SOA Approach for E-service

ZIVILE PETRAVICIUTE, GENADIJUS KULVIETIS, EGIDIJUS OSTASIUS
Information Technology Department
Vilnius Gediminas Technical University
Sauletekio 11, Vilnius, LT-10223
LITHUANIA

http://www.vgtu.lt

Abstract: - Every leading company knows that the success depends on the client's satisfaction and good relationships with them. As the demand for quick and easy access to the information and services grows, it forms an e-business environment. Therefore, one of 20 basic public services, a car registry service, is planned to move online. Thus, to integrate car registration system as linked services, that can be accessed over a network, service oriented architecture can be used.

Key-Words: - SOA, Business process management, E-service, Car registration

1 Introduction

Given the competitive nature of business every single company is constantly seeking for a manner to catch up with changing needs and requirements to fulfill a client's expectations. As customers and business partners demands for quick and easy access to the information and services, together, these factors form an e-business environment. The e-relationships with the clients are set whenever company starts using the Internet, publicly deploying internal applications and giving clients access to its key systems. Later, transactions on key systems are allowed, which leads to improvement of business process performance [1].

According to eEurope 2002 Action Plan endorsed by the Feira European Council in June 2000 (strengthened by the eEurope 2005 Action Plan) the objective is to develop modern public services and a dynamic environment for e-business through widespread availability of broadband access at competitive prices and a secure information infrastructure. According to EU eGovernment, car registry is one of 20 basic public services, targeted to the citizens group. Consequently, the offering of this service using digital technologies is planned to move online in most of European countries [2]. Therefore, to model the flow of data, people, systems and physical resources in order to modify processes in alignment with business objectives and market needs business process management technology can be used.

Business process management, or BPM, is all about making a business processes run better. BPM solutions not only allow automating processes, making them more efficient, reducing costs and expenses, but also provide a visibility into business. BPM is not business process reengineering, enterprise application integration, workflow management, or another packaged application, it is the synthesis and extension of all these management theories, technologies and techniques into a unified whole with business-oriented development environments, easy process-building interfaces, and a number of standards to help make it all work with existing IT infrastructures [3][4][5]. BPM links to legacy composite components and applications, orchestrates Web services, measures business activity and optimizes processes for better business result and work throughput [6].

BPM allows companies to implement the continuous end-to-end business process lifecycle from analytical modeling, developing and deploying to performance management and optimization based on BPEL and service-oriented architecture [7]. Therefore, BPM allows to be responsive to the ever changing business through the optimization and automation of the processes to identify and eliminate bottlenecks and redundancies, reduce risk by gaining an understanding process, decrease maintenance cost, automate process implementation, eliminate manual tasks, execute new business rules and processes, pinpoint future process improvements.

This paper covers the movement of road vehicle registration procedure online. To automate, improve and understand the registration process of new, used or imported car business process management methodology based on service oriented architecture is used. The flow of data, people, systems and physical resources are modeled to build processes in alignment with business objectives and market needs.

2 SOA Approach

The goal of BPM is unprecedented process flexibility, where human and automated workflows can be determined in real time. The speed and agility of IT organizations implementing and integrating the

process automation components must match the speed and agility of business analysts redesigning the process. For this to happen, processes must be independent of specific information resources and task automation applications. In order the logic of a process not to get hard-coded into a particular technology platform, the integration technology must easily couple the resources and applications that make up the process. Standards-based service oriented architecture (SOA) provides the technical ability to create that processes independence [8].

An SOA not only provides a common communication framework, but it is also can be viewed as a set of design principles that can be applied to the design of both computing assets and process assets.

3 SOA approach for Car Registration Procedure

Car registration is a standard procedure to register a new, used or imported car. It involves person identification, vehicle inspection (identification and evaluation of technical parameters), document identification and data verification. Depending on applicable restriction it is allowed or forbidden to continue registration operations: issue of national number plates and/or issue of vehicle registration certificate.

According to four-stage framework measuring 'availability of public services online' defined in [9], car registration system in Lithuania satisfies only the first one (information). The second stage (one-way interaction) is not applicable because according to submitted customer documents all paper forms needed to start registration are filled by staff-members.

In brief, standard car registration procedure consists of [10]:

- Identification of person which wants or has a commission to register a road vehicle.
- Check of vehicle: identification and evaluation of technical parameters.
- Identification of documents found on registration; data from documents entry and correctness check.
- Check for restrictions. The entered data is checked in mortgage and acts on property arrest registers, database of wanted vehicles, database of wanted persons. Depending on applicable restriction it is allowed or forbidden to continue registration operations.
- Assignment of national number plates.
- Printing of vehicle registration certificate.
- End of registration. Issue vehicle registration certificate and if appointed issue of appropriate national number plates.
- Payment for services (can be done in cash or via bank transfer). Printing invoice on demand.

