Technical Challenges on Acceptance of Ride-Sharing Platform – An Exploratory Study of Kathmandu

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ABSTRACT

The online-based industry has been growing since the internet became publicly available. People can now participate in economic activity thanks to the internet. Even in Nepal, an online-based economy has developed, prompting people to use the internet to do business. The internet and technology have offered a road to business, even in the transportation industry. Ridesharing was first started by the company Uber in 2009, which is still a success.

Similarly, in Nepal, Tootle was formed in 2017, and Pathao in 2018 has been widespread and giving services as an opportunity to both riders and passengers. The study covers the technical factors that impact the acceptance of ride sharing in Kathmandu. The factor identified is the rider information's privacy, payment modes, and internet/GPS availability. The Integrated Technology Acceptance Paradigm (ITAP) has been identified as a technology acceptance framework to analyze the acceptance of ridesharing. From the data analyzed, it is found that all three variables have a positive and significant relationship with the acceptance of the ride-sharing platform.

Keywords: ITAP, Ride sharing, App Based Taxi, Uber, Pathao

1 Introduction

Ridesharing is a part of the sharing economy, where the registered rider to the platform provides rides by their private vehicle to the passengers in exchange for fare by using the mobile application. There are few ride-sharing services currently operating in Kathmandu valley. The use of technology is growing at a rapid pace in Kathmandu. We know the emergence of technology not only helps us to work but also makes our daily transportation at ease. We can say till now, the ride-sharing platform is almost available only in Kathmandu. The study targets the two popular and competitive ride-sharing services Pathao and Tootle in Kathmandu. The study was concerned with the technical factors that might influence acceptance of the ride-sharing services. The study evaluates the thoughts of the public where they take the ridesharing as an opportunity or risk to them.

1.1Problem statement

In cities including Kathmandu, where ride-sharing platforms are on the rise (Hamal, 2019), some people see it as a benefit, while others see it as a risk. The specific problem addressed in the study is several elements that influence the adoption of the ride-sharing platform. A lot of research has previously been done on this subject, but most of it hasn't focused on the technological aspects. Most of the previous research focused on topics other than technology, such as environmental advantages, passenger safety, car and traffic reduction, and so on. Specific technical aspects that influence ride-sharing adoption, such as a cashless economy, ratings and feedback, unprotected personal information, internet/GPS availability, and so on, are either ignored or not discussed in the preceding literature. Accepting any technology necessitates a secure platform on which to exchange their data. Ride-sharing acceptance is influenced by several factors, one of which is privacy. Without data privacy, the risk of identity theft might escalate to the point where programs become untrustworthy. The system's usability will be jeopardized if the information privacy is inconsistent. Passengers are not always the ones who carry cash

and change. Multiple payment modalities, such as phonepay, digital wallets, and internet payments, which are cashless transactions, provide an opportunity for travelers (Bauer, 2017)In Nepal, where internet penetration is still nearly 35 percent in 2019, the vast majority of the population is unable to use online platforms (Statista, 2020). The number of people who own smartphones, as well as the availability of a stable internet connection and GPS, have a big impact on ride-sharing platform acceptance. In other words, having quick access to technology gives you the power to choose whether or not to accept an application (Liu & Wayne Xu, 2019). We know that a number of technological aspects influence people's use of ride-sharing services and that these issues have hitherto only been considered at a macro level. And our research will attempt to address these technical issues on a micro level.

1.2Objectives of the research

- To find if the privacy of users' information has any relationship with their use of ride- sharing services.
- To find whether Internet/GPS availability has a significant relationship with ride- sharing service acceptability.
- To identify whether there is a significant relationship between integrated payment methods and the ride-sharing platform.
- To investigate an appropriate framework for ride-sharing platform adoption in Kathmandu.

1.3Research questions

- The questions concern the acceptance of the ride-sharing and the elements that influence it.
- Is there a significant relationship between a user's information privacy and ride-sharing platform acceptance?
- Is there a significant relationship between the availability of the Internet/GPS and ride- sharing platform acceptance?
- Is there a significant relationship between integrated payment modes and ride-sharing platform acceptance?
- Which conceptual framework on technological acceptance is appropriate for examining the acceptance of ride-sharing systems in Kathmandu?

1.4Scope of the research

The study's scope is confined to Kathmandu and a small number of people. In the study, there are two sorts of users: riders and passengers. Riders become corporate partners and use the ride- sharing platform to provide transportation. Passengers, on the other hand, are individuals who utilize the app to get a ride. The study looks at both sorts of users and how they accept applications. The research is limited to the elements that may influence two types of users' adoption of the ride-sharing platform. The research will look into technical issues such as data privacy, cashless transactions, and internet/GPS accessibility. Other academics have raised concerns regarding non-technical elements such as environmental difficulties and passenger safety, which are not addressed in the study.

