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## Article

# Online bike: Role of perceived technology, perceived risk, and institution-based trust on service usage via online trust

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## MARKETING | RESEARCH ARTICLE

# Online bike: Role of perceived technology, perceived risk, and institution-based trust on service usage via online trust

Lilik N. Yuliati<sup>1\*</sup>, Hasdevi A. Dradjat<sup>2</sup> and Megawati Simanjuntak<sup>2</sup>

**Abstract:** This research aimed to analyze the effect of perceived technology, perceived risk, and institution-based trust on online trust and service usage of online bike-sharing services in Indonesia. As many as 200 respondents were chosen through systematical random sampling techniques. The data obtained were processed using descriptive method and structural equation modeling (SEM) through LISREL 8.7 software. The findings revealed that online trust were predicted by the perceived technology (path coefficient = 0.44; t-value = 11.27) and institution-based trust (path coefficient = 0.73; t-value = 15.47). However, the effect of perceived risk on online trust was not evident (t-value = 1.73). The service usage was determined by the perceived technology positively (path coefficient = 0.55; t-value = 11.25), perceived risk (path coefficient = -0.06; t-value = 3.56), and online trust (path coefficient = 0.05; t-value = 2.02). Also, perceived technology (path coefficient = 0.03; t-value = 2.05) and institution-based trust indirectly affected service usage via online trust (path coefficient = 0.04; t-value = 1.99). The Implications for experts and the governments as well as suggestions for future research are discussed.

**Subjects:** Business, Management and Accounting; Management of Technology & Innovation; Marketing

**Keywords:** online bike; perceived technology risk; service usage; trust



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### PUBLIC INTEREST STATEMENT

Under the growing presence of online-bike sharing service in Indonesia, consumers are facing numerous service providers to evaluate and choose from. To improve the service usage of online-bike sharing, consumer-perceived quality is an important determining factor. This paper provides information on consumer-perceived technology, perceived risk, and online trust toward the big three online-bike sharing companies in Indonesia, and how these factors affect consumer service usage behavior. The findings will be drawn to practical suggestions and implications for the company to improve its service as well as the government to regulate the online-bike sharing activity in Indonesia.

## 1. Introduction

Traffic congestion issue has always been a challenge for many government, especially in a developing country like Indonesia. One effective solution to solve traffic congestion is by utilizing bike-sharing, which enables the public to avoid traffic jams. Recently, the bike-sharing method has been evolved, adding online access to its process. Online bike-sharing has been a great breakthrough in public which enables people to order bike-sharing transport in a single touch. In 2015 alone, online bike-sharing users had reached over eighteen million (Wardhana & Konadi, 2015).

In Indonesia, several online bike-sharing service providers have been established, such as Gojek, Grab, BluJek, TopJek, Jeger, LadyJek, and many more. However, this research will be focused only on three providers, which are Gojek, Grab, and Uber. These three providers were chosen based on public ratings surveyed by the Indonesian Consumers Foundation (Indonesian Consumers Foundation, 2017), which rated Gojek as the first public choice (72.6%), followed by Grab (66.9%), and Uber (51%).

Online bike-sharing rises through public popularity for many reasons, such as cost-saving (84.1%), fast transport time (81.9%), comfort (78.8%), and safety (61.4%). Theoretically, these reasons are closely related to service encounter needs theory (Lovelock & Wirtz, 2011; Rahman et al., 2019). Service encounter is the actual direct interaction between customer and service provider and their evaluation of the service quality to their expectation. Before this direct interaction occurred, online trust becomes an important factor. This is due to the absence of direct physical interaction between customers and drivers in the bike ordering process. The online trust itself can be defined as customers' positive attitude or faith to a certain online brand.

Even though 77.7% of customers responded positively to online bike-sharing services, several customers expressed their disappointment. Based on the Indonesian Consumers Foundation (2017), these disappointments could be based on three categories, which are technology, risk, and trust. Technology-based disappointment involved factors such as difficulties to get a driver (22.3%) and broken map application (13.11%). On risk-based disappointment, bad vehicle conditions (6.04%) and bad driving habits (4.73%) become prominent factors. Meanwhile, on trust-based disappointment, driver dishonesty (5.03%) and driver stubbornness (2.89%) were the main concern.

This disappointment issue has raised quite a concern to online bike-sharing service providers. Therefore, a good perceived quality on technology, risk, and trust can be defined as the important determining factor to bike-sharing service usage. Good perceived technology will increase customer trust to use a bike-sharing service. Perceived ease of use and perceived usefulness in the apps are believed to be the determinant factors on perceived technology (Heryani et al., 2020). In a study conducted by Kamarulzaman (2007), perceived ease of use and perceived usefulness could build up online trust as well as increase the perceived usefulness of e-commerce.

Perceived risk in the online service can be reduced by online trust because the perceived risk is a strong trust antecedent (Mukherjee & Nath, 2007). Chen and Barnes (2007) stated that perceived risk positively influenced online trust in electronic commerce. Meanwhile, trust disappointment is related to institution-based trust, one of determinant in online trust. The concept of institution-based trust proposed by Chao (2008) represents the beliefs held by consumers about favorable conditions, in which they feel safe, assured, and comfortable with the prospect of depending on the business. Ghoreishi and Mohammadi (2015) concluded that high institution-based trust would increase customer online trust in using online services.

