

## E-government: from E-registration and E-information board to E-governance

Aleksiej Iurasov<sup>1,2a</sup>

<sup>1</sup> Department of Business Management,  
Vilnius Gediminas Technical University, Saulėtekio avenue 11, LT-10223 Vilnius, Lithuania

<sup>2</sup> Vilnius Business College, Kalvariju str. 125, Vilnius, Lithuania

*Received 11 November 2015, accepted 15 December 2015*

**Abstract.** This article is both theoretical and an applied one. It is actuality determined by the necessity to form the theoretical background for setting up the e-government. Sometimes practical applications are carried out in directions, which are not covered by applied scientific developments. This is the reason for the low efficiency of e-government projects implementation. Unlike similar projects of corporate automation, investment in e-government does not lead to a significant reduction in public spending or qualitative changes in governance. At the time when the business is developing management innovation create new business processes and organizational forms, such as virtual enterprises, the state automates the business processes of the 20th century.

**Citations:** Aleksiej Iurasov. E-government: from E-registration and E-information board to E-governance – *Innovative Infotechnologies for Science, Business and Education*, ISSN 2029-1035 – **1(18)** 2015 – Pp. 3-6.

**Keywords:** e-government; e-governance; Decision Support Systems (DSS); balanced scorecard (BSC); Key Performance Indicators (KPI); geographical information systems (GIS).

**JEL:** C82 - Methodology for Collecting, Estimating, and Organizing Macroeconomic Data; E61 - Policy Objectives; Policy Designs and Consistency; Policy Coordination; H11 - Economic Impacts of Globalization: Policy; Structure, Scope, and Performance of Government; O38 - Technological Change: Government Policy; R50 - Regional Government Analysis: General.

**Short title:** E-government.

### Introduction

For the moment being there is no common concept of the electronic government. There is only a set of general requirements defined by the citizens and businesses to be accepted by government of information society. Various categories of consumers are united in aspiration to receive more effective access to the information in order to reduce cost of transactions, to make interaction with state structures simpler, faster and more comfortable.

Practical work in this direction is not always based on the up-to-date scientific developments, and sometimes the work is carried out in directions, which are not covered by applied scientific developments. This is the reason for the low efficiency of e-government projects implementation [1].

Automation of work of the state (in the form of creation of the e-government) is at the initial stage of theoretical judgment, development of technologies, instruments and mentality of the government and the society [2]. Thus, in the current scientific workouts and also in published articles and reports of the conferences a great attention is put on the private questions: differences in the implementation of e-government services between developed and developing countries [3]; to characteristics of the implementation of e-government servi-

ces in particular countries [4]; to awareness of citizens and businesses of the expected effect of the use of electronic government services [5]; to assessing the development of e-government [6-8].

The majority of authors usually approach the description and problem solving empirically [4]. This approach is characterized by general discussions about the principles, lack of mathematical modeling links, economic calculations, software engineering as the single system, government's support in decision-making [2]. It is caused by absence of the complex scientifically-proved approach to construction of electronic system of a government administration, the general standards of its functioning focused on improvement of quality of life of the population, growth of competitiveness in the given territory and other strategic targets. Very often under the name of "the electronic government" is given to separate sites which enables citizens and the enterprises making transactions with the state (or getting state services).

This brings a certain confusion of concepts: "Electronic government" is understood as the "Electronic information desk and registry" which is deprived from the functions of management in a territory on the basis of the advanced information technology [9].

<sup>a</sup>Email: aleksej.iurasov@gmail.com

## 1. Research analysis

In order to understand the difference, let us focus on definition: the electronic government represents the system of the government based on automation of all administrative processes at the national level and serving as objective a significant increase in the efficiency of the government [9]. The above-mentioned approach can not give neither the "significant increase in the efficiency of the government" nor "automation of all administrative processes at the national level".

