Types of methods and researches used in e-government systems/applications

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ABSTRACT

E-Government is more and more a major characteristic of knowledge and information society. The e-Government system development was influenced in all countries by legislative measures regarding on-line services from public administration and also by rapidly usage of ICTs.

In this context, the paper presents some methods and researches used in e-Government systems/applications in order to provide through electronic means, high quality, efficient and accessible public services to citizen and business.

Keywords: e-Government, methods, researches challenges, strategies, risks.

1.INTRODUCTION

E-government is using the tools and systems based on Information and Communication Technologies (ICTs) to provide better public services to citizens and businesses. ICTs are already widely used by government bodies, just as in enterprises, but e-Government involves much more than just the tools. Effective e-Government also involves rethinking organizations and processes, and changing behavior so that public services are delivered more efficiently to the people who need to use them. Implemented well, e-Government enables all citizens, enterprises and organizations to carry out their business with government more easily, more quickly and at lower cost.

The e-Government covers four major aspects of communication and services:

- **Administration - Citizens.** Modern Internet and Intranet web-based solutions coupled with conventional means for ensuring broad access, which will lead to qualitative changes in the terms for communication and provision of services to citizens;
- **Administration - Business**. Modern solutions for optimization of processes and business relationships between the public administration and various business entities;
- **Administration - Administration**. IT development at the national and interstate levels with a view of ensuring effective interaction of various administrative structures;
- **Internal Institutional Efficiency and Effectiveness.** Organization and optimization of business processes, administration-employee relations and communication processes within administrative structures.

E-Government systems/applications empower citizens and businesses to transact government business on-line that might otherwise require "a trip downtown". Agencies benefit too, from reduced paperwork, improved databases, and increased efficiency Web-based e-Government systems/applications have many general advantages compared to walk-in offices, printed material, and telephone-based citizen service bureaus. The advantages of e-Government systems/applications are the following:

- *faster response*: e-Government systems respond immediately, 24-hrs/day, 7 days/week;

- *lower costs*: e-Government systems are typically cheaper than salaries & office space, all things considered;
- *more up-to-date and complete information:* Because they are supported by real-time computer databases, e-Government systems can provide efficient access to millions of database records and other documents, some of which are updated daily.

The researches in e-government have tight connections with other areas of research such as: computer science, informatics systems, public administration and political sciences. The researches from this field may be divided into the following groups: *researches based on theory; researches based on framework; researches based on models; researches based on schemas; researches based on concept; researches based on category.*

The *researches based on theory* are applying or testing an already identified theory. The *researches based on framework* are using a structure, which precisely derives from a theory. For example, a framework of different regularization perspectives bases on political science theory. The *researches based on models* are using a plan which does not make reference towards other knowledge. The *researches based on schemas* are using a plan of techniques or a technical architecture for e-government. The *researches based on concept* are using a particular concept, for example "*stovepipe government*". The *researches based on category* are presenting a categories' set or a list of factors which must not miss from an e-government Web site.

In e-Government are distinguished the following methods, sorted by their frequency usage: *questionnaires, file's analysis, "hunt and peck", interview, the evaluation of Web content, reflection upon the project experience, examination.*

2. CHALLENGES IN E-GOVERNMENT SYSTEMS/APPLICATIONS

In development of e-government systems, there are *some challenges* regarding the agencies' autonomy, political pressure, the environmental context (political or social), the quality of information, opposite interests, the removal of inconsistency, inaccuracy, incompleteness etc.

The challenges in e-government may be gathered in five categories: challenges referring to information and data, challenges regarding to information technology, organizational and managerial challenges, confronts concerning the legislation and rules in this field, challenges regarding the institutional and the environmental area. The main categories of challenge, the challenges on each category and successful strategies used for each category are presented in Table 1.

