

## Technology Acceptance of E-commerce in Indonesia

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**Abstract:** Forum Jual Beli (FJB) *Kaskus*, an e-commerce portal of *Kaskus* online forum in Indonesia has achieved a total transaction up to 575 billion rupiah/month in 2012. This intriguing fact shows how e-commerce technology has developed well for consumers in Indonesia. The aim of this paper is to investigate what factors that affect the technology acceptance of e-commerce in Indonesia, which intended to identify what improvement can be made for the future. The data for this research were collected from 223 respondents of *Kaskus* users. The research model is based on Technology Acceptance Model (TAM). Results showed that Trust positively affects Intended Use but, Perceived Ease of Use has insignificant affect towards Intended Use, and also Risk is not negatively affects Intended Use. Seller Status & Reputation indeed has positive affect towards Trust. In conclusion, for *Kaskus* the power of community from which already existed must be maintained, as it proved to be the reason of why they become a successful e-commerce site.

**Key-Words:** *Technology Acceptance Model (TAM), Electronic Commerce, Perceived Community, Seller Status & Reputation*

### 1. Introduction

Internet, who nowadays does not know the word of 'the internet'? Since the year of 1990 when Tim Berners-Lee invented a web browser, which makes possible for people to explore the content from one computer to the other, the development of internet is keep growing and growing, even until now. So, how much is the growth exactly then and now? In Indonesia, comparing from year 2000 and 2011, there is an increase of 50 million users or growing by 1000 % [16]. This shows that the awareness of Indonesia's people towards the internet is increasing and the numbers will still keep growing in more future years.

The reason why Internet today becoming very popular is because, internet provide a various kind of things that fulfill the various needs of different people all over the world, people can read news, access to forum, online chatting, playing games, blogging, social networking, searching educational material, and also as for online business.

Online business or is more known as e-commerce is one of many results which are produced from the massive growth of

internet usage. E-commerce is a trading transaction (buying or selling) that using internet technology as the medium. This kind of transaction is getting popular day by day in around the world, so as in Indonesia.

The growing of internet usage itself directly influencing people to use e-commerce websites as their media to sell or buy anything they want. There are also several reason of this e-commerce gaining popularity, they are: Easiness/Simplicity, Unlimited Verities, Easy Comparing, and Competitive Price/Negotiable Price [15].

In Indonesia there is a popular e-commerce sites named as *Kaskus*. Originally, *Kaskus* is an online community forum for Indonesian people, but in its development the website becoming more popular because one of its sub-forums, which is: FJB *Kaskus*. In this place people can buy and sell anything they want new or used, and they can placed their products without need to pay some amount of fee. In 2012, Andrew Darwis the co-founder and current CTO of *Kaskus* stated that in 1 month the total transaction in FJB *Kaskus* currently (end of year 2012) can achieve up to 575 billion rupiah/month [27]. In previous year, *Kaskus* also vowed by Forbes as #1 e-commerce

websites in Indonesia, which makes it a high potential prospect for e-commerce market.

However, with currently there are so many competitors out there that can disrupt *Kaskus* existence in e-commerce industry; the sites cannot feel satisfied enough for what they have already achieved. Competitors will keep developing and growing to improve their business, just like what *Kaskus* themselves. At some point or in some year a competitor invented some technology innovation that can help the e-commerce process be better. There is always a possibility in technology. So, to avoid that, this research will provide a data to explain and describe what factors that may have a significant impact towards the acceptance of *Kaskus* with the help of Technology Acceptance Model (TAM) theory which was introduced and popularized by Davis [4] with several new and modified theories.

The result of research itself may be given as the consideration to *Kaskus*, for their future improvement.

## 2. Literature Review and Hypothesis

### 2.1 Electronic Commerce (E-commerce)

Electronic commerce is a type of transaction of goods or services which is conducted with the media of internet [18]. It is open to any sides, whether it's individual, groups, or organizations. The transaction of goods and services must be ordered through internet, but the payment and delivery of them may be happened with internet (online) or not (offline) [18].

