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# Factors Influencing Adoption of Mobile Government Services: Evidence from Indonesia's Vehicle Registration Application

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**Abstract.** Every motorized vehicle owner must have a STNK (Vehicle Registration Certificate) which must be renewed every year. The annual STNK renewal is a process that must be carried out by vehicle owners every year every time they make a tax payment. Keeping up with developments in the digital era, Korlantas Polri continues to strive to improve services to the public by introducing the SIGNAL (National Digital Samsat) mobile application in 2021. This research analyzes the factors that influence people's intentions to use the SIGNAL mobile application to renew their STNK. Quantitative survey data was collected from 196 Indonesian citizens living in Jakarta and PLS-SEM methodology was applied. Findings reveal that performance expectations, social influence, and trust in technology have a positive impact on people's intention to use applications. However, facilitating conditions and trust in the government do not have a significant influence. This research contributes insight into the key drivers of mobile app use to receive government services.

**Keywords:** Smartphones, Mobile Apps, Vehicle Registration, Technology Acceptance Models, Public Services

# 1. Introduction

Every motorized vehicle owner must have a STNK (Vehicle Registration Certificate) which must be renewed every year. The annual STNK renewal is a process that must be carried out by vehicle owners every year every time they make a tax payment. Based on the results of a diagnostic study on the digital transformation of taxes related to motor vehicles carried out by the DKI Jakarta Provincial Bapenda together with the Computer Science Center of the University of Indonesia, it was stated that paying annual vehicle tax at SAMSAT (One-stop Administration Services Office) was considered not easy. The process is quite complicated because filling out documents or forms has to be done repeatedly, apart from that, people's productivity is also wasted because they have to spend at least half working day to complete the motor vehicle taxes processes (Kompas, 2021).

Keeping up with developments in the digital era, Korlantas Polri is trying to improve the services provided to the public by introducing a mobile application called SIGNAL (National Digital SAMSAT) in 2021. The SIGNAL application is an application designed and created by Korlantas Polri to make it easier for the public to get services from the National Police, which one of the service is annual STNK renewal (Samsatdigital, 2021). Before SIGNAL, each regional government created its own service to pay vehicle taxes online, via website or mobile application. These services were not optimized due to a lack of socialization carried out by the local government. Many people still choose to pay taxes offline. With the launch of the SIGNAL application, it is hoped that the motor vehicle tax payment process will become easier, and can reduce the queues that occur at the SAMSAT office (Liputan6, 2023).

Reported by CNN Indonesia, the number of people who download the application is more than the number of transactions carried out via the application by quite a large gap. It is recorded that a lot of people have downloaded the application but have not made transactions. Many people download the application just because they want to know about the application (CNN Indonesia, 2021). This research was conducted to analyze the factors that influence people's intentions to not only download the application, but also use the SIGNAL mobile application to renew their STNK online using UTAUT model.

Previous study related to e-Government adoption by Taiwo (Taiwo et al., 2014) has succeeded in combining and investigating existing empirical literatures on Unified Theory of Acceptance and Use of Technology (UTAUT). The study result shows that performance expectancy has strong influence to people's intention to adopt a e-Government application while others are slightly weak but significant.

The rest of the paper is structured as the followings: Section 2 reviews the related literature and hypotheses development. Section 3 presents the research model and discusses the empirical study to measure respondents' intention to use SIGNAL application to renew their STNK online. The analysis's findings, conclusions, and results are discussed in the last section.

# 2. Literature Review

## 2.1. Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT) model consists of eight leading information technology acceptance models from the social psychology domain and is applied to the information systems domain. The eight models are The Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Motivational Model (MM), Theory of Planned Behavior (TPB), Combined TAM and TPB (C-TAM-TPB), Model of PC Utilization (MPCU), The Innovation Diffusion Theory (IDT), The Social Cognitive Theory (SCT) (Venkatesh et al., 2003). Similarities in the empirical validation of these models gave birth to the UTAUT model. The four main constructs in the UTAUT model are:

- Performance Expectancy (PE): the extent to which an individual believes that using a computerized system will help him improve his job performance.
- Effort Expectancy (EE): the level of ease associated with using a computer system.

