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User Behavior Intention Towards E-Hailing Applications

1st Indah Wahyu Utami
Science and Technology Faculty
Duta Bangsa University Surakarta
Indonesia
indah_wahyu@udb.ac.id

2nd Satinder Kumar
School of Management Studies,
Punjabi University Patiala,
India
satinder@pdi.ac.in

3rd Anisha Kannu
Research Scholar, School of Management Studies,
Punjabi University Patiala,
India
anishaKannu@gmail.com

4th Apif Sofyan
Science and Technology Faculty
Duta Bangsa University Surakarta,
Indonesia
apifsofyan11@gmail.com

5th Fioga Zahra Fernando
Science and Technology Faculty
Duta Bangsa University Surakarta,
Indonesia
fiogazfernando@gmail.com

***Abstract*—Technological advancements related to Global Positioning System (GPS) have led to the growth of automated transport systems. The most innovative mode of traveling is a cab/taxi which can be booked through E-hailing apps using a smartphone. The adoption of digital and information technology has brought remarkable change in the expectations and wants of the users significantly. Previous study pointed that effectiveness and usefulness help in impacting the objective to adopt m-commerce. Perceived usefulness affects user adoption of mobile securities services. As already stated, the increasing growth in the adoption of the aggregator model in India has provided profitable opportunities to unorganized taxi operators as well. Thus, the need arises to view the intention of e-hailing application usage and subsequently their effect on the users of these apps. So the objective is to Study the users' behavior intention towards e-hailing applications.**

Keywords—E-Hailing Applications, Convenient, Economical, Safety

I. INTRODUCTION

Technological advancements related to Global Positioning System (GPS) have led to the growth of automated transport systems. The most innovative mode of traveling is a cab/taxi which can be booked through E-hailing apps using a smartphone. E-Hailing applications are technological innovations that aroused in the Taxi industry in recent times.

1.1 E-Hailing Apps

E-hailing apps refer to the advanced mobile applications through which users can send requests to avail transportation facility using the internet as well as geo-location and track the service provided and also make the payments due for the service availed. Such application enables both the driver and the passenger who is searching for cabs/taxis which are available in a given area to identify the location.

1.2 Rising Demand for Cab Services

Indian market of taxi services is showing an annual growth rate of more than 17% during 2016-2021. The need for taxi services in India is increasing rapidly. The major reasons behind this are: changing lifestyles and increasing disposable income of the passengers. Apart from this, people prefer to travel by taxi rather than their own vehicle due to traffic congestion coupled with the easy availability of taxis at a reasonable cost. Such increasing demand can be credited to various innovative and attractive offers such as easy booking with the help of mobile phones, 24×7 customer support, various cash, and online payment options; electronic meters for fare calculation, GPS installed vehicles, etc. In India, Major Service providers are Ola, Uber, Meru Cabs, etc. Such increasing growth in the adoption of E- Hailing applications, it is expected that during next five years the market share of unorganized radio taxi services will decline

REVIEW OF LITERATURE

Lu et al. [1] conducted a research to test the relationships among various latent constructs such as social influences, innovativeness, and aim to adopt wireless technology. 388 MBA students were surveyed in the university in Texas. The survey questionnaire was adopted for data collection. Structural equation modeling analysis showed the high relationships among the personal innovativeness, influences of society and the belief constructs that are easy to use and helpful results in adopting intentions of consumers.

Hallegatte et al. (2006) conducted a research to examine impact of easy to use, perceived usefulness and faith in website on the consumer intention to come back to that website. Firstly an experimental study was conducted in laboratory setting on 110 subjects and was asked to complete all the details of a questionnaire to measure their attitude towards using the website and intention to return to that website. Model fitting was tested by using SEM. The outcomes of research explain the trust in the website directly affects the behavioral intention to return to the website.

Khalifa et al. [2] conducted a survey study in Hong Kong to examine the determinants of adoption of m-commerce with the framework of incorporating well established technology theories, i.e., Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB). A sample of 220 mobile users who did not adopt m-commerce was put into randomly. The analyzes of data is done using Partial Least Square (PLS). The empirical results showed that perceived helpfulness and self- efficacy play a vital role in affecting the behavior of consumers to adopt mobile commerce.

Hong et al. [3] in their model of decomposed theory of planned behavior studied the variables which has effect on behavioral intention of existing customers to use mobile data services. They categorized mobile data services in four parts

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i.e., information content, entertainment, communications and commercial transactions. Their study involved 811 consumers survey by online mode that use mobile data services which was conducted in Hong Kong.

Lu et al. [4] examined in their research the variables influencing adoption of wireless mobile data services (WMDS) in China. Data was collected from 1432 respondents in cities across China using SEM for testing the hypotheses using AMOS. Comparing the said five factors, WMDS technology was found to is the important predictor of belief constructs i.e., usefulness and easy to use were found to have important influence on users usefulness of WMDS but it had no such impact on ease of using it.

