

## Conference Paper

# Electronic Ticketing: What Factors Make People Use this Technology?

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## Abstract

In this fourth industry revolution era, there are so many technologies that enable people to do their activities easily. The aim of this research was to investigate factors that influenced people to use one of technology around us, electronic ticketing system. This research uses as the indicators from Unified Theory of Acceptance and Use of Technology (UTAUT) Model which developed by Venkatesh et al (2003). The indicators used in this research were use behavior, behavioral intention, performance expectancy, effort expectancy, social influence, and facilitating conditions. This research used 5-Likert scale questionnaire and there are 218 respondents who are responds to this questionnaire. The data was analyzed using Partial Least Square (PLS). The result of this research shows that performance expectancy influence behavioral intention on using electronic ticketing system. Effort expectancy also influences behavioral intention on using electronic ticketing system. Meanwhile, social influence indicator does not influence behavioral intention on using electronic ticketing system. Facilitating condition indicator influence use behavior on using electronic ticketing system, and behavioral intention itself does not influence use behavior on using electronic ticketing system.

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**Keywords:** behavioral intention, effort expectancy, facilitating condition, online ticketing, performance expectancy, social influence, use behavior, UTAUT

## 1. Introduction

In our life today, we have a very close relationship with Information Technology (IT). We use IT for many reasons, such as, for helping us in our work, for making our life become easier, and many other reasons. These reasons become more reasonable because the development of IT is very huge. The development of IT also influences our life. Technologies have changed our lifestyle [1]. Not only important for our daily activities and our works, IT also important for business activities. Most business companies use IT to support their decision making processes. The use of IT in business companies reflected on their investment towards IT. From the latest U.S data, in 1980-2011, private business investments in IT arise until more than 50 percent of all capital investment [2]. From this data, we can see that the needs of IT for business companies are higher during

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the years. When business companies invest some money on their IT, they can do more extensive activities. The activities are sharing databases, interchanging documents, integrating products, and communicating across the firm [3]. IT also provides tools to analyze specific data, plan business journey, and solve complex problems [4].

In Indonesia, most business companies also invest their funds on IT. We can see that in the last decades, the innovation of IT were numerous. Consumers now can fulfill their needs easily through the IT developed by business companies, such as consumers can orders food or rides from remote area through the application on their smartphones. Other examples are about electronic ticketing systems. With this technology, consumers can order their train, plane, or other types of transportation tickets through websites or using their gadgets.

The use of IT can be evaluated through models. One of the famous models to evaluate IT usage is Unified Theory of Acceptance and Use of Technology (UTAUT). UTAUT was developed by Venkatesh, et al. to understand the unified view of user acceptance [5]. We will discuss this model later in the next part of this paper. The research question of this paper based on UTAUT model is: what factors that influenced people in using electronic ticketing systems? Focus of this paper is on consumers' acceptance of this system. The structures of this paper are: in the first section, there is a brief introduction about this paper. Next section, we will discuss about the UTAUT Model and previous researches related to UTAUT Model in order to build the hypotheses. After that, there will be a research method section consists of type of research, sampling method, data collection method, and data analysis technique. The next section will talk about the data analysis, results, and discussion, and the last section is the conclusion of this paper.

## 2. Unified Theory of Acceptance and Use of Technology

Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh et al. in 2003 [5]. UTAUT is a combination from previous IT acceptance model, such as Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), Combined-TAM-TPB Model (C-TAM-TPB), Motivational Model (MM), Innovation-Diffusion Theory (IDT), Model of PC Utilization (MPUC), and Social Cognitive Theory (SCT) [6]. These models indicate that users' behavior in using technology has been studied for long time. In their research, Venkatesh et al., [5] compare the previous eight models of user acceptance.

