

E-Learning in the Frame of the European e-Governance

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ABSTRACT

The paper deals with some European initiatives for e-Learning as a part of e-Governance and necessity of information and communication technologies implementation to ensure high level of digital (electronic) servicing. Global information society should be developed and all components of e-Governance should be united in a common environment. The main programs for the new initiatives support are presented. The problems of the conceptual modeling and formal describing of the basic components are discussed. The strategy for European e-Governance organization (including principles of e-Learning) should be connected with the realization of a united European Information Society and reliable and effectiveness global information infrastructure based on the advanced ICT.

Categories and Subject Descriptors

H.0 [Information Systems]: General
 K.4.4. [Computers and Society]: Electronic Learning
 K6.1. [Management of Computing and Information Systems]: Project and People Management

General Terms

Management, Design, Reliability, Human Factors, Theory.

Keywords

E-Governance, e-Learning, Information and Communication Infrastructure, Information Servicing, Conceptual Modeling.

1. INTRODUCTION

The application of information and communication technologies (ICT) in the public sector and particularly in the administrative services is the main factor for realization of e-Governance [1]. Basic technologies which are used concern databases, telecommunication systems, expert systems, knowledge based systems and networking. The main European strategy is to create a Global Information Society (GIS) uniting all components of the e-services, as e-Learning, e-Government, e-Health, etc. [2, 3, 4]

The initial steps of non-traditional education were distance learning and correspondence courses. When computers and information technologies (IT) became available, new initiatives are realized. The European countries and in particular the European Union (EU) have well understanding for the role of ICT in the field of education and training. Four discrete phases of development of EU educational policies were identified [5, 6]:

- *Initiation phase*, beginning in 1951 with the provisions of the Treaties of Paris and Rome;

- *Foundation phase*, beginning in 1963 with the formulation of the common principles for vocation education;
- *Expansion phase*, beginning in 1976 with the introduction of the first common programmes for education and the concept of the European dimension in education and training;
- *Consolidation phase*, beginning with the Treaty on EU (Maastricht Treaty) which provided a new legal basis for EU policies and initiatives in the field.

There are different positions describing and criticizing the EU policies in education and training. All these accounts have difficulties to cover the complexity and variety of the topic. Moreover, in the discourse on European integration, a great deal of attention has been given to the process of policy formulation in the EU and the national levels.

The paper deals with some European initiatives and programs in education and training. The initiative e-Learning as a part of e-Governance program is presented and the role of the GIS for improving e-Learning processes is discussed. Some empirical research in the field are presented [7, 8, 9] and obtained results and assessments are shown.

2. INITIATIVES FOR E-GOVERNANCE

The beginning of new millennium is connected with the establishing of conceptions for a global information society realization and developing of the main principles of e-Governance in Europe. In this respect e-Learning initiative is a very important part of all programs for the creating and developing of the European information society. The basic European initiatives are listed below.

eEurope

The first initiative *eEurope* (Lisbon, 2000) is the basis of e-Governance strategy and it has developed by *eEurope+* (Warszawa, May 2000). These initiatives are connected with the possibility for access and using information resources and technologies. The second initiative is provided for direct and interactive on-line access to knowledge, education, learning and training, government, health, culture, etc. The main components of this initiative permit to build the common environment of global Information Society (IS) based on information and communication infrastructure – fig. 1.

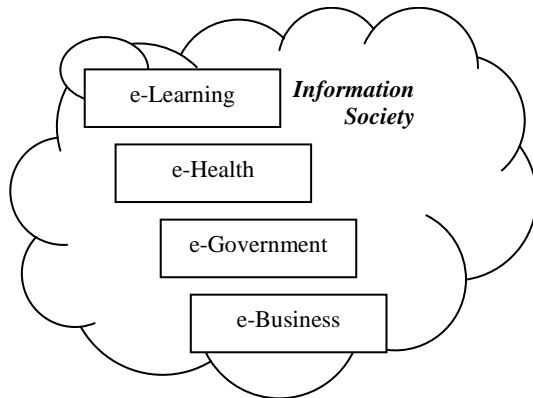


Figure 1. Environment of Information Society.

eEurope2002

The action plan *eEurope2002* (2000) was adopted as a next step for ensuring faster, cheaper and reliable access to the distributed information resources via Internet. This plan stimulates developing the legislative base connected with the laws for data protection, electronic commerce, author's right, etc.

eEurope2005

The main task of the plan *eEurope2005* (Barcelona, June 2002) is to build common environment for e-services on the basis of the components e-Learning, e-Health, e-Government, e-Business. The goal is to give an opportunity the citizens to use advanced on-line administrative services in different spaces of e-Governance, including education and training. This initiative should give the basis for realization of a reliable and secure information infrastructure. The main priorities are as follows:

- connections between all levels of the state administration, schools and medical organizations by using advanced network technologies for realization of accessible, fast and reliable information and communication infrastructure;
- development of different platforms for citizens' access to all interactive administrative services;
- development of common medium for on-line electronic services and standardization in the frame of EU.

