

**Analysis of the Influence of Technological Innovativeness on Perceived Usefulness, Perceived Ease of Use, and Perceived Playfulness and their implications for Usage Intention: An analysis of LinkAja application users**

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**ABSTRACT**

*By using the TAM (Technology Acceptance Model) framework, this study aims to investigate the factors that influence the usage intention of e-wallet applications, especially LinkAja, to make payments in today's digital era. Through the data collection process carried out by surveying 100 respondents, the results found show that the technological innovativeness (IT) variable can indirectly affect usage intention through the variable perceived ease of use and perceived playfulness, besides that it was also found that the variable perceived ease of use (PEU) and perceived playfulness (PP) has a positive effect on usage intention. By investigating digital payments using e-wallets as a means of transactions, this study is expected to contribute to the development of the LinkAja application as one of the largest e-wallet companies in Indonesia, because the digital economy is one of the stimuli that could support the economic development of a country. In addition, the digitization of monetary transactions around the world is also a major factor requiring the use of e-wallets by the public, thereby increasing the number of users in the future. This research is certainly quite important to do because it is hoped that it can add insight to the public about the LinkAja e-wallet and also help the LinkAja company to find out what things affect people's intentions to use LinkAja as their e-wallet so that the company can adjust its development. going forward with variables that do affect the desire to use LinkAja.*

**Keywords:** *Usage intention, Technological innovativeness, Perceived usefulness, Perceived ease of use, Perceived playfulness,*

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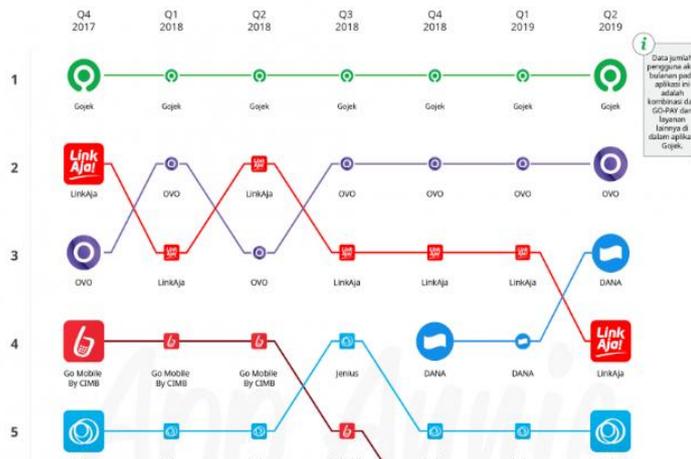
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**INTRODUCTION**

**Research Background**

In today's world, we have entered a world where everything we do has started to be digital, or what is now better known as the digital era, and of course, this can be realized because of internet technology which has an impact on increasing human mobility in carrying out activities. everyday life, and also the presence of various kinds of gadgets. Gadgets have sophisticated features and require internet access to be always connected, gadgets also have their influence on applications, systems, and hardware (Pekick, 2016). Gadgets can also be classified into several categories, such as tablets, computers, laptops, and smartphones/mobile phones. Of course, one of the most common gadgets owned by everyone in the world is a smartphone, because today's life indirectly requires us to have these gadgets to carry out daily activities more mobile, especially with the increasing popularity of the internet.

One of the companies engaged in the field of mobile applications, especially e-wallet, is LinkAja, where LinkAja is a mobile app that offers services in the field of financial technology (fintech) in the form of mobile payments, especially e-wallet, and was created specifically for smartphones. The LinkAja application can be said to have been quite successful in penetrating the Indonesian digital wallet market because it was ranked 2nd in the category of the largest number of monthly users in the mobile apps segment in Indonesia in 2017. One of the advantages that LinkAja has compared to its competitors lies in the synergy of State-Owned Enterprises (BUMN) services so far to the community. These include buying fuel at Pertamina's gas stations for non-cash and paying tolls, and it will be developed into an e-wallet that is integrated with the public transportation payment system, where all public transportation costs from buses to planes can use LinkAja (Wicaksana, 2019).