- Social Influence (Social Influence or SI): the degree to which an individual perceives that important others believe that he or she should use a new computer system or technology.
- Facilitating Conditions (FC): the degree to which an individual believes that the organizational and technical infrastructure available to him or her supports use.

Apart from that, there are also two endogenous variables, namely behavioral intention to use technology and usage behavior, as well as four moderators, namely gender, age, experience, and willingness to use. Behavioral Intention is a person's willingness and readiness to do something with a certain behavioral intention. In this research, the behavioral intention referred to is people's intention to use mobile applications to obtain government services. Four main constructs (Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Condition) are direct determinants of Behavioral Intention (BI) (Venkatesh et al., 2003).

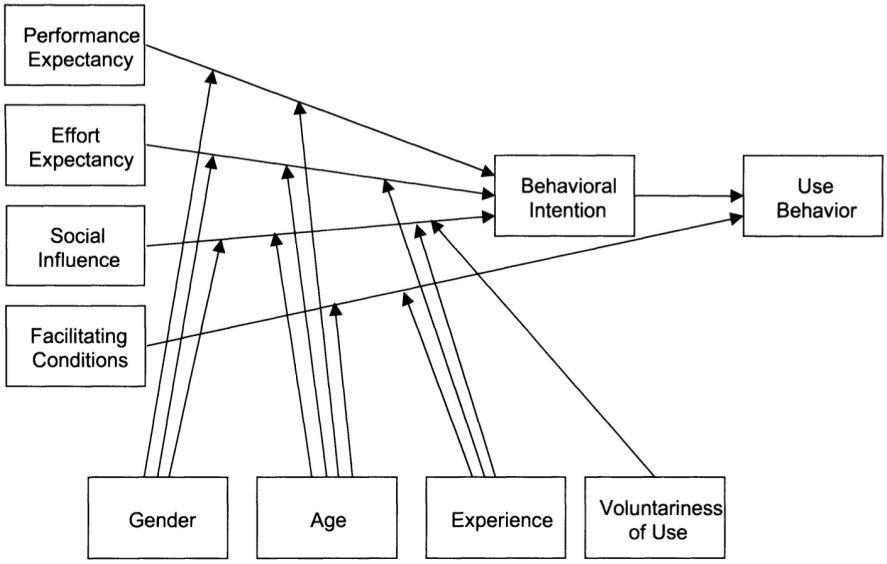


Fig. 1: Unified Theory of Acceptance and Use of Technology Model

## 2.2. Trust

Trust is a concept that is surrounded by conceptual ambiguity because trust has never been a very common sociological topic (Luhmann. N, 1988). The concept of trust is closely related to risk and expectations. Trust is used as a substitute for risk, but it also creates risk for the person who trusts it. Trust involves the belief that others will, to the extent they can, look after our interests, that they will not take advantage of us or harm us. Therefore, trust involves personal vulnerability caused by uncertainty regarding another person's future behavior. We cannot be sure, but we trust that they will do no harm, or at least not malign, and act in ways that might put us at risk (Annette Baier, 1986).

Trust is an important concept, someone will be more likely to explore and use more features of a technology if they trust it (Mcknight et al., 2011). There are three main types of trust concepts proposed for information technology, namely trustworthy beliefs, trusting intentions, and trusting behavior (McKnight H. et al., 2009). Trustworthy beliefs mean a definite belief that the other party has favorable attributes, such as benevolence, integrity, and competence, which are strong enough to create an intention to trust.

Trusting intent refers to a committed willingness to depend on, or be vulnerable to, another party in a particular way, which is strong enough to create trusting behavior. Trusting behavior means convincing actions that show that someone is in fact dependent on another party, not on oneself or on control (McKnight D, 2005).

