

# Conceptual Model for Cashless Society: A Literature Synthesis

Raden Aswin Rahadi, Yunieta Anny Nainggolan, Kurnia Fajar Afgani, Mohd. Yusoff Yusliza, Zikri Muhammad, Chynthia Angelina, and Khalid Farooq

**Abstract**—This study provides a review of 50 number of papers, the synthesis and thus develops a comprehensive conceptual model for developing a cashless society in a country. Based on our analysis, factors such as performance expectancy, effort expectancy, facilitating conditions, perceived risk, price value, perceived security, habit, trust, and social influence, all are affecting the use behavior of a customers. Future studies using quantitative and qualitative methods can be conducted based on the proposed conceptual model.

**Index Terms**—Cashless Society, Conceptual Model, Literature Synthesis, Electronic Payment.

## I. INTRODUCTION

In order to have a stable economy, a country will need to have a secure, convenient and affordable payment instrument [1]. Economic stability enables other macro-economic objectives to be achieved, such as stable prices and sustainable growth. It also creates the right environment for job creation and balance of payments. This is largely because stability creates certainty and confidence, and this encourages investment in technology and human resources.

In accordance with the use of electronic payment instruments throughout the community, which on the other hand can be referred to as non-cash payment instruments, it brings up something called: Cashless Society. Cashless society is defined as an environment where people use non-cash payment instruments as a habit, especially for transactions in their economic activities [2]. In recent years, a society without cash has come to the attention of the whole country. The reason behind this is because it has been known that the burden of using cash on society consumes about 1.5% of GDP, while on the other hand, the use of electronic payment instruments is proven to increase economic growth and advance financial inclusion as good [3].

Therefore evaluation of the level of adoption of the use of electronic payments in the community must be considered. According to Patel and Connolly [4], there are always certain factors that influence technology adoption. Likewise, as a technology-based payment instrument, electronic payment has several factors that influence adoption in the community [5], which makes it important to be examined and then evaluated, to reach people without cash. Community characteristics also play an important role in achieving a society without cash, on whether people want to change their

current habits of using cash payment instruments to use non-cash payment instruments.

This research will focus on examining factors that may determine the use of electronic payment instruments, to support a society without cash. The results of this study will be useful to see the current level of adoption of electronic payment instruments and the extent of their support for the community without cash. Recommendations for creating further innovations and making decisions related to government built on the results of this study are also provided.

## II. LITERATURE REVIEW

### A. Electronic Payment Instrument

#### 1) Definition of Electronic Payment Instrument

Previously, the emergence of Information and Communication Technology (ICT) has led to great revolutionary developments in finance, economics, and operations, which included the development of electronic payment instruments as well [6]. Electronic payment instruments have come to the attention and attracted the attention of researchers for the importance of their vital role in the current era of electronic commerce. As a result, it leads to different perspectives on the definition of electronic payments, among others, from different perspectives, ranging from finance, business technology, to information systems [7].

Looking from the financial field, [8] defines electronic payments as a form of financial instrument, where buyers and sellers are facilitated by electronic communication. Simply stated, [9] defines electronic payments as all types of payments made without using any paper instruments. More specifically, [10] defines electronic payments as electronic value payments, transacted from payer to recipient through a comprehensive electronic payment channel, which allows payers to freely access and manage their transactions through electronic networks. From the above definition, an electronic payment instrument can be defined as an instrument of payment between parties, for which transactions occur through electronic means.

#### 2) Types of Electronic Pay Instruments

To simplify the types of electronic payment instruments, [11] made three categories based on the underlying systems

of each instrument, which are cash-like system, check-like system, and hybrid system. Each system covers up several instruments, on which a cash-like system with electronic cash (e-cash) instrument, check-like system with credit card and debit card instrument, and hybrid system with stored-value card instrument. In addition, as the usage of internet plays an important role for the development of electronic payment instruments, [12] stated another category that is driven by the usage of internet, called internet payment system. This category consists of several electronic payment instruments, as for instance, electronic wallet (e-wallet); mobile payment; mobile banking; and internet banking.

