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A SERVQUAL Model Analysis for Users' Satisfaction of Ride Sharing Service in Kathmandu Valley

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Abstract

Background: Ride-sharing services have emerged as an alternative mode of urban transportation in Kathmandu Valley, aiming to address issues such as traffic congestion and limited public transport options. However, user satisfaction with these services remains uncertain due to varying service quality and operational challenges.

Purpose: The purpose of the study is to assess the user's satisfaction with the ride-sharing service in Kathmandu Valley. Specifically, the study assesses the current status of ride-sharing services in the Kathmandu Valley to examine the impact of service quality on user satisfaction with ride-sharing services in the Kathmandu Valley, to identify the various challenges faced by ride-sharing services, and to propose potential solutions to address these challenges.

Design/methodology/approach: This study adopted an explanatory research design. Expectation confirmation theory (ECT) is used for the study because SERVQUAL is based on the expectancy-disconfirmation paradigm, which states that service quality is defined as the degree to which consumers' pre-consumption expectations of quality are confirmed or contradicted by their actual perception of the service experience. The primary data for this study were collected from 417 respondents, using a non-probability convenience sampling method. Structured questions were administered through the KOBO toolbox to gather the necessary information. The collected data were then analyzed using descriptive and inferential statistics in MS Excel and SmartPLS 4.0.

Findings: Tangibility, reliability, responsiveness, and empathy directly influence users' satisfaction in using ride-sharing services in the Kathmandu Valley; however, assurance had no direct influence on users' satisfaction. In the context of using ride-sharing services, Nepali customers are not yet accustomed to using ride-sharing services compared to developed countries. Besides, the major challenges faced by ride-sharing service users include long wait times, safety concerns, unavailability of rides, unfriendly or unprofessional driver behavior, pricing issues, vehicle cleanliness, payment options, and difficulty using the app. The major solutions to the challenges are short wait times, enhanced safety measures, sufficient ride availability, friendly or professional driver behavior, better pricing models, improved vehicle maintenance, more driver training programs, easy-to-use apps, and more payment options.

Conclusion: This study concludes that tangibility, reliability, responsiveness, and empathy have a positive and significant relationship with users' satisfaction, whereas assurance is insignificantly correlated with user satisfaction.

Keywords: Ride-sharing Service, Users' Satisfaction, SERVQUAL Dimension, Service Quality, Kathmandu Valley.

1. Introduction

Ride-sharing services (RSS) have risen and are a well-recognized technology in the high-tech, 21st-century era. They are on-demand transportation services offered by privately owned vehicles or registered transport operators, usually through smartphone applications supported by internet access (Dey et al., 2021). A ride-hailing service is a social and economic innovation that utilizes vehicle resources to the fullest, reduces the waste of energy, and makes the participation of all parties, passengers, drivers, and service providers profitable (Shaheen et al., 2019). Simply put, ride-sharing enables people traveling to the same place or in the same direction to share the same car, which lowers the expenses of traveling, including fuel, parking, and toll fees (Wang et al., 2020). Customer satisfaction refers to the overall level of satisfaction a customer experiences based on the degree to which a product or service meets or exceeds their expectations (Ing et al., 2020). According to Esbjerg (2012), customer satisfaction refers to the subjective assessment of a person's satisfaction or dissatisfaction, depending on the degree of fulfillment in a service compared to the person's expectations. Equally, Shetu and Kaysher (2021) define it as an evaluation of the supplier's effectiveness in meeting consumer needs and demand, and Elmeguid et al. (2018) observe that satisfaction is based on a comparison with previous expectations. Zhou and Zhang (2019) note that customer satisfaction is a positive emotional reaction that occurs when perceived performance meets or exceeds expectations.

Arteaga-Sanchez et al. (2020) also specify that it is the cumulative assessment of a consumer's experience with products or services over time. The development of the internet and smartphone applications coincided with the emergence of ride-sharing companies. Uber (2009), Ola Cabs (2010), Yandex Taxi (2011), Sidecar (2011), Lyft (2012), DiDi (2012), Careem (2012), Bolt (2013), and Free Now (2019) are some of the companies globally that transformed urban transportation. In Nepal, the country became a part of the digital mobility ecosystem in 2017 (Tootle), 2018 (Pathao), and 2024 (InDrive). Mobile transportation platforms like Uber and Grab are part of a revolution that is revolutionizing the taxi and transportation industry in countries such as Malaysia, Bangladesh, India, Pakistan, the United States, and China, among others, internationally. These services have increased the competition of traditional taxis, as they provide more convenience at a reasonable price. Pathao, Uber and Obhai are leading in Bangladesh, whereas Grab has a significant presence in Malaysia (Balachandran and Hamzah, 2017; Aw et al., 2019; Rahman et al., 2020; Mohammad and Arif, 2022). Rapid urbanization and technological advancement in India have enhanced the development of ride-sourcing services (Shah, 2021; Wadud et al., 2022).

In Pakistan, a similar case, the low availability of transportation among the population has popularized the use of Uber and Careem (Shah et al., 2022; Shamim et al., 2021). Uber and Lyft have disrupted traditional taxi services and impacted labor markets in the United States (Freund et al., 2020; Shin et al., 2023). Didi is the most popular platform in China, although it still raises safety concerns (Jin and Chen, 2021; Shao and Yin, 2019). All of these platforms have transformed transportation networks, opening up new economic prospects and reducing congestion; however, issues of safety, regulation, and market competition are not absent (Ali et al., 2022). The application of ride-sharing services, such as Tootle (2017), Pathao (2018), and InDrive (2024), has played a crucial role in enhancing urban mobility in the Kathmandu Valley by reducing congestion and pollution, which are significant contributors to air pollution in the Valley. Although Nepal is undergoing urbanization and technological advancement, the public transportation facility there has not been sufficient, and many commuters have turned to private and communal transportation methods.

Nevertheless, there are several persistent problems, including data privacy issues, partial internet or GPS connections, and inadequate digital payment solutions. Especially popular with younger users are Tootle and Pathao, which provide rides based on motorcycles, but still face regulatory and legal limitations despite their convenient platforms (Singh & Sah, 2022; Mishra & Kumar, 2022; Mishra, 2020). Pathao, inDrive, and Uber offer convenient and affordable mobility solutions that help reduce the need for car ownership and traffic congestion, as well as mitigate the adverse environmental effects. Such services also

offer drivers flexible work arrangements and earnings. However, they experience unremitting problems in passenger safety, service quality, regulatory adherence, and driver competition, which have an impact on profitability and reliability (Wireko-Gyebi et al., 2024). These critical factors must be balanced to make these platforms sustainably acceptable.

