E-LEARNING OPPORTUNITIES FOR E-GOVERNMENT

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Abstract: With the advancements in information and communication technologies governments are able to deliver more sophisticated electronic services to citizens and businesses. Nevertheless the uptake of e-services can be very weak if there is a lack of understanding of their functioning. Therefore the future development of electronic government depends greatly on permanent and relevant education of government employees and users. Traditional classroom based learning is not best suited for the area of e-government. More appropriate and effective learning approach would be e-learning. This paper examines the benefits of e-learning compared to other learning approaches and explains the key factors for successful e-learning implementation in e-government.

Keywords: E-Learning platform, E-government, Education

1. INTRODUCTION

Rapid development of information and communication technologies affected all areas of human interest as well as education. Raising the quality and accessibility of all forms of education is considered to be a catalyst for rapid development of modern society. This implies moving from the traditional learning approaches to the computer-based and interactive learning. Electronic form of learning or e-learning is an approach to teaching and learning [1] that is being widely adopted by educational institutions for provision of programs and courses. E-learning is conceptualized in a number of ways, but basically it refers to the way people communicate and learn electronically. It encompasses both formal and non-formal learning that uses an information network for course delivery, interaction and facilitation. E-learning changes the way people gain new skills and knowledge. It eliminates barriers that have prevented people from accessing high quality education and enables organizations to be more responsive in a changing environment. During the last few years e-learning has been increasingly implemented for vocational education and training in many areas. One of the new area of e-learning implementation is e-government.

Electronic government or e-government can be seen as the use of information and communication technologies for enhanced access and delivery of government services to citizens, businesses and government employees [2]. Changes in the area of e-government are very dynamic, since the laws, procedures and demands alter frequently. With effective deployment of e-learning governments could raise the level of technology and application user skills. E-government services integrate a large number of business processes and heterogeneous technologies, that makes them challenging both for e-government employees and e-government users. Basic e-government services include actions, like downloading documents or

filling online forms, that could be easily accomplished by e-government users with basic IT knowledge. However sophisticated e-services require more demanding actions, one example would be electronically signing the form and sending it back to the government officials. This kind of actions require more profound understanding of technology. In the reverse case, in which government employee needs to receive and process the obtained information or document, often lacks an understanding of implemented technologies. Therefore, there is a great need for education of people employed in government administration but also for the prospective users of e-government.

Governments face many cultural and organizational challenges in transforming their structures, processes and internal employee culture in order to integrate e-learning into e-government environment. Efforts for e-learning implementation often lead towards automation of administrating the teaching and learning processes by means of software known as Learning Management Systems (LMS) [1]. LMS software offers vast of possibilities for governments to educate their employees and users. More importantly LMS offers possibility for integration with other government departments, such as human resources and accounting. In this way both administrative and supervisory tasks can be automated while the overall cost and impact of education can be tracked and quantified.

The rest of the paper is organized as follows. Section 2 describes the significance of education in the area of e-government and gives ways to educate employees and e-government users. The authors' point of view on the e-learning benefits and necessary preconditions for successful e-learning implementation are given in Section 3. Section 4 presents recommendations for Learning Management System integration within the e-government environment. Conclusion is given in Section 5, followed by the list of references.

2. EDUCATION FOR E-GOVERNMENT

E-government is focused on providing services to citizens, business and government agencies by electronic means [3]. Whether informational, interactive, or transactional, e-government services require skills and knowledge for implementation, maintenance and usage. For this reason, both e-government employees and users need proper education.

Education of e-government employees

Education of employees in e-government often happens on demand, usually when an employee needs to be acquainted with the procedures, technologies and services. For this particular case tutoring will be a good choice, but when there is a necessity for education of a large number of employees some other learning approach might be more convenient and effective.

According to [4], education of employees in e-government can be done using one of the following approaches: conventional learning, presence courses, offline learning and e-learning.

Educating e-government employees in the conventional way, using paper and the traditional face-to-face classroom based methods, can be difficult both for educators and learners. The reason for this mostly lies in the fact that electronic processes, communication and services are much harder to describe than to show or experience.

Advances in networking and communication technologies enabled organizations to embrace a blended model of learning, such as presence courses. Presence courses are dependent of the communication infrastructure for distribution of the course material, but they often happen in the classroom and require time and resource scheduling. This makes them less suitable for education of e-government employees.

