CONTROL OF CASH PAYMENT SYSTEM BASED ON THE SOFTWARE AS A SERVICE

Mirko Cobović, B.Sc.[1], Andreja Katolik, B.Sc.[2], Ninoslav Novak, Ph.D.[3]
[1]Polytechnic of Slavonski Brod, Republic of Croatia, mirko.cobovic@vusb.hr
[2]Polytechnic of Slavonski Brod, Republic of Croatia, andrea.katolik@vusb.hr
[3]Faculty of Economics in Osijek, Republic of Croatia, nnovak@efos.hr

Abstract

Small and medium enterprises have a growing role and influence on the increase of production, and therefore on greater economic growth. By the Law of fiscalization enterprises which receive cash money for their products and services shall embed systems for fiscalization.

According to Law of fiscalization in circulation of cash, fiscalization represents a set of measures implemented by the tax payers,in order to enable effective monitoring of realized turnover in cash.

Although, the Law provides system components for the implementation of fiscalization such as unique account identifier, elements of accounts, protective code of the issuer, etc., it leaves enough space to upgrade the system to provide services and assistance to small and medium sized enterprises.

Systems that are offered on the market, represent an additional workload on enterprises as an economic as well as technological. The authors explore the possibility of a new model of a system based on Cloud Computing, SaaS model. The model in this manner, hardware and software infrastructure is provided as a service. Accordingly, companies will not have the need for a large initial investment in ICT infrastructure, and later maintenance requirements. Service would be paid by the model pay as you go.

Also, the paper will present a comparative analysis of the system for implementation of fiscalization based on technological and cost components.

JEL Classification: D24, E42

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1. INTRODUCTION

By entering into force the Law of fiscalization, the taxpayers of fiscalization are introduced with additional requirements related to information systems. Taxpayers are forced to adapt existing or in worse case, get a new ICT infrastructure. Acquisition and adaptation of infrastructure carries additional start-up costs in the business.

Guided by the above-mentioned problems, the paper presents a model of conducting fiscalization which helps in taxpayers adaptation, particularly relating to micro, small and medium enterprises.

The goal of the paper is to present the system model which supports fiscalization based on SaaS and points to the savings by using such services.

In this paper, the hypotheses are:

H1 Fiscalization reduces the gray economy

H2 In comparison with countries that have introduced fiscalization Croatian law of fiscalization simplifies the introduction of end-users

H3 System model for fiscalization based on SaaS is more favorable compared to systems that are based on our own infrastructure.

In this paper are used methods of analysis and synthesis, abstraction and generalization and comparative methods.

2. INFORMATION SYSTEMS

The owledge and information are the two basic resources for a successful business. To make informed decisions it is necessary to own various information about the business enterprise and its surroundings. Some of the most significant trends within the change mode in a business organization are working in a group, the possibility to work outside the office, not a hierarchical organization and entrusting, partially, work to the external organizations. The information system represents the set of all resources in providing necessary information needed to make business decisions in order to improve the functioning of the organizational system.

Information technology with fast communication and the possibility of using a distributed database and centralized data warehouse, thus locally distributed tools for decision making supports, also, non-hierarchical work organization, in which, due to rapid changes in the business surroundings, individuals and work groups in

the realization of a task, are to a large extent independent and can quickly adapt to change and respond to new challenges.

"E-business leads to management optimization, reduces the need for paper, reduces transport costs, makes faster and better decision-making opportunities, integrates the supply chain, and thereby, increases the businesses competitiveness in the market." (Ćerić & Varga, 2004, 33)

3. FISCALIZATION

The country's successful economic development is in a great extent based on a well-designed tax model. It is important to emphasize that those are particularly successful tax models that stimulate the economy, while at the same time suppress the grey or black economy. The introduction of the tax laws with this goal for each country is a step forward in its development.

According to the final draft of the Fiscalization Law-October/November 2012., 01.01.2013. begins the implementation of fiscalization.

The Fiscalization is a set of measures which are going to be applied by fiscalization taxpayers in order to achieve effective supervision over records in cash turnover. The introduction of fiscalization means to bring order, by establishing a system of recording the output of each account, and the recording inputs of goods and services that create new values, recording each cost in the entrepreneur business.

The reason for introducing fiscalization is a high level of tax evasion, and low turnover record (only 15% cash turnover). Fiscalization objectives are prevention of tax evasion in the cash operations, improvement in the tax inspection procedures, raising customer awareness of the importance of taking receipts and the unfair competition suppression. The path that Croatia has chosen decentralizes control and it switches to the end user, with certain stimulation if they find undeclared transaction.

