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The Development of e-Government in the Republic of Moldova

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Abstract

Moldova has received very different rankings in different comparative studies on e-government development. This paper attempts to analyze the real state of e-government in the Republic of Moldova. We discuss the current situation, and evaluate that current situation using several accepted models. The most interesting aspect of this research is that e-government in Moldova is developing in the very complicated conditions of transition from a Soviet state with a centralized command system to a democratic state with a market economy, in parallel with a total reengineering of government institutions. In order to direct the strategy of the government of Moldova towards further development, we make a number of suggestions tailored to this complex environment.

Keywords: e-government, information and communication technology, Moldova

1 Introduction

The processes of integration in Europe and "globalization" throughout the world have led to countries becoming more and more interdependent. In this context, a significant challenge for researchers and practitioners is found in the processes occurring in the Newly Independent States, which appeared after the USSR's collapse, and where the period of transition from Soviet regimes with their totally centralized command economies to democratic societies with market economies, has proved to be much more complicated and multidimensional than

expected. To what extent are these countries able to integrate into the world community when this requires new standards and principles in almost all fields of activity?

Rising public demand for government information is a common characteristic of modern societies, and it is an important dimension of democracy. This is especially important in the states of the former Soviet Union (FSU), including the Republic of Moldova, that suffered long decades under the totalitarian Soviet regime. E-government holds out a promise of help with this problem; however, experience in the field of e-government development, accumulated in the industrialized countries, cannot be directly transferred to these countries because they are also undergoing, in parallel, a total reengineering of public institutions, and because their governments are quite different from those in the industrialized west. The government of Moldova is democratically elected, but in many ways it still has highly centralized government functions and little autonomy for local governments. It is therefore necessary to carefully consider how to create and nurture e-government in this kind of environment.

This paper seeks to examine the current state of e-government development in the Republic of Moldova, and to compare it to other countries in order to direct the strategy of the government of Moldova in further development. Moldova's very different rankings in different comparative studies on e-government development served as a stimulus for this research. For example, each year since 2002, a report on Global e-government has been published, first by the Taubman Center for Public Policy (West, 2002-2007) and then by the Brookings Institute (West 2008). In addition to assessments of the general state of e-government services throughout the world, the report includes a comparative ranking of the e-governments of the countries of the world. In 2002, the Republic of Moldova was ranked 105th, and Russia was ranked 132nd. In 2005, Moldova had climbed to 57th, while Russia had only climbed to 110th. Moldova was the highest ranked country in the CIS, and indeed it outranked some of the former Warsaw states. In particular, Moldova was ranked slightly above Romania, the western state to which it has the closest cultural ties.

Table 1. Ranking of Moldova's e-government in the reports of the Taubman Center and Brookings Institute

Country	**Rank per year**			
	2005	2006	2007	2008
Moldova	57	132	181	126
Ukraine	93	21	115	89
Russia	110	43	133	95
...	...	...	...	...
Romania	84	61	98	146

However, in the context of the rankings in the following three years, this evaluation of Moldova's e-government looks too optimistic. Some selected data from these reports, related to Moldova, other countries of the FSU and Romania, are listed in the Table 1. In 2008 Moldova was ranked only 126th, changing its position from the highest ranked country in the CIS to a position behind all the CIS countries except Turkmenistan (183rd) and Tajikistan (tied at 126th).

Table 2. UN e-government readiness index

Country	**Rank per year**	
	2005	2008
Moldova	109	93
Ukraine	48	41
Russia	50	60
...		...
Romania	44	51

At the same time, Moldova's ranking in other studies is very different, both absolutely and comparatively (West, 2002-7; International Telecommunication Union, 2005; Sciadas 2005). For example, in Table 2 (data selected from two United Nations studies (United Nations 2003, 2008)), we see that Moldova's e-government readiness was ranked as

109th in 2005 - 10th in the CIS - and moved up to 93rd in 2008 - 5th in the CIS. These studies suggest change in the opposite direction from that suggested by the Brown/Brookings studies.

Rankings like these are widely reported in the media in Moldova, and are used by the government as assessments of the current situation. The wide variation in the rankings of the e-government development in the Republic of Moldova strongly suggests that additional research is needed.

2 Theoretical framework

Recently, interest in the *information society*, and more specifically in *e-government*, has increased dramatically, as has the number of publications in this field. A significant part of them are dedicated to e-government evaluation studies (Janssen, Rotthier & Snijkers, 2004; Kunstelj & Vintar, 2004). But the results are varied, and the same country in different studies may receive significantly different evaluations of its e-government. As noticed by Janssen et. al. (2004), "the boom in the amount of comparative studies produced in the years 2000-2001 has more than often resulted in a country scoring the high marks in one study, and ending at the bottom in another."

This recent research studying approaches to e-government evaluations has noted that different evaluation studies have covered different aspects of e-government, using different indicators. A crucial step for an objective and useful evaluation of the level of development of e-government is to choose the correct definition of the concept "e-government," the relevant criteria and indicators for the measurement of e-government, and an appropriate approach to monitoring, evaluating and benchmarking e-government development.

