

impact of automated teller machine (atm) on the performance of tanzanian banks

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Abstract - The objective of this study is to investigate the effects of ATM technology on the performance of banks in Tanzania. There have been studies on the quality of service provided by automated teller machines, but they have not focused on the effects of this technology on the customer satisfaction. The study is additionally motivated by the challenges that face the country's banks, which are often under-reported. There has been a debate about the relevance of ATM machines due to the increasing number of countries that are moving away from virus technology and are now using chip cards for their transactions. The study was conducted on a sample of 125 bank employees in Dar es Salaam City. The results of the study were analyzed using the SPSS software package and the chi-square technique. Although the implementation of ATM terminals has generally been beneficial for banks in Tanzania, it has also been associated with higher fraud rates. The quality of service provided by ATM machines is not related to the privacy and security of its users or providers. Therefore, banks should enhance their security measures to prevent web scammers from infiltrating their customers' accounts. They should also provide customers with electronic warnings when their transactions are being processed through the machines.

Index Terms - ATM, bank performance, fraud, information technology

Introduction

Today's business environment is heavily influenced by international experience and globalization. In order to succeed, banks and other financial institutions need to adopt a comprehensive approach to managing their activities. According to Mitroff, only the banks and businesses that are well-equipped to understand the new regulations will be able to prosper. Due to the increasing competition in the financial industry, executives and management have realized that they need to change their approach to managing their activities. One of the most effective ways to succeed is by developing a global management system that is capable of handling multiple international business strategies. This system should be able to be equipped with the necessary personnel to implement these strategies. The rapid emergence and evolution of the financial industry has greatly increased the scope and number of services that banks can offer their customers. Due to the technological advancements that have occurred in the past few years, banks have become the biggest users of new equipment.

Despite the increasing complexity of their operations, banks are still happy to see that they can improve the quality of their services by implementing new technology. However, this process may not provide them with the economic value they need. Despite the increasing number of technological advancements, banks are still not able to fully benefit from the increased customer satisfaction they can achieve through the use of new equipment. Although there are various technological applications that banks need to implement in order to improve their operations, researchers are still not able to agree on the exact link between the number of automated teller machines and the efficiency of their operations. Some of them believe that the increasing number of technological advancements is not enough to justify the increased profitability of banks. An ATM, also known as a cash machine or banking machine, is a type of telecommunications device that enables financial institutions' clients to conduct transactions without the need for a bank clerk or cashier. An ATM works by allowing a customer to identify themselves by inserting a plastic card with a magnetic stripe or chip, which also has a unique card number and certain security information. An authentication process is carried out by the customer after they enter their PIN.

According to Ogbuji et al., in order for a customer to conduct a transaction using an ATM, they need to go to almost any other machine in the world. However, this has caused a lot of frustration among customers, as the machines do not always dispense cash or debit transactions. According to Dapo, the increasing number of ATMs is causing more concern for the country's financial institutions. As a result, many of them have experienced issues related to their operations. Besides the epileptic services that these machines provide, they have also caused a lot of problems for their users. One of the most common issues that these machines have caused is the theft of bank accounts by fraudsters. This type of financial crime occurs when the fraudsters steal the card information and PIN, which is a special secret code that allows them to access the card's usage. The link between the efficiency of a financial institution and the use of an ATM is a complex one. Since the level of productivity and efficiency that an organization has is related to its overall success, it is important that the various sectors of the financial industry adopt strategies and procedures that can improve the efficiency of their operations. Some of the ways that financial institutions can improve their efficiency include establishing goals, training and development, and adopting information technology. These are all practical ways that can help them increase their performance. The technological and management aspects of the banking industry are also taken into account when it comes to determining the level of efficiency and effectiveness of the sector.

Despite the various technological advancements that have occurred in the financial industry, the impact of the use of an ATM on the performance of financial institutions has not been fully studied. This is because there has been a lack of research on the effects of the technology on the operations of the providers. In Tanzania, banks have started to network their ATMs, which has increased their customer's utility. ATM has been regarded as the preferred delivery method for consumer banking in the country.

Literature Review

The various facets of our lives are touched by the banking system, which features numerous opportunities and challenges. Some of the ways people can use it include making a purchase, paying bills, moving funds, and accessing funds through an ATM. Aside from banks, various types of financial services are also available through micro-finance institutions. These include loans and check cashing services. These services are not commonly available in certain communities. Automated teller machines (ATMs) are commonly used by financial institutions to improve their performance. They are also used to manage various aspects of the banking industry. According to the FHFA, the machines are used in the banking sector for 420 million transactions each year, which is equivalent to around \$3.3 billion in annual revenues. This article aims to provide a comprehensive overview of the various types of financial services that are available through banks. It will also talk about the technological changes that have occurred in the industry. ATM's are referred to by various names. Some of these include automatic banking machines, which are commonly used in the US. Others include cashpoint, which is a type of automated banking machine that is commonly used in the UK. Other types of machines include bank machines, cash line, and autotellers. Some of these are also known as bank machines, which are commonly used in various countries. Some of these include Bankomat, which is a type of automated banking machine that is commonly used in Russia and Europe. According to Abor, an ATM is a combination of a record-keeping system, a cash vault, and a computer terminal. It allows customers to access the bank's book keeping system by presenting a plastic card with a personal identification number or by punching a code into the computer terminal.