The rapid development of the sharing economy and its impact on urban mobility have sparked growing scholarly interest in the topic of ride-sharing services and their effect on user satisfaction. Customer satisfaction is crucial to improving the quality of a service, user experience, and client loyalty. The experience gained from such studies can help service providers determine the determinants of customer perceptions and behavior, enabling them to improve their service. Additionally, such understandings can help policymakers formulate enabling structures to support the development of equitable, efficient, and sustainable transportation systems, resulting in less congestion and environmental degradation. Finally, ride-sharing services, driven by digital technology and mobile applications, have transformed the meaning of transportation in cities through the provision of affordability, flexibility, and sustainability. Uber, Lyft, and DiDi are global innovators who have revolutionized the world of mobility, and Tootle, Pathao, and InDrive have made a major positive impact on transportation in Nepal, despite regulatory and infrastructural obstacles. Measuring consumer satisfaction in this dynamic environment is crucial for enhancing service quality, increasing user trust, and informing evidence-based policies that can lead to safer, more trustworthy, and sustainable urban transport systems.

2. Literature Review

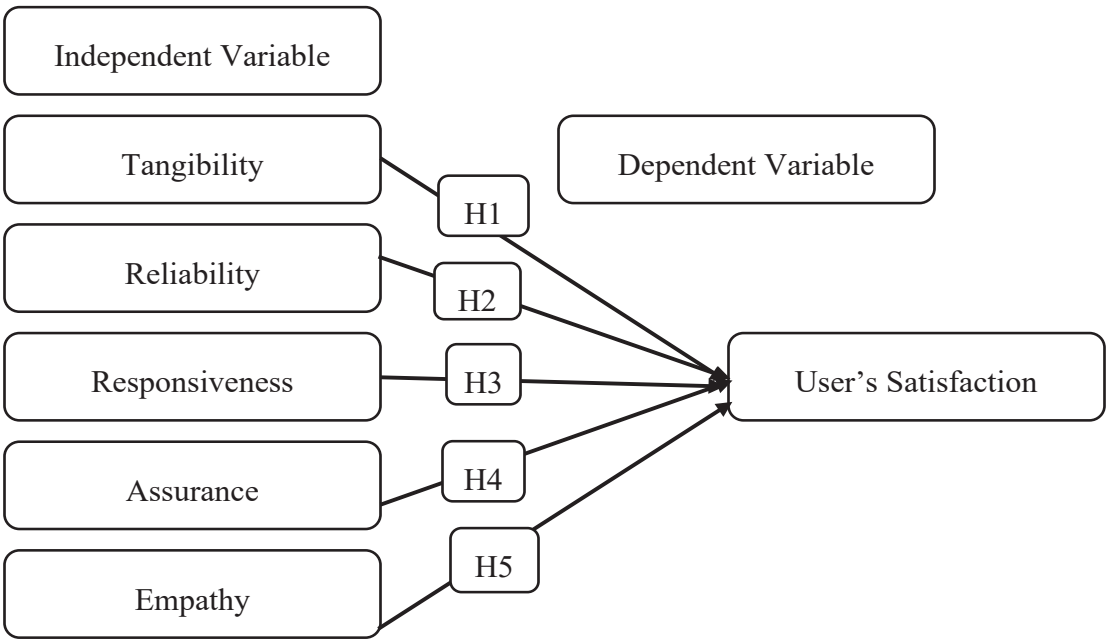
Theoretical Framework and Development of Hypotheses

This study is theoretically grounded in the Expectation Confirmation Theory (ECT), which posits that the level of pre-service expectation confirmation or disconfirmation of the actual service experience influences user satisfaction. ECT states that customers form preliminary expectations prior to consuming a service and then compare these expectations with their perceived service performance. In case the perceived performance equals or surpasses expectations, there is positive confirmation and a result in satisfaction. Disconfirmation, on the other hand, leads to dissatisfaction. As the SERVQUAL model is conceptually based on the expectancy-disconfirmation paradigm, ECT provides a suitable theoretical framework for this research, which systematically assesses the effect of perceived service quality dimensions on user satisfaction in ride-sharing services in the Kathmandu Valley.

The formulation of the hypotheses in this study is based on Expectation Confirmation Theory (ECT) and the SERVQUAL model, which provide a framework for understanding how the dimensions of service quality influence user satisfaction. The theory is based on the assumption that satisfaction occurs when perceived service performance is as good or better than the pre-established expectations. On this basis, the paper recognizes five major dimensions of service quality, namely tangibility, reliability, responsiveness, assurance, and empathy, as determinants of satisfaction among users regarding ride-sharing services in the Kathmandu Valley. Tangibility is the corporeal facets of the service, such as the looks of vehicles, the visualization of drivers, and technological interface; it was found that those factors have a considerable positive impact on customer satisfaction in the previous literature (Dey et al., 2019; Wireko-Gyebi et al., 2024), so the hypothesis is that tangibility positively affects user satisfaction. Reliability refers to the quality of service providers in delivering reliable and high-quality services, such as rides and consistent performance, which have been observed to have a positive impact on trust and satisfaction (Balachandran and Hamzah, 2017). Therefore, the null hypothesis is that reliability positively influences user satisfaction. Responsiveness, or the readiness of drivers or platforms to assist users, has been observed to have a direct impact on satisfaction by enhancing user convenience and confidence (Ziyad et al., 2020); thus, responsiveness is projected to have a positive influence on user satisfaction. Assurance is the ability, politeness, and reliability of the service provider, which shows whether users trust them to be safe and the drivers to be professional. Though its effect has been both positive and negative in different studies, it is assumed that there is a positive correlation between assurance and user satisfaction. And finally,

empathy, a component that demonstrates the level of customization in the attention and care provided to users by service providers, has consistently been associated with increased satisfaction (Wireko-Gyebi et al., 2024; Dey et al., 2019). Therefore, empathy should also provide a positive and significant influence on user satisfaction. Combined, these hypotheses provide the basis of the evaluation of the influence of the dimensions of service quality on the overall comprehension of the ride-sharing service users in Kathmandu Valley

Figure 1: Proposed Conceptual Framework



Source: Modified From Wireko-Gyebi et al. (2024)

Tangibility

Parasuraman et al. (1985) defines tangibility as encompassing physical facilities, decor, and personal appearance. Similar studies suggest that tangibility also pertains to client safety and convenience, which reflects a company's image and quality (Zeithaml et al., 1988). It includes the physical evidence and amenities provided by service providers. Research has shown that tangibles are positively and significantly associated with user satisfaction (Dey et al., 2019), influence customer satisfaction (Wireko-Gyebi et al., 2024), and have a significant positive relationship with customer satisfaction (Balachandran & Hamzah, 2017). Therefore, the following hypothesis is proposed:

H1: Tangible has a positive and significant influence on users' satisfaction.