Offline learning implies learning without the presence of a teacher. It requires a strong motivation and self-direction since there is no feedback or help. It is best suited for persons on the move since they can use this type of learning from home. Since e-government employees need to learn in their working environment and during their working hours, this method is better suited for personal and not professional education.

Different terminologies have been used for electronic learning, still regardless of the term used (online learning, networked learning, virtual learning, etc.) e-learning implies the distance between the instructor and the learner bridged by means of electronic technology [5]. E-learning includes delivery of instructions via all types of electronic media including the Internet, satellite broadcasts, audio/video tape, TV and DVD. According to [6] e-learning is the appropriate application of the Internet to support the delivery of learning, skills and knowledge in a holistic approach not limited to any particular courses, technologies or infrastructures.

E-learning brings many benefits to its users. As stated by Roffe [7] e-learning provides just in time delivery, accessibility from any site, cost effectiveness, learner centred learning, rapidly updated content, uniformity of content and interactivity. Rosenberg [8] specifies eleven benefits of e-learning: lower costs, enhanced business responsiveness, consistent or customized messages, need dependant, timely and dependable content, 24/7 learning, no "ramp-up" time, universal, community builder, scalable, leveraged corporate investment in the Web and increased value of customer service. The real value of e-learning, as stated in [1], lies not only in its ability to train anyone, anytime, anywhere but in the ability to train the right people to gain the right skills or knowledge at the right time.

E-learning programs are interactive, personalized and usually embedded in a learner centred framework [9]. In comparison with the traditional, face-to-face, approaches to learning which are focused on gaining skills and filling knowledge gaps, e-learning helps in gaining better performance of employees. When a learner encounters a problem, he can immediately discuss it with other users or he can see the solution of the problem in an interactive way. There are many arguments in favour of e-learning, still those against it usually refer to obligatory computer literacy and loss of physical contacts between learners. E-learning is centred on computer technologies and those learners without good computer skills could have difficulties. Between learners engaged in e-learning process there is no physical interaction, which could be a minor drawback in the process of knowledge acquisition. Despite of these arguments, electronic learning is becoming more and more accepted learning method for cost-effective and innovative delivery of knowledge among the employees at all government levels.

Process-based learning: A group of authors [10] proposed a process based learning approach in e-government. This approach relies on the consideration that e-learning must be confronted as a process and as an artefact [11]. From this perspective e-government processes, being diverse and complex, need an appropriate knowledge management strategy that could be applied both for governmental employees and users. Process-based knowledge management tools can be successfully defined and implemented in order to transform e-government processes into valuable knowledge measures.

Education of e-government users

Although technological progress offers new possibilities for e-government to offer better and more sophisticated services, e-government often faces with a low usage of these services. Some reasons for this may lie in the rapid changes of the way governments are providing customer services with the aim to take good positions in the race with new technologies. Other reasons should be sought in the digital divide among e-government users. The digital divide is defined by [12] as a difference in the availability of and access to digital technology across various social groups. The reasons for digital divide lie in differences in computer skill levels for which are responsible:

socio-economic factors, education, age, location, gender or culture. E-government users with basic computer literacy, partial knowledge of Internet technologies and limited access to electronic services can easily lose interest in e-government offerings. This is why governments need to track usage of e-government services, identify the potential problems and take proper actions in education of e-government users.

Although education of e-government users can be done in classroom, offline or using presence courses, the most appropriate way would be e-learning. Reason for this lies in the fact that Internet is used both in e-government and in e-learning as a medium for delivery. E-government users access e-services via Web portal, and it would be easy and cost-effective for governments to deliver learning courses and materials in the same way.

3. BENEFITS AND SUCCESS FACTORS OF E-LEARNING IMPLEMENTATION IN E-GOVERNMENT

Based on the general list of e-learning benefits given in [7][8], we have identified five benefits of special significance for the area of e-government, as well as factors for successful implementation of e-learning.