Without reiterating a detailed description (Janssen et. al. 2004) of the wide spectrum of definitions of e-government between the narrow (evaluating e-government solely in terms of online service delivery) and the broad (evaluating the broader use of information and communication technology (ICT) in the public sector), in this article we will use a broad definition, which we believe most apt for our search for

appropriate future strategies.

2.1 Broad Goals

Most researchers in the field promote the idea that e-government should be customer focused, and we support the approach that government and organizational processes should be restructured while being automated: "Re-invent government, don't simply automate it" (Poon & Huang, 2002).

E-government is much more than offering electronic services online and it must be based on applying ICT to the full range of government functions, including relations with citizens, internal governmental functions and interactions between governmental bodies. Recently some countries have begun to move away from systems organized around government function, and towards more integrated organizations based on the customers' view of events (Kunstelj & Vintar, 2004).

An interesting example of successful implementation of citizen-focussed e-government in Hong Kong is described by Poon and Huang (2002). The ESDLife (from ESD, electronic service delivery) site asks users what they want to do, rather than asking them what governmental department they need to visit. The e-government coordinator attributes some of the success of the program to this novel organization that does not require citizens to understand the details of government structure.

Poon and Huang (2002) also observe that e-government has three large groups of functions: *e-service* (the delivery of services to the citizens), *e-democracy* (electronic communications between government and citizens, including voting), and *e-business* (activities involving government and business). Such a comprehensive definition of e-government requires the use of multiple evaluative criteria and approaches.

2.2 Specific Criteria

One evaluation of e-government in this article will be based on a widely used model (Kunstelj et. al, 2004; Teicher & Dow, 2002; National Of-

fice of Information Economy & DMR Consulting, 2003) describing the following four stages of e-government development:

1. *Web Presence* – providing basic information on the Internet.
2. *Interaction* – providing more information, online forms to fill out and print, facilitating electronic communication with government offices, providing site search and links to other sites.
3. *Transaction* – offering full online transactions using electronic payment if required and including online delivery of receipts and documents.
4. *Transformation* – the long-term objective of e-government, with integrated services in a "one-stop shop."

Note, however, that these criteria evaluate e-government mostly in terms of the services provided electronically by the government for the citizens. They fail to evaluate whether the citizens can access these services, including both questions of citizen knowledge and of technological availability. They also fail to evaluate whether the citizens are ready and willing to access e-government. Therefore, we will also use the "holistic" approach suggested by Kunstelj and Vintar (2004). They classified indicators into four main groups: *environmental maturity*, *back-office*, *front-office* and *impact*. Their approach suggests that assessment should be focused, when possible, on "how much value the service brings to the citizen."

In order to apply these models, we need an understanding of the current state of information technology and of e-government in Moldova.

3 General evaluation of current Moldovan e-government

The hierarchical structure of government in Moldova includes the central national government, municipality (cities with separate administration sectors) and county (raional) government and local (towns, villages) government.

The central public administration consists of the Presidency, Parliament, Government, and other institutions attached to the Parliament or Government (National Bank, Accounts Chamber, national agencies, etc.), in total 36 institutions.

There are 5 municipalities, 60 cities and 917 villages (communes) in Moldova. In each of these 982 localities, the public administration is represented by a mayoral office. To those municipalities and villages belong another 697 localities, for a total of 1679 (Statistical Yearbook, 2008). Of the 60 cities, 40 are county centers. The public administration of each county is represented by a County Council.

We performed a census and evaluation of government websites in Moldova (without the Trans-Dniester region). Our census, ending 12 November 2008, found 52 functioning government websites in Moldova, as follows:

- central public administration – 33 institutions (91.7%), including 100% of the high public administration (Presidency, Parliament and Government);
- municipality and county public administration – 18 institutions (51.4%);
- city and village public administration – 1 site (0.1%). There are another 23 localities with websites, but they don't represent the respective governments.

These websites were assessed using the following six criteria:

- What is the available range of information and services?
- Which of the 20 services recommended by the European Union's eEurope benchmarking project are provided by the site? (Communication from the commission, 2005)
- What forms of feedback or e-communication are provided for the users?
- What is the level of maintenance (updating)?

- Can the website be searched?
- Does the website provide access statistics?

In our assessment, more than one third of those 52 are rich in information - they contain a significant amount of interesting and useful information. Especially impressive is the database of legal documents that includes more than 43 thousand normative documents concerning national law. The most visited is the main Government website (www.gov.md) - 888381 visits as of 12 November 2008. However, the sites rarely contain forms for feedback from the population to public administrators, with the exception of a few surveys and the ability to initiate online contact with specific people in public institutions.

As mentioned above, for the first e-Europe benchmarking exercise (Communication from the commission, 2005), the European Union approved a set of 20 e-government services to be used as benchmarks: 12 for citizens and 8 for business. Of these 20 basic online services only two are offered in Moldova and even these only partially: job search and access to state information. The state has taken some actions to improve this situation. The implementation of each of these 20 services has been assigned to a specific government organization (Ministry of Information Development, 2008), but no concrete deadlines have been specified.

