

## Guide for the Reader

### **Aim of this book**

This book shows that it is now possible to carry out projects that deal with the progressive overhaul of a company's information system. The methods and techniques that are used to control risk management are proven and can be used throughout the entire information system. In this book we introduce the foundations of SOA and also list the advantages of adopting the SOA approach when it comes to restructuring an information system. We also show that SOA cannot be used on its own if a company's aim is to successfully restructure its information system. The SOA approach needs to be accompanied by the use of an enterprise method, which models the company's needs.

This book will have achieved its objective if it can make IT departments and companies in general understand that SOA is an architecture that should be used for the progressive overhaul of a company's information system. Another aim of the book is to make them aware of the methods and techniques that are available so that they can undertake such an overhaul project.

### **Who is this book for?**

This book has been organized into four parts, which will enable readers to read a topic that they are particularly interested in:

– For the decision-maker, “Part I – Why a Sustainable Information System?” looks at the strategic reasons why a company might want to carry out a progressive overhaul of its information system.

– For the architect of the information system, “Part II – The Principles of SOA” defines SOA and lists all of the concepts that are part of the SOA approach.

– For the project manager and the project team, “Part III – The Need for an Enterprise Method”, shows that it is necessary to use a methodology during the restructure of an information system. Part III also shows how this methodology can control the risks linked to renovating the information system.

– For the technical architect, “Part IV – Mastering Existing Techniques” introduces the technical components that are available and the way in which they should be used in order to carry out a successful SOA project.

### **Organization of the chapters**

Chapter 1 – Initial Perspectives – is an assessment of the current state of information systems and an introduction to an SOA type of architecture.

Chapters 2 to 4 (Part I – Why a Sustainable Information System?) provides decision-makers with an understanding or a better understanding of SOA as well as providing information on the different SOA maturity levels:

– Chapter 2 – Company-oriented Services – looks at the strategies of the service-oriented approach and lists guidelines which help the decision-makers see how the SOA approach can benefit the company in which they work.

– Chapter 3 – SOA Maturity Levels – describes the main phases of the SOA approach. This chapter deals first with cosmetic SOA; this level of SOA does not change the IT that is in place. This is followed by a description of extended SOA and overhaul SOA, both of which work harder towards increasing the agility of the information system as well as the rationalization of the information system.

– Chapter 4 – Economic and Social Aspects – provides important information on what people expect from SOA. This enables us to judge the importance of the SOA approach as well as judging how it will be used in the future. In this chapter we also explain why it is important that both junior and senior IT specialists work together, as well as explaining why the rationalization of a company’s production process is more important than offshoring, and finally we explain the role of software editors etc.

Chapters 5 and 6 (Part II – The Principles of SOA) give more precise information on the properties of SOA:

– Chapter 5 – The Properties of SOA – reviews all the criteria that an information system must adhere to if SOA is to be integrated within the information system.

– Chapter 6 – Orchestration (BPM and SOA) – provides information on the concept of orchestration and shows that this concept can be found on all levels of the information system’s architecture.

Chapters 7 to 9 (Part III – The Need for an Enterprise Method) deal with the methodologies that need to be used while the services are being designed:

– Chapter 7 – The Discovery of Services (Reference Framework and Urbanization) – highlights the importance of having a reference framework that is capable of organizing an information system. The reference framework should possess a topology whose structure can place all of the services in their rightful position in relation to the modeling of organization and business needs. In this chapter we introduce the Anglo-Saxon reference frameworks of Zachman, TOGAF by the Open Group and Herzum. We also introduce tools and processes such as UML, MDA and functional enterprise architecture, which leads us on to the Praxeme enterprise method.

– Chapter 8 – The Praxeme Enterprise Method – introduces the origins of this method as well as enterprise system topology, which is divided into eight aspects that deal with the design needs of the information system and which integrates the SOA approach into the information system.

– Chapter 9 – Modeling with Praxeme – provides information on the design process. This starts with the upstream models that are used to express the company’s needs and continues right through to the procedures that are used to design the services. In this chapter a detailed description of the SOA approach is also given.

Chapters 10 to 14 (Part IV – Mastering Existing Techniques) introduce the technical aspects that need to be considered when restructuring an information system:

– Chapter 10 – Tools for Industrializing the Method – describes what tools are to be used with the methodology. The following principles are described in detail: virtual machine (which is used for the execution of services), pseudo-code, modeling CASE tool and Model Driven Architecture (MDA). A detailed description of the tools that are used to increase the agility of the information system is also given, including the Business Rules Management System and Master Data Management.