Perceived technology, perceived risk, and online trust are allegedly believed to affect service encounters. The applied technology by the providers has to make customers more comfortable using the service. Amajida (2016) concluded that technology in online bike-sharing applications enabled the public to overcome uncertainty in public transportation risk. However, the online bike-sharing usage still could not avoid physical transportation risks such as a traffic accident. Data

from the Directorate of Traffic of Jakarta Metropolitan Police (2014) showed that between 2010 and 2014, over 50% of traffic accident was caused by motorcycle. Despite this risk, online bike-sharing services still become the most popular transportation mode. The lower the accident risk, the service encounter will increase proportionally. Fadare (2016) stated that perceived risk significantly and negatively affected online service usage.

According to Alsajjan and Dennis (2010), trust can play an important role in boosting the level of adoption among online customers, including service usage. Trust is an assessment made by the online consumer regarding the trustworthiness of the electronic vendor. Therefore, trust is a very important factor in determining the success of an online website or application including online bike applications.

According to the phenomenon stated above, the research questions are as below:

- (1) How is the online bike-sharing service usage?
- (2) How do the perceived technology, perceived risk, and institution-based trust affect consumers' online trust?
- (3) How do the perceived technology, perceived risk, and online trust affect the online bike-sharing service usage?
- (4) What are the managerial implications that can be applied in managing online bike marketing activities?

## 2. Literature review

### 2.1. Predictors of the online trust

#### 2.1.1. Perceived technology

The perceived technology variable that is derived from the Technology Acceptance Model (TAM) suggests that perceived usefulness and perceived ease of use are the two main components of the TAM (Teo & Liu, 2007). The study indicating the effect of perceived technology on the formation of trust in electronic commerce has been proven. In a study conducted by Constante et al. (2011), well-perceived technology showed in application or website could increase feelings of trust in the group of customers, while on the other hand, bad perceived technology showed in application or website could reduce the users' feeling of trust.

Therefore, Kamarulzaman (2007) argued that perceived ease of use could build up online trust as well as increase the perceived usefulness of e-commerce. Research by Ling et al. (2011) concluded that there was positive significant effect of perceived technology on customer's online trust.

Hypothesis 1: Perceived technology has a significant effect on online trust.

#### 2.1.2. Perceived risk

Kotler and Kevin (2009) defined factors related to risks are (1) financial risk; (2) performance risk; (3) psychological risk; (4) time risk; (5) social risk; and (6) physical risk. In this research, the social risk is excluded from the perceived risk dimension, since on online transactions, there is no physical interaction between customers and providers. Distrust and risk are natural factors and they are sometimes invisible in guarantees and agreements (Grabner-Kräuter & Faullant, 2008). Recent research indicates that trust has a critical influence on users' willingness to engage in online in case of perceived risk (Alsajjan & Dennis, 2010). Chen and Barnes (2007) described that perceived risk positively influenced initial trust in electronic commerce. Mukherjee and Nath (2007) argued that there was a positive relationship between perceived risk and trust in online retailing. According to Grabner-Kräuter and Faullant (2008), perceived risk had a significant influence on user intention to use online service and could also influence the online trust. However, some

scholars do not support these arguments. Gurung (2007) concluded that perceived risk did not affect online trust in e-commerce. In conclusion, there is no consensus in the extant literature in determining the relationship between perceived risk and online trust.

Hypothesis 2: Perceived risk has a significant effect on online trust.

### 2.1.3. *Institution-based trust*

According to Chao (2008), institution-based trust is one determinant affecting online trust. The institution-based trust itself consists of perceived security and perceived privacy. Perceived security could be defined as a consumer's perception of protection from an online threat such as illegitimate cyber transaction and data invasion to one's account. Kooli et al. (2014) indicated that there was a significant impact of institution-based trust on online trust. A study conducted by Wang (2012) concluded that institution-based trust was a strong antecedent towards online trust. Research by Ghoreishi and Mohammadi (2015) and Chao (2008) showed that institution-based trust became one determinant factor that positively and significantly affected online trust.

Hypothesis 3: Institution-based trust has a significant effect on online trust.

## 2.2. *Predictors of the service usage*

### 2.2.1. *Perceived technology*

According to Lovelock and Wirtz (2011), there are three steps to service usage behavior. These steps include prepurchases, service encounters, and post-encounter. These steps are commonly used to understand how consumers identify their needs, finding an alternative solution, choosing, encountering the services, and evaluating the experience from said services. Ha and Stoel (2008) suggested perceived technology as a major factor in determining online purchase intentions.

According to Safeena et al. (2011), the factors influencing the consumer's adaption of using online internet banking in India and hence investigates the influence of perceived usefulness, perceived ease of use and perceived usefulness. According to Amin (2007), perceived usefulness and perceived ease of use were the factors that affected the adaption of online services include internet banking. A user who has a higher perceived technology are likely to have more positive service usage (Amin, 2009).

Hypothesis 4: Perceived technology has a significant effect on service usage.

### 2.2.2. *Perceived risk*

Research regarding perceived risk has always been an interesting subject to study. Perceived risk was found to negatively and significantly influence the service usage of airlines (Putri, 2012). Findings revealed by Fadare (2016) showed that perceived risk such as performance risk, social risk, time risk, financial risk, and security risk negatively influenced intention towards the use of internet banking. The study conducted by Reddy (2012) showed that perceived risk negatively and significantly influenced service intention of internet banking. The difference in this research from previous research was the perceived risk dimension including financial risk, performance risk, physical risk, time risk, and psychological risk since it is considered to be the most relevant aspect.

