to their convenience. 52.85% of drivers prefer to drive a taxi at day time, 2.85% prefer to drive a taxi at night, and 44.30% prefer to drive a taxi at both times, i.e. day and night. They further stated that some of the motivating factors to drive taxi during the night are: they get extra fare at night (30%), encounter less traffic and jams (20%), and 50% stated that as they do another job as well as drive taxi as part-time service, they prefer driving a taxi during night times.

As 171 respondents prefer to drive a taxi at both times, i.e., day and night. 83% of drivers stated that they are comfortable working alone for long hours, and 17% of drivers are not satisfied to work alone for long hours. Drivers can work long hours, but that must be governed by law, and drivers must practice driving as per the country's law. Briefly, after 5 hours of driving, you must take a minimum break of 30 minutes or 45 minutes in any period of 8 hours. You mustn't work more than 16 hours, and then there is a compulsory break of 10 hours. Similarly, the study also revealed that drivers themselves own 54.66% of the taxi. 31.87% of drivers have taken a taxi on the lease, 10.62% of drivers hire a taxi from owners and drive for them, and 2.85% stated that they use taxis from various other sources.

Likewise, we often hear news of various issues between taxi drivers and customers. The conflict between them may occur due to multiple reasons. This study unleashed that 59% of the taxi drivers have been threatened while driving the taxi by their customer, and 41% of the taxi drivers have not been threatened by the customer while driving the taxi. This shows their customers have threatened the majority of drivers. If drivers had proper knowledge about taxi management, they would easily handle the situation. It was depicted from the study that 60% taxi driver knows about taxi management in Nepal whereas 40% taxi drivers don't know about taxi management. From this, we can say that maximum drivers know about taxi management in Nepal.

Figure 1 depicts that 83.68% of taxi drivers considered that passenger's safety is essential for them. In contrast, in driving, 3.63% of drivers responded they are moderately concerned about passenger's safety, and 12.69% responded that passenger's safety is quite essential for them while driving the taxi. 55% of the respondents use an online platform, and 45% do not use an online platform. From the data, we can state that many respondents are aware of the online platform, but many respondents still need to follow the current trends. Out of the total respondent, i.e. 386, 52, i.e. 24% respondents are using Tootle, 143, i.e. 67% respondents are using Pathao, and 19, i.e. 9% of the respondent are using Sarathi. The majority of drivers seems to be using Pathao rather than another platform.

Figure 1. Passenger's Safety Considered by Taxi Drivers

4.3. Awareness Level

The awareness level in this study depicts the awareness level of taxi drivers towards taxi management in Kathmandu valley. It also showcases the perception of taxi drivers on taxi management. This section classified the awareness level as emotional, traffic, customer services, government, and behavioural aspects. It helps us to know how healthy taxi drivers know about taxi management.

Under the Emotional dimension, respondents were asked about their awareness of travelling new routes and drivers' awareness of driving safely at night. While asked upon their understanding on travelling to new route 1.81% drivers are extremely low aware, 17.36% are quiet aware, 39.12% are moderately mindful, 38.86% are highly conservative, and 2.85% are extremely high aware. Likewise, when asked about taxi drivers driving safely at night, 2.59% of drivers are extremely low aware, 29.02% are pretty mindful, 26.94% are moderately conservative, 41.19% are highly conscious, and 0.26% are extremely high aware.

Further, regarding the government rules, it was classified as awareness of taxi stand management and drivers following rules and regulations prescribed by traffic. Table 2 under the Traffic rules dimension suggests that 2.33% of taxi drivers are extremely low aware, 29.53% are pretty mindful, 18.65% drivers are moderately conservative, 46.63% are highly conscious, and 2.85% are extremely high aware regarding taxi stand management in the valley. Similarly, 0.78% of drivers are extremely low aware, 22.80% are pretty mindful, 30.05% are moderately conservative, 44.56% are highly knowledgeable, and 1.81% are extremely high aware of rules and regulations to be followed, taxi drivers.

Under the customer services dimension, 3.63% of drivers are extremely low aware, 27.72% are pretty mindful, 33.42% are moderately cautious, 33.94% are highly conservative, and 1.30% are extremely familiar comfortable interacting with customers. Also, 2.85% of drivers are extremely low aware, 30.31% drivers are pretty mindful, 18.65% drivers are moderately cautious, 46.11% drivers are high, and 2.07% are extremely high awareness regarding the frequency of customers. On a similar note, under standard meter rates provided by government, drivers feel that 24.87% of drivers think a poor understanding of it, 43.78% are pretty aware of it, and 12.18% are moderately 17.62% are highly mindful, and 1.55% are extremely high aware.

Talking about rules and regulations of the government, it was found that 29.27% of respondents are extremely low aware, 40.67% are pretty mindful, 11.92% are moderately conservative, 15.80% are highly conscious, and 2.33% are extremely highly aware. Regarding the behavioural aspect, 3.11% of drivers think they are extremely low aware regarding it, 23.32% are low mindful, 13.47% are moderately conservative, 58.55% are highly conscious, and 1.55% are extremely highly aware.

Figure 2. *Taxi Drivers' Awareness Level*

4.4. *Challenges in Taxi Services*

Taxi drivers witness various challenges daily, as we can hear from multiple sources as well. Likewise, this study also indicated that 77% of taxi drivers had faced difficulties in taxi services, while 23% stated they had not faced any challenges while driving a taxi. Taxi Drivers across the world operates in a mobile environment that challenges the traditional concepts of the workplace. They provide 24x7 services uniquely tailored to individual travel's requirements, a feature not supplied by other means of public transportation.

