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Influence of Personal Banking Behaviour on the Usage of the Electronic Card for Toll Road Payment

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Abstract

The implementation of electronic toll collections brings many benefits for highway by reducing queuing. As a matter of fact, the number of toll road customers in Indonesia who used electronic cards for toll payment is very low. It is argued that behaviours in using electronic card for toll payment have a strong relation with personal behaviours and attitudes of customers of commercial banks. In order to investigate the reason behind the behaviour of electronic card usage, this study aims to investigate the influence of personal banking behaviour on the usage of the electronic card for toll road payment. To test the hypothesis that personal banking behaviour shapes the adaptability and level of usage of electronic card to pay the toll, a set of sample, originated from 29 toll roads in Indonesia, has been analysed. Not just personal characteristics, this study collected personal banking behaviour. This study found that toll road customers show a higher preference to use cash transactions instead of electronic payment. The customers were not homogenous in the characteristics of personal banking behaviours. It was found that personal banking behaviours have a significant impact on the adaptability of electronic card usage. The respondents perceived that there were no significant benefits to use electronic card in the toll road system, since there was a lack of connection with respondents' daily financial behaviours. This study reveals the importance of integrated cards, which connect transport and non-transport, to reduce the burden of using different kinds of electronic cards.

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1. Introduction

Observing and modelling human movement in urban environments is the key to forecasting traffic and to improving urban infrastructure (Liu et al., 2009), since humans keep moving. One significant problem in urban areas is congestion. The entry of a new user into the road network worsens traffic congestion and increases the travel costs incurred by the road users that have been present (Kitamura et al., 1999). To reduce congestion and its negative impacts, Knaian (2000) stated that the use of information technology, better known as Intelligent Transportation Systems (ITS), is the most obvious solution. ITS covers advanced communication, information, and electronics technology to solve transportation problems (Figueiredo et al., 2001).

One of the major problems in toll road system is queuing at toll booths. The problem can be reduced by improving its transaction time (Kamarulazizi and Ismail, 2005), namely by applying better instruments to reduce service time at toll booths (Sodikin et al., 2006). One of the choices to reduce service time at toll booths is applying the electronic payment using electronic toll collection (ETC) system (Karsaman, 2008).

ETC is a recent innovation that makes prospective users consider its simplicity to start using it (Purnama, 2012) by collecting toll electronically used on highways, bridges, and tunnels (Xu et al., 2007). Norway was the first country in the world that used ETC that is valid for the entire toll road and can also be used for parking and gas payment (Gabriel, 2008). The implementation of ETC in the toll road system brings many benefits, such as eliminating traffic congestion at toll gates, increasing traffic flow that will reduce queues, and also reducing fuel consumption since the vehicles do not have to repeatedly stop and go at toll road entrances and exits (ITS Technology Enchantment Association, 2003). Worrall (1999) gave an example that the implementation of the ETC system, known as E-Pass, has helped to reduce vehicle emissions, improve traffic flow, and increase communication with customers. However, the improvement and application of ITS becomes harder since transportation planners are facing difficulty in obtaining large, real-world observational data of human movement, and the significant cost of data collection (Brockman et al., 2006).

Using the ETC system, all problems related to manual toll fee collection will be eliminated, thereby achieving a higher efficiency rate per transaction, because this system requires no human interactions that could lead to cheating and human errors (Kamarulazizi and Ismail, 2005) and newly deployed ETC systems will reduce both toll road operators staff and delay (Levinson and Chang, 2002). The wide-ranging deployment of ETC has had a tremendous effect upon the toll industry worldwide, because of its ability to offer many opportunities to affect travel behaviour (Worrall, 1999).

Moreover, studying users' behaviour means learning about user preferences in making decisions with their own resources to choose a product (Yudhistira, 2014) including the electronic toll card for payment. Klee (2005) stated that there are factors that influence users in using the electronic payment system, such as socio-demographic (age, gender, education, and language), financial, technology, and supply-side related ones.

Meanwhile in Indonesia, most of the toll road system still uses the manual collection system using cash transaction, for both open and closed toll road systems (Sodikin et al., 2006), which results in heavy congestion in many toll gates especially in urban areas. Toll Road Operators (which is well known as BUJT, *Badan Usaha Jalan Tol*) have initiated the application in several toll road segments and the Indonesian Toll Road Authority (BPJT, *Badan Pengatur Jalan Tol*) (as the responsible institution for the development of toll roads in Indonesia) have also supported and targeted the implementation of electronic toll payment in all toll road segments in Indonesia. The Indonesian Toll Road Authority also supported the effort to find a suitable technology to anticipate the development of new technology such as Easy Pass or Open Toll systems. At present, the electronic toll payment was implemented only in several segments depend on the readiness of the toll road operators. ETC that has been applied in Indonesia's toll road was a smart card. Toll road operators have a freedom to select the bank institution as their counterpart in managing toll payment. It resulted several card-issuing banks, where different toll road operators may requested different card for toll payment. This situation was the possible reason for the fact that, the usage has not been effective yet. Only 12% of the total number of transactions used the electronic transaction for toll road payment, where the electronic toll payment had been implemented in less than 30% of Indonesia's toll roads (Sindo, 2014).

Keeping in mind the motivation as explained above, it is interesting to investigate the reason for the weak adaptability of ETC by toll road users in Indonesia. This kind of study is important to reduce the negative impact of congestion using the potential benefit of information technology advancement. It is believed that many efforts should

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