



Holistic Electronic Government Services Integration Model: from Theory to Practice

Authors

Tadas Limba

*Institute of Digital Technologies, Faculty of Social Technologies,
Mykolas Romeris University*

*tlimba@mruni.eu
Vilnius, LT-0100, Lithuania*

Gintarė Gulevičiūtė

*Institute of Digital Technologies, Faculty of Social Technologies,
Mykolas Romeris University*

*gintare.guleviciute@gmail.com
Vilnius, LT-0100, Lithuania*

Abstract

The systematic, comparative analysis of the models of electronic government services carried out in the scientific work and the assessment of opportunities of their application in the self-government level makes the topic a novelty. With the help of the method of comparative analysis the models of electronic government services have been assessed and there has been distinguished the total of six. Two of them being the main common models of electronic government services have the features that enable the development of new models of electronic government services that are more targeted at changes taking place in public needs and inside organizational processes signifying the originality. The aim of this work is to develop a Holistic Electronic Government Services Integration Model which could ensure the efficient integration of electronic government services in the local self-government level. The scientific work analyzes the improvement opportunities of the models of electronic government services and their application alternatives in Lithuanian municipalities. In order to evaluate implementation of "Holistic Electronic Government Services Integration Model", four empirical studies have been conducted, which show the possibility of this model application. The newly developed model of electronic government services that has been designed basing on the principle of integrating online expert consultation is primarily targeted at improvement of inside processes' changes of an organization. Practicing the application of that model in the local self-government level starting with improvement of inside processes of an organization should help adapt more accurately and efficiently to the changing needs of the society while providing electronic government services, thus establishing a higher public value. The practical novelty of work is reflected not only through the integration opportunities' assessment of the principle of online expert consultation services into the theoretical models of electronic government services that have already been developed by the scientists, but also on the basis of this principle there has been created a "Holistic Electronic Government Services Integration Model" in accordance with "E-Diamond" model basis and its practical application realization with the design of "The project of implementing the principle of online expert consultation on the model of electronic government services" for the future investigations.

Key Words

E-government, electronic government services, Stage model of electronic government services, "E-Diamond" model of electronic government services, Holistic Electronic Government Services Integration Model, local authorities, public administration.

I. INTRODUCTION

Electronic government is being implemented worldwide and in all levels of governance. Local authorities play a particularly important role, since they can identify the changing customers' needs best of all [1]. Although the governance functions of those institutions in different countries slightly differ, their common goal remains the same, that is not only to make the governance itself more efficient, but also to make it more accessible for the public [17, 18]. Municipalities, that are able to provide public service for the consumers in more effective and modern ways can also meet other public needs, in this way implementing directly one of the principles of European local self-government charter, which is the one of ensuring a tighter link between local self-government and the public. Basing on that it can be claimed, that the role of electronic government is of quite an important manner while making an impact on a suitable choice of different models for the implementation of the above mentioned and other principles of local authorities.

Scientific issue. Issues and their solutions concerning the efficient electronic government services provision occur worldwide. In some countries, Lithuania is one of them, the models that are identified only hardly coordinate with the models of electronic government services covered in this work or separate fragments of such models being applied in local self-government levels. In order to solve those problems it would be expedient to find new, improved and more effective models of electronic government services that can meet the needs of customers better while providing electronic government services.

Object of the research. The application of the models of electronic government services for public administration.

Purpose – the aim of work is to develop a *Holistic Electronic Government Services Integration Model* which could ensure the efficient integration of electronic government services in the local self-government level.

There have been set *the following objectives* for the above mentioned purpose to be achieved:

1. To carry out the comparative analysis of Stage models of electronic government services;
2. To analyze in detail "E-Diamond" electronic government services model;
3. Having analyzed the Stage models and "E-Diamond" model of electronic government services and having carried out their comparative analysis, to establish the main features of those models for their improvement;

4. To reveal the conceptual-holistic prospects for improving electronic governance services models;
5. To offer a new model of electronic government services for the local authorities;
6. To conduct research of application a new model of electronic government services in Lithuanian municipalities.

Practical significance. The development alternatives of the suggested *Holistic Electronic Government Services Integration Model* and its principle of *online expert consultation services* for municipalities provide the conditions to carry out the experiment thus pointing out the practical value of the scientific work.

Models of electronic government services, that are created and being analyzed by worldwide scientists, aim at seeking solutions and their alternatives for more efficient public services provision. The years of establishment of the models reflecting the recent development trends of models of electronic government services show that the subject matter of the models of electronic government services is relevant and fairly new worldwide as well as in Lithuania.

II. ANALYSIS OF STAGES MODELS OF ELECTRONIC GOVERNANCE SERVICES

An easy way to comply with the paper formatting requirements is to use this document as a template and simply type your text into it. All Stages Models – „ANAO“, „SAFAD“, „Lee & Layne“, Public sector processes completing („PSP completing“) and „Hiller & Belanger“, which are already analyzed by G. Goldkuhl and A. Persson, have a common feature, namely the first stage has poor functionality and the last one has low level of integration involving all management levels (local and other authorities, legal and natural persons). Another common feature comes with the level of integration, i.e. the higher it is the higher requirements for technologies [23]. Given the common features there are some clear differences as well. In order to compare the models in a more convenient manner the similarities and differences have been put in a table. The features of the models are presented in the columns and the rows list the features of the stages (see Table 1).

TABLE I: A COMPARATIVE ANALYSIS OF THE STAGES MODELS

	„ANAO“	„SAFAD“	„Lee & Layne“	„PSP completing“	„Hiller & Belanger“
I	<i>Publishing information</i>	<i>Information</i>	<i>Catalogue</i>	<i>Cultivation</i>	<i>Information</i>
II	<i>Interaction</i>	<i>Interaction</i>	<i>Transaction</i>	<i>Extention</i>	<i>Two-way Communication</i>
III	<i>Transaction of secure information</i>	<i>Transaction</i>	<i>Vertical integration</i>	<i>Maturity</i>	<i>Transaction</i>
IV	<i>Sharing information with other agencies</i>	<i>Integration</i>	<i>Horizontal integration</i>	<i>Revolution</i>	<i>Integration</i>
V	(Does'nt exist)	(Does'nt exist)	(Does'nt exist)	(Does'nt exist)	<i>Political participation</i>

Source: Limba, T., 2009.

The comparative analysis of the models that has been carried out shows the fact that electronic governance stage models have advantages and disadvantages although it is worth remembering that in both theoretical and practical works, where the issues of electronic governance are being analyzed, we would not possibly find absolutely perfect models that would be able to fit any public administration systems. A common spread of stage models in different worldwide public sector systems shows that this type of models are easily implemented in public administration, although it is necessary to emphasize that the spread of their application does not completely illustrate the usefulness and quality of the models while providing public service for users. Having evaluated the weaknesses and threats of the models the essential issues must be pointed out. Firstly, integration of stages is rather complicated process, e.g. a higher stage cannot be integrated without firstly integrating a lower stage. However, this is mainly the issue of technological solutions. Another more important problem might arise while implementing stage models at the moment, namely the rapid change in public sector organizational processes and increasing aiming at individual and complex needs of users, which are related to multiple social phenomena. In conclusion, it can be stated that having assessed the advantages and disadvantages of the above mentioned models' application in public sector, there could be explored not only those but also more developed alternatives for implementing electronic governance models in public administration institutions.

III. ANALYSIS OF "E-DIAMOND" ELECTRONIC GOVERNANCE SERVICES MODEL

All paragraphs must be indented. All paragraphs must be justified, i.e. both left-justified and right-justified. Electronic governance service model "E-Diamond" is based on a different attitude to public service in comparison with the analyzed stage model group, although it is not completely distant from stage models. This model has been designed as an opposition to stage models. On the other hand, the authors themselves believe that the development of the "E-Diamond" model is restructuring the stage models into poles [16]. The analysis of the "E-Diamond" model and efforts to find connections with stages can be based on the Swedish "SAFAD" stage model [15].

The analysis of stage models shows the predominance of aiming to collect informative services into one pool around one particular subject, in other words, coordinated, individualized and informative electronic governance services (further on – services). The following opposition for this classification is provided in the E- Diamond model: separation, generalizing and performativeness. This kind of division composes three electronic governance services poles [15]. The poles with subdivisions are illustrated in the picture below (see Figure 1).

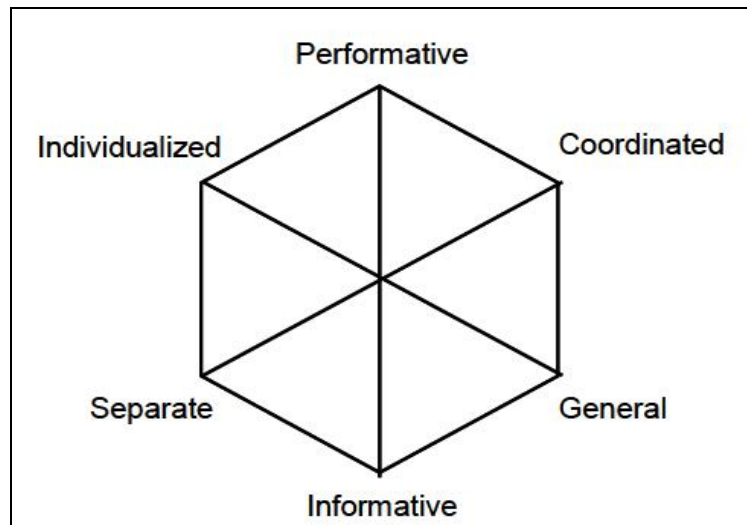


FIGURE I: "E-DIAMOND" MODEL. SOURCE: GOLDKUHL, G., PERSSON, A., STURGART, 2006, P. 72

The first opposition in the poles is separate and coordinated services. Separate meaning the ones that require only one institution to provide service, their opposition being coordinated services that correspond stage model integration levels [15] and in a way the partial services layer of the interinstitutional multiple interaction model structure [18]. Coordinated services have two more subdivisions: aligned and fused services.