a) *Electronic Cash (E-Cash)*

The use of e-cash is like using ordinary cash as a paper-based payment instrument, because it allows users to carry out transactions without the need for intermediaries - for example, banks or other third parties - in each transaction. However, initially, users need to register for e-cash accounts from their own devices in all applications provided by e-cash providers, which can be in the form of several banks or other financial institutions. Once a user has an account, users can easily add a certain amount of money to their account, which can be used directly for each transaction. E-cash is designed to simply replace the use of actual cash with the use of digital cash carried in the user's device.

b) *Credit Card*

Credit cards are card-based payment instruments issued by banks or other financial institutions that allow users to buy certain items now and pay later in the payment period. This allows users to make debts up to a certain amount because it depends on several factors (e.g. monthly income levels, credit reputation, and total user assets).

c) *Debit Card*

Since the 1990s, debit cards have become a central non-cash payment instrument that is growing rapidly throughout society [13]. Debit card acted like a check, whereas every transaction fee is taken directly from the checking account of the holder. Unlike credit cards, debit cards do not allow holders to make transactions beyond the amount of money they have in their account.

d) *Electronic Wallet (E-Wallet)*

Electronic wallet (e-wallet) is defined by [14] as a system for storing owner information, such as a physical wallet. Owner's identity, billing and shipping information, address of consumers or other information can be stored in e-wallet [5].

e) *Mobile Payment*

Cellular payment system is defined as a type of payment system that focuses on cellular devices or smartphones as devices for conducting monetary value transfer transactions, which are provided by cellular network operators [5].

f) *Mobile Banking*

Mobile banking is defined as a wireless communication channel provided by the banking industry to facilitate its customers to carry out transactions such as checking balances and transferring to other accounts from their mobile phones [15]. This instrument account is linked to each mobile device according to its cellular network and can be accessed via SMS or application.

g) *Internet Banking*

Internet banking, or also often referred to as online banking, is an instrument provided by the banking industry to enable

its customers to use the internet in all browsers, as a channel for conducting banking transactions, such as checking their accounts, pay bills, and transferring funds[16]. Unlike mobile banking, internet banking is accessed through a browser using a World Wide Web (WWW) server, and is not limited to the use of a mobile device, because it can be accessed via a PC or other device as long as it has internet access.

B. *Cashless Society*

1) *Definition of Cashless Society*

The main concept of a society without cash is based on transactions on electronic payment instruments [17]. Even so, [18] explains that a society without cash does not necessarily mean there are no cash transactions at all in economic settings, instead, the number of money-based transactions is being minimized at the lowest level. Still in line with the previous definition, [19] defines a society without cash as a condition of society, where most transactions in their economic system are not carried out for exchange in the form of actual cash.

2) *Steps of Cashless Society*

Retail payment cash transactions show 85% results in all countries, equal to 60% of the total retail transaction value [3] where cash is mainly used as payment instruments in low-value retail [18]. In addition, although there are many different options for non-cash payment instruments, for example credit cards, debit card, electronic wallet, electronic money, and mobile payments, the use of actual cash as a payment instrument is still dominant. Although cash may be convenient to use as a payment instrument, it makes tax transparency less and is also expensive in overall. Driven by this condition, many governments throughout the country began to look for strategies to reduce the costs incurred by using cash by making their payment systems less dependent on cash, and encouraging the use of non-cash payment instruments to the public even further.

MasterCard with its research conducted by [3], introducing a framework for measuring non-cash travel across countries. This framework uses a methodology that focuses on the value of consumer payments in a country. There are three indicators in this framework for measuring progress. First is the Stock, which measures the percentage of the value of consumer payments by using non-cash payment instruments. Second, Trajectory, which is a measurement of cash-share shift from the value of consumer payments. The latter is Readiness, which measures the current state level for switching from cash to non-cash payment instruments, measured by looking through access to financial services, macro-economic and cultural factors, scale and competition of traders, & technology and infrastructure.