The functional capabilities of the "automation of all administrative processes at the national level" will be illustrated by several examples. Suppose that the information accumulated in the automated systems of public institutions is processed on the basis of Data mining and aggregated into layers of GIS e-governance. Furthermore, becomes available in different levels of decision-making in a Decision Support System (DSS) executive authorities, which increases the speed and quality of decision making. Standard applications and algorithmic approach may be applied in several cases:

1. Handling investor who wants to build a plant for the production of building materials, the system will determine the optimal location of the enterprise. To do so, all necessary information is extracted from corresponding GIS layers: human resources, roads and engineering infrastructure, natural resources (sand, gravel, etc.). Thus, there are considered the priorities of territorial development such as support for depressed areas (high unemployment, low tax flow in municipal budget, etc.) and the options for the plant with their detailed argumentation are provided.

2. A serious seasonal task for the authorities becomes spring flooding. Flood forecast by meteorologists leads to the automatic calculation of the probability of loss for all the objects within the flood zone and flooding. The loss is defined on the grounds of the objects located in the terrain landscape according to GIS. For such purposes the information about the objects of engineering infrastructure, buildings and facilities, storage of hazardous chemicals and waste management, enterprises and farms, sites of cultural and historical value, etc. is used.

Furthermore, in order to find a solution, the system requires to specify the costs of flood prevention for specified areas. It might be applied to the large-scale projects, such as dam construction etc. Otherwise apart from running costs (but including costs of new working places, income tax, etc.), the costs of evacuation of people and property during the time of flooding (based on the size of compensation for the lost property) and the costs of people transportation/relocation are taken into the consideration. The system will output the summary which allows us to make well-grounded decisions on elimination of dangerous flood consequences. In some cases shore reinforcement and the construction of a dam will be accepted, in other cases, relocation of road or/and electricity transmission lines into safe place. Exceptional cases might require fund allocation for the evacuation of several elderly residents of a deserted village and compensation for the farm property losses.

3. The monitoring of economic, social-demographic, urban planning, natural- environment, etc. situation in the

country in real time is reflected on the government website by means of Key Performance Indicators (KPI). For example, you can see a negative dynamics of indicator "standard of living". By clicking the button it enters the section of indicators that shows the standard of living. Firstly, there you can find the ratio of infected by influenza and healthy people is close to the level of epidemiological proportion and anti-epidemic measures should be carried out. Secondly, the increased mortality rate in road accidents requires necessary investments in road lighting and/or improvement of the road police activity. Thirdly, due to the increase in cardiovascular diseases, necessary prevention activities should be taken into the consideration.

4. Multi-type information systems of different public services will either be unified or replaced by a single integrated system (ensuring information transparency at all levels). For example, in the unified system all business processes of public servants will be reflected in the form of KPI indicator changes.

5. The State government could be treated as a mathematical function due to the following approaches:

- a) target values of the main socio-economic indicators have been approved by elections (e.g., "standard of living");

- b) there are well-known formulas for calculating the indicators;

- c) there is information about the decision taking (there is a possibility to check how the *claimed* goals pass toward the *declared* goals);

- d) the final result is formulated (for example, changes in the value of the index "standard of living").

6. It will be possible to choose not politicians that give certain promises, but the system of government objectives. For example, one politician proposes to increase the value of "standard of living" by improving the indicators included in the formula for calculating the "standard of living" taken from the sections "Health" and "Education". Whereas, his opponent in the elections demonstrates the feasibility of increasing the value of "Competitiveness of the territory / country", while improving "the ease of doing business level", "Investment attractiveness" and "Security". The opponent also argues that in the long term it will lead to the growth of "standard of living". The opponents operate on exact figures.

7. DSS of e-government collects the information on all decisions taken and the reasoning for retrospective analysis. The described solutions play an important role in increasing transparency, accountability of the government officials and focus on the implementation of strategic goals of e-government.

Apart from quality indicators mentioned above, technology of Decision Support System (DSS) and Business Intelligence (BI) are used for the operation of public administration. Taken together, these technologies are used to enhance the efficiency of public administration, and represent an integral part of the concept of government intelligence.