Reliability

According to Knight et al. (1986), reliability refers to the ability to provide a service consistently and punctually. When assessing the quality aspects of a ride-sharing service, important factors include scheduled routes, communication, arrival times, and trip duration. Reliability reflects prompt, accurate, and dependable service delivery. However, Dey et al. (2019) found that reliability is not significantly linked to user satisfaction. In contrast, Wireko-Gyebi et al. (2024) indicate that reliability has a positive and significant impact on customer satisfaction. Similarly, Balachandran and Hamzah (2017) found a positive, significant relationship between reliability and customer satisfaction. Therefore, the following hypothesis is proposed:

H2: Reliability has a positive and significant influence on users' satisfaction.

Responsiveness

Responsiveness in service is a key indicator of a provider's willingness and ability to promptly and effectively address client requests. It reflects the provider's capability to offer timely assistance, resolve issues, and adapt to evolving customer needs. Responsiveness refers to the readiness of service providers to deliver services effectively. According to Dey et al. (2019), responsiveness is positively and significantly associated with user satisfaction. Wireko-Gyebi et al. (2024) also found that responsiveness has a positive and significant effect on customer satisfaction. Additionally, research by Ziyad et al. (2020) demonstrated that responsiveness positively influences consumer satisfaction. Therefore, the following hypothesis is proposed:

H3: Responsiveness has a positive and significant influence on users' satisfaction.

Assurance

Assurance encompasses the service provider's level of knowledge, experience, capability, safety, and security concerns during service delivery, as well as their courteous behavior (Zeithaml et al. 1988). It reflects the provider's expertise and attention to safety and customer service. While the assurance dimension is not strongly linked to user satisfaction (Dey et al., 2019), it has a positive and significant impact on customer satisfaction (Wireko-Gyebi et al., 2024; Shetu & Kaysher, 2021). Therefore, the following hypothesis is proposed:

H4: Assurance has a positive and significant influence on users' satisfaction.

Empathy

This aligns with service providers' goal of providing quality attention to users and their ability to understand individual customer needs (Zeithaml et al. 1988). It reflects their commitment to delivering excellent service and their capacity to recognize specific customer demands. Empathy is positively and significantly correlated with user satisfaction (Dey et al., 2019) and has a positive impact on customer satisfaction (Wireko-Gyebi et al., 2024). Research indicates that empathy positively influences consumer satisfaction (Ziyad et al., 2020). Therefore, the following hypothesis is proposed:

H5: Empathy has a positive and significant influence on users' satisfaction.

Table 1: Variables and their Definition

Construct	Indicators	Observed Variable	Explanation
Tangibility	TAN 1	Modern	Vehicles look modern
	TAN 2	Appealing	Vehicles are visually appealing
	TAN 3	Seats	Seats in vehicles are comfortable
	TAN 4	Neat and tidy	Drivers appear neat and tidy
	TAN 5	GPS System	The RSS should have a GPS System.
	TAN 6	Bills	A bill should be provided to the passenger upon completion of the journey.

Reliability	REL 1	Punctual	Drivers are punctual
	REL 2	Promised Service	RSS providers provide promised services
	REL 3	Consistent quality services	RSS providers provide consistent quality services
	REL 4	Safely	The driver drives safely
	REL 5	Security	There should be no security concerns for female passengers.
	REL 6*	Problem Solving	When a customer encounters an issue, effective RSS demonstrates a genuine commitment to resolving it.
Responsiveness	RES 1	Willing to help	RSS providers are always ready to assist customers.
	RES 2	Timely and Efficient	The driver provides timely and efficient service.
	RES 3*	Prompt solution	RSS providers ensure prompt solutions to service inconsistencies.
	RES 4	Never busy	The driver is never too busy to respond to your request
	RES 5	Interactions	My interactions with RSS providers are straight forward and informative.
Assurance	ASS 1	Safe	It is safe and easy to use RSS
	ASS 2	Skill and Traffic rule.	Drivers are knowledgeable and proficient in traffic rules and regulations.
	ASS 3	Confident	Feels assured in selecting RSS.
	ASS 4	Courteous	The driver is consistently courteous
	ASS 5	Passenger goods	Safety of Passengers Goods
Empathy	EMP 1	Interest	RSS providers prioritize the best interests of their customers.
	EMP 2	Special attention	RSS providers offer special care to women, children, and individuals with physical disabilities.
	EMP 3	Convenient operating hours	RSS providers have flexible operating hours.
	EMP 4	Privacy	Online platform assures privacy
	EMP 5	Delay and Unavailability.	Information on the delay and service unavailability
Users Satisfaction	US 1*	Satisfying experience	RSS is a satisfying experience.
	US 2	Like	I like using this RSS.
	US 3	Satisfaction	I am satisfied with using the RSS
	US 4	Matched Expectation	The performance of vehicles matched my expectations
	US 5	Pleasure	It is a pleasure travelling with these vehicles overall,

3. Research Methods

This study adopts a descriptive and explanatory research design. Explanatory research design to examine the cause-and-effect relationship between the variable and supports to ascertain how and why, because the research is survey-based through a questionnaire. A descriptive research design is used to describe the characteristics or behavior of a subject and to address the "what" component of the study. An explanatory study describes a condition or problem in terms of its causal interactions. Exploratory research is used when there is little or no knowledge about a topic. It is used to investigate and obtain insights into a phenomenon, allowing for more precise research questions or hypotheses for future investigations. It addresses the "how" and "why" questions. The primary goal of explanatory research is to uncover concerns and critical variables in a specific study. A descriptive research design is a method for describing the characteristics of the population or topic under study. It addresses the "what" component rather than the "how" or "why" of an event. This method is highly relevant to quantitative analysis (Rahi, 2017).