Government of Moldova decision nr. 668 from 19 June 2006 requires the creation of websites of municipality and county public administrations by 1 October 2006, and of mayoralty and villages ones by 1 January 2007. Thus, by the beginning of 2007 all public administration institutions of Moldova were required to be present on the Internet. It should be noted, however, that this decision provides neither funding, which is left to the localities, nor specifics about what is required. This decision was a positive step, but as of November 2008, it has been incompletely realized.

Using this data, representing some aspects of Moldova's e-government development, we will evaluate Moldova's e-government according to the models discussed above. First, we will assess the four stages of *Web Presence, Interaction, Transaction* and *Transformation*.

Based on the information in our census, we see that Moldova's e-government has reached the first two levels of development: *Web Presence* and *Interaction*. Some databases are rather significant (e.g. the large database of legal documents) and there are some good websites (those aforementioned websites relatively rich in information), but even at these stages the presence is severely limited below the national level.

All the information and services available for customers represent only front-office functions, a kind of government façade, without a link with back-office processes and information.

The stage of *Transactions* is only at the very beginning, with ongoing discussions at different levels of government about the necessity of online transaction services. There is no evidence of real results in moving toward the "last" stage of *Transformation*. However, there are some government initiatives as preconditions for this stage, for example: "Design of the Conception of an Integrated System for the Circulation of Electronic Documents (by 1 August 2006)"; "Design of the Conception of a Governmental Portal (by 1 October 2006)," and the creation of the model of this portal to provide public services online (by 20 October 2006). As of November 2008, this portal has not yet been launched.

Although many functions and internal operations (back-office processes) are computerized, and have a rather good level of informatization, with many applications, these back-office systems are oriented to the existing administrative structures, and are not integrated with front-office systems. The next stages of development (*Transactions* and *Transformation*) will require significant reengineering of government processes and information systems.

At the time of our census, governmental units below the county level had almost no web presence. As we have noted, government in Moldova tends to flow from the national level down to other levels and it is no surprise that the level of e-government development in the central (national level) government is much better than in the local governments. But we have seen that there are government decisions, which were designed to implement elements of e-government in all local governments by January 2007.

4 In-depth Evaluation

Recall the second major evaluative classification, in which Kunstelj and Vintar (2004) classified indicators into four main groups: *environment maturity*, *back-office*, *front-office* and *impact*. We will now use this classification to take a more in-depth look at conditions in Moldova. Since we have already discussed back-office and front-office applications, and the disconnect between them, we will focus on environmental maturity and impact.

4.1 Environment maturity

Certainly, one of the necessary conditions for e-government implementation is an adequate level of ICT infrastructure development. But e-government can't be interpreted only as the implementation of ICT and the providing of information on governmental sites; these should be taken only as necessary technological preconditions. For an efficient and successful e-government, it is necessary to have a range of additional conditions, linked with the quality of the environment. Kunstelj and Vintar (2004) give the following eight main indicators of what they call "***environment maturity***": *adoption and use of information infrastructure, adoption and content of strategic documents and opinions on strategic documents, trust and security issues, digital divide issues, knowledge and skills issues, motivation and barriers to implementing e-government and to using e-government, financing the development of e-government, motivation and barriers to the development of integrated services.*

In other words, environment maturity is e-readiness: the readiness of the government and customers (citizens and businesses) for e-government processes. We have further classified their eight indicators into two groups, those principally concerning the technological and financial issues involved in providing and accessing e-government and those more concerned with social issues. While we realize that this division is approximate and some indicators straddle the categories, we want to emphasize that there are two major issues, the readiness of the

infrastructure and the readiness of the people, both outside and inside government, to use it.

Technological and Financial Issues

Adoption and use of information infrastructure

The current state of the ICT service market can be evaluated, roughly, by such indicators as phone penetration, the number of computers per 100 inhabitants, and the number of Internet users per 100 inhabitants.

According the National Regulatory Agency in Telecommunications and Informatics (ANRTI), in 2007 fixed phone penetration in Moldova was 30.3% (ANRTI, 2007). For comparison, fixed phone penetration in the United States exceeds 95%.

Mobile phone services began in 1998 (Voxtel). A second operator (Moldcell) entered the market in 2000, the third license was issued (to the state phone company MoldTelecom) in 2006, and a fourth operator (Eventis Mobile) entered the market in 2007. In 2007, mobile phone penetration reached 52.7%, having overtaken that of fixed phones several years before (Statistical Yearbook of the Republic of Moldova, 2008). But in comparison with Romania (106.7%), Ukraine (119.6%), Russia (114.6%), Belarus (61.4%) and Bulgaria (129.6%), the mobile phone sector in Moldova lags behind (International Telecommunication Union, 2008). The evolution of fixed and mobile telephony in Moldova in 2000-2007 is shown in fig.1.

The fraction of the information and communication technologies sector in the GDP has increased from 6.3% in 2002, to 10.1% in 2007 (Statistical Yearbook of the Republic of Moldova, 2008). In 2007, the value of the ICT service market reached nearly 5.40 billion Moldovan lei ($519 million), of which 4.19% consists of Internet access services (Statistical Yearbook of the Republic of Moldova, 2008, ANRTI, 2007).

