Web Services for Insurance Companies

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Abstract: In the last few years, information of any kind has been defined as the most important strategic resource which must be managed by every organization. Collecting information, analysis, production and distribution define the quality of the systems of informatical communication technologies (ICT) and informatical technological services. In the insurance companies, there is a trend in which the ICT systems migrate to a higher level of development, than the already establish development level, and they use new technologies to implement the service oriented model. Acquiring information, analysis, production and distribution in the present processes of insurance are by far bureaucratic, prepared by people, which results in long period of creating a new portfolio, or claim settlement. A great number of the world insurance companies, including the Macedonian insurance companies, use heterogenic ICT systems which have diverse types of storing and procession information. Exchanging information between companies or/and the national bureaus for insurance usually must be done manually. The main idea of this research is to manifest the global use of service oriented ICT systems in cooperation with insurance business processes and reduce the processing time. The new ICT systems must extract all the benefits of the past, present, and future investments and to create essential advancements. The insurance companies reduce process time up to 30% by employing reusable business services through a service oriented structure i.e. web services and software agents as basic representatives of the new ICT systems.

1 Introduction

The future is always the reason which formulates the look and the role of information technology in insurance. The managing models which have been used so far in the insurance business have imposed a precise role of information communication technology in the whole process. Usually to role was to: acquire information, which was collected manually, and to introduce some sort of electronically managing the portfolio. This was the case because the products with which the insurance business came to the market were already defined and offered on one hand, and on the other hand the level of technology. At the moment, the markets requests for products which will be personalized and flexible to the maximum, but at the same time available 24 hours a day, 7 days a week, 356 days a

year. This changed the complete role of the information communication technology in the insurance. The already existing information solutions (business applications, organized in clients-server environment, or web pages which are based on WEB 1.x and incorporate within themselves non-automated B2C interactions) enable this requests but the flexibility and personalization are still lacking out. With the evolution of the World Wide Web from an environment in which the users acquire certain information, in an environment in which the computers perform certain functions on behalf of their users, a possibility is being creating for new type of insurance leadership. At the moment, the result of that evolution is the semantic web, which with standardized web services is the new wave in the insurance ICT systems. Services oriented architecture, i.e. web services and software agents, as basic representatives of the of the semantic web, allow the insurance programs to be exactly what the market requests: business-process-driven, on-demand, and reusable know-how; in other words: business to business, and business to consumer personalized programs with great limitations in the insurance with the service-oriented technology, are the next great step.

2 Transformations in doing the business

As the competition increases, insurance agents should present their product at the market on time, and should be able to make sure that all of the information which would be involved in the process will be included. In this research also explains how the Service oriented architecture, i.e. web services and the software agents, where the functions of the ICT are connected with the business processes, help out the insurance companies to be one step ahead.

As the saying goes *future shapes the present*, so will the role of the ICT in the companies be greater and more oriented toward the business processes. The trends in the insurance industry, but as well the trends in the financially oriented business which work with capital of risky basis, go through a phase of merging and acquiring of business. The increased activity of merging and acquiring, caused many processes in the ICT sectors with the purpose to unify the systems which are based on heterogenic platforms.

As a result of this, the possibility for implementation of new advances in a company's application is a MUST, so that they can be brought to the market on time.

The problems in such situations increase if in the entire process, external entities are involved. Bringing the products to the market involves additional distributive channels, which will be an addition to the traditional model, i.e. agent/broker-banks, supermarkets, travel agencies, etc. This means that underwriters, will be manually incorporated not as much as before in the determination process for accepting a certain portfolio, while the web services or the software agents which will perform this part of the process, must be with the already implemented set of business rules.

3 Adjusting the ICT with the business processes

Convention: The work environment for this research of SOA without further explanation in research is taken from the Internet.

In order to make the idea presented in the abstract possible, and to keep up with the transformations of the insurance business, it is necessary to change the traditional approach of solving problems. This would mean that the new step in the ICT sectors will start with SOA, i.e. service oriented architecture. Just as the rest of the terminology of ICT, the true meaning of it becomes unclear for the rest of the business. The constant upgrades, migrations of ICT systems, new software and hardware for the business, mean great expenses. The new ICT systems must extract all the benefits from the past, present, and future investments and to produce certain advantages. Thus, the ICT mangers must pay careful attention, and thoroughly approach toward the selection of the technologies.

The insurance companies, deploying reusable business services through service oriented structure, i.e. web services and software agents as basic representatives of the new ICT systems have reduced processing times up to 30%[1], which is the main key which justifies all of the investments in that field.

SOA, literary means adjusting the business processes with the time processing, i.e. all of the ICT functions will be attached to a certain business.