Study Area and Population

The study focuses on Nepal's Kathmandu Valley, located in Province 3. This Valley sits at an elevation of 1,300 meters above sea level and is positioned between latitudes 27°32'13" and 27°49'10" North, and longitudes 85°11'31" and 85°31'38" East. The total area of the Valley is 665 square kilometers, while the districts of Kathmandu, Lalitpur, and Bhaktapur together cover 899 square kilometers. The entire Bhaktapur district, 85% of Kathmandu district, and 50% of Lalitpur district are encompassed by the Valley. Shaped like a bowl, the Valley is surrounded by the Mahabharat Mountains. It is bordered by four hills: Phulchowki to the southeast, Chandragiri/Champa Devi to the southwest, Shivapuri to the northwest, and Nagarkot to the northeast. The highest elevations are 2,166 meters in Bhaktapur, 2,732 meters in Kathmandu, and 2,831 meters in Lalitpur (Rajbhandari et al., 2022; Mohanty, 1970).

The Kathmandu Valley is selected as the study area due to its high population density, substantial traffic congestion, and its importance as Nepal's economic hub. The Valley's urban environment, comprising a mix of residential, business, and tourism districts, generates a diversified and strong demand for efficient transportation options. Furthermore, the region's rapid adoption of new technology, such as ride-sharing applications, makes it an ideal place to study usage patterns and the viability of ride-sharing services in a dynamic urban context. The population of the research is the general customer of a ride-sharing service.

Sampling Technique and Sample Size

The phrase "research sampling techniques" pertains to the strategy for selecting cases, which involves the methods used to choose a subset of units from a larger population (Haute, 2021). Sampling techniques are the processes by which a portion of the entire population or a specific sampling frame is chosen. These techniques can be applied to make inferences about a group or to derive general conclusions regarding existing theories (Taherdoost et al., 2016).

Sampling techniques are generally categorized into two main types: Probability (or random) sampling and non-probability (or non-random) sampling. Probability sampling ensures that every item in the population has an equal chance of being selected for the sample. This includes methods such as simple random sampling, stratified sampling, cluster sampling, systematic sampling, and multi-stage sampling. In contrast, non-probability sampling consists of samples where each element in the population has an unknown likelihood of being included. This type includes convenience sampling, purposive sampling, quota sampling, and snowball sampling (Taherdoost et al., 2016).

Non-probability sampling is used in this research because it is most suitable when the population of the study is uncertain. Since access to the full population is limited, this helps to meet the specific criteria. Under this, convenience sampling is used because the participants are often readily and easily available. It is popular among students due to its cost-effectiveness and ease of use. Convenience sampling can effectively address research difficulties. Thus, the sample size needed for the study is 403, but due to time constraints, only 417 samples were collected. Data were obtained from 417 respondents in the Kathmandu Valley.

Research Instruments, Data Collection and Analysis

An instrument is a measurement tool (a questionnaire or checklist) that is utilized to collect, conduct, and structure data to be used in the research (Sathiyaseelan, 2015; Salmia, 2023). In the current research, primary data were gathered using a structured questionnaire that was used to survey users of ride-sharing services in the Kathmandu Valley. The questionnaire (63 closed-ended questions) was completed via the KOBO Toolbox, an online tool that facilitated the work and ensured the systematization of data entries and structure. It was separated into four major parts: the first gathered socio-demographic information (gender, marital status, age, education, occupation, and income), the second covered the current situation and perception of the ride-sharing services, the third covered the variables of service quality (tangibility, reliability, responsiveness, assurance, empathy, and overall satisfaction), and the fourth identified the challenges that the users face and potential remedies. To determine the clarity and viability of the questionnaire, a pilot test was conducted between July 16 and 18, 2024, using the KOBO Toolbox, with 15 respondents, and the necessary changes were made. Primary data were collected between July 21 and August 12, 2024 (online (via email) and offline (pen-and-paper) data collection), and resulted in 417 valid responses. Data were analyzed using both descriptive and inferential techniques. Descriptive data analysis was conducted with the help of charts and tables, while inferential data analysis was based on structural equation modeling with several latent constructs. Data entry, management, and analysis were performed using KOBO Toolbox, SmartPLS 4.0, and Microsoft Excel.

4. Results

Socio-demographic Characteristics

The Socio-Demographic variables of the surveyed are included in this section. Data is collected from 417 respondents. In this part, the gender, marital status, age, education level, occupation, income level, and location of respondents are presented in a tabulated form, which helps to clearly interpret them.

Table 2: Socio-demographic Characteristics

Title	Category	Number	Percentage (%)
Gender	Male	287	68.82
	Female	130	31.18
Marital Status	Unmarried	310	74.34
	Married	101	24.22
	Others	6	1.44
Age in years	Below 18	37	8.87
	18-24	177	42.45
	25-34	188	45.08
	35-44	9	2.16
	45-54	5	1.2
	55 and above	1	0.24
Location	Kathmandu	240	57.55
	Lalitpur	121	29.02
	Bhaktapur	56	13.43
Education Level	Illiterate	16	3.84
	SLC/SEE	48	11.51
	Intermediate/+2	86	20.62
	Bachelors	175	41.97
	Master and above	92	22.06

Employment Status	Private Sector	110	26.38
	Government sector	29	6.95
	Industrial sector	13	3.12
	Self employed	40	9.59
	Unemployed	28	6.71
	Students	194	46.52
	Others	3	0.72
Your average monthly income (NRS)	Below 20000	232	55.64
	20000-50000	137	32.85
	50000-100000	32	7.67
	100000 above	16	3.84

Table 2 indicates the demographic details of the 417 respondents interviewed. The results show that 68.82 percent of the respondents are male, and 31.18 percent are female, indicating that the participants in this study are predominantly male. These findings align with the report by Shetu and Kaysher (2021), who indicated that 70.6 percent of their respondents were male and 29.4 percent were female. Regarding marital status, 74.34% of the respondents are not married, 24.22% are married, and 1.44% are in another category. This finding aligns with the research conducted by Wireko-Gyebi et al. (2024), which revealed that 65.4% of the sampled population were unmarried, while 34.6% were married. Regarding age distribution, the highest percentage (45.08%) of respondents falls within the 25-34 age group, with 42.45% and 1.20% within the 18-24 and 45-54 age groups, respectively. This implies that young adults, aged 25-34 years, are the primary focus of the study. Regarding education, 22.06% of the respondents hold a master's degree, 41.97% have a bachelor's degree, 20.62% have intermediate-level education, 11.51% have passed the education examination (School Education Examination)**,** and 3.84% are illiterate. At the geographical level, most respondents (57.55%) are located in Kathmandu District, 29.02% in Lalitpur, and 13.43% in Bhaktapur, indicating that the Kathmandu Valley is the center of the study area. With respect to employment status, 46.52**%** of the respondents are students, 26.38% are employed in the private sector, 6.95% are employed in the government sector, 9.54% are self-employed, 6.71% are unemployed, and 0.72% are in another category. The findings can be compared with those of Singh and Sah (2022), who found that 49 percent of participants were students, 25 percent of respondents worked in either the government or private sector, 24 percent of respondents were self-employed, and 2 **%** of respondents were unemployed. In terms of monthly income, 55.64% of the respondents have a monthly income of less than NPR 20,000, 32.85% between NPR 20,000 and NPR 50,000, 7.67% between NPR 50,000 and NPR 100,000, and 3.84**%** greater than NPR 100,000. This distribution implies that a large percentage of respondents belong to lower- to middle-income groups, which could affect their attractiveness to inexpensive and convenient ride-sharing services in the Kathmandu Valley.