Hypothesis 5: Perceived risk has a significant effect on service usage.

### 2.2.3. *Online trust*

Research by Goudarzi et al. (2013) stated that trust had a positive effect on the adoption of service, including internet banking. According to Alsajjan and Dennis (2010), trust can play an important role in boosting the level of adoption among online customers. Trust is an assessment made by the online consumer regarding the trustworthiness of the electronic vendor. Trust can be defined as

a user's confident belief in a company's honesty toward the user. Consumer's trust in their online transactions is important and has been identified as a key to the development of the system (Al-Somali et al., 2009; Goudarzi et al., 2013). Meanwhile, there was a positive significant effect of trust on usage behavior (Ling et al., 2011; Simanjuntak, Putri et al., 2020). Even though previous research about online bike-sharing had been conducted, this research becomes a more complex study since involving three online bike-sharing service providers.

Hypothesis 6: Online trust has a significant effect on service usage.

Based on the discussions and evidence from the prior studies, we developed the conceptual framework which is presented in Figure 1.

### 3. Methodology

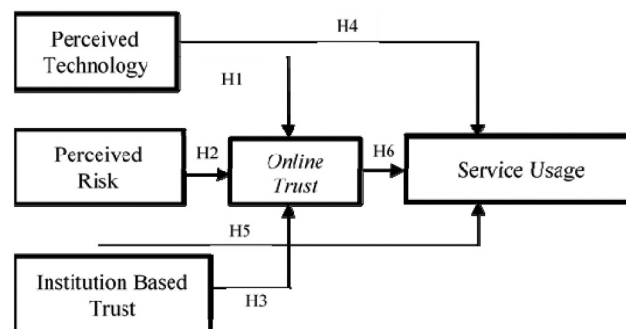
#### 3.1. Measurement instrument

The extensive literature review based on the previous studies in the area of online bike inclined concept helped in developing the survey instrument for the current research. Based on this, we have developed five constructs or latent variables and some observable items to measure each construct. The first construct or latent variable was perceived technology which was measured with the help of two dimensions such as perceived ease of use and perceived usefulness. The second construct was perceived risk which was measured with the help of five dimensions where the respondents were asked about financial risk, performance risk, physical risk, time risk, and psychological risk. The third construct or latent variable was institution-based trust, a strong determinant of online trust. Institution-based trust was measured with the help of two dimensions such as perceived security and perceived privacy. The other two constructs were online trust and service usage. In the study final set of 38 items after pre-testing on 34 respondents was made. The purpose of the pre-testing was necessary to improve the quality in terms of suitability and lucidity of the questionnaire. Almost all the questions were measured on a five-point Likert-type scale which ranges between 1 and 5 where 1 stands for "strongly disagree" and 5 is for "strongly agree," except the questions for service usage. The questions for service usage were measured on a 3-point Likert where 1 stand for "seldom," 2 stands for "usually" and 3 stands for "always." The final questionnaire was divided into two broad sections. The first section was about the demographic characteristic of the respondents and vehicle ownership. In the next sections, respondents were asked about their experience related to the online bike.

##### 3.1.1. Sampling design and data collection

The sampling method used in this research was the systematical random sampling technique. Respondents were determined using the kish grid approach. This method was commonly used in marketing research, especially on the household survey. The research sample size was 200 people from the subdistrict of North Bogor, Bogor City, West Java, Indonesia who were collected at the

Figure 1. Conceptual framework.





household level. Data were collected using a structured questionnaire and self-reported under the supervision of the researcher. Aside from self-report, the researcher also directly interviewed respondents for any unclear questions. Data were processed descriptively using the SPSS 24 and research models were developed through the Structural Equation Modelling (SEM) using the LISREL 8.7. In addition, the independent sample t-test was conducted to test the statistical difference of each variable between male and female respondents. The summary of the constructs and the measurement items is presented in Table 1.

## 4. Results

### 4.1. Descriptive analysis of respondent characteristics and research variables

The demographic and vehicle ownership of the samples are shown in Table 2. The research samples was dominated by women with over 70% of the total respondents. Almost half of the samples was in the age range of 15–24 years old. Majority of the samples had a bachelor's degree (58.5%) and the occupation of the university student (39%). Monthly expenditures of the samples were dominated by more than Rp3,000,001 (28%). The vehicle ownership was dominated by motorcycle (37.5%).

Descriptive analysis of the gender difference of all research variables is shown in Table 3. The independent sample T-test was conducted to test the statistical difference of each variable between male and female respondents. Based on the analysis, female ( $M = 72.57$ ) in average reported slightly higher scores of perceived technology than male ( $M = 71.01$ ), but the difference was not significant ( $p > 0.05$ ). On the contrary, male respondents ( $M = 45.45$ ) showed higher perceived risk scores than female respondents ( $M = 40.93$ ), and the gender difference was significant ( $p < 0.05$ ).

In terms of trust, both female and male respondents showed better institution-based trust than online trust. Based on gender differences, male respondents ( $M = 72.68$ ) reported higher scores of institution-based trust than female respondents ( $M = 69.11$ ). Meanwhile, for online trust, female ( $M = 63.33$ ) reported higher scores than male ( $M = 59.84$ ). Both trust variables did not show any significant gender differences. Finally, female in this study ( $M = 60.22$ ) showed more online bike service usage than male ( $M = 53.06$ ). A statistically significant gender difference was evident in the online bike service usage ( $p < 0.05$ ), that supported by. Several researches showed that gender associated with behavior (Hartatin & Simanjuntak, 2016; Jeddawi et al., 2019; Simanjuntak, 2019; Simanjuntak & Dewantara, 2014; Simanjuntak, 2020; Simanjuntak & Musyifah, 2016).