Kim et al. [5] in their empirical research analyzed the influence of variables to the intention of various types of users who use mobile for the payments. They researched a m-payment research model. It comprises two types of variables i.e., user-centric factors (m-payment knowledge and personal innovativeness) and four m-payment system characteristics (reachability, mobility, convenience and compatibility).

Li et al. (2011) in the study conducted investigated the variables influencing the users to go for mobile securities services. In their research a model has been developed with the help of TAM. They collected data through 174 valid questionnaires which were got filled from post graduate students of colleges. The data was analyzed using structural equations model (SEM). In their study perceived usefulness was the influential variable affecting user adoption on mobile securities service.

Azadavar, Shahbazi et.al [6] investigated the role of security in consumer's perception towards online shopping. The data was collected from those people who access the internet with use of factor analysis. The outcomes of study showed that trust, price of products, service, consumer's income were the more important factors while purchasing online. While making online transactions security of transactions was the main important factor.

Nardal and Sahin [7] examined ethical problems treat to customer privacy. They also examined how consumer's online buying behavior is being influenced by ethical problems. Ethical problems like security, privacy, reliability limit the growth of online retailing. Online retailers forced to know about the type of privacy protection policies they have to use. Most of the companies adopt strict privacy policies and realized to get success in e-commerce. Ethical issues are vital in e-commerce to maintain secure confident environment.

Peng et al. [8] explains that the development of m-commerce has encountering an expeditious growth while calling taxi-application. They integrated three existing "attitude-intention- behavior" models i.e., TAM, IDT and TPB, and proposed a research model including some external variables are extracted which has an impact on the user's to choose for calling taxi applications.

Questionnaire survey through internet was performed to collect the data of 238 users of call-taxi app in China. The model has been tested using structural equation modeling (SEM). Results demonstrated that the user attitude was indirectly and positively influenced by compatibility, easy to use and usefulness; subjective norm had positive and risk had inverse impact on behavioral intention toward using of taxi app.

Amin et al. [9] conducted an empirical research with a purpose to inspect the influence of customers' perception of helpfulness, easy to use, and trust on their satisfaction with mobile website. The study was conducted in Malaysia with use of Purposive sampling technique to collect data from 302 respondents. The analyses of the study showed that the trust positively affects the customers' satisfaction with mobile services. The relationships between all variables of the study were found to be significant.

Zhou [10] conducted a research in China with the objective of understanding users' behavior in respect to location based services. 278 customers of two telecommunication operators in China were the respondents of the study. For examining the structural model and testing research hypotheses partial least square (PLS) was adopted. The outcomes showed that the perceived usefulness was affected mainly by the ubiquitous connection, whereas trust by the offerings. Trust and privacy issues significantly affect the perceived usefulness.

Manjunath G [11] has come up with a study on Brand awareness and Level of Customers Satisfaction towards OLA cabs in Bengaluru. The objective was to know the level of customer satisfaction towards OLA Cabs with the help of Chi-Square test to analyze the data. The outcome of study was that, OLA is a known mobile application used for transportation in India. It originated with an online cab aggregator in Mumbai and now is based of Bengaluru and is one of the growing businesses in India.

Kumar et al. [12] in their review paper proposed a research model based on TAM to explore the variables which influence the Mobile banking in India. They found the Self efficacy, 24x7 hours availability and Apps compatibility as Ease of Use; Transaction cost & Efficient transaction as the primary factors leading to Perceived Usefulness; and Privacy Risk and Transaction Risk as the leading factors of Perceived Risk towards users' intention of using mobile banking.

P Kishore & N.Ramesh [13] conducted examined the variables Influencing the selection of Cab Services by the consumers. The reliability analysis and Chi-Square test was applied to 120 respondents to test the study on its objectives. The results of the study found that three factors that are as price consciousness; coupon redemption behavior and innovativeness influence the consumers in selection of cab services.

Shukla, Chandra & Jain [14] conducted a study on Ola & Uber. An analysis was done considering various parameters for both the E-Hailing Applications. The result of study concluded that the companies should optimize their costs at all levels and focus should be on being more customer-centric & target oriented. They should be innovative and should keep delighting their customers with the motive of "customer is the king".

V. Hemanth Kumar and K. Sentamilselvan [15] conducted a study which emphasize on the consumer satisfaction in respect to the various brands of taxi service providers in Chennai. The study conducted focuses on the consumer's mindset towards use of call taxi services, comfortness, easy access, proper fare system, promotion, safety and convenience, and satisfaction towards the service quality of the service providers.