Some attendant initiatives in this period were the forum of European e-administrative services named *E-Forum* (created at December 2001 – www.eu-forum.org), the pilot pan-European portal for trans-border activities *Your Europe* (started at October 2002 – http://europa.eu.int/youreurope/index_en.html), the program of European Commission (EC) “Interchange of Data between Administrators”, the portal *EURES* (European Employment Services – <http://europa.eu.int/eures>), etc.

i2010

EC starts the initiative *i2010* (presented on June 1st, 2005) [3] for enforcing the ICT and media environment in Europe (http://europa.eu.int/newsletter/index_en.htm) collected regulation instruments, scientific researches and industrial partnership.

Three policy priorities are defined in this initiative:

- to create an open and competitive single market for information society and media services within the EU;

- to increase EU investment in research on information and communication technologies by 80%;
- to promote an inclusive European information society.

The *i2010* is an initiative for “digital economy” and it is based on the following three “i” (pillars) – information space; innovation and investments in research; inclusion.

The creation of the new information space *i2010* for information society and media services in EU will include some initiatives connected to the audio-video services; actualization of the regulation frame of e-communications; strategy for secure information society; approach for effective management of the right for using of digital information and digital signature (2006 – 2007). The goal of this initiative is to increase (by 80%) the European investments for scientific research in the ICT area and.

The third “i” in the *i2010* initiative aims to create an European Information Society and in this respect EC developed an Action Plan in e-Governance area with requirements about e-services for citizens. Some other initiatives will give better possibilities for using ICT in human life, intelligent transport means, digital libraries, etc. The priorities of the *i2010* will be executed by new program “*Competitiveness and Innovation Framework Programme*” (C&I FP). Some of main programs realized in the frame of European initiatives are shown in Fig.2.

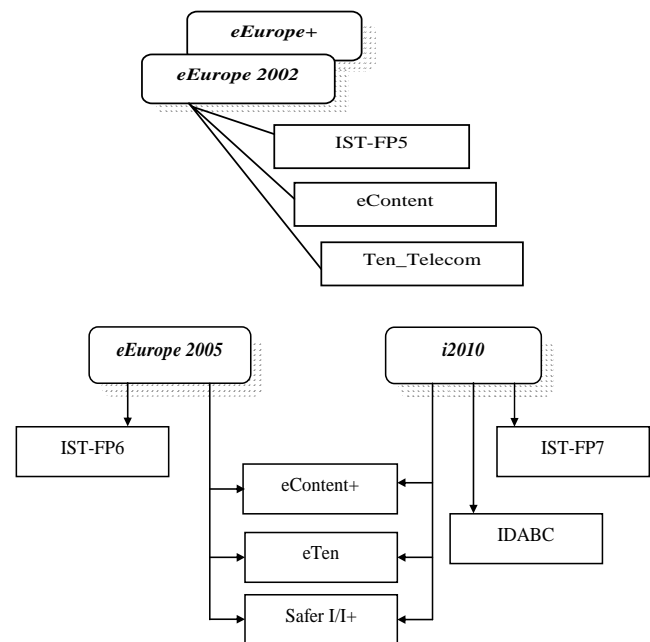


Figure 2. European initiatives and programs

• *Information Society Technologies* (IST-FP6/FP7) – a program for development of economy on the basis of advanced ICT. The main goal is to stimulate the research and innovations. FP6 should give easy and unlimited access to the different services in the IS. FP7 (2007-2013) will develop the European Research Area.

• *eContent+* (2005 – 2008) – for development of the information infrastructure and easier using of digital services and products.

The purpose is to support the European strategy in e-Governance and e-Learning areas.

- *eTEN* (<http://europa.eu.int/eten>) – development of a global IS in EU and support the creation and including of global e-services. The basic thematic areas are e-Government, e-Learning, e-Health. The significance of this program for e-Learning development is connected with the creation of effectiveness and accessible services, including new means for education and communications.
- *Safer Internet* (Safer I) and *Safer Internet+* (Safer I+) – a program for reliable and secure using of Internet environment.
- *Interoperable Delivery of European eGovernment Services to public Administration, Businesses and Citizens* (IDABC) – this program is presented officially on the February 1st, 2005 and uses the ICT possibilities for improving the administrative services for citizens and businesses. In this respect this program is oriented to e-Government (<http://europa.eu.int/idabc>).