E-learning benefits for e-government

- Cost effectiveness:
Cost reduction is the single most influential factor in adoption and implementation of e-learning in the public administration. The reduction of time spent away from the job is a positive offshoot. Using Internet or local area network learning courses can be accessed directly from the learner's working places. Also elimination of costs associated to teachers' and learners' salaries, coaching, workshops fees, travel, classroom rentals go in favour of the e-learning method adoption.
- Pervasive, continuous and relevant learning:
 E-learning method makes learning available anytime, anywhere and for anyone. E-learning is driven by context and delivered on demand. Employee skills become outdated in less than five years, this is why is important to make the learning process life-long and continuous. Learning is personalized and compelling. It is applied in time and not when needed for some particular case. Collaborative nature of e-learning allows access to expertise and knowledge of other employees and enterprises.
- Removing geographic and demographic barriers:
E-learning has the potential to reach out to more people than using conventional learning methods, both geographically and demographically [13]. It eliminates the barriers between people in different government departments that have prevented them from acquiring high quality education and supports services involving e-government technology, applications development, strategic direction and cultural change. E-government employees learn in a relatively anonymous environment without the embarrassment of failure and any socio-cultural prejudice from personal contact with the instructor. E-learning relies on a broadband connection that allows presence of a large number of participants that are geographically distributed across the whole country. It gives an equal opportunity for education to employees at all government levels and in that way helps in building a life-long learning culture in the public administration.
- Knowledge sharing:
Electronic form of learning propagates knowledge sharing through access to expertise and collaboration between employees and partners, improving the performance and productivity of employees.

Factors for successful e-learning implementation

Successful implementation of e-learning within the e-government environment depends on the following factors:
- Strategy
E-learning should be seen not only as a flexible approach to teaching and learning, but also as a learning method that has improved performance outcomes. That is why government officials need to establish a long-term strategy for education of employees and current or prospective e-government users.
- Leadership Support
Motivation and support are required from government officials in order for employees to endorse the learning process. Beside psychological, financial support is also needed, especially with resources allocation and establishment of learning infrastructure.
- Legal framework
Successful implementation of e-learning can only be possible within supportive regulatory environment. All aspects related to the adoption of e-government solutions require legal background, therefore e-learning system integration within the current e-government systems requires the same.
- Technology/infrastructure
Government officials need to provide appropriate technology and infrastructure for e-learning. The Internet market offers many open source learning platforms that are free of charge, so most of the times the investments in technology are very little. E-learning imposes that each government employee needs a networked computer at his workplace in order to access available courses. In most cases government buildings already have appropriate equipment for e-learning, including computers, network equipment and communication infrastructure. E-government department in charge of the e-learning process must provide timely material dispatch, while the technical support team must be available at any time to fix problems with Internet connectivity or access issues.
- Learning material
Learning material must be prepared and published online before, during and after the course. The material can include word-processed documents, digital photos, movies, papers, slides, links to relevant Web sites, online journals and books, or any other multimedia resource. E-learning maybe requires a lot of initial effort for producing material, but if looking long-term this is easily balanced by much easier changing and adapting the content compared to other learning methods. Since electronic content can be easily restructured it is better suited than offline teaching material, which is essential in the case of e-government.
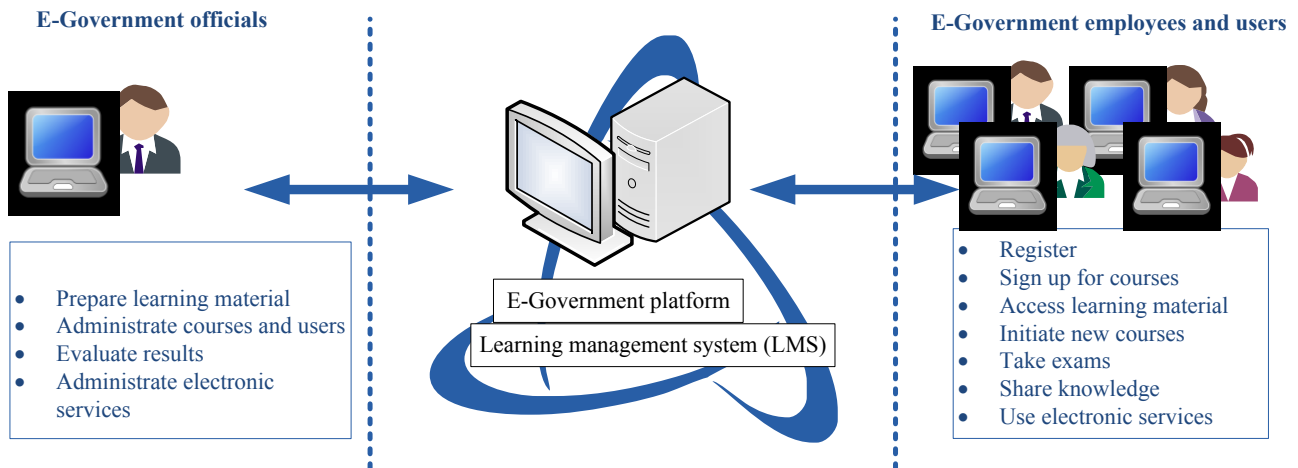
E-Government officials

