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ANALYSIS OF ACCEPTANCE ONLINE TRANSPORTATION APPLICATION IN THE RIAU ISLANDS USING THE TECHNOLOGY ACCEPTANCE MODEL

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ABSTRACT

Traffic density in the Riau Islands area is increasing day by day. Population density that has exceeded this threshold causes congestion on the road which causes losses to people who are carrying out activities. As e-commerce grows rapidly, it becomes a push for e-commerce applications that develop in line with the community's need for online application-based services that operate on smartphones. The application of online application-based transportation services that are growing rapidly. One of the factors of this online application-based transportation service innovation is the growing number of internet services offered by internet service providers and more and more internet users, so that the internet becomes a necessity and lifestyle for the community. This research is a development of previous research in examining the factors that influence public acceptance of online transportation applications using the UTAUT2 research model; the current study uses the Technology Acceptance Model research model. This questionnaire was distributed to 400 respondents to the residents of the Riau Islands using Amos and SPSS. The results of the analysis of transportation application online acceptance in Riau Kepulauan using Technology Acceptance Model were seen from the construct of behavioral intention use to attitude toward using is 100%, actual system use to behavioral intention to use is 94.7%, perceived usefulness to perceived ease of use is 80.3%, attitude toward using to perceived usefulness is 47.6% whereas behavioral intention use to perceived usefulness is not effected as positive.

Keywords: *TAM, Transportation Application Online, Information System.*

Introduction

Traffic density in the Riau Islands area is increasing day by day. Population density that has exceeded this threshold causes congestion on the road which causes losses to people who are carrying out activities. Traffic density in the Riau Islands area is increasing day by day. Population density that has exceeded this threshold causes congestion on the road which results in losses for people who are carrying out activities. Online transportation services are the latest advances in internet business assistance where customers can place vehicle orders and at the same time respond to orders through applications that have been installed (Ashoer et al. 2020).

As e-commerce grows rapidly, it becomes a push for e-commerce applications that develop in line with the community's need for online application-based services that operate on smartphones (Hanifurohman 2020).

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With the application of online application-based transportation services, which are growing rapidly, greatly influencing the community through every activity efficiently and quickly (Ramadhan 2020). One of the factors of this online application-based transportation service innovation is that the internet service provider is growing as well as the internet services offered and the increasing number of internet users, so that the internet becomes a necessity and lifestyle for the community (Istiana 2021).

Research on the acceptance of online application-based transportation services has many criteria that must be considered. So we need a method that can assist in the research process of acceptance of online application-based transportation services. Technology Acceptance Model (TAM) is a model in conducting research that aims to conduct research on user behavior when accepting using online transportation applications in the Riau Islands (Gerhana, Irfan, and Slamet 2017).

This research is a development of a previous study entitled Acceptance Factors for Online Transportation Applications in Batam by adopting the UTAUT2 model and the Information System Success model (Siahaan and Legowo 2019). Based on previous research, it was found that the user satisfaction factor had a positive effect on user behavior by 91.2%, while the quality of the system on user satisfaction was 68% (Siahaan and Legowo 2019).

This study wants to analyze the acceptance of online transportation applications using the Technology Acceptance Model method by comparing the UTAUT2 method and the Information System Success Model (Davis, Bagozzi, and Warshaw 1989).

Literature Review

A. Online Transportation

Online Transportation is an internet-based transportation service, every transaction, from ordering, queuing, payment to evaluation of online transportation services. "transportare" Latin for transportation. Trans means passing or next to it, while portare means carrying or carrying. Transportation can be defined as a business that involves moving people and goods from one point to another.

In accessing online transportation applications, users use tools in the form of smartphone, where the application is installed on the user's smartphone. By accessing online transportation applications on smartphones, online transportation passengers no longer have to go to motorcycle taxi stops or wait on the side of the road. In addition, passengers do not need to participate in negotiations, because fares are also determined based on distance traveled in the application.

B. Smartphone

Smartphone is a cellular device that has a capacity where its use and role is almost the same as a computer, and one illustration of the advantages of smart phones from a software point of view is the data access provided by its services. This service can be used for any smartphone so that users can connect to the Internet at any time. On smartphones, this data access service is very useful for chatting, emailing, browsing, ordering food, and shopping online. Smartphones are also not devices that can only SMS, make and receive calls, there is an application center on every smartphone, then smartphones can be used as commercial

media (e-commerce), e-learning facilities and entertainment or game facilities.