Based on the framework and indicators explained above, the journey of each country is being measured, the results will be classified into four levels, sorted from lowest to highest score:

a) *Inception*

It consists of countries where they have just begun to shift from using cash payment instruments, with less than 40% of cashless transactions in the community. shows countries with still lacking Readiness, which makes Share and Trajectory at low levels [3].

b) *Transitioning*

Consists of countries that have developed good non-cash payment instruments, with 40-60% transactions without cash

in the community. Indicates the country where Readiness is increasing, so Share and Trajectory are increasing.

*c) Tipping Point*

Consists of countries where most cash payment instruments have been converted, with 60-80% of transactions without cash in the community. Indicates a country that already has a high level of Readiness and Share, which makes Trajectory decline.

*d) Nearly Cashless*

Consists of countries where cashless is almost effective, with more than 80% of cashless transactions in the community. Indicates a country where its share almost shows 100% results, thereby making the Trajectory fall. As a final result, under normal conditions if there are no important exceptions, trips to the community without cash for each country must be presented and follow the path.

However, results from [3] shows that not all countries actually follow the path as in this study, because there are some countries that are out of line, which is currently a global concern about travel without their cash. This can happen due to two different factors. The first is Government Action, which succeeded in accelerating the Trajectory. Second is Innovation, to overcome the lack of readiness.

Still referring to [3], the results show that countries that have reached almost no cash level are dominated by developed countries in Europe, such as Sweden, Belgium and the United Kingdom. On the other hand, in recent years, the concern of people without cash over the world has seen China, the United Arab Emirates, and Kenya, because these three countries show an interesting journey in that direction. China is the only country that has an exceptional track score of 100 out of 100. It happens because of Government Actions, which currently encourage citizens to use their local cellular payments such as AliPay and We Chat Pay for all transactions. The United Arab Emirates and Kenya also show high trajectory scores and readiness among other countries at the same level - Inception.

Data in the study showed that the United Arab Emirates had a score of 65, followed by Kenya at 51, while other countries only had a score of around 20-ish. It happened as a result of government actions, which have been implemented in both countries. The Government of the United Arab Emirates issued a mandate to pay salaries and compensation for workers by using non-cash payment instruments, as a strategy for cashless solutions while the Kenyan government explicitly allowed the market to do some innovations related to these payment instruments, they succeeded in making their M-Pesa.

### *C. Previous Studies*

A technology adoption model that combines certain variables is being used in this study. We will begin the literature synthesis with the analysis of Unified Theory of Acceptance and Use of Technology (UTAUT), followed with the recent studies related with the conceptual model that we will be developing.

*1) Performance Expectancy, Effort Expectancy, and Social Influence towards Behavioral Intention to Use*

UTAUT is a theory put forward by [20], which was developed through a systematic comprehensive review of eight previous models Diffusion of Innovation Theory (DIT), Theory of Reasonable Behavior (TRA), Social Cognitive

Theory (SCT), Theory of Acceptance Model (TAM), Theory of Planned Behavior (TPB), Model of PC utilisation (MPCU), Motivational Model (MM), and Combined TAM and TPB (C-TAM-TPB). UTAUT has three factors that directly influence behavioral intentions to use technology, namely performance expectations, effort expectations, and social influence. Referring to the fact that UTAUT is built from a combination of eight models and previous technology adoption theories, each of the factors that build UTAUT is also formed by a combination of certain factors from previous models and theories that have been refined [20].

Performance expectations are explained as the level at which individuals believe that using technology will help in terms of their work performance, which can be explained as a condition where people will tend to adopt new technology when they have confidence that certain technology will help them in doing their work. This factor is formed by a combination of five different factors, the perceived benefits of TAM, external motivation of the Motivation Model, job suitability of the MPCU, the relative benefits of DIT, and expected results of SCT [20].

Effort expectation explains the level of ease about the use of technology, which is more concrete, meaning people will tend to adopt new technology when they believe it will allow them to do less effort on it. This factor is formed by a combination of three different factors, which are considered the use of TAM, the complexity of MPCU, and the ease of use of DIT [20].

Social influence explains the level at which individuals perceive that it is important for others to believe that they must use certain technologies. There are three different factors that build social influence, namely subjective norms from TRA, TPB, and C-TAM-TPB, social factors from MPCU, and images from DIT [20].

