FACTORS INFLUENCING THE ADOPTION OF RIDE SHARING: A PLS-SEM APPROACH

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This Report Presented in Partial Fulfillment of the Requirements for
The Degree of Masters of Science in Computer Science and Engineering

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APPROVAL

This Thesis titled **"Factors Influencing The Adoption Of Ride Sharing: A PLS-SEM Approach"**, submitted by **Fatema Toz Johora**, ID: **241-25-055** to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of **MSc. in Computer Science and Engineering** and approved as to its style and contents. The presentation has been held on **24-05-2025**.

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I hereby declare that this research has been done by me under the supervision of **Dr. Arif Mahmud, Associate professor and Associate Head, Department of CSE,** Daffodil International University. I also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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ABSTRACT

Currently, ride-sharing has become a popular mode of transportation due to its affordability and reduced hassle compared to traditional public transport. However, major challenges such as safety concerns, traffic congestion, and weak transport infrastructure persist. This study analyzes the acceptance level of ride-sharing services in Bangladesh. An extended ASE (Attitude–Social Influence–Self-Efficacy) model was used by incorporating the concept of Personal Innovativeness. The research explores how personal beliefs, social influence, and the willingness to adopt new technologies affect the usage of ride-sharing services. A survey was conducted among students from various universities, resulting in 429 responses, out of which 355 valid responses were selected for analysis. The data was analyzed using PLS-SEM (Partial Least Squares Structural Equation Modeling) and ANN (Artificial Neural Networks) methods. The results show that self-efficacy, social influence, and attitude significantly impact personal innovativeness, which in turn influences users' adoption behavior. Additionally, notable differences were found in these relationships based on gender. This study not only contributes to academic literature by applying the ASE model in the transportation sector but also provides practical recommendations for ride-sharing companies and policymakers.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1

Introduction

1.1 Introduction

One of the main global networks of connectedness is transportation. However, it faces various security challenges due to its operating environment [1]. Public, air, rail, and maritime transportation systems face multiple threats; including theft [2] .Theft in public transport is one of the most common issues. Pick pocketing and robberies frequently occur in busy cities, particularly on buses, trains, and metro stations. This creates an unsafe environment for women and vulnerable groups, often leading to harassment and physical assaults [3],[4]. Additionally, transport services are frequently disrupted due to vandalism and riots. Railway stations are at risk of terrorist attacks, and trains carrying valuable goods face the threat of theft and looting. Cross-border transport also faces significant security risks, including illegal immigration, human trafficking, the transportation of prohibited goods, and document fraud [5]. In air transport, despite strict security measures, incidents such as aircraft hijackings, drug smuggling, and the trafficking of illegal goods and weapons continue to occur. However, despite being essential to global trade, maritime transportation is also susceptible to risks including human trafficking, smuggling, and water pollution. Moreover, GPS spoofing makes ship control systems more complex [6].

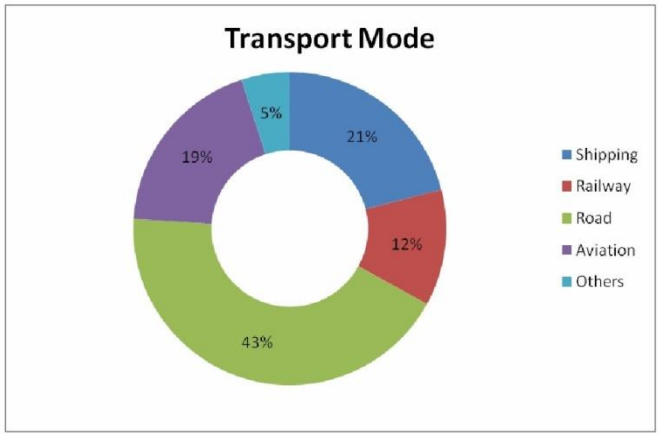

Fig. 1.1: Different transport modes [1]

Ride-sharing services are gaining popularity worldwide due to their secure and reliable offerings. Some of the well-known ride-sharing platforms include Uber, Pathao, Amarbike, Car Rental, Chalo, Sahaj Ride, Oban, and Obhai [7]. Several ride-sharing companies have also launched operations in Bangladesh, providing a convenient and affordable mode of transportation for users. These services guarantee a smooth and safe travel experience by enabling users to find the closest available car immediately, book a trip, track the driver's whereabouts in real time, and estimate the fee in advance [8]. Consequently, ride-sharing services help to lessen air pollution, traffic congestion, and transportation expenses [9]. Additionally, by generating jobs, ride-sharing businesses contribute significantly to the local economy. The ability to work around their desired timetables is advantageous to drivers [10]. Users can also evaluate drivers based on ratings and reviews, which helps maintain service quality. These services not only benefit ride-sharing companies but also foster market competition by attracting new businesses to the industry [11]. The proliferation of app-based ride-sharing services, which make transportation quicker and more effective, has been greatly aided by the broad availability of smart phones and improved internet connections. Their real-time response to demand makes them accessible to people from all walks of life, further increasing their popularity [12]. However, ride-sharing services have also faced criticism and debate regarding workers' rights, transportation policies, and environmental impacts. While they are regulated in some countries, they remain a popular and effective mode of transportation in many regions worldwide. Their future success will depend on factors such as user demand, advancements in technology, and government regulations [13].