E-commerce can be categorized into 4 (four) types [11]:

Consumer to Consumer (C2C)	Website's operator is not responsible for the logistics. They only help gathering information and establishing credit-rating systems. The eBay is a good example of C2C platform.
Consumer to Business (C2B)	Consumers come as groups by topics and needs. By group body negotiations and demand aggregators, they can play a leading role for the products.
Business to Business (B2B)	By using EDI, commerce among businesses can be conducted over internet to integrate supply chain and logistics to reduce costs and promote efficiency in internet environment.

*Kaskus*, the chosen e-commerce website for this research is considered as B2C and C2C types, but just like eBay, *Kaskus* is mainly the C2C type as every registered user can buy and sell new or used products. Still, there is small proportion of Business Company that directly sells in *Kaskus* through their official distributor.

### 2.2 Technology Acceptance Model (TAM)

TAM is built for the researcher to find an explanation, why a certain technology may be unacceptable, and can find corrective steps [4]. With the key purpose is to provide a foundation for tracing the impact of external factors on internal beliefs, attitudes, and intentions.

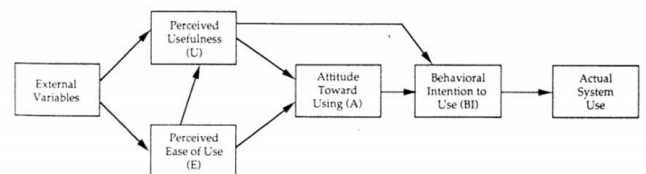


Figure 1 Technology Acceptance Model (TAM) [4]

After its first publication, Technology Acceptance Model has been modified into some new model like there is *Technology Acceptance Model 2* [24], *Technology Acceptance Model 3* [23], then *Unified Theory of Acceptance and Use of Technology (UTAUT)* [25].

Table 1 E-commerce Types [11]

TYPES	DEFINITIONS
Business to Consumer (B2C)	Enterprises provide the commodities or services in internet directly and offer sufficient information and convenient interface to attract consumers to buy online in order to eliminate channel intermediaries.

In e-commerce scope, there are already several researches like: Koch et al. (2011), Gefen et al. (2011), and Pavlou (2003). These 3 researches are referred in this study as main theories to build our own TAM conceptual design.

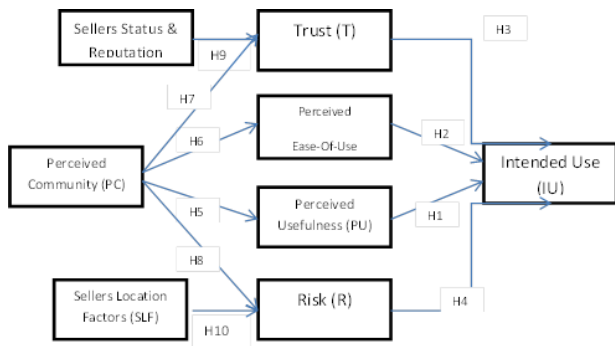


Figure 2 New Research Model

**2.2.1 Perceived Usefulness, Perceived Ease of Use, Intended Use**

Intended use is “a behavioural tendency of people to keep using a certain technology, level of intention to use can be predicted by their behaviour towards that certain technology” [4]. Perceived Usefulness (PU) is defined as a “criterion of the individual’s subjective opinion on the utility (useful or not) offered by the certain technology in task-related context” [7]. While, Perceived Ease of Use (PEOU) is “a cognitive effort (hard or easy) needed to learn and apply the new technology” [4].

When people feel an e-commerce website is easy to operate to find the goods they wanted and useful for their daily shopping activity they tend to use more that site. However, they won’t use the site if the fell it doesn’t useful for shopping although it is easy to operate and vice versa. These situations result the hypothesis below:

**H1:** Perceived Usefulness positively affects Intended Use of *Kaskus*

**H2:** Perceived Ease-Of-Use positively affects Intended Use of *Kaskus*

**2.2.2 Trust, Intended Use**

Trust has a definition of “a belief that promises are reliable and obligations will be fulfilled” [7]. The promises and obligations in the definition apply on both buyer and seller, but

for this context the trust itself will be more from the perspective from buyer to seller. Another concept also stating that trust is the expectation that an actor (seller) will agree to 3 conditions: (1) Fulfill its obligations, (2) Be predictable, and (3) Be fair and not opportunistic [7].