Source: www.appannie.com, 2020

Figure 1. Rating of E-Wallet Applications Based on Number of Monthly Active Users

Even though it was ranked 2nd in the number of monthly active users in 2017-2019 as shown in Figure 1.1, LinkAja's ranking continued to decline so that LinkAja's position changed to 4th in the second quarter of 2019. If you look at the data on LinkAja's ranking from the fourth quarter of 2017 to the second quarter of 2019, it appears that

LinkAja failed to maintain its position in the Indonesian e-wallet market, because instead of experiencing an increase in ranking, LinkAja has experienced a decline. This indicates that LinkAja has had difficulties in competing with several other big competitors in the e-wallet mobile apps industry such as Gopay, OVO, DANA.

Through the phenomenon related to the decrease in user ratings experienced by LinkAja as described above, the study was conducted to know what factors influence the usage intention of a mobile application brand, especially mobile payments in the form of e-wallet. Researchers also analyzed to obtain information about the problems in technological innovativeness carried out by LinkAja which have an impact on factors such as perceived usefulness, perceived ease of use, and perceived playfulness, which affect the usage intention of the LinkAja brand.

In this digital era, technological developments occur very rapidly, of course, this comes with many benefits for humans. One technology that is very useful for many people is internet technology, where the internet itself acts as a window to connect people through their gadgets without having to be limited by distance. Of the many gadgets that exist, smartphones are the gadgets that most people have, and various kinds of mobile apps can be downloaded with certain functions along with their unique offers. Of the many types of mobile apps available, mobile apps engaged in the fintech (financial technology) sector, especially e-wallet, are experiencing a fairly rapid increase in popularity. This shows that the potential of an e-wallet as a means of payment or digital wallet is the main choice for the majority of people in the digital era who prioritize convenience in daily activities, one of which is when transacting.

LinkAja is still not a top-of-mind for Indonesians when it comes to using an e-wallet application, as well as the decline in LinkAja's dominance in the ranking of the number of monthly active users, which initially ranked 2nd in 2017, to 4th in 2019. Of course, this shows that competition is getting fiercer along with the times, which is caused by more and more big competitors entering the e-wallet business industry. In addition to all that, there are reviews from LinkAja users who have problems typing using the LinkAja application, ranging from a less friendly interface, failing when opening the application, problems when upgrading to full service, accounts that log out themselves, lagging, to failed transactions. but the balance is still lost. Whereas as one of the largest technology companies in Indonesia, LinkAja should optimize the features it has, or launch new technological innovations that can repair/replace problematic old features to improve the user experience of the LinkAja application itself.

Seeing this phenomenon, the researcher aims to find out whether the technological innovativeness factor influences perceived usefulness, perceived ease of use, and perceived playfulness and its implications for the desire to use the LinkAja application.

## **RESEARCH PURPOSES**

Based on the formulation of the problem and the research questions above, the objectives of the research conducted on the LinkAja mobile application are:

- To find out and analyze the effect of technological innovativeness on perceived usefulness in the LinkAja mobile application.

- To find out and analyze the effect of technological innovativeness on perceived ease of use in the LinkAja mobile application.
- To find out and analyze the effect of technological innovativeness on perceived playfulness in the LinkAja mobile application.
- To find out and analyze the effect of perceived usefulness on usage intention on the LinkAja mobile application.
- To find out and analyze the effect of perceived ease of use on usage intention on the LinkAja mobile application.
- To find out and analyze the effect of perceived playfulness on usage intention on the LinkAja mobile application.

## **Literature review**

### **Mobile Applications**

According to Pressman & Maxim (2014), mobile applications or mobile apps are applications that have been specifically designed for mobile platforms, such as IOS, Android, or Windows Mobile. Mobile applications were defined as a developed application established in the cellular phone and could be used to do some functions and were designed to consider its mobility in the specific platform (Sammons & Cross, 2017). These applications are widely used to promote a brand and company's services (Hur, Lee & Choo, 2017).

### **Mobile Payment**

Dahlberg, Mallat, Ondrus, & Zmijewska, (2018) said that mobile payment can be defined as a means of payment for goods, services, and bills through mobile devices such as smartphones, and works by utilizing wireless technology and other communication technologies. Pousttchi (2018) had the same definition of mobile payment as a process of initiating, authorization, and payment settlement using cellular communication technical and platform.

### **Technology Acceptance Model (TAM)**

Technology Acceptance Model (TAM) is one of the concepts that can be used to analyze various factors that influence the acceptance of the use of technology. This theory was first introduced by Davis (1989) and later on developed by Alharbi (2014) who mentioned that the model is focused on the user-friendly technology system.

### **Technological Innovativeness**

Technological innovativeness is defined as a personal trait that reflects an individual's intention to try new technologies (Bulut, et. al, 2021).

