

# Determinants of Adoption of Electronic Payment Systems for Small and Medium Enterprises in Rwanda: A Case of R-Switch

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**Abstract:** *Electronic Payment Systems as a form of payment, is steadily growing in usage worldwide and in Rwanda. The objective of the study, was to find out the determinants of adoption of electronic payment systems for Rwandan small and medium business enterprises with a focus on debit cards. This study used the primary data collected through questionnaires from bank managers who are in charge of the management of distribution of debit cards at banks, supermarkets tellers and online retailers, existing electronic payment systems platforms in Rwanda, regulatory authority and to individuals who use currently available debit cards during payment as the target population. The researcher then did editing and filtering to ensure the accuracy of the data input procedure, and the researcher also used coding of the answers provided to put the data into limited groups and categories. The research is mainly a qualitative research where the methodology which was used are questionnaires, and this was carried out using explorative, comparative and descriptive methods. This study sought to highlight the determinants of the adoption of electronic payment systems focusing mainly on debit cards in Rwanda, as a method of a structural analysis of the challenges faced on the usage of debit cards through the available platforms and their reliability in regular business especially for small and medium enterprises. The findings show that the major determinants of adoption of electronic payment systems are technological infrastructure and security while social and cultural influences together with the legal and regulatory frameworks don't play as much of a role. As a recommendation from the study, there is a need for the local payment switch to upgrade its capacities so that debit cards they offer can be able to be used for online purchases as this will help spur the growth of SMEs in Rwanda.*

**Keywords:** e-Commerce: Electronic Payment Systems: Automated Clearing House, Small and medium-sized enterprises

## 1. Background of the Study

The birth of information and communication technology (ICT) as a result of the merging of computer science and telecommunication engineering, brought about the dramatic changes in the way business is conducted in order to compete in the global market place and this trend has spread throughout the globe (Schneider, 2011). The combination of traditional commerce and the Internet, providing opportunities for business or organizations to develop new business models to take advantages of globalization is known as electronic commerce or e-commerce.

Although the idea of using electronic payment systems originated many decades ago, where efforts for the proposal of the use of prepaid cards for settlements and the handling of transactions through the use of prepaid cards, this idea didn't kick off right away even though there were various attempts to utilize the idea of cards for payments as a principle of the idea of electronic money and payments (Moreton, 2011).

In the early 20<sup>th</sup> century, the Diners Club International (IDC) issued its first electronic payment card known as the Diners Club card. A few years after, a coalition of banks in the United States of America and subsequently various other banks joined together and issued the first universal payment card which is now known as VISA. As a competitor to VISA some majors banks in California, USA started to issue what is now known as MasterCard and what eventually followed is the development of appropriate information technologies applicable in the banking industry (E-Money, 2013).

In the 2013 Rwanda ICT Sector Profile, this can be seen for Rwanda through the utilization of Points of Sales (POS) where statistics show that value of transaction through POS grew exponentially in 2013 reaching close to 18 billion Rwandan francs (RWF) and in 2012 it stood at 8.5 billion RWF. A trend can be observed on the increased preferred choice of payment in electronic payments over cash while conducting business in Rwanda.

There are different methods of online payment which are identified according to the parties involved, the major four types of e-Commerce are as follows;

Business to Business (B2B); in this type of e-commerce, two different businesses exchange information electronically between each other (Chaffey, 2002). In this category, companies who do business with other companies like suppliers and retailers, manufacturers and distributor all fall under this. Business to Consumer (B2C); in this type of e-commerce, it involves the business transactions between organizations and consumers (Chaffey, 2002). Consumer to consumer (C2C); in this type of e-commerce, it involves business transactions between two different consumers on a dedicated website which specializes in online auctions where buyers can also be sellers and the vice-versa (Chaffey, 2002). Consumer to Business (C2B); in this type of e-commerce, it involves situations where the consumer makes online transactions from a business. This can be done with businesses which specialize in providing consumers with discount or sales information regarding all available services in a particular area or for a particular product (Chaffey, 2002).