1.5Significance of the research

The study examines the technical aspects that may influence the public's acceptance of ride- sharing systems in Kathmandu. Riders, Passengers, Transport Government Bodies, Revenue Department, Online Payment System, Internet Service Provider/Mobile Network, and Market Player are some of the entities.

Riders

Riders sign up as partners with the ride-sharing platform, and the information gathered and evaluated

may help them figure out what the passenger needs for a safe ride.

Passengers

Passengers are the people who use the app to get a ride, and the information gathered could help them find the best ride-sharing platform for their needs.

Government Agencies in Charge of Transportation

The data can be used by transport government organizations to determine whether a ride-sharing platform is possible in Nepal. The government may utilize the data to enact new legislation addressing the safest usage of the ride-sharing business in Nepal.

Payment System over the Internet

The information gathered could aid the online payment service provider in determining the feasibility of integrating a payment mechanism into the ride-sharing platform.

Mobile Network/Internet Service Provider (ISP)

The application's backbone is ISP/mobile data, and the availability of the internet has an impact on the ride-sharing platform's acceptance. Data can assist ISPs in determining the rate of internet penetration in Kathmandu.

Market participants

There is always the possibility of a fresh entry into a lucrative industry like ride-sharing. The findings of the study will aid newcomers in conducting market research before joining the industry. This could aid them in analyzing the risk of failure and mitigating it promptly.

2 LITERATURE REVIEW

2.1 INFORMATION PRIVACY

The use of mobile phones for getting rides has become popular in urban areas. Ridesharing applications require several sensitive data like user location, vehicle details, driver license information, passenger identification details, and payment information to operate.

There are several research talks about how the sensitive data of the riders were captured by attackers with simple techniques. The application needs sensitive information like driver number, name, license number, and driver pictures upon the ride confirmation. The attackers first request the ride, then harvest the sensitive data and cancel the ride right after the crucial information were pulled from the application (Pham, 2017) The hypothesis was defined as Perceived privacy risk having a negative impact on the perceived usefulness. And it was rejected by the data analysis, which means instead of privacy having a negative impact on application usage, it has a positive impact (Nwaogu, 2021)). We can see a similar finding with the privacy concern: doubting the service provider's integrity and benevolence on misusing the customer's personal information. Found that the privacy concern might increase the perceived risk and worry the users about crucial information losses (Zhou, 2012).

2.2PAYMENTS MODES

A cashless transaction is an electronic payment made through a secure network. The payment can be made at any time and any place. The ride-sharing platform has also integrated payment modes within the application. The application is connected through a bank account where the amount can be transferred and cashed out. The payment is made when the ride is completed successfully through cash or cashless, whichever is feasible for both rider and passenger (Hamal, 2019). Ride-sharing uses the e-wallet integrated, which is secure as physical cash. The pay value is represented by an electronic coin that the bank accepts. The payee can transfer the coin, and will be converted to cash by the bank later.

Grab a leading Southeast Asia ride-sharing platform that had made the cashless payment required in the Philippines to prevent direct contact. Similarly, in Malaysia, Grab had instructed a program called Grab-Protect that encourages the users to make cashless payments to decrease the risk of Covid-19 (Taeihagh, 2021). These steps taken by the ride-sharing service provided could be an example to others to follow the same to avoid an unwanted hassle in cash payment and accept the cashless.

2.3TECHNOLOGY ACCEPTANCE

Technology acceptance is the primary concern of almost all ride-sharing platforms. Based on the data collected from the actual use, the integrated technology acceptance model is to be identified that includes technical and social factors. The acceptance of the ride-sharing platform has multiple theoretical angles that can be studied. Many authors had suggested several theories on several levels in the diffusion of innovation. Rogers in his explanation how different innovations, ideas, technology, and practices were accepted or rejected in society (E.M., 2003)Innovation diffusion by Rogers in 2003 proposed a process that includes several stages of technology acceptance. The process starts with the knowledge stage where the users learn about the technology, then the persuasion stage where the user's attitude about the technology was analyzed, then the decision stage where the user was free to choose to accept or reject the technology, and then the implementation stage where the users put the technology to their practice and finally the confirmation stage where the users seek for the support (Agency for Clinical Innovation (ACI), 2015).

