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THE USAGE OF CASH DEPOSIT MACHINES: AN EMPIRICAL ANALYSIS OF IDENTIFYING DETERMINANT FACTORS

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ABSTRACT

Banks in Sri Lanka have launched a new generation of machines facilitating cash deposits that are credited instantly to accounts. The purpose of this paper is to identify the factors that influence the customers' level of cash deposit machines (CDMs) usage. The Technology Acceptance Model (TAM) was used to accomplish the purpose of the research. The study used primary data in the form of a structured questionnaire covering the variables of TAM. Correlational analysis was used to demonstrate the constructed hypotheses among the variables, and multiple linear regression was used to measure the impact of customer attitude towards the usage of CDM. Results from the analysis indicated that reliability, perceived ease of use, perceived risk and perceived usefulness were significant factors, whereas the security factor was considered less significant concerning the use of CDMs. The contribution of this research is related to the analysis from a theoretical and empirical perspective of the customer attitude towards the usage of CDM. The practical implications drawn from this study will be useful to bank managers, marketing experts and advertising executives in providing good quality services promoting CDM, whilst developing grievance settlement to build trust among customers, enabling extensive usage.

Keywords: New generation machines, Bank automation technology, Cash Deposit Machines, consumer perception.

1. INTRODUCTION

In Sri Lanka, the use of automation in banking industry emerged with Automated Teller Machine (ATM), followed by the developments of E-Banking and M-Banking (Vivekanandan & Jayasena, 2012; Warf, 2017). This was facilitated by both Information and Communication Technology (ICT) which is playing a vital role in business activities, specifically more in the banking sector. More recently, a new banking technology was introduced to Sri Lanka, this being the Cash Deposit Machine (CDM). In terms of defining a CDM, it is a self-service terminal that allows customers to make deposits and payment transactions by cash. The machine enables customers to credit cash to the specific account on a real-time basis in a '24x7 work window' although some banks are unable to provide '24x7 work window' due to in-station CDMs. Self-Service Technologies (SSTs) are considered more effective and innovative in satisfying the needs of customers. These systems have replaced human tellers with automated teller machines. A CDM is a non-personal service delivery mechanism and one of the latest self-service products, allows bank customers to conveniently make bank deposits without wasting their valuable time in queues. Many public and private banks established CDMs with the introduction of CDM technology to Sri Lanka a few years ago.

Jubair (2014) highlighted Self Service banking with self-service machine has one of the important factors in banking sector. Through these service customers are getting better service at lower cost. Most of the customers are satisfied through this service. Jubair (2014) state that some of the customers are not using this service because of lack of knowledge and security issue. Furthermore, Sisat, Barbudhe, and Bhopale (2014) pointed out, CDM makes easy to deposit cash to customer account as day by day this process is becoming easier. However, Sisat et al. (2014) further stated that security and reliability must be taken into consideration while designing the security algorithm for ATM.

As the use of CDM increasing day-by-day, it is important to study the usage of CDM and identify the factors that influence the customers' level of CDM usage. This study one of such an attempt.

This study is benefited by both customers and the bank in a variety of ways. Mainly the bank will be benefited by this study as it provides details of the evaluation of factors that determine the use of CDMs. Hence, this study will provide clear understanding and better awareness about customers' attitude towards the adaption to the bankers/tellers, which will lead to seek means to be more efficient and ensure timeliness in their service. Furthermore, the results of the study depict and evaluate various customer attitudes towards

CDM systems which will be helpful for current CDM users and potential users to get an idea about the advantages as well as disadvantages they get by using CDMs. Moreover, the fact that there is a limited number of studies that are conducted on CDMs and this is also being the latest technology introduced in Sri Lankan banks. This, it has finally motivated and led researchers to examine the factors affecting customer usage towards this newly introduced automated system, CDM.

Satisfying customers on all possible service dimensions at an age where it is becoming increasingly challenging to, and it is extremely important in order to enhance daily operational functions of banks (Khan, 2016). Thus, the current study investigated the factors that influence bank users on service delivery in the form of an automated system. The referred literature is confined to ATMs due to the fact that CDM-related studies are limited in Sri Lanka and both systems are similar in nature. Since the questionnaire prepared was widely substantiated with reference to international journals, performing a pilot study was regarded as needless.

