MAPPING E-GOVERNMENT STAKEHOLDER REQUIREMENTS TO PUBLIC ADMINISTRATION OPERATIONAL NEEDS

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ABSTRACT

This paper proposes a framework for e-government development projects aiming at the detection of inconsistencies, incompatibilities and mistakes during the early design stages. This is achieved by applying a Requirements Engineering methodology for the identification of stakeholder requirements and dependencies. Furthermore, a generic identification of public administration's functions is being proposed making it possible to detect deficits in service provision. Using a Goal Oriented Requirements Engineering methodology and relevant tools, stakeholders' and functional goals are mapped. An example of a knowledge management system, presenting the case of a Greek e-government application is discussed here in relation to the proposed framework.

KEYWORDS

e-Government, Public Administration, e-Government Stakeholder requirements, e-Government requirements

1. INTRODUCTION

Public Administration (PA) in general or Public Organizations (PO) more specifically should adjust to the new era of e-government. Yet, they are neither isolated nor independent. They belong to an administrative environment; they are accountable to political offices both at national and supranational level.

Government managers need to analyze and evaluate ICT choices because these choices are among the most complex and expensive decisions they are expected to make (Dawes et al., 2004). A PO needs to identify and satisfy all stakeholders with the implementation of an e-government initiative, because only then it is possible for such an initiative to succeed.

Information System (IS) projects begin by examining and understanding the business and organizational domain in which the information system is to be introduced. The system analysis phase of information systems development is concerned with representing this business domain (often called the "real world domain"). Such a description is termed a conceptual model: "Conceptual modelling is the activity of formally describing some aspects of the physical and social world around us for purposes of understanding and communication" (Mylopoulos, 1992)

The past fifteen years have seen the rise of a new phase in software development which is concerned with the acquisition, modelling and analysis of stakeholder purposes ("goals") in order to derive functional and non-functional requirements. (Mylopoulos, 2006)

This work aims at proposing a framework that addresses the need of introducing the right e-government system in an organization. It considers public organizations in EU member states and takes a country's administration (namely Greece) as a typical case. It identifies all stakeholders and by using formal sources, like policy and strategy papers, constitutions and principles in wielding and finally researches on citizens and businesses views, lists/registers their requirements. Stakeholders' requirements are non functional requirements and goals that every initiative has to achieve in order to be successful. Thus, it is essential for them to be analyzed and move from abstract to concrete, in order to be connected with organizational operations/procedures. To achieve this correspondence Goal Oriented Requirements Engineering (GORE) methodology and tools are used. Then a grid of intertwined goals is shaped.

The framework aims at providing a clear, unambiguous and shared understanding of the business or program objective an organization wants to achieve. Many projects go wrong at this very first step because those responsible assume everyone sees the situation and its resolution in the same way.

This paper is structured as follows: section 2 outlines the problem and reviews the related work. A comparison to the framework proposed, is also provided here. Section 3 presents the proposed solution. In section 4 a case study is presented and in section 5 a discussion about the proposals in this paper is held and potential results of the work are assessed.

2. RELATED WORK

Quite a few different methodologies and techniques used in mapping requirements are available. This section provides a brief presentation of the most popular amongst developers at the time of writing.

A) Object-oriented modelling languages such as UML have been developed for modelling software systems, not application domains. There is no formal account or analysis of the connection between the objectives of the different stakeholders (human, social or otherwise) and the system-to-be.

The main problem to overcome in using object-oriented IS design languages for conceptual modelling is the lack of meaning of language constructs such as 'object', 'class', 'attribute', and 'operation' when used to model application domains (Evermann & Wand, 2005)

B) The KAOS method (Knowledge Acquisition in autOmated Specification) has been applied in industrial projects, in a wide variety of domains, to engineer requirements for fairly different types of systems (van Lamsweerde, 2001; 2005). The method has also been used to build goal oriented models for various strategic planning and business process reengineering projects, to reengineer unintelligible requirements documents, and to generate calls for tenders and tender evaluation forms in a large international organization. To the best of our knowledge there is no application of the KAOS method in the e-government domain.