2.4 INTEGRATED TECHNOLOGY ACCEPTANCE PARADIGM (ITAP)

The research done by Lin in 2003 on the acceptance of communication technology and its uses proposed the integrated research model that explains the acceptance of communication technology. The framework analyzes the factors as social system, audience, and technology use patterns that impact the acceptance decision (Lin, 2003)The type of technology is different with its features. Lin, in the paper, focused on communication technology and ignored the other type as non-communication, non-internet based, etc. The recent study in the Integrated Technology Acceptance Paradigm (ITAP) perfectly covers the individual from the micro level to macro (Atkin, 2015).). Mau, in his article, mentioned six factors as technology, system, audience, social, usages, and acceptance factors that impact the technology acceptance. Technology factors consist of technical attributes of the innovation, such as internet and application availability. System factors refer to the rules, regulations, policies, culture, and market competition. Social factors include social structure and status. Audience factors consist of individual beliefs, attitudes, and perceptions. Use factors gathered the personal behavioral response after the actual consumption of the innovation, and the acceptance factors include the decision made in the acceptance (Mou, 2016). The factors are closely interpreted, and their interactions create a road map toward the acceptance.

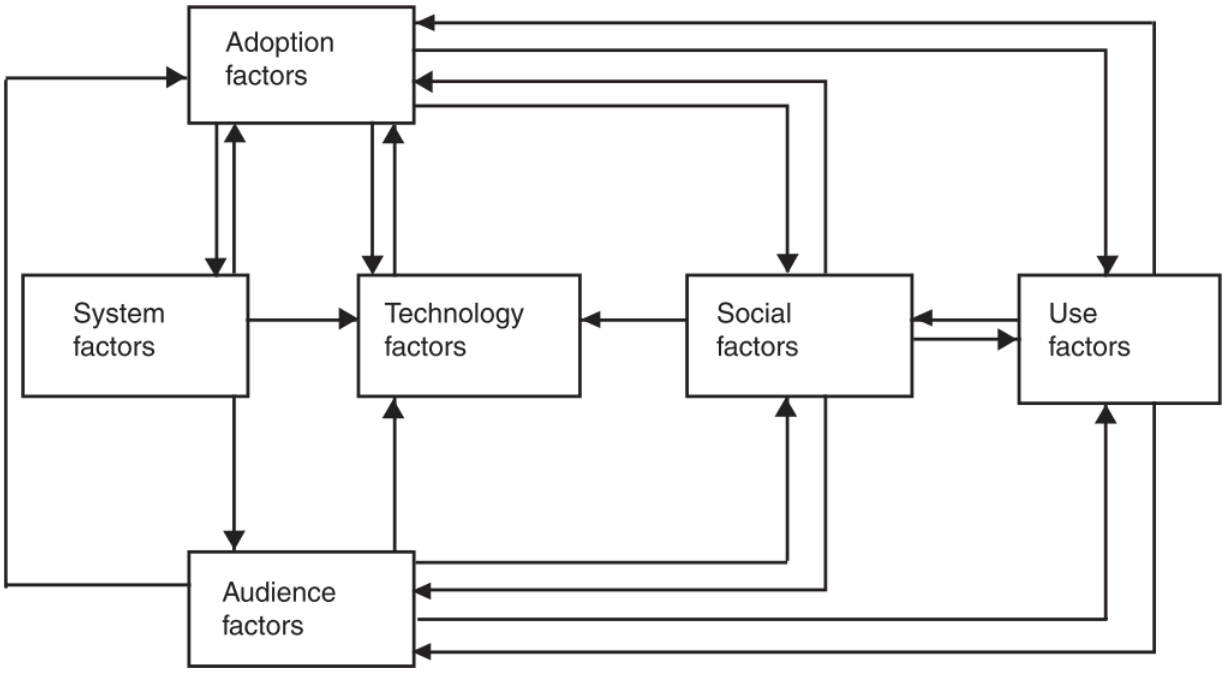

Figure 1: Integrated Technology Acceptance Paradigm (ITAP) (Lin, 2003)*)*

System Factors

The system-level factors include macrosocial forces which impact the diffusion of the technology. Macrosocial can have internal and external parties, including policies, culture, politics, economic, and social changes. Financial standards and industrial regulation are two external influences that impact the diffusion process of technology acceptance (Lin, 2003)Regarding ride-sharing acceptance, several policies and incentives programs benefit and drawbacks for the users.

Technology Factors

The technology factors include technical product characteristics such as the data transmission speed, multitasking, etc. These characteristics are also considered as the two technical personalities as ease of use and capability (Lin, 2003)Rogers has proposed five technical attribute dimensions as trialability, complexity, relative advantage, compatibility, and observability (E.M., 2003). Ridesharing application is complex to use. It has several features that might confuse the users. The ride-sharing platform matches the riderswith the passengers by using GPS.