*2) Perceived Security towards Behavioral Intention to Use*

According to the model proposed by [5] security perception is one of the factors being examined against the user's intention to use electronic payment instruments. When it comes to electronic payment instruments, security represents an individual's perception in terms of the feasibility of payment methods, as well as all data transmission and storage mechanisms in the instrument [21]. Security perceptions are explained as subjective probabilities where individuals will think that their personal information provided will not be explored and misused by irresponsible parties [22].

There have been several previous studies that have used security as a factor to examine user intentions to use electronic payment instruments, which are summarized in the table below.

*3) Facilitation Conditions towards Behavioral Intention to Use*

Behavioral intention to use is one of the facilitating conditions analyzed to understand one consumers' selection habit. Habit in the context of online shopping as the extent to which buyers tend to shop online automatically without thinking [23]. There is a significant positive relationship between facilitating conditions and behavioral intention to use a certain system, like in ATM [24]. Organizational facilitating conditions are defined as the degree to which an individual believes that a satisfactory level of organizational and technical infrastructure exists to support use of the system

[25]. Study by [26] reveals that digital storytelling has highly significant effects on facilitating condition, performance expectancy, effort expectancy, and social influence in descending order.

4) *Perceived Risk towards Behavioral Intention to Use*

Perceived risk is one of the factors that will influence the behavioral intention to use by the consumers. [27] suggested that perceived risk models confirm its robustness in predicting customers' intention of adoption of mobile banking. [28] reveals that system risks of e-commerce are the major determinants of the adoption behavior. [29]'s study shows that perceived risk has a direct impact on the consumers' behavioral intention to use an online channel for purchase. [30]'s research indicated that the intention to use online banking is adversely affected mainly by the security/privacy risk, as well as financial risk and is positively affected mainly by perceived benefit, attitude and perceived usefulness. Trust and perceived risk were shown to be direct antecedents of intention to use, and trust functioned as an indirect antecedent [31].

5) *Price Value towards Behavioral Intention to Use*

Price value is one of the influencing factors towards behavioral intention to use. [32] suggests that price perceptions have a strong influence on customer value and price perceptions have a direct significant effect on customer satisfaction and behavioral intentions. [33] suggests that brand awareness and price fairness play significant roles in the customer value process. [34] proposes that service quality, value and satisfaction have a simultaneous direct effect on behavioral intentions. [35] analyzed that perceived value directly influences customer satisfaction and behavioral intentions.

6) *Habit towards Behavioral Intention to Use*

Habits of the customers influenced the behavioral intention to use. [36] suggests that the previous habits of the university students influenced their behavioral intention to use electronic mobile learning. [37] proposed that in order to adapt to new technologies, understanding of preexisting habits should be conducted to break those habits before encouraging the development of the new ones. [38]'s research results proposed that hedonic motivation and social influence have a significant impact on behavioral intention through payment habit as a mediator. [39]'s findings indicate that habits influence the customer intention to change their user behavior from offline to online services.

7) *Trust towards Behavioral Intention to Use*

The authors proposed that trusts influence the behavioral intention to use. [40] suggests that initial trust played a significant influence on behavioral intention to use online banking services. [41] proposed that system and service quality positively affect trust for Thai online banking customers. [42]'s analysis produced the results that customers' intention to conduct online transactions is explained by technological, trust, and subjective norm beliefs. [43]'s study results reveal a strong mediating role of trusting intention on the intention to use the banking system.

8) *Behavioral Intention to Use towards Actual Use Behavior*

The relationship between behavioral intentions to use towards actual use behavior has been examined by various adoption models prior to the UTAUT model by [20]. In 1977

[44] produced the Theory of Reasoned Action (TRA) proposed that attitude toward behavior and subjective norm towards behavioral intention. Behavioral intention towards behavior. In [45] developed the Theory of Planned Behavior (TPB) where it proposed attitude toward behavior, subjective norm, and perceived behavioral control toward behavioral intention. Behavioral intention towards behavior. [46] Developed the Technology Acceptance Model (TAM) where perceived usefulness and perceived ease of use towards behavioral intention to use.