The second opposition includes general and individualized services. General services are provided for everyone without requiring personal identification in the database, whereas individualized services are provided only having identified a person in the electronic space. The latter are divided into non-secured and secured services. Non-secured services in this model can be related with electronic mail requests in stage models (the second stage of "SAFAD") where you need the basic personal identification (basic presentation indicating the name, surname, occupation, etc.), but the information provided for the applicant is not personal, thus a secured personal identification is not necessary, which would be extremely important for secured services subdivision under the fourth stage of "SAFAD".

The last poles of the opposition provide informative and performative services. Informative services are targeted only at the information available for reading, e.g. information provided in the website of municipality, whereas the performative services allow the user pursue interaction with an institution on the integrational level [15,16]. For instance, the following information is available on the website of municipality after submitting application for it: information on the vision, mission, objectives and activity. Further systemized information and valid public services are provided after having clarified the request if it is required or carrying out different interinstitutional procedures on the computerized databases. It is worth mentioning that informative services can be subdivided into pre-arranged knowledge and selected information. Pre-arranged information (or knowledge) is received when a customer is surfing the website of an

institution, and selected information is the one that is filtered through the browsing system on the site [16].

The founders of the "E-Diamond" model criticize the negative application of the stages principle [16]. The stage models aim at including all the previous stages to the last stage and they set it as the objective, although it is not always possible and necessary to transmit services from the first level to the highest, e.g. there is no point in seeking to transmit the publicity of municipality documents to the highest level. Here the advantages of the "E-Diamond" model come up. This model does not aim at transmitting everything to the highest level, because there is no such level. There are three incomparable areas that are all of equal importance and necessary, and the complexity of services fluctuates in different poles of the areas [16].

Assessing this model according to the analysis that has been carried out firstly it is necessary to point out that the practice of applying the "E-Diamond" model is not very common. As it was mentioned above, the model has been developed by Swedish scientists, so it has been tried to be applied in Sweden. Having assessed the theoretical analysis of the "E-Diamond" model, its application should be easier implemented in practice from the technological point of view than the stage models, because in that case the barriers are created due to the pursue of the higher stage. However, from the organizational processes development point of view, the implementation of the "E-Diamond" model might be a little bit more complicated for a few reasons. Firstly, the lack of experience of implementing such a model might create certain obstacles for implementation and proper sorting out of public services to particular poles. As it was analyzed describing the threats for model implementation, it might occur that at the same time one or a few services should be attributed to different opposite poles.

However, it is more likely that the main problem is related to the lack of expertise of public administration institutions civil servants in the area of electronic governance project implementation field. The "E-Diamond" model structure in itself is slightly more complicated than that of stage models, therefore it could be harder taken in and brought into awareness by the civil servants, responsible for implementing projects of this kind in the public sector.

IV. COMPARATIVE ANALYSIS OF THE STAGES AND "E-DIAMOND" ELECTRONIC GOVERNANCE SERVICES MODELS: AN IMPACT FOR THEIR IMPROVEMENT

All electronic governance models that have been analysed in this paper have their own distinguishing features in comparison with other models. The stages and „E-Diamond“ models are considered universal. Stage Models, e.g., „SAFAD“, „ANAO“, are considered to be founding models, others basing on the origin or their paradigm are complementing the founding ones or emphasize other features of the models – "E-Diamond" Model. What is also necessary to point out is that electronic governance Stage Models that have been developed and applied for a longer period of time, have been useful for a while, although further application prospects cast certain scientific doubts. On the other hand, what is also arguable is the usefulness of later developed theoretical electronic governance models (the case of „E-Diamond Model).

In order to assess the usefulness and more suitable application of electronic governance models in public sector in a more accurate and efficient manner, one of the proposed alternatives is to define the common features of electronic governance Stages Model and “E-Diamond” Model, which could be the following:

- Possible levels of implementation
- The main features of different level, or in case they are not available, different stages or steps;
- The level of targeting at the client;
- The level of targeting at organizational inner processes;
- Feedback (self-assessment opportunity);
- Technological background for the implementation of the selected model [23].

The comparative analysis according to the features mentioned above will also help distinguish the advantages and disadvantages of the model (see Table 2).

TABLE II: A COMPARATIVE ANALYSIS OF COMMON FEATURES OF THE STAGES AND “E-DIAMOND” ELECTRONIC GOVERNANCE SERVICES MODELS. SOURCE: LIMBA 2011.

<i>Model</i> <i>Features</i>	Stages Models	“E-Diamond” Model
1. Possible levels of implementation	There are 4 most common levels of implementation ¹ .	The level of implementation is defined according to three different features – poling ² .
2. Description of features for different levels	1) Every higher level includes all features of the lower level (stage) and complements them. 2) The first level deals with information publicity, whereas the highest level has a complete organizational integration.	1) The services are defined as a combination being individualized, general and performative of a certain level. 2) Every pole distributes the services from simple to more complicated ones.
2. Targeting at the client	Every higher stage integrates the clients even more, but the model is not suitable for every day life situations.	One of the poles is the relation between individualized and general.
3. Targeting at inner processes	The attention is paid. The fourth stage most commonly is devoted to interorganizational processes.	The model partly distinguishes targeting at inner processes.
4. Feedback	The model does not envisage such an opportunity.	The model does not envisage such an opportunity.
5. Possibility for service assessment	It is available. It is assessed according to the level the service belongs to.	It is available. It can be assessed according to the place the service is in the “E-Diamond”.
6. Technological background	Every higher stage requires more modern technologies and better integration.	The more complicated the services of each pole are, the more complicated technological solutions they require in order to provide them.

1. An exception is „Hiller & Belanger“ model which has 5 levels of implementation.
2. Service poles: *separate* ↔ *coordinated*; *general* ↔ *individualized*; *informative* ↔ *performative*.

In evaluation of these general features designed for the models exceptionally from the point of traditional public administration conceptions, the most important of them are to be considered two of them – orientation towards the client and orientation towards internal organizational processes. However, the science of public administration, having assessed the information technology actively penetrating into all public administration system reform processes and public life, in this context becomes interdisciplinary; therefore, importance of other aforementioned general features of electronic government services models does not lose significance and value. After carrying out the comparative analysis of models, it is possible to make a presumption that both electronic government services stages' model and the “E-Diamond” model are sufficiently proportionally oriented by the features of the orientation towards a client and orientation towards internal organizational processes.

Having carried out a comparative analysis of the models, it would be purposeful to analyze some similarities and differences among the models, identifying the causes and essentials of them.

The most simple comparison to carry out would be of the Stages Model and the “E-Diamond”. The “E-Diamond” model is made up of regrouping and complementing the stages of “SAFAD” Model into certain opposition. As the authors of the model claim [16], the first two stages of the “SAFAD” Model, namely the opportunities for information provision and ensurance of interaction in the electronic space, might be treated as the oppositin of informative and performative services, with regards to the services being used by the customer (see Picture 9). The third stage of the “SAFAD” Model implements the transactional services – receiving and transmitting information or electronic governance services. Services of a transactional nature are different from the other services in the level of individualization, thus in the authors' opinion [16], the emergence of the opposition of individual and general electronic governance services would be purposeful. The fourth stage of the Stages Model, i.e. the Integration becomes an opposition to individualized and integrated services of the “E-Diamond” Model (Figure 2).

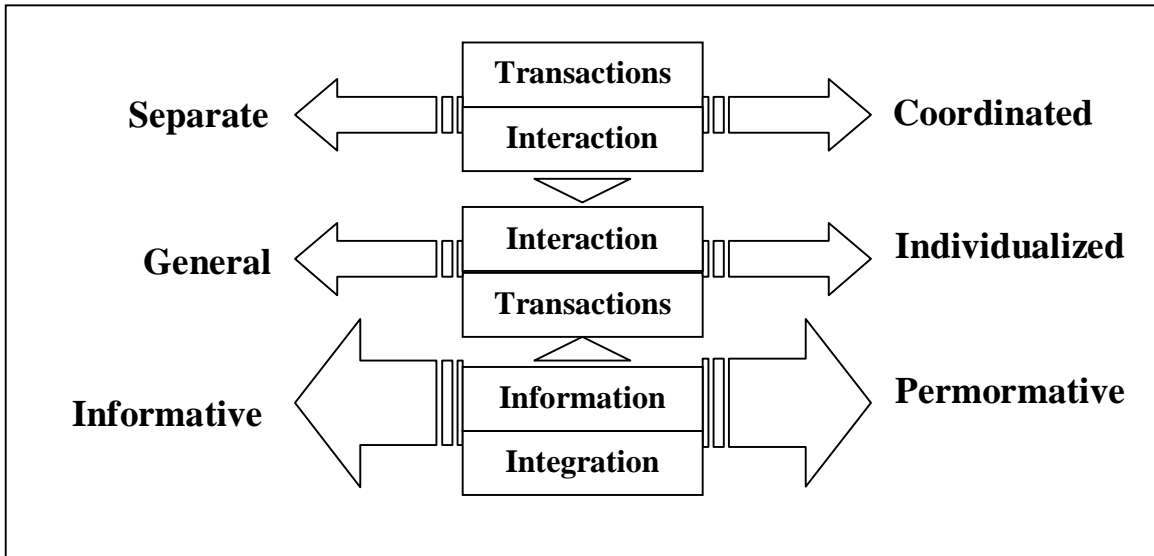


FIGURE II: TRANSFORMATION OF THE STAGES MODEL INTO THE “E-DIAMOND” MODEL. SOURCE: LIMBA, 2011

It is worth paying attention to the fact that only the Stages Model provides the opportunity to assess the implementation of electronic governance services according to the levels set in advance. However, with the help of other models it can be identified what is the status of the electronic governance services provision. For instance, if the municipality provides only individualized, informative and general services, it might be assumed that either there is no technological basis or the integration of services having more complicated implementation (individualized, merged, implemented on the web) is avoided.