**H3:** Trust positively affects Intended Use of *Kaskus*

**2.2.3 Risk, Intended Use**

The definition of risk has several amount of meaning. Related to the e-commerce context, the definition or risk is “the overall amount of uncertainty perceived by consumer in a particular purchase situation” [7], which this concept is also supported from the recent study [19]. Another study revealed that the risk of consumer in e-commerce industry is greater than the commerce in conventional/physical stores, because of e-commerce’s distribution and impersonal nature [27].

**H4:** Risk negatively affects Intended Use of *Kaskus*

**2.2.4 Perceived Community**

Perceived community characteristics in TAM are built from 3(three) components: (1) Community size, (2) Structure of community and (3) Number of lead-users perceived [12].

Community size is “a number of users that actively participate in community content by giving comment and ratings” [12]. When the size is getting larger, the likeliness to generate more word-of-mouth effect is also bigger [13, 20]. For the community itself, the size can generates revenue through an indirect network effect. Structure of community is referring to “the construct activity, distribution of activity, and the number of lead-users” [12].

Lead-user is defined as “people that have been shown before other users” [20]. With them, the community can be more attractive and the acceptance by other users is more likely to happen [12].

**H5:** Perceived Community positively affects Perceived Usefulness

**H6:** Perceived Community positively affects Perceived Ease of Use

**H7:** Perceived Community positively affects Trust

In addition, there has been no research yet regarding the effects of Perceived Community (PC) towards Risk. It is known that network size is an important factor in security attacks. It means that the possibility of security attacks is getting higher as the network size is getting bigger. This condition results the hypothesis below:

**H8:** Perceived Community negatively affects Risks

### 2.2.5 Sellers Status & Reputation

Reputation of seller can be divided into two dimensions [10]:

First, reputation is reflecting into the ability of the seller that they can deliver a good/service in good quality which is believed by the potential customers. Secondly, it also reflects the ‘trust’ that labelled by the potential customer, based on how the seller giving information prior to the transaction, concerning several aspects, for example about the quality and suitability. They believe that those two dimensions have a relationship.

Seller reputation is very important asset for a seller, because on day to day basis the potential customer is selecting the seller based on their reputation. Especially, in the condition where the quality of the good or service is hard to measure and the customer cannot figure out exactly what outcome that they will be expecting [1].

**H9:** Sellers Status & Reputation positively affects Trust

### 2.2.6 Sellers Location Factors

Previous research has shown that, on e-commerce website of eBay and MercadoLibre, the volume exchanges of trading decreases with distance. This means that the buyer more prefer to transact with the seller that live in the same city rather than the seller outside their area, as this apply too towards seller to buyer [14].

The geographic location also matters for digital goods like downloadable music and videos, where there is not involving transport or any other trade costs [14]. Those research shows the fact that people has a more tendency to choose a seller in e-commerce site which is located the nearest or even in the same city with them.

This occur because of the nature of e-commerce itself

where the potential customer cannot see directly the real condition of the goods itself, only relying on the picture which is given in the sites. So, to seek the evidence whether there will be affects between Seller Location Factors and Risks, the hypothesis is:

**H10:** Sellers Location Factors negatively affects Risk

The above mentioned hypotheses are listed in Table 2. The relationship between constructs and hypotheses are illustrated in Fig. 2.