3.1. TAX SYSTEM

Until the day 01 January 2013 the only way of checking the taxpayer was field work of tax inspectors by order of superiors and invoices books review. As it is above mentioned, tax inspectors have not been able to find out whether the taxpayer has fully performed his obligations to the state or not. By reviewing accounts and business records irregularities could be observed, but not to the extent that it is allowed

by the fiscalization model. "The Fiscalization model contains four Acts, namely the Law on Value Added Tax Act, the Income Tax Act, Income Tax and Accounting Act. The fiscalization model connects above mentioned laws, recognizes taxpayers, accelerates and helps tax inspectors in the struggle with the grey economy." (Tax Administration, 2013)

3.2. THE PROCESS OF IMPLEMENTING FISCALIZATION

The process of implementing fiscalization is carried out by many European countries, starting with Italy, Poland, the Czech Republic, Slovakia, Hungary, Serbia, etc. All of them had successfully implemented fiscalization. Countries that have not implemented fiscalization are in the process implementation, for example, Germany. Croatia carries out the process of the Law on fiscalization implementation on transparent rules. The existence of the monopoly is disabled from fiscal solutions providers, because each trader is free to choose whatever fiscal solution that best fits their surroundings and needs. In most cases, it is required the usage of fiscal cash or printers that contain fiscal memory which stores items and applicable taxes. Apart from the laws, that precisely specify the fiscal device to be used, fiscal law often determines the level of customer service that the seller is obligated to buy, and is related to the fiscal cash or a printer maintenance. "The legislator, as the next regulation in certain countries prescribes which driver should be used to control and communicate with the fiscal device, and often fiscal law touches on POS application and stipulates which application is allowed and which is not. All provisions of the Fiscal Law are represent technical requirements and include financial expenses during the implementation, apropos constant costs when using the product. "(Tax Administration, 2013)

The changes in business is what affects traders, almost all countries prohibit the negative items on the fiscal account, prohibit products with zero cost, limit possible discounts, abatements and others. When we are talking about the Croatian fiscal law, it is discussed about the law that prescribes only one thing, and that is the application of the fiscal slot at the state server. In fiscal policy direct comparison it may be said that with the business side and the technical side, the Croatian law is the simplest, and yet the most effective and it is shown in Table 1.

Table 1 Fiscalization implementation comparison in the countries bordering with the Republic of Croatian

COUNTRY	FISCALIZATION TYPE	MAINTAINANCE	CHANGES IN MERCHANTS BUSINESS PROCESSES	THE CERTIFICATION PROCESS CUSTOM POS SOLUTIONS
BOSNIA AND HERCEGOVINA	Compulsory usage of fiscal equipment by certain manufacturers	Contractually obligated to maintain the fiscal device	Large-scale	Not necessary
CROATIA	Software exclusively	Not obligatory	Almost non-existent	Not necessary
HUNGARY	Compulsory usage of fiscal equipment by certain manufacturers	Contractually obligated to maintain the fiscal device	Large-scale	Very expensive
SERBIA	Compulsory usage of fiscal equipment by certain manufacturers	Contractually obligated to maintain the fiscal device	Large-scale	Not necessary

Source: Žališevskij, R; 2012, 18

4. UPGRADING POSSIBILITIES OF THE FISCALISATION MODEL

By entering into force the Law of fiscalization, the taxpayers are forced to adapt existing or in worse case, get a new ICT infrastructure. The implementation of the Cloud Computing business changes habits of ICT using. Computing power, storage space for data and applications required for usage are used as a service. With this strategy, ICT is accessible to businesses and customers. Also, Cloud Computing is used in other commercial and scientific sectors such as marketing, organization of conferences, sharing of biomedical materials and others.

4.1. CLOUD COMPUTING

"Cloud Computing is a set of online services designed to provide a variety of computer services. The providing of these services is characterized by features: on-demand self-service, network access, resource virtualization, rapid elasticity and scalability, pay as you go." (Brumec, 2011., 25)

Cloud computing consists of three service models: SaaS (Software as a Service), PaaS (Platform as a Service) and IaaS (Infrastructure as a Service). Services are accessible through standard interfaces such as Internet browsers, SOA (Service-Oriented Architecture) or REST (Representational State Transfer Services).

For the fiscalization implementation, acceptable model is SaaS. Software as a Service, which is sometimes referred to as the Application as a Service (AaaS), and in that version offers multiple user interface and ready-made software. Applications can be offered to one or more users simultaneously.

According to the approach the Cloud Computing is categorized on: Public Clouds, Private Clouds, Hybrid Clouds and Academic Clouds.

For the fiscalization purposes Public Cloud is suitable, where it is possible to install the necessary applications for the proper execution of their obligations.

5. FISCALIZATION MODEL BASED ON SAAS

Fiscalization model relying on SaaS is designed as an application that is applicable to any device that has a permanent connection to the Internet. Fiscalization taxpayer is obliged to provide a computer, tablet or thin client to input and view data, a device for printing it on paper and a permanent connection to the Internet. The number of sets depends on the company size, number of branches and number of workers.