In 2005, the number of users of Internet access services by dial-up showed an increase of 26.9% Y/Y. This increase was due, mainly, to the extension of point of presence of alternative operators in county centers, and to the reduction in the fees for the use of this service from 42 bani per minute in 2004 to 8.4 bani per minute in 2005 (ANRTI,

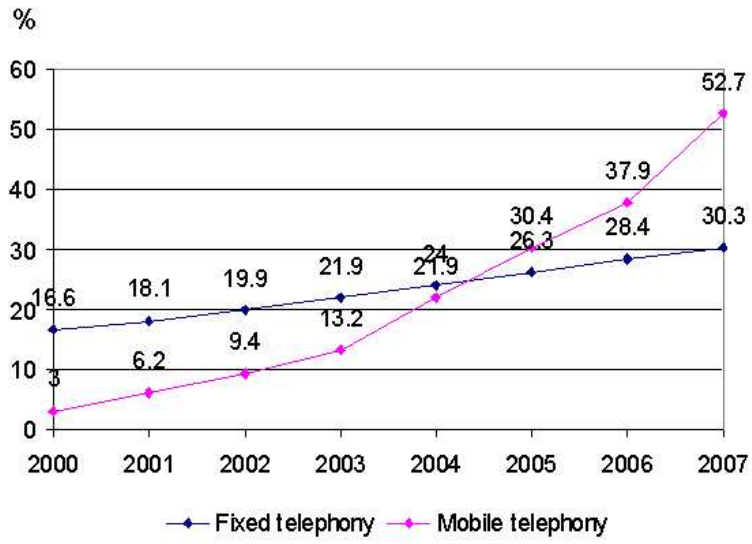

Figure 1. Evolution of fixed and mobile phone penetration

2005). In 2006 this rate was down to 7 bani per minute everywhere in Moldova. In 2007, the number of subscribers to services of Internet Access Providers increased 33.2% over the level of 2006.

The changing number of Internet users per 100 inhabitants is shown in fig. 2; it is, practically, linearly increasing. Internet use penetration in Moldova in 2007 (18.45%) was less than in Ukraine (21.64%), Russia (21.05%), Bulgaria (24.94%), Romania (52.24%) and Belarus (61.93%) (Statistical Yearbook of the Republic of Moldova, 2008; ITU 2008). The evolution of computer usage in 2001-2007 years is reflected in fig. 3 (Statistical Yearbook of the Republic of Moldova, 2008). In 2004 there were 3.2 PCs per 100 inhabitants in Moldova, more than in Ukraine (2.8 PC), but less than in Bulgaria (5.9 PC), Romania (11.3 PC), and Russia (13.2 PC) (ITU, 2004).

By 31 December 2000, 14 ATMs and nearly 200 Point Of Sale terminals had been installed. Payment by electronic cards in 2000 constituted only 0.6% of total consumer sales. Although this was small,

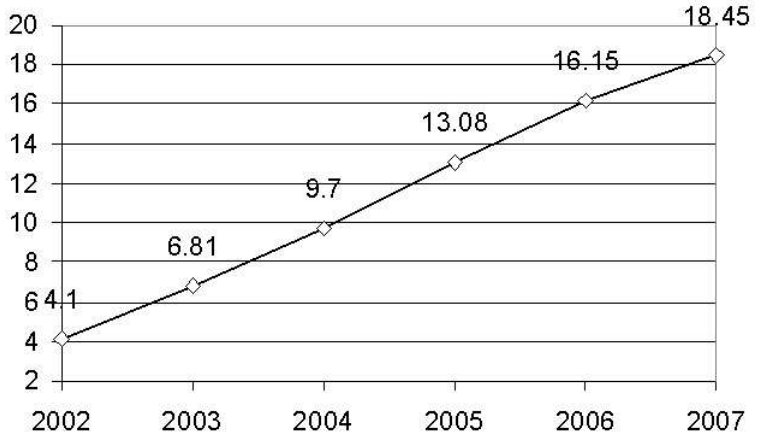

Figure 2. Number of Internet users per 100 inhabitants

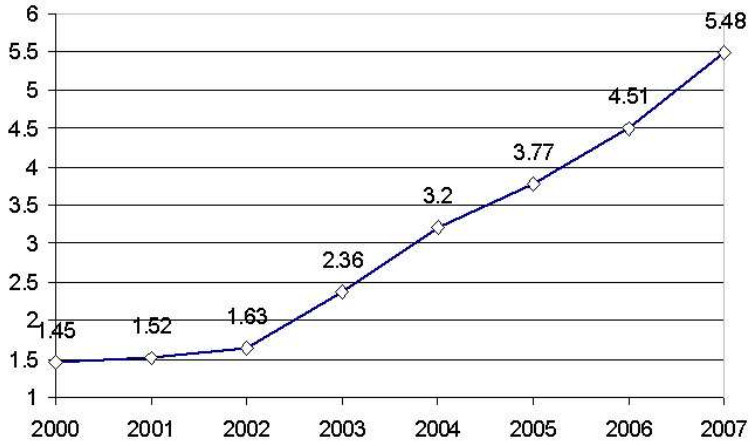

Figure 3. Number of PCs per 100 inhabitants

analysis of payment services using electronic cards shows that this sector is developing at a high rate. The number of cards per 100 inhabitants was 1.5 in 2001, 4.4 in 2002, 10 in 2004, 12.7 in 2005, and 19.0 in September 2008 (Banca Nationala a Moldovei, 2008). Of the 16 commercial banks in Moldova, 12 banks offer electronic cards. It should be noted that Moldova has done a generation skip in this technology. Very few Moldovans have used checks, but they are now beginning to use bankcards.