In the comparison, they list the core constructs for each model [5] as follows: Theory of Reasoned Actions has two core constructs: attitude toward behavior and subjective

norm; Technology Acceptance Model has three core constructs: perceived usefulness, perceived ease of use, and subjective norm; Motivational Model with its two core constructs: extrinsic and intrinsic motivation; Theory of Planned Behavior has core constructs: attitude toward behavior, subjective norm, and perceived behavioral control; Combined TAM and TPB has four core constructs: attitude toward behavior, subjective norm, perceived behavioral control, and perceived usefulness; Model of PC Utilization with some core constructs: job-fit, complexity, long-term consequences, affects toward use, social factors, facilitating conditions; Innovation Diffusion Theory has core constructs: relative advantage, ease of use, image, visibility, compatibility, results demonstrability, voluntariness of use; and social cognitive theory has some core constructs: outcome expectations-performance, outcome expectations-personal, self-efficacy, affect and anxiety. After comparing the eight models of user acceptance, Venkatesh et al., found that there are four constructs will play a significant role as direct determinants of user and usage behavior, they are performance expectancy, effort expectancy, social influence, and facilitating conditions [5]. They also find that gender, age, voluntariness in use, and experience are key moderators for their acceptance model. **Figure 1** is the UTAUT Model developed by Venkatesh, et al.

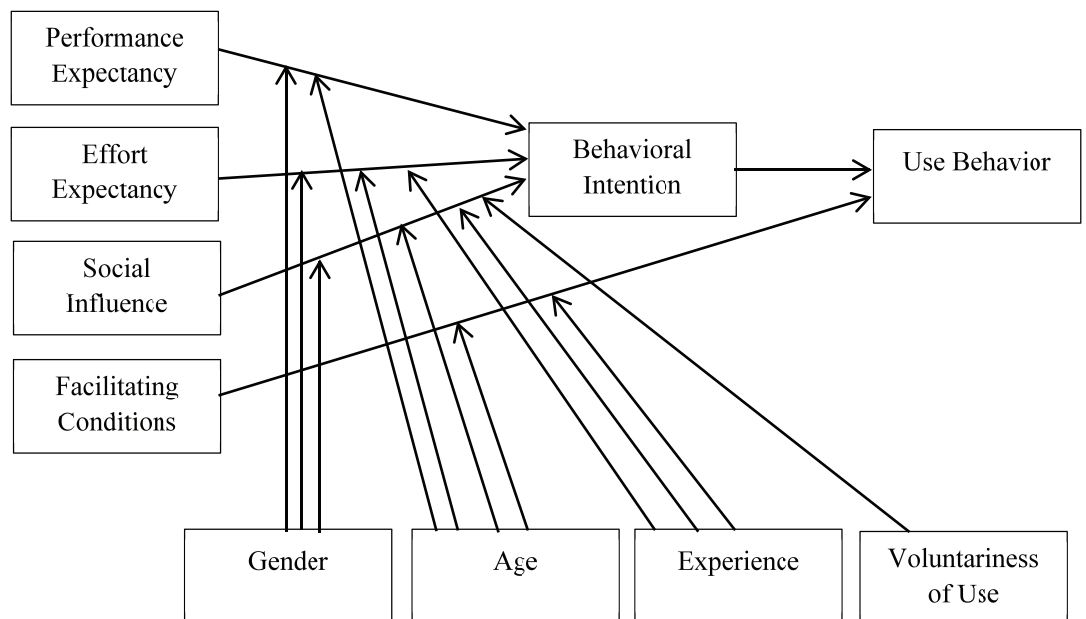


Figure 1: UTAUT Model.

## 2.1. Constructs in UTAUT

UTAUT developed by Venkatesh et al. [5] has some constructs as depicted in **Figure 1**. The four core constructs of UTAUT are:

### 2.1.1. Performance Expectancy

Venkatesh et al., define performance expectancy as the degree to which an individual believes that using the system will help him or her to attain gains in job performance [5]. The relation between performance expectancy and intention will be moderated by gender and age [5].

### 2.1.2. Effort expectancy

Effort expectancy defined as the degree of ease associated with the use of system [5]. This construct will be moderated by gender, age, and experience in the relation with behavioral intention.

### 2.1.3. Social Influence

Social influence defined as the degree to which an individual perceives that important others believe he or she should use the new system [5]. Gender, age, voluntariness in use, and experience will moderate the relation between this construct and behavioral intention.