C) Ontologies have long been used and accepted as a means to perform conceptual domain modelling in the knowledge engineering community (Swartout and Tate, 1999). Software-intensive systems require an essential way to build a common language that creates a shared understanding between stakeholders and promotes cohesiveness between the information gathered from diverse sources to guide their software engineering processes (Lee and Gandhi, 2005). To assist autonomous agent interactions, the use of ontologies resulting from the RE process has been suggested by Brietman et al. (2003). They outline a Language Extended Lexicon (LEL) (Leite & Franco, 1993) based approach to structured ontology construction. The LEL by itself does not carry any semantics unless it is instantiated using a conceptual model. Evermann and Wand (2005) discuss other ontology based object oriented domain modelling approaches in detail. These though are beyond the scope of this paper.

D) In TROPOS methodology the five main development phases are: Early Requirements, Late Requirements, Architectural Design, Detailed Design and Implementation (Castro et al., 2000) As an example of use of the TROPOS methodology in e-government projects is a real application developed for the local government of Trentino (Provincia Autonoma di Trento, or PAT). The e-Culture system is a web-based broker of cultural information and services for PAT, including information obtained from museums, exhibitions, and other cultural organizations and events (Bresciani et al., 2004).

Tropos adopts the i* (Yu, 1995) modelling framework for analyzing requirements. The ultimate objective of requirement analysis in Tropos is to provide a set of functional and non-functional requirements for the system-to-be.

Forward and backward reasoning is supported in Tropos by the goal reasoning tool (GR-Tool). Basically, the GR-Tool is a graphical tool in which it is possible to draw the goal models and run the algorithms and tools for forward and backward reasoning (Giorgini et al., 2005).

The Tool for Agent Oriented visual Modelling for the Eclipse platform (TAOM4E) tool supports the TROPOS agent-oriented software engineering methodology. This tool is based on the Eclipse Platform that offers a flexible solution to the problem of component integration (Bertolini et al., 2006).

E) REF is a Requirements' Engineering Framework explicitly designed to support the analysts in reasoning about socio-technical systems, and transform high-level organizational needs into system requirements. By adopting concepts like Actors, Goals, and Intentional Dependency, and introducing an essential graphical notation, REF claims to be a very effective and usable tool. In addition, "REF supports the analysts in dealing with complex and system/organizational design related issues, such as shared and clashing stakeholders' needs, by introducing some specific analysis-oriented notations to allow an early marking and detection of such situations"(Donzelli and Bresciani, 2003)

While the proposed solution adopts the above mentioned theory and techniques of GORE, as well as the tools for visual representation of the framework it is differentiated by providing a holistic approach. That is:

♦ It considers / identifies stakeholders and their requirements in an upper, domain level (regardless of procedure) allowing depiction of all of them in an overall manner.

♦ It allows the consideration of PA as a whole. POs and units are instances of PA. Entrusting a public service to one of them might be occasional and the rationale that led to it might be revised.

♦ It studies PA's function in an abstract generic level classifying all operations in three levels. This will allow the use of the technique proposed here to all kinds of PA processes.

♦ It joins functional and non functional requirements assigning non functional stakeholder requirements to PA's operation.

3. PROPOSED SOLUTION

To facilitate decisions about introduction of systems that promote e-government and provide solutions to PA's operational needs, first we identify e-government stakeholders and their dependencies. Their goals are analyzed in the case study, by careful identification of all stakeholders and the ways they can influence or be affected by the project. Many projects limit stakeholder considerations to those who are directly involved in the development of a system. Generally, this is not enough, as those who are indirectly affected count too (Dawes et al., 2004).