## 2.3. Hypotheses Development

The concept that builds the UTAUT model is Performance Expectancy, namely the extent to which an

individual believes that using a computerized system will help to improve his or her work performance. Second, Effort Expectancy, namely the level of ease associated with using a computer system. Third, Social Influence which can be interpreted as the extent to which an individual sees that important others believe that he or she should use a new computer system or technology. Many previous studies show that Performance Expectancy and Effort Expectancy, Social Influence have a significant influence on user intentions, therefore the hypothesis proposed by researchers is as follows:

**H1**: Performance expectations from using the application influence the intention to use the application.

**H2**: Ease of use of a mobile application influences the intention to use the application.

**H3**: Social influence influences the intention to use the application.

The availability of facilitating conditions, namely the extent to which individuals believe that the organizational and technical infrastructure is available to support system use, also has a significant influence on user intentions. Previous studies found that Facilitating Conditions did not have a significant influence on user intentions (Taiwo et al., 2014). Therefore, researchers want to prove this by proposing the following hypothesis:

**H4**: Facilitating conditions influence the intention to use the application.

Trust in the government is defined as the public's belief or hope that the government will carry out certain actions that are important to them without any control over the government's performance because the government is the party responsible for providing services to the community (Alsaghier et al., 2008). Researchers propose the following hypothesis:

**H5**: Trust in government influences intention to use applications

Trust in technology can be defined as the belief that a particular technology has what is needed to perform a task as expected in a particular situation (Schoorman et al., 2007). In this research, researchers use institutional or organizational-based trust which refers to trust in the technology used to carry out electronic transactions, namely the internet. Trust in technology reflects three beliefs, namely reliability, functionality, and usability (Mcknight et al., 2011). Researchers put forward the following hypothesis:

**H6**: Trust in technology influences intention to use applications

# 3. Research Method

## 3.1. Model Building

Based on the literature review presented in the theoretical basis section, it appears that the four constructs of the UTAUT model, namely performance expectations, effort expectations, social influence and facilitating conditions influence people's adoption of e-Government in their respective countries. In addition, the feasibility, validity and stability of the UTAUT model in technology adoption research studies in several contexts have been confirmed (Alawadhi & Morris, 2008).

Perceptions of trust also have an impact on the adoption of e-Government by the public (Carter & Bélanger, 2005). Several researchers emphasize that the decision to carry out transactions via e-Government requires public trust in the government and also in technology.

Because the developers of UTAUT recommended that modifications and revisions of the UTAUT model are necessary for different applications in different contexts (Venkatesh et al., 2003), the researcher made modifications to the construction of the UTAUT model to suit the research. Items to measure trust in government, trust in technology were adapted from research conducted by previous researchers (Carter & Bélanger, 2005). Based on the variables used in research conducted by previous researchers related to e-Government, in this research, to be able to determine people's intentions to use mobile applications to receive government services, the variables used are as follows:

- Performance Expectancy (PE)
- Effort Expectancy (EE)
- Social Influences (SI)
- Facilitating Conditions (FC)
- Trust in Government (TIG)

- Trust in Technology (TIT)

