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Increased cash productivity through self-service technologies - Albania case study

ERDET KËLLIÇI
Department of Informatics, Statistics and Economies
European University of Tirana
Head of ICT Department, OST Sh.A., Tirana, Albania

Abstract

Technology is advancing toward new frontiers and is offering many tools to perform transactions and purchase goods through self-service products. The most used payment method in Europe especially in Balkan region is cash. Cash is expensive and developed countries already reduced it to minimum using modern technologies including credit card processors, mobile payment and electronic wallets. Banks, financial institutions, service providers and governments facilitate this reduction. Most of Eastern Europe countries including Albania are cash based countries, because most of the financial transactions are performed using this payment method. Cash is risky due to its anonymity, starting from simple concept of losing it and leading to most complex concepts including money laundering and corruption. General opinion is that best option is to reduce cash payments to minimum. This goal may be achieved using several tools including government, banks and organizations. The cash reduction will increase transactions performance by removing intermediaries and complex cash handling and counting techniques. I will focus only on technology contribution on cash reduction using several technological tools. This study analyzes Albania as a cash country and several technological tools used to purchase services and products. To support the conclusions of this paper I have analyzed real data processing from payment platform including mobile payments, financial institutions and self-service kiosks performance survey.

Key words: Mobile payments, self-service kiosks, transactions, payments, cash.

1. INTRODUCTION

Technological equipment like self-service kiosks, mobile devices, computers, card processors are facilitating the purchase of goods and services. These technologies tend to increase the transaction performance and increase security while performing a financial transaction. For example the Forrester Research identified that self-service technologies can reduce the cost of a service interaction from $35 on the phone to 75 cents online [15]. Self-service technology is used in almost every industry for process streamlining, consistent service quality delivery, and client volume management [5]. Still cash is the most used payment tool in most of European countries and this situation is not going to change anytime soon toward the decrease of cash transactions performed between individuals or businesses. Cash transactions mean higher anonymity and higher risk than electronic transactions leading, lose of cash, thieving and the risk of using counterfeit money while performing transactions. There are policies that tend to increase cash usage from individuals, for example, some policies posed by European Union (EU) to Eastern Europe countries for traveling are not helping on cash reduction. Who is traveling to EU is asked to keep a certain amount of cash with him to cross the border as an insurance that he/she will be able to support the travel to EU country and to support the stay in that country. According Albanian Ministry of Foreign Affairs when an Albanian citizen travels abroad, should provide cash guaranty for staying in an EU country. EU countries require a cash guaranty from foreign travelers and it is usually around 50 EUR per day. This example is just to show that government imposes barriers to cash reduction in the region due to such

type of policies that are not focused on cash reduction and furthermore show that cash is still the main source of trust from EU countries toward individuals.

The objective of this work is to identify electronic tools and solutions that can lead to cash reduction and facilitate transactions between businesses and individuals in Albania by increasing transaction performance and transaction security. Reducing cash will affect the way money is send and received, for some businesses and individuals it may lead to legal issues due to their type of activity or because of the informality that is a concerning and present issue in our country. Customer interaction with machines and devices is analyzed in order to provide information and help on the creation of a profile for Albanian customers and their willingness to interact with technological tools and purchase services. The self-service technologies tend to interact with persons without involving third parties to help them to perform the transaction. This interaction is named Technology Readiness (TR) and is defined by [9] as "people's propensity to embrace and use new technologies for accomplishing goals in home life and at work".

Albania offers several payment methods starting from cash to e-money. This diversity of services allows me to study several ecosystems on their elements and identifying the characteristics of each service offered by local companies. The data analyses will help me to see how the customers behave using these tools and what the preferred payment methods are for Albanian individuals and businesses. This paper will analyze Albanian payment methods and customer behavior toward these tools.

