

# Exploring Factors Influencing Electronic Money Adoption (Qualitative Study of T-Cash)

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**Abstract:** T-Cash, the second biggest electronic money in Indonesia, has been around for seven years but number of registered yet active users is still low. This study aims to know the reasons that drive Telkomsel subscribers registering T-Cash, and factors that driving and inhibiting T-Cash adoption. Qualitative research with correlational type of study is used in the research. Data were collected through in-depth interviews with three respondents in Jabodetabek, Bandung, Surabaya, Yogyakarta, and Semarang. The results suggest that the relative advantages of electronic money include payment process simplicity, cashless transaction ability, ubiquitous purchases and payments, time efficiency, and queues avoidance. Micropayments are the most compatible with T-Cash especially for the purchases of F&B, cinema tickets, mobile phone credits purchases, bill payments, and purchases in certain events. The adoption of T-Cash is mostly contributed by other users' influence as well as the very well-known issuer, Telkomsel. Further, additional findings, the price promotions, are frequently shown up as an effective strategy for T-Cash target market. There are several barriers that slow the T-Cash adoption, including complex top up process, high top up fee, limited merchants acceptance, lack of device and network reliability, unauthorized of T-Cash use, and compromise of privacy.

**Keywords:** Electronic Money, Electronic Money Adoption, Micropayment

## 1. Introduction

As people live in a global era where technology grows rapidly, payment system trend in society changes into noncash payment system which is more safe and efficient. Electronic money (e-money) as a payment system alternative grows fast and follows the success of card payment system. Moreover, the electronic money payment system index in Indonesia recorded the most marked improvement over the period from 2011-2015 and the trend is still increasing. Among all 20 electronic money products in Indonesia, T-Cash stands as the second biggest position with 26% portion of electronic money market share in Indonesia, right after Kartu Flazz from PT Bank Central Asia (BCA), Tbk with 46% of the total market share of electronic money<sup>[1]</sup>.

In 2015, it is only 11.14% of total Telkomsel subscribers who registered as T-Cash users. The increase of number is not significant if we compare to the percentage of T-Cash users as the percentage of Telkomsel subscribers in 2011 which reaches 7.47%. T-Cash only experience 3.67% increase of total registered users within five years. The big expansion of T-Cash will be started from the second quarter of 2016 with target of 5 million – 6 million T-Cash active users since the active users until early 2016 is only about 300 thousand users or only 1.76% of the total T-Cash registered users.

The aims of this paper is to know the reasons that drive Telkomsel subscribers registering T-Cash, and factors that driving and inhibiting T-Cash adoption. The paper contributes to existing electronic money research by presenting factors that support and inhibit electronic money adoption, as well as giving recommendations for Telkomsel as T-Cash issuer and also future researches of this topic.

## 2. Electronic Money Adoption

Indonesia's payment system is essentially a legal framework for transferring funds from one party to another. A payment system comprises three main elements which are payment instruments, processing, and a means of settlement. The payment instruments are basically divided into cash and non-cash payment instruments<sup>[2]</sup>. Electronic money is one of the non-cash payment instruments.

Electronic money is defined as stored-value or prepaid products in which a record of the funds or value available to a consumer is stored on an electronic device in the consumer's possession<sup>[3]</sup>. It is a payment instrument that involves the following elements: 1) issued based on the amount of money paid initially by the users to issuers; 2) the amount of money is stored electronically in media such as server or chip; 3) used as payment instrument to merchants who are not the issuers of the electronic money; and 4) the amount of electronic money paid by the users and managed by the issuers is not considered as savings as stipulated by the laws regulating banking<sup>[4]</sup>. Mallat (2006) has developed a research model regarding the factors affecting consumer adoption of mobile payments based on several studies which is shown in Figure 1.