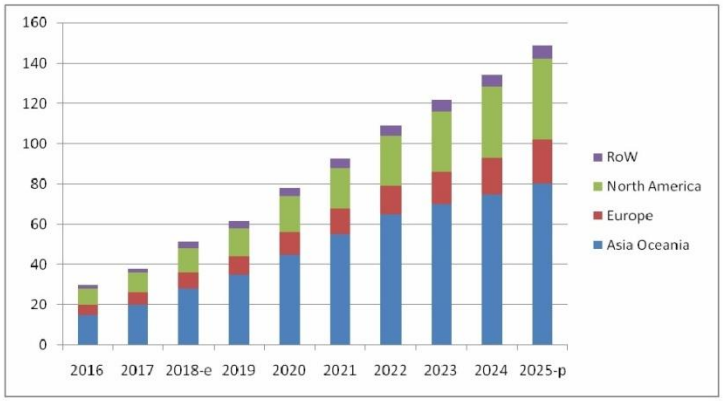

Fig. 1.2: Ride sharing market, globally [14]

The regular transport system in Bangladesh is consistently facing issues related to road safety, passenger safety, and cargo security. One of the main problems is road accidents, which occur due to traffic law violations, excessive speeding, and reckless driving [15]. According to the National Road Accident Data, thousands of deaths occur every year, with most accidents involving buses, trucks, and motorbikes [16]. In addition, passenger safety is compromised due to the inadequate implementation of safety measures in train and ferry transport. As a result, incidents such as fatalities are occurring due to overcrowded passenger transport [17]. Furthermore, vehicles are frequently subjected to theft, robbery, and physical assault. These criminal activities create a frightening environment for passengers, especially on public buses and trains [18]. Passengers also face issues like pick pocketing, violent behavior, and gang-related crimes [19]. The lack of surveillance and monitoring systems in many transport modes has created a security gap. Although the government has implemented measures such as installing CCTV cameras on public buses, the irregular application and maintenance of these systems have rendered them ineffective [20]. Political unrest, protests, and strikes also contribute to security problems. During strikes or political protests, public transport systems are often disrupted, increasing the likelihood of passengers being trapped in violent situations. These problems frequently lead to damage to transport vehicles and injuries to passengers [21].

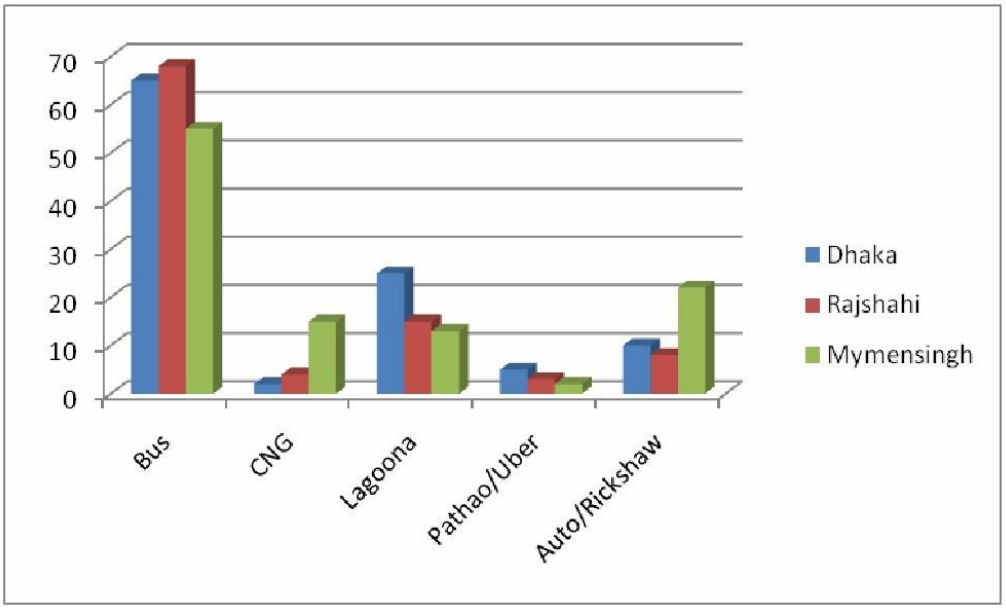

Fig. 1.3: Security Issues in Bangladesh's Regular Transport System [19].

Ride-sharing services are on the rise in Bangladesh. They allow passengers to take transportation services according to their time and ability [22]. The demand is increasing due to the traffic congestion in busy cities and limited public transport options [23]. Ride-sharing platforms have been in existence in Bangladesh since mid-2010. Led by companies like Uber and Pathao, these platforms allow users to book rides through mobile applications, track drivers in real-time, and enjoy accurate transactions [24]. The convenience of these services quickly gained popularity among the urban population, leading to an increase in their adoption rate. A survey of 200 consumers and users on ridesharing found that about 88.5% of respondents - who saw ridesharing as an alternative to traditional transportation - saw this choice as being driven by digital technology and mobile applications, especially among people aged 18 to [25], [26]. Flexibility, convenience, time savings, and ease of use are the main reasons for this [27].