- Prepare learning material
- Administrate courses and users
- Evaluate results
- Administrate electronic services

E-Government platform

Learning management system (LMS)

E-Government employees and users

- Register
- Sign up for courses
- Access learning material
- Initiate new courses
- Take exams
- Share knowledge
- Use electronic services

Image 1: Exchange of information and knowledge through integrated platform

4. E-LEARNING INTEGRATION WITHIN THE E-GOVERNMENT ENVIRONMENT

There are various e-learning systems in the Internet market, both commercial and open source. For the e-government system structure, in which e-government services are offered through the Web, the most suitable e-learning solution falls under the Learning Management System (LMS) category. Learning Management System can be seen as a framework that handles all aspects of the learning process [14]. It provides platform for the governments' online learning environment by enabling the management, delivery and tracking the education for employees and e-government users.

Considering that there are many commercial and free learning management systems with common features, selecting the most appropriate LMS would depend on many factors: system requirements, integration possibilities, scalability, modularity, etc. The comparison of learning management systems by features, names or groups can be done using online tools, such as EduTools [15]. Government officials can rely on this or similar tool in order to find the LMS solution with most suitable features. Chosen LMS should be installed and hosted at the government servers, so that it can be available to the users via Internet or intranet. E-government employees should have the ability to access e-learning platform both from the workplace and from their home. In this way they can distribute their learning time according to their professional or personal obligations.

Integration of the chosen LMS must be done both at the back and at the front end. Back-end integration would impose connection to appropriate back-end databases and human resources systems so that government officials and human resources personnel can track course and career progress of employees and users. LMS must be available from e-government Web portal and from any other Web page which promotes e-government services, this will be achieved with front-end integration. Front-end integration enables visibility of LMS. It reflects back-end integration and allows users to sign up and evolve in courses.

After adoption, installation and integration of e-learning system within e-government environment, e-government employees and users can involve in the learning process. Image 1. illustrates the process of information and knowledge exchange between e-government users and employees through the integrated platform.

As it can be seen from Image 1, e-government officials are in charge of:
- Preparation of materials for learning
- Administration of users and courses
- Evaluation of results
- Administration of electronic services

E-government officials can choose persons responsible for creating course materials or they can appoint educational institutions for this matter. Types of courses can vary from basic to advance. In that way they will cover wider audience. E-government department in charge of education has a responsibility to administrate users and courses. They have an administrative privilege to the e-learning platform, which means that they can create/modify and delete courses, create quizzes, questionnaires and exercises for learners, create virtual discussion rooms and manage users.

Evaluation of learning results is important for tracking usage of e-government services. The more people are educated, the more eager they will be to use e-services in everyday life. Through the LMS activity reports administrators can track user progress and have insight into number of people interested in offered e-learning courses. LMS can automatically grade multiple choices exams and present evaluation data to the system administrators.

E-government officials would be able to administrate electronic services through the integrated platform. They would be able to add or modify e-services or information related to them. Integrated platform would also allow them to accomplish tasks related to e-learning, such as assignment of learning courses to services.

E-Government employees and users will be able to accomplish the following through the integrated platform:

- Registration
- Sign up for courses
- Access learning material
- Initiate new courses
- Take exams
- Share knowledge
- Use electronic services

Users interested in e-learning possibilities of integrated platform would have to register. Registration is important since it will allow tracking number of users interested in education. After registration, users will be able to sign up for learning courses. They could sign up for one or more courses, repeat learning units as often as required and control the duration of learning sessions. Each learning course will allow users to learn in an interactive way, download learning material, join discussion rooms in order to share their knowledge or leave comments and take tests for proofing gained knowledge. Users interested solely in using electronic services would be able to access the integrated platform in a same way they have done before, and for that purpose the registration would not be obligatory.

5. CONCLUSION

Education of e-government employees and users is important to assure proper maintenance, functioning and usage of e-government services that are becoming more sophisticated under the influence of innovations in ICT. E-learning approach to education can be successfully implemented in e-government for education of both e-government users and employees. This can be achieved by front and back end integration of e-learning system within e-government environment. The integration process itself encompasses many technical, organizational, legal and standardization issues. Detailed explanation of this process will be the subject of our future work. We plan to identify LMS that is best suited for the Serbian e-government model, and explore it's potential for integration with the existing business processes and solutions adopted in Serbian e-government.

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