Table 2 Hypotheses of Research

	<i>Description</i>
<b>H1</b>	<i>Perceived Usefulness positively affects Intended Use</i>
<b>H2</b>	<i>Perceived Ease-of-Use positively affects Intended Use</i>
<b>H3</b>	<i>Trust positively affects Intended Use</i>
<b>H4</b>	<i>Risk negatively affects Intended Use</i>
<b>H5</b>	<i>Perceived Community positively affects Perceived Usefulness</i>
<b>H6</b>	<i>Perceived Community positively affects Perceived Ease of Use</i>
<b>H7</b>	<i>Perceived Community positively affects Trust</i>
<b>H8</b>	<i>Perceived Community negatively affects Risks</i>
<b>H9</b>	<i>Sellers Status &amp; Reputation positively affects Trust</i>
<b>H10</b>	<i>Sellers Location Factors negatively affects Risk</i>

## 3. Research Design

### 3.1. Respondents

For Structural Equation Modeling (SEM) analysis, there are several theories to determine the number of sample. The number of sample which must be fulfilled for using SEM is at least 100 sample ( $\geq 100$ ) [9]. Also, using Partial Least Square (PLS) path modeling the needed sample size is minimum 30 to 100 cases [26]. So, 200 or more respondents are sufficient enough based on those references.

There are 223 respondents for this research; the respondents are the *Kaskus* users who have shopped in the sites at least one times in the last 3 months, who’s gathered directly from *Kaskus* website. The result of demographic background as it follows: 91% is male, 9% female. Majority

of the age is 20-24 with 44%, then 15-19 with 26%, so it combined to 70%, while the rest of them on group of 25+ are covering 30%. In occupation, 53% are students, followed by employees with 28%, and the other 19% varies from teacher, self-employment and unoccupied.

In terms of the longevity of knowing *Kaskus* sites, 50% of them have known for more than 3 years, 29% have known it for 2-3 years, and the last 21% of them have known for less than 2 years. For the frequencies of shopping in *Kaskus* for last 3 months, 56% have shopped for 1-2 times. 28% have shopped for 3-5 times, and the rest of 16% have shopped more than 5 times.

**3.2. Measurements**

In this research there are 8 constructs with the total indicators of 50: Perceived Community, Perceived Ease of Use, Perceived Usefulness, Seller Status & Reputation, Seller Location Factors, Trust, Risk, and Intended Use (Complete detailed indicators are provided in Table 3 below).

Measurement scale for all indicators is using Likert scale of 1 – 6. With explanation of each the scale as follow: 1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Tend to Disagree*, 4 = *Tend to Agree*, 5 = *Agree*, 6 = *Strongly Agree*.

The constructs is based on previous TAM researches in e-commerce scope from: Koch et al. [12], Gefen et al. [7], and Pavlou [19].

**3.3. Data Collection & Analysis**

The data is collected through the online questionnaire by using obsurvey.com. The analysis process is helped by XLSTAT version 2012.5.01 software, which is specialized software that built to analyse interdependence problems with Partial Least Square Method (PLS).

PLS is a model equation Structural Equation Modeling (SEM) based components or variants. PLS is an alternative approach that shifts from a covariance-based SEM approach to variance based [26]. Covariance-based SEM generally tests causality or theories while PLS is more predictive models. PLS is a flexible analytical method because it is doesn't need many assumptions. For example, the data should not be

normally distributed; the sample does not need to be big. Also, it can be used to confirm the relatively new theory.

For the analysis, PLS method has several steps that need to be done. This analysis consists of convergent validity and discriminant validity. Convergent validity has 3 types of examination: reliability item (validity of each indicator), composite reliability and average variance extracted (AVE). Then, the last analysis step is Goodness-of-Fit Index (GoF) before evaluating the structural model as a whole.

**4. Result and Discussion**

**4.1 Reliability and Validity Analysis**

Validity is an extent to which a measure or set of measures correctly represents the concept of the study [8]. It is concerned with how well the concept is defined by the measures. While, reliability is an extent to which variable or set of variables is consistent in what it is intended to measure [8].

The main difference with validity is, reliability relates to what should be measured not how it is measured [8].

