Jelena Jardas Antonić, Assistant professor
Faculty of Economics Rijeka
Ivana Filipovića 4, 51000 Rijeka
Phone: 051 355-140   Fax:
E-mail address: jjardas@gmail.com

Danijel Antonić
City of Rijeka
Korzo 16, 51000 Rijeka
Phone: 051 209-364   Fax:
E-mail address:danijel.antonic@rijeka.hr

PROMOTING EFFICIENCY AND TRANSPARENCY OF PUBLIC ADMINISTRATION BY IMPLEMENTING CLOUD COMPUTING

PROMICANJE EFIKASNOSTI I TRANSPARENTNOSTI TIJELA JAVNE UPRAVE IMPLEMENTACIJOM „RAČUNARSTVA U OBLAKU"

ABSTRACT

One of the prerequisites of economic growth in the Republic of Croatia is the development of an e-government based on openness, transparency, efficiency and effectiveness. New trends in ICT technology create new economic opportunities which on one hand support the economic sector by generating added value and on the other, contribute to the rationalization of public administration activities. The use of innovative solutions leads to a decrease in the need for traditional advertising channels which are more expensive and less effective.

This paper presents a way of using new ICT technologies in such a manner that the existing Public Sector Information is republished at public places by Cloud Computing Solutions making the information more accessible to a wider range of citizens. The paper presents and describes an example of good practice i.e. it presents the advantages of cloud solutions achieved through the Speeding Every European Digital (SEED) EU project in which the City of Rijeka took part as one of the partners. The paper focuses on the advantages of using Cloud Computing for interactive Public Sector Advertising of services provided by public authorities. Its affordability contributes to long-term sustainability of the system, establishment new e-Service for informing the public about services provided by public authorities, educational and scientific institutions thus having a stronger end user impact and raising public awareness of the existence of e-Government and content and open data services. This all contributes to an increase in the level of transparency, openness and mutual benefit, thus providing the information that will give its users the possibility for creating new economic opportunities.

Keywords: *cloud computing, e-Government, digital economy, digital advertising, public administration, transparency.*

SAŽETAK

Jedan od preduvjeta za ekonomski rast u RH je razvoj e-uprave koja se temelji na otvorenosti, transparentnosti, efikasnosti i učinkovitosti. Novi trendovi u ICT tehnologiji omogućuju stvaranje novih ekonomskih prilika koje postaju podrška gospodarskom sektoru s jedne strane i racionalizaciji poslovanja javne uprave s druge strane budući da se korištenjem inovativnih rješenja omogućuje smanjivanje potreba za tradicionalnim kanalima oglašavanja koji su skuplji i manje učinkoviti.

U ovom radu se prikazuje mogućnost korištenja novih ICT tehnologija za publiciranje postojećih informacija tijela javne uprave na javnim mjestima uporabom rješenja „računarstva u oblaku" (Cloud rješenja) kako bi informacije postale dostupnije širem spektru građanstva. Kao primjer dobre prakse u radu su prikazane prednosti Cloud rješenja kroz EU projekt Speeding Every European Digital (SEED) čiji je partner grad Rijeka. Cilj je ovog rada prikazati prednosti korištenja jednog takvog tehnološkog rješenja za informiranje javnosti o uslugama tijela javne vlasti, zasnovanog na „računarstvu u oblaku", koje financijskom pristupačnošću doprinosi dugoročnoj održivosti sustava, uspostavlja novi elektronički servis informiranja javnosti o uslugama tijela javne vlasti, obrazovnih i znanstvenih institucija, čime pridonosi jačem utjecaju na građane i ostale korisnike javnih usluga.

U radu su također navedene mogućnosti korištenja prikazanog sustava u svrhu podizanja svijesti građana o postojanju e- Uprave i servisa koji im nude sadržaj i otvorenu vrstu podataka te time podižu razinu transparentnosti, otvorenosti i obostrane korisnosti, čime se otvara mogućnost za stvaranje novih ekonomskih prilika.

Ključne riječi: *računarstvo u oblaku, e-U prava, otvoreni podaci, digitalno oglašavanje, javna uprava, transparentnost*

1. Introduction

Continuous and rapid development of Internet technology, the growth in its users and the requirements set by legal entities and citizens in terms of public administration have led to the development of an electronic government. In order to achieve the above requirements it is necessary to conduct an organizational restructuring of the government, define the legal framework, ensure adequate ICT infrastructure, and educate users (Šegota; Jardas Antonić;Rakamarić Šegić, 2012).