The challenges faced by taxi drivers are similar services provided by online vehicle platforms and an increase in the usage of private vehicles. Moreover, other problems include challenges arising from the government's rules and regulations and ill customer behaviour. Similarly, four significant challenges are pointed by taxi drivers that they face in taxi services in this study which includes; increase in usage of private vehicles and easy access to public transportation, government policies, online vehicle service provider platform and parking difficulties.

Among the majority of the above-stated challenges (32%) of drivers stated that increase in usage of private vehicles and easy access to public transportation has been a significant challenge for them as people opt to use private or public vehicles before choosing a taxi and they don't prefer taxi over private and public transportation unless it is emergency. Likewise,

24% of drivers stated that they face parking problems to a greater extent. The emergence of online vehicle service providers has emerged as a new challenge for them. People find those services easy and convenient rather than waiting and searching for a taxi respectively. 20% of drivers revealed that the rules and regulations set by the government for taxi and its driver are challenging.

Figure 3. *Challenges*

As drivers responded, public and private vehicles get lots of customers as they charge a lower rate than taxi services as they do not have to pay taxes that taxi services have to pay, so taxi drivers see them as a challenge. Due to various government policies and the low meter rate provided by the government, it isn't easy to stay in the taxi business. As we can see, nowadays, many online platforms like Tootle, Pathao are providing transportation services to the customer. They charge low prices. With the help of technology, they have created challenges to taxi services. Lastly, the lack of parking facility in the crowded area has to charge high prices, so the customer refuses to use taxi services.

4.5. Managerial Solution and Way-forward

Suggestions to Manage Challenges

As most (77%) of the drivers were facing challenges in taxi services in Kathmandu valley, those challenges could be mitigated with productive efforts. Thus, drivers were further asked if those challenges were manageable or not, for which 73.83% of drivers stated that such problems might be managed if taken care of properly and tremendous effort are given from respective responsible sides. For instance, the need to continuously improve their service providing while reducing their charges has caused many logistics and transportation companies to install GPS devices in their complete vehicular fleets. These gadgets permit the agencies to reveal the movement of their fleet in real-time and use that data to improve their fleet's efficiency, reliability, and security. The availability of GPS traces from these fleets has also allowed researchers to inspect various topics associated with planning, mobility, efficiency, and other areas involving vicinity traces (Sen & Balan, 2013). If similar other efforts are made looking upon the challenges, challenges might be mitigated to a certain extent.

Figure 4 portrays managerial solutions for challenges faced by taxi drivers. 30.05% stated that it is possible to manage taxis by providing GPS services in the taxi to locate their customers who need a taxi. 14.51% mentioned it is possible to manage taxis by giving route permits. 16.58% said that it is possible to manage taxis by introducing new policies by the government that favour taxi drivers. 7.51% responded by providing proper training to help manage taxis, and there will be a fewer traffic problems. Lastly, 31.35% mentioned if there are better parking facilities it will be helpful to manage taxis.

Figure 4. *Managerial Solutions for challenges faced by taxi drivers'*

Suggestion to Manage Taxi

14% of drivers responded those taxi owners have to work with committed drivers to take care of taxi services properly. 11% stated that drivers should view things from customer points and try to understand them, 41% suggested targeting the audience based on location helps them reach the maximum number of customers.

Figure 5. *Suggestion for Taxi Management*

They should target areas with a more significant inflow of people. Similarly, 11% suggested that there should be better parking to help them with traffic in crowded places. Lastly, 21.50% indicated that the government should regulate better meter fares.

On a similar note, as defined by the industry forerunners, a typical taxi management software should have separate mobile or web applications for passengers, drivers, dispatchers, and admin. So that passengers can book their cab from their application, the same can be notified via the driver app. Employing the dispatcher app, the dispatchers can assign cabs and drivers and dispatch vehicles for bookings. Likewise, the admin or the business owner can track all the processes in real-time.

5. Conclusion

As this study discusses challenges that taxi drivers face in taxi management, the study found that 77% of drivers face challenges in the Kathmandu valley. Pieces of training, better policies, and a GPS are some solutions that could help mitigate the challenges. Likewise, drivers' commitment towards enhancement of taxi management, targeting audience based on location, and improvising meter fares could further help the overall taxi management process. Additionally, it was also concluded that if the government could make policies that are drivers friendly and promote taxi management, it would enhance the overall system effectively. This study would be useful to policy makers and concerned authorities in the field of taxi management and taxi drivers as well to make strategies on minimizing challenges arising in the field.

Therefore, this study recommends policy makers and responsible authorities consider a strategy to improvise the overall taxi management system in the valley. If the taxi management system got effective, that would be an encouragement for other vehicle management. Likewise, drivers should also try to cope with customers. Customers should also behave well and treat healthy drivers as cooperation between both will be helpful for management of taxi service to the greater extent. Also, this study was conducted in Kathmandu valley only due to several constraints; therefore, further study could include other parts of the country where taxi mobility is high. Only descriptive part is incorporated in this study, so another study of a similar kind is possible with inferential research. Some variables might be missing that would strengthen the study, so proper analysis of variables can be made, making this study more assertive in the future.

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