The indicators are significantly lower than in developed countries, but comparable with other countries in the FSU. As mentioned above, the fraction of the GDP that is generated by Information Technology industries has seen robust growth. The mobile phone and cable Internet markets continue to grow. Even in Moldova's complicated economy, ICT has grown and should continue to do so. Although this growth is not fueled by e-government needs, it will serve them.

Adoption and content of strategic documents

Moldova continues to be a country in which central government decrees are necessary preconditions for action and change. The government has adopted a wide range of documents related to strategies and action plans for e-government development. Notably, the President of Moldova issued, on 19 March 2004, a decree "Regarding the edification of Moldova's information society" nr. 1743-III. After this decree a series of Parliamentary laws and Governmental decisions in this domain has followed, including a law "Regarding the electronic document and digital signature" nr. 264-XV from 15 July 2004; a law "Regarding electronic commerce" nr. 284-XV from 22 July 2004; the Government decision "Regarding the National strategy for the edification of the information society - Electronic Moldova" nr. 255 from 9 march 2005; and the Government decision "Regarding the Conception of electronic government" nr. 733 from 28 June 2006.

The conception of electronic government foresees, for example:

- Preparation of the Design of an integrated system for the circulation of electronic documents (by 1 August 2006);
- Preparation of the Design of a governmental portal (by 1 October

2006), and creation of the model of this portal to provide public services online (by 20 October 2006);

- Preparation of proposals regarding the creation of the Center for electronic government (by 15 September 2006);
- The adoption of Methodological norms for instruction and certification of public functionaries in information and communication technologies (by 1 September 2006);
- Preparation of an annual plan of actions for the implementation of electronic government.

Analysis of the content of these strategic documents shows that the Moldovan Government has, generally, taken into account best practices accumulated in industrialized countries in the field of information society and e-government development (Relyea & Shuler, 2001; Wong, 1996; Kraemer & King, 1996). These documents are designed to encourage the development of different aspects of the information society, and of e-government. At present, it is too early to assess the effectiveness of the projects envisioned by these documents.

Financing the development of e-government

We have already discussed some investments in e-government. But these government investments were not enough to support modern requirements. As mentioned above, external support helped, although corruption lessened the desired effects (Lambsdorff 2001). Financial conditions have been better, with a more stable budget, since the organisation of an independent Ministry of Information Development in 2004. Prior to this, Informatics had not existed as a separate Ministerial level division. It had either been a lower level division, or had been subsumed in the Ministry of Transport and Communication and had been plagued by erratic financing.

Social Issues

Trust and security issues

It is well known that computer information systems are more vulnerable than traditional paper-based information systems. Research

shows that concerns about security can be a major impediment to the development of e-government (Teicher & Dow, 2002). In our opinion, trust is a very important factor not only for the different structural parts of the government, but especially for relations between citizens and e-government.

Since most aspects of this problem of trust and security are common to all countries, including Moldova, we will mention only some things specific to Moldova. The level of trust in online environments is rather low in Moldova. Recent radical changes in the country have lead to many losses. For example, most people lost all the money they had in the banking system, and corruption during the transitional phase after the break up of the Soviet system caused many problems. This has had a negative impact on the measure of trust of citizens in government in general and in modern institutions (including e-government), in particular. The situation becomes worse in the context of additional factors such as insufficient ICT skills and security.

In 2005, three elections for the mayor of Chisinau were invalidated because the turnout was below the legal minimum of 33% of the registered voters. Some scholars have argued that online/internet voting can be used to increase voter participation. Despite this, widespread distrust among the general public would make it extremely difficult to use e-voting in Moldova. In fact, voting in Moldova is still done using paper ballots.

Indeed, we can see a lack of trust in the field of e-commerce, e-cards, and so on even among sophisticated academics. Even in technical departments, the implementation of e-cards for the receipt of academic salaries was not welcomed voluntarily, but rather was imposed by administrative fiat.

Digital divide issues

One of the well-documented (Teicher & Dow, 2002; Relyea & Shuler, 2001) factors that impede the spread of e-government is the digital divide, the disparity in access to computers and networks among different groups of society. Some reasons for poor access include "lack of financial resources, living in remote areas, disabilities, and lack of education and/or language skills" (Teicher & Dow, 2002).

Moldova is a compact country with a high density of population, and thus, has no real problems with remote areas, although the penetration of technology into the villages is much less than into the cities. Despite a population containing many ethnic groups, there are also no essential problems with language skills. The two languages known by almost all people in the country (Romanian and Russian) and English as an international language are used in most government websites. The main problem is the lack of sufficient financial resources. Nevertheless, many steps have been taken to make computers and the Internet accessible to a larger part of the people.

Knowledge and skills issues

As mentioned above, the use of ICT services can be significantly limited by an insufficient level of related skills. Even in the most advanced countries special attention has been paid to this. In Moldova, there have been a number of positive efforts in this area, chief among these are:

1) Efforts of the Ministry of Education and the Ministry of Labor and Social Protection designed to improve instruction in the ICT fields for students and other citizens.

