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Applying SOA Approach to Financial Institution: Case Study

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Abstract. A financial institution is an institution that conducts financial transactions, such as depositing money, taking out loans and/or exchanging currencies. Systems used by them like any other system tend to skew old, but, the replacement and integration of these systems is a difficult due to the heterogeneous nature. Due to this it is imperative to consider alternative infrastructure such as SOA (service-oriented architecture), which is seen as the best technology for internal and external interfaces, resulting cost reductions associated with its deployment; combined with standardized protocols, and increased interoperability among IT infrastructures. Studies shows that this flexible architecture will encourage innovation and increase the banks' ability to react to customer feedback a lot more swiftly.

An approach to building information system for the financial institution, based on the technology of SOA is discussed in the paper. The financial institution for which we have proposed a SOA based architecture is Saving House Mozhnosti, a financial institution that exists in the financial market for 17 years. The Savings House serves micro, small and middle enterprises that belong in the sector of trade, services and production as well as physical persons and offers financial products and services such as crediting and savings. It is recognizable for the support to the people in need to get financial support for their good business ideas, belief in free initiative, individual creativity and personal responsibility. As one successful financial institution, there is no doubt it can highly benefit by SOA approach.

Our goal is to act as a guide in helping this institution tackle the types of issues using a services-based approach, thus improving customer experience. The proposed approach will improve the manageability of the system, increase its speed and reliability and provide security.

Keywords: Infrastructures., SOA., transactions., technology.

1 Introduction

Financial institutions are faced with the continued need to increase the flexibility of the services they offer, whereas are being under intense pressure to reduce costs. Due to rapid changing of the marketplace, financial institutions should react effectively in timely manner[1]. To meet the demands of the customers, IT Infrastructure needs to be tailored creating thus a competitive advantage for the organization to complete business processes. SOA as an infrastructure, is a relatively new concept with an increase interest in it, both from industry and the academy[2]. There are a variety of statistics available from various magazines and technology analysts relating to the adoption of SOA in the industry,
generally indicating the widespread acceptance of SOA. SOA delivers greater business values and competitive advantage in the marketplace by offering better alignment between IT and business processes with its attributes, such as reusability, agility, etc. It is aggregation of components that satisfy a design need. It comprises of components, services, and processes. Components are binaries that have a defined interface whereas service is a grouping of components that finishes a job[3].

In this paper we will present an SOA based approach for a financial institution called Saving House Moznosti [4], a financial institution that operates for 17 years in the market of Republic of North Macedonia. It offers services to micro, small and middle enterprises, but it offers financial products and services to physical persons as well. In the market it is recognized for the financial support that it gives to the people to implement their business ideas, by offering initial capital. Financial institutions should focus on investing in such a way to provide tailored services and products to customers, but there are always some small gaps that lead to customer service issues. Some of the issues that our financial institution in study faces are:

- Automatically loan approval
- Renewal of FD (FixedDeposit)

But as any other solution, the proposed approach for the financial institution in this study has its own limitations. First, one very important issue is that what should be taken into the considerations is the fact that its clients are people who usually are working on agriculture sector, and literally not all of them own a device that enables them to fulfill a loan request. Another issue that must be considered is the financial situation of the company, whether it can implement it, as the implementation part is a bit difficult, as is it the nature of SOA.

2 Methodology

The online application and documentations for loan can be sent to a Client Relationship Officer through email, but, when customers want to get a loan, they must go by themselves to the offices of the Saving House so they will get the right information on the amount of money they can borrow. The approval process of approving the loan takes some time, which causes frustration to the customer which in some cases they may end up taking his/her business elsewhere. But, those are rules followed by client relationship officers who have a certain protocol for approving a loan and giving money to the customer. We think that this information can be controlled by customers themselves, if such a service is offered in a web-based way. First, the costumer will have to fill a form with his personal data, and from there he'll be segmented automatically to the system and check the possible loans he could borrow from this institution, and then apply by following the necessary procedures. This would be cost effective on both sides and would substitute the traditional way of getting information from the Client Relationship Officer in person. The second issue we listed has to do with the renewal of FD. So, after the fixed deposit matures, the system automatically renews the FD if not withdrawn, informing the customer manually, by cell phone, or not informing at all. We suggest that this can be done by
reminders which the system will sent to the customers automatically few days before maturity.
As we can see, we have the Customers and Client Relationship Officers as main actors for our approach. SOA would act as middleware between these two roles, thus creating flexible services.