Once customers have gained access, they can then use these to conduct various retail banking transactions. These are mostly located outside banks, but can also be found in malls, airports, and places that are far away from the main branch of a financial institution. Initially, these were only used for cash dispensing. Due to the technological advancements that have occurred in the banking industry, these types of machines have now been able to provide various services. In addition to being able to withdraw and deposit funds, customers can also make payments and check their balances using their credit or debit cards. With the use of these types of machines, people no longer need to go to a bank to perform basic transactions. ATM usage has drastically cut the service staff of traditional banks, which has had a negative impact on the industry. The fees that financial institutions charge for using these machines have made transactions profitable for them, which has led to a reduction in the number of service personnel in banks. As a result, many of these are now being leased or commercially owned by financial institutions. This technical sector has developed a process for maintaining and creting these machines. In 2012, Ogbuji and colleagues noted that the use of ATMs has replaced the traditional paper-based payment system. An automatic teller machine enables customers to conduct their banking transactions from any ATM in the world. This makes it an ideal alternative to the traditional counters of banks.

The combined services of an ATM and a human teller can result in higher productivity for banks during business hours. It also saves customers time by allowing them to perform their transactions in a more efficient manner. In addition, having these types of machines can be a cost-effective way of increasing the bank's efficiency. According to a study conducted by Rose in 1999, the average number of transactions that an ATM makes per month is more than that of a human teller. ATMs continue to operate even after the human tellers have left the scene, which means banks are still able to achieve continuous productivity even after business hours. An ATM works by having a component that accepts card information. When a user inserts their card into the component, it will prompt for an authentication through the ATM PIN. Each ATM machine has its own unique TID, which is programmed to identify it in different locations. Through an internet connection, users can make transactions at the ATM. All of the transactions are carried out globally through the networks of various financial institutions, such as Mastercard, Visa, and Cirrus. The back side of ATM cards also has a logo that refers to the network. The process of transferring funds using an ATM involves connecting the machine to the network and the card holder's bank. After the necessary authorization step, the transaction is completed. According to Ugwu, ATMs are designed to provide 24-hour services to customers who cannot visit a bank branch during regular business hours. These types of machines can be utilized by customers to make transactions such as transferring funds, paying for goods and services, and checking their balances. An ATM machine validates a card's information by reading its magnetic strip and card number, as well as the expiration date, pre-selected PIN number, and the user's provided card number. Unfortunately, there are still certain security flaws that criminal-minded individuals can exploit to commit fraud. Despite the technological advancements that have been made in the field of ATM transactions, there are still some areas that they can still target to carry out illegal activities.

History of Automated Teller Machine in Tanzania

In the 1990s, financial institutions and banks in Tanzania started offering ATM services. The first bank to introduce this service was Standard Chartered Bank. Since then, the competition among the various operators has been fierce. Each of the banks has its own unique approach to providing the best possible service. Since its inception, the number of ATMs has increased significantly. Also, the locations of these machines have changed. Initially, these were only available in the bank's premises. Today, these machines can be found at various locations such as petrol stations and market centres. These types of machines are commonly found in banks and customer convenience areas. They allow people to complete their transactions without leaving their homes or cars. Since these types of machines are interconnected, they can be used by anyone with a bank card or credit card.

Other functions which the machines are capable of performing include:

- (i) Printing of Cityments
- (ii) Transfer of funds
- (iii) Payment of bills
- (iv) Cash advances

Display of promotional messages

Banking Performance

In 2006, many bank customers in Tanzania experienced a collective relief after the country's financial institutions introduced the Automated teller machine. But the implementation of this technology has presented various challenges. In his paper, he noted that the introduction of the Automated teller machine has played a vital role in the country's financial institutions' efforts to compete against their competitors. It allows them to provide customers with fast and efficient services. According to Adeoti, the use of ATMs has made it easy and convenient for customers to settle their bills in the country's financial system. The number of these machines has increased significantly since 2006. In 2007, almost all banks in the country had introduced these types of machines. The use of information technology has also played a significant role in the marketing of financial services. With the help of this technology, a customer can easily transfer funds from one account to another, and other important information related to a transaction can be accessed thousands of miles away.