According to Davis (1989), the Technology Acceptance Model (TAM) has been recognised as an influential framework for describing the nature in which users adopt Information Technology (IT). TAM proposes that how users intend to use a new information system directly influences their adoption of the system. Essentially, the TAM model represents a core foundation for explaining the main underlying factors regarding the degree of consumers' usage.

(1) Perceived ease of use, (2) Perceived usefulness, (3) Perceived risk, (4) Trust and (5) Security are namely the five independent variables in the original framework. In the present study, the variable 'trust' was modified to 'reliability' as most scholars have discussed the reliability factor. As per the initial TAM model proposed by Davis (1989), there are five variables affecting a customer's attitude that are derived through the determinants of customers' level of usage. However, attitude plays a vital role as the use of CDM will be decided from the relationship between attitudes and the independent variables. If a customer finds operating CDM to be effortless, then the level of CDM usage will increase and vice versa. Therefore, the level of usage of CDM depends on the attitude of the customer on automated banking service.

2. METHODOLOGY

2.1. Methodology

Based on the theoretical background, the research model shown in Figure 1 is used to examine the relationship between the influential factors.

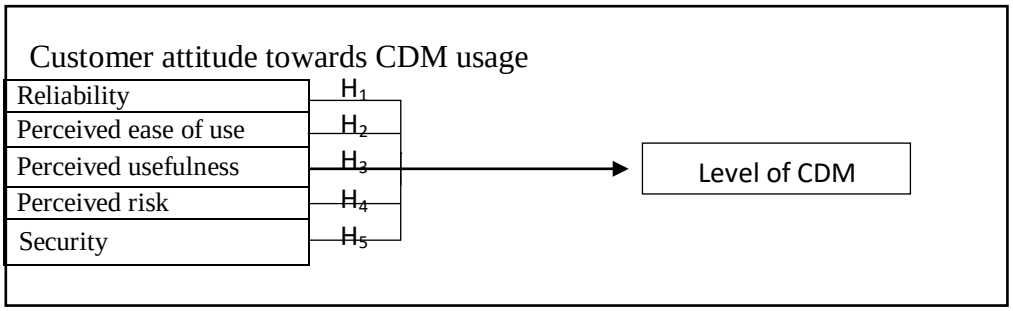

Figure 1. The research framework of this study

Source: Based on Wijesekara and Kandambi (2016)

2.1.1. Reliability

The capability to accomplish the necessary service accurately and dependably is recognised as reliability (de Almeida, Fazendeiro, & Inácio, 2018; Iberahim, Mohd Taufik, Mohd Adzmir, & Saharuddin, 2016). Mwatsika (2016) has mentioned that reliability comprises of the range of services at ATMs, the accuracy of ATM transactions, speed of ATMs, ATMs not out of order, ATM system usability and ease of access to ATMs. The reliability of ATMs is dependent upon the functions performed at the expected level of customers. An error-free and consistent service is the expectation of every customer. As said by Singh and Kaur (2013) and Mwatsika (2016), a customer should feel assured when they use an automated banking service. The customers of CDMs expect the transactions related to depositing of cash between account holders and crediting of other utility payments to be consistent and accurate. Therefore, necessary steps are to be taken by banks to assure and guarantee the availability of services providers at any cost.

2.1.2. Perceived ease of use

The perceived ease of use, according to Davis (1989), as cited by Narteh (2015), is defined as "the degree to which the prospective user expects the target system to be free of effort". The study focused on the effect of perceived ease of use, whether higher or lower, on the level of CDM usage. Accordingly, Thatcher, Shaik, and Zimmerman (2005) assumed that ease of

use determines the customers' preference on whether to approach human tellers or automated banking. Moreover, perceived ease of use characterises an ATM system which is hassle-free and uses language which easily guides customers. This statement elaborates that the interfaces in CDMs should be designed to be easily understood by customers with minimal knowledge of technology. This implies that perceived ease of use is expected to have a positive influence on users' attitudes in their interaction with the CDMs. Customers will not be reluctant to use new service systems if they are easy to learn and easy to use. Therefore, these criteria could be considered by service providers in order to promote CDM usage as the level of CDM usage is less compared to ATM usage.