In conclusion it can be shown that the relationship between behavioral intention to use and actual use behavior are proven to be previously examined by certain adoption models.

9) *Continuance Usage Intention*

Continuance usage intention is the final goal that this study is intended to achieve. [47] proposed that perceived usefulness, satisfaction, habit, enjoyment, and subjective norms influence the customer's decision in continuance intention. [48] suggested that continuance usage intention can be explained by the information, system, and service quality variables. [49] proposed that subjective norms and technology continuance theory influenced the continuance usage intention of the customers. [50]'s study results suggested that perceived usefulness, perceived satisfaction, and perceived flow determines the continuance usage intention.

III. CONCEPTUAL FRAMEWORK

Based on the review of literature in previous section there are eight factors that may affect the use behavior and then the continuance usage intention. The framework can be seen in Figure 1 below.

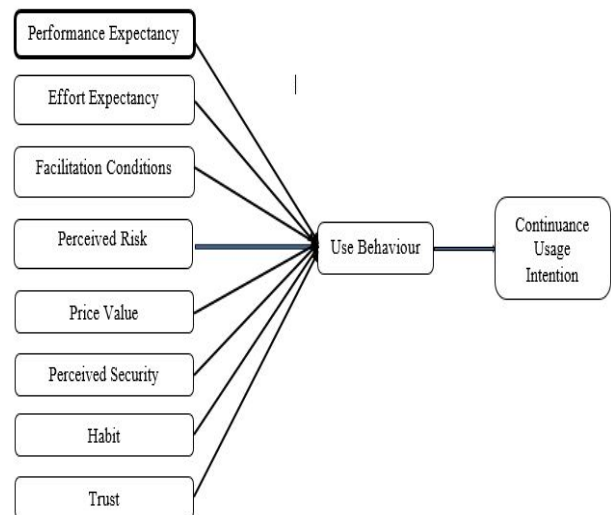


Fig. 1. Conceptual Model (Authors' Analysis)

The factors that influence the usage of electronic payment instruments becomes the concern of this study that will be assessed by using the proposed model with the following variables: performance expectancy, effort expectancy, facilitating conditions, perceived risk, price value, perceived security, habit, trust, and social influence, are all affecting the use behavior of a customers, which then will leads to continuance usage intention.

Understanding the factors that affect the use of e-payment system by customers may have implications to corporate to develop an online platform or e-payment system that is user friendly, secured, and creating value. This can be implemented by carefully examining the factors that determine the use behavior, thus improved the system accordingly. Each country and each type of business may have different ways of e-payment system subject to the behavior of the society to the e-payment system.

#### IV. FUTURE RESEARCH

After reviewing the literature, we propose a conceptual model that may influence the use behavior and the continuance usage of electronic payment instruments. We recommend that government should consider those eight factors to develop a cashless society to reduce transaction costs and improve economic growth faster. Future quantitative and qualitative studies can be conducted to test the conceptual model that authors have been proposed through this research.

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**Raden Aswin Rahadi** has direct experience working for 20 (twenty) years in real estate, property, architecture, design, investment management, financial consulting and research industry. He holds a bachelor degree in Architecture Engineering from Institut Teknologi Bandung, two master degrees in Management from Swiss German University, Indonesia and in Business Administration from Fachhochschule Konstanz-Hochschule für Technik, Wirtschaft und

Gestaltung, Germany, a Doctorate degree in Management Science from School of Business and Management, Institut Teknologi Bandung. He also holds Qualified Wealth Planner (QWP®) certification from IAFP Global, International NLP Basic Practitioner Certificate from National Federation of Neuro-Linguistic Programming (NFNLP), and Registered Financial Associate (RFA®) Certificate from International Association of Registered Financial Consultants



**Yunieta Anny Nainggolan** is an Assistant Professor of Finance at School of Business and Management, Institut Teknologi Bandung, Indonesia, with a Doctor of Philosophy (in Finance) from Queensland University of Technology, Australia. Her research interests are in fund management, ethical fund, socially responsible investment, Islamic finance, disclosure and reporting, corporate finance, and corporate governance. She has published in reputable

journals including *Journal of Business Ethics*, *Emerging Markets Finance and Trade*, and *Social Responsibility Journal*. She has earned professional certifications such as Investment Manager Representative (WMI) and Certified Wealth Managers’ Association (CWMA®).