Following the identification of goals an illustration of PA's operations is created. A simple but comprehensive/concise division of them is proposed along with an association of the categories resulted with essential needs of PA.
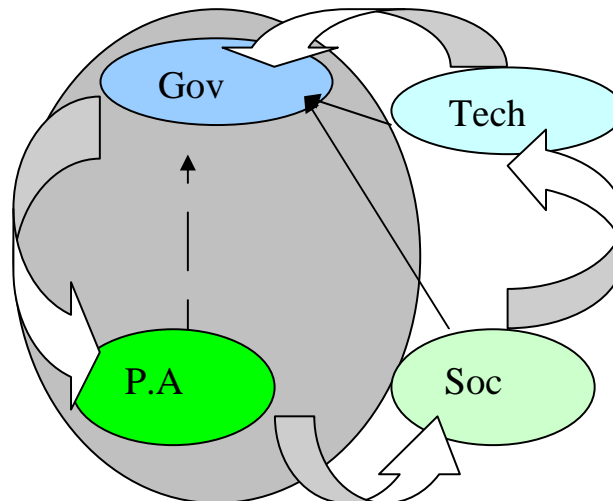

3.1 e Gov Stakeholders' Dependencies

Figure 1. E –government life cycle

In Figure 1, stakeholders in an e-Government life cycle are considered. In the government frame both national and supranational authorities are included. Thus national government goals related to e-government or PA modernization and EU goals for a unified European aspect are identified.

In PA, goals of POs (PA entities) and goals of public servants coexist as entities of administrative universe of discourse too. Society supports goals from both citizens and businesses. Technology is considered as a stakeholder in the context of the use of state of the art technologies that would in turn pose specific requirements on human and financial resources.

Government transfers political-economical view, which results from inputs of society, PA and technology progress, as a need for good governance and starts the e government process, as a means to shift governance in order to adjust it to the current socioeconomic requirements. Additionally, this view depicts the current status of laws and institutions as frameworks in which any e-government initiative should evolve. Thus e-government is considered as a vehicle, which starts as a vision, concept and template from the government and follows the next steps in order to be implemented (block arrows). To these steps, needs and constrains are added.

Clockwise, technology oriented solutions have been tested, but they are not able to provide working results. For example for interoperability issues there is the option of the implementation of governmental intranets, but to exploit full dynamics of an interoperable linkage it is better to define involved administrative units and procedures. Additionally interoperability may be constrained by security issues. Similarly, simply following citizens' and businesses' wills is unwise. PA also defends constitutional principles and legitimacy that lie beyond these wills. Furthermore State serves citizens and businesses through PA and receives their messages for readjustment politics through various channels. Society cannot directly affect procedures that PA follows. This is the PA's managers' and executives' privilege. The final state is the new initial one and in proportion to the feedback, it might prompt for a new e-government initiative circle.

3.2 Stakeholders' Goals

This section presents an attempt by the authors to elicit stakeholder requirements using as sources formal documents and surveys. These were obtained from the official web sites of the EU and those of the fifteen older member states.

3.2.1 Current e-government Strategies of EU 15 Older Member States

Having reviewed the vision and objectives for e-government in the EU's fifteen older member states through the study of strategy and policy documents, two dominant trends have been identified (Savvas et al., 2007):

♦ The first one focuses on the empowerment of democracy through an open, transparent and participatory society (social state model)

♦ The second aims at gathering economic returns through cuts on state expenditure or on the basis of raising competitiveness and of increasing jobs offered by businesses. Citizens obtain additional benefits through tax reduction. (Market driven model)

Components of the first one are: participation and transparency; and of the second one efficiency, effectiveness and money savingsThe Greek government, like any other member

state's government, belongs to this environment following good practices and being influenced by other members' strategies.

3.2.2. EU Goals/Requirements

For the EU, e-Government is expected to help public administrations to realise good governance ('e-governance') in terms of an administration that is:

♦ Open and transparent, i.e. democratic and accountable
♦ Inclusive, i.e. provides services for all
♦ Efficient and productive, i.e. provides maximum value for taxpayers' money.

