

## VALUE BASED GOVERNMENT INFORMATION SYSTEMS

### **Abstract**

The translation from the traditional way of performing the Government services to the e-Government is viewed as an opportunity to fundamentally change the processes in the governance in order to make it more accessible and effective for the citizens. The information system is a key factor of this process. Traditional methodologies used for government information systems design do not connect in proper way the citizens' values and governmental objectives and requirements with the information systems facilities. The result is a mismatch between citizens' expectations, administrative goals and information system's characteristics. The key of success is to identify citizens', political strategists' and information technologies professionals' perceptions of value and match them. The citizens' perception of value is documented by using empirical studies results, and also the governmental authorities' priorities which are established by using the present Information and Communications Technology in Public Administration Strategy of Romanian Government. The goal of this paper is to bring together Value Analysis concepts and information systems architecture in order to transform them in architectural requirements for the information systems design.

**Keywords:** Government services, efficiency, citizen centered, value, government information systems.

**JEL CODES:** H11, R11, L86

# SISTEME INFORMAȚIONALE PENTRU ADMINISTRAȚIA PUBLICĂ PROIECTATE PRIN VALOARE

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### **Rezumat**

Trecerea de la modul tradițional de accesare a serviciilor puse la dispoziție de administrația publică la e-Government este văzută ca oportunitate de a schimba în mod fundamental procesele din administrația publică pentru a le face mult mai accesibile cetățenilor. Sistemul informațional joacă un rol important în acest proces. Metodologiile clasice utilizate pentru proiectarea sistemelor informaționale pentru administrație nu leagă așteptările cetățenilor și obiectivele administrației cu facilitățile puse la dispoziție de sistemele informaționale. Ca urmare, asistăm la o nepotrivire între așteptările cetățenilor, scopurile administrației publice și caracteristicile sistemelor informaționale. Factorul cheie în dezvoltarea unui sistem informațional este ca dezvoltarea acestuia să pornească de la modul în care percep valoarea cetățenii, politicienii și profesioniștii din domeniul informaticii și să le pună de acord. Percepția cetățenilor a fost determinată prin recenzia studiilor empirice, cât și a priorităților autorităților, care au fost determinate prin analiza Strategiei Guvernului României privind informatizarea administrației publice. Scopul lucrării este să introducă Analiza Valorii în proiectarea sistemelor informaționale pentru determinarea cerințelor față de sistemul informațional.

**Cuvinte cheie:** administrația publică, eficiență, cetățean, valoare, sisteme informaționale pentru administrația publică.



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## 1. INTRODUCTION

Information and Communications Technology become a driving force behind human development and growth in the new millennium. The Information Society is a unique chance to decrease the gap between underdevelopment and the industrialized countries, including at the governance level. Information Society is the foundation for an efficient governing. E-Government refers to the use of Information Technologies by governmental agencies that have the ability to transform relations with citizens, and the branches of government. These technologies can assure a better delivery of government services to citizens, citizens' interactions with government, and citizens' empowerment through access to information, or more efficient government management (Moga, 2005). E-Governance concept extends to the use of Information Technology that has the ability to transform relations with citizens, business, and other branches of the government. Better delivery of citizen services, improved interaction with business and industry-citizen empowerment through access to information. World over, e-Governance is the outgrowth of the efforts made by the governments to improve relations with their citizens. As a result, e-government services are divided in government to citizen (G2C), government to business (G2B) and government to government (G2G). The research is focused on citizens' relationship to governmental services (G2C).

Application of Information Technologies in the form of Governance has inherent capability to empower the poorest citizens of countries. Over the past decades, there have been islands of e-Governance initiatives in Romania at the national, district and even block level. The experiences of the various initiatives played an important role in shaping national e-Governance strategy of the countries, with following vision: make all Government services accessible to the common individuals in their locality, through common service delivery and ensure efficiency, transparency and reliability. Reduced corruption, increased transparency, greater convenience, revenue growth and/or cost reduction are the resulting benefits.

The Government services have to meet citizens' needs through Information Systems designed to better satisfy them. The Information Systems are developed from public financial resources which are very restrictive. That is why in order to ensure the efficiency of Government services, the responsible authorities have to get them at the lowest price and utilization costs as possible and get from them the maximum benefits in term of satisfaction the citizen needs and their needs.

Mahrer and Brandtweiner (2004) analyzed the implementation and management of a web-based Government Information System in Austria. Their research showed that Information Systems failure models must be considered as viable concepts for practitioners when it comes to identifying potential obstacles in the development of web-based Government Information Systems. This research is a particular approach that intends to link the software design with the Government services objectives affected. The basic concepts of this approach are similar with the ones introduced by Faulk and Harmon (2000) in their software development projects. In the center of this approach is the value of the final product, called users value. The value is given by the users, who are the citizens. Chien-Chih (2007) proposed a value-based approach for the strategic management framework and process for supporting efficient and effective planning, implementation, as well as evaluation of e-government's strategies. In his opinion, the core of this model includes public beneficiaries, government internal organization and process, government service chain, and society and national environments (Chien-Chih, 2008).