The software to manage business data and the process of signing and generation data are maintained in the system of Cloud Computing. Fiscalization taxpayer selects those modules as needed and by enterprise functions and pays them by usage.

Fiscalization taxpayer by the above mentioned does not have a large initial investment for the purchase of a server, upgrade of the client's computers, the complex network infrastructure and adequate software. There is also no maintenance costs and investments in infrastructure renewal.

Fiscalization taxpayer, in this case, is properly required to fill out the application, sign it and send it to be approved on signing and verification by the tax administration, and after approval to print out the receipt.

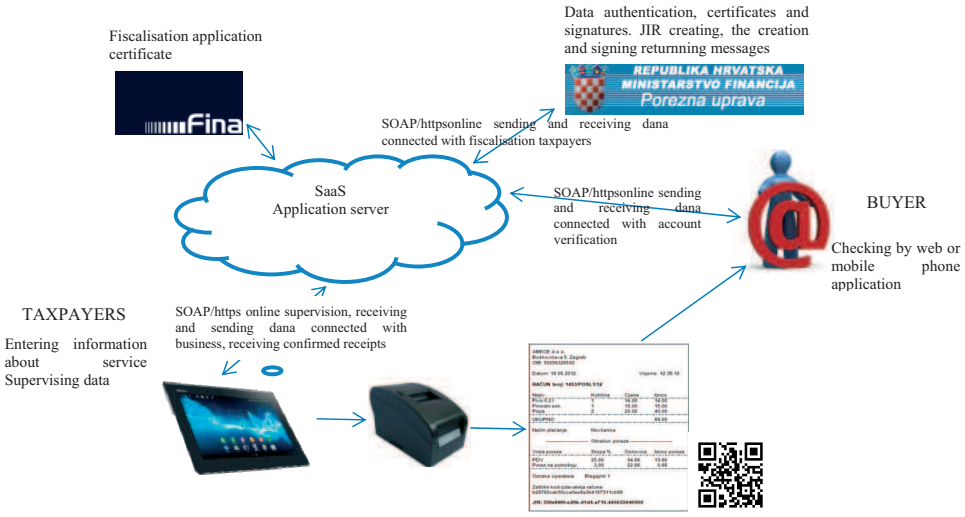
Given that the data is already entered on the remote servers, the Tax Authority, with the certain approvals of fiscal payers and certain fiscal adjustment of legislation

would have access to the transaction. Using agents to search for Tax Administration could sort, filter, and compare data fiscalization of taxpayers, assigning the appropriate JIR and return it signed to taxpayer to allow issuance. The access to survey data, is also possible to use any input-output device that has a permanent connection to the Internet, while to check it by the Tax Authority, a major computer server performance is needed.

The buyer can validate account by using a web or application on a mobile device using JIR. The JIR would be shown in the form of a numeric display and by the QR code to reduce verification time, and the error possibility.

The system is shown in Figure 1

Figure 1 Fiscalisation model relying on SaaS



Source: Made by authors (based on our own research)

Level of rights, security and data confidentiality in the Cloud Computing is defined by SLA (service-level agreements) contracts. The access to applications is possible only through a registered device (MAC address or IMEI) and correspondingly fiscalization taxpayers username and password or the tax administration employees. Protocols that are used to exchange data are SSL, SOAP/HTTPS.

5.1. COST COMPARISON MODEL

Most computers in general, private or business, have a total utilization of between 5% and 20%, but the applications running on these systems sometimes require the maximum that the computer can achieve. In the procurement of hardware, one has to take into account precisely these maximums that applications require. Then, administrators are faced with a situation in which that purchased hardware, in most of the time is not fully used, but it is necessary to obtain it due to working conditions.

The optimal procurement according to the above can be defined as the engagement of computing resources necessary to be paid for its use, without a major capital investment in its own, not enough used resources. Furthermore, in this paper, it will be shown the calculation costs for three different models. For research purposes, authors collected the data from the small and medium enterprises. According to the dana, authors selected a system from one computer server, computer network and personal computer. The prices from computer network and computer users will not be considered because of the assumption that all systems need the same number of computers with the same characteristics. All prices are without VAT and are prone to change.

The average price per server is 8.000,00. The computer servers characteristics are one four core CPU, disk space of 500 GB and 4 GB of RAM, with an additional UPS power safety. The average electricity price is 0,65 kn/kWh, and the actual consumption (the server and cooling) is 0,6 kWh. The costs of buying and preparing servers are calculated based on 20 hours of administrator work, administrator hourly cost by average is 250,00 kn. The system operating costs amounts to 6.500,00 kn.

The applications required for business information systems and systems fiscalization that would include commodity-material accounting, warehouse management, wholesale and retail trade, and a one year warranty and maintenance by the three offerings is by average 10.500,00 kn. The maintenance after one year is paid by flat, on average, 200,00 kn/monthly. The bidders offer application, also, through monthly rent in the amount of 500,00 kn/monthly. With the application, it is needed to obtain additional licensed databases that by average value amounted to 4.000,00 kn for a pack of 4 licenses.