**Kurnia Fajar Afgani** is the full-time lecturer in Business Risk and Finance group. His research interests are Islamic Finance and Business Economics. His teaching interest includes Business Economics, and Islamic Finance. He is graduated with Master of Business Administration from the School of Business and Management Institut Teknologi Bandung, and has also obtained a Bachelor of Business Administration from Parahyangan Catholic University (UNPAR). He holds Certified Wealth Manager (CWM®) certification from Certified Wealth Managers’ Association (CWMA®). He worked for the Bank BJB Syariah Company for around 10 years prior to taking this position as a faculty member of the SBM ITB until present.



**Yuzliza Mohd Yusoff** is currently an Associate Professor of Human Resource Management since July 2016 in the Marketing Department at the Faculty of Business, Economics and Social Development, Universiti Malaysia Terengganu. Prior joining Universiti Malaysia Terengganu, she served for seven years on the School of Management and Graduate School of Business, Universiti Sains Malaysia. She has an H-Index of 9 and total citations of 222 in Scopus. Her research

interest includes Green Human Resource Management, Employee Green Behaviour, Pro-Environmental Behaviour, Organizational and Behavioural Studies, Human Resource Management, International Human Resource Management (International Students’ Adjustment), Electronic Human Resource Management, Line Managers’ Involvement in Human Resource Management, Empowerment, Human Resource Roles and Competencies. Her publications have appeared in *Journal of Cleaner Production*, *Business Strategy and the Environment*, *Benchmarking: International Journal*, *International Journal of Manpower*, *Journal of Management Development* among others. Her full profile can be accessed from <https://yuzlizamohdyusoff.wordpress.com/publications/journal/>. She can be contacted via [yuzliza@umt.edu.my](mailto:yuzliza@umt.edu.my)



**Zikri Muhammad** is a Senior Lecturer at the Faculty of Business, Economics and Social Development, Universiti Malaysia Terengganu. Prior joining Universiti Malaysia Terengganu, he served for five years on the School of Humanities, Universiti Sains Malaysia. He obtained his Ph.D. in geography from Universiti Kebangsaan Malaysia, Master of Arts from Universiti Sains Malaysia, and Bachelor of Business Administration from Universiti Putra Malaysia.

His research interest includes urban geography, sustainable development, quality of life, and local government. He can be contacted via [zikri@umt.edu.my](mailto:zikri@umt.edu.my)



**Chynthia Angelina** is a high-motivated student, intelligent, and goal achiever who has keen interest in business and social issues. She always passionate to go extra miles and learn new things. Actively involved in several projects and organizations, she possesses the skill of leadership, working in agility, and team collaboration. Currently she is pursuing her bachelor’s in management degree in School of Business and Management, Institut Teknologi Bandung, Indonesia while appointed as StudentxCEOs as a member of the finance team



**Khalid Farooq** is a PhD scholar who joined University Malaysia Terengganu (UMT) in the year 2019. He is a Graduate Research Assistant at the Faculty of Business, Economics, and Social Development (UMT). Prior to that he has acquired seven years of Entrepreneur experience with an emphasis on marketing and developing strategies for business. Additionally, his previous professional experience and skills assisted in

enhancing his contemporary teaching techniques with practical knowledge of the field in the business context of Pakistan. He has completed his MBA (HRM) from COMSATS Institute of Information Technology Pakistan in 2008. He did his MS (HRM) from the University of Central Punjab, Lahore in 2012. His area of interest is Green Human Resource Management, Employee Ecological Behavior, Pro-Environmental Behavior, Organizational and Behavioral Studies, Human Resource Management. He can be contacted via [Khalid\\_farooq\\_khan@yahoo.com](mailto:Khalid_farooq_khan@yahoo.com)