These are goals identical to the ones mentioned previously for the governments of the EU's member states. The same, to an extend stands for the new i2010 e-Government Action Plan that defines five priorities (The new European strategy for Information Society i2010, 2005): 1) No citizen left behind, 2) Making efficiency and effectiveness a reality, 3) Implementing high-impact key services for citizens and businesses, 4) Putting key enablers in place, 5) Strengthening participation and democratic decision-making.

In addition the European Union focuses in three groups of issues for e-Government beyond 2005 ("e-Government Beyond 2005", 2004): 1) more profound modernisation of public administrations for sustainable benefits, 2) innovation in government services and governance, 3) emergence of pan-European e-Government solutions.

EU goals follow behind national government ones because the EU's guidelines are not mandatory. But it is recommended to be taken into consideration from each member state government.

3.2.3 Citizen and Business Goals

Citizen and business requirements are reported in many studies held by various institutions throughout Europe. The majority of these studies are not focused on satisfaction of users but they simply assess people needs as a means for varied purposes. In this context recent studies (e-Government Unit, 2006), carried out by European Observatories for Information Society revealed/detected the goals presented below (Cap-Gemini, 2006).

Additionally, specific studies focusing on Greek citizens and businesses (Greek IS Observatory, 2006), (case study), and for Greeks and foreigners that live in Greece (EDET S.A., 2005), revealed their requirements as *Problem categories*: 60% of problems concern red tape and complicacy of procedures and the long expectance for the processing of the requests of citizens and businesses. 38% concern vague legal framework that is the lack of an unvarying explanation and the complexity of the issue. 21% concern the shortage of forms which have to be fulfilled, the number of the copies needed, the administrative language used and the inconsistent demands. 6% of the complaints concern electronic (e-Government) services.

3.2.4 Other goals

Public Organization - The main objective for POs in relation to the others is collaboration. This is divided in two parts: The ability and the will for collaboration. The ability refers to technical matters like system interoperability along with organizational and semantic issues. Will refers to people. For the case study our experience in Greek PA and practices and the interaction with managers and executives confirm the above need.

Public servants - Apart from financial requests public servants unions have repeatedly stated their goals for better working conditions along with a set of sub-goals. For the case

study ADEDY was used as it is the bigger labour union of public servants in Greece. Its main goals were elicited from the various documents that it produces and distributes.

Technology goals - Technology requirements result both from technological evolution and evolution on project management and managerial choices, related to the use of applicable and sustainable systems. They also refer to cost evaluation and other economical matters. They are guided by scientific and technological progress (papers, projects, best practices etc.) Thus the overall environment of stakeholders' requirements in which an e-government initiative is taking place is formed as shown below:
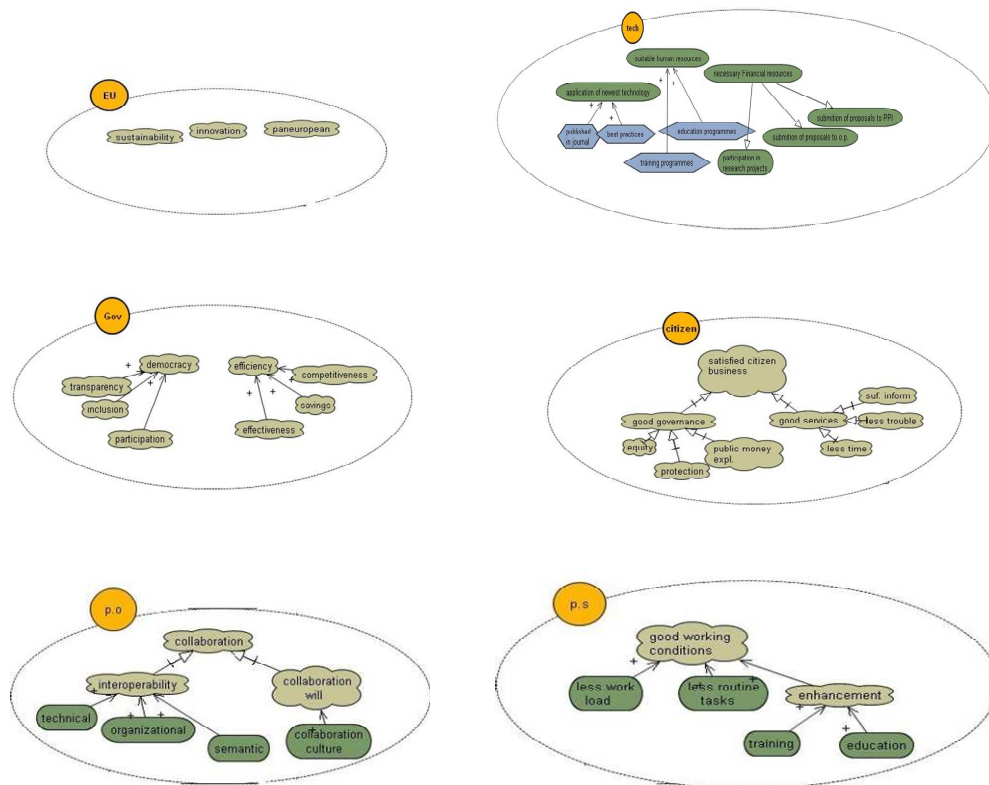