Need of Study

The popularity of online booking of taxis through mobile apps is in growth period nowadays. Also the share of organized sector in taxi industry is increasing. As already stated, the increasing growth in the usage of aggregator model

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of Taxi services in India has also provided profitable opportunities to the unorganized taxi operators. With that, it is expected that in coming years the market share of unorganized taxi services will decline. Such increasing demand can be credited to various innovative and attractive offers such as easy booking of cabs with the help of mobile apps, 24×7 customer support, various cash and online payment options, electronic meters for fares, GPS vehicles etc. Therefore, such increasing demand for e-hailing services offers a big challenge to the managers, operators and service providers in this sector to understand the factors that influence e-hailing apps adoption. Thus, the need arises to understand the user behavior intention towards usage of e-hailing applications. So the objective is to Study the user behavior intention towards e-hailing applications.

II. RESEARCH METHODOLOGY

The present study is exploratory research by the means of primary data analysis in which an attempt has been made to explore the behavior intention of E-Taxi users for E-Hailing apps. The respondents were selected from the state of Punjab. With the help of snowball sampling technique data was collected from 185 respondents accessing the E-hailing applications for travelling. Cronbach's alphas, item to total correlation and inter item correlations have been calculated to check the validity and reliability of the variables in the developed scale. Therefore, reliability of the statements extracted which allowed us to proceed further for analysis of the observed data. The data reduced with the help of Exploratory Factor Analysis to check respondent's behavior intention regarding E-hailing Apps.

User Behavior Intention Towards
E-Hailing Applications

The data reduction technique is put into use to find the intention of the respondents regarding E-Hailing Applications revealed specific factors, which define the user behavior. We have explored three factors through twelve statements. These factors are Safety, Economical and Convenient. These factors explain attributes of E-hailing Applications which were significant to the respondents.

In order to conduct factor analysis for user behavior intention towards E-Hailing app scale has been developed with the help of literature. In the initial stage variables were added and subtracted depending upon the requirement of study. For the survey, Likert scale was used with 12 items to be filled by the respondents. After finalization of scale of the items has been tested, the Cronbach alpha reliability is checked.

EFA results

In order to identify the factors influencing the user behavior intention towards E-hailing application data reduction technique was used. Sample adequacy has been done by calculating the KMO value which is .874 and it has been found significant. Researcher recommend after finding KMO adequate, to go for further that is factors analysis. So in present paper after finding the adequacy of sample data reduction technique has been used to find out the factors influencing the intention of user regarding E-hailing application. Depending upon the value of eigenvalue three factors were extracted. Total and cumulative variance as shown in the table 3 has also been calculated to find out the reliability and validity of the data.

The communalities values ranges from .611 to .910 (Table 1). As per (Hair et al., 2009) communalities are >0.5 is which explains the continuity of factor analysis. Hence, all the requirements of uni-dimensionality, reliability and validity and are fulfilled.

Table 1. Scale Reliability Analysis (Behavior Intention towards E-Hailing Apps)

	Initial	Extraction	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	$\bar{x}$	σ
I feel it as a safer mode of transport	1.000	.611	.718	.918	2.11	.846
I think they are reliable	1.000	.707	.740	.917	2.29	.902
I feel they are cost effective	1.000	.889	.518	.926	2.57	.937
I think it as faster means of reaching than other taxi's	1.000	.758	.687	.919	2.40	1.089
I am satisfied with booking of such cabs	1.000	.747	.794	.915	2.23	.945
I feel they provide Door to Door access	1.000	.863	.687	.919	1.86	.822
I feel comfortable with its traceability feature	1.000	.904	.703	.919	1.92	.859
I think it provide at time pick-up and drop	1.000	.887	.736	.918	1.81	.822
I feel it convenient to use	1.000	.881	.696	.919	1.95	.852
I feel it safe during night time	1.000	.910	.763	.916	2.54	1.093
I like to communicate with driver	1.000	.747	.641	.923	2.86	1.237
It is value for money service	1.000	.845	.622	.922	2.56	.852

Pearson's Correlation Solutions

The extent of relationship among the 12 main individualistic variables of E-Hailing Applications is being measured with the help of correlation analysis.

As per the scale, a rating of 5 each is given to 12 items which shows total score as 60.

- The mean score of the respondents was 27.09 (Table 3).
- The mean correlation was .521 and it varies from .258 to .885 with a range .601.

With sufficient correlation among factors we can go ahead with factor analysis.