C. Technology Acceptance Model

The technology acceptance model is a description of the acceptance of the information system used by the user. Through Davis et al who developed this TAM. Based on the Theory of Reasoned Action (TRA) model, TAM developed TRA by adding 2 main constructs to the TRA model (Gerhana et al. 2017). Perceived usefulness and perceived ease of use are the two main constructs (Davis et al. 1989). Perceived usefulness and perceived ease of use both constructs have an influence on behavior intention to use. Perceived ease of use affects perceived usefulness. The variables used in the Technology Acceptance Model are Perceived usefulness, perceived easy of use, attitude toward using, behavioral intention to use, actual system use (Davis et al. 1989).
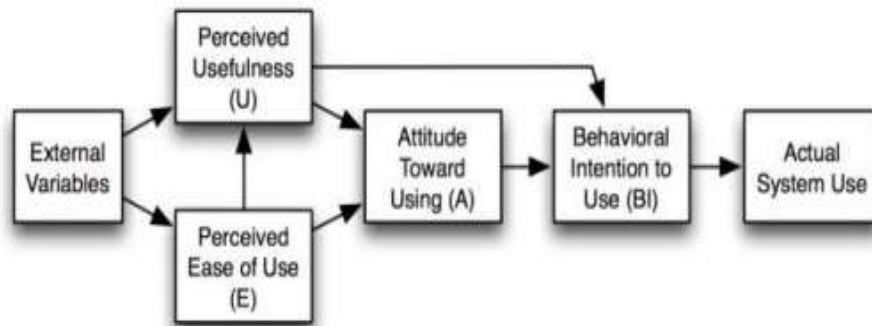

Figure 1. Technology Acceptance Model (Davis et al. 1989)

When using an information system, the perception of perceived ease of use reflects a person's level of trust that is comfortable and does not require much effort.

Perceived usage describes the level of user confidence in using the system which will improve performance. People use information systems and technology because they believe performance will improve.

Attitude to the user's behavior is the first reaction to a favorable or unfavorable state with respect to a particular object.

Behavioral intention is an individual's drive to adopt a certain attitude to continue using a particular technology.

The actual usage is just hard to observe and judge from a list of questions. Actual use can be well estimated using the behavioral intention variable.

Research Methods
A. Research Model

The research carried out utilizes the Technology Acceptance Model research model which includes 5 constructs, namely perceived usefulness, perceived ease of use, attitudes towards use, behavioral interest in using, actual use. The research model of this study will be explained in Figure 2 as below:
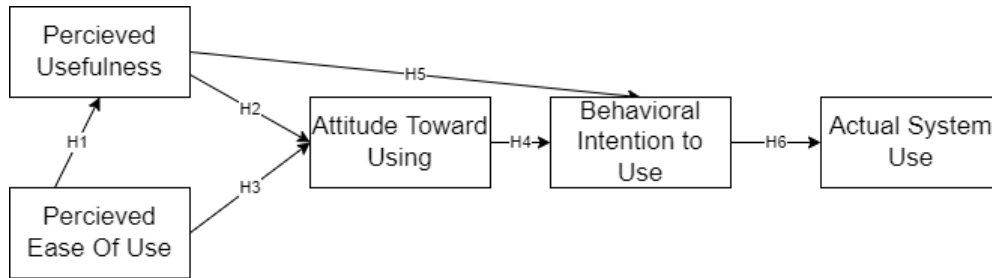
Figure 2. Online Transportation Acceptance Research Model

Based on the picture of the research model above, it produces six hypotheses, with the following hypotheses:

Table 1. Conference on Management Combines

H1	Percieved ease of use will positively affect perceived usefulness
H2	Percieved usefulness will positively affect attitude towards using
H3	Percieved ease of use will positively affect attitude towards using
H4	Attitude toward using will positively affect behavior intention to use
H5	Percieved usefulness will positively affect behavior intention to use
H6	Behavior intention to use will positively affect actual system use

B. Design Of Research Instruments

1) Research Population

The population is the total number of research objects, these objects are usually the objects of attention collected and related to research. The population taken in this study was taken based on the total population of the Riau Islands with the total population in the Riau Islands as much as 206456. This data will be used to calculate the number of respondents (https://kepri.bps.go.id/indicator/12/48/1/jumlah-penduduk.html).

