

# How to Efficiently Reach New Public Administration With the use of New Technological Solutions

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## Abstract

Now, the public administration gives even more of its services not only in the electronic but also in the mobile form. Instead of the electronic administration, it is even more talked about about the mobile and intelligent administration, about its unique concept *e-m-i- Administration*. In this paper, we deal with the new technological solutions based on knowledge bases and semantic web which can provide a part of the necessary knowledge to everyone who have the need or want to introduce electronic and mobile business in the public administration. We observe the part of the necessary knowledge which is necessary for efficient introduction of the electronic and mobile services. For updating a part of the knowledge in the knowledge base we use Protégé editor, open-source platform. Here, we suggest a new concept of efficient reaching the knowledge for a more quick and simple implementation of a more efficient services in the public administration.

**Keywords:** *public administration, e-m-i-Administration, knowledge bases, efficient service*

## 1. Introduction

In most of the developing countries, there is a great desire to have a functional, cheap and efficient public administration. Many studies, law proposals and projects have been done, in order to reach radical changes in the present manner of work of the public administration. Significant progress is made, but it is still not enough and it still does not satisfy user's needs, regarding quality, speed and price of the service. Due to the specificity which they have, the amount of work and the number of visitors in the public administration is constantly increasing. It must be adapted to the users' needs and it should enable to the service user that business with the administration is performed faster, cheaper and more simple with the use of new technologies from home or from work. It must be created conditions for a quicker response on the users' demands.

Now, the trend of services is oriented towards the user, self-service and service offering<sup>1</sup>.

In order to be able to talk completely about the service oriented towards the user, it is essential to provide beside the service in electronic form via computer also the service via mobile devices. It is essential to provide electronic and mobile service (e-m-Service).

Citizens, in most cases, see the public administration services as very slow and time-consuming, inconvenient, burdensome and complex. Users appreciate the service that are: quick, simple, efficient, tailor-made, safe and reliable. It is expected of the public administration to behave as a successful business organization. It is true that the public administration does not have to fight for its service users and that it simply does not have competition and its position, fundamentally, is different from the market systems. Can new technologies also lead to the competition in the public administration. Certainly that it can lead, because the users will ask for a more efficient service of those that can provide them.

## 2. Knowledge bases and semantic web<sup>2</sup>

The concept of the semantic Web was introduced by Tim Berners Lee (2001) as a clear structure to the content of the Web page.

<sup>1</sup> Radivojević, M., Filipović, Z., Kremenović, O., Od elektronskog poslovanja do poslovne inteligencije u javnoj upravi. JU Službeni glasnik Republike Srpske, Banja Luka, 2012. Knjiga - strana 584, ISBN 978-99938-22-28-8, COBISS.BH-ID 2411288.

<sup>2</sup> Kuleto, V., Subotić, N., Radivojević, M., The new approach in observing electronic-digital money based on knowledgebases and semantic web, International Journal of Research in Management, Engineering, IT and Social Sciences, Volume 5 Issue 11, str. 21 - 40, ISSN 2250-0588, november, 2015.

It has emerged in the quest for more efficient solutions for finding information and also as new extension of the World Wide Web and it enables better cooperation between the users and the computer (Walton, Christopher D. 2007).

It is based on the idea that the information on the web becomes more machine readable. Instead of documents connected with hyperlinks it should use interconnected data (information) that have a specified structure and meaning.

It will allow computers to find, understand and use the data ( information ) via the web in order to achieve certain goals. It covers a lot of different areas and there must be a few people that have completely the same idea on the semantic web. According to the Passin (2004), it can be identified topics which are most frequently used in connection with it (Thomas., B., 2007):

- Indexing and access to information – for the purpose of finding information, the access of the semantic web should go further from the indexing of the keywords and alphabetic indexing.
- Metadata – used during the search and finding the information
- Annotation – adding information on the existing document available on the web without the modification of the original document.
- Machine collecting of data – software itself determines which data are needed and how to get them and then it takes them itself.
- Discovering the service – services must be found, discover what they do and how to invite them.
- Intelligent software agents – someone or something that acts in the user's name.

