

## E-ServEval: a system for quality evaluation of the on-line public services

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*This paper describes the objectives, the general architecture and the components of the web-based system for quality evaluation of the on-line public services developed using the framework of the complex research project “System for quality evaluation of the on-line public services for citizens and business environment (e-ServEval)”. The paper also presents the technological options regarding the design and development of the system, the functions of the components and the aspects regarding the interface between user and e-ServEval system. Finally, the stage of the project and the conclusions are presented.*

**Keywords:** e-government, e-government services quality, quality evaluation.

### 1 Introduction

The on-line public services represent one of the most dynamic areas of the modern economy, as well as a field of major theoretical interest. The quality of the on-line public services holds a central position within the initiatives concerning the development and improvement of services for electronic government and performance management in public administration. According to the largely public accepted opinion in the field literature, the on-line public services refer to services supplied by electronic means by the public administration for the citizens and the business environment.

The focus on the quality of the on-line public services is a significant part of the digital reform, which – at its turn – is a part of the public administration reform for improving the performances of the authorities from this point of view. There is a general consensus that the authorities of the central public administration have to adopt a strategic management approach oriented mainly towards results, centred on the quality of supplied services and the citizens' needs.

**System for the quality evaluation of the on-line public services for citizens and business environment (e-ServEval)** is a project developed under the Excellency Research Program (2005-2008) by a consortium composed of the National Institute for Research and Development in Informatics (ICI), the Academy of Economic Studies (ASE), the National Communications Research Institute (INSCC) and the National

Institute for Research and Development for Labour Protection (INCDPM).

Based on the research and development results, the designed **e-ServEval** system will be applied for the quality evaluation of the main public services widely used that are developed, implemented and available on-line in Romania.

This paper is organized as follows: first we describe the project objectives; then we provide a brief overview of the general architecture of the e-ServEval system and the technological options for the development of the system. This is followed by a description of the system structure and the main functions of the components and the interfaces between users and e-ServEval. Finally, we report on the stage of the project and the future actions for the research team.

### 2. Objectives

At European level [1], the European Commission has defined within the initiatives and actions concerning the e-government a list of 20 basic public services: 12 basic public services for citizens (i.e.: payments of the social aid based upon the declarations for total income, on-line payments of taxes etc.) and 8 basic services for the business environment (i.e.: public bids issued by the Govern, VAT payment, payment of income tax etc.).

The degree in which the objectives of the quality of the on-line public services are quantified and made public, as well as the degree of measurement and reporting, vary from one country to another. The most fre-

quent evaluations are being made by the public surveys, by the investigations regarding customers' satisfaction concerning the on-line public services supplied by the public administration authorities, by benchmarking the on-line availability of the different types of public services etc.

The conceptual framework of the on-line public services quality and the different approaches used at international level are presented in [3, 6].

In this context and considering the present national and international state in the field, the project's research team proposes the development, experimentation and implementation of a software solution and methods system for solving the following problems related with the quality evaluation of public on-line services [3, 5]:

- (1) the quality evaluation of a public on-line service taking into account the service supply *process*, the user *interface* and supplied *information* by the portal which sustains the services; in this way, it is ensured an integrated approach for the evaluation of public on-line service's quality taking into account their core components (front-office and back-office);
- (2) the quantification and evaluation of public on-line services taking into account the *user's features*, services' *typology*, and the *availability* degree of *on-line services*; in this way, it's assured a modern approach focused on users for the evaluation of public on-line service quality;
- (3) the development of software solutions and methods that ensures the correlation of service's *quality* with public on-line service development strategy and with performance of the authority from public administration that supply the service;
- (4) the evaluation of public on-line service s both from the user's point of view, and from the service's supplier point of view.

### 3. The general architecture

The general architecture highlights the main components e-ServEval that assures the technical and functional requirements defined in [4]. The architecture is based on the

multi-tiered, layered framework which is used to describe the web-based applications.