It is also possible to state that the designed “E-Diamond” model as it liberates the stages from their technological dependence, thus, it is simpler and more universal from the application aspect and in conceptual approach its implementation should be simpler. However, it is more likely that the main problem is not technological dependence of the stages’ models or issues of stages liberalisation while transforming them into the “E-Diamond” model, but the lack of competence by the officials of public administration institutions in the area of electronic government services project implementation [26]. The structure of the “E-Diamond” model itself is more complex than that of the stages’ models; thus, it could be more difficult to be understood and comprehended by civil servants responsible for the implementation of the projects of such nature in public sector. Consequently, the appearance of new models unambiguously requires also the changes in qualification and competence of civil servants.

V. CONCEPTUAL-HOLISTIC PROSPECTS OF IMPROVING ELECTRONIC GOVERNANCE SERVICES MODELS

It is difficult to distinguish one model that would be dominating or the best. Each model has its advantages and disadvantages. However, it is necessary to emphasize that these models are developed not only basing on theoretical paradigms, but also on practice of integrating electronic governance service into public sector in foreign countries. A great number of theoretical models,

such as ANAO, SAFAD, Lee & Layne are developed basing on experience of electronic governance service implementation in public administration institutions in Australia, Sweden and the USA. It should not be forgotten that all these models have been implemented and applied considering the peculiarities of public administration in every country, especially the specific system of local authorities and the national users needs. At this point it should be mentioned that the needs of local authorities systems and national users in different countries around the world vary, therefore claiming that one of the analyzed and compared models would suit perfectly to other countries, e.g. Lithuania, would be wrong [25]. Thus, we can draw a conclusion, that basing on the background of the above analyzed models, it would be purposeful to develop more universal electronic governance service models that would include holistic-social, competence and technological aspects, suitable for most countries public sector systems.

Some worldwide and European Union public administration institutions, especially municipalities, have a relatively low connection with local community while carrying out interactions. It is seen while providing information, especially public services to the public. Having designed websites for the municipalities [1], it was thought that putting public information to electronic space would lead to more favourable conditions for the customers to use them, which would eventually solve the problem of the flow of residents applying directly to municipalities. However, some scientists [2, 6, 8, 9] tend to have doubts concerning that being the only solution. In such a case quite an important issue is identified and a question is asked directly relating to it – how could it be possible to provide services more efficiently and increase the flow of residents applying directly for public information and services while applying and developing the electronic governance service models. What is more, how can the activity and the importance of municipalities be fostered in the context of modernization.

In order to solve this problem, it is suggested to base on statements by Swiss scientists N. Thom and A. Ritz who state management of public institutions as well as municipalities demand new strategies, administrative and technological solutions from the fast changing environment [31]. However, existing legal conditions cast doubt on the reality of such a prospect.

What especially needs to be placed some emphasis on is the fact that those changes are resisted by administrative staff who are accustomed to the existing stable systems and are not inclined to innovations. The fact how public institutions are able to accept changes in the system and its environment and realize the factors that influence them has a considerable importance on public sector management.

Discretion of management differs in making influence on outside environment, human factors and conditions for institutions. The management's role in influencing the conditions for political level is much lower than conditions for institutional level and human factors. The law on public organizations and public service still restricts flexibility, which is of extreme importance for the development of the modern reforms [31].

It should not be forgotten, that public sector conditions are divided into:

- *Outside conditions;*
- *Inside conditions.*

The public sector outside conditions include only general results and results of specific influence on outside environment, e.g. when there is provided final integrated and prepared public service for the user and additional consultancy service of how to use the implemented public service. The outside conditions provide the opportunity for the user to judge, e.g. if the public service is provided in a sufficiently qualified and effective manner [31]. Whereas inside conditions, that are affecting the management of public institutions, fall into the following:

- *Institutional conditions;*
- *Human factors.*

Institutional conditions are targeted at selecting proper administrative structure and the required number of employees, as well as the process of the executed reform. Usually the conditions of institutions are obvious and they set a clearly defined operation area for the management. Thus, while modernizing the administration, the pursue to reform and change those aspects is usually more reasonable than the pursue to change human aspect. However, the human aspects influence even more important organizational decisions, that are crucial to the proximity of outside factors as well, namely the directiveness of the public sector functions, depth and quality, the civil servants overcoming the barriers of social experience, knowledge and skills [31].

While confirming the above stated, we can base upon the presumption which is still relevant nowadays that was made by the USA scientist Kenneth L. Kraemer who has been exploring the peculiarities of the innovative tools implementation in the public sector. The author claims that one of the more important factors that limits the use of information technologies and the implementation of similar innovations in public sector is the lack of computer literacy and training among employees of public administration institutions. The use of information technologies provides more flexibility for such public sector organizations as municipality and its divisions [10, 19].

Having assessed the above mentioned scientific statements, it can be established that while implementing innovative means in local authorities institutions a great deal of attention must first of all be paid to the law reform, which is related to administrative changes due to the influence of innovations that are being implemented, and to the civil servants expertise development in the area of electronic governance service implementation. The emphasis must be placed on the fact that project implementation of electronic governance service and management in the local authorities level depend on the expertise and computer literacy of employees in municipalities. Electronic governance services first of all are implemented into the information-technological system of local authorities institutions and only then they can be provided to users. Thus, it can be stated that the quality and efficiency of providing electronic governance service

depend on the level of knowledge and abilities of civil servants to use information technologies, as well as the outside and new instruments of public consultancy in the area of electronic governance services. Therefore, *a great amount of attention must be drawn to changes in competence* while designing and developing the new model of integrating electronic governance service, which would include holistic-social, competence and technological aspects.

VI. DESIGNING AND APPLICATION OF HOLISTIC ELECTRONIC GOVERNMENT SERVICES INTEGRATION MODEL FOR LOCAL AUTHORITIES

In discussing the aforementioned problem solving methods, various proposals are possible; however, one of them would be, particularly taking into account the problem of interaction between the institutions of district self-government and residents as well as business, – to create a model based on the principle of expert consultation application. External framework of the model would include the *“Virtual Union of Local Authorities”*. That is to say, it would be possible to merge local authorities into the single virtual unit on the cyberspace leaving their former usual structural functioning and the possibility to use the websites of these local authorities. The *“Virtual Union of Local Authorities”* model would be characterized by the implementation of the expert advisory function, e.g. for district municipalities, and this in its own turn would contribute to solving the issues of active use of electronic government services and their provision quality. To put it simply, the example could be a special model *grounded by online expert consultations* individually applied by one or several smaller district municipalities of Lithuania characteristic of the lowest activeness among residents addressing them as well as the larger city municipalities.

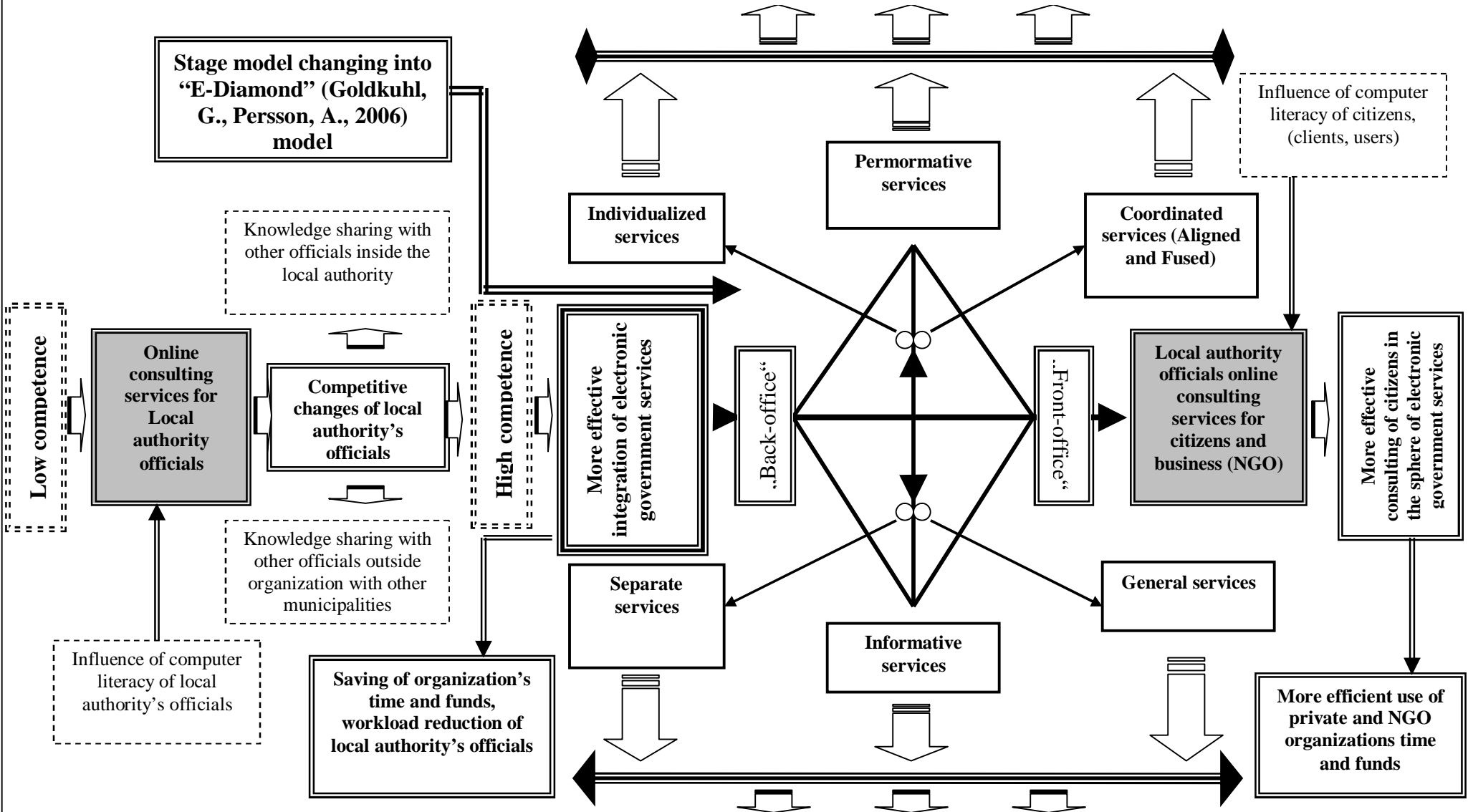
It is important to note that functioning of the *“Virtual Union of Local Authorities”* might be exceptionally virtual, on the contrary to other associations or public sector institutions. The *“Virtual Union of Local Authorities”* would function solely on the cyberspace or, more precisely, would exceptionally be characteristic of just the advisory function striving for improvement of interaction between local authorities and the public. Of course, attempting to consolidate such novelties in practice, though the advisory functioning of the proposed model, it would be worth to regulate it by legal acts of the Republic of Lithuania.