Figure 2. The overall framework with an elementary goal analysis

In the overall environment contradictions may surface between different stakeholder requirements. For example Greece is a member state of the EU and in assessing the dominant role of each goal on an ad-hoc basis, it is essential to consider its European dimension as this might prevail over the local one.

Otherwise representation of interactions between stakeholders' goals is achieved through the use of e government life cycle. Sinisterly transition of goals and requirements ensures its infiltration.

4. AN e-GOVERNMENT SERVICE EXAMPLE

Due to the large number of legal norms that exist in Greece, there is a true need for help to civil servants who use legislation, in order to maintain an updated version. The development of a software system for the management of the preamble of administrative acts will allow the automatic retrieval and synthesis of the law in force and supportive material for the act's grounds for decision (Savvas, 2007).

The problem is twofold. It concerns both the composition of an administrative act and its grounds for decision. It is based on the availability of an up to date legal framework and to the provision of the right knowledge to the right public servant, at the right moment, for the right case.

The operation of a system that would be in position to provide the proper legal framework for the production of an act, concerns both public servants who are responsible for that and citizens to whom the act is addressed to. It promotes and supports the principle of the "proper function of PA". Finally the use of a knowledge base of precedents of acts, opinions and jurisprudence, adheres to the principles of "good administration".

The system employs a Knowledge portal which contains the procedures that each administrative unit performs.

To design the templates, a knowledge engineer cooperates with experts (public servants) in order to acquire their knowledge. Knowledge is captured in ontologies. Building ontologies means entering in a process in which tacit knowledge is made conceptually explicit in a formal machine-readable language.

To provide these functionalities, an ontology of PA procedures has been built in OWL. This represents PA structure and documents. The procedures are represented in OWL-S service models.

To check the system according to the framework that proposed, the authors follow the principles of Requirements engineering as discussed by van Lamsweerde (2000):

A. the elicitation of the goals to be achieved by the system envisioned (WHY issues): legal updated template and case based reasoning

B. the operationalization of such goals into specifications of services and constraints (WHAT issues): support of public servants in composing acts, support of citizens in controlling PA (new service in the new era – the same procedure that will support PA service is used through telecommunication channels for citizens)

C. and the assignment of responsibilities for the resulting requirements to agents such as humans, devices and software available or to be developed (WHO issues): Administrative KM system, Ontology of PA procedures, RDF metadata, XML metadata, XML to RDF translator and other technologies concerning interface and nets.