Current Status of Ride-Sharing Service

This section focuses on the Current Status of Ride-Sharing Services in Kathmandu Valley, exploring how these services are currently perceived and utilized by the local population. Respondents were asked if they had ever used any ride-sharing service and how often they used ride-sharing services. The findings indicate that 78.18% of respondents have used RSS, and 21.82% of respondents have not used any RSS. 19.9% of respondents use RSS rarely, 17.99% use it sometimes, 17.51% use it weekly, and 12.23% use it daily. In terms of the purpose of using RSS, 53.96% of respondents use it for personal work, 11.27% of respondents use it for college, 9.59% of respondents use it for office work, and 3.36% of respondents use it for other reasons. In terms of reasons for using RSS, 41.97% of respondents use it for convenience, 15.11% of respondents use it for time efficiency, 8.15% of respondents use it for safety, 7.91% of respondents use it for Cost-Effectiveness, and 5.04% of respondents use it for traffic congestion. Out of 417 respondents using RSS, 50.36% were satisfied, 18.23% were very satisfied, 9.11% were neutral,

0.24% were dissatisfied, and 0.24% were very dissatisfied.

Figure 2: Current Status of Ride-sharing Service

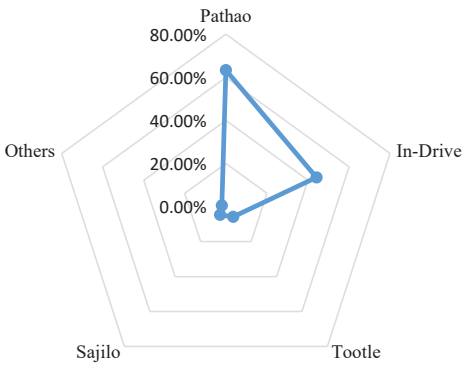
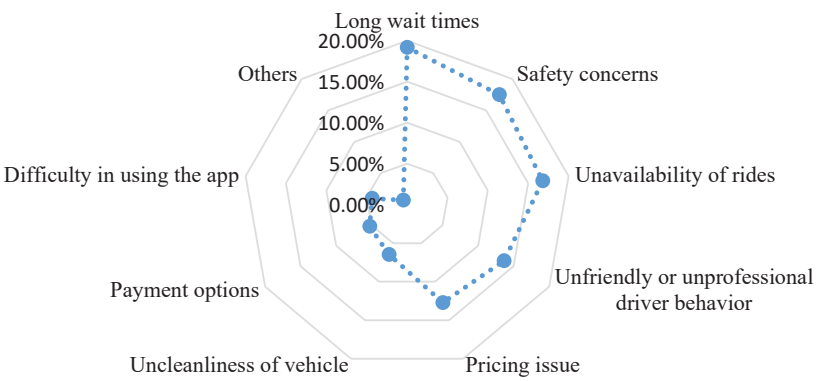


Figure 2 reveals that the majority of respondents use Pathao and In-Drive. 63.31% of respondents use Pathao, 44.12% of respondents use In-Drive, 5.76% of respondents use Tootle, 4.56% of respondents use Sajilo, and 1.92% of respondents use other apps. However, a similar study conducted by Singh & Sah (2022) found that Pathao is used by 47% of individuals, in-driver by 31%, tootle by 14%, and Sahara and pick-me by 4% each.

Challenges Faced by Ride-Sharing Service Users and Managerial Solutions

The challenges related to Ride-sharing services faced by RSS users are discussed in this section. The model response to the question of whether customers faced any challenges in using ride-sharing services shows that 35.97% of the respondents faced challenges, while 64.03% of respondents did not face any challenges while using ride-sharing services. Out of 35.97% of respondents who acknowledged challenges associated with ride sharing service, 19.18%, 17.51%, 16.79%, 13.67%, 12.71%, 6.47%, 5.28% 4.32%, and 0.72% of the respondents perceived long wait times, safety concerns, unavailability of rides, unfriendly or unprofessional driver behavior, pricing issue, uncleanliness of vehicle, payment options, difficulty in using the app, and others respectively.

Figure 3: Challenges Faced by Ride-Sharing Service Users.



Out of 417 respondents, 35.97% think that the challenges that occurred are manageable, whereas 64.03% think that they are not manageable. Out of 35.97% of respondents who acknowledged challenges associated with ride-sharing services, they also agreed that these challenges can be managed. According to data, 19.42%, 18.94%, 17.51%, 16.55%, 15.11%, 8.87%, 7.91%, 6.24%, 5.76%, and 0.72% of the respondents perceived short wait times, enhanced safety measures, sufficient availability of ride, friendly or professional driver behavior, better pricing models, improved vehicle maintenance, more driver training programs, easy in using the app, more payment options, and others respectively.

Inferential Analysis

Inferential statistics involve estimating a population based on data derived from a sample (Stapor, 2020). This field encompasses a wide array of methods that extend beyond mere data description, allowing researchers to make generalizations from a sample to the broader population (Guetterman, 2019). The key components include assessing measurement models such as internal consistency reliability, convergent validity, discriminant validity, collinearity analysis for common method bias, and model fit tests as well as evaluating structural models through techniques like bootstrapping, path coefficients, confidence interval bias correction, the coefficient of determination (R^2), effect size (f^2), predictive power (Q^2), and robustness checks.

Measurement Model Assessment

The outer model, also known as the measurement model, assesses how effectively indicators represent latent variables. Reflective indicators are examined for convergent validity, discriminant validity, average variance extracted (AVE), and composite reliability. In contrast, formative indicators are usually evaluated for multicollinearity using the Variance Inflation Factor (VIF) to ensure they are not excessively correlated, as this could distort the latent structure (Jannah & Hazriyanto, 2019).