In considering the possibilities to apply the “E-Diamond” model in local authorities of Lithuania and having assessed the current situation of electronic government services integration, the development of the “lower edge of the diamond” fragments is possible. The lower edge of the “E-Diamond” model includes provision of services of more informative nature; however, this edge is integrated not gradually (one following another), but individually. In other words, all the edges of the model are independent of each other, in contrast to the models of electronic government stages. As in Lithuania the principles of stage models are known and applied, it is possible to state that in Lithuania practical application of the “E-Diamond” model has not been identified [24].

In successful improvement of electronic government services introduction in local authorities, in future it would be possible to discuss the development of the “E-Diamond” model in the upper “edge” fragments or the entire “E-Diamond” model integration.

However, having assessed quite poor experience of Lithuania in improving electronic government services, relevant electronic government service integration at self-government level problems, absence of alternative contemporary electronic government service models, the proposal would be to introduce the principle of “online expert consultation services” at the levels of “front-office” and “back-office” moving from the current electronic government stages’ model to the “E-Diamond” model, in this way designing a new and one of the most appropriate alternatives of *Holistic Electronic Government Services Integration Model* (see Figure 3).

MORE QUALITATIVE AND EFFECTIVE PROVISION OF ELECTRONIC GOVERNMENT SERVICES



Source: Compiled by the author

FIGURE III: HOLISTIC ELECTRONIC GOVERNMENT SERVICES INTEGRATION MODEL

The first aspect "*Low Competence*" of this model structure is taken as a starting point showing the low organizational competence of a municipality in the area of electronic government services. What is more, it is important to point out that the implementation of the principle of *online expert consultation services* is closely related to and is dependent on the *computer literacy skills of municipalities' officials*. Obviously, the higher the level of computer literacy of local authorities' officials, the more effectively the online expert consultation services can be integrated in an organization, and vice versa. Thus, it is important to point out that the officials' ability to participate in providing them with online expert consultation services is directly related to their own level of computer literacy, which is an important structural component of the aforementioned model.

At the "back-office" of the municipality a structural element "*Qualification changes of municipalities' officials*" is created after the provision of the online expert consultation services. This element has two branches:

- *Sharing the gained knowledge in the area of electronic government services within the organization, passing this knowledge on to all main structural levels of the organization;*
- *Sharing the gained knowledge in the area of electronic government services among organizations, spread of this knowledge among all local authorities (and other public administration institutions of the state) and their different structural levels.*

As far as the holistic model of integrating electronic government services is concerned, the *outcome aspect* of the organizational inner structure of the municipality, which outlines the obtained result while implementing the principle of the online expert consultation, is a *high organizational competence in the area of electronic government services*. However, the main structural element of the outcome of this model that helps to withdraw inefficient stage model and move on to the three alternate poles (six elements) implementation of the "E-Diamond" model is *the more efficient integration of electronic government services*, which ensures saving the costs of the municipality budget and time as well as the reduction of the workload of municipalities' officials more effectively.

At the "back-office" level the online expert consultation services, as it has already been mentioned, would firstly be provided for the officials of municipalities. While at the "front-office" level of an organization having become qualified specialists of this area the officials of municipalities providing *online expert consultation services* for the public could inform residents and businesspeople about the electronic government services and their advantages. It has to be mentioned that at the "front-office" level the online expert consultation services in the area of electronic government services would be provided for residents and business entities on the principle of online consultation. Of course, here other, quite important problems of the public motivation to participate in seminars of such nature and computer literacy arise, on which consultation effectiveness, saving finances and time of the interested, and finally, key expected result – a more high-quality and efficient electronic government service provision – depend.

The "online expert consultation service level" principle is characteristic of universality, therefore, it can be quite easily integrated into the aforementioned and on this basis designed

Holistic Electronic Government Services Integration Model. "Online expert consultation service level" principle can be easily implemented also in practice.

Based on the proportion of electronic government service model comparison by orientation into municipal internal processes and orientation towards satisfaction of client needs, currently the most appropriate to Lithuania and forming the conditions for the occurrence of the new research possibilities would be suggested and created *the Holistic Electronic Government Services Integration Model* on "E-Diamond" model basis. This *Holistic Electronic Government Services Integration Model* was also designed using the basis of the survey of the electronic government services provision situation in Lithuania (Limba, T, 2009, B).

It is presumable that after application and implementation of the proposed *Holistic Electronic Government Services Integration Model*, more favourable mutual conditions would be formed: to municipalities – to more effectively integrate electronic government services, and to the public – to more effectively and in a more high-quality manner make use of electronic government services provided by both larger (city) and smaller (of district) municipalities.

The practical application realization of *Holistic Electronic Government Services Integration Model* with the design of "The project of implementing the principle of online expert consultation on the model of electronic government services" could be created and analyzed in detail for the future investigations.

VII. RESEARCH OF APPLICATION HOLISTIC ELECTRONIC GOVERNMENT SERVICES INTEGRATION MODEL IN LITHUANIAN MUNICIPALITIES

A. Experts' evaluation methodology and data analysis

Qualitative research method had been applied by questioning various Lithuanian authorities and institutions experts, whose work relates to the implementation of electronic government services. The aim of experts' evaluation – to identify the importance and relevance of instrumentation of Lithuanian residents' and municipalities' officials research. Lithuanian residents' research was carried out using 27 questions questionnaire. Municipalities' officials were asked to answer 28 questions. All were asked to indicate their gender, age, place of residence, education, employment, office, computer literacy, to provide answers to questions related to an evaluation of electronic government services. The questionnaire consists of the questions in accordance with the principles of the questionnaire formation. Before submitting the questionnaire for respondents, they were aware of the purpose, relevance of problem. There has been shown that the form is anonymous and the data will be used generally. Questionnaire identifying the key explanations and instructions on how to fill it.

Experts evaluated questionnaires for Lithuanian residents and municipalities' officials and ranked the questions according to the importance. Based on the foregoing method, nine Lithuanian experts were interviewed. Lithuanian experts were interviewed about two questionnaires to residents and municipalities' officials without the socio-demographic characteristics of reflective questions, only those issues that have a close link to electronic

government services were evaluated. After evaluation, the least important questions were taken away from the questionnaires.

B. Residents' research methodology

Based on quantitative research methods the questionnaire survey method was used in order to obtain the opinion of the residents of Lithuania about Lithuanian municipalities offered electronic government services and their adaptation capabilities.

The purpose of residents' research – to investigate the population favor evaluating electronic government services adaptation capabilities in Lithuanian municipalities.

There have been introduced 2 hypotheses:

1. Respondents' quality evaluation of electronic government services in municipalities depends on their own ability to use electronic government services;
2. Respondents' ability to access electronic government services depends on the competence of civil servants to advice in this area.

The dependence between the two variables to identify and test hypotheses to confirm or deny, the calculation of Spearman's correlation coefficient used by "STATISTICA" data processing program.

Sampling Method - by giving questionnaires for residents, respondents were selected through probability samples nested sampling method. Questionnaires were proportional to the number of total population of the municipality [29]. Required sample calculated using <http://www.surveysystem.com/sscalc.htm> website. Calculation of the sample indicated that the confidence level is 95 percent, 5 percent confidence interval, population – 2,7 million. The estimated sample – 384. There had been surveyed 420 respondents. Distributed 458 questionnaires. Distributed questionnaires have 81 percent return rate.

C. Residents' research data analysis

Residents were asked to evaluate municipalities' officials ability to consult in electronic government services area. 8 percent of surveyed respondents municipalities' officials ability to consult in electronic government services area evaluated 5 points out of ten. Equal parts – 5 percent of respondents municipalities' officials ability to consult in electronic government services area evaluated 6 and 7 points. 4 percent of respondents municipalities' officials ability to consult in electronic government services area evaluated 8 points out of ten. Only 2 percent of respondents evaluated municipalities' officials ability to consult in electronic government services area with the highest scores - 9, 10. The rest of the respondents ability to consult in electronic government services area evaluated below 2 percent or did not answer to this question (71 percent) (see Figure 4).