### 2.1.4. Facilitating Conditions

Venkatesh et al., define facilitating conditions as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system [5]. Age and experience will moderate the relation between facilitating conditions and use behavior.

## 2.2. Previous Literatures on UTAUT

UTAUT has been widely used in acceptance and use of technology researches. Choudrie et al., for the example, in their research about the acceptance of using

smartphone in UK [7]. They combined four determinants of UTAUT (social influence, facilitating conditions, effort expectancy, performance expectancy) with perceived enjoyment, and two constructs from Diffusion of Innovation Model (observability and compatibility). They conducted the research to 204 respondents. They gathered the data through online questionnaires in two-ways, through SurveyMonkey website and e-mail. From 204 responses, only 160 questionnaires could be used. The data was analyzed using Partial Least Square (PLS). From the research, they found that determinants of UTAUT were important factors of adoption and use of smartphones.

In other research, Orji investigated the acceptance and use of Electronic Library Systems (ELS) [8]. She conducted the research towards 116 graduated students as the participants. Little bit difference with Choudrie et al., Orji added one variable to her UTAUT model. The addition variable is nationality, so she called her research model as NUTAUT (Nationality UTAUT). From her research, she found that all of four construct of UTAUT are the critical components that affect the acceptance and use of ELS and facilitating conditions is the most important one [8].

### 3. Online Ticketing

Online ticketing is the popular method for consumers to get their public transportation tickets nowadays. Online ticketing also called as electronic ticketing (e-ticketing). E-tickets are replacement of paper-based tickets. According to Sulaiman et al., there are some characteristics of e-ticketing, such as e-ticketing model allows authorized travel agents to transmit ticketing information directly to the airline's database, enabling passengers to check-in and boarding without showing paper tickets [9]. Online ticketing is a part of electronic commerce (e-commerce) because its transactions were done by the internet [10].

Authorized travel agents in Indonesia and travel companies now have their own online ticketing system. They make this innovation on ticket sales in order to satisfy their customers who can buy the tickets easily wherever and whenever they want. In this paper, we only focus on train online ticketing system.

### 4. Research Hypothesis

Based on some previous literatures, we construct our research hypothesis as follows:

#### 4.1. Performance expectancy to behavioral intention

Alwahaishi and Snasel found that performance expectancy influence behavioral intention on Information and Communication Technology (ICT) based on their research [11]. In other research, Goswami and Dutta found that performance expectancy positively affect the behavioral intention maong women entrepreneurs in India in using e-commerce [13]. These conditions are very reasonable, because when people feel that using technology can help them to attain the gain in their job, they will have intention to use that technology.

H1: performance expectancy has significant and positive influence towards behavioral intention on using online ticketing system.

#### 4.2. Effort expectancy to behavioral intention

Effort expectancy has influence toward behavioral intention according to research from Alwahaishi and Snasel [11]. Similar with Alwahaishi and Snasel, Attuquayefio and Addo also found that effort expectancy significantly predicted the behavioral intention to use ICT [12]. Goswami and Dutta also found from their research that effort expectancy has a positive affect to behavioral intention for women entrepreneurs in India to use e-commerce [13]. The reasonable argument based from these literatures is the condition when people feel using technology is easy, they will have intention to use it.

H2: effort expectancy has significant and positive influence towards behavioral intention on using online ticketing system.

#### 4.3. Social influence to behavioral intention

People will have intention to use technology, based on others' suggestions. From this condition, Alwahaishi and Snasel found that social influence affect behavioral intention in using ICT [11]. Goswami and Dutta also found the same thing. When they investigated women entrepreneurs in India, they found that social influence positively affect the behavioral intention.

H3: social influence has significant and positive influence towards behavioral intention on using online ticketing system.

#### 4.4. Facilitating conditions to use behavior

Attuquayefio and Addo found that facilitating conditions significantly influence use behavior on ICT [12]. Goswami and Dutta also found that among women entrepreneurs in India, facilitating conditions positively affect their actual use in e-commerce. Facilitating conditions, based on theoretical background, defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system [5]. When people believe that there are high supports to use the system or technology, they will use the system or technology.