So e-commerce involves the movement of real money from the person who pays through the issuer and the acquirer and then to the person accepting payment (Kalinga, 2010). There are other models of electronic payment systems, but for the purpose of this study the researcher looked at Credit cards and Debit cards.

**Credit Cards:** with credit card payment systems, the account of the person receiving the payment is credited with the amount of sales before the account of the person making the payment is debited (Chaffey, 2002). They are also known as 'pay-later' systems.

**Debit Cards;** with debit cards, the account of the person paying is directly debited upon payment using the card. This is same system through which Automated Teller Machines (ATM) operate. When debit card holders use their cards, the amount is directly charged to the funds in their account.

The shift from cash to electronic payments can dramatically reduce costs for governments, the development community, the private sector, and recipients. A recent report by the World Bank found that governments can save up to 75 percent with electronic payment programs (World Bank, 2012). Electronic payments can eliminate the handling, transportation and distribution fees associated with cash-based payments and also can eliminate the risk of fraud and theft, which is a persistent challenge of both in-kind and cash distributions.

**Security:** The security of data and information is very important in all systems built to relay such information. When it comes to Electronic payment systems, it is paramount that all information and data relayed through are safeguarded against unauthorized access and easy modifications and of course the system has to be available upon request by the authorized user.

**Technological Infrastructure:** Proper and modern Infrastructure is crucial for the successful implementation of electronic payments systems as well as it is a challenge too. This type of infrastructure has to be cost effective to the entity establishing it, and then reliable and accessible to the users. The type of infrastructure used for electronic payment systems is built and based on a network which can be a computer or mobile network and most cases both. A network that links banks and other financial institutions for clearing and payment confirmation is a requirement for electronic payment systems (Tadesse & Kidan, 2005). The level of penetration of these networks limits the development and progress of e-Commerce in general.

There is the need for national regulatory and legal framework that is in alignment with regional and international standards is very important in creating a trustworthy and business friendly environment (Tadesse & Kidan, 2005). **Social and Cultural influences:** Cultural and historical differences in attitudes and the use of different forms of money (e.g. use of credit card in North America and use of debit cards in Europe) complicate the task of developing an electronic payment system that is applicable at international level (Tadesse & Kidan, 2005).

Through the introduction and usage of social media platforms such as Facebook, Twitter, Instagram accessible through smartphones and interactive devices, the exposure and awareness on the possibilities of online payments are becoming more evident for their regular users and this is leading to the increased demand for such services (Idisemi, 2011). Lack of such services for online users could lead to a decline or loss of customers and the introduction to these kind of payment options could spur the local tech-scene into the building of local systems hence an increase in experienced human resource. According to Petrakis (2012), in the role of interpersonal trust and knowledge in the number of small and medium enterprises, they conclude that knowledge positively affects the number of SMEs, which in turn, positively affects interpersonal trust. From the SME toolkit (Ministry of Commerce. Rwanda, 2010) in Rwanda, Small and Medium enterprises can be defined as; Small Enterprises: enterprises in this category have 0.5 to 15 Million (RWF) net capital investments, 0.3 to 12 Million (RWF) Annual turn-over and 4 to 30 employees. Medium Enterprises: enterprises in this category have 15 to 75 Million (RWF), net capital investments, 12 to 50 Million (RWF) annual turn-over and 31 to 100 employees.

This has led to the creation of mobile money payments platforms and such examples include the M-Pesa which was first heard of in Kenya and initiated by Safaricom which is one of the leading mobile phone network operators in the sub-Saharan region. Statistics show that over 85% of Kenyans use the M-Pesa system daily and by 2013 this amounts to 677,205,000,000 Kenyan Shillings (KShs) in total which shows a rapidly growing increase in the usage for various activities which include transfers, withdrawals, deposits and person-to-person payments (Safaricom, 2014).