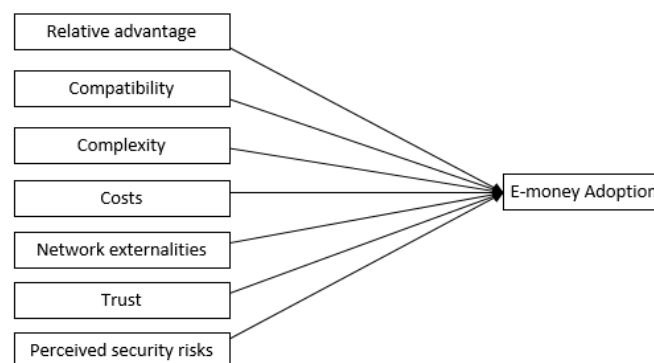


Figure 1: Research Framework

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The study adapted the Roger's (1995) theory of the diffusion of innovations. The diffusion of innovations theory has been widely established as a tool to explain the adoption of electronic payments<sup>[5]</sup>. The model used in the study focuses on relative advantage, complexity, and compatibility as the technology adoption instruments. Costs is added as a construct due to its direct effect on consumer adoption if the cost is passed on to consumers<sup>[6]</sup>. Then, network externalities is adapted since payment systems exhibit network externalities as the value of a payment system to a single user increases when more users begin to use it<sup>[7]</sup>. Trust and perceived security risks were adapted as the key requirements for secure financial transactions in an electronic environment include confidentiality, data integrity, authentication, and non-repudiation. Below are descriptions of each instruments<sup>[8]</sup>.

*Relative advantage* –relative advantage is the degree to which an innovation is perceived as being better than the idea it supersedes<sup>[9]</sup>. Prior studies suggest that mobile payments are commonly expected to increase consumer convenience by reducing the need for coins and cash in certain physical purchases, digital purchases, or even bill payments<sup>[10]</sup>. Similarly, it offers location-free access which is linked to the users' convenience and efficiency<sup>[11]</sup>. The users can experience 35 percent more efficient to conduct electronic payment at points of sale than cash as well as avoiding making long queues<sup>[12,13]</sup>.

*Complexity* –complexity is the degree to which an innovation is perceived as relatively difficult to understand and use<sup>[9]</sup>. Laukkanen & Lauronen (2005:36) The complexity and problems with usability have contributed to the low adoption of a variety of payment systems, including electronic money<sup>[11]</sup>.

*Compatibility* –compatibility is the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters<sup>[9]</sup>. The emergence of NFC technology in the mobile contactless market as a mechanism for small value payment which is a great deal of interest about physical model solution<sup>[14]</sup>.

*Cost* – Electronic money users really consider to the costs of the electronic transactions should be low enough to make the total cost of the purchase competitive with physical world prices<sup>[6]</sup>.

*Network Externalities* – The degree to which an innovation is affected by the amount of other consumers and merchants using it<sup>[6]</sup>. The further penetration of merchants segments and opening new acceptance channels may increase speed and convenience of payments, thus enhancing customer loyalty<sup>[15]</sup>.

*Trust* – The dimension of a business relationship that determines the level to which each party feels they can rely on the integrity of the promise offered by the other<sup>[16]</sup>. The lack of security and consumer trust in service providers as a major barrier to adoption of electronic transactions<sup>[17]</sup>.

*Perceived Security Risks* – It is one of instruments to make consumer's trust on some tools because it can protect and concerns which can be divided more into three characteristics such as integrity, availability and confidentiality that is used in technical practice as solutions and in managerial activity<sup>[18]</sup>. In a mobile environment, one of the main constraints of electronic and mobile commerce transaction is lack of consumer perceived security and trust in vendors and payment systems<sup>[17]</sup>.

### 3. Methodology and Data Collection

This paper use qualitative type as its research method, whereas the process of observation and accurate data collecting were based on the data field featuring an in-depth interview with respondents. The result will not emphasize generalization, but more to significance or meaning. Since the data collection is guided by the facts in the field, there is no theory guided the study. Therefore the data analysis is inductive based on the facts found and then constructed into a hypothesis or theory. In qualitative research, the data is analyzed to perform hypothesis while in quantitative research the data is analyzed to test the hypothesis<sup>[19]</sup>. The strength of qualitative research is its ability to provide complex textual descriptions of how people experience a given research issue. It provides information about the "human" side of an issue – that is, the often contradictory behaviors, beliefs, opinions, emotions, and relationships of individuals<sup>[20]</sup>.