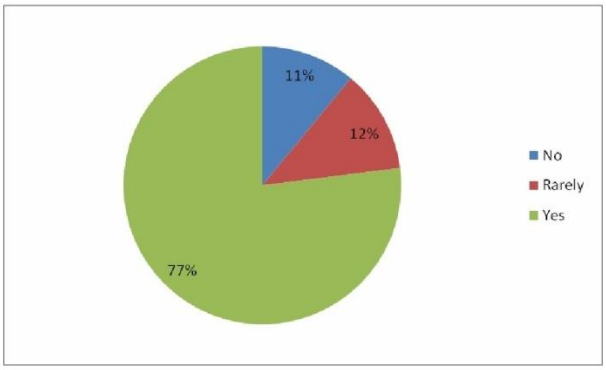

Fig 1.4:Users Of Ride Sharing [14]

1.2 Motivation

In recent years, ride-sharing has brought significant changes to urban transportation infrastructure worldwide. These services have made commuting easier and more affordable for people. The use of ride-sharing platforms has grown considerably, particularly in Bangladesh's crowded cities. Not with standing these advancements, these services continue to confront a number of difficulties, including poor route planning, traffic jams, lengthy wait times, unstable prices, and safety concerns.ML technology can

provide a number of features to handle these problems, including demand forecasting, dynamic pricing, fraud detection, real-time route optimization, data-driven decision-making, and tailored user experiences.

By incorporating machine learning into their services, ride-sharing businesses in a number of nations have improved operational effectiveness and customer happiness. However, there is currently a lack of research-based analysis and a low level of practical use and adoption of this technology in Bangladesh.

This study's primary goal is to investigate the state, adoption, and application potential of machine learning technology in Bangladesh's ride-sharing market. The research will determine the facilitators and obstacles to machine learning adoption, evaluate the technological preparedness of local platforms, and examine how machine learning may be utilized to augment service quality and promote customer pleasure. In addition, this research aims to provide relevant and actionable recommendations for policymakers, technology developers, and ride-sharing companies so that they can implement machine learning technologies through appropriate strategies tailored to local needs.

The ultimate goal of this project is to contribute to the conversation on digital transformation in emerging countries and show how cutting-edge technology like machine learning can help progress smart urban transportation and enhance public services.

1.3 Research Questions

Data for the study was only gathered from people who fit certain criteria, like students, potential users, and Dhaka residents. Possible research questions include:

1. To what extent do Perceived Self-Efficacy, Attitude, and Social Influence Personal Innovativeness in the context of ride-sharing adoption?
2. Does Personal Innovativeness mediate the relationship between the ASE model variables (Attitude, Social Influence, and Self-Efficacy) and the behavioral intention to adopt ride-sharing services?

3. Among Personal Innovativeness, Self-Efficacy, Social Influence, and Attitude, which construct has the most significant impact on the adoption of ride-sharing services?

1.4 Project Management and Finance

For the research, no money was obtained from any person or organization.

1.5 Report Layout

The research background, goals, and main research questions are reviewed in Chapter 1. The literature review is gathered in Chapter 2. The proposed model and hypotheses are described in depth in Chapter 3. A detailed description of the research methodology is given in Chapter 4, and the results, the moderating influence of gender, and the criteria for assessing the measurement model are covered in Chapter 5. The investigation is finally brought to a close in Chapter 6 with examinations of its theoretical and practical implications.

CHAPTER 2

Background

2.1 Preliminaries/Terminologies

The Attitude, Social Influence, and Perceived Self-Efficacy model is considered a theoretical framework designed to explain and predict behavioral change. It is particularly used in the health sector. The ASE model assumes that behavioral intentions are central to understanding and predicting human actions. The model emphasizes three key determinants of behavioral intention: attitude, social influence, and self-efficacy. These components collectively influence an individual's specific behavior. According to the ASE model, these constructs function as mediators in understanding human behavior, thereby facilitating a better understanding of the process of behavior change.

A substantial body of research has employed the ASE model to examine health-related behaviors across various populations and cultural settings. For example, investigated the role of self-efficacy in healthcare practices among nurses in South Korea, underscoring its significant impact [28]. Explored social influence on reproductive health behavior among men of reproductive age in Belgium, Sweden, and Ireland [29]. Similarly, examined the influence of attitude and self-efficacy on health behaviors among older adults in the Netherlands[30].Focused on the role of the ASE model in shaping policy decision-making among general practitioners in Spain and the United Kingdom[31]. In the Netherlands, studied physicians' attitudes and levels of self-efficacy in relation to health insurance decision-making[32], [33]. Studies conducted among adolescent students in Norway, Romania, and the Netherlands highlighted the significance of peer influence and self-efficacy in shaping behavioral outcomes[34], [35].Applied the ASE model within family settings, examining how both children's and parents' food choices in Norway were influenced by attitudinal and social factors [36].

Collectively, these studies underscore the ASE model's broad applicability and effectiveness in explaining psychological determinants of health behavior. Its use across

diverse populations and settings demonstrates its value as a robust framework for understanding and promoting health behavior change.

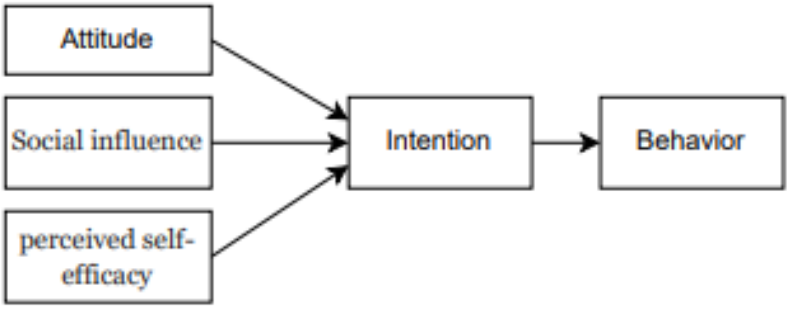

Fig. 2.1 ASE Model

2.2 Literature review of ASE model

Table 1 ASE Model in Different Papers:

Serial	Authors	Year	Journal/conference name	Country	Sample type	Sample size	# of citation	Application
1	van Bree et al. (2015)	2015	Psychology of Sport and Exercise	Netherlands	Older Adult	1976	36	Health
2	Lotrean et al. (2013)	2013	Child: care, health and development	Romania and Netherlands	Junior High School Students	504	10	Health
3	Melbye et al. (2013)	2013	Appetite	Norway	10–12-Year-Olds And Their	796 Child And 963	46	Health

					Parents	Parent		
4	Jensen and Sørensen	2014	Scandinavian Journal of Public Health	Denmark	High School Students	670	15	Health
5	García-Fernández et al.	2017	International Journal of Nursing Studies	Spain	Nursing Students	352	11	Health
6	Huang et al.	2018	Journal of Adolescent Health	Taiwan	Adolescents	1040	13	Health
7	Müller et al.	2020	Journal of Public Health	Germany	Office Workers	312	6	Health
8	Abebe and Berhane	2012	Ethiopian Journal of Health Development	Ethiopia	Rural Mothers	250	5	Health
9	Nguyen et al.	2015	Asia-Pacific Journal of Public Health	Vietnam	University Students	490	12	Health

2.3 Personal Innovativeness

The term "personal innovativeness" describes a person's propensity for innovation or experimentation. It is a psychological characteristic that shows a person's readiness to accept new ideas, services, or technology items. The definition states that "personal innovativeness in information technology is an individual's willingness to use any new information technology" [37]. According to a meta-analysis, PI (Personal Innovativeness)

is a strong predictor in the adoption of technology in the travel and hospitality industry. The survey indicated that individuals with high PI—both employees and clients—were more likely to adopt reservation and service technologies [38]. Innovation readiness and entrepreneurial value generation were predicted using PI. The study found that the Innovator Mindset tool was validated [39]. PI was associated with students' behavioral intentions when using academic technology. This study explored the adoption of digital learning platforms in higher education [40]. This study shows a strong relationship between consumer PI and purchase intention and product innovation. It concludes that PI controls how new products are determined [41]. It is understandable how people's interest in implementing smart meters is influenced by personal innovative capabilities, especially when it comes to privacy issues.When choosing to employ smart meter technology, those with greater PI are more likely to think about privacy problems, according to research [42]. The adoption and use of electronic devices were associated with PI. Even in uncertain situations, those with high PI were more inclined to test new devices [43]. High PI consumers are better able to manage the uncertainties and security threats associated with new technology. The association between PI and readiness to embrace new and dangerous digital advances was investigated in this study [46]. In addition to being more eager to use new methods and tools, individuals with higher Personal Innovativeness (PI) are better able to handle the risks and uncertainties that come with innovation. As the pace of digital transformation increases across various sectors—including mobile banking, IoT, e-commerce, and digital education—PI continues to serve as a crucial predictor. This underscores the need to consider users' innovative capabilities in both academic research and real-world technology design.

2.4 Research Gaps

The use of machine learning (ML) techniques in ride-sharing systems has been the subject of much international study, however most of these studies are focused in technologically advanced regions like North America, Europe, and parts of East Asia. The development of algorithms for demand forecast, dynamic pricing, route optimization, and client retention is the main emphasis of these studies. Nevertheless, there is a dearth

of empirical research that examines the organizational adoption of machine learning technology in underdeveloped countries, especially in light of Bangladesh's distinct socioeconomic and infrastructure backdrop. Few studies have examined the organizational and behavioral factors impacting the adoption of ML-based systems in local ride-sharing services; instead, they have focused on user acceptance, regulatory restrictions, or the overall expansion of digital platforms. Furthermore, existing research frequently ignores the interaction among stakeholders involved in ML implementation between perceived competence, social influence, and individual decision-making attitudes.

The Attitude, Social influence, Perceived Self-Efficacy model is used as the theoretical foundation for this investigation in order to close this crucial gap. An effective lens for analyzing behavioral factors impacting the adoption of technology is the ASE model. In particular, it is in a unique position to capture the triadic influence of an individual or organizational actor's confidence in their capacity to use such technologies effectively, their personal attitude toward ML, and their perception of social expectations from peers or institutions. The ASE model provides a deep understanding that goes beyond technological issues and encompasses psychosocial components, which is important given the embryonic stage of machine learning adoption in Bangladesh's ride-sharing ecosystem and the relatively low level of digital readiness among some players. Because of its focus on behavioral intentions, this model is especially well-suited for situations in which human variables, scarce resources, and changing market dynamics significantly influence organizational adoption. By contextualizing ML adoption using the ASE model, this study aims to close the existing research gap and add a fresh viewpoint to the body of knowledge on the dissemination of technology in developing economies.

2.5 Challenges

The acquisition of representative data that accurately reflects the diverse factors influencing ride-sharing adoption across different groups and geographic contexts poses a significant challenge, due to the need for comprehensive and high-quality survey responses. Contextual variability—such as differences in urban infrastructure, cultural

perceptions, and user expectations—can affect the reliability of adoption models by introducing inconsistency in behavioral indicators and perceived constructs. Model generalization refers to the ability of the proposed structural equation model to perform reliably across varying user profiles and usage contexts, without being limited by the specific characteristics of the sampled data.