2) Research Sample

The sample is owned by the population on the elements of magnitude and individuality. In the research carried out, the researcher used a sampling technique because of the limitations of the researcher in reaching the entire population of the study. Slovin's formula is sampling that is used to find the number of samples that are in accordance with the research objectives. Slovin's formula in the field of statistics is a formula that is often used to calculate large data populations in the form of surveys.

$$n = \frac{N}{1 + Ne^2}$$

$$n = \frac{2064564}{1 + 2064564 \, (0{,}05)^2}$$

$$n = \frac{2064564}{1 + 2064564 \, (0{,}0025)}$$

$$n = \frac{2064564}{1 + 5161{,}41}$$

$$n = \frac{2064564}{5261{,}41} = 399{,}9 = \text{rounded to } 400$$

Description:
n = sample size
N = population size
e = leniency or inaccuracy due to tolerable sampling error / margin of error

3) Data Collection Technique

Questionnaires are a technique used in data collection. The questionnaires were distributed online by distributing questions using a google form.

4) Data Source

Data is a collection of records of information obtained based on facts that have occurred which can be described with symbols, codes, numbers, and others. Sources of data collected by questionnaires that have been distributed based on the constructs of the Technology Acceptance Model method.

Results and Discussion
A. Data Analysis

This questionnaire is based on examples from various studies. This questionnaire was distributed to 400 respondents from the Riau Islands. The distribution of questionnaires to respondents will start from early July 2021 to September 2021. The distribution of questionnaires is also carried out directly by researchers by distributing URLs or links from google forms that have been created by researchers. Questionnaires that have been filled out by respondents can be processed because they cannot be defective or incomplete.

The following are the characteristics of the respondents based on gender, age, education level, experience using online transportation applications and the city of origin of the respondents.

Table 2. Respondent Characteristics

Category	Type	Total	%
Gender	Man	224	56%
	Woman	176	44%
Age	15-18	59	14.8%
	19-25	225	56.3%
	26-30	58	14.5%
	31-40	58	14.5%
	>40	0	0%
Last Education	Highschool	220	55%
	Diploma	40	10%
	Bachelor	138	34.5%
	Master	2	0.5%
Experience Using Gojek/Grab Application	< 1 Year	14	3.5%
	1-2 Year	143	35.8%
	>2 Year	243	60.7%
Home Town	Batam	173	43.3%
	Tanjungpinang	159	39.7%
	Balai Karimun	68	17%

1) Respondents' Criteria by Age: Based on the age factor of respondents aged 19 to 25 years as many as 225 respondents or 56.3%, followed by respondents aged 15 to 18 years totaling 59 respondents or 14.8%, respondents 26 to 30 years totaling 58 respondents or 14.5% , and respondents from 31 to 40 years, totaling 58 respondents or 14.5%, can be seen as follows.

2) Respondents' Criteria by Gender: Based on gender, the dominant respondents were 224 men or 56%, while the number of female respondents was 176 people or 44%.

3) Respondents Criteria Based on Recent Education: Based on education level, namely high school as many as 220 respondents or 55%, Bachelor as many as 138 respondents or 34.5%, Diploma as many as 40 respondents or 10%, and Master as many as 2 respondents or 0.5%.

4) Respondents Criteria Based on Experience: Based on the experience factor using the Gojek, Grab, and Maxim applications which are less than 1 year as many as 14 respondents or 3.5%, respondents with 1 to 2 years experience 143 people or 35.8%, and respondents with more than 2 years experience totaled 243 people or 60.7%.

5) Respondents Criteria Based on City of Origin: Based on the city of origin, the respondents who came from Batam city were 173 respondents or 43.3%, respondents from Tanjungpinang city were 159 respondents or 39.6%, and respondents from Balai Karimun city were 68 respondents or 17%.

6) Respondents Criteria Based on Occupation: Based on the profession of the respondent, namely students as many

as 205 respondents or 51.2%, private employees 188 respondents or 47%, students 4 respondents or 1%, civil servants 2 respondents or 0.5%, and lecturers 1 respondent or 0.3%.