There are various developments globally when it comes to electronic payment systems of which there are very few innovations generally in Africa which could include; credit and debit cards and ATMs, digital cash, electronic cheques, and electronic wallets. A report from the Rwanda Ministry of Youth and ICT (MYICT) indicates that the volume of ATM transactions have increased from 1,976,376 in 2011 to 7,774,053 in 2013 and the value of ATM transactions (In million RWF), increased from 122,536 in 2011 to 260,585 in 2013 (Ministry of Youth and Information Communication and Technology. Rwanda, 2013). And the type of cards used for ATM transactions are mainly debit cards which are issued by a majority of the banks here in Rwanda.

According to statistics from the National Bank of Rwanda, the majority of card holders in Rwanda have debit cards that are issued through R-Switch which is the National Electronic payment switch responsible for enabling electronic payment settlements but the local banks are only offering credit cards built on foreign platforms and networks which are the only ones with the capabilities to work on the available online payment platforms (National Bank of Rwanda, 2014).

R-Switch functions on a local network used mainly for its ATM transactions for direct withdrawals, but this same network can be used to build upon local electronic payment systems which will in turn enable local SMEs to be able to

incorporate alternative and attainable payment options for local customers.

### 1.1 Statement of the Problem

It is commonly acknowledged that the promotion of the use of electronic payment systems for e-Commerce helps to boost the growth of small and medium sized businesses and in the long run, leads to the economic development of the host countries. Even though the benefits of using electronic payments systems most especially in the developed countries of Europe, Americas and parts of Asia have become eminent, in Africa, this practice is yet to be fully accepted and used to its full potential with cases of some countries still at the early stages of establishing the right policies, infrastructure and frameworks to capitalize on the economic and social-cultural advantages (Ackorlie, 2009).

The study resulted as result of the author's concern about the use of debit cards for e-Commerce within the local businesses in Rwanda. Although many people and business owners possess electronic cards, these are used mainly for cash withdrawals and not for online purchases. The study focused on small and medium enterprises and also on the general customers of such businesses who use online payment services currently on offer in Rwanda.

In Rwanda, the use of electronic debit or credit cards is a very new trend with most of the commercial banks in the country now widely offering electronic cards. Even though the number of cardholders are gradually increasing, majority of these cards being issued are used for direct cash withdraws from ATMs by the clients. For these electronic cards to become fully operational for online usage, there is the need for the establishment of suitable electronic payment systems through which both the clients and businesses can then start reaping the multiple advantages of electronic payments.

### 1.2 Objectives of Study

#### 1.2.1. General Objective

Determinants of adoption of electronic payment systems for small and medium enterprises in Rwanda: a case of R-switch.

#### 1.2.2. Specific Objectives

Specifically, this study sought;

- 1) To determine the effect of security on electronic payment systems adoption in SMEs through the use of debit cards in Rwanda
- 2) To examine the role of technological infrastructure on the adoption of the use of electronic payment systems in SMEs through the use of debit cards in Rwanda
- 3) To identify the role of regulatory and legal frameworks on the adoption of electronic payment systems through the use of debit cards in Rwandan SMEs
- 4) To describe the effects of social and cultural influences on the adoption of electronic payments systems through the use of debit cards in Rwandan SMEs

### 1.3 Hypotheses

- 1)  $H_0$ : There is no effect of security on electronic payment systems adoption in SMEs through the use of debit cards in Rwanda  
 $H_1$ : There is an effect of security on electronic payment systems adoption in SMEs through the use of debit cards in Rwanda
- 2)  $H_0$ : There is no role of technological infrastructure on the adoption of the use of electronic payment systems in SMEs through the use of debit cards in Rwanda  
 $H_1$ : There is a role of technological infrastructure on the adoption of the use of electronic payment systems in SMEs through the use of debit cards in Rwanda
- 3)  $H_0$ : There is no role of regulatory and legal frameworks on the adoption of the use of electronic payment systems in SMEs through the use of debit cards in Rwanda  
 $H_1$ : There is a role of regulatory and legal frameworks on the adoption of the use of electronic payment systems in SMEs through the use of debit cards in Rwanda
- 4)  $H_0$ : There is no effect of social and cultural influences on the adoption of the use of electronic payment systems in SMEs through the use of debit cards in Rwanda  
 $H_1$ : There are effects of social and cultural influences on the adoption of the use of electronic