Therefore, SOA is the "missing link" in order to adjust ICT with business and to decompose the business processes, but to place them on the Internet as well, in order to make them more efficient and more reachable. Certain business processes become redundant and are eliminated in order to accomplish faster and more efficient creation of a new portfolio or claim settlement. Direct implementation of SOA for the insurance companies means that they catch up the trends of working in a big family on the financial market, i.e. they become consumers of electronic commerce.

With SOA, the business processes will be easily integrated among corporations and national bureaus of insurance, which directly means acquiring information, analysis, production, and distribution, become atomized as small work pieces of the computer code.

If we take a look at an auto claim (TPL or CASCO), the work business procedure consists of series of business processes, both human and atomized. The atomized processes will call business services (web services or software agents) in order to execute a preliminary estimate of loss of function, reimbursement or reserves, which must be determined for further processing of the claims, i.e. other entity to complete a certain procedure on behalf of its name and vice versa, and this is now possible. The division is made in the logic of business (which is static) and in the rules if business (which are dynamic). ICT systems only implement these distinctions whose implementation is relatively fast and simple.

On the other hand, underwriting (new portfolios) is a part of business rules which are divided into executive rules, which at the time being are really bureaucratic and exposed

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[1] Business White Paper, 2006, Optimizing the insurance Business, SOFTWARE AG, www.softwareag.com

to changes (new obligations, new limitations of insured sums, new entities involved in the process of determination, etc). Now with SOA implementation, they can be implemented without changing the entire application software.

In the years to come we will see if all the companies will transform toward the SOA approach in order to be more competitive and become globally available.

Global availability has imposed a new necessity on the market: flexible and personalized insurance products and services, i.e. accessible 365x12x24. This is available with the SOA structure of the ICT systems in the insurance market. In order to gain the epithet company of the 21st century, the insurance companies must fulfill these challenges. On-demand insurance is the first challenge which the insurance companies face. On-demand insurance is actually an already set up distributive channel which allows the insurance companies to distribute their products through banks, post offices, supermarkets, kiosks, or any other channel but at the same time be paid for. This can be established in many ways, such as phone cards, automobile and other appliances, enabling the on-demand insurance to be charged by mobile moving forces. With the creation and publicity of web services or software agents, this type of insurance through outsourcing of internal business processes, i.e. with the implementation of SOA model, is confirmed to be a possible type of insurance.

4 SOA implementation

The insurance companies incorporate in their structure many units which are really complex. Underwriting department, claims department, financials department, human resource department, acquisition department, call centers, etc. The implementation of the SOA in the insurance companies is faced with two challenges: internal and external adoption. As part of the companies there are a great number of business processes which in the business chain take place within the same company, between different departments. At the moment they are "bottle neck" because greater part of the ICT functions is geared toward creating efficient services for the consumers. Those business processes take up great deal of the necessary processing time for one subject. For example, (Fig. 1): In order to pay out one automobile claim first of all one has to make the claim. An estimate is made, reimbursement or reserve is defined for processing the claim, and at the end it is paid out. This seems to be a simple process, but it is not. In order to pay out a claim, the company checks within its recourses if the insurer has paid his insurance policy, has the claim happened in the insured period, does the insurer have a positive technical result, (is the insurer working out for the best of the insurance company, does he/she have many claims, is he/she manipulator, etc) police evidence is looked through again, and a decision is made at the end. At the moment all of these processes are done manually or they are to some extent atomized. Usually it is necessary to open several applications in order to get all of the necessary information in order to work out the claim successfully.
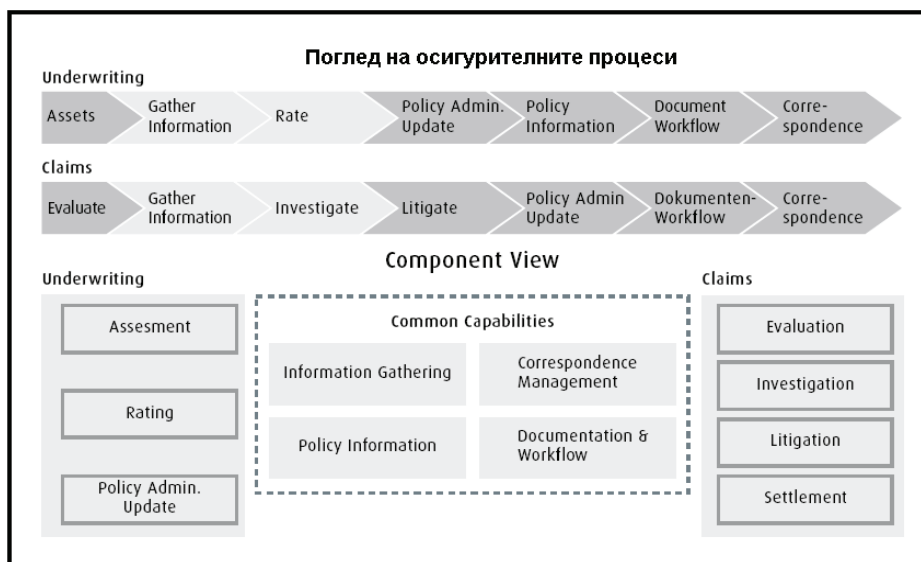
Fig. 1. Picture1. Insurance Processes[2]