#### The client layer

The client layer refers to the user's environment of the services delivered through the e-ServEval system. All the evaluators have access the e-ServEval services from the web browser.

The evaluators communicate with the e-ServEval system using browsers capable of HTTP protocol-based communication. It assumes that the evaluator has access at the web in order to use the e-ServEval system. The e-ServEval system will function correctly with the following browsers: Internet Explorer 6.0 or older versions, Netscape Navigator and Opera 6.0 or older versions. The administrator of the system and the experts can access the e-ServEval system from local computers, without using a dedicated browser.

#### Web access layer

The functions of the system will be implemented and presented as an assembly of services on a web site dedicated to the e-ServEval system. The external and internal evaluators will access the same e-ServEval homepage.

The control for the access to the resources from the web server is based on the identity of the user. The system will automatically generate the identification data for the evaluator (username and password) when an evaluator requires the registration into the system. To access the e-ServEval system, the users will send the authentication data (username and password) using the forms provided on the system's homepage.

#### Application layer

This layer contents the main functional components specific for the management of the evaluation process including data analysis processes, validation of measurement models and reports for the evaluation results.

#### Data management layer

This layer implements services for the research, adding, change or deletion of information from data collections which contain information from completed questionnaires and from data collections containing infor-

mation used to administrate the e-ServEval system (e.g., users lists)

The development of the e-ServEval system is oriented towards the use of open-source software, and the development of its own software modules. Supplementary, we use software products:

- open-source: Linux operating system, Apache web server, MySQL database server (data management), PHP (creating programs for components);
- commercial: SPSS 14 for Windows (statistical analysis and processing), AMOS 6.0 (optimization and validation of measurement models).

#### 4. The e-ServEval components

The general structure of e-ServEval system contains an assembly of components which have interfaces and interactions (Figure 1).

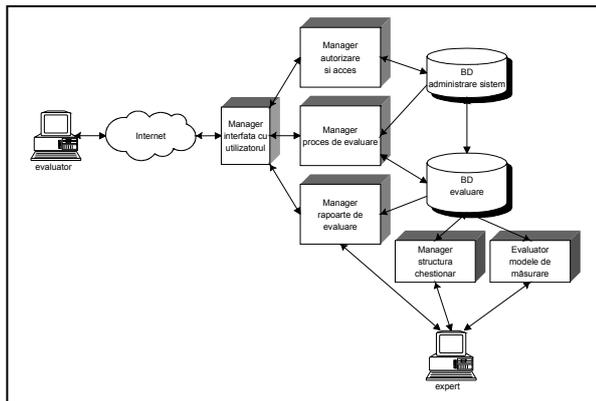


Fig.1. The e-ServEval system components

##### *User Interface Manager (UIM)*

This component is used by all evaluators to browse through the e-ServEval pages specific for the evaluation process. Also, the component ensures the monitoring of the workflow in the system and controls the execution of the other components.

##### *Authorization and Access Manager (AAM)*

This component administrates the users list of the system, validates and monitors the users' access to the system. An important function of this component is to ensure the security and to monitor the unauthorized attempts to access the system.

##### *Evaluation Process Manager (EPM)*

This component guides the evaluators in the on-line evaluation process, administrates the list of the types of on-line public services and provides information regarding the evaluation process. Also, it checks if the fields in the questionnaires are completed and if the database is up-graded with the results from the questionnaires. In Figure 2 it's presented the main menu in the interface between the evaluator and EPM component.