### 1.4 Significance of Study

This study was to highlight the need for a change in the current methods of online payments so as to encourage the establishment and use of debit cards which work on local Electronic payment platforms. The study worked on highlighting this need for a change by looking at how factors regarding social and cultural, technological, regulatory and legal frameworks and security influences affecting existing in methods of operation of electronic payment systems for online transactions. The study aimed at looking into how this strategy would be helping to foster the socio-economic empowerment of the Rwandan SMEs and its citizens through attainable resources for online businesses. The study also provided more viable options for the ordinary Rwandan consumers who would rather use local payment systems as opposed to foreign payment systems which come with unreachable conditions.

## 2. Introduction

### 2.1 Research Design

The researcher used the descriptive design, and this was done through deductive reasoning where the researcher starts at the top with a very broad spectrum of information and work the way down to a specific conclusion.

### 2.2 Population

The target population was 10 SMEs which include Online Retailers and Supermarkets with and without any online payment systems all these within Kigali. ,28 regular bank customers and 8 branch managers from 8 different local banks which provide credit cards and debit cards Kigali. , 2 staff; administrative and technical from the existing ATM networks and 2 staff from the national Regulatory Authority.

### 2.3 Sampling Frame

**Table 2.1:** Sample frame

Category	Target Population	Sample Size	Sampling Method
Branch Managers at Commercial banks	8	6	Random sampling
Managers of Supermarkets and Online retailers	10	8	Random sampling
Individual bank customers	28	26	Random sampling
Payment Switch Staff	2	2	Random sampling
Regulatory Authority Staff	2	2	Random sampling
<b>Total</b>	<b>50</b>	<b>44</b>	

### 2.4 Sampling technique and Sample size

Through the use of stratified sampling as the methods of sampling from the population, whereby every element in the population is assigned to only one stratum. Then simple random sampling was used for each stratum in order to reduce sampling error.

### 2.5 Data Collection Instruments

The research was conducted using questionnaires and

### 2.6 Data Analysis and Presentation

The raw data collected from primary sources by the researcher is edited and coded, is statistically treated and drafted in tables, the statistical package for social sciences (SPSS) is used to produce results that are further interpreted.

## 3. Research Findings and Discussion

### 3.1 Effects of Security on Electronic Payment Systems adoption

**Table 3.1:** Effects of Security on Electronic payment systems adoption

Effects of Security on the adoption of Electronic payment systems adoption	N	Mean	Std. Deviation	C.V
Advantages and Disadvantages of using Electronic payment	36	4.7778	.42164	0.08825
Integration of appropriate systems	36	7.7778	2.51976	0.32397
Rwanda has set appropriate measures	36	4.7222	.56625	0.119911
Security of personal information crucial	36	4.7500	.43916	0.092454
Safeguarding options provided	36	8.0833	2.60082	0.321751
Security's role on types of cards offered	36	8.0833	2.60082	0.321751
Payment platform used has to be secure	36	8.1389	2.52024	0.309654

The effects of security on electronic payment systems adoption in SMEs through the use of debit cards with the highest mean were payment platform used has to be secure and a joint safeguarding options provided together with security's role on types of cards offered. However, safeguarding options provided together with security's role

on types of cards offered have a high coefficient of variation, which shows that the respondents varied on the five level Likert scale.