In order to provide their customers with better personalized services, banks are now developing and deploying automated teller machines. In Tanzania, for instance, some banks are providing their customers with Access Terminals, which allow them to view or print their account balances. These are essentially special services that have previously been unavailable to them. According to some schools, the use of ATMs has been beneficial for banks. They noted that it allows them to reduce their costs and improve their customer service. In addition, it has the potential to increase their investment opportunities. Moutinho also Cityd that the machines have the potential to speed up transactions and improve the efficiency of banks.

Besides being convenient and faster, the use of ATMs also provides various value-added services to its customers. Some of these include the ability to pay for college fees, fund transfers, and settle insurance premium payments. Moreover, the flexibility of using these machines allows customers to bank with other financial institutions, which is very important for banks. Through the interbank networks, customers can now easily access the ATMs of various banks. ATM networks are cheaper to operate than deploying additional equipment in expensive locations. In 2013, the Interswitch group's director, Siyanbola, Cityd that out of the country's 26 million ATM cards, 16 of them were issued by commercial banks. Over 14 microfinance institutions also issued Interswitch verve cards. The remaining 10 million are held by Visa and Mastercard, two global payment card brands.

Vendors have started equipping their machines with biometric devices that can be used for authentication. These solutions have been designed to cater to the rural population, allowing them to interact with their machines in their local language. This technology has the potential to expand the ATM usage in interior parts of the nation. There's also been a lot of interest in white-label ATMs, wherein the ownership of these machines goes to third parties, who then make money from the transactions. The concept of the automated teller machine is already prevalent in the US. It's expected that the use of biometric devices will further expand the scope of the ATM industry. Unfortunately, the security and convenience of using an ATM have been negatively affected by the activities of fraudsters who use plastic money. According to Ihejiahi, the lack of cooperation between banks has contributed to the rise of ATM-related frauds. He Cityd that banks are reluctant to share information related to ATM frauds, which makes it difficult for them to effectively combat this issue. The increasing number of frauds at the hands of fraudsters has overshadowed the various technological advancements that have been made in the financial sector over the years.

Despite the positive effects of the introduction of automated teller machines, the situation has drastically changed since they were first introduced. Due to the increasing number of frauds, the function of these machines has been severely affected. According to him, one of the main factors that contribute to ATM frauds is the indiscriminate use of card numbers and security features. He also Cityd that customers are careless about their card information, such as their response to text messages and e-mails that ask for their card details. According to Omankhanleu, the activities of ATM fraudster are threatening the country's financial system. He noted that their methods could lead to the dumping of cards. Similar to other objects of value, an ATM is also a target of fraud. Its systems and functions are often compromised in order to steal money. Some of the most common types of frauds that have been carried out against these machines include shoulder surfing, Lebanese loop, using stolen cards, and card jamming. The activities of fraudsters in the country's banking environment have undermined the operations of the ATM system. ATM fraud has become a recurring decimal that highlights the country's financial system issues.

Theoretical Framework

During the 1960s, studies about the influence of wealthy nations on the development of less developed countries emerged. The study, which is based on the Theoretical Modernization theory, assumes that people live in a network society. When these networks break free from their territorial boundaries, they can disrupt the country's economic and cultural self-sufficiency once it had been established. The concept of interconnected societies has been shown to imply that people can co-exist with each other. This is because the separation between national life and international affairs has been greatly eroded. The relationship between the banking industry and automated teller machines has also been acknowledged as a contributing factor to the country's development.

Methodology

Five banks were randomly chosen to participate in the study. These are: First CRDB, NMB, NBC, Exim Bank, and TCB. The study was conducted in Dar es Salaam to collect feedback from 25 staff members of the banks. A Likert Scale was then used to measure the level of disagreement and agreement among the respondents.

The response format is as follows:

- VHE Very high extent
- HE High extent
- AE Average extent LE Low extent
- VLE Very low extent

The frequency distribution and the Chi-square were utilized to analyze the collected data and examine the patterns of response to the various variables under investigation.

$$X^2 = \frac{\sum(O - E)^2}{E}$$

Where: *O* = Observed frequency *E* = Expected frequency

Data Analysis

The questionnaire was administered to 125 individuals. Out of the total, about 80% of the respondents filled out and returned the questionnaires. Although the questions covered various subjects, only the relevant results were reported in the table below.

Question 1: Automated Teller Machine (ATM) contribute immensely to effectiveness of banking sector.

Table 1. Effect of Automated Teller Machine (ATM) on effectiveness of banking sector

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Average extent	17	17.0	17.0	17.0
High extent	35	35.0	35.0	52.0
Very high extent	48	48.0	48.0	100.0
Total	100	100.0	100.0	

Source: Questionnaire returned

The percentage of people who indicated that the automated teller machine is very high or low is shown in the table. The analysis revealed that the machine is very high in the population sample, while the efficiency of the banking sector is increased 17%.