### 4.2. Online bike service usage

This research investigated the big three online bike-sharing service providers in Indonesia, namely Gojek, Grab, and Uber. The online bike service usage of the research samples are presented can be seen in Table 4. The majority of online bike-sharing users used Grab (96%), followed by Gojek (89.5%), and lastly Uber (56.5%). Seldom usage frequency was dominated by Uber (66.4%) whereas frequent (46.9%) and always (12.5%) frequency usage were dominated by Grab. The majority of Uber users paid on cash (96.5%), meanwhile 3 out of 10 Gojek users paid on non-cash (33.5%). The majority of Grab users gave a rating as feedback to drivers (84.9%) whereas only 16.2% of Gojek user and 4.4% of Uber users gave rating and comments as feedback.

Every respondent had reasons for choosing certain online bike-sharing service providers, which were divided into seven categories: price, ease of access, comfort, security, promotion frequency, payment method, and driver. The rating of the reason for choosing Gojek was price, promotion frequency, comfort, security, ease of access, driver, and payment method. Meanwhile, the rating of choosing Grab and Uber were price, promotion frequency, comfort, security, driver, and payment method.

### 4.3. Model fit

The structural equation modeling (SEM) was applied to examine the proposed conceptual research framework. The level of fitness evaluation model was done based on several stages, including (1) overall model fit; (2) measurement model fit; (3) structural model fit.



**Table 1. Latent variables and observable items**

Latent variable	Observable item
<p><b>Perceived Technology (PT)</b>, the questions about the ease of use and usefulness of the application</p>	<p><b>Perceived Ease of Use (PEU)</b> (Alsajjan &amp; Dennis, 2010; Yiu et al., 2007):</p> <ul style="list-style-type: none"> <li>• The ease of download the application (PTPE1)</li> <li>• The ease of installing process (PTPE2)</li> <li>• The Indonesian language service (PTPE3)</li> <li>• The ease of reservation process (PTPE4)</li> </ul> <p><b>Perceived Usefulness (PU)</b> (Alsajjan &amp; Dennis, 2010; Amin, 2009):</p> <ul style="list-style-type: none"> <li>• Helps to determine the unknown location (PTPU1)</li> <li>• Helps to track the current location of the driver (PTPU2)</li> <li>• Support high mobility (PTPU3)</li> <li>• Help to determine the information of rush hour (PTPU4)</li> </ul>
<p><b>Perceived Risk (PR)</b>, the questions about the risk of using the online bike</p>	<p><b>Financial Risk (FR)</b> (Kotler &amp; Kevin, 2009):</p> <ul style="list-style-type: none"> <li>• The price considered to be expensive (PRF1)</li> <li>• Additional charges during peak hours (PRF2)</li> <li>• Do not know the information about promotion (PRF3)</li> </ul> <p><b>Performance Risk (PR)</b> (Kotler &amp; Kevin, 2009):</p> <ul style="list-style-type: none"> <li>• Constrained by the weather (PRP1)</li> <li>• The bike is no longer appropriate to use (PRP2)</li> <li>• Causing delayed work (PRP3)</li> </ul> <p><b>Physical Risk (PhR)</b> (Kotler &amp; Kevin, 2009):</p> <ul style="list-style-type: none"> <li>• Negative effects on health (PRPH1)</li> <li>• Traffic accidents (PRPH2)</li> <li>• Direct vehicle emission (PRPH3)</li> </ul> <p><b>Time Risk (TR)</b> (Kotler &amp; Kevin, 2009):</p> <ul style="list-style-type: none"> <li>• Long time required to order by the mobile app (PRT1)</li> <li>• Long time waiting for the estimated time of the arrival (PRT2)</li> <li>• Long time riding an online bike (PRT3)</li> </ul> <p><b>Psychological Risk (PsR)</b> (Kotler &amp; Kevin, 2009):</p> <ul style="list-style-type: none"> <li>• The uncomfortable feeling caused by riding an online bike (PRPS1)</li> <li>• The anxious feeling caused by riding an online bike (PRPS2)</li> <li>• The scared feeling caused by riding an online bike (PRPS3)</li> </ul>
<p><b>Institution-based Trust (IBT)</b>, the questions about the trust to the driver and company</p>	<p><b>Perceived Security (PS)</b> (Chao, 2008; Kooli et al., 2014):</p> <ul style="list-style-type: none"> <li>• Safety transaction (IPS1)</li> <li>• Clear identification of the driver (IPS2)</li> <li>• Good track record of the driver (IPS3)</li> <li>• Trust issue according to the punishment for undisciplined drivers (IPS4)</li> </ul> <p><b>Perceived Privacy (PP)</b> (Chao, 2008; Kooli et al., 2014):</p> <ul style="list-style-type: none"> <li>• Willingness to put personal information (IPP1)</li> <li>• Personal information will be safe (IPP2)</li> <li>• Will not give personal information to the third party (IPP3)</li> </ul>
<p><b>Online Trust (OT)</b>, the questions about trust in general</p>	<p>(Ling et al., 2011; Goudarzi et al., 2013)</p> <ul style="list-style-type: none"> <li>• Honest information offered (OT1)</li> <li>• Trusted ride (OT2)</li> <li>• Trust in providing information while interacting with the drivers (OT3)</li> </ul>
<p><b>Service Usage (Y)</b>, the questions about the usage of online bike</p>	<p>(Lovelock &amp; Wirtz, 2011)</p> <ul style="list-style-type: none"> <li>• Traveling during peak hours (Y1)</li> <li>• Online bike as a public transportation option (Y2)</li> <li>• Using cash payment method (Y3)</li> <li>• Giving rating after driving (Y4)</li> <li>• Using the online bike on own initiative (Y5)</li> </ul>