The example presented above concerns construction of documents. Task copes with the document. In order to find additional requirements, for example, for the document, one can divide documents into informative ones and those supporting an act. An informative document has to fulfill requirements such as "less time", "sufficient information" plus a set of principles of the administrative law, that specify "good governance" sub goals, like "justice" and "protection".

Further analysis dealing with procedures namely with communication may lead to the following: communication must be facilitated between all entities of the administrative universe of discourse. This includes administrative units and citizens/businesses. To face the problem into the short term a multichannel approach is compulsory. Thus info kiosks, call centers, etc. should be established.

5. METHOD'S APPLICATION EXAMPLES

To validate this method a Greek Public Organization was used. To this effect two critical procedures of the Greek PA, as applied in a directorate of a region, have been analysed and suggestions for the introduction of appropriate e-government systems have been made.

The first procedure refers to the management of the Programme of Public Investments. The method will primarily assess the informational need of the certain procedure and will suggest a database which in a sense is not an integrated e-government initiative. It consists though a part of an integrated one and has to take under consideration all future interconnection, interface and interoperability requirements.

The second project on the contrary concerns the whole function of a PO's department. All procedures/services that the department provides will be examined according to stakeholders' needs and are going to be enhanced by the use of e-government systems. Matters of effectiveness are also addressed here, through the external communication with the potential investors, to increase competition and to secure that funding is going to end to the right investors and investments, for the promotion of Development.

A. An application for the management of the Public Investments Programme (PIP) in the Region of Central Macedonia (RCM).

To determine the informational needs of the department responsible for the management of the PIP the types of acts that the department issues are identified. Apart from the legislation that is being taken under consideration, the specific information needed is what is mentioned in the preamble.

The undertaken initiative concerns the establishment of a database for the operation of the PIP in RCM. A database is a core informational entity. It facilitates the expressional and communicational function, but it is mainly concerned about data and information structures.

The documents that the department issues and their relevant informational needs are described below:

1. Proposal to the Ministry of Finance (MoF) for the allocation of the financial resources per project and collective decision. For this act information is required about, (a) the approved payment limits per Collective Decision must be kept (encyclical from MoF), (b) data relating to the implementation level of a project (credits, payments etc) and (c) estimation proposals from the organization that implements the project for the future course.

2. Notification of all agencies which implement projects for the approved credit per project. No special information except from the addresses of the agencies should be kept.

3. Notification to the MoF for the subsumption of a project to the PIP. Information required for the subsumption in the Regional Operational Programme (acts from the Managing Authority of ROP).

4. Notification of agencies for the subsumption of their projects to PIP. Another organization's (MoF) act, change the world (data of projects) in the database of RCM.

5. Project's credit approval. Information required about, (a) subsumption in ROP, (b) subsumption in PIP, (c) budget, (d) credit, (e) contract details and (f) auctioning details.

6. Order to the Bank of Greece for project financing

Information required in this case is (a) approved credit per project, (b) payment details per project, and (c) requests for financing

From the six above documents only three of them are acts (1,5,6). The other three are notifications required due to communication barriers set by the administration. The process of defining information required by the acts is described above in its abstraction. For example for act no. 5 above, (project credit approval), further details for the six points are given below.

• subsumption in ROP - number of the act of the Managing Authority, date, number of subprojects, time-schedule, budget allocation, agency which will implement, territory (prefecture, municipality), etc
• Subsumption in PIP - number of individual or collective decision of the MoF, date, category, subcategory, special number, number and date of proposal, project's name, etc
• Budget - current, initial, numbers and dates of acts of modifications, number and dates of proposals for modifications.
• Credit - current, initial, number and dates of acts of modifications, number and dates of proposal of modifications
• Contract - amount, name of the contractor, number and date of the contract, subcontractors, time-schedule, etc
• auctioning details - numbers and dates of acts that approved auctioning details, etc.