In-depth interview and observation in form of photos are used in this study. The respondents are three T-Cash users in Jabodetabek, Bandung, Yogyakarta, Semarang, and Surabaya with total of 27 interviewees. The nine cities are chosen due they are all the original cities of T-Cash existence so that the focus of the author is in Java island. The interview will be done directly with a help of another interviewer which is chosen by the author. The additional interviewer is needed in order to have a comparing perception regarding the content of in-depth interviews. Method triangulation is chosen to use in this research, since it is suitable with the need of this research, which must be done in a short time but with the analysis as detail as possible. The data disclosure will be done directly to the T-Cash users. This research will use multiple methods of data collection and analysis.

### 4. Results and Discussions

#### 4.1 T-Cash Use

Based on the in-depth interview sessions which are conducted in Jakarta, Bogor, Depok, Tangerang, Bekasi, Bandung, Surabaya, Yogyakarta, and Semarang, it concludes that there are total 27 interviewees, which consist of 18 males (66.67%) and female (33.33%). The majority of the respondents is employee (48.14%) and is in young adult age which is ≤25 years old (52%) with educational background of bachelor degree (84%). The most of the interviewees uses T-Cash basic service (88.89%) and has an average duration of T-Cash use around a year (51.85%) with T-Cash use frequency ≤ 3 times in a week (70.37%). There are some reasons why T-Cash users subscribe T-Cash at the very

place; events (33.33%), friends and relatives' influence (25.92%), advertisements (22.22%), and others (18.53%). Furthermore, 96.29% of the interviewees admit that the maximum amount spent on T-Cash is IDR 100,000, while only one of them (respondent #7) mentions that she/he can spend up to IDR 200,000 per transaction.

#### 4.2 Relative Advantage

Payment process simplicity, cashless transaction ability, ubiquitous purchases and payments, time efficiency, and queues avoidance are things provided by T-Cash that are perceived by the T-Cash users' as advantageous. Among all the interviewees, only one of them, which is respondent #4, does not agree that the payment process using T-Cash is simple and convenient. The simple and easy payment process using T-Cash is due to its practical tapping process using NFC technology and its easy carry of the NFC sticker that sticks all the time in the users' mobile phone. The convenient yet simple payment process is stated the most by male (100%) and young adult (55.56%) interviewees, which reflects T-Cash is precisely addressing Indonesian young generation who prefer to use the most convenient payment method.

*"Pleasant to use, not complicated, just tap and insert the PIN." (R19, Depok)*

*"T-Cash is simple, easy to use, very easy to bring because it is patched to our mobile phone so we will never leave it behind. Unlike the wallet, people bring the mobile phone as the priority." (R22, Tangerang)*

The next relative advantage is its ability to do cashless transactions which means the users can avoid carrying cash around which is sometimes make them inconvenient. The cashless transaction ability is mentioned by 62.96% interviewees, which are mostly male (66.67%) and young adult (33.33%).

*"...we don't have to bring cash around, so it's comfortable. There will be no change needed after paying, less complicated. It's just simpler." (R1, Semarang)*

The possibility to conduct ubiquitous purchases is also considered as advantage by 59.26% interviewees, which is stated mostly by male (55.56%) and young adult (37.04%) interviewees. This advantage enables users to purchase things anytime and anywhere such as mobile phone credit and bill payments.

*"(T-Cash is) good, because it is very helpful. For example, we can pay anything from anywhere. (R10, Bandung)*

*"T-Cash is making it very easy for me usually to buy phone credits and pay the bills, I don't need to go out of the house or office." (R23, Tangerang)*

Next, time efficiency is another benefit perceived by 51.85 interviewees, which is mostly male (50%). The users can do the payment in a manner with the least time and effort so that

they can allocate their time to complete another important work.

*"I think using T-Cash helps ease the transaction process and making my time more efficient." (R18, Bogor)*

The last benefit perceived by the 33.33% interviewees is the possibility to avoid long queues since the users can make purchases remotely, or the payment duration is shorter and there are some different line for the T-Cash users in certain POS such as Cinema XXI. Queues avoidance is mentioned the most by male (33.33%) and young adult interviewees (25.92%).