In order that the idea of the semantic web functions, the computers would have to have access to the collections of information. It has to provide the rules for reasoning about the data and to allow the presentation of data, information and knowledge.

In this paper we use Protégé editor, an open source platform for updating part of the necessary knowledge which allows users to: read and store knowledge and update and visualize classes. It allows the display of meanings of terms and relationships among those terms. It provides a rich set of modeling structures and activities that support the creation, visualization and manipulation of knowledge that are represented in different formats.

### 3. e-Administration

e-Administration can be observed from “On-line Access to the Services“ to “The Tools for Building and Reconstruction of the Democracy“. The view on the e-administration first of all depends on the interest of the one person that describes it. For a businessman, it is a quick electronic registration of the company, arranged, electronically managed cadastre or On-line public procurements. For a citizen, it is the most interesting the verification and the payment of taxes oOn-line, free of theft electoral system, school enrollment results and faculty enrollment results on the Internet, notification of the spraying of mosquitos or about the public works in the neighborhood. Primarily, a journalist is interested for a unlimited, fast and free access to the the public information. For human rights fighters, it is important the supervision system of the Government work, etc.

e-Administration includes the application of the tools and techniques of e-Business on the work of the public administration, in order to improve the service quality and reduce costs for the citizens and business organizations<sup>1</sup>.

The task of the public administration is not just simple collecting and processing the data but also the creation and the distribution of the necessary information and knowledge elements. E-Administration should enable:

- Disposable and accurate collecting of all relevant information at the cite of its creation;
- Adequate safekeeping of all collected information to the moment of its use;
- Corresponding circulation of information which enables that the real information is found in the right time at the right place.
- Promptly processing of information and promptly reporting;
- Making optimal decisions based on accurate data;
- Using data according to the in advance determined procedures and the rights of the access.

We shall present the basic knowledge on the thing that e-Administration should enable, with the use of Protégé editor (Figure 1).

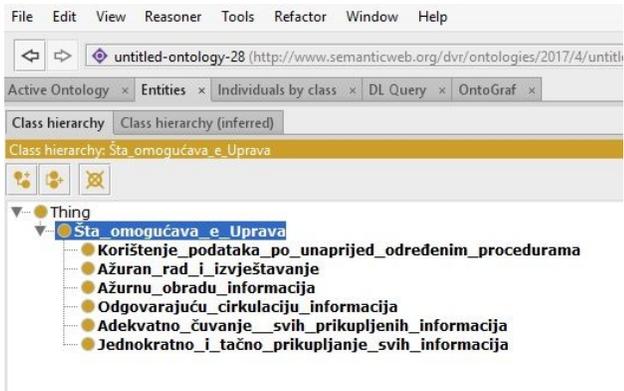


Fig. 1 What e-Administration enables

e-Administration will be able to fulfill those tasks only when it is conceptualized and realized as a unique system, which should be:

- Rational, functional and harmonized with the environment,
- developed on the real access (by stages, modular),
- use state-of-the-art technologies,
- enable integration of information and expert systems and knowledge bases.
- Enable the adapting of the computer technology to the work conditions.

In Figure 2 (e-Administration as a unique system) are represented tasks which the a-administration shall be able to fulfill if it is realized as a unique system.

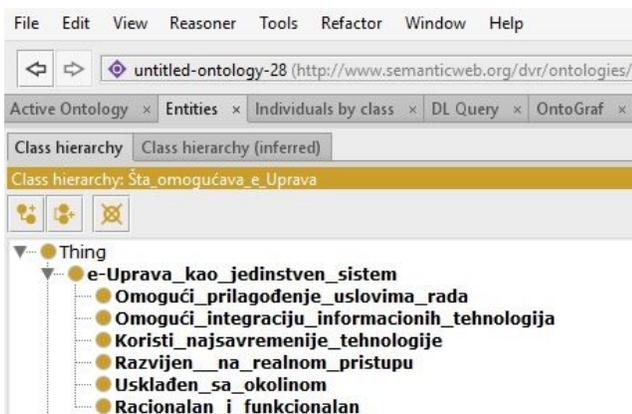


Fig. 2 e-Administration as a unique system

The development of the e-Administration does not mean only the introducing and using new technologies but also the reshaping the existing processes within the public administration.