Briefly stated, the target is to embody the system which implements third (two-way interaction) and fourth (full electronic case handling) stage of availability of public services online to register a new, used or imported car, to extend temporally registered vehicle registration, to order national number plates, to change vehicle registration certificate, to order vehicle state certificate, to register a change of vehicle owner, supply information about registered vehicles. Other aims are:

- To improve and simplify registration procedure, provide it anytime (24 hours per day, 7 days per week) and anywhere (if there are no technical restrictions);
- Optimize the workflow of the process by automating manual works (which are performed by worker) if there is a technical possibility to automate it;
- To integrate the public service with other systems that provide e-services, to implement the one-window system (one-window service delivery enables governments to provide citizens and businesses with multi-channel access to "joined-up" or integrated government services [11]);
- To integrate, if it is possible, all required systems and registers;
- To reduce outlay.

To automate most of operations, to lower time expenses and outlay, to satisfy customers, to decrease the gap between cities and regions most of all car registration operations can be moved online. To authenticate in the system without any intermediate (staff-member) it would be enough to have e-identification card or personal digital certificate. This e-authentication problem is common for major e-services based systems and is solved globally. Identification of vehicle and evaluation of technical parameters (if any missing in given documents) performed by qualified worker can't be available in e-environment. However, it can be possible to check a vehicle only once and subsequently, if no data changed, the initial data could be used. Identification of documents found on registration must be synchronized by registration system or other information systems which issued these documents. Herewith, check for restrictions should be done. Thus, direct integration of data exchange between systems is concerned.

National number plates are assigned by staff-member. However, operating in e-environment national number plates could be automatically assigned. In exceptional case customer could choose, reserve or order desired national number plates from

existing ones in warehouse or from possible symbol set. Printing of registration certificate can't be moved online because the certificate is printed on strict form. Payment for services can be done in cash or via bank transfer. In e-environment payment would be done only via bank transfer.

So, to model and manage car registration system IBM's Integration suite, which narrows the gap between sophisticated process modeling and enterprise implementation, is used. SOA ideals are incorporated at every stage and in every product. There is a separation between actual process integration and specific information resources and automation applications. Consequently, BPM and SOA supports car registration system as linked services that can be accessed when needed over a network and can be geographically and technologically diverse.

4 Conclusion

Companies have always searched for ways to create new business value, and to become even more productive. Owing to this, business processes are becoming increasingly definite and business process management solution is evolving to comprehensive solution that models, monitors, simulates and redesigns processes for competitive development. Admittedly, processes must become independent of information resources and task automation applications. Therefore, implementing service oriented architecture brings a great number of benefits such as greater code reuse, network-based architecture, greater alignment of business and IT, better process standardization.

The use of BPM and SOA can support car registration system as linked services that can be accessed when needed over a network and can be geographically and technologically diverse.

Dramatic improvement in efficiency is not the only benefit promised by moving car registration procedure online. It also increases online use of public services, reduces the gap between cities and regions, provides better conditions for free movement of EU citizens and their data security, and gives them stimulus to learn information technologies.

References:

[1] Dovile Vojevodina, Exception Handling Automation in E-business Workflow Processes. Proceedings of CAiSE'05 Doctoral Consortium, pp. 42-54, 2005

[2] EU: eGovernment in the Member States of the European Union – 3rd edition, March 2006 http://europa.eu.int/idabc/egovo

[3] Howard Smith, Peter Fingar, Business Processes: From Reengineering to Management, *Darwin Magazine*, March 2003

[4] Lionel Carrasco, Why BPM matters, March 2006, ASPnews http://www.aspnews.com/analysis/print.php/11274_3590971

[5] Bruce Silver, Three Promises of BPM: Agility, Flexibility, Visibility, *Transform Magazine*, November 2002

[6] Nathaniel Palmer, Blow the Lid Off Automation, *Intelligent Enterprise*, 2004/2005 Vol. 8, No. 4, 35 p.

[7] Ueli Wahli, Larissa Leybovich, Neil MacKinnon et al., WebSphere Process Integration V6: Business Process Management Modeling through Monitoring, March 2006, ITSO, IBM Corp.

[8] Jasmine Noel, BPM ans SOA: Better Together, White Paper, IBM Corp.

[9] Web-Based Survey on Electronic Public Services, Report of the Fifth Measurement, March 2005, Capgemini

[10] Egidijus Ostašius, IT panaudojimas registruojant transporto priemones, *Mokslas ir technika* 2005 20 No. 1, 21-22 p.

[11] Single-Window Government: Using the new generation of e-government to transform government operations, 2005, CGI Group Inc.