SOA is a cohesive frame of services. This means that, first of all mapping must be done between the business process of the ICT function and to create appropriate ICT services. At the moment, great numbers of the insurance companies are with ICT services which are based on client-server model, (two tier model). This model is not enough looking from that aspect that runtime software limitations occur, which become installed on the client's machines or because of new users logging in the system. That is why in the mapping between the business processes and the ICT functions, that model is abandoned and it turns to multi tier level, which has no need of client software, but simply uses some of the already know internet browsers (Internet Explorer, Netscape, Firefox, Opera etc.). At that moment mapping i.e. ICT services is aligned with the web services or software agents. Within the process of mapping, certain business processes become redundant and eliminated.

Mapping between business components and insurance companies enable them to determine the main business blocks for future business status in different areas and operative functions (merging with other companies, etc.)

It is the same with the second challenge- external adoption of SOA. The so far static web information and calculators which could be found on their web pages are not enough to completely satisfy the consumer's requests. This means the following: in order to find

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[2] Business White Paper, 2006, Optimizing the insurance Business, page 2, Figure 1, SOFTWARE AG, www.softwareag.com

an insurance company or an insurance product to satisfy one's needs to the fullest, one needs to browse couple of web pages, get familiarized with the products, and at the end go to the insurance company which meets the needs.

SOA adoption at this point means something different. It means creating and publishing web services or software agents which will save one's time, and lower the bureaucracy within the company. Not only will one be able to find the product and the company which best suits his/her needs, but make an on-line policy and payment. These web services or software agents could be published in two ways: on the portals of the companies, or the public directories of services in order to be reachable for incorporating into the portals of broker's companies, banks, distributive channels, personalized, etc. For satisfactory implementation of SOA (not only within insurance companies but anywhere where it is done) it is necessary to take a look at the SOA background.

5 SOA background: Web services, software agents, and semantic web

There are so many definitions for web services and software agents. As axioms in this research, the following two will be used:

Web services-software components which are only defined through URI (Universal Resource Identifier) and execute certain functions on behalf of their users, through public interface, published for the clients using XML (eXtensible Markup Language). They can be found on public directories and implemented by other applications through XML based SOAP (Single Object Access Protocol) messages but through standardized web protocols, such as HTTP. They must be incorporated by one of the software agents. **Software agents-** Independent software components, which are part of ICT systems and **participate react** independently in the events of the environments and are capable to determine future agenda of its reactions.

Based on its construction, both web services and software agents have similar characteristics. Professor *Michael N. Huhns*[3] from the University of South Carolina defines software agents as the future of web services, because the software agents incorporate and enhance the possibilities of the web services.

The web services and the software agents as part of the WWW (World Wide Web) as it exists today are not able to execute completely its tasks which were initially assigned to them. WEB 1.x is a set on numerous pages, information, and links, which lead to other pages. The information is not formed by any already defined order, and they do not contain any information for machine reading and interpreting. This is the case because WEB 1.x is designed for people.

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[3] Michael N. Huhns, University of South Carolina, Department of Computer Science and Engineering, Columbia, SC 29208, USA, Huhns@engr.sc.edu , http://www.cse.sc.edu/~huhns

Thus, the WWW progress at a higher level is inevitable. The product of this progress is the Semantic web. The Semantic web is basically imagined to be improvement of the already existing web, i.e. universal medium for information exchange through interpretation of their meaning- semantics, and it is directed for the use of people but absorbed by machines as well.

In order to reach the real meaning of the semantic web and the actions of the web services and the software agents, it must me mentioned that the protocols of information remain the same, but additional technologies are added within the web pages such as DAML (DARPA Agent Markup Language) , RDF (Resource Description Framework) and XML with which the parsing for finding information on the pages by the web services and agents is fully used (in comparison to the *brut force* way so far), and the web services and agents already know what can be found on the pages, but information classified according to their meaning(semantics) and philosophy of existence (ontology).