3. FORMAL MODEL OF E-GOVERNANCE AND E-LEARNING INITIATIVE

The objective of conventional e-Governance is to help citizens using administrative services via the Internet. The e-Governance will cut the frontiers of time and space. It helps citizens to access information at anytime, at any place using net-enable system. E-Governance is a set of documents, books, guidelines, files, applications and information resources. In this respect e-Learning could be regarded as a part of national information infrastructure and in particularly as a part of national e-Governance (Fig. 3).

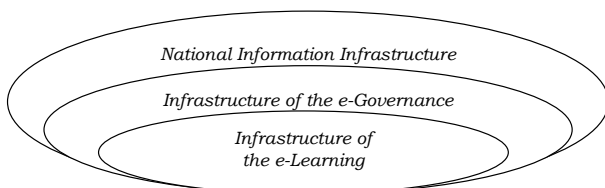


Figure 3. Formal model of e-Learning as a part of the National Information Infrastructure

The traditional model for e-Governance information services and organization of interactions between users and servers could be described by tree types of communications (Fig. 4): A2A – administration to administration; A2C – administration to citizens; A2B – administration to businesses.

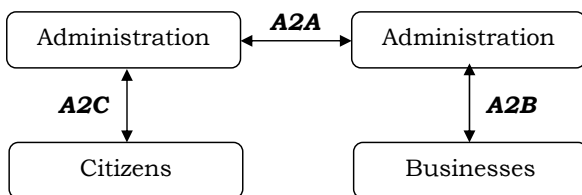


Figure 4. Model of the e-Governance interactions

The EU e-Learning program in the eEurope2005 initiative [3] defines that the ICT, properly used, contribute to the quality of education and training and to Europe’s move to a knowledge-based society. This program is a further step towards realizing the vision of technology services lifelong learning. It focuses on a set of actions in high priority areas, chosen for their strategic

relevance to the modernization of Europe’s education and training systems.

The initiative eEurope2005, in the section for e-Learning, defines that only about 27% of the EU workspace has received job-related computer training. Key skills include digital literacy and higher-order skills such as teamwork, problem solving and project management.

E-Learning can promote social integration and inclusion, opening access to learning for people with special needs and those living in difficult circumstances. Modern e-Learning solutions recognize the importance of learning as a social process, offering possibilities for collaboration with other learners, for interaction, with the content and for guidance from teachers, trainers and tutors. These learn-centered approaches put the learners back in command, with a wealth of learning resources at their fingertips, customized to their individual needs. Teachers and trainers, however, continue to play a central role, using their students in a “blended” approach.

E-Learning initiative has four components:

- to equip schools with multimedia computers;
- to train European teachers in digital technologies;
- to develop European educational services and software;
- to speed up the networking of schools and teachers.

Most of the resources should be mobilized in the national and inter-national regions and adequate instruments for education, training and testing should be developed. All these goals must be oriented to the advanced ICT.

The principles of e-Learning could be described by the formal model in the fig. 4, in the context of information infrastructure and IS but this model does not fully represent all functions that new initiatives give to the e-Governance as a part of GIS. Some parameters connected with people and their needs are not formalized by this interaction model. In this respect a new formal model based on the Knowledge Management System (KMS) is introduced in [8]. This model introduces knowledge on the place of the information and will help engineers who architect e-Governance and e-Learning applications. The software engineering process of Information Management Systems (IMS) of e-Governance is cycle-based and the proposed formal model keeps this form of interactions – Fig. 5.

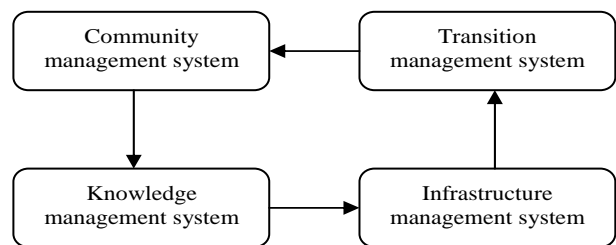


Figure 5. Cyclic Formal model based on KMS

The first level of the cyclic formal model is built by understanding that e-Governance is a transition process from conventional to people-oriented proactive electronic system. People are organized as communities. The model provides a platform where various communities and special interest group represent themselves. An environment with specialized expertise (Community management system) that can help people answer

questions, and guide them to find solutions is organized. All communities of people should be attracted towards the system. To accept this transition process, the communities need to be trained and educated. The electronic media should be used friendly and accessible (Transition management system).