The Cloud Computing infrastructure costs are elastic, which is a great advantage to the business. The service is not required to be paid at the time when it not in use.

The applications required for business information systems and systems fiscalization would consist of commodity-material accounting, warehousing, wholesale and retail. According to the analysis of parts in the existing system that relies on SaaS, it is amounted to 300,00 kn/monthly for the workplace. Given that in the first case and in the second one 4 licenses were selected, in this case will be selected 4 jobs to be worked on in two shifts.

In order to get the total cost it is required to examine 10 categories of infrastructure costs. Categories of costs are: Cost Of Hardware For Intended Useful Life Of 4 Years; Cost Of Electricity For Operation And Cooling; Cost Of Purchasing And Preparing Servers; The Costs Of Administering The Server; Cost Of The OS. Excluded Costs; Cost Of Application; Cost Of Renting Applications; Applications Maintenance; System Renting.

Based on the data, Table 2 is created, where costs are summarized by category in the period of 4 years.

Table 2 Costs of ICT infrastructure in the period of 4 years were analyzed in 10 categories in kuna

Costs Categories	ICT Infrastructure	ICT Infrastructure With Rented App	Saas
Written Off Server Costs	8.000,00	8.000,00	0,00
Electric Energy Costs	13.665,60	13.665,60	0,00
Cost Of Buying And Preparing Servers	5.000,00	5.000,00	0,00
OS Costs	6.500,00	6.500,00	0,00
Excluded Costs	14.400,00	14.400,00	0,00
Application Costs	14.050,00	4.000,00	0,00
Application Renting Costs	0,00	24.000.00	0,00
Application Maintenance	9.600,00	0,00	0,00
System Renting	0,00	0,00	56.000,00
Total Costs	71.215,60	88.953.60	56.000,00

Source: Made by authors (based on our own research)

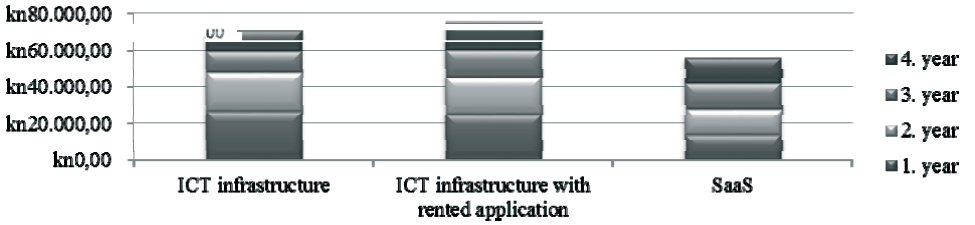
In Table 3 and Figure 1 are shown comparative costs through four years of using the system.

Table 3 The comparison of total costs over 4 years in kuna

Total Cost	1. year	2. year	3. year	4. year	Total Cost
ICT infrastructure	26.691,40	21.691,40	11.416,40	11.416,40	71.215,60
ICT infrastructure with rented app.	25.266,40	20.266,40	15.016,40	15.016,40	75.565,60
SaaS	14.000,00	14.000,00	14.000,00	14.000,00	56.000,00

Source: Made by authors (based on our own research)

Graph 1 The comparison of total costs over 4 years



Source: Made by authors (based on our own research)

According to the data provided in Tables 2 and 3 and Figure 1 it can be concluded that the use of SaaS in the first four years would reduce operating costs for at least 15,000.00 kn and achieve savings of 21,3%. Also, one can see that the biggest savings is made through the first two years, while in the other two years the savings is made by using their own ICT infrastructure. Therefore it could be concluded that the further use of SaaS will not generate more savings. However, one must take into account that the ICT infrastructure after four years is technologically outdated and needs to be renewed, which would require new investment of the users themselves.

6. CONCLUSION

In this paper is presented a system model to support fiscalization completaly adapted with the needs of taxpayers. The characteristics of the existing system are given and deployment capabilities of existing systems. The hypothesis H1 which is stating that the implementation of fiscalization process generally reduces the gray economy, is proven. Also, in comparison with other countries that have introduced fiscalization, Croatia is introduced with a simplified system that reduces the problems around implementation of fiscalization and thus proves the hypothesis H2.

Furthermore, the paper presents a model for the implementation of fiscalization based on SaaS with basic characteristics. On the basis of characteristics a comparative analysis is made with other existing models. The analysis shows that the model based on SaaS reduces the cost to end users and thus proves the hypothesis H3.

It can be concluded that the use of SaaS reduces the cost of micro, small and medium-sized enterprises in fiscalization implementation, but also in other processes that require the data processing by using ICT.

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