H4: facilitating conditions has significant and positive influence towards use behavior on using online ticketing system.

#### 4.5. Behavioral intention to use behavior

Goswami and Dutta found that behavioral intention among women entrepreneurs positively affect to their use on e-commerce technology [13]. Theoretically, when people have a high intention to use the technology, it is possible for them to use the technology, actually.

H5: behavioral intention has significant and positive influence towards use behavior on using online ticketing system.

### 5. Research Model

Figure 2 shows our research model, based on our hypotheses.

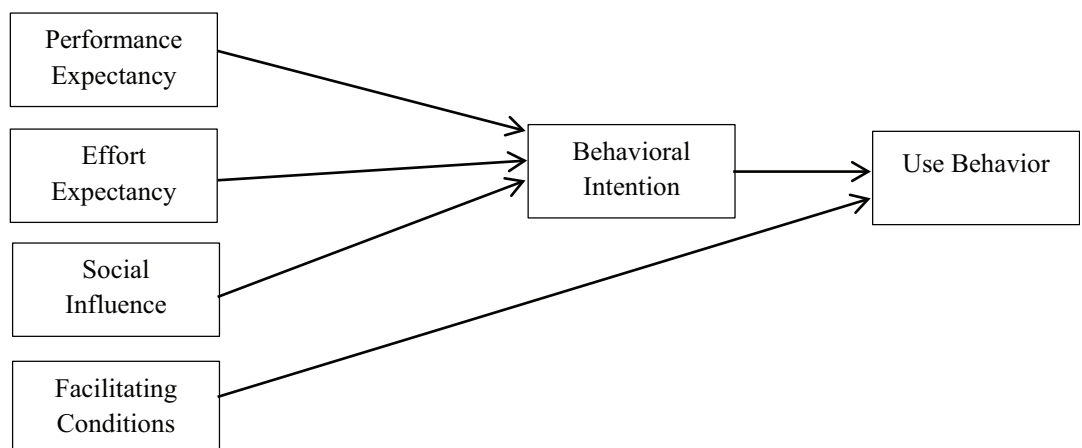


Figure 2: Research Model.

## 6. Research Methodology

This paper is a quantitative research. We conducted our research toward people who ever use online ticketing system especially for train transportation. To gather the data, we use 5-Likert scale questionnaire with 21 items to be answered by respondents. We modified all items in questionnaire from some previous researches to adjust with the condition of our research. **Table 1** presents the items in our questionnaire.

## 7. Data Analysis

### 7.1. Data Demography

We deliver our questionnaire through Google form to every people who ever buy train ticket using KAI Access online ticketing system. Finally, we got 100 responds that can be used to be analyzed in our paper. Table 2 presents the demography of our respondents. In the next section, we analyze the data using Partial Least Square (PLS).

### 7.2. Outer Model

Outer Model in PLS consists of convergent validity, discriminant validity, and reliability.

#### 7.2.1. Convergent validity

Convergent validity shows the correlation between indicators and its constructs. Minimum requirement for convergent validity is above 0.6 for the loading factor [14]. **Table 3** presents the convergent validity from each constructs. The table shows that all constructs in this paper have loading factor above the minimum requirements.

#### 7.2.2. Discriminant validity

Discriminant validity measured from square root of Average Variance Extracted (AVE) for each constructs. Theoretically, good discriminant validity required the value of square root of Average Variance Extracted (AVE) for each constructs is higher than correlation between its construct toward another constructs [14]. Discriminant validity is often assessed by a construct and its indicators distinct from another construct and its



TABLE 1: Questionnaire Items.

