



E-government with service oriented architecture

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Abstract: The relationship between service oriented architecture and e-government is one of the most important issues in the scope of IT. This paper first presents the service oriented architecture then defines e-government. Finally we present the relationship between service oriented architecture and e-government.

Keywords: e-government; soa; service; citizen; web service.

I. INTRODAUTION

With the popularity of the Internet and especially the World Wide Web (WWW) for realizing electronic business and electronic commerce, there is a growing need of standardization of communication between different applications to allow for interoperability and communication.

E-government generally refers to the delivery of national or local government information and services via the Internet or other digital means to citizens or businesses or other governmental agencies. The purpose of e-government is to develop a government e-portal, a one-stop Internet gateway to major government services.

Nowadays, we can notice that every country is providing and developing their own solutions, projects and initiatives. As result, we can find a lack of interoperability among them. We can even find interoperability lacks in solutions from the same administration. To overcome this situation we propose the use of service oriented architecture.

II. SERVICE ORIENTED ARCHITECTURE (SOA)

SOA is an architectural style that attempts to support business processes by being an independent infrastructure. It is an approach defining and provisioning the IT infrastructure that is supposed to allow different applications to exchange data and participate in business processes loosely coupled from the operating systems and programming languages underlying those applications [1]. The SOA paradigm is a holistic approach towards the execution of business processes within enterprise architectures (EA)[3].

Service-Oriented Architecture (SOA) is a paradigm of designing and developing IT solutions which positions a service as the primary building block. A service is an autonomous and reusable unit of business or administrative logic. Rules and methods of accessing services are specified in service contracts.

A program which invokes or interacts with a service is called a service consumer. The role of a service consumer is temporary – it is assigned to a program only during interaction with a service. A service that is implemented as a program can

invoke other services. A service plays a role of a consumer during interaction with other services [7].

III. E-GOVERNMENT

E-government is the use of modern information and communication technologies such as internet, local area network, wide area network, mobiles, etc., by government to improve effectiveness, efficiency, and service delivery to citizens and promote transparency and it enables citizens to interact and receive services from the federal, state or local governments twenty four hours a day, seven days a week [6,10,11].

Implementing e-government projects aims at achieving several objectives and goals that adhere to the following principles:

- Improvement and enhancement delivery of government services
- Empowerment of citizens through greater access to government information and ability to interact and participate
- Transparency achievement and higher accountability of the government
- Improvement of internal relationship between the government and the citizens' electronic Delivery

The Goal of E-Government is To enable citizens and private/public sectors to access government services in effective and efficient integrated services delivery to the customers any where, any time in a form convenient to the service recipients through the use of internet and other channels like mobile phones, etc. It also enables citizen to participate in the government's policies framing and decision making.

Preliminary analyses indicate the need to redesign the basic processes and to use the Service Oriented Architecture (SOA) and the web services for optimizing the performance of e-government applications. This can be achieved by enhancing the agility and flexibility of the technologies used in e-government applications [6].

As a start, the 4-level model adopted by the European Commission was adopted, stating four different levels for electronic services. Those are:

- a. **Level 1** - Information: This level contains only information about the corresponding service.
- b. **Level 2** - One-way interaction: A 2nd level service provides to the end user downloadable material, such as .pdf forms or similar documentations which have to be filled in by the user and handed to the corresponding office.
- c. **Level 3** - Two way interaction: This level provides on line tools where a user can fill in his request and initiate the process of the transaction. For completing the transaction, the end user must appear at the service office and collect his receipt. Services offered in level 3 require the authentication of the user.
- d. **Level 4** - Transaction: Services in the 4th level are fully automated and the end user gets the service's output in electronic format, after imitating the transaction. Such services include steps as authentication, decision, notification and delivery of receipt[5].

Over the past few years e-government related projects have been in the process of development.

The degree of sophistication of those projects can be categorized in four levels:

- a) Static web sites providing information.
- b) Web sites with interaction.
- c) Support of internal and external workflows of the administration.
- d) Online voting[2].

Another look at the dimensions of e-government can be achieved by categorizing the involved partners:

Government government (G2G) or administration-to-administration

(A2A): internal processes of the administration.