Note that for all of the above categories it is useful to have temporal changes of the information types. Additionally and for internal use the department is obliged to provide reports concerning the implementation and financial monitoring of the projects. So data should be classified per Collective Decision, category, territory, date etc. This is an easy task as data from these categories have been kept (e.g. subsumption in ROP). Using the proposed method stakeholder needs that restrict the informational requirements are identified as, (a) data and their usage (group H) and (b) less workload, less routine tasks (group I).

Group H is further analyzed in:
• Data organization (relational databases, data standardization, integrated data, compatibility in form, in naming, in semantics and uniform metadata repository)
• Data security (end to end protection)
• Access rights (identification, authentication, Firewalls, encryption, directory services, PKI, single-sign–on server, access control, LDAP)
• Use of data patterns and structures which will allow interoperability
• Scalability

The above analysis is made based on technology resources, as issues of data concern technology matters.

Finally group I can be analyzed in usability, friendly interface and ready customized forms.

B. One stop shop for investors in Region of Central Macedonia.

The law that ruled the services provided for investors in Greece has recently changed due to effectiveness problems. To define this deficit we use the corresponding ratio effect/consequence with

effect=service="financing of private investments" and

consequence=rise of the GDP in the whole of the country and regionally.

This ratio was too high meaning that the service "financing of private investments" was not contributing as much as the government would like to be for the development of the country.

At this moment the department of private investments of RCM provides three services as we can understand from the acts that issues and we may see below. To fill the template of the acts certain information is needed:

I. Subsumption/rejection of a proposal for the financing of a private investment up to 4 MEURO.
II. Financing of an approved private project up to 4MEURO.
III. Financing cut-off and funding return.

Collectively concerning required information, this will be about: a) Completeness of applicant's file (all the necessary documents), b) other PO acts that declare agreement or disagreement to the investment (prefecture agencies, agencies for antiquities etc.), c) database for assessors and inspection committee's d) records of working committee's (keeping and storage), e) government's journal details, f) autopsies' details g) acts for appointment of assessors and inspectors, h) suggestions of assessors and inspectors, i) investors' written reasoning and j) responsible tax offices for every investor.

This information comes from other entities (other POs and potential investors), but mainly from the databases of the RCM itself.

The e-government project which will be introduced will concern the whole administrative procedure and will address all the three functional requirements of PA. Thus it is going to help to the composition of documents, organization, retrieval and accessibility in information and communication with internal and mainly external entities.

For the composition of acts and concerning expressional needs it is essential to form the part of the preamble which lists the laws that rule each procedure. Thus additional information is needed for (Savvas and Bassiliades, 2008):

- the laws in force and their amendments, for the subsumption or rejection of a proposal.
- supporting material of previous acts and case laws (jurisprudence) that will help the public servant to form an opinion based on administrative case based reasoning.

Further analysis of the functional requirements detected is made in the same way as in the case of PIP above. For each functional area the corresponding set of stakeholders' needs is considered as in figure 2.

Entities that defined from the above needs and between which communication is held are investors (potential and existing), POs (the above mentioned agencies), internal databases, assessors and inspectors, National Printing Office and Tax Offices.

As we may see above, potential investors are identified between the entities that communicate with RCM, through acts that mention the submission of a proposal for an investment. These acts could be for subsumption or rejection of an investment proposal. As the rejection acts had been increased it was obvious that an effectiveness problem occurred. (The ratio output/effect was getting lower). Rejection happens due to typical or concrete reasons. Typical refer to incompleteness of the applicants file, while concrete refer to investor's capability or investment's feasibility.

Both reasons originate from the communication that precedes them.

Potential investors or their consultants were gathering information for investment opportunities by calling RCM, by visiting RCM or simply by reading the law. This was a semiformal type of contact and the provision of information occurred verbally or through brochures. This type of communication is implicated in two kinds of problems. First, it was not so helpful for people conducting RCM and second, it couldn't easily directed to potential investors that had not conducted RCM before (e.g. Foreigners, young and inexperienced investors etc.)