2) The adoption of Methodological norms for instruction and certification of public functionaries in information and communication technologies (by 1 September 2006).

Of special importance in the support of instruction in informatics for employees is the role of the private sector. Managers of companies (in most cases members of the younger generation, with new education and vision) understand the strategic importance of using modern information technologies as a support for daily activities, and support instruction of personnel. Moreover, they encourage the development of informatics knowledge in potential employees, leading to improved instruction in informatics for graduate students. In practice, it is now impossible to find a good job in a modern company or organization without skills in ICT.

Moldova has a relatively good system of education. It is significant that specialists with higher education (i.e. with university qualification) make up 11.2% of the population in Moldova compared with, for example, 16% in Germany (University Degrees, 2003).

Motivation and barriers to implementing e-government

The general motivation for implementing e-government is the same as in other countries: e.g. increased convenience for citizens, better informed citizens, increased citizen participation in many aspects of government.

Thus, we will address only some specific aspects. Access to government information and the providing of more advanced e-government services do not depend only on the level of ICT penetration. To a great extent it depends on the readiness of the society to reach a certain level of access to information (government openness). Although, theoretically, Moldova's society has chosen the strategic way towards democracy, the actual state is still far from ideal. It has proved to be the case that it is not enough to declare a democratic society, it is necessary to build it step by step, and it is a long path, depending not only on the government but on the citizens, too. They are not accustomed to pushing for their rights, an activity which might well have been fatal in the USSR. This "culture" is changing in the new generation, albeit slowly.

In such a situation, even a high level of ICT development in the country won't lead to a full use of the opportunities offered by e-government. E-government in these conditions might be merely a façade to cover internal traditional bureaucracy, supporting the functioning of bureaucratic structures, not citizens. On the other hand, we should note that e-government makes it both easier and anonymous to obtain government information. This is one major way that e-government can help foster the rights of the people in developing countries.

Motivation and barriers to the development of integrated services

Again, the motivation for the development of integrated services

is similar to that in other countries. Specific obstacles are similar to those to implementing (the simpler) e-government we have just discussed; however, given the existing level of democracy and the traditional bureaucratic culture, implementing and developing integrated e-government services, which require much more cooperation, would face even more difficulty at present. This is a challenge for the future.

4.2 Impact

We do not know of any prior systematic research on the impact of Moldova's e-government. Certainly the major positive effects of e-government, including improved, more convenient and faster citizen services, should hold in Moldova.

We do wish to note that e-government has a special role to play in a developing country like Moldova. The development of ICT and e-government can lead to greater involvement of the people in governing, and hence to a strengthening of democracy (Bolun & Lupan, 2004). The active interconnection between citizens and different levels of government, based on on-going feedback, can be an efficient engine for solving complex problems.

However, we need to emphasize that these positive effects will be totally realized only after reaching the next levels of e-government development. These levels cannot be reached without better integration of e-government services, orienting them to life-events.

A survey of university students' and teachers' perspectives on e-government in Moldova

In order to assess some aspects of the impact of e-government on the citizens of Moldova a survey was undertaken in the Academy of Economic Studies of Moldova (ASEM), one of the largest universities in Moldova. The aim of the survey was to assess to what extent students and teachers are accessing e-government services. A questionnaire was mailed to 600 people. Responses were received from 293 students and 157 members of the teaching staff (faculty), from all departments of ASEM.

In the four IT-specialized Departments 40% of student respondents

and 67% of teacher respondents use Internet access time to visit different government sites. They are mainly looking for information: laws, decisions, government documents, newspapers and information about political parties, etc. Recall that our census revealed that this is really all that can be done on government sites at this time.

In non-IT departments the results look very different. First of all, while there was a 100% response rate among students, the participation of teachers in the survey was much less (only a 47% response rate). After the fact, nonrespondents explained that they don't use the Internet to access e-government. Taking this fact into consideration in overall statistics, we see that teachers access the Internet, generally and more specifically for e-government work, more rarely (16%) than the students of these non-IT departments (35%).

We asked for suggestions for the improvement of e-government services. The proposals we received were formulated by students from across the campus and by IT professors, but none came from teachers of non-IT departments.

As expected, professors in the IT-specialized departments use websites in research and preparation. Outside of those departments, the students seemed to be more engaged with e-government and more ready to use e-government services. Note that ASEM is an institute of Economics and Business, and all the faculty at ASEM, including those in non-IT departments, have access to and some knowledge of technology.

In Moldova, University students are almost all of "traditional" age - between 18 and 23. Today, the average age of professors is higher than in the past, because few young scholars are choosing the profession, which is poorly paid in Moldova. Our work also confirms that, at least within our specialized survey population, people are accessing the e-government sites. This population is characterized by both familiarity with and access to technology. Among professors, the more technically literate groups clearly access e-government sites more often. While this is also true among the students, the difference is smaller, and a significant percentage of both IT and non-IT students report using e-government. None of this is surprising and this research clearly needs follow-up work, but it does emphasize the need to take special

measures in order to increase IT availability and literacy in all parts of the society. It also seems to confirm our hypothesis that the acceleration of the development of information society and e-government services is possible mostly because of the younger generation.