### 3.2 Role of Technological infrastructure on the adoption of electronic payment systems

**Table 3.2:** Role of Technological infrastructure on the adoption of electronic payment systems

Role of technological infrastructure on the adoption of electronic payment systems	N	Mean	Std. Deviation	C.V
Different technologies being tried	36	6.5833	2.98927	0.45407
EPS is well organized and integrated	36	6.8889	2.52731	0.36687
EPS is customizable and flexible	36	6.8889	2.52731	0.36687
Company has internal and external technical support	36	6.4167	2.97009	0.46287
Company provides training and maintenance to EPS	36	6.2778	3.05765	0.48706
Rwanda set up equipment that can host consumer data locally	36	4.7222	.56625	0.11991
Company has investment and financial support for development	36	5.8889	3.37874	0.57375
Rwanda needs to upgrade infrastructure	36	3.2778	.61464	0.18752
Local IT companies can support EPS technological infrastructure	36	3.7778	.86557	0.22912

The role of technological infrastructure on the adoption of electronic payment systems with the highest mean was a joint EPS being well organized and integrated, and EPS is customizable and flexible. However the Company having investment and financial support for development had a higher coefficient of variation showing that commitment by the company to invest in development of EPS is regarded as a major factor.

### 3.3 Role of regulatory and legal frameworks on the adoption of electronic payment systems

The role of regulatory and legal frameworks on the adoption of electronic payment systems with the highest mean was that Rwanda has set legal environment and ICT policies on EPS. However the highest standard deviation was on the Company encourages ideas and projects on EPS which shows a big divide between respondents who believed their companies encouraged ideas on EPS and those who did not.



**Table 3.3:** Role of regulatory and legal frameworks on the adoption of electronic payment systems

Role of regulatory and legal frameworks on the adoption of electronic payment systems	N	Mean	Std. Deviation
Company shows commitment in implementation of EPS	36	6.2500	2.71898
Company has clear EPS policies	36	7.6667	2.81831
Company has staff with right knowledge on EPS policies	36	5.3889	3.49103
Roles and responsibilities clearly assigned to staff	36	7.4722	3.04712
Company encourages ideas and projects on EPS	36	6.6111	4.13541
Rwanda has set legal environment and ICT policies on EPS	36	7.8333	2.62406
Legal environment good to promote dev of EPS	36	7.6111	2.88125
Government shows strong commitment in promotion of EPS	36	7.8056	2.65996

### 3.4 Effects of social and cultural influences on the adoption of electronic payments systems

**Table 3.4:** Effects of social and cultural influences on the adoption of electronic payments systems

Effects of social and cultural influences on the adoption of electronic payment systems	N	Mean	Std. Deviation
Use of EPS increasing with International community and returning residents	36	6.8333	2.74122
Number of debits cards should increase with new workforce	36	6.6944	2.70259
Usage of debit cards a latest trends, need to be encouraged	36	6.6667	2.72554

**Table 4.11** Paired differences of the Social cultural and Technological infrastructure

Pair 1	Social Cultural–Technological Infrastructure	Paired Differences			t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean			
		-0.125	0.75374	0.30771	-0.406	5	0.701

According to the results of the t- test, it was observed that there was a significant difference in the scores of social and cultural influences; the mean is 6.17, standard deviation is 0.82 and with the technological infrastructure; the mean is 6.30, standard deviation is 0.81,  $t(5) = -406$  and  $p = 0.701$ .

The study put the significance level for all hypotheses to be 0.05. All the hypotheses that have been stated were all tested in the null form, with the assumption that there is significant relationship between the independent and dependent variables.

#### Hypothesis 1

$$H_0: \mu_1 = \mu_2$$

$$H_1: \mu_1 \neq \mu_2$$

where

- $\mu_1$  is population mean of Social Cultural
- $\mu_2$  is population mean of Technical Infrastructure

The difference of means = 0.13

$$t = -406$$

$$p = 0.701$$

If,  $\alpha \neq 0.05$ ,  $p > \alpha$ ,

Need for awareness campaigns on different EPS	36	6.5278	2.85343
Clients belief on saving culture using debit cards	36	4.8056	3.82338
Need for company to start using EPS	36	5.5000	4.09529

The effects of social and cultural influence on the adoption of electronic payment systems with the highest mean was that the Use of EPS was increasing with International community and returning residents, however the Need for company to start using EPS had the highest standard deviation which showed that there is a big difference in terms of those whose companies had already started using EPS and those who had not.