Digitalization has entered all spheres of life, from business to the private. It has changed the way in which people interact, their life environment and habits, and imposing a question on the impact of these changes on surrounding institutions and their business activities (Jardas Antonić, Šegota, 2012, 35).

Objectives in the implementation of ICT in public administration bodies have never been more demanding than nowadays. In times of crisis it is necessary to optimize and rationalize the business of public administration with the help of ICT technologies i.e. to reduce costs and increase the efficiency and availability of administrative body services to citizens and the business sector.

In accordance with the Malmo's strategic guidelines for the development of digital administration in the EU (Andersen, Francesconi, Grönlund, Engers, 2011, 332), it is necessary to create new digital public administration services which will be tailored according to the needs of citizens and the business sector by placing the user at the center. The aim of these services is to simplify communication with the public administration bodies by making

it faster, easier and more accessible to all citizens regardless of age, social or other exclusion and, at the same time, extremely safe.

Nowadays many authors speak about the world as an Information Society centered around the production, storage, retrieval, and utilization of information in which the *network society* transforms politics, economic, culture but also family and individuals (Castells, 2000, 13). The SEED project is a part of this Information Society-centered system implemented in public administration.

2. Virtual Economy and Cloud Computing

As a new EU member, Croatia is faced with the challenge to make all the information about its services and public institutions available to all EU citizens. From the foregoing, there is an evident necessity to create new innovative solutions tailored according to the needs of citizens. They should be able to access the desired information by using different technology platforms such as smart phones, tablet computers and other. These modern technological solutions should be implemented on technologies such as Cloud Computing, which will reduce operating costs and at the same time provide flexibility, interoperability, dynamic and emergent security solutions. Cloud Solution analyzed in this paper contributes to all aspects mentioned above (Figure 1).

Studies have shown that in UK and the U.S. the implementation of Cloud Computing in public administration resulted in savings of 20% in the private sector on a sample of 1,300 companies and 83% of them generated savings with the implementation of ICT solutions (Nicholson B., 2013).

Figure 1 SEED Contribution to the strength of the Virtuous Circle of Digital Economy

Source: A Digital Agenda for Europe, Brussels, 2010.

Cloud Computing is based on the business model of renting computing services such as computers, applications and services primarily through Internet access (Leavitt, 2009, 15). The user can enjoy the maximum benefits of mobility and interoperability due to the fact that the desired cloud service is available via a web browser on any of their mobile devices from any location. One of the elements of cost reduction through Cloud Computing is that the price of the service depends on how much it is used, which allows dynamic scaling of resources with respect to users' needs by minimizing the possibility of over-dimensioning the investment in IT resources and yet providing all the required security in the case of a rapid growth in the need for additional resources.

The main advantages of Cloud Computing versus the classical model of providing IT services are: dynamism and flexibility of services, broad network access, joining and scalability of resources, metered service and service on request.

There are the three basic models of service delivery in the cloud based concept "everything as a service"(Erl, Puttini, 2013, 63):

- Infrastructure as a Service (IaaS)
- Platform as a Service (PaaS);
- Software as a Service (SaaS)

Each model varies according to the type of services it provides. The IaaS model provides the ICT infrastructure as a service, the PaaS model provides the ICT environment and finally there is the SaaS model which provides the complete application solution as a service. All these models free the user (the public body providing e-Government service) from wasting highly educated ICT human resources for maintenance of such solutions in addition to all the benefits of the models "pay as you use". The advantage of this service is that the user pays only for the mere usage of the service and may at any time terminate that use, without additional cost, since it is exempt from any licensing. However, a problem which may arise in using SaaS solutions is of legal and regulatory nature, especially in the area of cloud solutions for public bodies. Namely, in some countries such as the Republic of Croatia, there are laws that prohibits the storage of data beyond national borders. The Cloud solution analyzed in this study is based on the SaaS model and it is developed to comply with the legal framework of the Republic of Croatia.