B. Descriptive statistics

Descriptive statistics are presented with the aim of offering calculations on the data collected to draw general conclusions (Maswar 2017). Through this study, the variables used are perceived ease of use (PEOU), perceived use (PU), attitudes towards the use of online transportation applications (ATU), behavioral intentions to use online transportation applications (BIU), actual system use (ASU).

Table 3. Descriptive Statistics

	N	Min	Max	Mean	Std.D
Total_PEOU	400	14	25	22.94	2.607
Total_PU	400	13	25	22.76	2.625
Total_ATU	400	9	21	18.49	2.163
Total_BIU	400	8	25	22.64	2.938
Total_ASU	400	7	25	22.57	3.064
Valid N (listwise)	400				

1) PEOU construct: The minimum value with a sum of 14, the maximum value with a sum of 25, the mean with a sum of 22.94 and a standard deviation of 2.607. Ease of perception data is shared with the average score (M) and SD. So that the respondent's assessment of the perception ease of use is agreed.

2) PU construct: The results of the descriptive analysis of the variable perception of use obtained a minimum value of 13, a maximum value of 25, the mean with a total of 22.76 and a standard deviation of 2.625. Usage perception data are grouped with the average score

(M) and standard deviation (standard deviation/SD). The number of questions on the perceived ease of use variable is 5 questions with an assessment of honesty in the form of numbers, namely 1,2,3,4 and 5. The respondents' assessment of percieved usefulness is agree.

3) ATU construct: The results of the descriptive analysis of the aptitude for use variable found a minimum value of 9, a maximum value of 21, a mean of 18.49 and a standard deviation of 2.163. Attitudes towards use were grouped with the average score (M) and standard deviation (standard deviation/SD). The number of questions on the attitude variable to use is 5 questions with an assessment of honesty in the form of numbers, namely 1,2,3,4 and 5. The respondents' assessment of attitudes towards use is agree.

4) BIU construct: The smallest value with a total of 8 from the analysis results, the maximum value with a total of 25, the mean with a total of 22.64 and a standard deviation of 2,938. The number of behavioral intention variable questions includes 5 questions with an assessment of honesty in the form of numbers, namely 1,2,3,4 and 5. The respondents' assessment of behavior intention to use is agree.

5) ASU construct: The results of the descriptive analysis of the actual use variable obtained the smallest value with a total of 7, the maximum value with a total of 25, the mean with a total of 22.57 and a standard deviation of 3,064. The actual usage data were grouped into mean (M) and standard deviation (standard deviation/SD) scores. The total

number of actual usage questions is 5 questions with an honesty rating of 1,2,3,4 and 5. The respondents' assessment of actual system use is agree.

C. Reabilitiy Test

Table 4. Reability Test

Variabel	Cronbach's Alpha	Description
Percieved Ease Of Use	0,981	VALID
Percieved Usefulness	0,955	VALID
Attitude Toward Using	0,782	VALID
Behavior Intention To Use	0,969	VALID
Actual System Use	0,927	VALID

Through the explanation of this table, it can be seen that the variables are normal and valid. We can know this from the significance of all variables of perceived ease, perception of use, attitude towards use, intention to use behavior, and actual use which have a significance value above 0.6.

D. Validity Test

The validity test aims to measure whether or not a question questionnaire is valid. This validity test is carried out using the formula, namely the reciprocal relationship of product moment (Wijonarko and Wahyuningsih 2020). r is obtained from the output, and will be continued with a comparison of the values of r tables from book statistics and r tables adjusted to the number of samples that have been determined.

Table 5. Validity Test

Construct	Indicator	R Count	Description
Percieved Ease Of Use	PEOU.1	0,882	Valid
	PEOU.2	0,901	Valid
	PEOU.3	0,904	Valid
	PEOU.4	0,873	Valid
	PEOU.5	0,891	Valid
Percieved Usefulness	PU.1	0,855	Valid
	PU.2	0,871	Valid
	PU.3	0,880	Valid
	PU.4	0,865	Valid
	PU.5	0,895	Valid
Attitude Toward Using	ATU.1	0,906	Valid
	ATU.2	0,901	Valid
	ATU.3	0,125	Valid
	ATU.4	0,125	Valid
	ATU.5	0,809	Valid
Behavior Intention To Use	BIU.1	0,902	Valid
	BIU.2	0,870	Valid
	BIU.3	0,908	Valid
	BIU.4	0,892	Valid
	BIU.5	0,929	Valid
Actual System Use	ASU.1	0,750	Valid
	ASU.2	0,819	Valid
	ASU.3	0,923	Valid
	ASU.4	0,815	Valid
	ASU.5	0,857	Valid