### 3.5 Paired sample t-Test

**Table 3.5:** Paired statistics of the means of all the variables

Pair		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Social Cultural	6.1713	6	.82464	.33666
	Technological Infrastructure	6.2963	6	.80961	.33052
Pair 2	Regulatory and Legal	6.9762	7	.91658	.34643
	Security	6.6190	7	1.75225	.66229

A paired samples t-test was conducted to compare the effects of social and cultural influences on the rate of adoption of electronic payment systems and the role of technological infrastructure on the rate of adoption of electronic payment systems.

hence, the study rejects  $H_0$  in favor of  $H_1$ , and conclude that, although both technological infrastructure and social cultural influence affect the adoption of electronic payment systems, looking at the means, the results show that technological infrastructure plays a more significant role in the adoption of electronic payment systems than social cultural influences. The same type of t-test was run to compare the role of regulatory and legal frameworks and the effect of security on the adoption of electronic payment systems and the results are as shown below

**Table 3.6:** Paired differences of the regulatory and legal frameworks together with the Security

Pair 2	Regulatory and Legal – Security	Paired Differences			t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean			
		0.35714	1.39345	0.52667	0.678	6	0.523

The t-test was also ran for the second group of means, and it was observed that there was a significant difference in the scores of regulatory and legal framework; the mean is 6.98,

standard deviation is 0.92 and with security; the mean is 6.62, standard deviation is 1.75,  $t(6)= 678$  and  $p=0.523$ .

### **Hypothesis 2**

$$H_0: \mu_1 = \mu_2$$

$$H_1: \mu_1 \neq \mu_2$$

where

- $\mu_1$  is population mean of Regulatory and Legal frameworks
- $\mu_2$  is population mean of Security

The difference of means = 0.35

$$t = 678$$

$$p = 0.523$$

if,  $\alpha \neq 0.05$ ,  $p > \alpha$ ,

hence, the study rejects  $H_0$  in favor of  $H_1$ , and conclude that, although both regulatory and legal frameworks and security affect the adoption of electronic payment systems, looking at the means, the results show that regulatory and legal frameworks plays a more significant role in the adoption of electronic payment systems than security.

## **4. Discussions and Findings**

The study found that the major determinants of adoption of electronic payment systems are technological infrastructure and regulatory and legal frameworks and then security as well as the social and cultural influence play lesser roles in the adoption of electronic payment systems. However there have been different studies where characteristics are brought into play like Lo (2011) who linked demography to consumers' adoption of electronic payment systems.

The results show a relationship with Pikkarein (2004) who suggested that technological infrastructure play a big role in the adoption of technological innovations such as electronic payment systems. This is in line with Kim (2010) whose study showed that security is a key component on whether payment systems are considered for usage by consumers. The results however are not in line with Venkatesh (2003) who made the assumption that social and cultural influence are among the major influences of using payment systems. But it can be noted that although this is not the case at the moment, this could change over time.

## **5. Summary, Conclusions and Recommendations**

### **5.1 Determine the effect of security on electronic payment systems adoption in SMEs through the use of debit cards in Rwanda**

From the responses from the questionnaire and the t-test analysis, it showed that security has an effect on electronic payment systems. It was noted from the responses that 69% believed their company provides different options on how to safeguard financial transactions and the majority of the respondents were those officers in charge of debit cards within the local banks. From these respondents of that question, 69% stated that security plays a big role in the types of debit cards that they offer and the major proportion were those staff in charge of debit cards at the local banks.