2. LITERATURE REVIEW

Most of the studies focus on customer relation with service provider [2], [3], [6], [7]. Based on technological progress an important part is interaction of customer with technological

tools that offer self-service transaction processing [3]. The studies mainly correlate the customer behavior to the benefits that he will get from the usage of the service and depending on service performance itself. This is partly correct because customer will use technology to perform such transaction and technology usage will depend on customer culture toward technology usage. The adoption of technology depends on the culture and value of the users [13]. Older people tend to be more comfortable interacting with persons instead of machines or technological tools like tablets, PC or smart phones. Technology adoption is a process that is starting with the user becoming aware of the technology and ending with the user embracing the technology and making full use of it [10]. The technology empowered customer is also a self-service, partial employee to the organization who may take over duties which have been previously performed by employees, thus, reducing company operational expenses [11]. Customers and citizens can engage in self-service kiosk technologies at airport and travel kiosks, vending machines, food-ordering kiosks, self-check-ins, health care kiosks, and retail kiosks [4]. This paper also consider mobile devices as one of the latest interface additions to the classification of SSTs (Self-Service Terminals) by interface [14], [4]. Compared to mobile technologies such as PDAs and mobile phones, SST kiosks have the advantage of wide screen size and easy to operate key boards [12].

3. METHODOLOGY

The scope of the paper is to identify if cash transactions in Albania for goods and services are in decrease following the global payment trend. This paper aggregates real data gathered from Albanian companies that offer self-service to their customers. This data aggregation will support the conclusions of this paper. The focus of this study is on mobile payments and

self-service kiosks. This paper brings analyze several studies in the field of self-service to support the findings.

4. SECURITY

In a payment process, security is one of the most important elements that is taken in consideration. The usage of mobile payments, smart cards and money transfer by agents can avoid the need for transport of cash or for beneficiaries to travel to a distribution point, significantly reducing the risk of diversion compared to physical cash or in-kind aid [8]. All transactions performed online must implement encryption of data, secure network and password protection for customers and prevent any unauthorized access from unauthorized persons or software. These considerations should be foreseen by the service provider during implementation of payment flow process and using online systems that keep each transaction safe, secure and private.

4.1 Secure data transmission

Secure transmission of data may be implemented by using site-to-site VPN connection technology and including the encryption of data through digital certificates that will encrypt the information transmitted to this private channel. Both endpoints of the site-to-site VPN connection must be able to authenticate each other before activating the connection by exchanging pre-shared keys using secure channels. Both parties have to declare their real IPs by restricting the communications between these sites only between pre-declared IPs. Furthermore, both parties can communicate using HTTPs secure protocol for data exchange by prior declaring their public IPs.

Secure authentication is achieved by implementing encryption key or password using strong complexity policies. Certificates are used for securing data transmission by protecting the data from unauthorized access. Securing

communication channels contributes to the increasing of data integrity.

The main customer's concerns in regards to the security of service Platform are privacy, integrity, authentication and non-repudiation. The Mobiliser Platform set, addresses these concerns as follows:

Confidentiality - All communications between customer, provider server and Pay and Go Platform are encrypted using SSL. Sensitive information (e.g. passwords) is stored in encrypted format in the database.

Integrity - SSL prevents alteration of data during transmission. Standard database services are used to provide storage and referential integrity.

4.2 Data and patch management

For better implementation of changes, payment provider must have two separate environments. The first one should be the test environment that is a copy of production environment. Before performing any change or development in production environment, the change should be implemented and tested in test environment. In production, Access Control Lists will control all software components of the system. Only specific users may run software, access configuration files or databases or update software releases. ACLs are a standard operating system security feature and is supported by all our identified platforms.

All data are stored in a database. Consideration of the following security requirements are made during this process:

- All data in the database are stored with a timestamp.
- Only required options and products are installed
- Default database user accounts are locked and set to expired
- Default passwords are changed
- Only privileges that are required to fulfill the specific task are granted to the DB accounts

- Administrative access are restricted (4-eyes-only)

Applications are used to facilitate the mobile payment process. These applications should be secured for the client and must fulfill the following security requirements:

Each account on the system has a related profile defined according to the business role description for this profile. This profile includes an entry for user staff ID that is mandatory and identifies a unique user. This field should be mandatory field in application and database.

A role based authority concept with different and configurable authority profiles is supported. Each account is protected with a password that is separated from the underlying Operating System password and the database direct access passwords.

The system should provide the capability to lock, deactivate, suspend or delete accounts and user IDs either manually or automatically, given some predefined actions and criteria. The system provides the ability to define the period of inactivity for each user. System provides the capability to add or restrict menu and submenu options for individual users or specific user groups, also assign access which may be defined as read, write, execute, create, delete, etc.