Internal consistency reliability pertains to the relationship among indicators that assess the same construct (Hair et al., 2023). To evaluate internal consistency reliability, we utilize Cronbach's alpha and composite reliability measures. According to Taber (2018), a Cronbach's alpha of 0.70 or higher is considered acceptable. Similarly, Hair et al. (2023) state that composite reliability should also be 0.70 or greater.

Convergent validity involves the consistency of indicators that assess the same construct (Cheung et al., 2024). To establish convergent validity, it's essential to consider the indicator's factor loading and average variance extracted (AVE). Acceptable criteria dictate that factor loading should be 0.60 or higher (Fahmi et al., 2022), while AVE should be 0.50 or greater (Cheung et al., 2024; Hair et al., 2023). It is indicated that outer loading is above 0.60 (Fahmi et al., 2022) and the average variance extracted (AVE) is above 0.50 (Hair et al., 2023), which demonstrates strong convergent validity for the construct. The reliability measures for the six constructs yielded Cronbach's alpha (CA) values ranging from 0.815 to 0.854 and composite reliability (CR) values ranging from 0.876 to 0.901. Based on the analysis, both Cronbach's alpha (CA) and composite reliability (CR) exceed 0.7, a widely accepted threshold. These high values indicate that the constructs demonstrate strong internal consistency reliability, confirming their robustness in the study.

Table 3: Internal Consistency Reliability and Convergent Validity

Constructs	Indicators	Outer Loading	CA	CR	AVE
Assurance	ass1	0.787	0.854	0.894	0.627
	ass2	0.825			
	ass3	0.805			
	ass4	0.753			
	ass5	0.789			
Empathy	emp1	0.781	0.841	0.887	0.611
	emp2	0.806			
	emp3	0.802			
	emp4	0.739			
	emp5	0.779			

Reliability	rel1 rel2 rel3 rel4 rel5	0.760 0.786 0.738 0.760 0.807	0.829	0.880	0.594
Responsiveness	res1 res2 res4 res5	0.817 0.844 0.831 0.844	0.854	0.901	0.696
Tangibility	tan1 tan2 tan3 tan4 tan5 tan6	0.730 0.687 0.790 0.745 0.787 0.670	0.833	0.876	0.542
Users Satisfaction	us2 us3 us4 us5	0.805 0.781 0.793 0.829	0.815	0.878	0.644

The Discriminant Validity Metric evaluates the distinctiveness of a construct from other constructs in the structural model (Hair et al., 2023). It reflects a method's capacity to differentiate similar aspects (Spangler et al., 2012). To test discriminant validity, we utilize the Fornell-Larcker Criterion (FLC), Cross Loading, and the Heterotrait-Monotrait Ratio (HTMT). According to the FLC, the shared variance among model constructs should not exceed their AVEs. HTMT represents the average correlation of indicators across different constructs, with an acceptable threshold of 0.90 or less (Hair et al., 2023). Values below 0.9 are generally accepted (Hair et al., 2023). In this study, all HTMT values are below 0.9, indicating that the criteria for discriminant validity are met and confirming the validity of the data. Table 8 demonstrates that the HTMT condition is satisfied, confirming there is no issue of discriminant validity.

Table 4: Heterotrait–Monotrait Ratio (HTMT) Results

Construct	ass	emp	rel	res	tan	us
ass						
emp	0.644					
rel	0.601	0.800				
res	0.646	0.880	0.770			
tan	0.511	0.624	0.760	0.638		
us	0.645	0.874	0.891	0.871	0.768	

Table 5: Fornell and Larcker Criterion (FLC) Results

Construct	ass	emp	rel	res	tan	us
ass	0.792					
emp	0.548	0.782				
rel	0.525	0.678	0.771			
res	0.563	0.748	0.652	0.834		
tan	0.473	0.560	0.655	0.564	0.736	
us	0.556	0.731	0.735	0.727	0.663	0.802

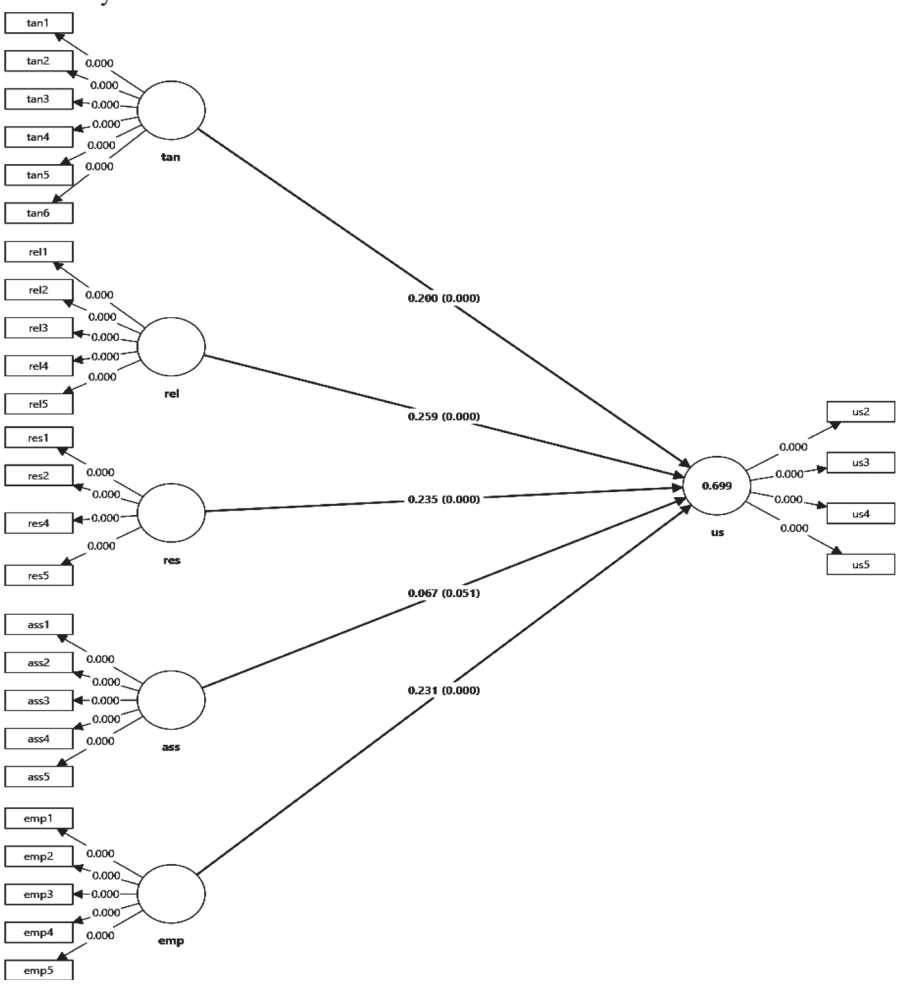
Multicollinearity occurs when two or more predictors are highly correlated, resulting in an increase in the standard error of the coefficients. Higher standard errors suggest that the coefficients for any or all independent variables may differ significantly from zero (Daoud, 2018). The variance inflation factor (VIF) is a commonly used measure to assess multicollinearity among indicators. A model is deemed free of multicollinearity if all VIF values from a thorough collinearity test are at or below 3.3 or 5 (Hair et al., 2023; Kock, 2015).