CHAPTER 3

RESEARCH MODEL AND HYPOTHESIS

3.1 Proposed Model

This model (Fig 3.1) essentially explores how a user's personal characteristics and the influence of the social environment combine to create interest in adopting ride-sharing technology. There are seven hypotheses in this diagram, which explains the relationship between different variables. Available self-efficacy analyzes a user's confidence in how to perform tasks such as running an app, providing location, and making payments. If friends or family members use or encourage this app, it has a social impact on the user. Whether the app is easy, affordable, and secure is reflected in the user's positive or negative comments. The use of new technologies has a greater impact on the behavior of those who are more likely to be personally innovative. Ultimately, the results dictate whether users are using it.

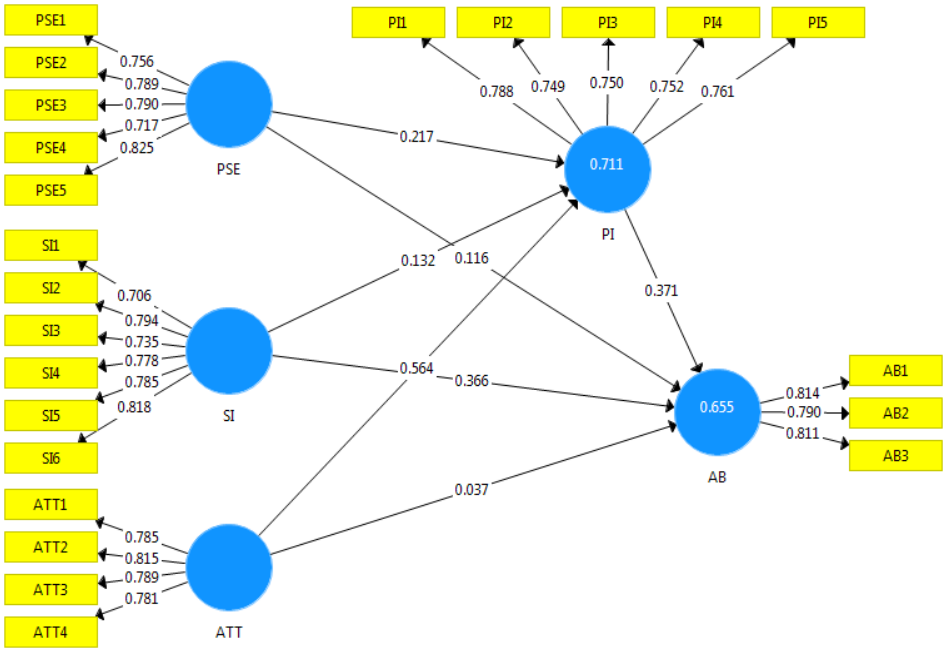

Fig. 3.1 Proposed Extended ASE Model

3.2 Hypothesis

The model shown in has been organized in accordance with the study's goals. Personal Innovativeness (PI) has been added to the ASE Framework, which serves as the foundation for this model.

H1: Perceived Self-Efficacy positively influences Personal Innovativeness for Ride Sharing.

The belief in one's own capacity to carry out a particular task or handle a circumstance is known as perceived self-efficacy. It affects behavior and decision-making. Because of security issues, personal innovativeness boosts one's perceived self-efficacy in embracing IoT [47]. Furthermore, clients' behavioral intention or mental preparedness to shop online is positively influenced by their level of self-efficacy [48].

H2: Social Influence positively influences Personal Innovativeness for Ride Sharing.

The term Social Influence describes how people alter their attitudes, behaviors, or beliefs in response to the presence, deeds, or expectations of others. It is crucial when making decisions, particularly when it comes to adopting technology, because people may be swayed by their peers, relatives, specialists, or social conventions. The social impact of IoT adoption for security reasons is positively influenced by individual innovation [47].

H3: Attitude positively influences Personal Innovativeness for Ride Sharing.

A positive or negative assessment of a certain entity is an expression of attitude, which is a psychological inclination. Despite security concerns, personal innovation has a favorable impact on attitudes toward IoT adoption [47]. Similarly, university students' perceptions toward using ChatGPT for instructional purposes are positively impacted by personal innovativeness [49].

H4: Perceived Self-Efficacy positively influences adoption behavior for Ride Sharing .

Health Self-efficacy positively influences Adoption behavior intention of healthcare information [50]. Self-efficacy positively influences the intention to adopt electronic markets among sellers [51].

H5: Social Influence positively influences adoption behavior for Ride Sharing.

Social influence positively influences the behavioral intention of sellers of the electronic market [51]. Social influence to adopt an innovation will have a positive effect on adoption intention [52].

H6: Attitude positively influences adoption behavior for Ride Sharing.

Customers' behavioral intention to use online buying platforms is strongly and favorably influenced by their attitude [48]. A favorable attitude toward environmentally friendly development has a large and positive impact on behavioral intention in housing projects [53]. Owners' views and their behavioral intention are substantially and favorably correlated when it comes to implementing BIM technology.

H7: Personal Innovativeness positively influences adoption behavior for Ride Sharing.

The term "personal innovativeness" describes a person's readiness to experiment with novel concepts or technology before others do. New information technologies are more likely to be adopted by those who are more innovative personally [54]. Personal innovativeness directly impacts behavioral intention to use new IT systems [55].

3.3 Hypotheses Results

Here, all of the results were significant, with the exception of the attitude to adoption behavior outcomes, which were non-significant.