E. Normality Test

The normality test is carried out to ensure that the data used is distributed normally. The normality test using the univariate method is to see the value of skewness in the data is between -2.58 to 2.58 and the kurtosis value is < 7, so the research data used can be declared normal. The data in this study were multivariate with a C.R kurtosis value of $1,998 < 7$.
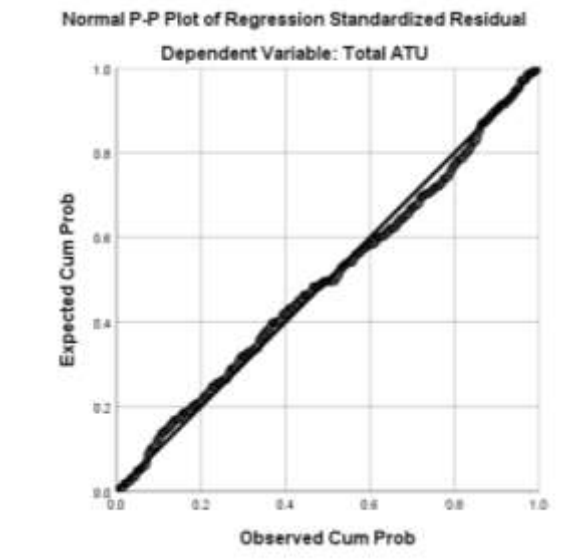
Table 6. Normality Test

Var	Min	Max	Skew	C.r	Kurt	C.r
ASU5	1,000	5,000	-,760	-1,379	,547	2,298
ASU4	1,000	5,000	-,335	-2,309	-,601	-2,525
ASU3	1,000	5,000	-,551	-1,626	,484	2,034
ASU2	1,000	5,000	-,384	-2,225	-,109	-,459
ASU1	1,000	5,000	-,894	-,509	,603	2,531
ASU5	1,000	5,000	-,760	-1,379	,547	2,298
BIU5	1,000	5,000	-,905	-2,200	,811	1,403
BIU4	1,000	5,000	-,551	-1,624	-,476	-1,998

BIU3	1,000	5,000	-,647	-1,436	,020	,085
BIU2	1,000	5,000	-1,144	-2,105	1,360	,908
BIU1	1,000	5,000	-,509	-2,275	-,196	-,822
ATU5	1,000	5,000	-,684	-1,744	,020	,085
ATU4	1,000	5,000	-1,102	-1,249	1,323	1,751
ATU3	1,000	5,000	-,747	-2,271	,425	1,783
ATU2	1,000	5,000	,104	,875	-,322	-1,350
ATU1	1,000	5,000	,082	,690	-,146	-,615
PU5	1,000	5,000	-,130	-1,090	-,286	-1,200
PU4	1,000	5,000	-,996	-2,366	,939	1,940
PU3	1,000	5,000	-,773	-1,493	,830	2,487
PU2	1,000	5,000	-,534	-1,485	,157	,658
PU1	1,000	5,000	-,241	-1,021	-,216	-,908
PEOU5	1,000	5,000	-,754	-2,330	,956	1,015
PEOU4	1,000	5,000	-,545	-,576	,385	1,615
PEOU3	1,000	5,000	-,465	-1,908	,335	1,407
PEOU2	1,000	5,000	-,521	-1,374	1,398	,868
PEOU1	1,000	5,000	-,268	-1,249	,265	1,112
Multivariate					3,775	1,998