Structure Model Assessment

A structural model illustrates the relationships between latent variables, also referred to as constructs. It describes the cause-and-effect links between the constructs and how they affect one another (the inner model) (Chatzoglou, 2018). Structural model assessment involves performing Bootstrapping, Path Coefficient Analysis, Confidence Interval Bias Correction, Coefficient of Determination (R^2), Effect Size (f^2), Predictive power (Q^2), and Robustness Checks in SmartPLS 4.0.

Path coefficient analysis is a valid statistical method for separating correlation coefficients into direct and indirect effects (Khan et al., 2022). Path coefficients indicate how much the values of an endogenous construct change in response to a one-standard-deviation change in a particular predictor construct, while holding all other predictor constructs constant. Path coefficients typically fall between -1 and +1; values nearer -1 signify strong negative associations, while values nearer +1 indicate strong positive relationships. It represents the beta value (Hair et al., 2023).

Figure 4: Path Analysis



In this model, the beta coefficient between tangibility and users' satisfaction is 0.200, indicating that a one-unit change in tangibility results in a 0.200-unit change in users' satisfaction. Similarly, the beta coefficient between reliability and users' satisfaction is 0.259, indicating that a one-unit change in reliability results in a 0.259-unit change in users' satisfaction. Similarly, the beta coefficient between responsiveness and user satisfaction is 0.235, indicating that a one-unit change in responsiveness results in a 0.235-unit change in user satisfaction. Likewise, the beta coefficient between assurance and user satisfaction is 0.067, indicating that a one-unit change in assurance results in a 0.067-unit change in users' satisfaction. Lastly, the beta coefficient between empathy and users' satisfaction is 0.231, which indicates that a unit change in empathy results in a 0.231-unit change in users' satisfaction. Overall, the model shows a positive relationship between the independent variables and the dependent variable.

The value of the Coefficient of Determination (R^2) in the model is 0.699. It means that 69.9% of the total variation in the dependent variable (Users' Satisfaction) is explained by the independent variable (tangibility, reliability, responsiveness, assurance, and empathy), and the remaining 30.1% of variation is attributed to other undefined factors.

Hypothesis Test

Researchers develop a hypothesis, a detailed and testable prediction based on their observation. Hypothesis testing then uses statistical tools to analyze data from a sample and see if it supports the prediction. This helps to draw a conclusion about a large population and ultimately assess the validity of theories.

Table 6: Hypothesis Testing

					Confidence Interval		
Hypothesis	**Beta**	**S.D.**	**t-value**	**P- values**	**2.50%**	**97.50%**	**Decision**
tan ≥ us (H1)	0.200	0.043	4.639	0.000	0.116	0.285	Supported
rel ≥ us (H2)	0.259	0.063	4.087	0.000	0.143	0.393	Supported
res ≥ us (H3)	0.235	0.067	3.531	0.000	0.104	0.363	Supported
ass ≥ us (H4)	0.067	0.034	1.954	0.051	0.001	0.136	Not Supported
emp ≥ us (H5)	0.231	0.062	3.711	0.000	0.109	0.352	Supported

Note: We use a 95% confidence interval with a bootstrapping of 10,000 sub-samples

In this study, four hypotheses (H1, H2, H3, and H5) are significant, which means the p-value is less than 0.05 and the β-coefficient lies within the confidence interval. It shows a significant relationship between the independent variables (tangibility, reliability, responsiveness, and empathy) and the dependent variable (user satisfaction). On the other hand, the table indicates that the H4 hypothesis is insignificant, as the p-value is greater than 0.05 and the β-coefficient does not fall within the confidence interval. It shows the insignificant relationship between assurance and users' satisfaction.

Coefficient of Determination (R^2) quantifies the percentage of the dependent variable's volatility that can be directly attributed to the independent variable (Wright, 1934). Chin (1998) proposed R^2 values for endogenous latent variables as follows: 0.67 for substantial, 0.33 for moderate, and 0.19 for weak. The value of the Coefficient of Determination (R^2) in the model is 0.699. It means that 69.9% of the total variation in the dependent variable (Users' Satisfaction) is explained by the independent variable (tangibility, reliability, responsiveness, assurance, and empathy), and the remaining 30.1% of variation is attributed to other undefined factors. The R^2 value indicates that the model has strong explanatory power, falling into the substantial category according to Chin's classification.

Cohen (1988) indicated that f^2 values represent the small, medium, and large effects of an exogenous latent variable, with thresholds of 0.02, 0.15, and 0.35, respectively. Predictive power (Q^2) compares the

RMSE values from the PLS-SEM and LM models. For predictive power (Q^2), PLS-SEM-RMSE should be lower than LM-RMSE, indicating greater prediction accuracy. When $Q^2 > 0$, it suggests that the model is predictively relevant, while $Q^2 < 0$ indicates that it is not (Chin, 1998)W. W., & Newsted, P. R. (1999.