The classical interaction of the web services and software agents on the web consists of three basic actions: publish, find, and bind (Fig. 2)
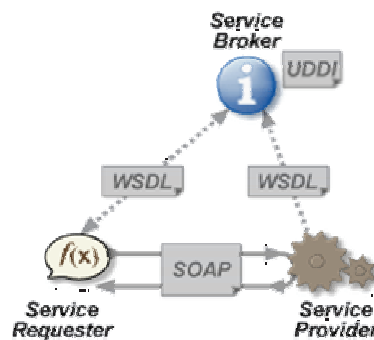

Fig. 2. Closed cycle of actions on web services

The difference between web services and software agents in the closed cycle of actions is that instead of UDDI (Universal Description, Discovery and Integration) directory and WSDL (Web Service Description Language) and SOAP (Single Object Access Protocol), the ACL (Agent Communication language) is used.

6 Composing web services

During the creation of a contemporary ICT system, a great number of web services and software agents are created. As separate program entities, through which the ICT functions execute certain part of a business process, usually dependency of other web services and agents appears. Therefore, their composition is necessary according to a

schema as in the real business process iteratively. The composing can be done in two ways: orchestration and choreography.

Both types of composition have their own characteristics: (Fig. 3 and Fig. 4):
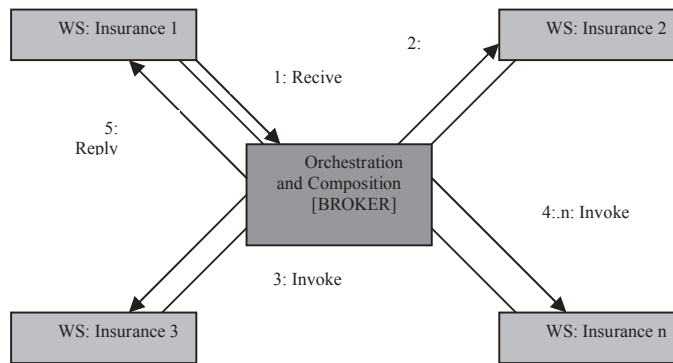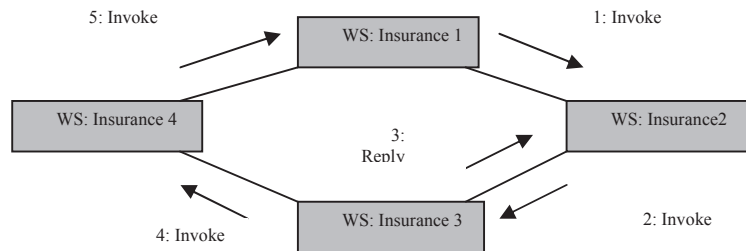

Fig. 3. Orchestration

Fig. 4. Choreography

The composition can basically be considered as creating software agents (if we go back to the definition that within each web service a software agent must be incorporated) through BPEL4WS (Business Process Execution Language for Web Services).

The achievements of the composing of the web services are the standardizing between applications within the company and extending integration between already isolated heterogenic systems between business partners.

7 Achievements of the SOA implementation

Which are the achievements of the SOA implementation? This is an inevitable question asked by the company management.

The accomplishments are exactly what the business managements expects to hear: lowering the maintenance expenses, increasing efficiency through reducing processing time, easy integrating with other company's systems in case it takes place, etc. This is what the business management wants to hear. But there are other accomplishments for the executives directly involved in implementation.

First of all, it is important to say that it is a technology which will probably mark the 21st century. The web services and the software agents to the public will mean the same thing which the WWW meant a decade ago. Coming from this point of view, the accomplishments for the businesses roughly defined are the following:

- From the business point of view:
1. Improved efficiency, the business procedure is improved within the company, and between the business partners, executing actions in real time, with up-to date information
2. Extended market, business process are offered as "services" of already existing and new consumers, opening new possibilities
- From the point of view of the direct executives the accomplishments are:
1. Development and implementation, development and implementation are relatively fast and simple
2. The software gets the epithet "located" it can be located on the global network, it can be implemented in the personal, company, or commercial portals,
3. Electronic communication with the partners and atomized process of integration of information
4. Between applications developed in different developmental environments
5. Re-executing of a transaction if it was unsuccessful
6. Electronic communication with the clients

8 Conclusion and further research

Insurance and insurance companies are an ever present theme in everyday life. For many of us it means spending a great amount of money. Most of the insurance agents, brokers, or distributive channels of such character, operate with manual calculations for a best offer for the customer. These calculations are usually based on already determined non-personalized schemes and out of prices. The time processing for our needs are huge, and the realization is quite burocratical. The web services and the software agents within the insurance companies aim to annulled the above mentioned and gain products which will be flexible and personalized to the maximum, but also available 365x12x24.

The implementation of the SOA in the insurance companies is exactly what will take those companies into the 21st century, century of electronic commerce without going through the same paths which existed during the implementation of the first informatical systems. Further research in this field is geared toward real implementation of such ICT system and confirming the theory of SOA.

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