Figure 3. ATU Residual Standard

Based on the picture above, the distribution of points in the regression equation ATU $= \beta_0 + \beta_1 X_1 + \beta_2 X_2$ spreads
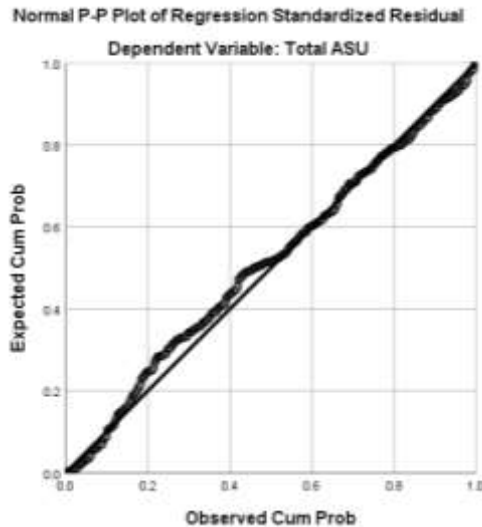
around the line and follows a diagonal line so that the residual value is normal.

Figure 4. BIU Residual Standard

Based on the picture above, the distribution of points in the regression equation BIU $= \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$ spreads around the line and follows a

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diagonal line so that the residual value is normal.

Figure 5. ASU Residual Standard

Based on the picture above, the distribution of points in the regression equation ASU $= \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4$ spreads around the line and follows a diagonal line so that the residual value is normal.

F. Hypothesis Test

1) SPSS Hypothesis: Simple linear regression analysis is used to measure the statistical relationship that occurs between 2 variables, namely the independent variable and the dependent variable [9]. The correlation coefficient (r) of perceived ease of use is 0.925 > 0.098 and a significance of 0.000 < 0.005. The conclusion includes that the perceived convenience variable has a significance with the perceived use variable.

Table 7. SPSS Test Result

Hipotesis	Pearson Correlation	Sig.(2-tailed)	N
PEOU -> PU	0,925	0.000	400
PU -> ATU	0,78	0.000	400
PEOU -> ATU	0,698	0.000	400
ATU -> BIU	0,811	0.000	400
PU -> BIU	0,902	0.000	400
BIU -> ASU	0,892	0.000	400

a. The correlation coefficient (r) of perceived ease of use is 0.925 > 0.098 and a significance of 0.000 < 0.005.

b. The correlation coefficient (r) of perceived usefulness on attitudes toward behavior is 0.780 > 0.098 and a significance of 0.000 < 0.005.

c. The correlation coefficient (r) of perceived ease of attitude toward behavior is 0.698 > 0.098 and a significance of 0.000 < 0.005.

d. The correlation coefficient (r) of attitude towards behavior towards behavioral intention to use is 0.811 > 0.098 and a significance of 0.000 < 0.005.

e. The correlation coefficient (r) of perceived usefulness on behavioral intentions on use is 0.902 > 0.098 and a significance of 0.000 < 0.005.

f. f. The correlation coefficient (r) of behavioral intention on actual system use is 0.892 > 0.098 and a significance of 0.000 < 0.005.

2) AMOS Hypothesis: Testing the amos hypothesis, namely Structural Equation Modeling is a statistical analysis

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method that uses a structural approach to solve problems or phenomena that arise [10]. SEM is used by comparing the critical ratio (CR) and probability (P) values resulting from data processing with the required statistical limits, with CR values above 1.96 and

P values below 0.05 having to be analyzed (probability). If the results of data processing are in accordance with the requirements, then the proposed hypothesis in the study can be accepted.
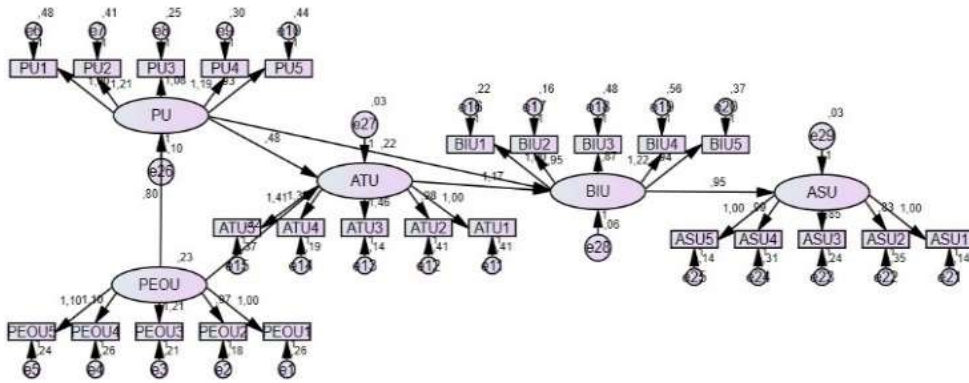
3)