2.1.3. Perceived usefulness

According to Davis (1989), as cited by Rose and Fogarty (2006) perceived usefulness was originally defined as the extent to which a system contributes towards an individual's job performance. When customers recognise that the CDM service is convenient for their banking transactions, they become more familiar with its use (Y. S. Wang, Wang, Lin, & Tang, 2003, p. 508). The extent to which a certain system is appropriate for an individual's plans, activities and needs, is illustrated through convenience. Specifically, an attribute that differentiates traditional banking from ATM services includes convenient proximity and time (Narteh, 2015).

It was observed during the study that the customers of some branches of Sampath Bank and Amana Bank are not entitled to use 24x7 service since the CDMs are located inside the branches. Therefore, provision of 24x7 service is to be considered seriously, and failing to do so will form the impression among customers that there is no difference between using CDMs and obtaining transactions over the counters. Timely and prompt service are important attributes that determine perceived usefulness, and in addition, the researchers mention that CDM customers also expect a speedy service compared to conducting transactions manually and expect CDM terminals to be available at the same as ATMs as both systems function in a similar manner. CDM terminals, as opposed to ATMs are only available in business cities, as a result, considered a weakness in service delivery.

2.1.4. Perceived risk

Perceived risk, according to Ram and Sheth (1989) as cited by Sohail and Al-Jabri (2014), "refers to the degree of risks inherent in an innovation". As reported by Lim (2003) as cited Cockrill, Goode, and Beetles (2009) reitered, in the context of ATM usage, the concerns will be regarding questions such as '*Is the machine actually going to give me money?*'. This construct also

involves the mental energy to purchase the service. In this framework, CDM users may deliberate in their mind questions concerning the safety of using the machine, the amount of money that can be lost if the product fails to perform well and the chances of cash getting stuck in the machine (Yang, Pang, Liu, Yen, & Michael Tarn, 2015).

Temporary breakdowns of machines were observed by the researchers of the present study when collecting data from bank customers. During such instances, the researchers found that a considerable number of customers were disappointed when they learned that the CDM is temporarily out of service and were then advised to proceed to the counters. This waste of time unintentionally leads to a loss of customer loyalty. The consequential impact of such negative experiences may lead to losing the customer base. Moreover, when customers are long-familiar and regularly transacted with human tellers at the bank or other service delivery points for a long duration, they establish a sense of safety with this human contact. Therefore, with the introduction of this self-service technology, a customer may feel, and ponder on questions such as, '*What would happen to my money if my cash gets stuck in the machine while depositing?*' In terms of perceived risk, "consumers may perceive Self-Service Bank Technologies (SSBTs) riskier than the traditional form of banking in relation to performance, physical and financial risk" (Rose & Fogarty, 2006, p. 125). If a CDM customer feels that the deposit process is getting slower than usual, the customer may feel uncertain in relation to financial and physical status, as a result, might be sceptical of the money actually being deposited to the required account in terms of the financial risk. The fears of risks are due to the psychological or cognitive dissonance of the customers.

2.1.5. Security

According to Sathye (1999); Suganthi (2001); Singhal and Padhmanabhan (2008) as cited by Singh and Kaur (2013), "Security is a serious matter of concern for the customers in deciding whether they would use a technology-based service or not". Compared to ATM users, CDM users do not face privacy issues as there are no cards or security codes when depositing money. For instance, if the customer fails to collect the debit card or credit card, another customer may acquire the money using the forgotten card, and may also illegally look at the personal details of the customer. However, at a CDM terminal, even though another customer may become aware of the personal details, no fraud will take place because it is only related to depositing of cash.

The researchers sought out to explore whether security plays a vital role in determining CDM usage as CDMs are regarded as one of the most recent bank innovations in the Sri Lanka.