The database collected for manipulating purposes should combine all the information of public organizations and in the future will become the largest repository of information ever created by man. Accumulation of information could be proceeded by means of Data mining technology (auto-

correlation, clustering transactions, Self-organizing Kohonen map, Expectation-maximization (EM) algorithm, logistic regression, neural networks, decision trees, etc.). The extraction and evaluation of the selected/sorted information will allow data user to develop the effective algorithms for decision making system.

Another important problem is the establishment of e-government. It means that the processes of re-engineering of the government, based on the principle of full use of new opportunities, must be provided by modern information technologies. The traditional offline business processes and organizational structures of the government are not effective in the information society.

The experience how to tackle the problem can be borrowed from the corporative automation area which is based on ERP technology. A key task is formulated as follows: a) forming a single logic of business processes of public administration; b) optimization in order to increase public efficiency; c) giving maximum transparency in these processes. In order to implement this task, the tools of modeling and optimization of business processes should be used (BPM) [10].

Fig. 1 represents structure of e-governance GIS.

## 2. Unification and standardisation

In addition, some problems, which are typical for the initial phase of corporate automation, must be solved in order to establish e-government. For example, "flap automation", when part of the functions (business processes) are automated using a wide range of often incompatible systems that operate separately [1].

Firstly, the implementation of this approach within the EU will require unification of the power structures, clearly constructed and formal logic of the actions of public officials. For example, currently the executive authorities in the different Member States are different in both: their structure and order of related functions. The structure, as well as the procedure for allocation of responsibilities and the algorithms for performing state functions will eventually be unified.

In some cases, it is advisable to create some unified interstate standards for e-government. For example, among the EU countries there is quite high mobility of the population which makes it feasible to develop a unified structure of electronic passports for all EU member states (smart cards with certificates of electronic digital signature or biometric identification information, passport data, hospital card, medical insurance, diplomas and certificates of education, driver's license and documents of the state registration of rights to real estate, banking and billing information, etc.).

Secondly, the executive level of e-government uses several technologies presented below.

1. Citizen relationship management (based on CRM- technologies - in this case, instead of customers are the citizens, instead of commercial goods and services - government services) built on the "single window" principle. To provide a personalized service, taking into account individual circumstances and demands of people, all services and information

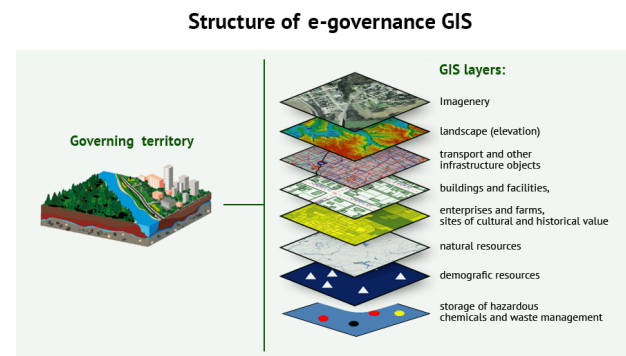


Fig. 1. Structure of e-governance GIS.

should be organized not in terms of the structure of the state (by departments and agencies) but from the point of view of the citizens (in accordance with any events in the life of people). These life events or "episodes" can include birth, marriage, death of loved ones, change of residence and admission to the educational institutions, the own business organization, etc. Experience gained with the help of Data Mining and Business Intelligence (BI) is used (In commercial CRM-system) to improve service and increase customer satisfaction. This experience will also benefit in e-government.

2. E-taxes involve declaration and payment of taxes, fines and fees. Statements may be available not only under quarterly basis but also automatically in real time. The possibility of e-tax declaration may extend the order of tax payment which entails a revolutionary change in taxation.

3. Knowledge management involves the expert systems, based on artificial intelligence and Internet technologies, in order to improve the quality of administrative work, to reduce the execution time and to automate the processing of stored information.

## Conclusions

The results of the implementation of science-based approach to the construction of e-government influence the formation of an information society to a much greater extent than the results of the currently accepted empirical approach.

Major changes will occur in the sectors of e-government as G2B (government to business - as a provider of services - the state, as well as a consumer - the business), G2G (Government to Government - in which entities on both sides are interacting - the state institutions), G2C (government to consumer - as a provider of services - the state, as well as a consumer - a real person).