This informal procedure should have been typical and is going to be provided by a portal subsystem. This is a new service, an e-government service, which addresses both efficiency and effectiveness issues. Effectiveness issues are addressed through the publication of the investments' choices that the law provides, in order to increase competition between investors. The right guidance of potential investors through the whole set of funding programmes in region's borders helps so as each potential investor will address the right funding programme. This concerns the quality and abilities of the investors to whom the acts of subsumptions are addressed. It is this effectiveness deficit that brought forth this new service.

Concerning efficiency, if the information given by the portal is accurate and complete, then the number of phone calls or personal visits in RCM will be reduced considerably, allowing servants to work for back office operations like assessments/evaluations.

This new e-government service is not a typical PA service. It is essential to be established by a law though, in order for it to be valid. For the communicational area the corresponding stakeholders' goals are groups C,D,E,F,G,J. Further analysis made is not presented here for brevity reasons.

PA is trying to fulfil all stakeholders' goals functioning in a certain legitimate pattern. Its function is ruled by laws. This stands for all countries, at least those that apply a normative administrative model (e.g. France, Germany, Austria, Spain, Portugal, Italy, Greece etc) (Billiets et. al., 2006). It also has a certain rationale, which is always the same for every procedure/service.

In the approach proposed by the authors, stakeholders of PA's function are defined based on the standard PA's environment and the supply and demand side of service provision. The groups that constitute this environment are certain and stable. In this proposal stakeholders are not responsible for achieving goals. PA and its administrative function are. Stakeholders are not part of its function.

6. DISCUSSION - CONCLUSIONS

In this work a compatibility framework for a successful e-government initiative implementation is proposed. The framework is exposed to a National (e.g. Greek) PA environment. The effort focuses on thinking beyond technology; to thinking about systems in context. To draft the framework work has been split in two dimensions, the operational/functional needs of the PA and the stakeholders' goals.

The three main types of functions in PA were identified and their requirements in relation with the document, communication and information correspondingly roughly described. Additionally a first attempt of assigning non functional requirements (e.g. stakeholder goals) to functional areas of PA has being made. For example a whole procedure or service needs information for a certain goal. This goal might stand/be implanted to the external environment of the organization.

Following the correspondence between whole procedure (service) and information this could for example mean reengineering: New needs of a new social-economic environment (information that is not currently provided to any entity, must now be offered in the context of new stakeholders' requirements). Avoiding information redundancy [Information that already exist in databases and is not restricted due to personal data protection (citizen requirement) should not be submitted again.]

In conclusion, whenever an e-government initiative is to be undertaken, one should check whether both sides of this framework are satisfied; In other words, if operational needs and stakeholders' goals are fulfilled. It is proposed to keep the following process:

♦ Check if the system to-be responds to operational needs. If the system to-be concerns tasks, procedure or whole procedures and in what way.

♦ Check the system's goals in relation to stakeholders' requirements.

♦ Differentiate, if necessary, the parts that are not compatible to the former requirements.

To demonstrate the use of the proposed framework, a knowledge management system for the construction of documents in the case of the Greek PA has been used. The Greek PA's

example was used since the goals of the stakeholders for that case had already been elicited. As operational needs of PA are fulfilled by an e-government system, they are its operational requirements. To these operational requirements stakeholder goals are mapped as implementation restrictions and guidelines.

Furthermore the method supports the building of sustainable systems by:

- Adopting EU principles like sustainability and Pan-European standards.
- Maintaining the balance between all stakeholders' goals assuring long term satisfaction.
- Incorporating views for the use of cutting edge technology solutions which will be in use for long term.
- Allowing and justifying, in parallel, reengineering so as to avoid setbacks and money waste due to systems that will need to be revised as the procedure that they support will be reviewed.
- Taking advantage of administrative knowledge embedded in administrative acts to describe operational needs.
- Ensuring stakeholders' needs are based on official documents and sources in order to be documented and unambiguous.
- Promoting common and shared understanding between all stakeholders and implementers for the PA function.

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