Figure 6. SPSS Amos Graph Results

Table 7. SPSS Test Result

No	Hypothesis	Estimate	S.E.	C.R.	P	Description
1	PEOU -> PU	0,803	0,084	9,540	***	Have a Positive Influence
2	PU -> ATU	0,476	0,077	6,177	***	Have a Positive Influence
3	PEOU -> ATU	0,319	0,066	4,807	***	Have a Positive Influence
4	ATU -> BIU	1,166	0,171	6,836	***	Have a Positive Influence
5	PU -> BIU	0,223	0,118	1,89	0,59	**Has No Positive Influence**
6	BIU -> ASU	0,947	0,049	19,269	***	Have a Positive Influence

a. The CR value of perceived ease of use is 9.540 > 1.96 and the P value is 0.000 < 0.05. The results of these two values indicate that there is a positive effect of perceived ease of use on perceptions of use. Thus, it can be concluded that hypothesis 1 of this study is accepted. The result of the contribution given by the perception of convenience to the perception of use is 0.803 for each unit.

b. The CR value of perceived use of attitudes towards behavior is

6.177 > 1.96 and the P value is 0.000 < 0.05. The results of these two values indicate that there is a positive influence of perceived usage on attitudes towards behavior. Thus, it can be concluded that the hypothesis 2 of this study is accepted. The result of the contribution given by the perception of use on attitudes towards behavior is 0.476 per unit.

c. The CR value of perceived ease of attitude towards behavior is 4.807 > 1.96 and the P value is 0.000 < 0.05. The results of these two values indicate that there is a positive influence of perceived ease on attitudes towards behavior. Thus, it can be concluded that hypothesis 3 of this study is accepted. The result of the contribution given the perception of ease of attitude towards behavior is 0.319 per unit.

d. The CR value of attitude towards behavior on behavioral intentions on the use of 6.836> 1.96 and P value of 0.000 <0.05. The results of these two values indicate that there is a positive influence of attitude on behavior on behavioral intentions on usage. Thus, it can be concluded that hypothesis 4 of this study is accepted. The results of the contribution given by the attitude towards behavior towards behavioral intentions on the use of 1.166 each one unit.

e. The CR value of perceived ease of use of behavioral intentions is 1.89 < 1.96 and the P value is 0.059 < 0.05. The results of these two values indicate that there is no positive effect of perceived ease of use on behavioral intentions on usage.

f. The CR value of behavioral intention on actual use is 19.269 > 1.96 and P value is 0.000 < 0.05. The results of these two values indicate that there is a positive influence of behavioral intention on actual use. Thus, it can be concluded that the hypothesis 6 of this study is accepted.

Based on a previous study entitled the factors that influence the acceptance of transportation applications in Batam City using the UTAUT2 model and the Information Success Model, the results of the user satisfaction variable (user satisfaction) on behavioral intention (user behavior) yield a value of 91.2%, and the quality of the system to user satisfaction by 68%. Meanwhile, according to research using the Technology Acceptance Model, the Behavioral Intention to Use (User Behavior) variable has a positive effect on Actual System use by 94%, and the Attitude toward using (user attitude) variable on Behavioral Intention to Use (User Behavior) by 100%.

Conclusions

This study aims to analyze the acceptance of online transportation applications in the Riau Islands using the Technology Acceptance Model (TAM). The variable consists of 5 main constructs in TAM such as perceived ease of use, perception of use, attitudes towards behavior, behavioral intentions towards use, actual use. According to the results of the study obtained

a hypothesis H_1, H_2, H_3, H_4 dan H_6 accepted, while hypothesis H_5 is rejected.

1. The variable perceived ease of use has a positive effect on perceived usefulness in using online transportation applications by 80.3%.
2. The perceived usefulness variable has a positive effect on attitude toward using in using online transportation applications by 47.6%
3. The perceived easy of use variable has a positive effect on attitude toward using in using online transportation applications by 31.9%
4. Attitude toward using variable has a positive effect on behavioral intention to use online transportation applications by 100%.
5. The perceived usefulness variable does not have a positive effect on behavioral intention to use on the actual system use of online transportation applications

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