5 Possible future directions of e-government development

We will now examine existing obstacles impeding the development of e-government and factors contributing to its development, and will formulate some suggestions on future directions. Analyzing the actual situation in e-government development in Moldova, we can see a range of negative and positive factors that could impede or contribute to the further development of e-government.

5.1 Positive and Negative factors influencing e-government potential

Positive factors

1. The growing worldwide information society environment, which facilitates transfer of experience to developing countries.

2. A generally strong program of Government initiatives.

3. Doing informatization and re-engineering of public institutions in parallel enables informatization to be done once, in accordance with the best practices accumulated in the field.

4. The small size of the country could be a positive factor in building its information society, as suggested by the work of some authors, including Pawłowska (2004).

5. Moldova has a good system of education, and quite a high level of literacy and human potential in the IT field.

Negative factors, existing obstacles to e-government development

1. A relatively weak information infrastructure in rural areas.
2. Complications linked with transitional processes in Moldova, when the processes of informatization and re-engineering of public institutions are taking place in parallel. While this could be an advantage, as we suggested above, Pawłowska (2004) argues that such conditions increase the risk of unsuccessful informatization.
3. There is currently a dilemma in designing Management Information Systems for the transitional period. It is widely accepted among Moldovan ICT professionals that centralized planning, coordination and control are proper only for Soviet regimes, and, once we build a new society, based on democratic principles and a market economy, we don't need centralized command and control at all. However, it seems impossible to build the integrated information space of an information society, including e-government, without well-organized information management. In the most developed countries with the highest level of information society and e-government development, we see a lot of examples of the positive role of government initiatives, strategies, and coordination of the processes of informatization. In fact, the best results in this field were obtained in those countries where there are centralized permanent organizations and coordination of the process of informatization. We will return to this important social dilemma immediately in our proposals for the future.

5.2 Proposals for future directions in e-government development

The dilemma discussed at the end of the last section lies near the heart of the process of democratization in Moldova. While wishing to avoid centralized control associated with their Soviet and czarist pasts, Moldovans are often attracted to the efficiency, and to the familiarity of the strong center.

There are good arguments for central government involvement in the process of developing e-government. Analysis of the experience of leading e-government countries shows that successful e-governments do not come about accidentally. On the contrary, they are the result of purposeful and well-organized government activities, of a well-determined strategy, laws, government decisions and specialized organizational structures. The government has played such a guiding role in e-government in, for example, France (Acaud & Lakel, 2003), the USA (Janssen et. al., 2004; Kramer & King, 1996), Hong-Kong (Poon & Huang, 2002), and the EU (Lee, Tan & Trimi, 2005).

In the USA (Relyea & Shuler, 2001; Kramer & King, 1996), we can see a very well-defined strategy on developing national information infrastructure and an active governmental position in promoting coordinated information management efforts, designed to minimize unnecessary duplication of effort, capitalize on successes, and "promote the development of innovative technologies, standards, and practices among the agencies, state and local governments, and the private sector."

Similar initiatives have been undertaken in other leading e-government countries, and we'd like to emphasize the importance of coordinating efforts in e-government development.

In France, the Agency for Information Technology in the Administration played a supervisory role of providing expertise and guidance to various administrations (Acaud & Lakel, 2003). The government in Hong Kong organized an e-Government Coordination Office, which was established to plan and oversee the e-government policies and initiatives, including the ESDLife project mentioned above (Poon & Huang, 2002).

The experiences of Poland (Pawłowska, 2004), which is very similar to Moldova, confirm the necessity to involve the government in the coordination of ICT projects. Two departments with activities directly related to information society development were established in Poland. One was the Department of Information Society, which is mostly a coordinator of projects dealing with information society and e-government.

In this context, we note that, although the Government of Moldova has undertaken a range of useful e-government initiatives, following the best practices of advanced countries, it would seem to be necessary to recommend an increase in the role of the central government in promoting and organizing the further development of e-government and extending it at all levels of local governance.

Indeed, given the current political environment in Moldova, it would seem essentially impossible to accomplish anything without such an increase.

However, Moldovan scholars are likely to understand this recommendation differently than we mean. It is vital to notice that we have described the roles played by central agencies as "guiding", "providing expertise", as a "coordinator," etc. Even these words might be misunderstood, so let us be very clear. We are recommending a stronger role as facilitator, as coordinator, but not as dictator, or as "the" deciding agency. In contrast to what is often assumed in Moldova, the existence of a central agency does not require that it be absolutely superior to everything else.

This difference between the western view and an all-too-common post-Soviet view leads us directly to another recommendation. The creation of the information society and its components requires very large ICT projects with significant risks of failure. To ensure the success of such large-scale projects, it is necessary to organise them very well and to coordinate them at all levels of the hierarchy (both vertically and horizontally). We recommend that the government organisations with concrete responsibilities involve experts, both researchers and practitioners, from academia and industry in the discussions of major e-government and information society projects. We also note that it is necessary to consult representatives of the citizenry that is to be served. In other words, we strongly suggest that governments listen to people from outside.