Government business (G2B) or administration-to-business (A2B):

interactions between governmental organizations and commercial or business organisations, e.g. taxes.

- i. Government to Employee services (G2E Services)

Government citizen (G2C) or administration-to-citizen

(A2C): interactions between governmental organisations and citizens, e.g. marriage[2,4,6].

The reasons for the implementation of e-government applications are based on efficiency and cost developments. Most projects make use of proprietary, often self-developed, standards for communication and interaction.³ The problem is a lack of coordination and joint efforts between the different projects, which might lead to incompatibilities and integration problems, e.g. with so-called one-stop-government portals. This is a single website that acts as a citizen portal, giving access to information originating from different sources or allowing transactions with different local, regional or federal or even foreign authorities[2].

IV. E-GOVERNMENT WITH SERVICE ORIENTED ARCHITECTURE

The World Wide Web Consortium (W3C) defines a Web service as a software application

“whose interfaces and bindings are capable of being defined, described and discovered by XML artifacts and supports direct interactions with other software applications using XML based messages via internet-based protocols[2].”

The realization of a citizen portal as a one-stop-government solution is a typical scenario which demonstrates the advantages of using the Web services concept. Web services allow for easy integration of different applications and information sources into one unified portal[2].

In Summary, government can use SOA for

- a. Data management
- b. Workflow management and automating business processes
- c. Service consolidation by making existing in-house legacy systems accessible through a single E-Government Portal
- d. Constituent services integration via a single interface for all types of constituent communication
- e. Improving external partner relationships with a shared library of web services components
- f. Cost efficiencies by integrating operations and eliminating redundant systems reducing IT automation project timelines
- g. Application consolidation, re-use, and alignment; and data sharing among loosely coupled networks

E-Government Portal is built based on Service Oriented Architecture (SOA). Service Oriented Architecture (SOA) may be defined as a group of services that communicate with each other through data-passing or two or more services coordinating some activity. SOA builds applications out of web / software services. Services comprise un-associated units of functionality that have no calls to each other embedded in them. They typically implement functionality most citizens would recognize as a service, such as filling out an online application for a driver's license, viewing an online electronic form, or submitting a grievance or query. To meet an existing or new business requirement, services are linked and sequenced in a process known as orchestration. Web services make these functional building blocks accessible over standard internet protocols independent of platforms and programming languages. These services can be new applications or just wrapped around existing legacy systems to make them network-enabled[6]. using a service-oriented architecture offers several advantages:

- a) Making it possible to the citizen to profit from various services while saving time. In the scenario presented above, the citizen will be able to affiliate his parent without having to present himself at the four administrations implied in the process of affiliation.
- b) Allowing a money profit for the citizen (less transport) and for the government (less paper).
- c) Decreasing the load of the employees in various governmental administrations.
- d) Allowing interoperability between the different governmental administrations in spite of their heterogeneity, thus facilitating the co-operation between them[4].

The steps to be considering in successfully executing Service Oriented E-Government are

- i. Service identification
- ii. Identification of forms
- iii. Business process re-engineering
- iv. Service solution architecture
- v. Integration to various government departments
- vi. Deployment (centralized/de-centralized)[6]

Service lifecycle approaches are often divided into three super-phases: design time, runtime, and change time. The lifecycle phases up to deployment are commonly referred to as design time. The usage phase is referred to as runtime, which addresses service change and revision [3,8,9].

Service lifecycles in SOA Government most commonly consist of seven phases: system analysis, covering global requirements, service creation policies, service granularity decisions, service definition, service design, service development, service deployment, service operation, and service retirement [3,8,9].

V. CONCLUSIONS

Service Oriented Architecture for e-government provides the transparent government to citizens by IT enabling various government departments. Usage of SOA and web services optimizes the performance of government applications. The Service Oriented E-Government based solution transforms the existing applications, data, and content into web services without reengineering the applications.

New e-government applications should be based on common standards to allow for easier integration with other applications. The issue becomes even more relevant under the aspects of European integration. The number of existing e-government applications is still small, therefore upgrading them to a Web service based framework is not a problematic issue at the moment. The experiences gained with the existing applications should go directly into the next generation, which should be based on Web service standards.

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