2.1.6. Level of CDM usage

According to Polit, Beck, and Hungler (1997) and Vogt and Johnson (2011) as cited by Flannelly, Flannelly, and Jankowski (2014, p. 162), "The presumed cause in a cause-effect relationship is called the independent variable, and the presumed effect is called the dependent variable". In line with our study, the dependent variable is recognised as the level of CDM usage. Currently, the level of CDM usage has not appeared by way of the banks' expected usage level, which is part of the reason for this research. It is clearly understood from literature that customer attitudes have a significant impact on their level of CDM usage. Almost all the literature reviewed has focused on separate aspects of CDM usage, highlighting the need to meet the literature gap. Based on the aforementioned facts, the research question of the study was formulated as being – '*Why do some consumers prefer manual cash deposit over CDM?*' The conceptual model TAM as stated above was used to evaluate the independent and dependent variables of this study.

Identifying the factors that influence the customers' level of CDM usage was the main objective of the study, using Sri Lanka as a case study to measure the impact of perceived usefulness, reliability, perceived ease of use, perceived risk and security on the use of CDM.

2.2. Method

The data drawn from 260 random bank customers from the district of Colombo in Sri Lanka was used in the study. It covered nine (9) banks, namely, Hatton National Bank (HNB), Sampath Bank, Commercial Bank, Bank of Ceylon (BoC), People's Bank, Nations Trust Bank (NTB), Seylan Bank, Nations Development Bank (NDB) and Amana Bank. A structured questionnaire was developed to gather data from bank customers in four (4) cities in the Colombo district, namely, *Bambalapitiya, Homagama, Kesbewa* and *Kaduwela*. The conceptual model containing five (5) different subsections, viz., reliability, perceived ease of use, preserved usefulness, perceived risk, and security to the level of CDM usage. To validate the applicability of the different subsections, the study calculated Cronbach's alpha to check the internal consistence. Cronbach's value of all five variables are higher than 0.700 which suggest that the scales are sufficiently reliable to the next level analysis (Table 1). Variance Inflation Factor (VIF) and Tolerance were used to verify independent variables were not highly correlated to each other.

Table 1: Reliability statistics

Dimensions	Cronbach's Alpha Value
Perceived Ease of Use	0.823
Perceived Risk	0.774
Perceived Usefulness	0.906
Reliability	0.795
Security	0.719

Correlation and multiple regression were the analytical tools used for the study. The Pearson correlation coefficient was used to test the constructed hypotheses of the study, whereas multiple linear regression was used to measure the impact. Accordingly, the researchers used a matrix to interpret the information of the study as it allows the reader to observe the size, direction and significance level of several correlations simultaneously. In line with the given dataset, the variables used were the time of CDM, bank name, safety options and the five (5) independent variables (perceived usefulness, reliability, perceived ease of use, perceived risk and security). The matrix contained results of all the variables and was presented pairwise.

Thus, the model to be estimated is

$$CDM_i = \beta_0 + \beta_1 \mathrm{EASE}_i + \beta_2 RISK_i + \beta_3 USEF_i + \beta_4 RELIA_i + \beta_5 SECU_i + \epsilon_i \quad (1)$$

where, *CDM* denotes level of CDM usage of i^{th} customer, *EASE* denotes perceived ease of use, *RISK* denotes perceived risk, *USEF* denotes usefulness, *RELI* denotes reliability and *SECU* denotes security. Finally, ϵ is the disturbance term of the model.

3. RESULTS AND DISCUSSIONS

This study works on five (5) hypotheses related to the interdependence of CDM usage and all the hypothesis can be summarised as follows.

Hypothesis 1: $\beta_1 > 0$: *There is a positive impact from reliability to customers' level of CDM usage.*

Hypothesis 2: $\beta_2 > 0$: *There is a positive impact from perceived ease of use to customers' level of CDM usage.*

Hypothesis 3: $\beta_3 > 0$: *There is a positive impact from perceived usefulness to customers' level of CDM usage.*

Hypothesis 4: $\beta_4 < 0$: *There is a negative impact from perceived risk to customers' level of CDM usage.*

Hypothesis 5: $\beta_5 < 0$: *There is a negative impact from security to customers' level of CDM usage.*

Results of the correction analysis of the above variables are shown in Table 2.