**Table 2. Demographic and vehicle ownership summary of the respondents**

<b>Variable</b>	<b>N</b>	<b>Percentage (%)</b>
<b>Gender</b>		
Male	62	31.0
Female	138	69.0
<b>Age</b>		
15–24	93	46.5
25–35	71	35.5
36–45	20	10.0
46–55	11	5.5
> 55	5	2.5
<b>Education</b>		
Junior high school	12	6.0
Senior high school	47	23.5
Diploma	9	4.5
Undergraduate	117	58.5
Postgraduate	15	7.5
<b>Occupation</b>		
Student	21	10.5
University student	78	39.0
Housewife	9	4.5
Professional	6	3.0
Entrepreneur	12	6.0
Others	74	37.0
<b>Expenditure per month</b>		
≤ Rp700,000	25	12.5
Rp700,001—Rp1,000,000	27	13.5
Rp1,000,001—Rp1,500,000	25	12.5
Rp1,500,001—Rp2,000,000	26	13.0
Rp2,000,001—Rp3,000,000	41	20.5
≥ Rp3,000,001	56	28.0
<b>Vehicle ownership</b>		
Car	36	18.0
Motorcycle	75	37.5
Bicycle	4	2.0
Car and motorcycle	38	19.0
Car, motorcycle, and bicycle	9	4.5
None	38	19.0

The results of the overall model fit are presented in Table 5. Each index value met the good fit requirements so that the research model was considered feasible. The results obtained after the re-verification indicate that the results of the overall model fit test fell in the good fit category. Although two parameters (Chi-square and p-value) fell in poor fit, the model was classified as good fit as the majority of the parameters met the requirements.

Based on the analysis, the observable item Y3 did not meet the loading factor requirement  $\geq 0.5$ , thus the respecification process had to be conducted. The measurement model of SEM is shown in Figure 2.

**Table 3. Research variables based on gender**

Variable	Female (n = 138)		Male (n = 62)		p-value
	Mean	SD	Mean	SD	
Perceived Technology	72.57	10.26	71.01	9.90	0.309
Perceived Risk	40.93	11.23	45.45	12.86	0.013*
Institution-based Trust	69.11	13.10	72.68	13.26	0.080
Online Trust	63.33	13.19	59.84	12.64	0.077
Service Usage	60.22	19.87	53.06	20.45	0.023*

Note. \*) Significant at  $p < 0.05$

**Table 4. Online bike service usage**

No.	Aspect	Percentage (%)		
		Gojek	Grab	Uber
1.	Online bike usage			
	Yes	89.5	96.0	56.5
	No	10.5	4.0	43.5
2.	Usage frequency			
	Seldom	48.6	40.6	66.4
	Usually	39.7	46.9	24.8
	Always	11.7	12.5	8.8
3.	Payment method			
	Cash	59.2	88.0	96.5
	Non-cash	33.5	8.3	3.5
	Cash and non-cash	7.3	3.6	0
4.	Feedback			
	Rating	81.0	84.9	83.2
	Comments	2.8	2.6	12.4
	Rating and comments	16.2	12.5	4.4

## 5. Hypotheses testing

The results of the hypothesis test are presented in Table 6. Based on the analysis, five out of six hypotheses were accepted as it followed the path coefficient value of more than 0.05 and a t-value of more than 1.96. Except Hypothesis 2, all hypotheses were statistically proved to be significant.

## 6. Discussion

### 6.1. Dimension contributions to the constructs

The dimension of the perceived technology with the highest contribution was perceived ease of use with a loading factor value of 0.75. The ease of use is shown as the ease of installing the application, service in Bahasa Indonesia, and the ease of ordering process. The perceived risk dimension with the highest contribution was performance risk (PR) with a loading factor value of 1.00. Common performance risks faced by the users are bad weather and unworthy vehicle condition which could lead to an engine stall and delaying outstanding works. The institution-based trust dimension with the highest contribution was perceived privacy (PP) with a loading factor value of 0.89. High perceived privacy could be shown through private identity on apps and guarantee that identity will not be distributed to the third party without consent.

**Table 5. Overall model fit**

No.	Index	Cut-off value	Result	Conclusion
1.	Root Mean Square Residual (RMR)	$\leq 0.1$	0.08	Good Fit
2.	Root Mean Square Error of Approximation (RMSEA)	$\leq 0.08$	0.05	Good Fit
3.	Goodness of Fit (GFI)	$\geq 0.9$	0.94	Good Fit
4.	Adjusted Goodness of Fit Index	$\geq 0.9$	0.93	Good Fit
5.	Normed Fit Index (NFI)	$\geq 0.9$	1.0	Good Fit
6.	Comparative Fit Index (CFI)	$\geq 0.9$	1.0	Good Fit
7.	Relative Fit Index (RFI)	$\geq 0.9$	1.0	Good Fit
8.	Chi-square ( $\chi^2$ )	$\chi^2$ is low relative to df, p-value is insignificant	841.61	Poor Fit
9.	Degree of Freedom (df)		574	
10.	p-value	$p > 0.05$	0.000	Poor Fit

The online trust dimension with the highest contribution was honest information offered by the online bike-sharing provider (OT1) with a loading factor value of 0.91. Clear, honest information has to be given by bike-sharing drivers to customers to ensure consumer online trust. This is especially important to secure the uncertain situation on using online bike-sharing and minimize the specific issues possibly occurred by the customer while using the service. Finally, the service usage dimension with the highest contribution was the use of the online bike-sharing service with own initiative (Y5) with a loading factor of 0.83. Self-consciousness on using the online bike-sharing service is one of the initiative examples without external force.