Constructs		
PE1	I would find electronic ticketing system useful in my job	Performance Expectancy
PE2	Using electronic ticketing system enables me to accomplish tasks more quickly	
PE3	Using electronic ticketing system in my job would increase my productivity	
PE4	Using electronic ticketing system would make it easier to do my job	
EE1	Electronic ticketing system is clear and understandable	Effort Expectancy
EE2	Electronic ticketing system makes me skillful at using the system	
EE3	Electronic ticketing system is easy to use	
EE4	Learning to operate the electronic ticketing system is easy for me	
SI1	The people around me think that I should use an electronic ticketing system	Social Influence
SI2	People who are important to me think that I should use electronic ticketing system	
SI3	People who influence my behavior think that I should use electronic ticketing system	
SI4	I think that in general, transportation system supports me to use electronic ticketing system	
FC1	I have the resources necessary to use electronic ticketing system	Facilitating Conditions
FC2	I have the knowledge necessary to use electronic ticketing system	
FC3	There is a special facility to help people who have trouble when they use electronic ticketing system	
FC4	Electronic ticketing system features enable me to buy tickets	
BI1	I intend to use electronic ticketing systems to buy the train tickets	Behavioral Intention
BI2	I plan to use electronic ticketing system when I need to buy train ticket	
BI3	I will suggest other people to use electronic ticketing system	
UB1	I use electronic ticketing system on regular basis	Use Behavior
UB2	I often use electronic ticketing system	
UB3	I prefer use electronic ticketing system when I need to buy train ticket	

indicators in the outer model [15]. **Table 4** presents the discriminant validity results and it shows that every constructs have good discriminant validity (based on **bold number**).

TABLE 2: Data Demography.

Demography Criteria		Amount
Sex	Male	54
	Female	36
<b>Total</b>		<b>100</b>
Age	19 years old	16
	20 years old	42
	21 years old	19
	22 years old	5
	23 years old	7
	24 years old	6
	25 years old	5
	<b>Total</b>	

TABLE 3: Convergent Validity.

Construct	Indicators	Loading Factor
Performance Expectancy	PE1	0.837
	PE2	0.798
	PE3	0.928
	PE4	0.829
Effort Expectancy	EE1	0.911
	EE2	0.867
	EE3	0.871
	EE4	0.853
Social Influence	SI1	0.694
	SI2	0.926
	SI3	0.749
Facilitating Conditions	FC1	0.829
	FC2	0.954
	FC3	0.940
	FC4	0.887
Behavioral Intention	BI1	0.966
	BI2	0.907
	BI3	0.969
Use Behavior	UB1	0.851
	UB2	0.912
	UB3	0.954

TABLE 4: Discriminant Validity.

	Performance Expectancy	Effort Expectancy	Social Influence	Facilitating Conditions	Behavioral Intention	Use Behavior
Performance Expectancy	<b>0.849</b>					
Effort Expectancy	0.755	<b>0.876</b>				
Social Influence	0.769	0.796	<b>0.934</b>			
Facilitating Conditions	0.855	0.875	0.876	<b>0.904</b>		
Behavioral Intentions	0.797	0.795	0.766	0.719	<b>0.948</b>	
Use Behavior	0.591	0.444	0.443	0.631	0.478	<b>0.907</b>

### 7.2.3. Reliability

Reliability test can be observed from Cronbach Alpha and Composite Reliability. Theoretically, minimum requirement from Cronbach Alpha and Composite Reliability is above 0.7 [14]. **Table 5** presents the Cronbach Alpha and Composite Reliability from each constructs. This table shows that all constructs in our paper are reliable.

TABLE 5: Reliability Test.

Constructs	Cronbach Alpha	Composite Reliability
Performance Expectancy	0.870	0.912
Effort Expectancy	0.899	0.929
Social Influence	0.703	0.836
Facilitating Conditions	0.925	0.947
Behavioral Intention	0.944	0.964
Use Behavior	0.891	0.932

## 7.3. Inner Model

### 7.3.1. Path Analysis

Path analysis is a part of inner model. It represents the correlation between independent variables and the dependent variables. **Table 6** shows the path analysis and it indicates that all correlations are positive.

TABLE 6: Path Analysis.

