

CHAPTER III

BASE THEORETICAL

3.1 Bus Rapid Transit (BRT)

BRT is an system of commuter transport which has enhanced stations and is between four and twenty times cheaper than using Light Rail Transit (Tao et al., 2014). Trans Jogja is the Bus Rapid Transit (BRT) system currently in use in the city of Yogyakarta, Indonesia. It was initiated by the Government of Yogyakarta and is the first bus transportation that uses a Smart card for ticketing in the city of Yogyakarta (This system is called a Smart Mass Transit System). Yogyakarta (Daerah Istimewa Yogyakarta, DIY) is a special region located on the island of Java in Indonesia. Yogyakarta includes Yogyakarta city and the four regencies of Bantul, Gunung Kidul, Kulon Progo, and Sleman. The total area of Yogyakarta is 3185,8 km² (Dirgahayani, 2013). Trans Jogja is an option of public mass transportation that has been operating within the area of Yogyakarta since February 2008 operated by P.T Jogja Tugu Trans. Trans Jogja buses are outfitted with air conditioning and each bus has the capability of 41 passengers, 22 sitting passengers and 19 standing. Trans Jogja operates daily from 5:30 am-until 9:30 pm and offers 17 different routes. There are estimated to be 13,000 riders on the system every day (Dirgahayani, 2013). In the Trans Jogja system shelters are estimated to be located every 300-400 meters and all should be services with the off-board electronic transit system (Dirgahayani and Nakamura, 2012). Trans Jogja is inexpensive and is beneficial to workers, students and tourists. Transfers

are permitted within the system with the purchase of a regular fare, IDR 3,500 for single trip users, IDR 2,700. for regular users, IDR 1,800 for regular student users and IDR 2700 for E-money.

3.2 E-ticket and E-money

An electronic ticket replaces the need for a disposable or paper ticket and serves as the value of the ticket while also collecting and recording proof of purchase (Qteishat, Alshibly and Al-ma'aitah, 2014). Unlike disposable paper tickets, electronic tickets harbor valuable information about purchased tickets and the destinations traveled which can be used to improve the overall system at later times (Udroiu, 2013). Currently there are three types of electronic tickets that are most utilized globally (Urbanek, 2015):

- Tickets and card with magnetic stripe
- Ticket sold via mobile phones
- Contactless electronic card

Some challenges of electronic ticketing includes maintaining and facilitating the privacy of the system and the individual users (Mut-Puigserver et al., 2012). The benefits of adopting e-tickets within large public transportation systems is that the systems can collect immense amounts of data that can be used to improve the overall workings of the system with regards to usage and management (Mezghani, 2008).

Electronic money has been implemented in many Bus Rapid Transit Systems for various reasons. E-money customers are rewarded with an IS/IT system that is

convenient, less expensive, more accessible and more consistent (Dehghan and Haghighi, 2015). Conventional ticketing does not possess the same accessibility and diversity of payment and the adoption of electronic money systems can provide users with lower overall cost as well as more convenient services (Dehghan and Haghighi, 2015). Benefitting from the miniaturization in electronics and the democratization of information systems, Electronic money which uses technology to replace the use of physical currency came to use in the 1970s (Papilloud and Haesler, 2014). There are many studies that show how adopting electronic money payment systems for small transactions can be very beneficial. Some examples of areas and venues of adoption include government fines, the payment of taxes and at social venues like clubs and cinemas (Wulandari and Soseco, 2016). Electronic money includes cards that are lined with magnetic tape, chip cards, contactless payments by card, mobile phone, or tablet PC, and virtual money such as Bitcoin, Litecoin, PPCoin, Ven or Linden dollars (Papilloud and Haesler, 2014). These forms of electronic moneys have three common properties: cryptography conditions the ways to access the money, the network represents a regulation of electronic moneys, and privileges differentiate the use of electronic moneys (Papilloud and Haesler, 2014). E-money can exist as online e-money and/or offline e-money. Online e-money requires interaction with a bank in order to communicate the transaction, through the bank, with other parties. Transactions that do not utilize the services of a bank can be conducted via offline e-money exchanges. E-money uses IT to facilitate the exchange of currency in the absence of physical cash. The exchange of

information is substituted for the exchange of currency. Such programming paradigms benefit consumers because they eliminate the need to process cash transactions at all locations by streamlining how payments are made (Zhang, 2011). In Indonesia this type of exchange is replacing more traditional forms of payments and is also being adopted by many other countries around the world. Currently in Indonesia there are various forms of e-money that are being utilized and include pre-paid methods such as BCA, flazz, indomaret card and BriZZi in addition to electronic wallet methods such as telkomsel's T-cash, indosat's purse and XL's XL cash (Wulandari and Soseco, 2016).