## 6.2. Research hypothesis test

The results of the hypotheses test show that almost all hypotheses are accepted except the Hypothesis 2 where the perceived risk was insignificant in affecting online trust. The dominant hypotheses in this research were the path between institution-based trust and online trust with a loading factor of 0.73 and the path between perceived technology and online service behavior with a loading factor of 0.55.

### 6.2.1. The effect of perceived technology on online trust (H1)

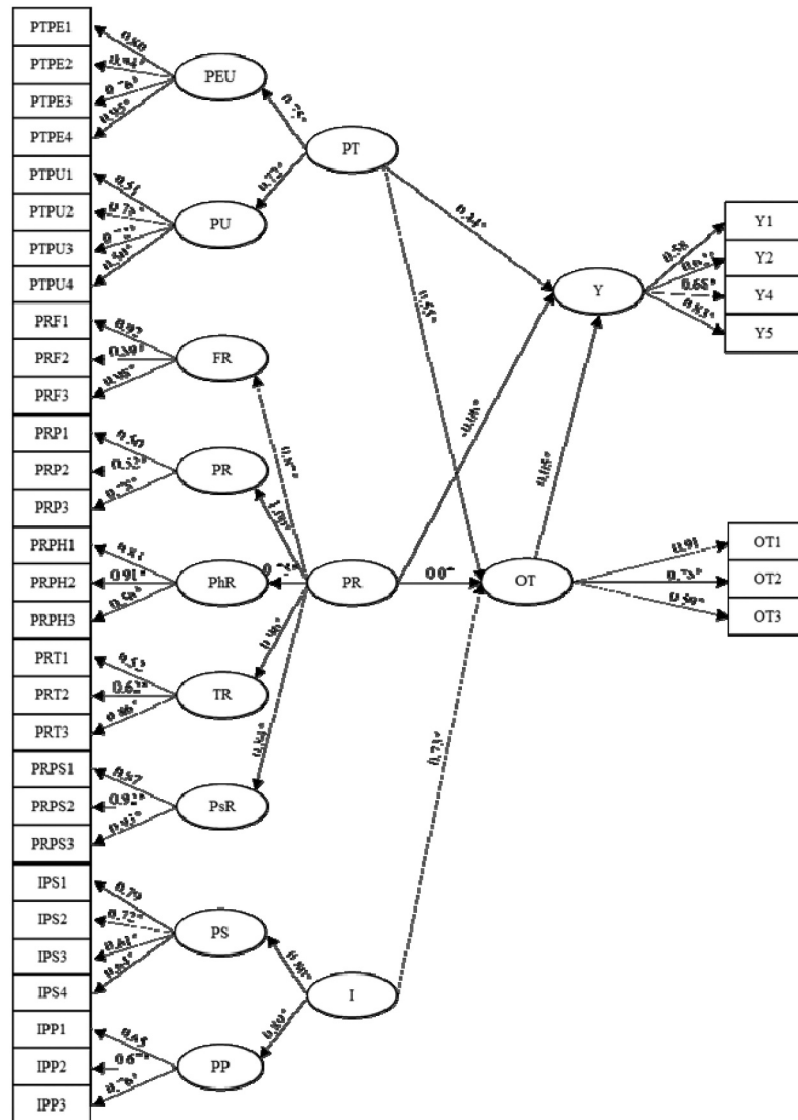
The results show that perceived technology had a positive effect on online trust with a path coefficient of 0.44 and a t-value of 11.27. The most dominant dimension of perceived technology was perceived ease of use with a loading factor of 0.75. Furthermore, ease to install of the application (PTPE2) and ease of ordering process (PTPE4) became the most contributing indicators. The application that could be installed easily becomes the main value-added which attracts customer to use online bike-sharing application. Ease of browsing and reaching the apps to download makes customers require less time to use the application. Aside from that, ease on ordering process also became another reason for a customer to use online bike-sharing. The result is also supported by previous research by Teo and Liu (2007), Constante et al. (2011), Kamarulzaman (2007), and Ling et al. (2011). These studies found that perceived technology had a positive significant effect on online trust.

### 6.2.2. The effect of perceived risk on online trust (H2)

The results show that perceived risk did not significantly influence online trust. Perceived risk insignificantly influenced online trust with a path coefficient value of 0.07 and a t-value of 1.73. The most dominant dimension of perceived risk is performance risk with a loading factor of 1.00. In terms of the online bike-sharing service, every person has a different perceived risk. The perceived risk in using an online bike-sharing may increase online trust if the risk is considered small.

**Figure 2. The measurement model of SEM.**

Note. \*) Significant at t-value > 1.96  
 PT = Perceived technology;  
 PEU = Perceived ease of use;  
 PU = Perceived usefulness;  
 PR = Perceived risk;  
 FR = Financial risk;  
 PR = Performance risk;  
 PhR = Physical risk; TR = Time risk; PsR = Psychological risk; I = Institution-based trust;  
 PS = Perceived security;  
 PP = Perceived privacy;  
 OT = Online trust; Y = Service usage.