The system provides an access control mechanism to be able to show which data entities or transactions any particular individual may read, modify or execute. All sensitive data are protected by mechanisms consistent with the sensitivity of the information to protect. The system performs internal checks to ensure data integrity.

4.3 Password policy

Password is the most used method to access specific data. Service provider must implement password policies to increase system security and integrity. All passwords should be stored encrypted and are inaccessible by standard users, by using

encryption algorithms. A password should not be transmitted in plain text format over network and they should not be stored into log files. Accounts should be automatically locked after a predefined number of unsuccessful login attempts and an expiration period must be associated to each password. The best way to secure access to the platform is by involving human identification including fingerprint, tokens or real time authentication codes using SMS or standard email.

5. DATA ANALYZES

Albania is a cash country suffering cash handling issues starting from security, informality and corruption. Technology can lead to cash reduction and can increase the security and safety of institutions, private companies and individuals. Cash reduction itself can lead to the increase of safety for everyone. It can bring a lot of benefits for government institutions and banks to control and identify electronic transactions. International literature describes cash as an expensive tools to be used for financial transactions due to its costs during production, costs of losing and also amortization due to heavy use. Cash is also in risk due to counterfeited banknotes or coins. These cash elements are replicated more easily with the current technology with a high accuracy.

5.1 Central bank data analyze

To have a clear view of cash structure in Albania I am analyzing data from Central Bank of Albania (BoA) that is the only institution that can produce cash.

Table1: The number and value of cash transaction in bank

Description	2016		2017		Yearly Change	
	Total No. TRX	Total Amount (in Mil)	Total No. TRX	Total Amount (in Mil)	Number	Value
Cash Transactions	11,388,857	2,572,650	10,765,198	2,593,771	-5,48%	0,82%
Cash Deposits	7,645,500	1,577,539	7,175,011	1,608,616	-6,15%	1,97%
Cash Withdrow	3,743,357	995,111	3,590,187	985,155	-4,09%	-1,00%

Source: Bank of Albania [1]

From this report is clear that cash usage is not decreasing from year to year. In Albania, the usage of cash for performing transaction is increasing. According to BoA this increase in cash is due to the strategies followed by the second level banks, which have increased request for cash. The other reason related to the usage of cash is the increase of requests for banknotes that have bigger value than in 2015. All this factors can lead to conclusion that Albania is not reducing cash usage. The banking system is not contributing on cash reduction using several methods like incentives and facilitating electronic payments.

5.2 Overview of Albanian payment services

Albania has already two e-money institutions that are converting cash in Electronic Money by contributing in cash transformation from cash to electronic money. In Albania there are 3 companies offering mobile payments using wallet or bank account for performing payments or person to person money transfer.

Table 2: Licensed companies from Bank of Albania

Company	Number and Date of License	Field of Activity
Paylink sh.a.	Nr. 1 dt. 04.10.2013	Operator of national card payment
Unioni financiar i Tiranës sh.a.	Nr. 1 dt. 08.12.1999	Service of payment and money transfer
Posta Shqiptare sh.a.	Nr. 3 dt. 18.04.2001	Service of payment and money transfer
AK - Invest sh.a.	Nr. 7 dt. 03.12.2003	Service of payment and money transfer
NOA sh.a.	Nr. 9 dt. 06.06.2007	Service of payment and money transfer
M-Pay sh.p.k.	Nr. 22 dt. 31.05.2011	Service of payment and money transfer
EasyPay sh.p.k.	Nr. 35 dt. 16.11.2015	Electronic money institution
Kastrati sh.p.k.	Nr. 36 dt. 10.03.2016	Service of payment and money transfer
Pay and Go sh.p.k.	Nr. 37 dt. 18.03.2016	Service of payment and money transfer

Source: Bank of Albania [1]

From the companies above only one of them has removed completely cash usage in its platform. This is M-Pay SHPK which connects customer mobile number to customer bank account. All the other service providers, including EasyPay SHPK, uses mixed methods for performing transactions by cash and electronic money. The above statement deducts that cash is still very strong and nearly all institutions are using it in their solutions because this helps them to perform better and to increase their customer base.