3. The SEED solution

In accordance with the previously discussed, the applicative solution for Interactive Public Sector Advertising will be presented and implemented on Cloud technology via the SaaS model developed within the SEED Project. The SEED project is funded by the European Commission through the Programme Competitiveness and Innovation Programme (CIP) (CIP, Project SEED, 2011). The SEED project is realized by 13 partners from 7 EU countries. The aim of project was to, through an applicative solution based on cloud computing, cut the current costs of public institution advertising and at the same time increase the level of citizens' knowledge about the e-Government services and public sector information (PSI) already published on an existing Internet portal (Figure 1). Statistics show that less than 41 % of EU citizens are aware of the existence of PSI already posted on the Internet. The European Commission estimates that there is a potential market worth € 30 billion in the re-use of public sector information (Kroes, 2010)

This paper gives an overview of the structure of the technical solution that was developed as a part of the project and presents its implementation in the City of Rijeka.

Figure 2 SEED project aims

Public Sector Information belongs to a special category of Open Data owned by a public authority. Open Data arose from the idea that there are certain categories of data which can be accessed and re-used. In addition to the economic benefits arising from PSI, another great benefit is a more efficient and transparent public sector which, through new e-Government services to citizens and businesses enables end-users to create additional value based on the provided information. Apart from creating additional value, one of the goals of e-government is to create a service that will be available to everyone regardless their social, economic or other exclusion. Consequently, the development of e -Services must also follow the EU guidelines on e-Inclusion.

4. SEED project – the Case of Rijeka

The City of Rijeka, in accordance with previously stated, has implemented the applicative solution of the SEED project for Interactive Public Sector Advertising with maximum use of publicly available data found on various portals. This has increased availability, openness, transparency and inclusiveness of citizens in informing and interaction.

One Point Stop Spots for dispensing information to citizens have been implemented at 12 most frequent locations in the City of Rijeka such as hospitals, sports facilities owned by the City and waiting rooms at public administration premises.

Depending on the location, digital displays for providing information to citizens, with or without the possibility of interaction, have been implemented. Due to the fact that the applicative solution was implemented on the SaaS model in the cloud, all that was needed for its use was an Internet connection and a web browser. (Figure 3).

Figure 3 Diagram of the SEED solution
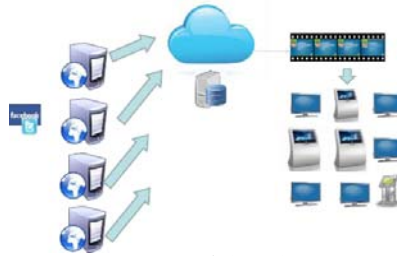
Source: made by author

The applicative solution is conceived to maximize the use of already available stock of information published on the Internet, to mold the said information and to publish it in form of news feeds, video clips and interactive materials on a specific web address. Every location with a digital display installed has the ability to display a web address that contains information tailored for that specific location. Because of this, it is possible to adjust the content being broadcast according to the location or the exact time of broadcasting.

Given that one of the goals of the application is to maximize the use of information already available on the Internet, a whole range of applicative components have been developed to connect the SEED solutions with as many applications on the Internet as possible. In this way, the need to further engage the employees of the City of Rijeka in creating new information tailored to the citizens has been reduced.

Figure 4 shows all the components of the SEED cloud solution that can be connected to existing applications on the Internet and the mode of conversing information for it to be broadcast on the digital display

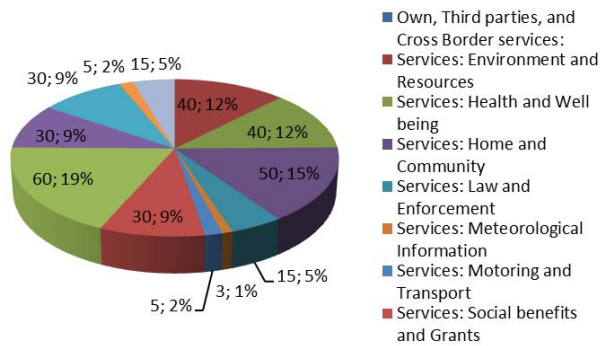Figure 4 Modules of the SEED solution for connecting with other applications on the Internet
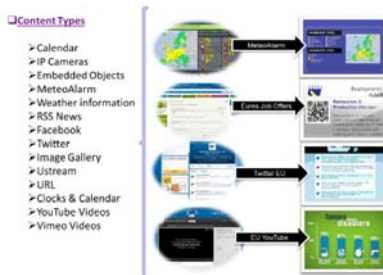
Source: Project SEED, DOW, 2011

During the development of the said solution, one of the priorities was the scalability in designing the hierarchical structure in view of which news can or cannot be published. During this process, the functionality of the editorial system for publishing and approving the news was implemented. This type of functionality proved to be very useful during the implementation of the solution in the City of Rijeka, because the number of institutions broadcasting their information has increased since the initial implementation of the solution. The publishing of information on the info channel was delegated to the public officials in charge of public relations of individual institutions and therefore reduced the need for additional hiring of human resources in this regard. The information reaching the citizens

through these channels is timely, the costs of publication minimal and at the same time, the city government is becoming more efficient, more open and transparent to its citizens.