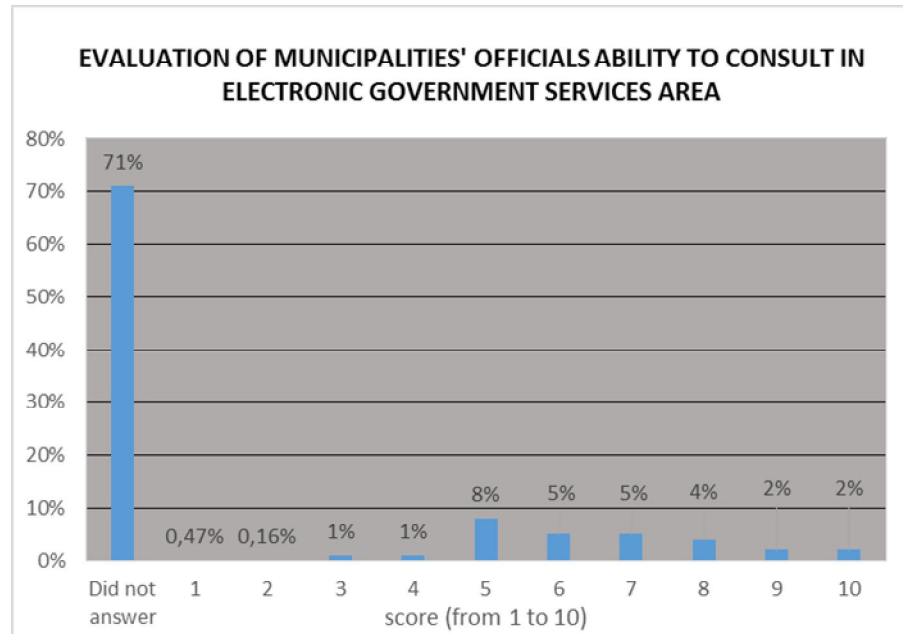


FIGURE IV: EVALUATION OF MUNICIPALITIES' OFFICIALS ABILITY TO CONSULT IN ELECTRONIC GOVERNMENT SERVICES AREA

Also, respondents expressed their opinion about expert consultation necessity for municipalities' officials in electronic government services area. Almost half of surveyed respondents - 42 percent believes, that municipalities' officials need expert advice in electronic government services area, so that they could later be precisely introduced and significantly encourage residents and business to use electronic government services. 30 percent of respondents answered that municipalities' officials need expert advice in electronic government services area, but it would have a slight impact on the population using electronic government services. 5 percent of respondents think that it has absolutely no influence on more active citizens and businesses using electronic government services. 7 percent of respondents believe that municipalities' officials do not need expert consultations about electronic government services, because more active people and businesses using electronic government services do not depend on them. 12 percent of respondents have no opinion on this issue (see Figure 5).

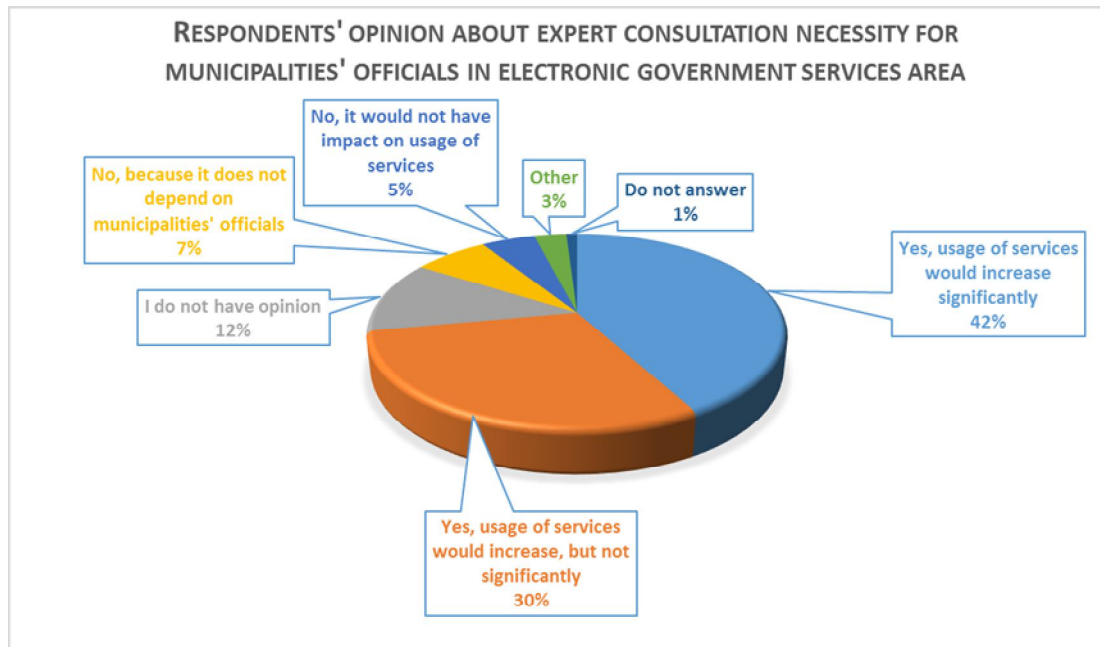


FIGURE V: RESPONDENTS' OPINION ABOUT EXPERT CONSULTATION NECESSITY FOR MUNICIPALITIES' OFFICIALS IN ELECTRONIC GOVERNMENT SERVICES AREA

After analyzing the data, it was important to approve or to deny hypothesis.

1 hypothesis. Respondents' quality evaluation of electronic government services in municipalities depends on their own ability to use electronic government services:

- Spearman R - Spearman ordinal correlation coefficient is 0,624282 - medium positive correlation: we can assume that when the respondent evaluates the quality of electronic government services better, then he evaluates his ability to use electronic government services better.
- Formulating H0 and the alternative hypothesis Ha: H0 - the correlation coefficient is equal to zero, or the relationship between the variables is not available, the Ha - the correlation coefficient is not zero, then the relationship between the variables exists.
- Selecting the significance level $\alpha = 0,05$ (five percent error), in social studies, it is recommended choose this error.
- p-level - observational significance level ($p\text{-level} = 0,00 < \alpha = 0,05$) refers to prove alternative hypothesis Ha and Spearman correlation coefficient is significantly different from zero. Hence, respondents electronic government service quality depends on their own ability to use electronic government services.

2 hypothesis. Respondents' ability to access electronic government services depends on the competence of civil servants to advice in this area:

- Spearman R - Spearman ordinal correlation coefficient is 0,434538 - a weak positive correlation close to the average: we can assume that when the respondent evaluate the competence of civil servants better, then he evaluates his ability to use electronic government services better.

- Formulating H0 and the alternative hypothesis Ha: H0 - the correlation coefficient is equal to zero, or the relationship between the variables is not available, the Ha - the correlation coefficient is not zero, then the relationship between the variables exists.
- Selecting the significance level $\alpha = 0,05$ (five percent error), in social studies, it is recommended choose this error.
- p-level - observational significance level ($p\text{-level} = 0,00000 < \alpha = 0,05$) refers to prove alternative hypothesis Ha and Spearman correlation coefficient is significantly different from zero. Respondents' ability to access electronic government services depends on the competence of civil servants to advice in this area.

The results of residents' research show that the interest in using electronic government services is large enough, but the level of computer literacy, affecting the ability to use the same services is quite low. Another very important reason to sway public skills and competence in the use of electronic government services - a poor Lithuanian municipal public awareness and familiarization with modern facilities, saving time and money to get public services. Research results showed, that according to the majority of respondents, the use of public services activity would increase, it would save time and financial costs, if Lithuanian municipalities use more electronic government services.

Based on the research results, it can be stated that the municipalities' officials lack of competence in the field of electronic government services is one of the major reasons causing the lack of electronic government services prevalence and use among the public. Research results revealed problems of electronic government services integration in municipalities and demonstrate the need of implementing *Holistic Electronic Government Services Integration Model*. However, only residents' survey to approve the above mentioned model implementation in Lithuanian municipalities system is not enough. In this case, it is also important to carry out a research of municipalities' officials, which data analysis would help to evaluate the need of this model on both sides.

D. Municipalities' officials research methodology

Based on qualitative research methods questionnaire survey method was also applied in order to obtain Lithuanian municipalities' officials opinion about Lithuanian municipalities offered electronic government services and their adaptation capabilities.

The purpose of municipalities' officials research – to determine, how Lithuanian municipalities' officials evaluate their institutions provided electronic government services adaptation options.

There have been introduced 4 hypotheses:

1. The municipal budget savings depend on direct appeal flow to the municipality associated with the electronic government services rendering to the public.
2. Municipalities' officials work load changes depend on direct appeal flow to the municipality associated with the electronic government services rendering to the public.

3. Municipalities' officials time costs change depends on direct appeal flow to the municipality associated with the electronic government services rendering to the public.
4. Municipality provided electronic government services quality evaluation depends on the respondents' knowledge evaluation in the area of electronic government services.

Submitting questionnaires to municipalities' officials, the respondents were selected through probability sampling, random sampling method. Required sample calculated using <http://www.surveysystem.com/sscalc.htm> website. Calculation of the sample indicated that the confidence level is 95 percent, confidence interval is 3 percent, population – 7500. The estimated sample – 934. There had been surveyed 1301 respondents. Distributed questionnaires have 85 percent return rate.