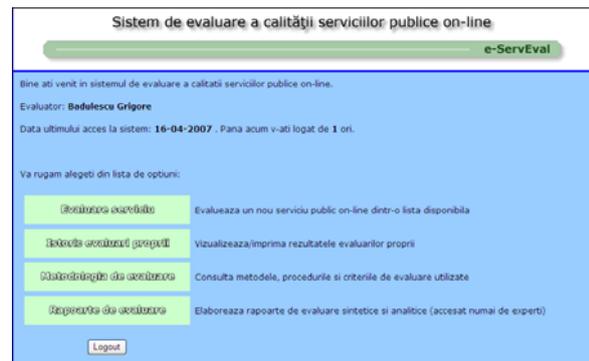


Fig.2. The main menu in the interface between the evaluator and EPM component

##### *Evaluation Report Manager (ERM)*

This component is responsible with the execution of the evaluators required operations concerning the visualization / printing of its own evaluation results (in tabular format and graphics), the history of its own evaluations (Figure 3). Also, this component is used by experts to develop reports regarding the global and analytical results obtained from evaluation (at service types level, at the level of quality characteristics concerning types of services, comparative analysis etc.).

Nr. crt.	Data evaluării	Tipul serviciu evaluat	Adresa web	Scor	Calificativ	Raport detaliat
1	16-03-2007	Serviciul 2	www.onmp.ro	2.33	satisfactor	vezi / print
2	27-04-2007	Serviciul 2	www.sib3.ro	4	bun	vezi / print
3	16-04-2007	Serviciul 2	www.id.ro	4.2	foarte bun	vezi / print
4	11-04-2007	Biblioteca digitala	www.library.utt.ro	4.51	foarte bun	vezi / print

Total evaluări: 4

Fig.3. An example of report regarding the history of the users own evaluations

##### *Questionnaires Structure Manager (QSM)*

This component is used by an expert for the development of the questionnaires and it's accomplished through specialized software to create on-line questionnaires. Figure 4 presents a sample evaluation questionnaire that has to be completed by an evaluator.

The screenshot shows a web-based evaluation questionnaire titled "Sistem de evaluare a calității serviciilor publice on-line" with the "e-ServEval" logo. The page is divided into "Intrare" and "evaluare/evaluata" sections. The main content is a " chestionarul de evaluare" for the evaluator "Badulescu Grigore". It lists seven criteria for evaluation, each with a rating scale from 1 to 5. The criteria are:

- Structura site-ului este clară (de ex.: sunt furnizate explicații privind modul de utilizare sau o hartă a site-ului)
- Site-ul web are o organizare ușor de înțeles, legăturile între pagini sunt logice, explicate și plasate adecvat
- Paginile în site-ul web sunt omogene (unitare) în prezentare și design
- Site-ul web furnizează un ghid sau o schemă de flux privind modalitatea de cumpărare online
- Funcțiile oferite de site și intrările/ieșirile sunt ușor de înțeles
- Site-ul web se parcurge ușor, logic și rapid înainte și înapoi prin pagini
- Site-ul web oferă funcții care ajută la găsirea ușoară a informațiilor

Each criterion has a corresponding row in a table with five columns labeled "1", "2", "3", "4", and "5", where the evaluator can select a rating.

**Fig.4.** Example from the structure of the evaluation questionnaire

#### Measurement Models Evaluator (MME)

This component is used by the e-ServEval questionnaire administrator for analysis, validation, optimization and evaluation of the measurement models. This component is accomplished with specialized software (statistical package SPSS 14 for Windows and AMOS 6.0 for Structural Equations Modeling).

#### 5. The project stage

The project is in its fifth phase of development "The experimentation of the pilot system." Until now, activities such as the elaboration of the experimentation methodology and the experimentation plan have been finalised. The activities for defining the evaluators list and the list of on-line public services, which will be the object of the experimentation, are about to be concluded.

We have in view categories of on-line public services for citizens that are widely used and available on-line in Romania [2]. An experimentation methodology created by the research team based on the best practices in the domain will be used. The results of the experiments will be recorded in experimentation reports.

#### 6. Conclusions

By applying the modern information technologies, the project contributes to resolve concrete and important problems regarding the measurement, the evaluation, and the improvement of quality for on-line public services. In addition, through the research results, the project adds to the research efforts done in the domain of evaluation for the services provided through electronic means and demonstrates the validity of technologies and modern applications in e-government.

In order to capitalize and exploit the results, we will undertake actions to include the system and its services in the offer of services for the project's partners.

#### 7. References

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