– Chapter 11 – Systems Integration and Common Information Language – details the tools that are necessary and which it make it possible to interconnect remote and heterogeneous information systems. The components of the Enterprise Service Bus (ESB) are described in this chapter. A description of the procedure that is used to create the common language (unified data structure relying on XML), which is necessary for the information systems to communicate with one another, is also given.

– Chapter 12 – SOA Platform – lists the different technical constituents that need to be adopted in the SOA approach beyond the level of the ESB. This chapter also deals with different technical themes such as performance management, security and how the technical constituents should be used. The audit tool, which works out the maturity level of the information technology that is available, is also introduced in this chapter. The SOA test card, which is divided into eight key areas and three maturity levels, lists the technology that is required for the traditional SOA approach to become platform SOA.

– Chapter 13 – Rules Management at the Scale of the Whole Enterprise – details one of the major components of ACMS (Agility Chain Management System): the Business Rules Management System (BRMS). We will also cover how BRMS brings agility for developing a Sustainable Architecture, thus deploying it at the enterprise level within an extended SOA.

– Chapter 14 – Semantic Integration – tackles how to reuse the semantic modeling to streamline interconnections between systems. In other words, the semantic modeling is useful to set up MDM but also to streamline systems integration in a sustainable manner.

## Introduction to the SOA Project at SMABTP

Throughout this book we will use examples from the SOA project that was undertaken at the SMABTP. The context of this project is described in this section.

### **The beginning of the project**

In 2001 the SMABTP, a French mutual insurance company in the construction sector, decided to restructure its information system. After an unsuccessful first attempt to change its information system to a market software package, the IT department of the company, in agreement with the general management of the company, decided to modernize its information system and launched its restructuring plan. The company's plan for restructuring its information system took into consideration all the needs and expectations of the members of the SMABTP. The company wanted to provide a range of insurance deals, which could be easily adapted to the needs of the company's customers. The creation of such a product offer was a complicated process due to the large variety of activities that the members of the SMABTP worked on. In other words, the product offer would have to cover all areas of the construction industry in which members of the SMABTP worked. These different areas include civil liability, building contracts and insurance. For example, they provide insurance cover against the breakdown of machines and heavy goods vehicles.

The decision to restructure their information system led the insurance company to focus the overhaul of their information system on its main business activities. The company also wanted to focus on creating a modern information system which would be capable of managing all of the company's insurance contracts, collecting the company's insurance premiums and paying out any claims. All of this would be

carried out in a rather customer-oriented market. In focusing the overhaul of their information system on its main business activities, the SMABTP has been able to create fruitful partnerships with other mutual insurance companies who are leaders in the private insurance market (companies that deal with car insurance, comprehensive home insurance, etc.) or in other very competitive markets, such as providing insurance for fleets of vehicles. The SMABTP has also worked in collaboration with other distribution networks with the aim of selling its construction insurance products.

Innovative decisions had to be made with the aim of creating an information system that could meet the following requirements of the company: how would it be possible to provide services that could be used for the processes of pricing, drawing up and consulting contracts, as well as providing services that could deal with claims management and the collection of insurance premiums. These services would function differently at the presentation level (user interface) or at the authorization level of the information system depending on whether they were used by the creators of the contracts, the company's customers or the company's partner institutions. This complete redesign of the company's information system, which focused more on the business needs of the company, had been planned several years in advance and started with the automation of the most important points of the old information system. Such a complete redesign meant that the company had to try to get the old and new information systems as well as the internal and external information systems to exist side by side for a long period of time. This was made possible by using a particular infrastructure that meant that the different systems could exchange data securely with one another in real time.

The first task the IT department had to deal with was to structure the information system into high-level functional domains and technical components, such as publishing, presentation (UI) or rights management. Inter-domain communication was carried out by using a standardized flow of data thanks to the use of an application integration tool or Enterprise Application Integration (EAI) with XML messages. This type of investment required the use of a lot of hardware and software. It also required a lot of work to be carried out by the people working on the project since they continually questioned the work methods that they were used to and were always learning new ones. The business advantages of this first phase of the project were significant:

- the double entry of data in different applications was removed, there was an improvement in the exchange of data between partner companies, and there was also an increased fluidification of the different processes;
- desktop publishing was integrated within the work process;
- applications became increasingly integrated into individual work stations.