#### 4. Mobile business in the public administration

Mobile business represents a new manner of approach and using services for business and serving. In the present day, the business completely becomes movable (mobile), integrated and turned toward the individual. Fast spreading and use of the wireless infrastructure has brought to the possibility of personalization in serving and public administration.

It is essential the monitoring and studying of the transformation of the human necessities and desires under the influence of the wireless technology, which conquers all spheres of life and work. People have necessities for a different type of requests and information when they use the service via mobile devices.

Fast spreading and the use of wireless infrastructure has led to a greater use of wireless applications. The following trends pave the way to m-Business:

- Greater number of applications and faster approach. New products appear (I-mode telephones) which enable the users simultaneously telephoning and searching the Internet.
- Integrated devices. New devices (hand computers) offer textual communication, receiving messages, e-mail, organization of personal data and obligations, Web browsers and similar, everything in one integrated device and everything in one place.
- Wireless networks. It enables different devices mutual communication and sending messages, what makes the work with the computers in motion completely real.
- Insuring the quality of the service. There are increasingly more demands for quality and reliability of the service. That is one new but resulting trend.
- Integrated services. Unique networks which will transfer by the same line the voice and the data and will demand also the series of new services based on mobile devices.
- Demands for mobile company. The users demand the same productivity and communication possibilities when they are on a trip, holiday or in their office. The reduction of the price and the size of mobile devices and the increase of the memory, reliability and functionality of these devices encourage the trend of their increasingly greater application.
- The need for mobile approach Internet access. Great importance of the Internet has led to the fact that the user wants the access “ everywhere and in any time“. Business people want the mobile access to the necessary data and information in order to make quality decisions on the basis of the reliable data and information.

Public administration has to listen, watch and act fast, in order to be observed the following trend of possibilities in the motion towards the mobile business. Monitoring and fulfilling the requests for the interactive services via mobile devices shall be one of the key tasks of the public administration. In the world of e-m-Business and e-m-Serving the innovation means to except the new trend and to use first its possibilities, use knowledge and technologies for creating new values. Trends should have the following characteristics:

1. Comfort. It effects on self-service of the users and the simplicity of use.
2. Efficiency. It effects the relationship between the public administration, its users and environment.
3. Effectiveness. New trends effect the internal structure and operational activities of the public administration.
4. Integration. New trends effect the consolidation of the business and services in the sense of realization of all needs in one place.

We shall represent the basic knowledge on trends that pave the way to m-Administration, with the use of Protégé editor (Figure 3).

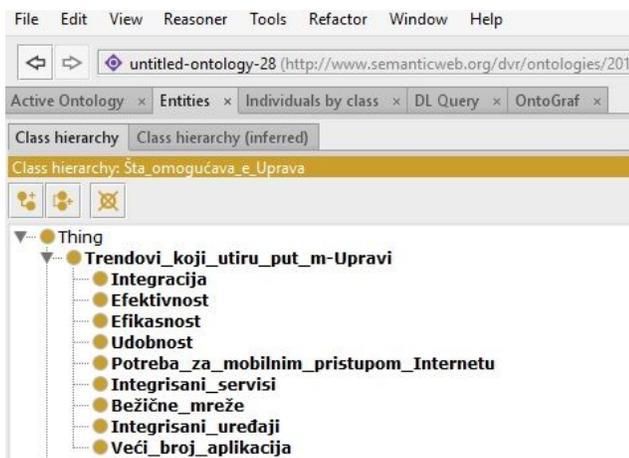


Fig. 3 Trends that pave the way to m-Administration

The trend in the work of the public administration includes the domination of the information, constantly changing user's demands, as well as the integration of the overall service processes.