*"...and maybe to avoid long line of queue because some places have special waiting line for T-Cash users. Like in a movie theater for example." (R14, Jakarta)*

*"I usually use T-Cash to buy phone credits and pay my speedy bills. Usually I have to wait in a queue, but with T-Cash it is simpler now." (R15, Jakarta)*

#### 4.3 Compatibility

It is concluded that T-Cash is compatible for micropayment purchases as stated by 96.29% interviewees. The interviewees are only willing to spend up to IDR 100,000 per transaction using T-Cash. Some merchants that are frequently mentioned by the interviewees are food and beverages (100%), cinema (96.30%), mobile phone credit purchases (40.74%), bill payments (40.74%), and purchases in certain events (7%). Some foods and beverages spots such as McDonald's, Wendy's, Baskin Robbins, Cha Time, and canteens in certain spots such as campus or office are frequently mentioned by all the interviewees.

*"Because the number of merchants who use T-Cash is still limited, I only use T-Cash for a certain need such as eating out in McD for example." (R14, Jakarta)*

Cinema XXI is the most visited cinema by the interviewees due to its price promotions and separated queue line facility for the T-Cash users. Male (100%) and young adult (55.56%) interviewees are the ones who perceives Cinema is compatible for using T-Cash payment the most.

*"I like using T-Cash to watch movies in cinema. Using T-Cash is cheaper and there is a special queuing line. So, no need to wait in a long line. T-Cash is supporting my hobby." (R2, Semarang)*

Telkomsel credit purchase and bill payments such as cable TVs, telephone and internet payment, as well as water and electricity bill are perceived as payment compatibility by the interviewees, which is mostly explained by males (50%).

*"I use T-Cash to buy phone credits and pay the bills. Sometimes we panic when our phone credits run out. And I remember T-Cash and we can buy phone credits from there. And I have used it to pay the bills."*

*Things get easier, you can pay and buy from anywhere.” (R20, Depok)*

Also, purchases in certain events are mentioned as compatible with T-Cash. This is stated by 22.22% of female interviewees.

*“(Using T-Cash) for eating, going to the movies, or buying souvenirs in certain events or shows. Usually there are a lot of exhibition where we can only pay using T-Cash. For example like that one time in Trans Studio Mall.” (R11, Bandung)*

#### 4.4 Complexity

Actually the payment process using T-Cash is easy and do not take much time for the users to be used to it, as stated by 100% of the interviewees. The complexity of T-Cash use is the process of T-Cash balance top up process. 77.78% interviewees mentioned the complex top up process as a barrier to T-Cash adoption. The complains of T-Cash top up process is regarding its top up channels, complex top up procedures in Indomaret, and error in network and devices sometimes.

*“The disadvantage is the top up is still difficult, because the channels are limited. Can only be done in Indomaret, because the GraPARI is too far, while doing it in the ATM is expensive. Unfortunately, not in every Indomaret the top up service is available. I’ve failed the top up one time because the cashier said the connection had some problems.” (R16, Bogor)*

*“The top up is troublesome. Because now you can only top up in GraPARI, ATM, and Indomaret. In ATM it’s expensive, in GraPARI it’s too far so I usually top up in Indomaret. But in Indomaret it is a bit complicated. We want simplicity. So actually all you need is to come to Indomaret and pay right? But no, now we have to request token and wait for it to be sent via SMS, complicated.” (R25, Surabaya)*

Up to now, users can only top up through GraPARIs, ATM Bersama, BCA, and Indomaret. It is perceived as too limited and unpractical, since the channels must be more widespread to increase the convenience of T-Cash users. Furthermore, due to transaction fees and locations, the most preferable one is Indomaret, although the top up process through it is somehow complicated. Besides, the interviewees are concerned the reliability of the device and network during the top up process through Indomaret. The poor networks or device errors often lead to the top up failure. Both male (77.78%) and female (77.78%) concern the same regarding the complexity of T-Cash.

#### 4.5 Network Externalities

The T-Cash users are influenced by friends and relatives that have used T-Cash before. 81.48% interviewees admitted that got influence from people around them to use T-Cash. The more users exist, the more widespread the influence is.