Value Analysis, as a technical and economic method of projection, fundamentally differs from the classic methods of the cost reduction through the functional and systemic approach of the designed objects, processes and services (Ionita, 2008). The first step of the design process is to identify the needs that the system has to fulfill. Because the economic value of a product/service is, in fact, the user recognized social value, the Value Analysis can be considered as the method that provides, on one hand, the users' needs fulfillment and, on the other hand, the reduction of their cost. In this particular case, value defines the relationship between the perceived benefits of Government Information Systems and its cost. According to Value Analysis approaching, the value of the Information Systems is given by the amount of its functions. The production cost can be cut in a special way by eliminating the useless functions and by relating development costs. This is a way to obtain a product for Government services with a greater value for a good price.

In the context of a hypercompetitive economy environment, the information systems developers focused of software environment more to become more adaptable and flexible in order to capture opportunities in a very dynamic market (Capatina, Olaru, and Balan, 2012). For the Information Technology professionals it is very important to understand which the users' requirements are. One of the key factors in the success of a software development project is to know what the users' value expectations are. Another important factor in an information system development project success is to understand the differences that appear in the perception of software's value between the citizens, the Government, the developing companies and the political decisional factors.

## 2. VALUE ANALYSIS BASED INFORMATION SYSTEMS DEVELOPMENT

The determination of software value requirements, as it is described by Faulk and Harmon (2000), is a three steps process as it is presented in Figure 1. First of all, information systems developers must be in contact with the citizens that are the final users for their products. In order to identify their specific needs, they may use questioners or personal interviews. The focus groups are made of people from different categories of users, with very different backgrounds. The questions are focused on the services that the users want to use and on their requirements on interaction level.

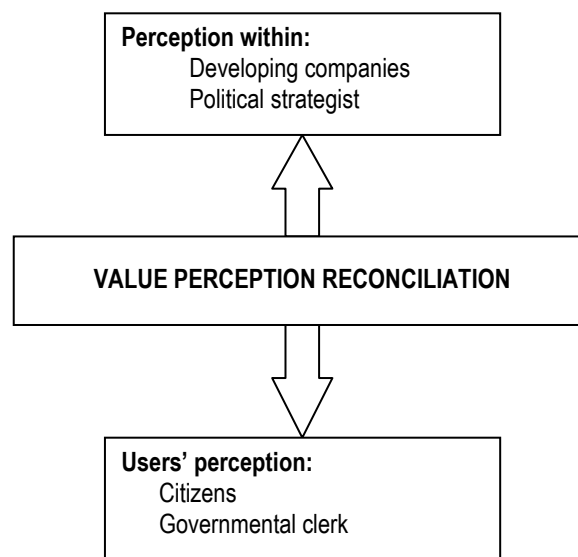


FIGURE 1: - THE PROCESS OF VALUE ANALYSIS BASED SOFTWARE DEVELOPMENT

The next step is to identify the value perception held by the employees within developer organization. In the traditional information technology practice and theory these perceptions have major influence in software design and architectural decision. The final stage is the reconciliation of internal value perceptions with those of citizens, governmental clerk, and politic strategist in order to establish the functions of the final product. It is hard work because of the significant differences between the developers' opinion about their own product and the citizens' value representation. Once a set of software functions has been identified, a decision is made regarding which function will be included in the product. User's opinion is weighed against Information Technology professionals' point of view.

In order to point out this research's needs and requirements, there were necessary investigations and thorough discussions with the involved groups and institutions, as it follows:

- Citizens, as the beneficiaries of the governmental services: The SIBIS polls and the SIBIS experts' reports (2001, 2003) had been analyzed. The obtained information is the basis of the identified requirements number 1, 2, 3, 5, 7 and 11 from Table 1;
- Political environment: In this paper is used the citizens' needs for e-government identified by Nica (2001). The obtained information is the basis of the identified requirements number 1 and 2 from Table 1. The Commission for Information Society and Communication was another political group that was consulted for the actual Governmental Program for Information Society and Communication. This commission's discussion list was used as a basis for the identified requirements number 4, 5, 8, 9, 10, 11, 12, 13, 14 and 15 from Table 1.
- IT professionals' involved in the actualization process of governmental services: Interview was used to determine IT Professionals' point of view. On their opinion were identified requirements number 5, 6, 9, 10, 11 and 14 from Table 1. It should be mention that the selected requirements, as it can be seen in Table 1, were considered the most representative for the information systems.

### 3. THE FAST DIAGRAM FOR GOVERNMENT INFORMATION SYSTEMS

The method used to describe the product through its functions is Task oriented FAST Diagram (Function Analysis Systems Technique Diagram). Task FAST Diagram is a structured method of function analysis that results in defining the product or process function and establishes the connections between them. The Task in Task FAST is defined as the need of the customer or final user. The diagram consists in four parts, as it follows: Scope line, Task, Basic functions and Supporting functions.

In order to develop a FAST Diagram for Government Information Systems, it will be used Snodgrass' method (1986). There are some specific steps in developing a Task Fast Diagram. First of all, the functions of the system have to be identified. It also should be added that each requirement determines a certain function. The second step is to separate the identified functions into basic and supporting functions. Basic functions are those which are essential for the performance of the Task. Without the basic function the system will not work. Supporting functions, though not essential, are extremely important in building customer acceptance and in selling the product or service.