E. Municipalities' officials research data analysis

It was important to find out municipalities' officials familiarity with public services transferring to internet maturity levels according to the Lithuanian E-government concept. 62 percent of respondents said, that they heard nothing about public services transferring to internet maturity levels according to the Lithuanian E-government concept. 25 percent of respondents accidentally found out about public services transferring to internet maturity levels according to the Lithuanian E-government concept from other sources of information. 9 percent of respondents noted that they are personally interesting in public services transferring to internet maturity levels according to the Lithuanian E-government concept. 4 percent of respondents indicated that they learned about public services transferring to internet maturity levels according to the Lithuanian E-government concept in special consultative lecture-seminars (see Figure 6).

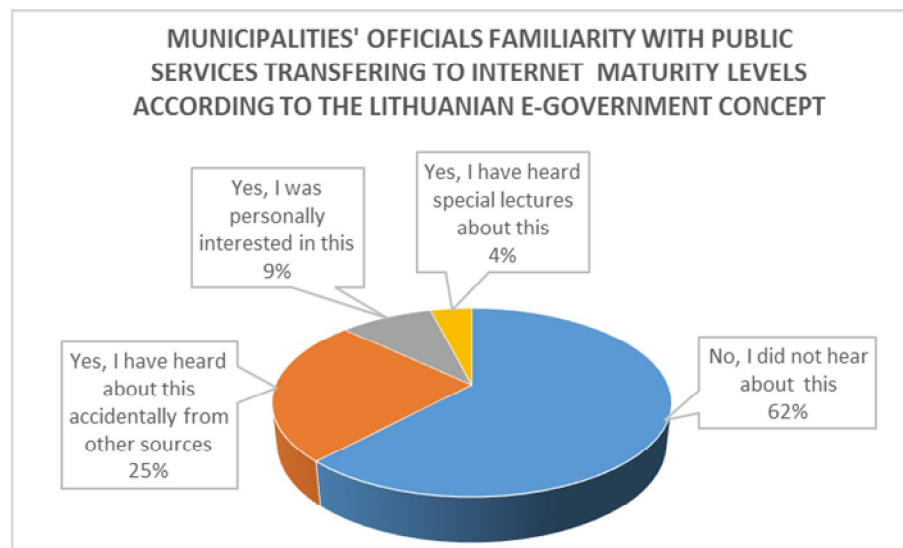


FIGURE VI: MUNICIPALITIES' OFFICIALS FAMILIARITY WITH PUBLIC SERVICES TRANSFERING TO INTERNET MATURITY LEVELS ACCORDING TO THE LITHUANIAN E-GOVERNMENT CONCEPT

Also, municipalities' officials were asked to evaluate their own knowledge associated with consulting in electronic government services area. Equal parts - 9 percent of surveyed respondents rated their ability to advise in electronic government services area 5, 7, and 8

points out of ten. 7 percent of respondents rated their ability to advice in electronic government services area 6 points out of ten. Equal parts - the 4 percent of surveyed respondents rated their ability to advice in electronic government services area 3, 4 and 9 points. Only 2 percent of respondents rated their ability to consult in electronic government services area with the highest grade – 10. 49% of respondents had never consulted in electronic government services area (see Figure 7).

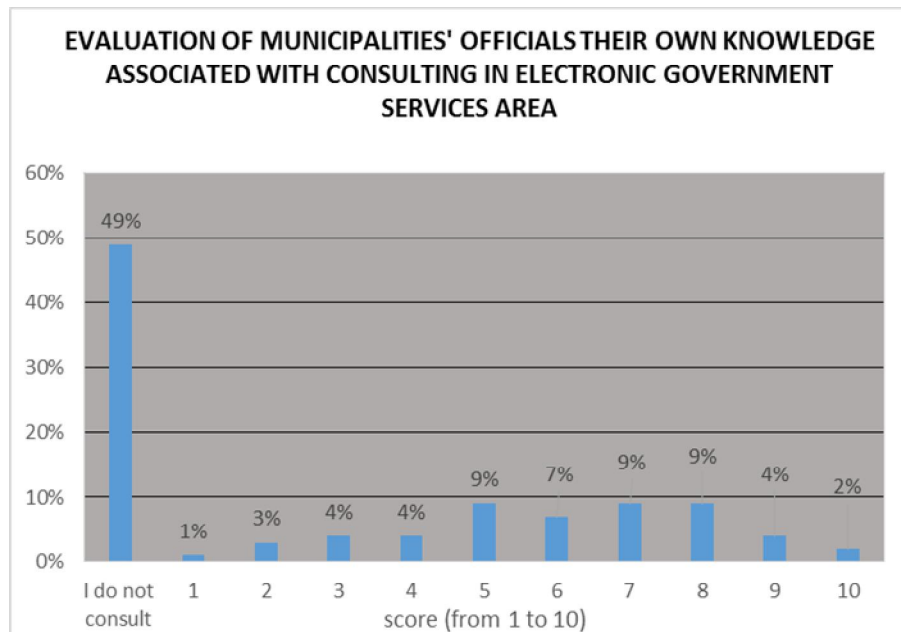


FIGURE VII: EVALUATION OF MUNICIPALITIES' OFFICIALS THEIR OWN KNOWLEDGE ASSOCIATED WITH CONSULTING IN ELECTRONIC GOVERNMENT SERVICES AREA

After analyzing the data, it was important to approve or evaluate their own knowledge associated with consulting in electronic government services area to deny hypothesis.

1 hypothesis. The municipal budget savings depends on direct appeal flow to the municipality associated with the electronic government services rendering to the public:

- Spearman R - Spearman ordinal correlation coefficient is 0,434538 - a weak positive correlation close to the average: we can assume that the more decrease direct referral flow to the municipality associated with electronic government services rendering to the public, the more the municipality saves budget.
- Formulating H0 and the alternative hypothesis Ha: H0 - the correlation coefficient is equal to zero, or the relationship between the variables is not available, the Ha - the correlation coefficient is not zero, then the relationship between the variables exists.
- Selecting the significance level $\alpha = 0,05$ (five percent error), in social studies, it is recommended choose this error.
- p-level - observational significance level ($p\text{-level} = 0,00 < \alpha = 0,05$) refers to prove alternative hypothesis Ha and Spearman correlation coefficient is significantly different from zero. The municipal budget savings depend on direct appeal flow to the

municipality associated with the electronic government services rendering to the public.

2 hypothesis. Municipalities' officials work load changes depend on direct appeal flow to the municipality associated with the electronic government services rendering to the public:

- Spearman R - Spearman ordinal correlation coefficient is 0,406339 - a weak positive correlation: we can assume that the more decrease direct referral flow to the municipality associated with electronic government services rendering to the public, the more reduces the municipalities' officials workload.
- Formulating H0 and the alternative hypothesis Ha: H0 - the correlation coefficient is equal to zero, or the relationship between the variables is not available, the Ha - the correlation coefficient is not zero, then the relationship between the variables exists.
- Selecting the significance level $\alpha = 0,05$ (five percent error), in social studies, it is recommended choose this error.
- p-level - observational significance level ($p\text{-level} = 0,00000 < \alpha = 0,05$) refers to prove alternative hypothesis Ha and Spearman correlation coefficient is significantly different from zero. Municipalities' officials workload changes depend on direct appeal flow to the municipality associated with the electronic government services rendering to the public.

3 hypothesis. Municipalities' officials time costs change depends on direct appeal flow to the municipality associated with the electronic government services rendering to the public:

- Spearman R - Spearman ordinal correlation coefficient is 0,339406 - a weak positive correlation: we can assume that the more decrease direct referral flow to the municipality associated with electronic government services rendering to the public, the more reduce the municipalities' officials time costs.
- Formulating H0 and the alternative hypothesis Ha: H0 - the correlation coefficient is equal to zero, or the relationship between the variables is not available, the Ha - the correlation coefficient is not zero, then the relationship between the variables exists.
- Selecting the significance level $\alpha = 0,05$ (five percent error), in social studies, it is recommended choose this error.
- p-level - observational significance level ($p\text{-level} = 0,00000 < \alpha = 0,05$) refers to prove alternative hypothesis Ha and Spearman correlation coefficient is significantly different from zero. Thus, municipalities' officials time costs change depends on direct appeal flow to the municipality associated with the electronic government services rendering to the public.

4 hypothesis. Municipality provided electronic government services quality evaluation depends on the respondents' knowledge evaluation in the area of electronic government services:

- Spearman R - Spearman ordinal correlation coefficient is 0,350651 - a weak positive correlation: we can assume that when the respondent evaluates his knowledge in the field of electronic government services better, then he evaluates the quality of municipality provided electronic government services better.

- Formulating H0 and the alternative hypothesis Ha: H0 - the correlation coefficient is equal to zero, or the relationship between the variables is not available, the Ha - the correlation coefficient is not zero, then the relationship between the variables exists.
- Selecting the significance level $\alpha = 0,05$ (five percent error), in social studies, it is recommended choose this error.
- p-level - observational significance level ($p\text{-level} = 0,00 < \alpha = 0,05$) refers to prove alternative hypothesis Ha and Spearman correlation coefficient is significantly different from zero. Consequently, municipality provided electronic government services quality evaluation depends on the respondents' knowledge evaluation in the area of electronic government services.

Research results showed that according to the majority of respondents, the use of public service activity would increase, it would save time and financial costs, if Lithuanian municipalities use more electronic government services. It has been determined that the majority of municipalities' officials are not familiar with the models of electronic government services. It is important to note that the majority of municipalities' officials are not familiar with current and identified electronic government services stage model in Lithuania.