Relationships	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Remarks
ATT -> AB	0.037	0.047	0.101	0.364	0.716	Non Significant
ATT -> PI	0.564	0.563	0.061	9.294	0.000	Significant
PI -> AB	0.371	0.368	0.095	3.899	0.000	Significant
PSE -> AB	0.116	0.116	0.059	1.969	0.050	Significant
PSE -> PI	0.217	0.218	0.062	3.489	0.001	Significant
SI -> AB	0.366	0.359	0.114	3.195	0.001	Significant
SI -> PI	0.132	0.133	0.061	2.157	0.032	Significant

CHAPTER 4

RESEARCH METHODOLOGY

4.1 Proposed Methodology

The study's scale items were tailored to the situation and taken from earlier research. First, the PSE (5 items), SI (6 items), ATT (4 Items), PI (5 items), AB (3 items) were adapted from: [70],[71],[68],[72],[73]. To make sure the survey was accurate and useful, pre-test and pilot surveys were carried out prior to the final one [56].

No	Constructs	Definition
1	Perceived Self-Efficacy	An individual's propensity to use ride-sharing services is influenced by their perception of their own capacity to use them successfully, which is known as perceived self-efficacy [72].
2	Social Influence	Social influence denotes the extent to which individuals perceive that important others believe they should use ride-sharing services, impacting their adoption decisions [73]
3	Attitude	Attitude towards ride-sharing is the degree to which an individual has a favorable or unfavorable evaluation of using ride-sharing apps, affecting their intention to use such services [68].
4	Personal Innovativeness	Personal innovativeness is the degree to which an individual is open to and willing to try out new technologies, such as ride-sharing apps, influencing their likelihood of adoption [69].
5	Adoption Behavior	Adoption behavior in ride-sharing refers to the actions taken by individuals to start using ride-sharing services, Social influence and practical simplicity are two examples of elements that influence decision-making. [70].

Table 4.1 Operational Definition of Variable

A research report must include survey items since they aid in the collection of quantifiable and organized data, particularly in studies pertaining to human behavior, attitudes, or technological adoption.

Variable	No	Items
Perceived Self Efficacy	PSE1	I feel comfortable using ride-sharing services for security purpose
	PSE2	Taking the necessary measures of using ride-sharing service is entirely under my control for security purpose
	PSE3	I have the resources and the knowledge to use ride-sharing services for security purpose
	PSE4	Taking the necessary measures to use a ride-sharing service is easy for security purpose
	PSE5	I can protect myself from unwanted incidents (security issues) of public transport by using a ride-sharing service
Social influence	SI1	I use the ride-sharing services for security purpose, because, as persons who play a vital role in my life want me to use them.
	SI2	I use the ride-sharing services for security purpose, because, as my friends want me to use them
	SI3	I use the ride-sharing services for security purpose, because, as people who are valuable to me recommend me to use them.
	SI4	I use the ride-sharing services for security purpose, because, as people who inspire me are using it.
	SI5	I use the ride-sharing services for security purpose, because, as my family members want me to use it
	SI6	I use the ride-sharing services for security purpose as other persons in my social circle want me to use them.
Attitude	ATT1	Using a ride-sharing service is a good idea for security purpose
	ATT2	Using a ride-sharing service is a wise idea for security purpose

	ATT3	I like the idea of using a ride-sharing service for security purpose
	ATT4	Using a ride-sharing service is a pleasant experience for security purpose
Personal innovativeness	PI1	The latest technologies allow me to work more in lesser time.
	PI2	I am keen to search for the latest technological developments taking place around me.
	PI3	I keep myself up with the latest technological developments which provide better results with fewer efforts.
	PI4	Other people come to me for advice on the usage and benefits of the latest technologies.
	PI5	In general, I am among the first in my social circle to acquire new technology whenever it appears.
Adoption Behavior	AB1	I currently use ride-sharing services for security purpose.
	AB2	I will recommend ride-sharing services to my friends or others for security purpose.
	AB3	Ride-sharing services are my first choice when I need better safety in transport.

Table 4.2 Survey Items

4.2. Data Collection

We used a few purposive sampling techniques to gather data. Only people who were at least eighteen years old had their data collected. residents of Dhaka city, and people who used this system. We used the following questions to select participants for data collection:

- Do you use ride sharing Service?
- Are you above 18 years old?

The last questionnaire could only be filled out by those who selected "yes" for both the first and second questions.An online Google Form survey was used to gather data between October 9, 2024, and February 15, 2025. The minimum sample size was initially calculated using the G*Power 3.1 tool, which determined a requirement of 115 participants. Nonetheless, questionnaires were distributed to 502 individuals via Telegram, Whats-App, Messenger, and email. After then, 429 responses were noted. 355 valid responses were then selected for the research.

4.3 Data analysis and results

For the pre-test and pilot surveys, a total of 10 and 27 individuals were chosen, respectively. To guarantee the accuracy of the contents, the volunteers thoroughly examined the survey's wording and length during the pre-test. They offered insightful criticism and direction to ensure that the material was understood.. In the pilot survey, participants were presented with the revised questionnaire based on the pre-test. Undergraduate students attend various universities in Dhaka, including Daffodil International University, American International University, United International University, Tejgaon College, Eden College and Mirpur Girls Ideal Laboratory institute. Data for the study was only gathered from people who fit certain criteria, like students, potential users, and Dhaka residents.