## 5. How to reach new solutions?

Without the good conceptualized plan and the development programme, it can not be reached e-m-

Administration. The complete development strategy of the one complex and complicated project must be conducted in stages and in phases. e-m- Administration entails the use of information and the application of information-communication technologies to improve: efficiency, productivity, transparency and responsibility.

In all countries it has been done or it is done on the introduction of e-Administration. The time is now to make advance, due to the fact that the new technologies, bases and Data Warehouses are in that extent developed that it must be approached fundamentally different to the improvement of serving the users.

The ones, who did not completely implemented electronic business in the public administration, should simultaneously work also on the mobile and intelligent work and serving. That is exactly what we consider in this paper. The existence of the automated information systems is the prerequisite for the introduction of e-m-i-Administration.

Variety of services, which the citizens provide the institutions of the public administration, are likely to result also in the need for the development of the whole series of different new applications.

## 6. The aim of establishing new solutions

The aim of establishing new solutions is to enable the organizational procedures, with the use of contemporary information resources and the latest technologies, the efficient system of collecting, processing and use of data by the each participant (state, canton, city, municipality). It must be ensured the same level of efficiency in the mutual coordinating of all participants, in order to be achieved the following aims, at least:

- Work improvement of all public administrations
- The improvement of the technical and technological basis,
- Ensuring the quality performance of the tasks and businesses,
- Promptly and quality performance of the law defined obligations,
- The increase of the level of information of all participants and especially the executor.

The introduction of e-m- Administration should not be limited on the fact that it is automatized the existing state and the existing manner of conducting business processes. It must be offered a new solution based on the actual needs

whose fulfillment will ensure the contemporary technological achievements.  
In Figure 4 (The aim of establishing new solutions) is represented basic knowledge on the aims which can be achieved by the implementation of the new solutions.

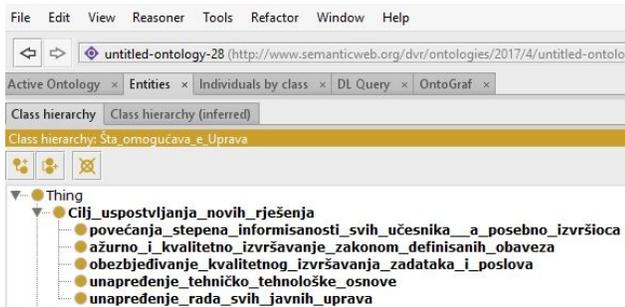


Fig. 4 The aim of establishing new solutions

## 7. Prerequisite for successful start

For the successful start of the development of e-m-Administration and the implementation of business intelligence is required:

- To train all participants that will in any way participate and work on those businesses
- To get acquainted with the future businesses and
- To explain them the perspectives of the future development.

Primarily, it should be done the Policy and Strategy of the development of e-m-i-Administration and suggest the corresponding number of projects and conceptual solutions.

Identifying the priorities:

- It is impossible to work everything at once,
- It is necessary to define priority businesses and priority actions,
- Due to the fact that the initial investments in the technical infrastructure are great, it is necessary to identify the most significant services in order to be done by priority and put on disposal to the users.
- Define the priorities including also the valuing the aims which promise the most.
- Clearly defined priorities enable them the awarding the resources and optimizing the full organizational possibilities.

- To single out the most important services which is possible to realize on the Web.

Work in the way, that first, the services are developed which will enable citizens to be satisfied and that the ratio of the time development and the price is acceptable. Efficiently setting the priorities contributes to: faster development, satisfaction of the service users and the employees, greater effects and more transparent work.

Already in the outset it must be known how to measure a success, how to follow progress in the development and which processes are critical and how to solve them.