*“Lots of my colleagues use T-Cash, they influence me enough. It seems like (T-Cash) turning to be a lifestyle among the office colleagues in my age.” (R24, Tangerang)*

The next influence comes from the merchants acceptance, which means the more merchants accept T-Cash as the payment tool, the more familiar T-Cash is. Unfortunately, merchants acceptance still needs to be expanded now. The limited merchants inhibit the adoption of T-Cash, since T-Cash should be as liquid as money where the payments can be conducted anywhere.

*“Money should be liquid, easy to spend. If T-Cash can’t reach small merchants, then T-Cash is not liquid. So the liquidity of T-Cash is below that of real cash. That’s dangerous. Second, when I got asked about where T-Cash should expand, T-Cash should be able to be spend as liquid as real cash. That’s all.” (R12, Bandung)*

In the future, the interviewees expected T-Cash to be expanded to retails (67%), other foods and beverages merchants (44%), toll payments (37%), fashion stores (22%), and entertainments (15%). Comparing to female interviewees, male interviewees concern more about retails (66.67%), foods and beverages (44.44%), and fashion stores (27.78%). While females more concern about the toll payments (55.56%).

#### 4.6 Costs

The costs criticized by the 25.93 % of the interviewees were about its top up fee, especially from bank transfer that charges IDR 6,500 for every transaction.

*“Looking at the cost, I think it’s a little bit too much to top up via transfer. The amount is as big as transferring to ATM Bersama, a little too expensive I think.” (R5, Yogyakarta)*

The most critique came from young adult whose age is under 25 years old (22.22%), which means this age range is still sensitive to the cost spent on electronic money. The fee charged by bank transfer is too high compare to the micropayment compatibility of T-Cash and slows the T-Cash use among the users.

#### 4.7 Perceived Security Risks

Perceived security risks of T-Cash payments described by the interviewees related to three different categories which were unauthorized use of T-Cash (33.33%), device and network reliability (25.93%), and compromise of privacy (18.52%). The interviewees are afraid that someone else can pay with their T-Cash if the device was stolen or lost since the password of T-Cash is sent through SMS. It is more a concern to males (38.89%) and young adult (18.52%) interviewees.

*“There is a risk. I’m afraid I will lose my mobile phone, people can see my PIN since it is informed*

*through SMS at the very first place. In case of the NFC sticker in the phone, I'm afraid it will fall and gone missing.” (R2, Semarang)*

Another thing is that the interviewees think that the error in payment transaction due to the device or network error is risky since they do not really sure whether the transaction has been conducted or not, which is concerned more by males (33.33%) and adults (18.52%).

*“The weakness shows up when the NFC reader could not read the T-Cash sticker on my phone, so that it disturbed the tapping process and we need to tap more than once. Besides, the late payment notification that supposed to be sent to my phone makes me worried whether the payment process was successful or not.” (R9, Bekasi)*

The last is the compromise of privacy which means the interviewees do not want their privacy to be misused for some advertisements or promotional things, which is explained all by male interviewees. These risks are perceived as inhibitor of the T-Cash adoption among the users.

*Other than that I am worried to put my privacy there, because they can track our shopping history or any other data that might interesting and I don't like that. There is also a possibility that our data is sold to another company for their promotion.” (R23, Tangerang)*

#### 4.8 Trust

The electronic money issuer plays an important part to build the users' trust towards the electronic money as it is described by 77.78% of interviewees. All of the female interviewees say that they trust T-Cash due to Telkomsel trustworthy brand, while only 94.4% male interviewees say the same. Telkomsel, as the biggest telecommunication provider in Indonesia, successfully build the trust among the subscribers to use T-Cash as their electronic money and promote T-Cash adoption.

#### 4.9 Additional Findings – Impact of Price Promotions

96.30% interviewees stated that the most interesting offer of T-Cash was the certain price promotions in almost of all its merchants, while only one of them (respondent #12) who was not interested to T-Cash price promotions. Further, all the female interviewees explained that the price promotions offered by T-Cash were interesting, this also reflects the interest of price promotions are affected females more than males. Among all the merchants that accept T-Cash, the most well-known price promotions were the ones in Cinema XXI and McDonald's restaurant. It shows that the price promotions strategy implemented by T-Cash now is reliable for its target market and do support the adoption of T-Cash among Telkomsel subscribers.