Let us illustrate this with a more concrete example. A next possible stage of Moldovan e-government development is to increase the informatization of the county (raional) level. There is a significant volume of work and cost involved, hence it is necessary to find ways to

accomplish this in the shortest possible time while economizing severely limited financial resources. Practically all governments in Moldova at the same level of hierarchy (county level, city, village level) have very similar structures and functions and offer similar services to citizens. In these conditions, the most economical way to solve the problem of effectiveness of informatization is the design and implementation of prototypical, standardized projects for all governments at each level. This would minimize duplication and expenditures. But we do not mean that the design has to be done by the national government, which might be the immediate traditional Moldovan reaction. It could be done by a few counties with the expectation that the best practices would then be shared. It could even be done by an NGO. However it is done, care must be taken to assure that prototyping does not restrict creativity too much.

In recommending a more inclusive, more democratically-inclined, yet still central organization, we are aware that there will be difficulties. However, this is a strategy that can be used within the current Moldova. In addition to this recommendation, we have a several more suggestions which we will discuss briefly.

Continue a National strategy for making ICT accessible to all citizens. The Clinton administration, on 9 December 1999, issued a presidential memorandum (Relyea & Shuler, 2001) designed to foster computer and Internet use among all Americans. Moldova needs e-government efforts like this initiative, designed to make computers and networks available to all citizens. It is worth noting that Moldova does have an innovative phone-based Internet service that requires no registration and is relatively inexpensive (about $0.32/hour).

Restructure, don't merely automate. It is necessary to avoid the easy way of creating e-government, based merely on traditional bureaucratic structures and their operations. The idea that e-government should be oriented to support needs of citizens, not the functioning of bureaucracies, is commonly promoted by researchers (Janssen et. al., 2004; Kunstelj & Vintar, 2004; Lee et. al., 2005; Poon & Huang, 2002; Teicher & Dow, 2002). To really enhance public services, e-government should be based on the integration of government processes, external

(online) and internal information services and systems.

Use Integrated Quality Management in e-government services. The initial deployment of e-government at the local and national government levels will be only the start of an ongoing process of evolving e-government. Active online citizens should develop new interests in and requirements for government services. This, in turn, should accelerate the development of e-government. This can be facilitated by the use of Quality Management of Information Services. This is a relatively new subfield of Information Management. It provides methods to evaluate systems on the basis of on-going feedback that measures user satisfaction with the offered services (e.g. usefulness of services, access to services, quality of information, timeliness). Our recent research suggests that it can be an efficient subsystem of integrated information management (Costas, 2005). The collected information can be used for generalisation and further improvement of the system and services. This feedback loop facilitates democracy in action, enabling organizations to better monitor customer satisfaction and to more rapidly incorporate customer suggestions for improvements into future e-government activities.

Integrated record management. As mentioned by Mittal et.al. (2004), record management is one of the most essential and widely used services in the e-governance framework. It is necessary to "provide a record management system to electronically capture, preserve, manage, protect, and ultimately dispose of records" (Mittal et.al., 2004). Our research in the field of information management (Costas, 2003; Costas, 2004) has argued for the necessity of an integrated document management system, including record management. This is one of the e-government functions that can be totally unified and realized as a typical project and application to be disseminated to all local e-governments.

6 Conclusions

In Moldova, the best situation in e-government has been reached at the national level, and very little has been done at local levels of gov-

ernment. With better organization and coordination of informatization, involving independent experts in the discussion of ICT projects, Moldova could have reached a much better level of e-government development even in the difficult conditions the country has faced during the last 17 years. Parallel development of e-government and total reengineering of government structures has certainly complicated the development of e-government, but at the same time, this could have been a good opportunity. This situation could have been used to develop new structures and government processes (back-office and front-office) to offer integrated e-government services. Unfortunately, this opportunity was lost in the conditions of transitional chaos.

Achievements are more modest than potential and conditions admit. But we believe that Moldova has a good chance to overcome its transitional problems. Certainly, ICT and e-government cannot wait until the process of democratization is finished. It is necessary to continue the process of ICT spread, because it synergistically accelerates the development of other components of the information society, including democratic changes. For example, the Australian federal government addresses these innovations, claiming that "ICTs have the potential to act as a catalyst for greater social interaction and community participation" (Teicher & Dow, 2002).

Even if the actual state of e-government is not yet as developed as is desirable, e-government in Moldova can make some contributions that e-government cannot make in more developed countries, where democratic traditions are more firmly established. It can accelerate the democratization of the society by promoting government openness, by making information more accessible, and by making government more accountable to its citizens. It can allow citizen-government interactions to be more anonymous, helping to encourage citizens scarred by years of totalitarian rule.

Although ICT infrastructure in Moldova is still not developed enough, the penetration and adoption rate of ICT is comparable with the rates of other transitional countries, sometimes even higher.

There are other positive factors, which can contribute to further essential development. The most important of these are a good literate

human potential and a good system of education, particularly good in the ICT field; a favorable geographical location (almost in the central part of Europe), with a relatively favorable environment, consisting of countries with a relatively high interest in e-government (Ukraine, Romania, etc.). In these conditions, with support from developed countries, Moldova has a good chance to make essential movement towards new levels of e-government development.

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