### **Perceived Usefulness**

Perceived usefulness is a belief from someone who thinks that with that person using a certain information technology system, the performance of the work he does will increase (Davis, 1989). Park (2014) stated that the perceived usefulness referred to the usage of a specific computer system will increase the performance of the computer system.

### **Perceived Ease of Use**

Gahtani (2012) asserted that perceived ease of use is a term that means being an innovation that is considered easy to handle and operate in people's minds when compared to available substitute modes.

### **Perceived Playfulness**

Venkatesh&Bala (2018) stated that perceived playfulness is a complex variable, which includes individual pleasure, psychological stimulation, and the interest of the individual/person.

### **Usage Intention**

According to Seitz &Aldebasi (2016) usage intention is a behavioral tendency to use technology and the desire to motivate other users.

### **Hypothesis Formulation**

#### **Technological innovativeness has a positive effect on perceived usefulness.**

The research from Ngafeeson& Sun (2015) showed that technological innovativeness had a significant effect onperceived usefulness. Lu et al.(2005) stated that technological innovativeness played an important role in creating individual perceived usefulness. Therefore, the research hypothesis was as follow:

**H1:** Technological innovativeness has a positive effect on perceived usefulness.

#### **Technological innovativeness has a positive effect on perceived ease of use.**

Adiyartaet al. (2018) found that innovativeness had a significant influence on*perceived ease of use*. Furthermore, Aydin (2016) mentioned that individual *technological innovativeness*had a positive effect on the *perceived ease of use*in the *e-wallet* services. Therefore, the research hypothesis was as follow:

**H2:** Technological innovativeness has a positive effect on perceived ease of use.

#### **Technological innovativeness has a positive effect on perceived playfulness.**

Zhou & Feng, (2017) stated that higher individual technological innovativeness*stended* to have more playfulness in acquiring the new technology usage. In addition, Rouibah & Abbas (2011) also stated that user innovativeness had a strong relationship with perceived playfulness. Therefore, the research hypothesis was as follow:

**H3:** Technological innovativeness has a positive effect on perceived playfulness

#### **Perceived usefulness has a positive influence on usage intention.**

The research conducted by Alotaibi et al., (2017) found that perceived usefulness has a positive effect onthe intention to use a mobile application. Itt (2019) also found that perceived usefulness had a positive effect on software mobile applications. Therefore, the research hypothesis was as follow:

**H4:** Perceived usefulness has a positive influence on usage intention.

#### **Perceived ease of use has a positive influence on usage intention**

Akhtar et al., (2019) showed that perceived ease of use influenced usage intention. Perceived ease of use of mobile payment creates a need to use mobile

payment (Setiawan&Setyawati, 2020). Therefore, the research hypothesis was as follow:

**H5:** Perceived ease of use has a positive influence on usage intention.

**Perceived playfulness has a positive influence on usage intention.**

Melendez et al., (2013) stated that perceived playfulness has a positive effect on individual usage intention and attitude. It means that perceived playfulness is an important factor in making a decision using something. Dumpit& Fernandez (2017) showed the positive influence of perceived playfulness on usage intention. Therefore, the research hypothesis was as follow:

**H6:** Perceived playfulness has a positive influence on usage intention.

**Research Model**

Based on the explanation theories above, the following is the proposed research framework that describes the relationship among variables that are shown in the hypotheses and will be tested with the statistical tools:

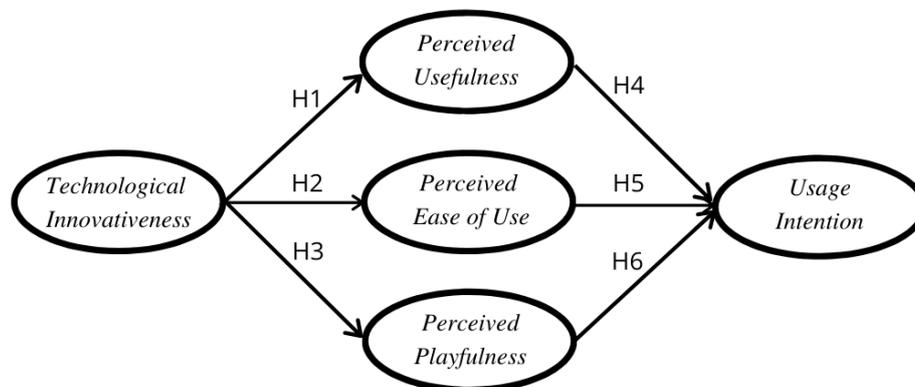


Figure 2. Proposed Conceptual Framework

**RESEARCH METHODOLOGY**

Like descriptive research, this research wants to know about the marketing phenomenon, in the form of what factors are affected by technological innovativeness and its implications for usage intention. Descriptive research used in this study is part of a conclusive research design.