Pay and Go sh.p.k is a company that uses self-service kiosks and connects service provider companies with customers. This company has not introduced any other payment method yet, but it is developing a mobile wallet solution and web page for online payment processing. From customer perspective self-service kiosk are easy to use because customers already have experience with technological tools like mobile phones that are handled using touch screens and the same technology is used by Pay and Go in its self-service kiosks using 17" and 19" touch screens. Customer is more motivated on using the machine because he is performing the transaction itself and this gives him security and self-esteem. Based in the report of BOA, Albania is a country that performs most of the transactions using cash. From the studies in the field due to this peculiarity of Albanian market and user behavior, self-service kiosks can be considered a successful technological tool. Still there are different barriers to these kind of services offered by service providers that can be eliminated by an active participation of government, since some of these services are public companies. Only Operator of Distribution of Electrical Energy (OSHEE) offers zero costs for customers that perform transactions using other third parties which are offering collection of payment for OSHEE. Still the main document that OSHEE recognizes is the booklet offered by company with company stamp. This is not possible to be done through self-service kiosks, bank payment or online and mobile payments. This brings insecurity to the

customer to use other channels of payment for paying electricity bills using third parties. Most of customers prefer to pay these bills in OSHEE offices causing queues and issues due to cash concentration in some collection points of OSHEE. This situation has led to internal thief of cash from OSHEE employees, contracting of a security escort for securing cash during transport from OSHEE offices to the banks causing an increase of operational costs for the company and increasing the security issues. The other public companies impose small fees for each payment performed by the customer through alternative channels and zero fees if the customer makes the payment in their offices. This is not a good strategy if we want to push third party services in the market and educate the customers to use alternative channels that offer a better customer experience and are time saving, like self-service kiosks, online payments, bank payment or mobile payments. The cash collection by public companies offices brings again the same issues like security of cash from theft or fraud from company staff and increased operational costs like offices, increased number of staff, transportation and security for handling with safety large amounts of cash.

Private companies instead have started to put incentives cash collection and offer the same standard for all companies that want to collect the cash on behalf of them. In Albania we can mention some lending companies like Iute Credit or NOA that are not offering anymore the collection and distribution of cash through their branches and by doing so they have reduced cash losses risks, counterfeit money process and decreased the operation costs by cutting of security and cashier personnel. These companies collect and give cash to their customers using other third parties service provider. For the offering of their services through third party providers, these companies are paying a fixed value to the service provider for each transaction processed through their channel.

5.3 Cash transactions data analyses

Pay and Go is a pure cash basic transactions self-service kiosks, enabling its customers to perform transactions using cash in both coins and banknotes. A self-service kiosk including its components is shown in the figure bellow.

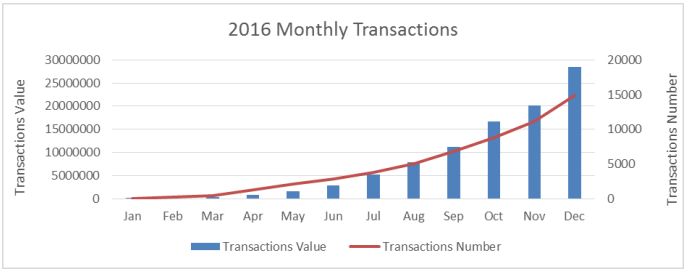
Figure 1: Pay and Go self-service kiosk

Source: Pay and Go sh.p.k

There are several consideration to be made that affect the operation costs of this equipment that will affect the business model that the company is using to make profit.

The graphic bellow shows the trend of cash payment of Pay and Go company starting its self-service kiosks in Albania on the beginning of 2016.

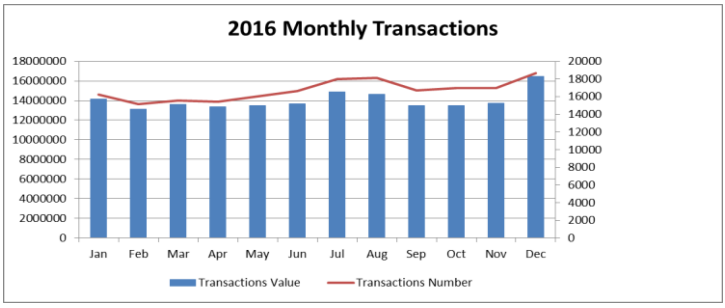
Figure 2: Number and value of Pay and Go transactions



Source: Pay and Go SHPK

From the graph, we can notice that both number of monthly transactions and the volume of transactions are in constant growth. There are several reasons regarding this natural growth of transactions volume and transactions number. The main reason is that this company started at the beginning of 2016, so the customers are using it for a short time. During its startup the company deployed around 120 self-service kiosks so the visibility of the service was low due to the small number of the self-service kiosks deployed. Currently the company has deployed around 360 self-service kiosks in Albania and is offering more than 20 services in its terminals.