Table 2. Correlation matrix for the studied variables

Scale	Level of CDM Usage	Perceived Ease of Use	Perceived Risk	Perceived Usefulness	Reliability	Security
Level of CDM Usage	1.00					
Perceived Ease of Use	0.761**	1.00				
Perceived Risk	0.232**	0.194**	1.00			
Perceived Usefulness	0.404**	0.263**	0.299**	1.00		
Reliability	0.182**	0.213**	0.667**	0.304**	1.00	
Security	0.125*	0.123**	0.625**	0.183**	0.546**	1.00

Notes: **Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed).

Almost all correlations were statistically significant at 0.01 level as per the correlation matrix, exhibiting the expected positive relationships. The correlation between reliability and level of CDM usage was 0.182, with a significance value of 0.010. This result described that there was a weak positive relationship between reliability and customer usage of CDM (H_1).

The correlation between the level of CDM usage and the perceived ease of use was 0.761, with a significance value of 0.000. Consequently, the stated results indicated that a very high correlation coefficient between these two variables, specifying a strong positive relationship. Jamil and Khan (2016), stated that CDM usage and perceived ease of use is the most significant dimension, since the ease of usage increase the possibility of customers using CDMs. Hence, the yielded results of the study suggested that the level of CDM usage and perceived ease of use were interrelated variables. This emphasised and indicated that for a service to be easy to use, the customer should feel comfortable to use the service.

In addition, a correlation of 0.404 with a significance value of 0.000 was observed between perceived usefulness and level of CDM usage was 0.404. Therefore, the correlation value depicted that the two variables had a moderate positive relationship, demonstrating that there was a moderate weak positive relationship between perceived usefulness and customer usage of CDM (H_3).

Furthermore, the p-value of the correlation between perceived risk and level of CDM usage was 0.232, with a significance value of 0.000. This result signified that the correlation coefficient between the variables was a weak positive relationship, suggesting that there is a weak positive relationship between perceived risk and customer usage of CDM (H_4).

Finally, correlation coefficient of 0.125, with a significance value of 0.030 was displayed for security and level of CDM usage. A weak positive relationship was derived from the correlation coefficient between the variables. Accordingly, the null hypothesis (H_0) of the study was rejected and therefore, the related hypothesis (H_a) was accepted, which implied that there is a weak positive relationship between security and customer usage of CDM (H_5).

The multiple linear regression results are shown in following Table 3.

Table 3. Multiple regression results

Variables	β	SE	Sig.
Perceived Ease of Use	0.672	0.038	0.000
Perceived Risk	0.055	0.031	0.046
Perceived Usefulness	0.160	0.030	0.000
Reliability	-0.048	0.027	0.073
Security	-0.008	0.029	0.799

Note: β =Beta; SE = Standard Error; Sig = Significant Value; the dependent variable is Level of CDM Usage. R^2 is 0.630.

As can be seen from Table 3, the coefficient of the determination is 0.630 implies 63 percent of the total variation of the level of CDM usage were explained by the five-independent variable. Coefficient of each independent variable is significant except the security implies security is not an important determination to the determination of the CDM usage.

However, important variables identified in describing the CDM usage were perceived ease of use and perceived usefulness. Perceived risk also plays a somewhat important role in CDM usage. Consequently, this indicated that the users of CDM have considered the availability of language in all three mediums. When describing the nature in which perceived ease of use may influence the level of CDM use, CDMs would be identified by users as being an easy method to perform banking activities. Similarly, the measurable attributes of the construction of perceived usefulness may include CDMs as being flexible and convenient. Perceived risk, an awareness of the limited time to perform a transaction along with the 24x7 service, have influenced the

perceived risk to be low, therefore is important in determining the usage of CDM.