5. Discussion

This study examined the satisfaction of ride-sharing service users in Kathmandu Valley, utilizing the SERVQUAL model, which considers five dimensions of satisfaction: tangibles, reliability, responsiveness, assurance, and empathy, as outlined by Shetu and Kaysher (2021). The research used both the measurement and structural model tests to determine the relationship between these constructs. There were five direct hypotheses developed to test the relationships, and four of them were accepted, while one was rejected. Hypothesis 1 was confirmed to be positive and significant in influencing user satisfaction because of the effect of tangibility. The given finding aligns with other studies carried out by Dey et al. (2019), Wireko-Gyebi et al., and Balachandran and Hamzah (2017), which have also found that tangible factors, including vehicle cleanliness, driver appearance, and technological interface, are crucial factors contributing to customer satisfaction. Equally, Hypothesis 2, which referred to reliability, was confirmed, meaning that reliable and dependable service delivery has a positive impact on user satisfaction. This finding aligns with the results of Wireko-Gyebi et al. (2024) and Balachandran and Hamzah (2017), which indicate that time responsiveness, accurate ride details, and standardized service provision are key contributors to customer trust and satisfaction within ride-sharing platforms. Responsiveness was also found to have a positive and significant effect on user satisfaction, confirming Hypothesis 3. This finding is supported by previous studies by Dey et al. (2019), Wireko-Gyebi et al. (2024), and Ziyad et al. (2020), which have indicated that a quick reaction, effective communication, and timely resolution of issues can improve the user experience and satisfaction with digital mobility services. Hypothesis 4, which investigated the influence of assurance on user satisfaction, was not confirmed. The outcome shows that assurance, which in this case is expressed as driver professionalism, safety perception, and confidence in service, does not play a critical role in affecting the level of satisfaction among Kathmandu Valley users. The discovery is similar to the work of Dey et al. (2019) and Sharma and Das (2017), indicating that assurance is of lesser importance in contexts where a user is willing to accept a low price, convenience, and technological feasibility, rather than personal trust in a service provider. Finally, Hypothesis 5 was confirmed, having proved that empathy has a positive and significant influence on user satisfaction. This means that the politeness of drivers, their personal consideration, and appreciation of the needs of passengers make a significant contribution to passenger satisfaction. The findings align with previous research by Dey et al. (2019), Ziyad et al. (2020), and Wireko-Gyebi et al. (2024), all of which appear to have focused on the significance of emotional connection and service personalization as factors impacting customer perceptions. All in all, the results of this paper support the Expectation Confirmation Theory (ECT), demonstrating that the higher expectations users have in terms of tangibility, reliability, responsiveness, and empathy are met or surpassed, the higher the degree of satisfaction they obtain. The fact that assurance is not an important determinant, however, implies that Kathmandu users can be more dependent on system-based reliability and technological convenience than on personal assurance factors. The research, therefore, contributes to the emerging body of literature on the SERVQUAL model in the sharing economy operational environment, providing valuable insights for research providers of ride-sharing services seeking to enhance customer satisfaction and loyalty in the growing urban market.

6. Conclusion

The primary objective of the research was to assess user satisfaction with ride-sharing services (RSS) in the Kathmandu Valley. Specifically, the study aimed to investigate the current state of ride-sharing services, determine the impact of service quality dimensions on user satisfaction, and identify the challenges presented by the services and potential solutions to address them. The results indicate that ride-sharing services have gained popularity among the urban dwellers in Kathmandu Valley. Among 417 respondents, 78.18% indicated that they use ride-sharing services, whereas 21.82% reported never having used such

services. Convenience (41.97%), time efficiency (15.11%), safety (8.15%), cost efficiency (7.91%), and decrease in traffic jams (5.04%) were ranked as the leading reasons why users use ride-sharing services. These findings suggest that the convenience of access and time-saving features are the least significant determinants of adoption among users in the Valley. Generally speaking, the data indicate that 50.36% of the respondents expressed satisfaction, 18.23% were very satisfied, 9.11% were neutral, and 0.24% expressed dissatisfaction and high dissatisfaction, respectively. This indicates that the perception of ride-sharing services is generally positive. Pathao was the most popular platform, with 63.31% of the participants reporting its use, followed by In-Drive (44.12%), Tootle (5.76%), Sajilo (4.56%), and other platforms (1.92%). The study has also examined how the dimensions of service quality, such as tangibles, reliability, responsiveness, assurance, and empathy, affect user satisfaction. The findings showed that user satisfaction was positively impacted by four dimensions (tangibility, reliability, responsiveness, and empathy) to a significant extent, as indicated by p-values less than 0.05. It means that the material aspects of the service (e.g., the clarity of vehicles, the appearance of drivers), the quality of rides, timely responsiveness, and the compassion of drivers are important in boosting user satisfaction.

On the other hand, assurance (H4) had a nonsignificant correlation with user satisfaction, as the p-value is above 0.05 and the beta coefficient falls outside the confidence interval. This leads to the argument that the individual variables of the driver's professionalism, trustworthiness, and the level of confidence in the service provider are not strong indicators of the level of satisfaction among Kathmandu users. The research also revealed that riders of the share program encountered several operational issues, including excessive waiting lines, safety concerns, a lack of on-demand rides, and driver misconduct, as well as cost problems, subpar vehicles, and technical issues with the application or payment options. To resolve the presented problems, respondents highlighted the following aspects: they should wait less time, the quality of safety should be enhanced, the quantity of rides should be sufficient, drivers should be trained on the job, the pricing system should be transparent, maintenance of the vehicles should be performed regularly, and several easy-to-use payment methods should be introduced. The study design employed a quantitative research approach to examine the relationship between the study constructs. The clearance of data was achieved through a web-based structured questionnaire administered online, and analysis using measurement and structural model assessment was performed to establish the strength and direction of the relationship between the constructs. Generally, the results suggest that ride-sharing services in the Kathmandu Valley have gained significant momentum, particularly among young and tech-savvy users who value convenience and efficiency. Services such as Pathao and InDrive have been market leaders in this industry. The findings indicate that dimensions of service quality, such as tangibility, reliability, responsiveness, and empathy, are high predictors of user satisfaction, while assurance is a less important variable. Customer satisfaction can also be enhanced by addressing user concerns regarding service reliability, safety, and professional character, which will guarantee the long-term sustainability of ride-sharing services in Nepal.

This research paper is relevant to the field of literature that has explored the dimensions of the SERVQUAL model and their influence on customer satisfaction in ride-sharing services in the Kathmandu Valley. It also examines the role of various service quality variables on customer satisfaction in an environment where customers belong to a diverse range of socioeconomic groups. The research offers useful insights to various stakeholders in the study, including ride-sharing service providers, customers, policymakers, regulators, academics, researchers, and the local economy. The findings can help ride-sharing service providers enhance the quality of their services and gain a competitive edge, while customers can enjoy improved service experiences. The insights can guide policymakers and regulators in developing more effective policies on urban mobility, and researchers can take new directions in future research. Moreover, the local economy will benefit from a more competitive and innovative ride-sharing market, and investors will be able to make informed decisions based on the analysis of customer satisfaction and market needs presented in the study. Moreover, the results can be utilized by ride-sharing companies to tailor their policies to the unique preferences and expectations of Kathmandu Valley customers, thereby gaining customer loyalty and market share.

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