According to the sample's summarized demographic characteristics in Table 2, the majority of people were between the ages of 26 and 30. In addition, there were 208 men

and 147 women who responded, with 135 of them being unmarried and 220 married. Details are given below:

Variables	Classification	Occurrence
Gender	Male	208
	Female	147
Age	18-25 years	70
	26-30 years	90
	31-35 years	75
	36-40 years	48
	41-45 years	20
	46-50 years	15
	51-55 years	15
	56-60 years	9
	61-65 years	5
	Above 65 years	8
Marital status	Married	220
	Single	135
Academic qualification	No recognized academic degree	11
	SSC or equivalent	12
	HSC or equivalent	38
	Diploma or equivalent	54
	Honors or equivalent	114
	Masters or equivalent	77
	PhD or equivalent	15
	Post Doctorate or equivalent	0
	Others	34

Profession	Don’t work	42
	Public sector	45
	Private sector	56
	Student	89
	Business	81
	Freelancing	28
	Others	14
Ride sharing service usage Experience	Less than 1 year	55
	1-2 years	89
	2-4 years	153
	More than 4 years	0
Preferred ride sharing service	Uber	48
	Pathao	21
	Shohoz Rides	0

Table 4.3 Demographic Characteristics of the Respondents

CHAPTER 5

EXPERIMENTAL RESULTS AND DISCUSSION

5.1 Measurement model Evaluation Criteria

Particularly for assessing measurement models, factor loadings, outer variance extracted, composite reliability, and average variance extracted are frequently employed in SEM or partial least squares SEM (PLS-SEM). A synopsis of each is given below: The degree to which each observable variable accurately reflects the underlying construct is measured by factor loadings. In general, a result of > 0.70 is regarded as satisfactory. Multicollinearity between items is detected using outer VIF. Generally speaking, VIF < 5 is acceptable, while occasionally < 3.3 is seen to be better. The reliability with which a construct's items measure the same underlying notion is indicated by its CR. While a value of 0.80 or more is regarded as desirable, a value of ≥ 0.70 is acceptable. The amount of variance that a construct extracts from its items is indicated by the average variance extracted (AVE). The construct can account for at least 50% of the variance in its indicators if its AVE value is 0.50 or above.

FL, VIF, AVE and CR Values:

Variables	Items	Factor Loadings	Outer VIF Values	AVE Values	Composite Reliability
Adoption Behavior	AB1	0.814	1.514	0.648	0.846
	AB2	0.790	1.385		
	AB3	0.811	1.429		
Attitude	ATT1	0.785	1.532	0.628	0.871
	ATT2	0.815	1.757		
	ATT3	0.789	1.615		
	ATT4	0.781	1.631		
Personal Innovativeness	PI1	0.788	1.713	0.578	0.872
	PI2	0.749	1.644		
	PI3	0.750	1.608		

	PI4	0.752	1.667		
	PI5	0.761	1.629		
Perceived Self Efficacy	PSE1	0.756	1.710	0.603	0.883
	PSE2	0.789	1.969		
	PSE3	0.790	1.804		
	PSE4	0.717	1.872		
	PSE5	0.825	1.951		
Social influence	SI1	0.706	1.480	0.593	0.897
	SI2	0.794	1.969		
	SI3	0.735	1.730		
	SI4	0.778	1.932		
	SI5	0.785	1.964		
	SI6	0.818	2.068		

Table 5.1 Factor Loadings, Outer VIF, CR, and AVE

In a research report, discriminant validity is crucial because the variables (constructs) being measured are genuinely independent of one another. Additionally, it improves the subjectivity of the study and raises the model's correctness.

	AB	ATT	PI	PSE	SI
AB	0.805				
ATT	0.699	0.793			
PI	0.747	0.817	0.760		
PSE	0.680	0.704	0.713	0.776	
SI	0.748	0.759	0.722	0.749	0.770

Table 5.2 Discriminant Validity

	R Square	R Square Adjusted	Q Square
AB	0.655	0.651	0.411
PI	0.711	0.708	0.404

Table 5.3 Structural model: R2 and Q^2

Relationships	f^2 values	Remarks
ATT -> PI	0.419	High effect
PSE-> PI	0.065	Low effect
SI-> PI	0.020	Low effect
ATT -> AB	0.001	No effect
PI -> AB	0.115	Low effect
PSE -> AB	0.014	Very low effect
SI -> AB	0.126	Low effect

Table 5.4 Effect Size

5.2 Moderation: Gender as moderator

According to the moderation study, users' use of ride-sharing services for security is influenced by gender. Attitudes affect men's and women's individual capacity for innovation, even though they do not directly induce adoption behavior. Men's capacity and adoption of innovation are more influenced by social pressure and self-efficacy. However, women are more likely to develop personal innovativeness—which in turn leads to adoption—through social influence. Overall, gender-specific differences in the impact of important variables like attitude, self-efficacy, and social influence support its moderating function.

Relationships	Path Coefficients Original (Men)	Path Coefficients Original (Women)	Path Coefficients Mean (Men)	Path Coefficients Mean (Women)	Stdev (Men)	Stdev (Women)	T-Value (Men)	T-Value (Women)	P-Value (Men)	P-Value (Women)
ATT -> AB	0.038	0.036	0.049	0.038	0.114	0.183	0.336	0.199	0.737	0.843
ATT -> PI	0.524	0.562	0.525	0.560	0.078	0.077	6.752	7.287	0.000	0.000
PI -> AB	0.330	0.382	0.334	0.385	0.140	0.133	2.348	2.884	0.019	0.004
PSE -> AB	0.197	0.031	0.192	0.034	0.091	0.098	2.165	0.312	0.031	0.755
PSE -> PI	0.369	0.031	0.365	0.037	0.084	0.076	4.399	0.402	0.000	0.688
SI -> AB	0.347	0.380	0.339	0.378	0.128	0.205	2.706	1.849	0.007	0.065
SI -> PI	0.023	0.307	0.025	0.306	0.083	0.088	0.275	3.481	0.783	0.001