Table 3 below shows the reliability item (validity of each indicator):

Table 3 Reliability Item

Latent variable	Manifest variables	Standardized loadings	Critical ratio (CR)
PC	PC1	0.724	13.581
	PC2	0.645	11.997
	PC3	0.751	19.924
	PC4	0.756	15.052
	PC5	0.833	27.011
	PC6	0.813	22.512
	PC7	0.491	6.021
SSR	SSR1	0.781	18.646
	SSR2	0.832	30.936
	SSR3	0.767	20.626
	SSR4	0.831	25.781
	SSR5	0.730	11.556

	SSR6	0.797	16.832
	SSR7	0.646	7.958
	SSR8	0.511	5.006
T	T1	0.829	29.443
	T2	0.812	27.532
	T3	0.782	22.001
	T4	0.848	31.490
	T5	0.872	31.754
	T6	0.806	24.727
	T7	0.857	42.836
SLF	SLF1	0.851	31.719
	SLF2	0.855	24.348
	SLF3	0.735	12.839
	SLF4	0.767	15.917
	SLF5	0.570	6.899
PEOU	PEOU1	0.704	14.197
	PEOU2	0.743	15.768
	PEOU3	0.697	12.074
	PEOU4	0.708	14.144
	PEOU5	0.761	19.310
	PEOU6	0.763	19.667
PU	PU1	0.857	31.994
	PU2	0.860	32.239
	PU3	0.888	38.633
	PU4	0.799	21.553
	PU5	0.678	14.138
	PU6	0.745	21.220
R	R1	0.819	26.097
	R2	0.849	26.873
	R3	0.850	29.056
	R4	0.847	25.647
	R5	0.809	21.072
	R6	0.820	24.672
IU	IU1	0.802	23.902
	IU2	0.669	10.410
	IU3	0.835	16.755
	IU4	0.812	19.741

	IU5	0.839	25.008
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Factor loadings value should be at least 0.5 to be considered acceptable [2]. In Table 3, among 50 items of indicators there is only 1 indicator which has value below the acceptable range, which is PC7 (0.491) and will be excluded from the analysis.

The value represents that on each variables or indicators is validating to their construct. Using "PC" latent variable as example, the construct latent has 6 indicators (PC1, PC2, PC3, PC4, PC5, and PC6) which all of them has loading values greater than 0.5. This indicates that those 6 indicators have a good validity level and they considered as valid indicators to measure the PC (Perceived Community) construct.

Table 4 Composite Reliability

Latent variable	Dimensions	Cronbach's alpha	D.G.rho (PCA)
PC	6	0.853	0.891
SSR	8	0.880	0.906
T	7	0.925	0.939
SLF	5	0.820	0.877
PEOU	6	0.823	0.874
PU	6	0.886	0.914
R	6	0.912	0.932
IU	5	0.837	0.885

Table 4 above shows the composite reliability which the measurement is analysed through the Cronbach's alpha and D.G rho (PCA). The value which is considered as acceptable for both of them is greater than 0.7 [17]. If the value >0.7 it means the latent variable/construct (PC, SSR, T, SLF, PEOU, PU, R, and IU) has a good reliability as a measurement tools for the whole model.

Based on the result from the table above, all 8 constructs has the value of cronbach's alpha and D.G rho (PCA) that greater than 0.7 which makes all of them has a good reliability and can be used for further analysis.

Table 5 Average Variance Extracted

Latent variable	Type	Mean Communalities (AVE)
PC	Exogenous	0.583
SSR	Exogenous	0.554
T	Endogenous	0.689
SLF	Exogenous	0.581
PEOU	Endogenous	0.533
PU	Endogenous	0.653
R	Endogenous	0.691
IU	Endogenous	0.630

The next step of evaluation is a checking towards average variance extracted (AVE). When the value is greater than 0.5; it can be said that the latent construct has a good convergent validity, otherwise the construct becomes questionable and should not proceed to further analysis [6]. Table 5 shows the AVE of each constructs. Based on above table, all the AVE value of each latent construct is greater than 0.5. The greater of AVE value, it means also the greater of the indicators representation towards their construct.