And 85% of the respondents stated that the payment platform which their organizations use have to be secure.

### **5.2 Examine the role of technological infrastructure on the adoption of the use of electronic payment systems in SMEs through the use of debit cards in Rwanda**

From the questionnaire feedback, 91% of the respondents stated that their organizations have EPS which are customizable and flexible enough to incorporate other EPS to meet customers' needs, and 73% of the respondents stated that their organizations have sufficient internal and external technical support for electronic payment systems and applications. This shows the amount of effort which banks and payment switches go through to ensure that their systems are compatible and reliable. And 78% of the respondents stated that Rwanda has set up appropriate equipment regarding cybersecurity and on the security of our data, this shows the amount of investment which the Government of Rwanda has put in in order to accelerate ICT and improve the lives of its citizens through financial independence.

### **5.3 Identify the role of regulatory and legal frameworks on the adoption of electronic payment systems through the use of debit cards in Rwandan SMEs**

From the questionnaire responses, it shows that 38% of the respondents believe that the management of their organizations show commitment in the implementation of electronic payment systems, while 40% of the respondents believe that the management of their organizations have a clear and precise electronic payment systems policy. However 87% of the respondents believe the Government has set the appropriate legal environment together with the right ICT policies which support the development of electronic payment systems.

### **5.6 Effects of social and cultural influences on the adoption of electronic payments systems through the use of debit cards in Rwandan SMEs**

From the questionnaire feedback, it shows 59% of the respondents agree that the use of electronic payment systems is increasing with the continued demand from members of the international community as well as returning local residents. The feedback from the respondents also showed that 60% believe that the use of debit cards as a form of electronic payment systems is among the latest trends and should be encouraged, while 59% of the respondents believe that the number and usage of debit cards should increase as more young people are now entering the workforce. This shows that electronic payment systems is new and trendy fashion and with a target population of the younger workforce.

## **5.7 Conclusions**

There is definitely a need for the increased usage of electronic payment systems across all levels of the society as this can be deduced from the respondents who are from different walks of life. According to the study, the two main determinants of adoption of electronic payment systems

were Regulatory and legal frameworks and Technological Infrastructure. From the stand point of Rwandan SMEs, the Government has made major strides in ensuring that secure and robust technological infrastructure have been installed across the country and this is acting as an enabler for the adoption of electronic payment systems. These can be seen from the increase in the number of options of electronic payment systems in the country from POSs at various service areas like shops, petrol stations, bars and hotels to the numerous amount of ATMs which are available across the country and accessible at any time.

The government has also set up the right institutions, personnel and policies which favour the development of electronic payment systems as this can be seen from the latest options of payment cards.

The social and cultural aspect is now being seen to influence the adoption of electronic payment systems because there is now more demand for the availability of electronic payment systems especially at different service and hospitality hotspots from the clients who are mostly non-locals and also from the younger generation of consumers. This is now leading to increased availability of POSs and ATMs and this is also leading to continuous network and connectivity stability being a core dependent for all of this to all function.

### 5.8 Recommendation

The study is aimed at identifying the determinants of adoption of electronic payment systems in Rwandan SMEs and it was noted that there is a need for the local payment switch to upgrade its capacities so that the debit cards they offer can be able to be used for online purchases. Despite the availability of good regulatory and legal frameworks set-up by reputable institutions to monitor, and with the high-grade infrastructure all of which the other non-local payment switches function on, the local payment switch cards can only function at POSs and ATMs.

This is hindering the growth of e-commerce especially online e-commerce.

### 5.9 Areas of Further Study

This study focused mainly on debit cards, future research should be conducted to find out more about the possibility of setting up other electronic payment switches and on how these new switches can collaborate with local engineers to build 'Made-in-Rwanda' type of electronic payment systems/ payment switch that can work locally and international. Additional study can be done in areas such as Bitcoin and payment switch interoperability to facilitate other kinds of payment forms apart from bank cards.

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