Table 1

Challenges' category	The challenge	The success strategy
Information and data	The quality of information and data	General plan Sustained feedback from users Quality assurance Training
Information technology	The need of dynamic information Security themes Technological incompatibility Technological complexity	Easy to use Presentations and prototypes
Organizational and managerial area	Size of the project Behavior and managerial attitude Organizational diversity The lack of alignment to organizational aims Multiple and in conflict goals Resistance to	The experience and the skill of team project IT leaders with worthy skills (technical, social) Realistic and evident goals The involvement of final users Planning Measurable results Good communication The upgrade of

	changes	business actions Adequate training
Legislation and regulations	Restrictive laws and regulations Inter-governmental connections	Politics and standards in Information technology
The Institutional and the Environmental area	Agencies' autonomy Political pressure Environmental context (social, economical)	Legislative support Strategic Outsourcing Relationships for public or private partnership

- **Challenges regarding data and information**

The e-government initiatives focus on the achievement, management, dissemination and joint utilization of the information. One main challenge in this category is the assurance of data quality and accuracy. The problem of data quality involves the removal of inconsistencies, incompleteness in data.

- **Challenges regarding Information Technology**

The usefulness and lightness of systems' usage from public administration are important factors which must be taken into consideration. Technological incompatibility was identified as a difficult challenge in IT projects. The systems which are too different and long-standing, extend the complexity of IT projects especially in areas of integrating information. The complexity and the novelty of technology are constraints which potentially affects IT projects. The lack of technical skill inside the team it is also an important factor.

- **Managerial and organizational challenges**

Without any doubt, the magnitude of the project, the users' and organizations' diversity which are involved in the project are the two main challenges in IT initiatives. There are also problems about the goals and objectives of IT initiatives. One of the problems is misalignment of organizational goals with IT projects. Another problem is the existence of too much opposite goals.

- **The challenges regarding legislation and regulations in this field**

The governmental organizations are created and operate according to a set of rules. Taking a decision in IT projects must make allowances for a great number of rules and regulations. For example, the laws in force permit to governmental agencies only annual budgets. It is affected the development of those IT projects which need a longer period to finalize.

- **Institutional and environmental challenges**

There are challenges about the institutionalized work method and the political environment in which governmental organizations operates. In this context there are not only rules and regulations but also targets, actions or attitudes which people are accepting. For example, although the low does not mention anything about the agencies' autonomy, they are acting like one.This situation constraints the effort of technology utilization to integrate these agencies or to use the information together.

3. SUCCESS' STRATEGIES

- **Strategies regarding data and information management**

The structures and definitions of data development is a critical problem for inter-organizational systems from public administration. This means the minimization of data problems, with help of joint standards and definitions of metadata which are used by all partners. For data quality maintenance, a sustained feedback from users is very necessary.

- **Strategies regarding Information Technology**

Due to technologies' complexity and novelty, a strategy that responds to challenges about Information Technology it is early focusing on prototypes processes and systems' development.

- **Managerial and organizational Strategies**

Clear goals' establishment and convocation of final users in projects were proved to be an effective strategy for exceeding the managerial and organizational challenges. The techniques for strategic planning may be seen like an "umbrella" for specific strategies such as: evident "milestones", channels of clear communication, improved business processes.

- **Strategies regarding legislation and regulations in this field**

The issuance of restrictive laws and regulations which ignores the relevant technologies from e-government may affect the project success. A strategy used to answer to this challenge is to make investments in changing the laws and regulations in a way that permits the implementation of top technologies. For example, the insertion of digital signature technologies in public administration demands major changes in legislation.

- **Institutional and environmental strategies**

Single leaders or managers cannot change the institutional rules or the used practices. However, if a large coalition captivates the legislator's attention then some institutions may be changed. There are at least two strategies regarding institutional factors: getting executive and legislative support, or strategic usage of "outsourcing".

4. COMPARING THE STANDARDS USED IN PUBLIC ADMINISTRATION

There are technical standards published in CEN, ETSI, ITU, IEEE or IETF and standards on data formats, semantics, ontologisms and processes published in ISO, OASIS, W3C and UN/CEFACT. Among the standards on data formats, EDI is the most popular and has the main target the documents' standardization. Among the standards referring to processes' definition, the most recognized are BPEL4WS, BPML and WSEL.

Afterward, we will refer to standards regarding semantic description.

The initiatives of Semantics Web Services (SWS) have two types of classes:
- initiatives regarding the description of SWS and developing meta-ontologisms suitable for representation of any aspect of SWS (for example: OWL-S, WSMO);
- initiatives for industrial standard usage (WSDL, UDDI, SOAP etc.), improved with semantic information regarding capabilities of a service, than matching capabilities of services with capabilities asked by clients who call the respective service (for example: METEOR-S, WebDG and WSMX).