To do a feasibility assessment:

- Whether the service users of the public administration have demanded exactly that service,
- Whether the foreseen sections (sectors) are ready according to the technology and capacities to support the project.
- Whether the price of costing of the project and reform is acceptable,

To perform the assessment of criticality:

- Whether the suggested service is suitable for the transition on the business intelligence in serving,
- Whether the creation of the service helps better and more positive image of the government with the citizens,
- Whether the introduction of the new service with the use of new technologies brings savings during work,
- Whether the new service demands additional financial investments.

Measure the results.

- Performance assessment is possible only if the criteria for measuring the results are immediately defined at the beginning.

In Figure 5 (Prerequisites for a successful start) some knowledge necessary for a successful beginning of the implementation of the new solutions is represented.

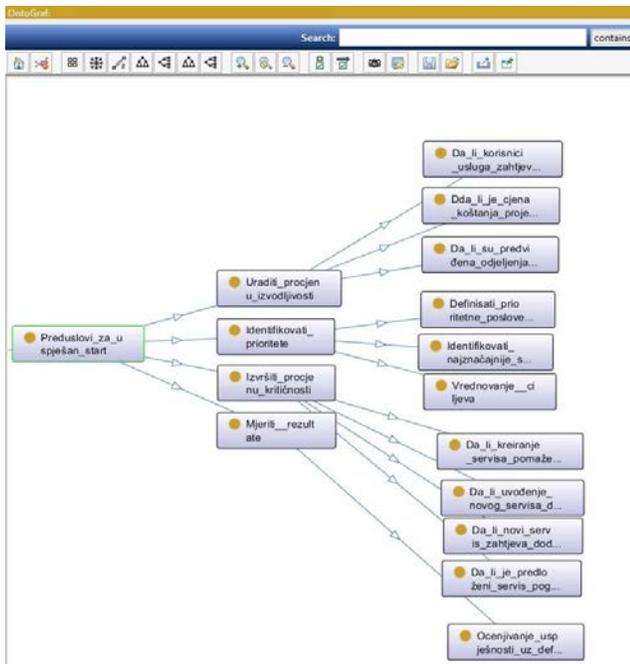


Fig. 5 OntoGraf - Prerequisites for a successful start

Well designed and conducted digitalization of the business processes can change the relationship between the provider and the service user.

Public administration must increase the number of services which will offer them *On-line* and it must adapt them to the needs of the users. On-line service providers win the victory over the classical administration especially in the segment of the selection of services. The services' users like solutions which offer a greater choice.

Contrary to the traditional administration, the administration which is doing business according to the principle of e-m-Service eventually shall reach the position to personalize the activities of providing services to each individual user. Services' users very quickly turn from individual solutions towards the integrated solutions. They are increasingly demanding solutions in one place and "under one roof". The administrations of more developed countries in this model have a greater number of services by the transaction, more pleasant and cheaper service. In order to resolve the problem of "selection, the users seek for the integrated solutions, because they make easier the process of seeking and obtaining the services.

## 8. Creating the environment for the development e-m-Administration

The experience of the developed countries demonstrates that the introduction of e-m-i-Administration and the

implementation of the business intelligence into e-m-Services, that is, the providing the necessary information to the citizens and business subjects and enabling the derivation of transactions (for example, paying the taxes, registration of the vehicle, selling the goods and services) is only possible with the realization of the certain basic assumptions. Basic assumptions are the following:

- Development of the corresponding legislation;
- Creating the corresponding ICT infrastructure, and horizontal and vertical networking;
- Creating a unique and secure system of e-mail as a mechanism of the transfer of documents within the authority. It is necessary to issue the Regulation on office management with the built elements of exchange and archiving the digital documents and with the established system of addressing and marking of digital documents;
- Improvement or construction of the new intelligent portals;
- Defining the system of electronic exchange of data as a basis for electronic business of the public administration – and in that purpose should be legalized e-Document and e-Signature and to construct a unique registration of the public digital keys within public administration.
- The construction of the unique system of public registries and records with the complete application of the principles of protection of the personal data and public, except the content of the category of the state or business secret. For that purpose it is necessary to issue or adapt the corresponding regulations.
- The construction of the system of bases and Data Warehouses with the open access through a computer-communication network for the necessity of the individual administration authorities, - for that purpose, it is necessary to construct a unique system of doing business in electronic documents and to digitalize the existing documents and the new ones in mandatory way create and store in knowledge bases in digital form. It should be conducted the public and legally based classification of data on the private, public and confidential and to define the rights of the access to data bases.
- Informatization of the certain areas of the public administration is of special importance as well as the informatization of the judiciary due to the support to the legal state and creating the financial discipline. The arranging of the records of land and real estate cadastre with the use of Geographic Information Systems (GIS).