However, many customers allegedly do not care about perceived risk, therefore they did not influence online trust. The result is also supported by the previous finding by Gurung (2007) which concluded that perceived risk did not influence online trust in e-commerce.

### 6.2.3. The effect of institution-based trust on online trust (H3)

The result shows that the institution-based trust positive significantly affected the online trust with a path coefficient value of 0.73 and a t-value of 15.47. The most dominant dimension of the institution-based trust was perceived privacy with the loading factor of 0.89. The guarantee to keep the user personal information private is truly required to increase online trust of the users. The result is supported by the previous research by Kooli et al. (2014), Wang (2012), Ghoreishi and Mohammadi (2015), and Chao (2008) in which institution-based trust significantly positively influenced online trust.

### 6.2.4. The effect of perceived technology on service usage of online bike (H4)

The results show that perceived technology had a positive effect on service usage with a path coefficient value of 0.44 and a t-value of 11.47. Better applied technology from a provider has

**Table 6. Research hypothesis test**

Path				Path coefficient	t-value	Conclusion	Result
H1:	Perceived technology (PT)	→	Online trust (OT)	0.44	11.27	Significant	Accepted
H2:	Perceived risk (PR)	→	Online trust (OT)	0.07	1.73	Insignificant	Rejected
H3:	Institution-based trust (IBT)	→	Online trust (OT)	0.73	15.47	Significant	Accepted
H4:	Perceived technology (PT)	→	Service usage (Y)	0.55	11.25	Significant	Accepted
H5:	Perceived risk (PR)	→	Service usage (Y)	-0.06	3.56	Significant	Accepted
H6:	Online trust (OT)	→	Service usage (Y)	0.05	2.02	Significant	Accepted

**Table 7. Indirect effects**

<b>Path</b>					<b>Path coefficient</b>	<b> t-value </b>	<b>Conclusion</b>
Perceived technology (PT)	→	Online trust (OT)	→	Service usage (Y)	0.03	2.05	Significant
Perceived risk (PR)	→	Online trust (OT)	→	Service usage (Y)	0.00	1.37	Insignificant
Institution-based trust (IBT)	→	Online trust (OT)	→	Service usage (Y)	0.04	1.99	Significant



made the customer more and more comfortable in using online bike-sharing daily. Several examples from perceived technology indicator such as ease of downloading and installing the application, assistance in determining an unfamiliar location, and tracking driver position. Availability on these features will ensure the ease in using the application. The result is in accordance with research by Ha and Stoel (2008), Safeena et al. (2011), Amin (2007), and Amin (2009). Furthermore, the most dominant indicator of service usage was the use of the online bike service with own initiative with a loading factor of 0.83.

#### *6.2.5. The effect of perceived risk on service usage of online bike (H5)*

The perceived risk significantly negatively influenced service usage with a path coefficient value of  $-0.06$  and a t-value of 3.56. The less risk will increase customer usage on online bike-sharing. One dimension with the highest loading factor is performance risk. Indicator of performance risk including rain or weather, unworthy vehicle, and risk on delayed activity. The delayed risk could be caused by other technical factors such as time spent on the road, unachieved estimated time, and more. The result of this research is in accordance with the previous findings by Putri (2012), Fadare (2016), and Reddy (2012).

#### *6.2.6. The effect of online trust on service usage of online bike (H6)*

The online trust had a significant positive effect on service usage behavior with a path coefficient value of 0.05 and a t-value of 2.02. The most dominant indicator of online trust was honest information offered to the customer (OT1) with the loading factor of 0.91. Trust on interaction or when using online bike-sharing services will increase service usage by the customers. The online trust itself is important to minimize specific issues that may occur when using the service. The result is in accordance with previous research by Goudarzi et al. (2013), Alsajjan and Dennis (2010), Al-Somali et al. (2009), Ling et al. (2011), and Hirzianto et al. (2019).

The indirect effects were also indicated in this research (Table 7). The indirect effect of perceived technology on service usage through online trust was 0.03 while the indirect effect of perceived technology on service usage was 0.44. Although both were considered significant, the direct effect had a greater path coefficient. The results of the indirect effect between these variables are in line with Anggraeni and Harris (2014) and Ling et al. (2011), in which the perceived technology had a positive and significant effect on the service usage through online trust. Research by Heijden et al. (2003) concluded that perceived technology significantly affected online purchases through online trust. A similar study conducted by Cho (2015) found that perceived technology had a positive and significant effect on the service usage of the online bike via online trust.

The size of the indirect effect of perceived risk on service usage through online trust was 0.00 whereas the effect of perceived risk on service usage was  $-0.06$ . Perceived risk had a significant direct effect but an insignificant indirect effect so that the direct effect of perceived risk on service usage had a greater effect. The results of this study are in accordance with the previous studies conducted by Leeraphong and Mardjo (2013) and Indiani et al. (2015). Similar research conducted by Ling et al. (2011) found that perceived risk did not significantly affect the use of online services with online trust as an intervening variable.

The indirect effect of institution-based trust on service usage through online trust was 0.04 and was considered significant. This finding proves that there is a positive and significant effect of institution-based trust on service usage. Studies on institution-based trust that affects the usage of online services through an online trust have been conducted by Breward (2007) and Mekovec and Hutinski (2012). Both studies concluded that institution-based trust with aspects of perceived privacy and perceived security had a positive and significant effect on the usage of online services through online trust. Research of Meskaran et al. (2013) concluded that the institution-based trust had a positive and significant effect on the use of online services through online trust.