Question 2: To what extent as Automated Teller Machine contribute to the effectiveness of banking sector. Machine stimulate growth of banking system.

Table 2. Impact of Automated Teller Machine on the growth of banking sector

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very low extent	4	4.0	4.0	4.0
Low extent	9	9.0	9.0	13.0
Average extent	20	20.0	20.0	33.0
High extent	30	30.0	30.0	63.0
Very high extent	37	37.0	37.0	100.0
Total	100	100.0	100.0	

Source: Questionnaire returned

The table shows that the introduction of automated teller machines has a high impact on the banking industry's growth. When 37% of the sample indicated that it has a very high effect, followed by 30% of the respondents with a high extent, and 19% of the sample size said that it has an average effect, just a few 4% noted that it has a very high effect.

Question 3: Extent to which Automated Teller Machine

Table 3. Impact of Automated Teller Machine on the profitability of banks

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very low extent	3	3.0	3.0	3.0
	Low extent	9	9.0	9.0	12.0
	Average extent	41	41.0	41.0	53.0
	High extent	26	26.0	26.0	79.0
	Very high extent	21	21.0	21.0	100.0
	Total	100	100.0	100.0	

Source: Questionnaire returned

The table shows that 42% of the respondents think the use of automated teller machines can improve the profitability of a bank. This indicates that the bank's staff members are aware of how the machines can be abused. In addition, many customers have reported that they have encountered issues with the machines when trying to make a debit or cash transaction. ATM users have expressed their dissatisfaction with the facility due to the various challenges it encounters. It is believed that the use of automated teller machines can improve the profitability of banks.

Question 4: Extent to which Automated Teller Machine ATM influence fraud in banking sector.

Table 4. Effect of Automated Teller Machine on fraud control in banking sector

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Average extent	13	13.0	13.0	13.0
	High extent	21	21.0	21.0	34.0
	Very high extent	66	66.0	66.0	100.0
	Total	100	100.0	100.0	

Source: Questionnaire returned

The table shows that ATM fraud is increasing in the banking industry, with 66% of the respondents stating that it is very high, 21% City that it is high, and 13% City that it is average. None of the respondents indicated low extent or very low extent. This is because there are various types of scams that are carried out using these machines.

Hypothesis Testing The only hypothesis tested in this paper is to find out whether ATM frauds significantly affect the patronage of banks by those affected.

Test: H_0 : ATM facility have not significantly improved bank performance.

H_1 : ATM facility have significantly improved bank performance.

Findings of the Study

The study finds that the use of automated teller machines has contributed to the efficiency of the banking industry. The rapid emergence and evolution of new technology has greatly impacted the banking sector's performance. In response to this, the country's banks have been promoting the use of various credit and debit cards. The study also finds that the use of automated teller machines has contributed to the growth of the banking industry. This is because the number of customers using these machines has increased. However, the efficiency of these machines remains a vital measure of the industry's performance. Another important aspect of the study is the volume of transactions that banks are receiving from their regular customers. ATM fraud and scams are threatening the continuous use of these machines by the users. This issue has become a concern for the providers and users of these services due to the diminished function of these machines. To reassure customers about the security and benefits of these channels, a lot of work needs to be done.

The lack of confidence that the users have in the security of their transactions is one of the factors that has caused the decline in the number of transactions through ATM channels. This issue is also attributed to the lack of knowledge about the various security measures that are involved in the use of these machines. The lack of direct interaction with the bank's staff members has also caused customers to feel uneasy about the possible risks associated with the use of ATM channels. To address these concerns, the bank should enhance the quality of its customer interactions.

Conclusion and Recommendations

The paper argues that the use of automated teller machines is very effective and has contributed to the growth of the banking industry. It aims to explore the various technological and economic factors that can be utilized to improve the country's financial sector.

The technological advancements that have occurred in the banking industry have contributed to the growth of the sector. Through the use of automated teller machines, investors and management have been able to gain a deeper understanding of how foreign competitors are able to gain an advantage over their local counterparts. The study analyzed the various problems and findings related to the use of automated teller machines in the banking industry. It identified several recommendations that can be implemented to improve the operations of the financial sector.

1. Government should protect financial institution by creating laws, which must be followed accordingly to enable them to improve in performance and activities.
2. Banking managers and government should properly adopt strategy that will encourage businessmen and general public in using automated teller machine which will improve effectiveness and efficient of the banking sector.
3. In a way of promoting the banking sector and micro finance banks, government should hold firm the laws on ATM fraudsters and scammers so as to boost economic of the nation.
4. The banks can employ customized software that records relevant information on ATM cards so that banks can establish whether unauthorized transaction has taken place or not. \

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