Reliability and security, as per the results, indicated lower levels of significance in explaining the overall use of CDM by the consumers in comparison to other variables. The regression results concluded that security played a less significant role in determining the level of CDM usage. According to Cockrill et al. (2009, p. 186), "security did not appear to play a direct role in determining customer satisfaction". The abovementioned statement is further corroborated with the study results. Finally, determinant of coefficient implied 63 percent of the total variation of the CDM usage are explained by these independent variables. Ultimately, the results of regression analysis aided in identifying the significant factors that influenced customers, namely, perceived ease of use, perceived usefulness, perceived risk and reliability which determined the use of CDM.

Moreover, the researchers could corroborate the finding of the current study to previous studies conducted by Pikkarainen, Pikkarainen, Karjaluoto, and Pahnila (2004), Jahangir and Begum (2008), Hosein (2010) as cited by Narteh and Kuada (2014, p. 363), "that ease of use is an important quality dimension which influences customer satisfaction". According to the findings of Cockrill *et al*. (2009, p. 186) "perceived risk appears to play a pivotal role in determining customer satisfaction for ATMs and this has very important implications to the way banks manage and improve their ATM networks as a way to reduce perceived risk". Further, perceived usefulness and perceived ease of use are the two measures that significantly influence customers' attitude and intentions to use ATMs, and perceived ease of use is a significant determinant of perceived usefulness (Kaur & Gupta, 2013). In agreement with W. Wang, Butler, Hsieh, and Hsu (2015) as cited by Kaur and Gupta (2013, p. 263), "consumers are likely to be more satisfied with ATM services if they believe that using the system will increase their performance and productivity". The determinants of CDM usage of the current is not only backed by the findings but also are recognised and acknowledged by previous research findings.

Time constraints was the major barrier to the study, thus, it conducting the study throughout the island became challenging and as a result, was restricted only to the Colombo District. Out of the thirteen (13) cities in the Colombo District, as mentioned above the study was conducted only four (4) cities. Hence, the researchers were only granted the opportunity to identify the perception of customers in Colombo who use CDMs. Furthermore, the researchers had to limit the sample size to 260, although the researchers had expected to collect data from 300 respondents. This is due to the limited timeframe to collect data, along with the occurrence that most CDM users

were reluctant to spare time to participate in the survey. Such customers were using CDMs to ease their busy routines. Another limitation of the study included the selection of only the top nine (9) local banks that provided the CDM facility. As acquiring permission from the parent company took a long period, foreign banks operative in Sri Lanka was not taken into consideration in the study.

4. CONCLUSION

The main reasons that affected the level of CDM usage in Sri Lanka, in view of the study were, perceived ease of use, perceived usefulness, perceived risk and reliability are significantly influential in creating a positive customer attitude. The finding were supported by TAM and related research. Nonetheless, security had lesser significance to influence the level of CDM usage in comparison to other independent variables of the study.

Identifying the factors that determine the use of CDM provides an understanding of customers' attitude towards the usage. Therefore, in the process of testing those variables through CDM customers, the researchers of the study learned that the perceptions they had towards this automated service. The suggestions given by CDM customers determines the need for improvement by the service providers. Hence the third objective of the study, which is to provide an insight to the bankers could be achieved. These improvements will add value to the service already generated by bankers.

The study identified specific areas that would be helpful for future researchers who may conduct studies in a similar area. Moreover, future research should be conducted covering a larger customer base of both local and international banks, including coverage of CDM facilities around the island. In further promoting CDM, whilst developing grievance settlement to build trust among customers, and opening CDM for a '24x7 work window', the roles played by the banks become critical.

Moreover, the banks should build awareness among customers such as the benefits that a customer receives from using CDM service as well as ways and means of using a CDM since most of the public was not aware of this banking service. A respondent shared an experience: during a visit to deposit money in a bank at Malabe had a huge queue to deposit cash manually while there were none using CDMs. There are several limitations in this paper. The results and analysis of this study were limited to the nine major local banks in Colombo. Therefore, further studies should be expanded to cover a comprehensive collection of bank customers which include foreign banks in Sri Lanka recommended to determine overall usage of the CDM in Sri Lanka.

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