*“Other than the ones I've mentioned, actually the main factor for people to use T-Cash right now is because of the promos. If there is no promotion, I don't think a lot of people will know about this e-money from Telkomsel.”*

This study provides important theoretical contributions to the existing adoption research. The interviewees were willing to use T-Cash due to its price promotions, even some knew T-Cash due to the promotions, not to substitute the traditional existing payment system. The adoption models exist nowadays are based on the innovations are introduced to replace the old ones (Rogers, 2003).

## 5. Conclusion and Recommendation

The results suggest that the relative advantages of electronic money include payment process simplicity, cashless transaction ability, ubiquitous purchases and payments, time efficiency, and queues avoidance. Micropayments are the most compatible with T-Cash especially for the purchases of F&B, cinema tickets, mobile phone credits purchases, bill payments, and purchases in certain events. The adoption of T-Cash is mostly contributed by other users' influence as well as the very well-known issuer, Telkomsel. Further, additional findings, the price promotions, are frequently shown up as an effective strategy for T-Cash target market. There are several barriers that slow the T-Cash adoption, including complex top up process, high top up fee, limited merchants acceptance, lack of device and network reliability, unauthorized of T-Cash use, and compromise of privacy.

### 5.1 Recommendation for Telkomsel

- 1) Expansion to other micropayment purchases and points of sale is needed such as parking and toll payments, digital content and services purchases, more F&Bs, fashion stores, and entertainments. As well as the familiarity to make a large value payments among the users need to be started, expansion to the retails such as Giant, Hypermart, and Hero are recommended to do since those are frequently mentioned by the interviewee users. The retails expansion would be better to be followed by certain price promotions to attract the users and then familiarize them with T-Cash payments, both for small value and large value payments.
- 2) The top up procedures need to be evaluated deeper by the company due to lots of critique from the interviewed T-Cash users. More widespread and flexible top up channels are needed to build a convenient way to top up the balance. Top up process especially from Indomaret needs to be as simple as come to the channel and give the money and tapping T-Cash, without having to request token, waiting for T-Cash send the token through SMS, and giving the phone number and T-Cash Tap. Further, the Indomaret cashiers need to be socialized continuously about T-Cash especially T-Cash top up procedures, so that there will be no failed top up process only because the cashiers are not familiar with it. The last is the reliability of the network and EDC reader devices need to be increased. The periodic checking to all the merchants need to be conducted, both for the network and technical checking for the EDC readers.
- 3) Due the only bank that collaborate with T-Cash is only BCA, the collaboration with more bank channels are needed so that the top up fee could be zero.
- 4) The risks perceived by the users need to be reduced through some ways. The T-Cash users especially the new

ones need be educated regarding the payment system security. Next, ensuring the reliability of the networks and the device in all merchants is needed so that the possibility of the error in conducting payment can be deducted. The privacy issue of the users need to be taken care of. T-Cash is not recommended to use and process the users' data or purchases history data for commercial business especially in this early adopting stage of the users.

5) The trustworthy feeling of the issuer needs to be more developed to other Telkomsel users but do not adopt T-Cash yet. Telkomsel also needs to maintain its well-known brand as the best and biggest telecommunication provider in Indonesia so that the loyalty of the users are well-maintained.

## 5.2 Recommendation for Future Research

1) Due to the qualitative methods used, the findings of this study cannot be used to generalize the population. The findings are used to describe the identifying relevant factors. In the future, the adoption effects proposed in Table 4.32 should be validated by testing them using quantitative methods with large sample.

2) The study cannot explain the most concerned factors based on the interviewees' expenditure due to the unwillingness of the interviewees to explain about the expenditure. Future quantitative study should consist expenditure as one of the demographic characteristics.

3) Further study could be about analyzing and investigating whether the additional finding in this study, price promotions, is also characteristic to other electronic money or mobile payments.

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