## 7. Conclusion

Online bike-sharing services have become a promising alternative to the traffic congestion in the big cities in Indonesia. Amid the growing popularity of the online transportation service in public, the service providers are concerned by the consumer disappointment issues which can be categorized into three aspects: technology, risk, and trust. This research aimed to investigate the effect of perceived technology, perceived risk, and institution-based trust on online trust and service usage of the three online bike-sharing providers in Indonesia (Grab, Gojek, and Uber).

Based on the result, Grab was the most used provider, Gojek became the second choice, and Uber in the last. The main reason for using all three providers was the price. The most dominant hypothesis in this research with the highest direct effect was H3, stating that the institution-based trust affected significantly and positively online trust.

Perceived technology significantly positively affected online trust (H1). The most dominant dimension of the perceived technology was perceived ease of use. Unlike the hypothesis, the perceived risk was found to insignificantly affect online trust (H2). The most dominant dimension of the perceived risk was performance risk. Institution-based trust significantly positively influenced online trust (H3). The most dominant dimension of this construct was perceived privacy.

Perceived technology significantly positively influenced service usage (H4). The perceived risk significantly negatively affected service usage behavior (H5). Online trust significantly positively influenced service usage behavior (H6). The most dominant indicator of the online trust was honest information offered to the customer. Meanwhile, the most dominant indicator of the service usage was the use of the online bike service with own initiative.

## 8. Contributions

The present research contributes to the body of knowledge of the online bike-sharing service usage, especially in Indonesia. The findings support the prior studies which found that online trust of the online bike-sharing users are determined by the perceived technology (Constante et al., 2011; Kamarulzaman, 2007; Ling et al., 2011; Teo & Liu, 2007) and institution-based trust (Chao, 2008; Ghoreishi & Mohammadi, 2015; Kooli et al., 2014; Wang, 2012). This research is also in line with the prior studies on predictors of the online bike-sharing service usage, namely perceived technology (Amin, 2007, 2009; Ha & Stoel, 2008; Safeena et al., 2011), perceived risk (Fadare, 2016; Putri, 2012; Reddy, 2012), and online trust (Alsajjan & Dennis, 2010; Al-Somali et al., 2009; Goudarzi et al., 2013; Ling et al., 2011). Furthermore, the indirect effects are also evident in explaining the service usage in this research. Perceived technology and institution-based trust are proved to affect service usage indirectly through online trust (Anggraeni & Harris, 2014; Breward, 2007; Cho, 2015; Heijden et al., 2003; Ling et al., 2011; Meskaran et al., 2013). These findings provide another mechanism that may explain service usage in the context of online transportation services.

## 9. Implications

### 9.1. Theoretical implications

The literature on the online bike-sharing service usage has widely investigated consumer trust which included the institution-based trust. This research incorporated the institution-based trust separately so that it may shed light on consumer perception toward each service provider. Also, the proposed models, which are developed from the service encounter needs theory and Technology Acceptance Model (TAM), have not been used to examine the effects on the online bike-sharing service usage in Indonesia. By drawing together these constructs in a single discussion, this research have shed light on the Indonesian consumer behavior on the online bike-sharing service and variables that may furthermore explain their decision to use certain online bike-sharing service provider.

### 9.2. Managerial implications

This research offers practical insights for experts. This research suggests the online bike-sharing service provider to maintain feature that could help customer track driver's position and maintain the honest information offered to consumers in terms of the product; maintain the cost promotion in a certain time in terms of price; and do the promotion especially for the cost promotion and ensure said information are well informed to customers in terms of promotion. Furthermore, the online bike companies should guarantee the privacy of consumer information, maintain the ease of reservation by application in terms of pace, and maintain the safety riding principles which could minimize the physical risk due to accidents in terms of people. Last but not least, the companies should also be able to maintain the effective length of travel time using a GPS feature.

The government is also expected to make legal system as well as state the legal status of the online bike-sharing service in Indonesia as one of the public transportation modes in Indonesia. Currently, the prevailing regulation for the online bike-sharing service (Regulation of the Minister of Transportation of the Republic of Indonesia Number PM 12 of 2019 on the Safety Protection of Riders of Motorcycle in Public Use) still causes dissatisfaction and uncertainty for various parties including the drivers, consumers, and local government in conducting supervision of the online bike-sharing service. In addition to applying regulations regarding the supervision and limitation of online bike-sharing service, regulations on safety guarantees for consumers are also very important.

### 9.3. Limitations and future directions

There are some limitations in the present research that could be addressed in the future research. The female samples were overrepresented, thus careful attention should be given in interpreting the findings. Given that the level of perceived technology, perceived risk, and online trust between men and women could be different, future research may want to address the gender overrepresentation issue.

Further studies may incorporate deeper aspects of 3 T related to online bike-sharing such as Tourism, Transportation, and Telecommunication to enrich the literature on this topic. Trust variables used in this research are only institution-based trust and online trust. Future research could add other determinant variables such as emotion (Simanjuntak, Nur et al., 2020), cognitive-based trust and personality-based trust. This research emphasized the consumers' point of view more than the drivers' point of view. Also, it only focused on the online bike service. Future research may want to investigate the service usage of other online transportations, such as online car services.

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