Table 6 Goodness-of-Fit Index

	GoF	Standard error	Critical ratio (CR)
<b>Absolute</b>	0.489	0.032	15.243
<b>Relative</b>	0.874	0.022	39.357
<b>Outer model</b>	0.996	0.003	336.204
<b>Inner model</b>	0.877	0.021	41.121

The last evaluation step is looking into goodness of fit (GoF absolute). Table 6 above is showing the value of GoF Index. The value which is needed to be look is on the second column of second row, the value is: 0.489. So, the structural model has GoF value of = 0.489. This value is considered as a GoF-large because it has the value which greater than 0.36 [3]. It means this model has a high ability to explain the empirical data as a whole.

#### 4.2 Evaluating Structural Model

After evaluating the measurement model, the next step is to evaluate outer model or structural model. To evaluate, first thing to do is seeing the significance of relationship between construct.

This can be seen from the path value which is describing the strength of affects from one construct to the other. A path coefficient between one construct to the other can be considered as significant if, the desired paths is greater than zero for positive relationship and less than zero for negative relationship. The resulting Table 7 below shows that from 10 hypotheses, 7 of them are significant; which means the hypothesis is accepted.

Table 7 Structural Model Results

	Description	Path Value	t	Pr> t	Results
<b>H1</b>	PU positively affects IU	0.425	5.849	0.000	<b>Accepted</b>
<b>H2</b>	PEOU positively affects IU	0.080	1.250	0.213	<i>Not Accepted</i>
<b>H3</b>	T positively affects IU	0.285	4.469	0.000	<b>Accepted</b>
<b>H4</b>	R negatively affects IU	0.157	3.360	0.001	<i>Not Accepted</i>
<b>H5</b>	PC positively affects PU	0.468	8.280	0.000	<b>Accepted</b>
<b>H6</b>	PC positively affects PEOU	0.607	11.368	0.000	<b>Accepted</b>
<b>H7</b>	PC positively affects T	0.474	7.305	0.000	<b>Accepted</b>
<b>H8</b>	PC negatively affects R	-0.114	-1.814	0.071	<b>Marginally Accepted</b>

<b>H9</b>	SSR positively affects T	0.152	2.344	0.020	<b>Accepted</b>
<b>H10</b>	SLF negatively affects R	0.464	7.373	0.000	<i>Not Accepted</i>

\*Notes:

**Accepted** : Significant at 0.05 levels

**Marginally Accepted** : Significant at 0.1 levels

*Not Accepted* : Not Significant

## 5. Conclusion

### 5.1 Conclusion

This research has proved several previous findings in e-commerce scope. Hypothesis 1 and 3 has a significant impact from one construct to the other. Especially regarding the trust that positively affects Intended Use, this confirms the finding from Gefen et al. [7]. However, there is also a contrary result from the previous finding from Pavlou [19] which Perceived Ease of Use is insignificant towards Intended Use, and also Risk is not negatively affects Intended Use.

In Perceived Community construct, the hypothesis 5, 6, 7, and 8 is also confirming the previous finding of Koch et al. [12] which significant towards Perceived Usefulness, Perceived Ease of Use, Trust and Risk.

In concluding this research, it can be said that if the e-commerce site is easier to use, the greater chance it also useful to shop for the users and will be used more by them. So, it is safe to say that e-commerce site should make sure that people is feel easy and useful when searching the goods and services which they desire.

### 5.2 Theoretical Contribution

The major findings in this research is the proven of proposed hypothesis in Hypothesis 9, which Seller Status & Reputation indeed has positive affect towards Trust. Still, the other proposed hypothesis of Seller Location Factor negatively affects Risk is proved to be insignificant. However, this result is quite understandable because the hypothesis is still new and

there are no recent studies that research this matter.

### 5.3 Practical Recommendation

For *Kaskus* itself, the power of community from which already existed must be maintained, as it proved to be the reason of why they become a successful e-commerce site.

Finally, e-commerce site have to think thoroughly in giving reputation system in their sites. Because, like it or not people will always tend to see sellers' status & reputation as it make the indicators whether they can trust them or not, or in bigger scale: trusting the e-commerce site or not.

### 5.4. Limitation and Further Research

As this research limited to 1 website in 1 country, the future research should use this research design to be tested in different e-commerce sites in many other countries. So, it can be confirmed as a valid new Technology Acceptance Model (TAM).



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