First initiatives class defines the concepts suitable to describe semantic every aspect of Web services. These aspects regularly include the functionality given by the service (characterized by preconditions and effects), the service interface (the messages between users and Web services) and non-operating characteristics of Web services (for example financial or performance details).

The concepts also explain the ontologisms' meta-model used in describing the area of interest.

The second initiative additionally uses a collection of intelligent instruments specialized in development, publication, finding and using the Web services.
Technologies and standards frequently put into practice are:
- for services definition: WSDL, WSDL-S
- for services publication: UDDI
- for services execution: SOAP, HTTP, RMI
- for processes description: BPEL4WS, BPML WSEL

- for ontologisms' definition and management: RDF-S, OWL, OWL-S

To compare the two initiatives SWS, must be aware of the problem type that may be solved. If de solving problem demands an efficient solution that can be often used in practice, then the first initiative is the right one. If the solving problem addresses to academic background, then it may be used the second initiative, which permits an explanation based on ontologisms.

- **Standards' applicability in current projects**

The „Semantic Government" project regards the analysis, design, implementation and evaluation of an integrated and intelligent background for Public Administration (PA) services' preparation, to national and pan-European level, with capitalization of concepts and technologies which are aligned to European Cadre of Inter-operability.

„Semantic Government" it is based on the paradigm of Services Oriented towards Architecture (SOA), implemented through technology of Semantics Web Services (SWS), sustained by Public Administration domain, and on modeling which will be documented in specific ontologisms of PA. They must be compatible with all European major programs and an initiative, in the field of pan-European services, and of semantic's interoperability (for example: European Cadre of Inter-operability).

Onto Gov (http://www.ontogov.com/) is an IST project in progress. Its main objective is developing, testing and validating a semantic-enriched platform, with ontologisms which are helping the consistent composition, reconfiguration and development of e-governmental services.

SmartGov (http://www.smartgov-project.org/) is a project finalized in February 2004.Its purpose was to specify, to develop and to evaluate a platform based on knowledge to assist the employs from public section, generating on-line transactions.

CTE-PAN (Methodologies and instruments for creating an intelligent collaboration and transaction in areas of public administration networks) (http://www.eurodyn.com/icte-pan/), a project in progress regarding the development of an innovative methodology for modeling the operations and Public Administration instruments, for transforming those models in specifications of the projects for e-government areas, automating and stimulating complex bureaucratic processes.

COSPA (Consortium for „Open Source" in Public Administration) is a project in progress (http://www.cospa-project.org) which watches the effects' analysis of Open Source Standards implementation.

eGOV(http://falcon.ifs.uni-linz.ac.at:8080/eGOV/) is a completed project having the following main objectives: preparing an open platform, extendable, measurable on-line, one-stop type which permits the public sector to offer citizens, business partners and administrative personnel information and services based on real events and business situations. The project eGOV does not use ontologisms, but defines meta-data that may be extended in shape of ontology for semantic description of e-government services.

WebDG project was made in Digital Web Government project (WebDG) created by Computers Department from Virginia Tech. It is an interesting case of comprehensive infrastructure for e-government web services. Main contributions of WebDG act around two characteristics such as:
- the e-government services' formation, The framework for automatic services is based on a set of rules which verifies services' consistence.
- the intimacy keeping. To protect intimacy, the requests for services contain users' accreditation letters, which filtrates the mechanisms used to assuring the access to sensitive information only for authorized persons.

5. RISK ANALYSIS

Major risks identified in this moment are presented below:
- Removing from program, late delivery and slow progress. This risk is kept back through periodical evaluations of status improvement, obtained with the relevant

indicators of project manager. These indicators will be used for sustaining the tendencies in obtaining progress, showing the current average of separation from program for each task**,** but as the same time maintaining the original plan;

- The underestimation of required effort. This risk is kept back by monitoring the planned program versus the real effort required for each task. The indicators and statistics will be included in reports of periodical progress;
- The changing of supervising staff. This risk may be avoided by work system standardization applied to different teams and defining a politics' consolidation, in such manner that in case of an unexpected departure, the remaining personnel may temporary compensate the absence of others, in attending a permanent replacement. The politics' consolidation will not be limited to key staff but will be applied as possible to all resources;
- Late access to resources. The access to software, hardware and human resources may be an obstacle for the project in progress. A way to remediate this risk is anticipating resources request and measuring the average period of time for each resource producer.

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