For the improvement of the processes of the public procurements, it is necessary to adopt the nomenclatures

and procedures which are already in use in the world, even if they do not absolutely correspond to our requirements. With this, it is not only realized the savings through the access to the world companies via the portal of the World Bank, but it is also provided an extremely cheap and in many elements also a free transfer of knowledge and technology for the same authorization and digitalization.

In Figure 6 is represented some knowledge related to the environment of the public administration with the use of Protégé editor, an open-source platform ,

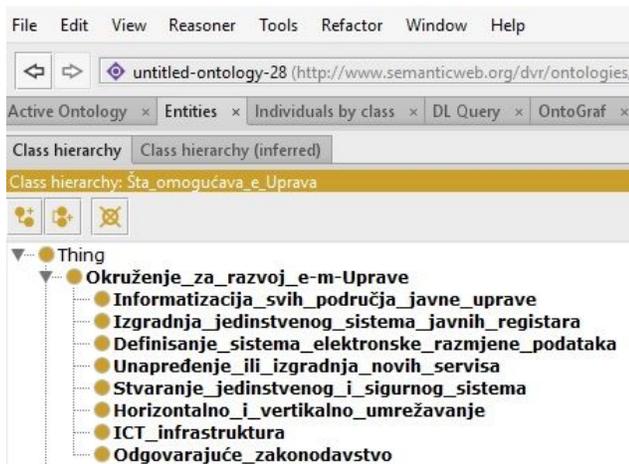


Fig. 6 Environment for e-m-Administration Development

## 9. Characteristic of the new concept

- It must exist more different communication channels which enable the access to public services and which are selected by the citizens and business subjects accordingly to their simplicity and accessibility.
- Public services should be organized according to the needs of its users, i.e. according to the life and business situations of the citizens and business subjects and not by the internal organization of the administration authorities.
- Services which the public administration provides must be completely mutual integrated, instead to represent the isolated entireties.
- The demands of the users are accepted at the reception places (counters) transparently processed in the background, regardless on the number of different authorities that participate in the processing. In providing of its services, some authority can rely on the services of the other authorities.
- To citizens and business subjects it is necessary minimal documentation in order to submit the request and to satisfy its needs. All others necessary

information, if they are in the possession of some other administration authority, are obtained in the communication within the public administration by using integrated services (service chain).

## 10. Conclusion

The realization of the concept of e-m-Administration and e-m-Service demands that new technologies are not only used as a tool for solving problems, but to be also in the same measure the driving force for reorganization and reconstruction. Therefore, the aims of introducing e-m-Administration may not be only the providing of the standard services with the use of new technologies. The main aim is the radical transformation of the manner of functioning of the public administration by using a great potential which the new technologies offer today. At the same time with the introduction of new technologies, it must be accessed also to the essential modification of the model of work. Informatization of the existing model of work would only strengthened the positions and extend the lifespan and the aim of automation is exactly to change the essence of work of the public administration, to make it more simple, open, efficient and oriented toward the citizens.

In order to make it possible, it is necessary that in parallel manner with the automation of work of the public administration is conducted also its organizational and structural transformation. The aim, that will be realized with the reform and introduction of the new administration is: the establishing of the stable, democratic and contemporary oriented, effective and efficient administration and which will be in the service of the users.

In the following period, it should be conducted a complete updating of the knowledge bases.

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