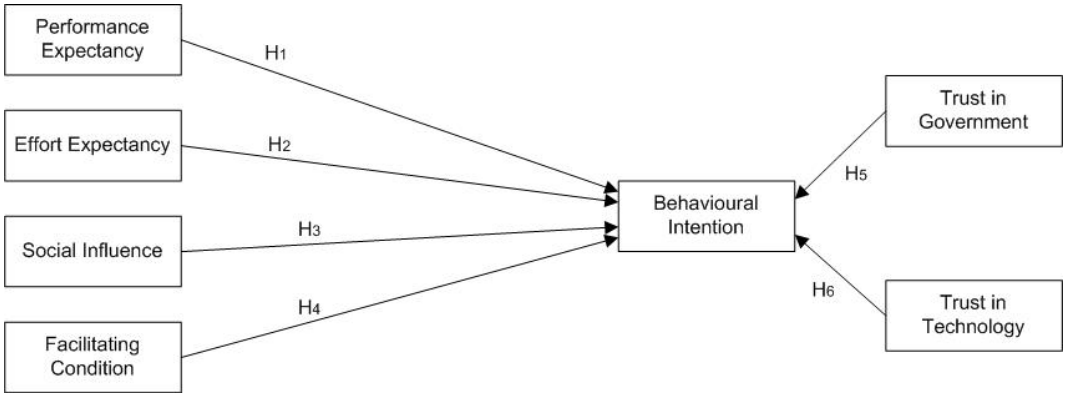


Fig. 2: Research Model

- Performance Expectancy (PE): this variable is the user's expectation that his or her work performance will improve by using the application. This variable is used to check whether people will have the intention to use the application if they feel that the process they need to go through will be faster and the services provided will also be better.
- Effort Expectancy (EE): this variable is the level of ease of effort expended by users to use the application. This variable is intended to check whether people will find it easy to learn how to use the application and whether this contributes to their intention to use the application.
- Social Influences (SI): this variable is the influence of other people on users to use the application. This variable is used to check whether other people such as colleagues, family, friends can influence a person's intention to use the application.
- Facilitating Conditions (FC): this variable is the user's level of confidence that the organizational and technical infrastructure available to supports the use of the application. This variable is used to check whether someone has adequate resources, such as having a cell phone with adequate specifications or the availability of videos on how to use the application, will influence someone's intention to use the application.
- Trust in Government (TIG): this variable is the level of user trust in the government. This variable is used to check whether if people trust the government, they will use applications issued by the government to receive public services.
- Trust in Technology (TIT): this variable is the level of user trust in a technology. This variable is used to check whether the application's resistance to hacking, viruses, and other similar things that will influence a person's intention to use the application.
- Behavioral Intention (BI): this variable is the behavioral intention of the user. This variable is a dependent variable, used to see whether the independent variables in the research model directly determine people's behavioral intentions towards using the application.

## 3.2. Analysis Design

The Partial Least Squares (PLS) method will be used to test research models using Smart PLS 4 software. PLS is a component-based approach for testing theoretical research models in structural equation modeling. The main purpose of PLS is to make predictions and not confirm. PLS does not require large sample sizes.

In this research, data collection was carried out using a questionnaire, therefore a measuring instrument is needed to determine the validity and reliability of the research variables.

The sampling technique used in this research is Non-Probability Convenience Sampling. Convenience Sampling or also known as Haphazard Sampling or Accidental Sampling, is a type of non-probability or non-random sampling in which members of the target population who meet certain criteria such as ease of access, geographic proximity, availability at a certain time, or willingness to

participate are included for research purposes. It can be said that research subjects are a population that is easily accessible to researchers(Rivera, 2019). Convenience sampling is sometimes considered "chance sampling" because elements can be selected in a sample simply because they happen to be located, spatially or administratively close to where the researcher is collecting data.

Data was collected through a survey questionnaire which contains questions related to participant demographic information such as employment, education, age, gender, etc., and also contains statements related to various variables used in the research model. Each statement was measured on a Likert scale with a value of 1 to 4, where 1 means strongly disagree and 4 means strongly agree.

Referring to the hypothesis that has been prepared, the following questions are presented in the form of a questionnaire to test the validity of the hypothesis:

Table 1: Construct Measures with Sources

| Construct | Item | Question | References |
|---|---|---|---|
| Performance Expectancy (PE) | PE1 | In your opinion, if you use the SIGNAL application, will you be able to renew your STNK more quickly? | (Venkatesh et al., 2003) |
| | PE2 | In your opinion, if you use the SIGNAL application, will you be able to renew your STNK more easily? | |
| | PE3 | Do you think the SIGNAL application will be useful for you? | |
| | PE4 | In your opinion, if you use the SIGNAL application to renew your STNK, will your productivity increase? | |
| | PE5 | In your opinion, do you think the quality of government services provided through the SIGNAL application will be better compared to the services provided if you come directly to the SAMSAT office? | |
| Effort Expectancy (EE) | EE1 | Do you think learning to operate the SIGNAL application will be easy for you? | (Venkatesh et al., 2003) |
| | EE2 | Do you think the SIGNAL application will be easy to use? | |
| | EE3 | Do you think it will be easy for you to become skilled at using the SIGNAL application? | |
| | EE4 | Do you think you will be flexible to interact with the SIGNAL application? | |
| | EE5 | Do you think it would be easy to make SIGNAL application to do what you want? | |
| Social Influences (SI) | SI1 | Can other people's thoughts influence your thoughts about using the SIGNAL application to renew your STNK? | (Venkatesh et al., 2003) |

| | | | |
|---|---|---|---|
| | SI2 | Could someone important to you (for example a family member or close friend) make you think about using the SIGNAL application to renew your STNK? | |
| | SI3 | Will you use the SIGNAL application because your colleagues also use the application? | |
| | SI4 | In your opinion, do the people who use the SIGNAL application where you work have more prestige than those who don't? | |
| | SI5 | In your opinion, do the people you know who use the SIGNAL application belong to the upper class? (for example, having a good level of education or financial condition) | |
| Facilitating Condition (FC) | FC1 | Do you think you will have control when using the SIGNAL application? (for example, you can choose to give access rights to a feature such as location or not) | (Venkatesh et al., 2003) |
| | FC2 | Do you think you have the necessary resources to use the application? (for example, a smartphone with sufficient specifications, manual guide, etc.) | |
| | FC3 | Do you have the necessary knowledge to use the SIGNAL application? | |
| | FC4 | In your opinion, does using the SIGNAL application to renew your vehicle registration suit your way of working? | |
| | FC5 | Do you think the SIGNAL application will be compatible with your smartphone? (for example, there are no problems such as the application closing itself) | |
| Trust in Government (TIG) | TIG1 | Do you think the SIGNAL application is a government mobile application, trustworthy? | (Carter & Belanger, 2004) |
| | TIG2 | Are you sure that your data will not be misused by the government if you use the SIGNAL application? | |
| Trust in Technology (TIT) | TIT1 | Do you think the SIGNAL application will be reliable? | (Carter & Belanger, 2004) |
| | TIT2 | Do you think the SIGNAL application will be safe and comfortable to use? | |
| | TIT3 | Do you think the SIGNAL application is resistant to attacks such as hacker attacks / viruses / malware, etc.? | |

| | | | |
|---|---|---|---|
| Behavioural Intention (BI) | BI1 | I intend to use the SIGNAL application to renew my STNK in the next 12 months. | (Venkatesh et al., 2003) |
| | BI2 | I predict that I will use the SIGNAL app in the next 12 months. | |
| | BI3 | I plan to use the SIGNAL application to renew my STNK in the next 12 months. | |

## 4. Result and Discussion

The variables PE, EE, SI, FC, TIG, TIT, and BI have AVE values above the minimum limit of 0.5 so it can be said that all variables in this study are valid. The Cronbach's Alpha value of all the variables tested has a value above 0.7, so it can be said that all the variables used in this research are reliable.

Table 2: Results for the Measurement Model

| **Variables** | **Indicator** | **Outer Loading** | **AVE** | **Cronbach's Alpha** | **P Values** |
|---|---|---|---|---|---|
| Performance Expectancy (PE) | PE1 | 0.856 | 0.827 | 0.948 | 0.037 |
| | PE2 | 0.920 | | | |
| | PE3 | 0.946 | | | |
| | PE4 | 0.931 | | | |
| | PE5 | 0.891 | | | |
| Effort Expectancy (EE) | EE1 | 0.907 | 0.804 | 0.939 | 0.674 |
| | EE2 | 0.893 | | | |
| | EE3 | 0.896 | | | |
| | EE4 | 0.892 | | | |
| | EE5 | 0.894 | | | |
| Social Influence (SI) | SI1 | 0.922 | 0.807 | 0.940 | 0.084 |
| | SI2 | 0.904 | | | |
| | SI3 | 0.925 | | | |
| | SI4 | 0.876 | | | |
| | SI5 | 0.863 | | | |
| Facilitating Condition (FC) | FC1 | 0.907 | 0.820 | 0.945 | 0.536 |
| | FC2 | 0.910 | | | |
| | FC3 | 0.916 | | | |
| | FC4 | 0.876 | | | |
| | FC5 | 0.917 | | | |
| Trust in Government (TIG) | TIG1 | 0.944 | 0.858 | 0.837 | 0.110 |