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Table 2. Correlation Matrix of User behavior intention of E-Hailing Applications

Extraction of Factors

	I feel it as a safer mode of transport	I think they are reliable	I feel they are cost effective	I think it as faster means of reaching than other taxi's	I am satisfied with booking of such cabs	I feel they provide Door to Door access	I feel comfortable with its traceability feature	I think it provide at time pick- up and drop	I feel it convenient to use	I feel it safe during night time	I like to communicate with driver	It is value for money service
I feel it as a safer mode of transport	1.000											
I think they are reliable	.569	1.000										
I feel they are cost effective	.481	.521	1.000									
I think it as faster means of reaching than other taxi's	.319	.681	.341	1.000								
I am satisfied with booking of such cabs	.681	.654	.363	.645	1.000							
I feel they provide Door to Door access	.561	.589	.394	.338	.317	1.000						
I feel comfortable with its traceability feature	.585	.588	.314	.366	.685	.838	1.000					
I think it provide at time pick-up and drop	.504	.491	.437	.443	.373	.845	.855	1.000				
I feel it convenient to use	.485	.494	.339	.348	.382	.812	.885	.847	1.000			
I feel it safe during night time	.547	.755	.314	.344	.740	.363	.435	.431	.411	1.000		
I like to communicate with driver	.545	.624	.343	.645	.593	.286	.387	.285	.359	.778	1.000	
It is value for money service	.511	.449	.733	.438	.383	.446	.463	.434	.336	.439	.422	1.000

With the help of factor analysis the underlying dimensions of E-Hailing Applications are identified. The present loading of factors ranges from .509 to .925 which satisfies the condition of being good as it is of more than 0.5. The factors that are generated have Eigen values falling in the range of 2.008 to 3.896.

Safety (F1)

The factor labeled 'SAFETY' explains 32.463% of the total variance in the analysis. It has 6 variables i.e., Safer mode, Reliable, Faster, Satisfied with booking, safe during night time, communicate with driver. This shows that today's customers are conscious regarding the safety during night time. The scale reliability of the factor is 0.914; loading of factors is from 0.509 to 0.925 and has 3.896 of Eigen Values.

Convienent (F2)

The second factor includes four variables and it is labeled as "Convenient". It includes Door to door access, Traceability feature, at time pick up and drop, Convenient to use. The factor has explained that 32.055% of variance in the data reduction solution. Results reveal that customers are happy with its traceability feature. The scale reliability of this factor is 0.956 and has 3.847 of Eigen Values whereas loading of factor ranges from 0.879 to 0.912.

Table3: Factor analysis results (Varimax rotated results)

	Factors		
	Safety (F1)	Convenient (F2)	Economical (F3)
I feel it safe during night time	.925		
I think it as faster means of reaching than other taxi's	.837		
I like to communicate with driver	.836		
I think they are reliable	.745		
I am satisfied with booking of such cabs	.715		
I feel it as a safer mode of transport	.509		
I feel comfortable with its traceability feature		.912	
I feel it convenient to use		.901	
I feel they provide Door to Door access		.881	
I think it provide at time pick-up and drop		.879	
I feel they are cost effective			.910
It is value for money service			.838
Eigen Value	3.896	3.847	2.008
% Variance	32.463	32.055	16.732
Cumulative % Variance	32.463	64.518	81.250
Scale Reliability alpha	0.914	0.956	0.857

Economical (F3)

The third factor has been named "Economical". It comprise of two variables i.e. Cost effectiveness and value for money service. The analysis shows that the cost effectiveness is the important factor for perception of consumers towards E-Hailing Applications. The factor loading ranges from 0.838 to 0.910. The scale reliability of this factor is 0.857. It covers 2.008 of the Eigen values. The particular factor has shown 16.732% of the total variance in its analysis.

III. Findings And Implications Of Study

The following findings and implications are made:-

- E-Hailing applications are used because of three reasons i.e.:
  - It provides Safety
  - It is Economical
  - It is convenient to use
- Consumers are more concerned about Cost Effectiveness of E-Hailing applications and use its services if it provides economical prices to their customers.
- Consumers are highly satisfied with Traceability feature of E- Hailing Applications such as OLA, UBER. They

feel secure as the Cab is being traced at every point of time.

- Consumers are more conscious about the safety of themselves at night time for using such applications.
- Consumers are happy with door to door access of E-Hailing applications.

Limitations of Study

- The sample size is of 185 respondents, it is a proportion of the entire population who use Taxi services in Punjab.
- The sampling technique is not random because the data is collected only from internet accessing users in cities of Punjab.
- Data collection consist only cities of Punjab that are Jalandhar, Ludhiana and Patiala.

IV. CONCLUSION

From the analysis and discussion the conclusion implies that various factors were extracted which affect the user behavior intention towards use of E-Hailing Applications. This research indicates that people are cost conscious. The influence of E-Hailing applications was greatly on the youth because it provides services at lower cost. But on the other side, some of the respondents did not prefer to go for E-Hailing applications because they considered calling directly the driver as more easy. It is vital to build customer's faith in E-Hailing applications by providing safety and cost effectiveness to its customers for its growth.

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