Based on the results of the research, it could be said that municipalities' officials experience in advising via Internet (together - by e-mail, and "online" system) about the availability of municipality services offered by electronic government services, are sufficiently low. That notes and the data that only 1,45 percent of municipalities' officials advised to residents or private entities about using electronic government services online. It can be said that the municipalities' officials qualification on consulting online about electronic government services should be improved.

Municipalities' officials research results revealed problems of electronic government services integration in municipalities and demonstrate the need of implementing *Holistic Electronic Government Services Integration Model*. It stimulate to conduct the experiment of implementing this model in Lithuanian municipalities.

F. Experiment methodology

Created *Holistic Electronic Government Services Integration Model* performance based on an experiment involving Lithuania municipalities' officials. Experiment was treated in accordance with the quantitative research methods.

The purpose of the experiment - to determine the implementation and action possibilities of created electronic government services model in Lithuanian municipalities. There have been set the following objectives for the above mentioned purpose to be achieved:

1. To hold networked (online) expert consultation seminars for municipalities' officials;
2. To familiarize municipalities' officials with electronic government services problems and performance contexts, electronic government services models through online expert consultation seminars, presented scientific material.

The hypothesis – quality of Lithuanian municipalities' officials in expert "online" seminars given tasks depends on duration of tasks.

Sampling Method - in the experiment, the respondents were selected through non-probability sampling, occasional sampling (when the sample included most conveniently analyzed elements). The study involved two respondents from each of the municipalities. Respondents from Šiauliai, Pakruojis, Anykščiai, Molėtai, Švenčionys and Druskininkai municipalities analyzing 4 subjects performed the 4 tasks in each theme, responded to a question in the first theme and two questions on rest topic (total - 3 themes). Respondents were analyzed scientific material related to electronic government services development aspects and features, models and application of these models, also coordination opportunities in Lithuanian local level. At the end of the research respondents answered two control questions intended to acquire the knowledge and skills inspection.

G. Experiment data analysis

It was important to compare, how much time respondents spent for the online expert consultation workshop tasks. Minimum time spent for the online expert consultation workshop tasks was 65 minutes, maximum – 413 minutes. Usually respondents spent from 150 to 250 minutes for the online expert consultation workshop tasks (see Figure 8).

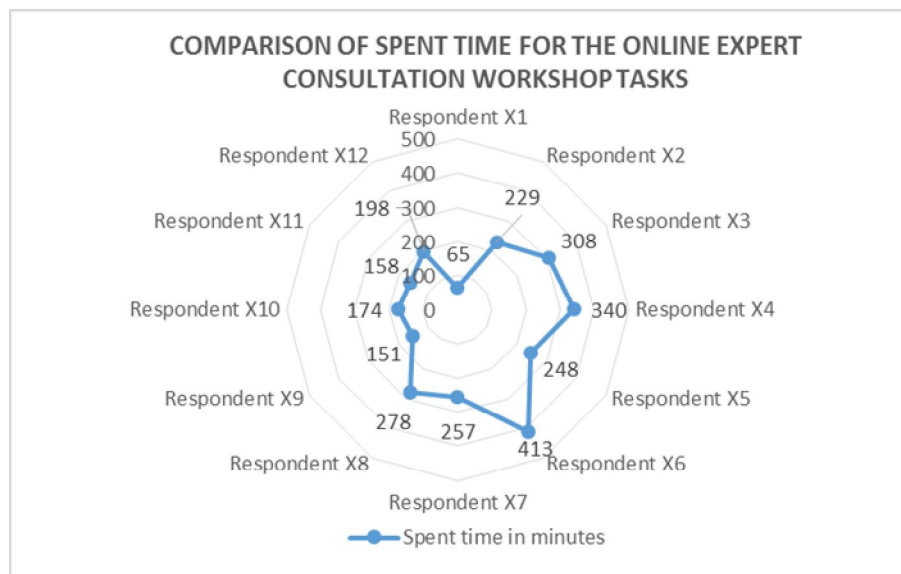


FIGURE VIII: COMPARISON OF SPENT TIME FOR THE ONLINE EXPERT CONSULTATION WORKSHOP TASKS

Also, it was important to define quality criterias total evaluation assessment comparison of respondents' given tasks. There were nine tasks (questions) and for every task respondent could get 1 point. Maximum he could get 9 points for all tasks. Every task was evaluated according to these criterias:

- Criterion 1: "Respondent understood the problem exactly" - evaluation of 1 point;
- Criterion 2: "Respondent realized the problem approximately" - evaluation of 0,75 points;
- Criterion 3: "Respondent partially realized the problem" - evaluation of 0,5 points;
- Criterion 4: "Respondent had difficulty in understanding the problem" - evaluation of 0,25 points;
- Criterion 5: "Respondent did not understand the problem" - evaluation of 0 points.

The lowest evaluation was 7,5 points, one respondent got maximum of evaluation – 9 point. Most of respondents were evaluated 8, 7,5 or 7,75 points (see Figure 9).

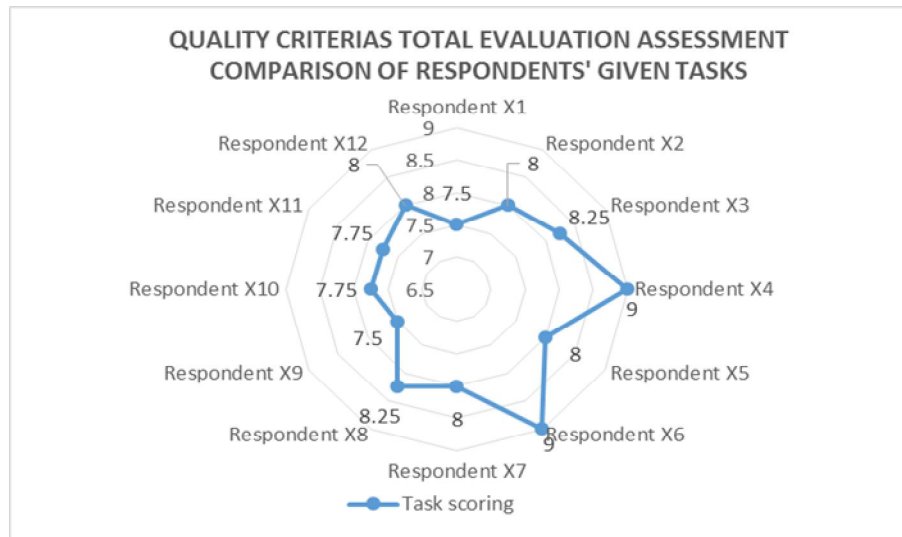


FIGURE IX: QUALITY CRITERIAS TOTAL EVALUATION ASSESSMENT COMPARISON OF RESPONDENTS' GIVEN TASKS

After the *Holistic Electronic Government Services Integration Model* application in Lithuanian municipalities experiment, it was important to approve or to deny hypothesis. In order to determine a single variable (X - tasks quality) dependence on another variable (Y - task completion time), the linear regression equation need to be calculated. Calculated using the following equation derived value of the coefficient of determination $R^2 = 0,8816$. In order to determine the dependence of one variable on another variable strength, it is necessary to calculate the Pearson correlation value. Pearson correlation coefficient value can be calculated using the coefficient of determination and is expressed in the following formula:

$$r = \sqrt{R^2}$$

The estimated correlation coefficient value obtained $r = 0,9389$ indicates that the variable interdependence relationship is strong. The hypothesis can be approved – quality of Lithuanian municipalities' officials in expert "online" seminars given tasks depends on duration of tasks. In other words, it can be said that the longer a respondent takes to perform this task, the higher the quality of tasks and vice versa - the less time the respondent spends, the worse the quality of task performance.

Respondents of experiment noted that they gained additional knowledge of electronic government services development opportunities for municipalities, especially they gained knowledge about implementation of electronic government services models at the municipal level.

Respondents at the end of the control questions indicated that knowledge are going to be used in practice, for example, designing and developing project of e-Šiauliai region. Respondents on their own initiative also noted that they will recommend for others

municipalities' officials and professionals to participate in this "online" consultation seminar intended for municipalities' officials to improve qualification of electronic government services and strive to raise public awareness of electronic government services more effective integration and use.

In summary, it can be stated that the current situation of electronic government services, residents and municipalities' officials assessment analysis and the results of the experiment carried out, confirm that the *Holistic Electronic Government Services Integration Model* is appropriate, can be effectively integrated and applied in Lithuanian local authorities.

VIII. CONCLUSION AND RECOMMENDATIONS

1. Having carried out comparative analysis of stage and "E-Diamond" models of electronic government services, there are distinguished six key features of the models, such as possible levels of implementation, attributes of different levels, targeting at the customer, targeting at the inside processes, feedback, possibility to evaluate services, technological background. However, out of six features the main ones are considered to be the feature of targeting at the inside organizational processes of self-government and the feature of targeting at the customer. The latter is emphasized most of all due to the fact that it represents customers interests best.

2. The implementation of the above mentioned features is identified in the models of "Stages" and "E-Diamond". Both of them are quite equally targeted at restructuring inside processes and meeting the needs of customers. Assessing the models of "Stages" and "E-Diamond" according to this rather neutral targeting, they can be applied in economically developing as well as highly developed countries, thus can be considered to be universal.

3. Aiming at a greater universality and practical applicability of models, the perspective of model improvement should be oriented towards improvement of conceptual-holistic processes under the external and internal conditions of the public sector system. The significance of internal conditions of public sector, first of all, is to be linked with human resources management peculiarities, upgrading of their competence and qualification skills. Of course, here a great role is played also by computer technology. Thus, in this case it is essential to emphasize that application and management of specific electronic government service models at local self-government level depend on the overall holistic processes – competence of municipal officials in innovation management area, their conceptual abilities in electronic government knowledge, application and proper formation of technology skills and computer literacy. Thus, it is possible to formulate a conclusion that quality and effectiveness of electronic government services provision to consumers depend on the knowledge of civil servants, level of their ability to use information technology, external and new public consultation in electronic government service area instruments.