The second level of the model is directed to the ICT platform organization and using. This level should be easily retrievable and should support and protect privacy, information rights and other cyber-laws, such as copyright, intellectual property of the contribution, personal data protection, confidentiality of poll, discussion or debate. The ICT and networking have very important role for organization of interactions on this level. The minimum and basic features of this level are to store and retrieve information, records and documents of the environment organizers (teachers, trainers, government, municipality or other one). Advanced features are: to extract statistical reports and to predict future, to help decision-making and to provide intelligent forecast for planning. A powerful integrated hardware and software network for these functions realization is needed. As a result, two systems in the second level – Knowledge management system and Infrastructure management system, should be designed.

4. EVALUATION OF E-LEARNING

With some basic documents [2, 3, 6], EU promotes the development of Europe towards “*becoming the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion*”. In this respect the universities have an important role to play in attaining this objective and they are the significant part of the new GIS. The integration of ICT is seen both as one of the new challenges and as a tool to meet these challenges. The number of joint meetings, scientific events, projects and publications in the last years shows that the development is increasing rapidly. This permits to develop an organizational conceptual framework for virtual universities environment. This is determined by the fact that the boundaries between universities and other forms of higher education in Europe have blurred. In general, a university is understood as being an institution that offers multidisciplinary medium-length and long courses for students and meet institutional and course requirements.

“Virtual University” (VU) is a term used to describe several different types of universities which offer their courses in e-learning format. The term VU sometimes means a university which exists only virtually, and where no physical connect or meeting place exists. However, there are different organizational modules for VU, the term can describe Internet portals that direct their visitors to e-Learning courses offered by any of several different universities, consortia of universities that offer their e-Learning courses jointly, and also individual universities whose courses are held on a virtual campus instead of a physical one. The organization of VU-environment is based on ICT used on the following two levels:

- organizational level – using ICT for administrative services and for reinforcing and supporting the organizational structures and all communications;

- educational level – using ICT for campus-based teaching as well as for e-Learning (academic and supplementary training) and includes integration of presentation programs, databases of modules, teaching materials, etc.

The final report of the project “Study of virtual models of universities” presents an investigation for evaluation the level of European e-Learning practice in two areas – basic academic training and in supplementary training (Table 1).

Table 1. Evaluation of the e-Learning level

Realization of courses in the e-Learning format	Academic training	Supplementary training
All courses are in e-Learning format	1%	1%
More than 50%	4%	4%
25 – 50 %	11%	8%
Less than 25 %	62%	48%
No e-Learning format courses	22%	39%

Most e-Learning courses at academic level are accredited, and of these the majority are accredited using ECTS, or will be in the near future. A majority of universities have developed quality assurance model to some extent. Almost all universities are using e-Learning to some degree in delivering their educational output but only 1% of studied universities are offering all of their courses in e-Learning format.

The quantity of e-Learning being offered in respect of supplementary training is somewhat less than for basic academic training. The part of the universities that offer more than half their supplementary training courses in e-Learning format is equal to the academic training.

Another research is directed to study of planning, implementing, and evaluation e-Learning initiatives [9]. The goal is to identify any performance gaps or opportunities for improvement and also affords organizations the opportunity to gain a better understanding of issues and challenges involved in planning, implementing, and evaluating e-Learning initiatives. The study focuses on three key areas for research described below.

- 1) Planning the e-Learning initiative
 - designing the transition from traditional training to e-learning;
 - identifying the resources needed (financial and human);
 - determining instructional methods;
 - anticipating and controlling organizational impact.
- 2) Implementing the e-Learning initiative
 - marketing and promoting the e-Learning initiative;
 - piloting the program.
- 3) Evaluating the e-Learning initiative
 - measuring the cost and benefits in the short and long term;
 - measuring quality, including effectiveness;
 - measuring services (availability and accessibility);
 - measuring speed (responsiveness).

A standard benchmarking methodology for evaluation of the key areas has been used. It includes four phases: experiment planning; data collection; data analysis; adaptation and assessments.

5. CONCLUSION

With the appearance of the Internet, different organizations, administrative structures and corporations began to believe in e-Learning as a new model for training. Businesses have begun to create high-quality training and deliver it in this medium. In this respect the universities should give their contribution to improve the information services in e-Learning field.

The new EU initiatives and programs will permit to increase the effectiveness of education and training on the base of a global information society organization. This common environment puts the problems connected with information resources realization, organization of common distributed environment, measuring of e-servicing parameters and evaluation of the distributed processes, realization of reliable system for network security, etc.

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