Social Factors

The social factors consist of users' social influence from their leaders on adopting the technology. The social group or the organization where the users belong influences the followers in the acceptance decision. The leaders are more knowledgeable and innovative in adopting the technology than their followers (Lin, 2003)People get influenced by the social group they belong to. In the ride-sharing platform, acceptance has a similar social influence on the acceptance.

Use Factors

The use factor is the way the users accept the technology after the decision made for the acceptance.

The user experience is counted as the use factor that includes several responses from the users as to whether the expected level of outcome is met if users are satisfied with the use, ability to control the user experience, and user interest by the user (Lin, 2003)Use factors are very much similar to the effort expectancy in the UTAUT and the perceived ease of use in the TAM model.

Audience Factors

The audience factors are concerned with the availability and affordability of the product tothe audience of the society. The individual characters in the community determine the technology acceptance. The audience factors include personal traits, self-realization, beliefs in self ability, and attitude toward the product (Lin, 2003) The acceptance of technology isalso impacted by the age and gender of the users. It is found that the male is more into adopting the technology than the females. Also, generation has a similar impact on the acceptance of the ride-sharing platform. Older people avoid risk and do not engage with theuse of technology. Younger is more into the new technologies. (P., 2019).

Acceptance Factors

The original ITAP consists of several factors that impact technology acceptance. The system, social, audience, technology, and use factors are analyzed above to adopt the ride- sharing platform. The outcome can be different as to adopt, not to adopt, likely to adopt, discontinuance, and reinvention (Lin, 2003)). The user can have any of the decisions made.It is found that from the study in China, the riders might have been engaging in using the ride-sharing platform with some delay. So the three decisions as acceptance, early acceptance, and likely acceptance are primarily found to be taken by the riders (P., 2019).

3 Research Methodology

3.1 Research design

As it relates to putting research ideas into projects, research design is an essential component of any study. The importance of research design in determining research procedures and features including research techniques, research strategy, and sample cannot be overstated.

3.1.1 Data collection

The practice of acquiring and measuring information on variables of interest is known as data collection. It allows you to respond to specific research questions, test hypotheses, and assess results. All fields of study, including physical and social sciences, humanities, business, and others, use data collection as part of their research.

After analyzing all the research methods in the market, we have chosen the quantitative research method by selecting the sample and distributing the questionnaires with scaling questions. The survey type of quantitative research targeted the population that uses the ride-sharing application in Kathmandu.

3.1.2 Sampling

The importance of sample size in statistical analysis cannot be overstated. Criterion sampling is the process of picking samples that meet a set of important criteria. Criterion-based sampling was used in this investigation. Only those state firms that had implemented at least one ITSM practice received questionnaires.

For the sampling method, we have chosen random sampling by distributing all the types of people who use or don't use the ride-sharing application in Kathmandu. This will help us know what percent of the population uses what kind of ride- sharing in Kathmandu and how many riders or passengers or non.

3.1.3 Data validation

The extent to which a survey evaluates the right elements that need to be measured is referred to as research validity. Validity, in simple terms, relates to how successfully an instrument measures what it is

supposed to measure.
Only reliability will suffice; measures must be both reliable and valid. For example, if a weight measuring scale is 4 kg off (it subtracts 4 kg from the real weight), it can still be considered dependable since it displays the same weight each time, we measure a certain object. The scale, however, is invalid because it does not show the item's true weight.

3.2Proposed Research Methodology

For this research, both qualitative as well as quantitative research approaches were followed. These divisions consisted of questions that were helpful in answering the research questions asked previously in section 1.3. Because the research will be conducted in both a quantitative manner, descriptive and exploratory research approaches will be used.

4 Data Analysis

The study focuses on the commuter acceptability of ride-sharing in Kathmandu. The data collection method refers to how the information is gathered. The sampling method used was convenient, and it followed the dissemination of online and onsite questionnaires via social media, emails, and paper. Because of the Covid epidemic, in-person data collecting is difficult; I must rely heavily on internet data collection.
The questionnaire was distributed to 450 users (Both riders and passengers) in Kathmandu, Nepal, in January 2022. Out of which, 329 valid responses were received. After the data were collected, they were cleaned by performing several procedures on the raw dataset. The cleaning process includes the removal of responses that don't have key information as demographic variables. After data was cleaned, only the sample of 329 was validated, and others were filtered out because of missing critical information.