3.3 UTAUT model

The Unified Theory of Acceptance and Use of Technology (UTAUT) was developed in 2003 by Venkatesh et al and the model incorporates the analysis of eight theoretical models in order to help understand why and how technology is adopted. The UTAUT model has been successful in determining the endorsement of certain information technology and system (IS/IT) (Khechine, Lakhal and Ndjambou, 2016). UTAUT provides a framework that is approximately 70 percent accurate for determining how users might behave (Hsu et al., 2014). The eight theoretical models used by Venkatesh et al include: Theory of Reasoned Action (TRA; Fishbein and Ajzen 1975), the Technology Acceptance Model (TAM; Davis, 1989), the Motivation Model (MM; Davis, Bagozzi, and Warshaw, 1992), the Theory of Planned Behavior (TPB; Ajzen, 1991), the Combined TAM and TPB (C-TAM-TPB; Taylor and Todd, 1995), the Model of Personal Computer Utilization (MPCU; Thompson,

Higgins and Howell, 1991), the Diffusion of Innovation Theory (DOI; Moore and Benbasat, 1991; Rogers, 1995), and the Social Cognitive Theory (SCT; Compeau and Higgins, 1995) (Khechine, Lakhali and Ndjambou, 2016). Performance, expectancy, effort expectancy, social influence, and facilitating conditions are the main constructs within UTAUT that assist in being able to predict customer and user behavior. Within the framework four main areas are analyzed to determine user behavior and adoption of technology gender, age, experience and voluntariness of use (Parameswaran, Kishore and Li, 2015). Performance expectancy is related to the ability of the system to help users and customers enhance their ability to perform a certain task (Venkatesh et al., 2017), and the effortlessness to which a person attributes to the usability of a system is called the effort expectancy (Maduku, 2015). Social influence is related to user perception of how much or how little the system is utilized by other users (Hsu et al., 2014). Facilitating conditions is related to the perception of the user and how well they think the system is supported and implemented (Cimperman, Makovec Brenčič and Trkman, 2016).

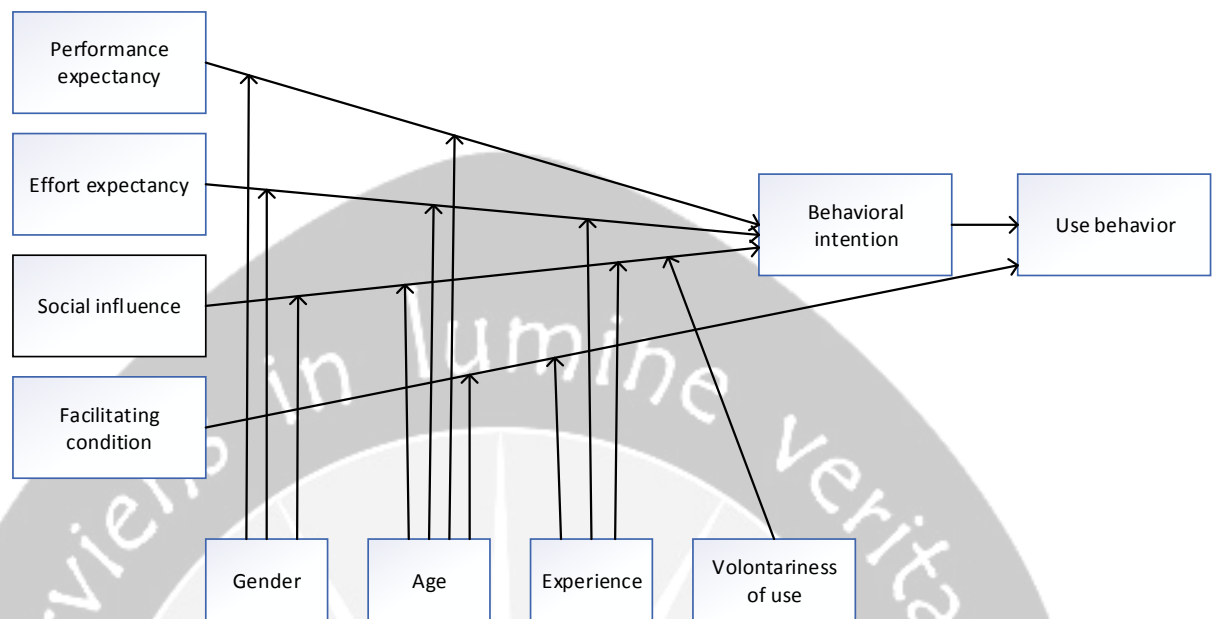


Figure2: Original UTAUT model (Venkatesh et al., 2003)