#### **Task determination:**

The turning point in detection of the task of Government Information Systems is to answer the following questions:

- What is the information systems' role in Government services?
- The answer is: Solve governmental issues.
- The answer to this question is a set of verb – noun functions. One distinctive function among all functions should be the main reason that the citizens use this product (the customers buy this product). By definition, "Solve governmental issues" is the Task of Government Information Systems.

**Basic functions' determination:**

Basic functions' determination can be done by asking the "HOW?" question for the task accomplished by the analyzed information system: How does an information system for Government Information Systems solve citizens' governmental service?

The answers are: Download documents, Fill in documents, Upload documents, Pay taxes/fees.

Asking the "WHY?" question for the prior determined basic functions will lead us to an answer which is the task "Solve governmental issues".

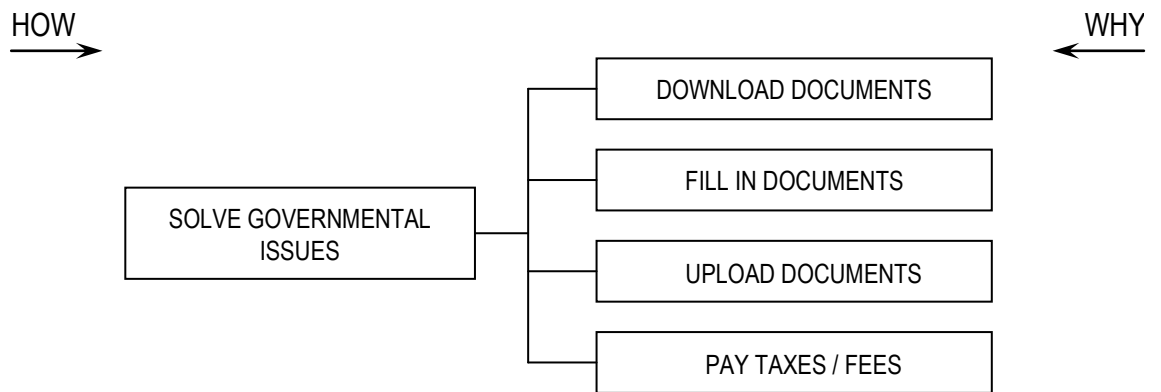


FIGURE 2: - BASIC FUNCTIONS OF FAST DIAGRAM FOR GOVERNMENT INFORMATION SYSTEMS

Supporting Functions – Needs, Wants and Requirements:

There are four main categories of supporting functions:

- assure convenience;
- assure dependability;
- satisfy user;

For each prior determined need there will be a supporting function. This step is shown in Table 1. The requirements previously determined can be considered supporting function.

TABLE 1: FUNCTIONS FOR GOVERNMENT INFORMATION SYSTEMS

No.	Requirements	Functions
1.	Citizens would rather not stand in line to solve their governmental services issues;	Save time
2.	Citizens prefer to solve their governmental services issues in their spare time;	Available non-stop
3.	Citizens should be informed about the available services and the way they could access them;	Furnish instructions Display directions
4.	A friendly and interactive interface makes the access easier;	Simplify interaction
5.	Citizens would rather like to find all the information available gathered together in only one site, instead of searching for them;	Minimize effort
6.	It is not desirable to have frequent changes in the interaction mode;	Minimize confusion
7.	Because of the limited PC number and Internet access, citizens prefer to access Internet and the desired information from work, Internet Café, etc	Available anywhere
8.	Citizens would rather like to meet the same kind of procedures and administrative circuits;	Standard Governmental procedure
9.	For a free access from outside of an information system, in order to ensure a better actualization of the software, data encoding should not be supplied by a single purveyor;	Allow actualization Ensure accessibility
10.	Stability of public data is a must; purveyor independent programs (from maintenance and utilization point of view) are indispensable;	Ensure stability
11.	State's and citizen's security is vital; that is why there should be used systems that do not allow remote control and unwanted data transmissions;	Ensure security
12.	Data changes should be restricted to only authorized people and institutions;	Ensure consistency
13.	Because of the low financing , system's costs are limited;	Minimize production cost
14.	It is important that the existing hard resources (infrastructure) can be reused;	Minimize implementation costs
15.	Because of the high initial investment, it is expected a decrease of staff and material expenses during the exploitation.	Minimize utilization cost

#### 4. CONCLUSIONS

The next development of the research is the calculation of each function's cost in order to offer to the stakeholders a stable basis for making a good decision. The technical solutions for each function are offered by a multidisciplinary project team which is, in fact, a characteristic of the Value Analysis Methodology. After the systemic analysis, the useless functions, or cost – inefficient functions, are eliminated or replaced. Also, vital functions are worked out for a better result. In all his case-studies,

Snodgrass (1986) shows that the projects that use Value Analysis lead to substantial savings and to remarkable performances' increase of the projected products/systems. That is why this paper offers a new prospective for Governmental services by using Value Analysis in order to get a better control of the costs, simultaneously with better services for citizens.

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