Other important work carried out in this project increased the agility of the original information system and made the information system more reactive to the requests made by the users of the system, such as: product rules could now be parameterized; it became possible to outsource business rules to an external business engine used by reusable services; and it also became possible to manage certain processes in a workflow tool. This first approach is a tool needs to be used in order to prepare today's society for the revolution of evolutionary processes and reusable services that is going to take place in the future. This first approach is only a step towards a stronger shared vision that everyone within the company will have.

The business services which were obtained from the original information systems could only partly adapt to change and were therefore only partly reusable. The next phase would be to create new agile business services and then to orchestrate them. The search for an effective methodology was essential at this point. This methodological approach facilitates the communication that takes place between users of the information system, analysts and developers. It also seems to be the keystone that was missing in previous overhaul projects.

After having spent five years working on the project it can be said that the SMABTP now has an information system that can be placed in one of the higher maturity levels of the SOA approach. However, it has still not reached the maximum level possible. Only some of the company's IT specialists and some of the users of the information system actively participated in the process (20% of the company's IT department). The concepts of SOA and the advantages of using them need to be shared with everyone working on IT projects within the company. The good thing about any future projects that may take place in the company is that the workload will be lightened. Not all of the different phases of the project were completed at the same time and the company's employees who were involved in the project began to understand what technology and what methods were required so that such a project could be a success. All of this was made possible thanks to continuous support from the company's general management and managers.

### ***More agility***

The modernization of the SMABTP's information system started with an SOA approach that did not have any impact on the company's original information system. Connectors were then created and added to the old systems and these improved the data exchanges that took place between the different platforms. The exchanges of data flow were standardized in XML in order to improve the clarity of the flow of data being exchanged. Very soon after this, the users of the information system requested that the portal (UI) be improved so that the data coming from other information systems could be presented in the same way. The objective of

modernizing the company's information system was for the company to have an overall view of their customers and contracts, claims and premiums files.

We benefited from the introduction of the company's new contract management system to complete another phase of the modernization process. This was achieved by outsourcing the business rules, which were part of the ILOG company's business rules management system known as ILOG JRules. It was possible to outsource the business rules thanks to the exchange of XML messages using the EAI tool. The interactions between the contract management application (AS400 software) and the business rules engine occurred thanks to the use of XML messages, which completely separated the two systems from one another. We also outsourced the different editions of the two systems with the help of a desktop publishing tool, which was also managed by flows of XML data that were sent from the contract management tool.

The project that was undertaken to digitize the claims management application gave us the opportunity to carry out more research as far as the SOA approach was concerned, especially after we made the decision to completely rewrite the application. We naturally adopted the overhaul SOA approach for the project, as this would let all of us use our own experience from other projects. EBX Platform, which is the Master Data Management tool that (Orchestra Networks), was added to the overhaul SOA project. Depending on authorization rights, the functional and technical users of the information system, as well as the users involved in the production of the claims management systems, could all have access to the Master Data Management tool. This tool managed the codes, the reference data, and the functional and technical parameters used by the different services, processes and rules.

After analyzing the users' needs, which was accompanied by a comparative study of the two claims management systems (gap analysis), and after studying the new processes with the users of the systems we noticed that the reusability level of the business components was low. For anyone who understands what is involved in this type of management they should be aware of the fact that many different processes affect the same management rules, such as: verifying the existence of the customer and the contract; verifying the existence of the insurance policies; evaluating policy; settling policy; consulting policy; and possibly canceling policy. In a reusable business service approach, it is expected that these different management rules are shared with other domains in the insurance industry.

The old methodologies do not highlight this fact. UML notation and the creation of object components do not make it possible to share these different management rules with other domains in the insurance industry. This is why that we felt that it was important to create a methodology that would easily facilitate the



implementation of an overhaul SOA project. After some unfruitful research we finally found a methodology that existed and was used, in part, in the SAGEM company. This methodology generally corresponded to what we were looking for: we wanted a methodology that would highlight all of the company's business services so that we could create our claims management application.

We improved the quality of this methodology with the aim of creating an agile information system when we carried out the overhaul SOA project at the SMABTP. Our work has also contributed to the creation of the public Praxeme method.

This huge effort on our part enabled us to create a piece of software which meets the requirements of having highly reusable and agile business services, i.e. the creation of agile data and agile parameters, the creation of processes through the outsourcing of business rules as well as the creation of processes by isolating the business rules in orchestration services. All modeling procedures that were used to achieve this end result are mentioned in this book.