	Performance Expectancy	Effort Expectancy	Social Influence	Facilitating Conditions	Behavioral Intention	Use Behavior
Performance Expectancy					0.453	
Effort Expectancy					0.421	
Social Influence					0.035	
Facilitating Conditions						0.593
Behavioral Intentions						0.052

### 7.3.2. R Square

**Table 7** shows the R Square value for the dependents variable. From the table, we can see that performance expectancy, effort expectancy, and social influence are able to explain the 72.2% of the changes of behavioral intention as the dependent variable. In other hand, facilitating conditions and behavioral intentions are able to explain 39.9% of the changes of use behavior as dependent variable.

TABLE 7: R Square.

	R Square
Behavioral Intention	0.722
Use Behavior	0.399

### 7.3.3. Bootstrapping

**Table 8** shows the bootstrapping results from our model using WarpPLS software. Bootstrapping results represented by the total effects from each hypothesis. The bootstrapping analysis allows for the statistical testing of the null hypothesis against the alternative hypothesis [16].

## 8. Results and Discussion

The results from data analysis are mostly consistent with previous literatures, that some of UTAUT constructs are the determinants toward the acceptance and use of technology. First hypothesis (H1) is supported. From **Table 8**, performance expectancy to behavioral intention has p-values 0.01 and it is significant (less than alpha, 0.05). The T-statistics value is 3.357 (higher than t-table, 1.64). From this result, we find that

TABLE 8: Total Effects.

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-Statistics (O/STDEV)	p-values
Performance Expectancy to Behavioral Intention	0.453	0.466	0.135	3.357	0.001
Effort Expectancy to Behavioral Intention	0.421	0.441	0.141	2.990	0.003
Social Influence to Behavioral Intention	0.035	0.005	0.195	0.180	0.857
Facilitating Conditions to Use Behavior	0.593	0.596	0.094	6.288	0.000
Behavioral Intention to Use Behavior	0.052	0.052	0.112	0.467	0.640

performance expectancy has a significant and positive effect to behavioral intention on using electronic ticketing systems. Second hypothesis (H2) also supported. From the table of total effects, the p-value is 0.003 (less than alpha, 0.05) and the T-statistics value is 2.990 (higher than t-table, 1.64). In other words, we also find that effort expectancy has a significant and positive effect to behavioral intention on using electronic ticketing systems. Unfortunately, the third hypothesis (H3) is not supported because it is not significant. We can see that the p-value for the effect of social influence to behavioral intention is 0.857 and it is higher than alpha (0.05). Next hypothesis (H4) is supported. The effect of facilitating conditions to use behavior has p-value (0.000) less than alpha (0.05), so it is significant. The T-statistics (6.288) is higher than t-table (1.64). From this result, we find that facilitating conditions has a significant and positive effect to behavioral intention on using electronic ticketing systems. Last hypothesis (H5) has a similar result with the third hypothesis. The effect of behavioral intention to use behavior is insignificant because it has p-value (0.640) higher than alpha (0.05), or in other words, we find that the last hypothesis is not supported.

## 9. Conclusion

From our research, we can conclude that the most determined factor on user acceptance and use of online ticketing especially train ticketing is facilitating conditions towards the behavioral intention. It means that people will use the online ticketing system when they find that all supports that they need to use online ticketing system are exists. This is very important to authorized travel agents or transportation companies, if they want the customers to use the online ticketing system regularly, the company should maintain

and also develop the facilitations in their online ticketing system in order to enhance the satisfaction of customers.

The least factor on accept and use online ticketing system is effort expectancy to behavioral intention. Effort expectancy regarded to the ease of using online ticketing system. With its lowest value, it indicates that users feels that the KAI Access is easy to use, but the ease of use of KAI Access is not the most determinants for them to use that technology. KAI Access has been used for some previous years, and PT Kereta Api Indonesia (PT KAI) as the owner of the online ticketing system, always develop their system regularly. For the example, in 2014, they launched the online ticketing system for mobile phones [17]. Other development, for example, in 2018, PT KAI upgraded their online system with other important features such as: cancelling the ticket, re-scheduling, or re-fund mechanism [18]. This regular and continuous development is very important to enhance the amount of users and to improve their satisfaction.

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