4. Despite the fact that in the old member states of the European Union – Austria, Netherlands, Belgium, Germany the principles of the electronic government administration are becoming a norm, having stepped through the threshold of the twentieth century, in the central and local authorities of the other European states, for example Lithuania, there is still widely applied the Max Weber's model of hierarchical bureaucracy, which impedes the success o innovations as well as the implementations of principles and models of electronic

government services. Therefore, to enable the establishment of the suggested *Holistic Electronic Government Services Integration Model* in Lithuanian municipalities, it is not sufficient to solve its application and implementation problems causing only competitive, managerial organizational changes. Practical implementation of the models of electronic government services in Lithuania should also be regulated by legal acts.

5. Provision of public services for the society is one of the realized and regularly developing functions of municipalities worldwide. The range of the services for residents and business is rather big, thus awareness of electronic government services provided by municipalities would be critical for nearly all levels of municipalities' officials. Consultations provided by experts during online consultation services based on the suggested *Holistic Electronic Government Services Integration Model*, that was created in accordance with "E-Diamond" model, could help municipalities' officials get accustomed with features of providing electronic government services to residents and business entities, as well as could provide an opportunity to become more competitive and efficient specialists in this area. What is more, the principle of online expert consultation of municipalities' officials of the suggested model could be implemented in the "back office" or/and "front office" of the public sector in Lithuania. Finally, it can be claimed that having implemented and widely applied the suggested *Holistic Electronic Government Services Integration Model*, more efficient integration of electronic government services in the local self-government level and more accurate implementation of public expectations might be anticipated.

6. Research of application *Holistic Electronic Government Services Integration Model* in Lithuanian municipalities have been conducted. Methodological research applied expert survey method, various Lithuanian authorities and institutions experts, whose work relates to the implementation of electronic government services were interviewed. The questionnaire survey method was used in order to obtain the opinion of the residents of Lithuania about Lithuanian municipalities offered electronic government services and their adaptation capabilities. Questionnaire survey method was also applied in order to obtain Lithuanian municipalities' officials opinion about Lithuanian municipalities offered electronic government services and their adaptation capabilities. Created *Holistic Electronic Government Services Integration Model* performance based on an experiment involving Lithuanian municipalities' officials. It can be stated that the current situation of electronic government services, residents and municipalities' officials assessment analysis and the results of the experiment carried out, confirm that the *Holistic Electronic Government Services Integration Model* is appropriate, can be effectively integrated and applied in Lithuanian local authorities.

REFERENCES

- [1] Ancarini, A. (2005). Towards quality e-service in the public sector: The evolution of web sites in the local public service sector, *Managing Service Quality*, Vol. 15, 6-23.
- [2] Andersen, K.V.; Henriksen, H.Z. (2003). E-government maturity models: extension of the Layne and Lee model. *Government information Quarterly*. No. 26, 236–248.
- [3] Andersen, K. V. (2004). *E-government and public sector process rebuilding*. Amsterdam: Kluwer.

- [4] Becker, J., Algermissen, L., Niehaves, B. (2005). Processes in E-Government focus: A procedure model for process oriented reorganisation in public administration on the local level. *Accepted to the First International Pragmatic Web Conference*, September, 87–103.
- [5] Becker, J., Algermissen, L., Niehaves, B. (2006). A procedure model for process oriented E-Government projects. *Accepted to the First International Pragmatic Web Conference*, September, 150–183.
- [6] Bretschneider, S. (2003). *Information technology, e-government, and institutional change*. *Public Administration Review*, 63(6), 738–744.
- [7] Buckley, J. (2003). E-service quality and the public sector, *Managing Service Quality*. Vol 13, 453-462.
- [8] Burn, J., Robins, G. (2003). Moving towards e-government: A case study of organisational change processes. *Logistics Information Management*, 25–35.
- [9] Coe, A., Paquet, G., Roy, J. (2001). E-Governance and Smart Communities – A Social Learning Challenge, *Social Science Computer Review*, 80-93.
- [10] Davenport, T.H. (1999). *Process Innovation: Reengineering Work through Information Technology*, Boston, MA: Harvard Business School Press, 246-267.
- [11] Domarkas, V., Lukoševičienė, V. (2006). Electronic government by the aspect of providing information for the society. *Public policy and administration*, No. 16, 73–86.
- [12] Fountain, J. (2001). *Building the virtual state: Information technology and institutional change*. Washington, DC, Brookings Institution, 64-78.
- [13] Goldkuhl, G. (2005). Socio-Instrumental Pragmatism: A Theoretical Synthesis for Pragmatic Conceptualisation in Information Systems, in *Proceedings of the 3rd Intl Conf on Action in Language, Organisations and Information Systems*, Limerick, 115-132.
- [14] Goldkuhl, G., Cronholm, S., Sjostrom, J. (2004). User Interfaces as Organisational Action Media, in *Proceedings of the 7th International Workshop on Organisational Semiotics* (pp. 124-140). Portugal.
- [15] Goldkuhl, G.; Persson, A. (2006). Characteristics of Public E-services: Investigating the “E-Diamond” Model. *Accepted to the First International Pragmatic Web Conference*, September (pp. 54-79). Stuttgart, Germany.
- [16] Goldkuhl, G., Persson, A. (2006). From e-ladder to “E-Diamond” – re-conceptualising models for public e-services. *Proceedings of the 14th European Conference on Information Systems* (pp. 117-132). Göteborg.
- [17] Gronlund, A. (2002). *Electronic Government - Design, Applications and Management*. Hershey et al.: Idea Group Publishing, 61- 77.
- [18] Gugliota, A., Cabral, L., Doingue, J., Roberto, V., Rowlatt, M., Davies, R. (2005). *A semantic web service-based architecture for the interoperability of e-government services*, 133–145.
- [19] Kraemer, K. L., King, J. L. (1996). *Information technology and administrative reform: Will the time after e-government be different?* Irvine, CA7 CRITO, University of California, 580-582.

- [20] Layne, K.; Lee, J. (2001). Developing fully functional e-government: a four stage model. *Government information Quarterly*. No. 18, 122–136.
- [21] Lenk, K., Traunmueller, R. (2001). *Broadening the Concept of Electronic Government*. In: Prins, J. E. J. (Ed.) *Designing E-Government*. Amsterdam: Kluwer, 63-74.
- [22] Lind, M., Forsgren, O., Salomonson, N., Albinsson, L. (2004). *The E-co model – citizens' driving e-services quality*, 97–124.
- [23] Limba, T. (2009) Electronic government services' maturity models: their comparative analysis. *Information Sciences*, 30-40.
- [24] Limba, T. (2009). *Models of electronic government services: opportunities of their application in Lithuanian municipalities*. (Doctoral dissertation, Mykolas Romeris University)
- [25] Limba, T. (2011). Comparative analysis of Stages models and "E-Diamond" model of electronic government services, the conceptual features of their improvement. *Information Sciences*, 8-23.
- [26] Limba, T. (2011) Comparative aspects of Electronic government services' maturity and "E-Diamond" models. *Social Technologies*, 1(1), 35-45.
- [27] Millard J. (2003). *The (r)e-Balancing of Government*. In e-Government: Public Administration for a New Century. UPGRADE. IV (2).
- [28] Persson A., Goldkuhl G. (2005). *Stage-models for public e-services – investigating conceptual foundations*. 2nd Scandinavian Workshop on e-government, February, Copenhagen, 151–188.
- [29] Rudzkienė, V. (2005) *Social Statistics*. Vilnius, MRU publishing center.
- [30] Signore, O.; Chesi, F.; Pallotti, M. (2003). *E-government: challenges and opportunities*. CMG Italy – XIX Annual Conference, Florence, Italy, 231–265.
- [31] Thom, N., Ritz A. (2004). *Public management*. Monography. Vilnius: LTU.

AUTHORS' BIOGRAPHY



Tadas Limba was born in Vilnius, Lithuania in 1976. He got B. Sc. in Politics from Vilnius University, 1999 and B. Sc. in Law from Mykolas Romeris University, 2010. He got M. Sc. in Public Administration from Mykolas Romeris University, 2001 and M. Sc. in Business Law from Mykolas Romeris University, 2012. Also, Tadas Limba got his Ph. D. in Management and Administration from Mykolas Romeris University, 2009. Tadas Limba is an Associate Professor from 2010. Since 2012 he also is a head of Institute of Digital Technologies.

He has published about 20 articles in several areas of information science, monography, handbook, especially in areas of e-government and e-business.

Tadas Limba is a member of Lithuanian Computer Society since 2007. Since 2013 he is Asia Center Board Member, South Korea's representative at Mykolas Romeris University. He plays an active role in international communication and development of joint double degree studies program with South Korea Dongseo University. Also, Tadas Limba made presentations at international and national conferences.



Gintarė Gulevičiūtė was born in Panevėžys, Lithuania in 1989. She got B. Sc. in Public Administration from Mykolas Romeris University in 2008. She got M. Sc. in Electronic Business Management from Mykolas Romeris University.

Now she is an assistant in Institute of Digital Technologies at Mykolas Romeris University. In 2013 she published an article about Peculiarities of Electronic Government Services Implementation in European Union. Her areas of interest is e-government and e-business.

Gintarė Gulevičiūtė is the coordinator of Digital Content Academy at Mykolas Romeris University. During her study years she has organized conference "Future business 2013" at Mykolas Romeris University.