The diversity of news categories in dissemination of information is tailored in accordance with the location of information points, and is shown by category and percentages below (Figure 5).

Figure 5 Categories of published information in percentages

A big advantage of a Cloud solution implemented in this way, is the exchange of already published information with other SEED system users, resulting in the possibility of targeted exchange of information between institutions throughout the European Union. For example, the City of Rijeka has enabled the members of the University of Rijeka to publish and share news in the field of higher education, student exchange and scientific cooperation with other academic institutions across Europe that also use the SEED system. This has increased the socio-economic conditions of students, teaching and scientific staff.

One of the intentions of the City of Rijeka in implementing info channels was to bring a large number of its digital services closer to its senior citizens and other digitally excluded groups in accordance with the principles of e-inclusion. The surveys, which have been conducted through all this time in order to ensure the quality of services, have found that the reactions of senior citizens were extremely positive. However, the same surveys identified that a large number of citizens belonging to younger age groups are uninformed about the availability of digital services provided by of the city authorities, municipal, cultural and other institutions.

A very small number of citizens participated or even knew about the consultative services of the city government, through which they themselves can have a say in city government decisions relating to urban planning or the granting of concessions for the city beach.

The survey also found that 11% of the population knows about or uses the City's e-Services, 23% know about, but do not use them, 47% of the population do not know anything about the e-services of the City and municipal companies and 19% do not want to use them (Figure 6). After the first year in the implementation of the SEED solution, a survey found that the percentage of citizens informed about the City's e-Services has increased by about 10%, while the system tracks doubling of usage of several e-Services provided by the City.

Figure 6 Usage of the City's e-Services
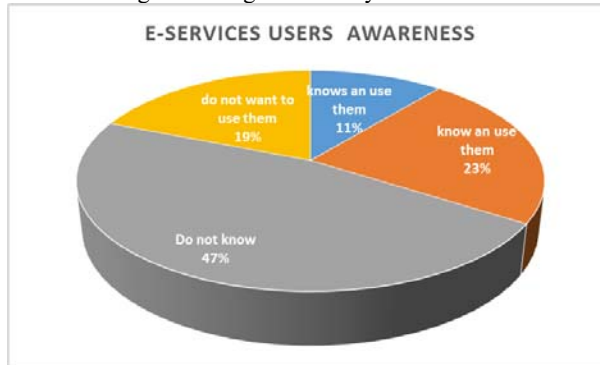
Source: made by authors

Encouragement of multi-ethnicity and multiculturalism through the info channel is extremely well received by the minorities, which is a small but valuable step in building the confidence of minorities toward public administration bodies.

5. Conclusion

The implementation of interactive information hubs through visually attractive and intuitive interfaces enabled citizens not prone to digital technology to participate in decision-making via e-consultative services. This is just one of the paths through which properly implemented digital technology is put into use for the benefit of the citizens, encouraging democracy, openness and transparency.

The reduced cost and efficiency of a public advertising channel implemented in this way, greatly exceeds the conventional method of public advertising through brochures, flyers or the media. The social benefit of this project which enables non-profit organizations, cultural institutions, charities, health organizations and others to advertise in times of financial crisis, represents an added value to all the previously listed benefits. However, it is also necessary to point out that there are a number of public institutions websites containing information which is not updated and is therefore useless for a public announcement system like this one i.e. there is no possibility for creating added value to the citizens.

Advanced technology, no matter how innovative and effective, will not solve the problem of efficiency and effectiveness of public officials without a radical change in the perception of their role in the society. Information should be available to citizens at all times, and not just on request. Only in this case will the use of new technologies give additional value to existing information, put the citizens at the center of interaction and foster their confidence in the bodies and services of the public administration.

Experience shows that the e-Services of public administration, implemented on the most advanced technologies, must have the support of local officials and citizens, because, if they are not used, they only represent a cost, regardless of how well designed they are.

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