Technological innovativeness was measured by three indicators (Hur, et. al, 2017), namely: the willingness to use the availability technology (TI1); the willingness to use new technology (TI2), and becoming a first user in using the new technology (TI3).

Perceived usefulness was measured by five indicators (Hur, et.al, 2017) such as easiness of LinkAja usage in shopping (PU1); more efficient payment (PU2); offer various promotion programs (PU3); speedy transaction settlement (PU4); and more convenient (PU5).

Perceived ease of use was measured by four indicators (Hur, et.al, 2017) as follows: easy to use (PEU1); understandable (PEU2); easy to learn (PEU3), and informative (PEU4).

Perceived playfulness was measured by four indicators (Hur, et.al, 2017), namely: meaningful (PP1); interesting experience (PP2); cheerful (PP3), and positive

experience (PP5).

Usage intention was measured by four indicators (Hur, et.al, 2017), such as LinkAja usage for the payment settlement (UI1); future usage of LinkAja (UI2); prefer use LinkAja compare with others (UI3), and recommending LinkAja to friends and families (UI4).

**Sampling Unit**

The sampling units used in this study are people aged at least 17 who have downloaded the LinkAja application and have used LinkAja to make payments.

**Sampling Method**

In this research, the sampling method used is purposive sampling which means that each element of the population does not have the same opportunity to be selected as a sample, but is based on personal assessments such as certain criteria/requirements from the researcher.

**Results and Discussion**

In this study, data were collected through questionnaires distributed online, and from the questionnaires, 118 respondents were collected during the period of data collection. Of which 106 respondents passed the screening stage by predetermined requirements, namely knowing about the LinkAja e-wallet application and having used the LinkAja e-wallet application for transactions. Of all respondent data that passed the screening stage, only 100 data were used for data processing. 58% of respondents were men and 42% were women. The majority of respondents (60%) were at 17-24 years old and the rest 37% were at 25-32 years old and 3% at the age of 33-40 years old. 58% respondents lived in Tangerang area, followed in Jakarta area (19%), Bekasi (11%), Depok (8%) and Bogor (4%). Based on their occupation, 57% of respondents were college students, 31% worked as employees, 10% worked as freelance and 2% worked as an entrepreneur.

**Results of SEM Measurement Model Analysis**

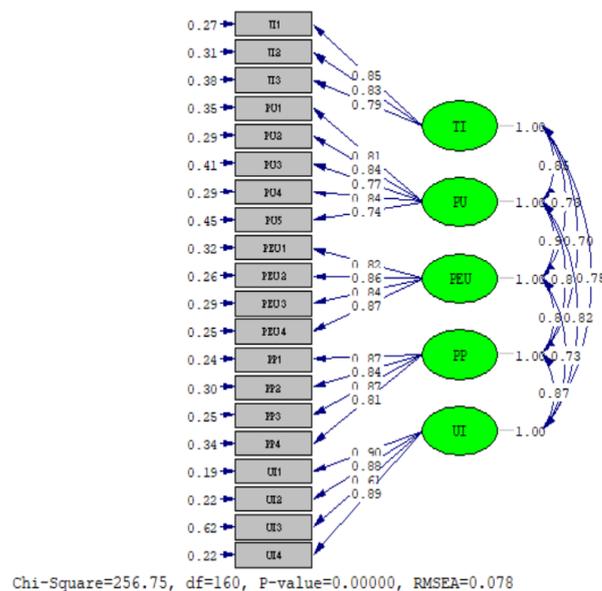


Figure 3. Measurement Model Path Diagram (Standardized Solution)

Figure 2 and Figure 3 above show the path diagram based on standardized solutions and t-values from the results of the measurement model test conducted through Lisrel 8.8 and will be used to measure the validity and reliability of the variable indicators in the research model used in this study, where the test results in The measurement model is summarized in the table of validity (Table 1) and reliability (table 2) below.