| | | | | | |
|---|---|---|---|---|---|
| | TIG2 | 0.909 | | | |
| Trust in Technology (TIT) | TIT1 | 0.965 | 0.915 | 0.953 | 0.012 |
| | TIT2 | 0.975 | | | |
| | TIT3 | 0.928 | | | |
| Behavioural Intention (BI) | BI1 | 0.976 | 0.953 | 0.975 | - |
| | BI2 | 0.976 | | | |
| | BI3 | 0.977 | | | |

Hypothesis testing uses a significance level of 0.1 so that if the P value < 0.10 then the hypothesis is accepted. From the results of the hypothesis test above. the discussion of each hypothesis is as follows:

- Hypothesis 1 (H1): performance expectations from using the application have a significant influence on the intention to use the application. Because the p-value <0.1, the hypothesis H1 is accepted. This means that if people feel that by using the SIGNAL application the STNK renewal process will be easier. faster and increase productivity because they don't need to spend at least half a day in a physical office. then people have a strong enough intention to use the application.
- Hypothesis 2 (H2): ease of use of a mobile application does not have a significant influence on intention to use the application. Because the p-value is > 0.1, the H2 hypothesis is not accepted. The ease of the application to use apparently does not significantly influence people's intentions to use the SIGNAL application.
- Hypothesis 3 (H3): social influence has a significant influence on intention to use the application. Because the p-value < 0.1, hypothesis H3 is accepted. Based on the results of this test, it appears that social influences, for example, from family, relatives and co-workers. have a significant influence in generating a person's intention to use the SIGNAL application to extend their STNK.
- Hypothesis 4 (H4): facilitating conditions do not have a significant effect on intention to use the application. Because the p-value is > 0.1, hypothesis H4 is not accepted. Even if people are given a video on how to use the application or have a smartphone with sufficient specifications to use the application. it does not significantly influence a person's intention to use the SIGNAL application to renew their STNK.
- Hypothesis 5 (H5): trust in the government does not have a significant influence on intention to use the application. Because the p-value is > 0.1. the H5 hypothesis is not accepted.
- Hypothesis 6 (H6): trust in technology has a significant influence on intention to use applications. Because the p-value <0.1, hypothesis H6 is accepted. If the public feels that the SIGNAL application will be resistant to hacking. resistant to virus and malware attacks. people's intention to use the SIGNAL application to renew their STNK will be significantly affected.

# 5. Result and Discussion

## 5.1. Implication

By investigating the factors that influence people's intention to use the SIGNAL application to renew their STNK in Jakarta. this research provides a useful contribution in highlighting performance factors, social influence, and trust in technology as significant factors. In this study, it was found that there were similar results with several previous similar studies conducted by other researchers, namely performance factors. Performance factors are factors that significantly influence a person's intention to use an application to receive government services, but there are also differences where in the results of this research. business factors are not a factor that influences people's intention to use the application.

### 5.2. Limitation and Recommendation for Future Research

In this research, the data collection tool used was only a questionnaire. For further research, interviews, observations, or others can also be added to strengthen the research results. In further research. researchers can also add other variables, because in this research there are still 29.3% of variables that are still outside the discussion. Future research can also be carried out for similar public services that also have a large number of users. Additionally, future research could also leverage the results of this study by examining the post-use impact of application on satisfaction and continued use.

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