3 Platform Design and Development

To give a better overview of this project initiation idea, we've used sequence diagram as type of UML diagram to describe the overall process of our proposed SOA Case in Study. As it can be seen from the Fig. 1, we've included both issues listed in problem statement.

![Fig.1. Sequence Diagram of the loan approval process and FD renewal](image)

The process is as following. The customer as the main entity in our case decides to request a loan at our financial institution in study, Mozhnosti, which already offers the online loan application.

The relevant parties from which Mozhnosti retrieve information are the following: Centralen Registar, Krediten Registar and Makedonsko Kreditno Buro that are included at the sequence diagram as specific services that already are used by client relationship officers during loan application process. In our case, the loan approval service changes the current
rules. After the customer enter his personal information (including age), amount of money to loan, etc. and submits the necessary documents he makes the request. Age is very important, since the customer based on his age is automatically segmented by the system for the loan he can borrow, such as student loans, retiree loans, etc. The loan application will be processed from loan approval service. Loan approval service asks to retrieve information about the customer from three services as usually done by client relationship officers, in order to request credit rating for the customer. Each of institutions mentioned are represented as individual Web Services, such as Central Registar service, Krediten Registar service and Makedonsko Krediten Buro service, and they provide the loan approval service the necessary information, in order to be capable for deciding at the end of the process. Each financial institution has its own categories of criteria, such as occupation, finance, assurance, etc. And they are provided and gathered from these services, from where they are compared to the limit score of the institution to approve or reject the loan. Some of the categories may be more important than others, for instance in weighting finance versus assurance, finance would be more crucial in evaluation criteria. After retrieving the results from these services, the loan approval service decides for the loan application of the customer and returns the results, the loan is rejected or approved. Finally, customer receives result and as an opportunity given to him is to decide whether to accept or give up on the loan requested. The following process may continue in person, thus signing the generated loan and making a contract with the financial institution for the sequential flow of the payment way, if one decides to accept the loan.

Fixed deposit is another issue, that is included in the same diagram. So, after user has deposited an amount of money, the FD (Fixed Deposit) service will remind him before the deposit matures, in order to notify the customer for the status of the deposit, thus the customer is given opportunity to decide to withdraw or renew the fixed deposit by himself.

4 Programming Platforms and Tools

In order to enable the proposed idea, we’ll propose also tools and programming platforms considered to be used. Since we have interaction between Web Services, BPEL process is appropriate for our case. BPEL as a web service with an associated process definition defined in an XML-based language [5], will allow the web services to interconnect and share information, respectively loan approval service will interconnect and receive information from three credit rating services defined in the sequence diagram above, and therefore will make an appropriate decision. Undoubtedly, WSDL must be defined for the BPEL process. As a programming language, Java is suggested to be used as the best choice for development, since it is used more and more in several domains. One of the biggest areas where Java is used is web service development, due to its compatibility and portability. Worth noting is the fact that Java do not introduce breaking changes with new
releases, it is a cross platform, and every solution written in any version of it will be running on all subsequent versions of the language [6].

SLA2 is one of the issues that must be taken in consideration. It is defined as "a commitment between a service provider and a client "[7]. And, it should ensure service availability, response time, quality, scalability, traffic levels, performance, etc. In order to prove functionality of services, the process must be tested, monitored and evaluated, if one wants to overcome challenges or problems that may face during development or after that. Also, security across users must be maintained.

Conclusion and Future Works

SOA is the future of banking and financial institutions. Although its steps have not begun yet, one thing is for sure, as soon as possible financial institutions in our country will begin to construct their architecture based on SOA opportunities, they will improve their performance in the marketplace, thus meeting the market demands. Innovation, effective cost and customer needs are three most important things that lead to a successful management of a financial institution. As soon as all the banks integrate SOA in their system, benefits will arise due to the reusability of services, interconnection, and so on. SOA is already used in banking industry across the world and has made big impacts. And, it will continue to revolutionize banking system. Our proposed approach is the very first step. This project idea represents a modest effort to improve the overall functioning of the financial institution in Republic of Macedonia. There is so much to be said and more to do, as improving the quality of banking should be one of the priorities in the development of countries like ours. Attempt to implement the proposed approach will remain as a future work.

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