Table1.Measurement Model Validity Test Results

No	Variable	Measurement Code	Standardized Factor Loading $\geq 0.5$	T-Value $\geq 1.65$	Validity Testing Result
1.	<i>Technological Innovativeness</i>	TI1	0.85	10.15	<i>Valid</i>
		TI2	0.83	9.78	
		TI3	0.79	9.04	
		PU1	0.81	9.59	
2.	<i>Perceived Usefulness</i>	PU2	0.84	10.27	<i>Valid</i>
		PU3	0.77	8.95	
		PU4	0.84	10.24	
		PU5	0.74	8.44	
		PEU1	0.82	9.84	
3.	<i>Perceived Ease of Use</i>	PEU2	0.86	10.56	<i>Valid</i>
		PEU3	0.84	10.19	
		PEU4	0.87	10.74	
		PP1	0.87	10.75	
4.	<i>Perceived Playfulness</i>	PP2	0.84	10.09	<i>Valid</i>
		PP3	0.87	10.67	
		PP4	0.81	9.65	
		UI1	0.90	11.45	
5.	<i>Usage Intention</i>	UI2	0.88	11.04	<i>Valid</i>
		UI3	0.61	6.61	
		UI4	0.89	11.10	

Table 2.Measurement Model ReliabilityTest Results

No	Variable	CR $\geq 0.7$	VE $\geq 0.5$	Results of Reliability Testing
1.	Technological Innovativeness	0.8640	0.6795	<i>Reliable</i>
2.	Perceived Usefulness	0.8993	0.6418	<i>Reliable</i>
3.	Perceived Ease of Use	0.9111	0.7196	<i>Reliable</i>
4.	Perceived Playfulness	0.9104	0.7178	<i>Reliable</i>
5.	Usage Intention	0.8959	0.6873	<i>Reliable</i>

Table 2 above shows the results of the calculation of reliability in the measurement model through construct reliability (CR) and also variance extracted (VE). And based on the results of the table, it can be said that all variables used in this study are reliable because they have met the requirements of CR 0.7 and VE 0.5.

Table3.Structural Model Hypothesis Test Results

Hypothesis	Description	t-table	t-value	Conclusion
H1	<i>Technological innovativeness has a positive effect on perceived usefulness.</i>	1.65	9.28	Data Supported Hypothesis
H2	<i>Technological innovativeness has a positive effect on perceived ease of use.</i>	1.65	8.70	Data Supported Hypothesis
H3	<i>Technological innovativeness has a positive effect on perceived playfulness</i>	1.65	8.75	Data Supported Hypothesis
H4	<i>Perceived usefulness has a positive influence on usage intention.</i>	1.65	2.06	Data Supported Hypothesis
H5	<i>Perceived ease of use has a positive influence on usage intention.</i>	1.65	2.92	Data Supported Hypothesis
H6	<i>Perceived playfulness has a positive influence on usage intention.</i>	1.65	5.09	Data Supported Hypothesis

Based on the data from the table above, the variables that are declared to have a positive effect are variables that have a value of more than 1.65 with the confidence level at 95%, and these variables are also declared valid so that the hypothesis can be accepted.

### Conclusions and Managerial Implications

Based on the results of the research and all the analyzes carried out in this study, the researchers can conclude that technological innovativeness has a positive effect on perceived usefulness, perceived ease of use, and perceived playfulness. Furthermore, each variable of perceived usefulness, ease of use, and perceived playfulness had a positive effect on user intention in using LinkAja. The innovation in technology in the LinkAja e-wallet application gives the perception that the LinkAja application is easy to use; very pleasant to use; offered attractive features and gives a pleasant experience.

The limitation of the study is related to the small number of respondents which just only 100 respondents participated in the survey. The value of R square showed that 83% of usage intention variables could be explained with variable perceived usefulness, perceived ease of use, and perceived playfulness with perceived playfulness had the biggest influence on usage intention. Therefore, there would be 17% of other variables that can be considered in increasing the usage intention, such as education, social networking, and familiarity with the new technology platform.

LinkAja should launch an innovative feature to strengthen the aspects of perceived usefulness, such as: adding a split bill feature, which makes it easier for users to type payments when making transactions together. Link Aja should add informative videos and channels to communicate promotional offers and any various programs to attract more users. In addition, LinkAja could improve the more user-friendly and attractive UI/IX of the application.

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