Figure 3: Number and value of MPay Transactions



Source: MPay SHPK

MPay has started its activity in April 2014 and the graph shows that both transactions and volume are not growing doing 2016. Based on this data is evident that the users are not embracing mobile technology and the usage of mobile payment

is limited to a small percentage of total payments for services. Based on MPay data there is not any natural growth on volumes that should be evident if the usage of mobile payment is preferred form Albanian users.

5.4 SST and Mobile payment flow

In this section, I have analyzed the flow of mobile payments and SST payment. Both models are compared giving a visual view for understanding all the steps involved in a payment process for each payment method.

The model used by SST and Mobile payment is shown into the schemas bellow.

Figure 4: Mobile payment flow

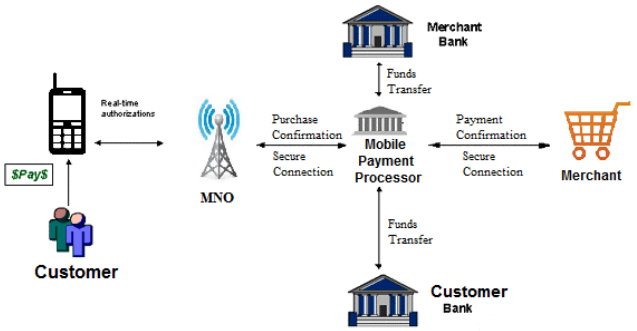


Figure 4: Source, Prepared by paper authors

Figure 5: SST payment flow

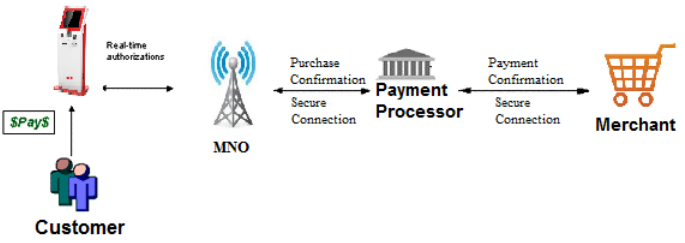


Figure 5: Source, Prepared by paper authors

As we can see both solutions are similar with the difference that mobile payments are performed from any place using

smart devices, meanwhile SST payments should be performed only in fixed places by approaching a payment terminal. Mobile payment are more convenient because any client can initiate a payment from any place inside the country or abroad by using a smart phone. Considering Albanian environment clients seems to prefer the payments through SST. This is not the most convenient payment method for them but they feel more comfortable using cash instead of their bank account.

6. CONCLUSIONS

Governments and central bank must lead cash reduction process. To achieve this goal the government should prepare a national strategy with the scope to facilitate and incentive electronic payments. SST can help to make the process of cash reduction by identifying cash transactions.

From this study most of transactions through SST are betting transactions. These transactions may seem anonymous from the client perception, but for government is very easy to trace and identify the exact user that is betting in terminals. This helps to identify the flow of money for each customer by contributing in the decrease of money laundering.

In Albania, cash is the most preferred payment method for services and goods. Government, central bank, public institutions should play a key role in the process of changing users mentality and their approach toward electronic channels, by supporting and guiding the transition of this large base of customers from cash to electronic channels. In Albania the electronic service providers are already in the market and they are currently struggling to survive, because of the inexistent care and support from the state. By implementing well-planned strategies, incentives, price reduction, loyalty programs and other instruments we can educate and direct our customers to switch from cash payments to SST.

Self-service transactions through SST or mobile devices will reduce transaction and processing costs for single transaction. This specific of self-service operation will help both service providers and their clients to reduce service costs and increase service performance.

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