4.1 DESCRIPTIVE ANALYSIS

The descriptive research method entails describing the targeted population's characteristics using the data gathered. The demographic factors are used in descriptive analysis for the study.

4.2 INFERENTIAL ANALYSIS

The inferential data analysis is the complex data analysis than the descriptive. It considers finding the relationship between the variables and generating the result. The inferential analysis is based on the five scale Likert questions in each dependent and independent variable.

4.3 Regression analysis

Regression analysis considers the strength and significance of the relationship between one dependent and multiple independent variables. Correlation is a type of regression analysis because it assumes the strength and significance of variables, but the variable is unclear. The regression analysis clearly relates and understands one dependent and multiple independent variables. I used two types of regression analysis as Bivariate and Multiple Regression. Bivariate and multiple regression are analyzed to examine the relationship between independent and dependent variables.

Table 1: Gender Demography

SN	Gender
1	Male
2	Female

Table 2: User type

SN	Age	Group

SN	Service type
1	Pathao
2	Tootle
3	Other

Table 3: Occupation

SN	Occupation
1	Student
2	Full-time employee
3	Civil servant
4	An employee of a private company
5	Entrepreneur

Table 4: Time of using the services

SN	Time of using the services
1	Less than 6 months
2	6–12 months
3	1 year
4	More than 1 year
5	Not specified

Table 5: Service type

SN	Highest education level
1	Below SLC
2	SLC
3	High school Diploma
4	Bachelor's Degree
5	Master's Degree
6	PhD
7	Not specified

Table 6: User type

SN	User type
1	Rider
2	Passenger
3	Other

Table 7: Frequency of service usage

SN	Frequency of service usage
1	Daily
2	Once a week
3	Twice a week
4	Thrice a week
5	Once a month
6	Not specified

5 Conclusion

Ride-sharing can be named ride-hailing, online taxi, taxi-sharing, etc., that provides a ride to people with the help of a mobile application. The Ridesharing platform is not new to the world but a new concept in Kathmandu. First, ride-sharing services were provided by Tootle in 2019 and followed by Pathao in 2019. We found three technical aspects that could influence the ride- sharing platform's popularity in Kathmandu. These technological considerations, such as Information Privacy, Internet/GPS Availability, and Payment Mode, may have a substantial impact on a user's willingness to accept ride-sharing in Kathmandu. The first three research questions concerned the link between the three independent variables and the one dependent variable. The analysis is based on the integrated technology acceptance model ITAP's technical factor. ITAP was chosen as the technology acceptance model to determine the technological elements that may influence the user's acceptance of ride-sharing services in Kathmandu.

6 RECOMMENDATIONS

- Applications could be vulnerable and uploaded information like driving license, social security number, and pictures could be misused. So, it is recommended to consult the service provider and ask them for their promise before registering as a partner.
- It is suggested that a smartphone can run the application and have stable internet.
- It also indicated that riders have several payment options while giving the ride to the passengers so that while receiving the fare, there will be no difficulties.
- The first suggestion is to hide the basic information such as name and phone number in the application while registering.
- The ride-sharing application is suggested to have an integrated payment system with several payment options in Nepal
- The accuracy of the GPS and location is a crucial element of the application, which is suggested to be accurate and stable.
- The government bodies as the traffic department, are suggested to see if the riders are legal to ride a vehicle and have a valid driving license.
- The government bodies are advised to determine the fair amount of fare.
- The government also needs to direct the cyber bureau to look after the any misuse of user’s data.
- It is recommended that the payment service provider integrate their services within the

application.

- We recommend a digital payment service provider to make their UI users friendly and easy to use so that people with less knowledge can use it.

7 LIMITATIONS

We have concluded specific results from the study; however, there are still some limitations.

- First, we know that the sample size doesn't have enough coverage to generalize the result to a larger area.
- Second, due to Covid 19 situation, we could not interact directly with the respondents; instead, we had to pass the online questionnaires. Because of this, we had a communication gap that might have impacted the response's accuracy.
- Third, the study is done in Kathmandu, where the internet and GPS availability is still in the early stage. Thus, the result drawn cannot be generalized to the other developed countries.
- Forth, the ITAP has several other acceptance factors, but we only focus on the technical and acceptance aspects despite ignoring the other as system, audience, social, and use elements. This might impact the accuracy of the result because user behavior is dynamic and longitudinal research may require user's behavior analysis.
- Fifth, the research has a small number of measurement items (2 to 3) in each section, questioning the data's reliability.
- Lastly, all the variables are drawn from the English papers because minimal articles were published in Nepal's ride-sharing platform, which can bias the Nepal market.

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