Those who criticize the position of algorithmization activities of government officials claim that in politics often it is necessary to make decisions that cannot be justified in the achievement of the strategic objectives of Balanced Scorecard (according to decision at governmental level). For example, a politician can make decisions that may result not in growth but in declining of value in "living standards of the area". However, this argument cannot be accepted because

this parameter (described by official in DSS system) represents the value or expression which not corresponds to the strategic objectives. Moreover, there are no formalized personal goals related to politics or its affiliated structures. Thus, this point of view does not indicate that the goals are of higher priorities than the target growth of living standards.

It should be noted that for certain states and developing companies the creation of an integrated DSS governance encompass difficult and complex project. The problem of project implementation at this level is closely associated with shortage of resources. The solution of the implementation problem at governmental level depends on the development of an open architecture DSS (starting with the structure of the GIS, KPI and BSC libraries). This will involve the creation of a library devoted to the decision-making algorithms alongside with the participants and stakeholders from different countries. As an analogy, you can offer an open architecture IBM PC (involve the creation of the personal compu-

ter industry by designers and manufacturers from around the world) and a consortium WWW (provide open standards for growth and development of the Internet). The transparency of decision-making mechanisms in e-government should be grounded from the first step of its development.

To stimulate this process, national laboratory "Standards decision support algorithms in the framework of e-government" may be established.

Historically, the Internet occurrence is related to the construction of the network services to meet the needs of public organizations. To solve the technological task (how to improve the reliability of net) the founders of the Network have implemented such mechanism of an information exchange which allows us to organize the connections among customers on a modern level of computer development and telecommunication technologies, which are more suitable in realizing many base functions of the state management.

## References

1. Stanimirovic D. Vintar M. . Conceptualization of an Integrated Indicator Model for the Evaluation of e-Government Policies. – *Electronic Journal of e-Government* 11(1) (2013) 293-307.
2. Iurasov A. Electronic government: development of the scientifically-proved concept. The use of multidisciplinary research for the introduction of new training programs/modules and/or new teaching methods in the field of E-Commerce. – Proceedings of the international conference of the "ECOMMIS" TEMPUS project. TU Berlin, 2012.
3. Chen Y.N., Chen H. M., Huang W. E-Government Strategies in Developed and Developing Countries: An Implementation Framework and Case Study. – *Journal of Global Information Management* 14(1) (2006) 23-46.
4. Franke R., Kroenung J., Born F. Eckhardt A. Influential Factors for E-Government Success in the Middle East: Case Study Evidence from Saudi Arabia. – *Electronic Journal of e-Government* 11(1) (2015) 39-62.
5. Joseph B. K. du Plessis T. Consumers' Awareness of the Value of e-Government in Zambia: Empirical Evidence. – *International Journal of Electronic Government Research* 11(3) (2015) 1-23. – doi:10.4018/IJEGR.2015070101.
6. Gueorguiev I., Dimitrova S., Komitskal M. Balanced Scorecard Based Management Information System. A Potential for Public Monitoring and Good Governance Advancement. – *Electronic Journal of e-Government* 3(1) (2005) 29-38.
7. Codagnone C. e-Government Economics Project (eGEP). – Measurement Framework Final Version/RSO SPA, 2006.
8. Siskos E., Askounis D. & Psarras J. Multicriteria decision support for global e-governing evaluation. – [https://www.researchgate.net/publication/260251528\\_Multicriteria\\_decision\\_support\\_for\\_global\\_e-governing\\_evaluation](https://www.researchgate.net/publication/260251528_Multicriteria_decision_support_for_global_e-governing_evaluation), accessed 2014 12 01.
9. Iurasov A.V. Basics of electronic commerce: the Textbook. – Moscow:Hot line-Telecom, 2013.
10. Niehaves B., Plattfaut R. & Becker J. Business process management capabilities in local governments: A multi-method study. – *Government Information Quarterly* 30(3) (2013) 217-225.