Table 5.5 Multi group variance results

5.3 Discussion of Findings

The study's findings suggest that social influence and self-efficacy are significant factors in college students' use of ride-sharing services and attitude, all of which contribute to both personal innovativeness and adoption behavior [[61]. The data supports that students who feel confident in their ability to use ride-sharing platforms (perceived self-efficacy), are influenced by peers and societal trends (social influence), and hold a favorable view toward such services (attitude) are more likely to adopt and explore these platforms innovatively[62]. Additionally, personal innovativeness emerges as a strong predictor of adoption behavior, indicating that students who are open to experimenting with new technologies are more inclined to integrate ride-sharing into their routines[63]. These interrelated factors emphasize the dynamic role of psychological and social dimensions in shaping students' intention to adopt ride-sharing services, suggesting that fostering digital confidence and positive perceptions can significantly boost adoption rates among young, tech-savvy users[64].

CHAPTER 6

CONCLUSION AND FUTURE WORK

6.1 Conclusion

Safe and secure transportation is a fundamental need for every citizen, especially in busy cities where hundreds of thousands of people commute daily. Since owning a private vehicle is not feasible for everyone, ride-sharing has gained widespread popularity as a modern, convenient, and relatively safe mode of transportation. However, users of this service often have concerns regarding safety and personal privacy.

However, we have utilized the ASE model—originally used in the healthcare sector—to the transportation sector. In this study, the ASE model has been successfully applied in the context of ride-sharing. *Personal Innovativeness (PI)* has played an important mediating role, influencing adoption behavior (AB) through PSE, ATT, and SI. Although ATT did not have a direct effect, it showed an indirect influence through PI. Gender-based analysis revealed that the effects of PSE and SI vary between men and women. The findings support the ASE model and highlight the importance of trust and innovativeness in promoting digital ride-sharing systems in urban life.

6.2 Contribution for Theory and Practice

By addressing gaps in research on technology adoption in urban transport systems, this study makes several theoretical advancements. Firstly, it is one of the first empirical studies to investigate ride-sharing intentions. The research extends the theoretical scope of the ASE model, originally used in the health sector, to the ride-sharing industry. While models like the TPB (Theory of Planned Behavior) have previously been used to analyze mobility behavior, the ASE model has not yet been widely applied in this domain. One of the fundamental concepts in this study's use of the ASE model is personal innovativeness. Although this concept is usually applied separately, this research integrates it within a unified framework, which is considered a novel theoretical contribution to understanding ride-sharing adoption.

The study concludes by validating the extended ASE model using PLS-SEM analysis, which clearly illustrates how social, psychological, and safety-related factors interact to influence technology adoption. The study also provides important practical guidance for ride-sharing service providers, policymakers, and urban development planners in developing countries like Bangladesh. It highlights that building trust is crucial. This includes implementing transparent fare structures, driver verification systems, and effective customer support. The findings justify policy interventions aimed at fostering trust and innovation in the ride-sharing sector. Governments can formulate appropriate policies focusing on safety, data transparency, and digital inclusion. Socially, an increase in ride-sharing usage can help reduce traffic congestion and air pollution, while ensuring affordable and inclusive mobility for citizens. Promoting this service among the youth can also foster sustainable travel habits.

In conclusion, our research enhances the explanatory power of technology adoption theories and simultaneously offers practical recommendations for developing creative, user-centric, and safe urban transport systems.

6.3 Implication for Further Study

In the context of ride-sharing adoption in Bangladesh, the ASE model is expanded by adding "Personal Innovativeness" as a fresh component, this study has significantly advanced the field. It does have some restrictions, though. First off, the research's sample is limited to Dhaka-based university students, which restricts the findings' applicability to other user demographics or areas of Bangladesh. Since most respondents were young and tech-savvy, their attitudes and behaviors may not represent older or less digitally literate populations [47]; [50]. Furthermore, sampling bias may be introduced by using convenience sampling from particular institutions, such as Daffodil International University, AIUB, etc., which represents the viewpoints of particular socioeconomic and educational groups [56]. Second, while PLS-SEM analysis offered structural insights, it heavily relies on linear relationships and may not adequately capture the complex, nonlinear dynamics of human behavioral patterns [54]. Third, because technology is changing so quickly, the study's cross-sectional survey approach makes it difficult to

determine a causal relationship between ASE model constructs and user behavior [55]. Finally, external variables like infrastructure quality, regulatory changes, and market competition were not included in the model, even if these elements significantly influence the adoption of technology in underdeveloped countries [58]; [51]. The cultural and trust-related elements that significantly impact the uptake of ride-sharing in South Asian populations were not fully investigated, in addition to the "social influence" concept [29]; [46]. Although the study's incorporation of personal innovativeness was novel, it was only examined from one angle. The analysis might have been enhanced by adding sub-dimensions such domain-specific innovativeness [38]. Seventh, the study ignored possible privacy, labor rights, and ethical concerns linked to ride-sharing technologies—subjects that are becoming more and more important in scholarly and policy discussions [10].

Lastly, even though the study talks about machine learning adoption, ML-specific concepts like algorithmic trust and transparency were left out of the behavioral model. This restricts the model's applicability in directing ride-sharing machine learning deployment tactics. In order to overcome these constraints, future research should use mixed-method approaches, diversity the sample, carry out longitudinal analysis, and take macro-level elements like infrastructure and policy into account.

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