

# Chapter 7

## Reverse Engineering of Enterprise Business Processes

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### ABSTRACT

*In the current context of globalization and with the increasing need to automate the work, modeling business processes has become essential. Modeling helps not only to understand processes but also to anticipate changes and build a flexible structure. In this chapter the authors adopt from software engineering the concept of reverse-engineering. For organizations with unmodeled BP, reverse-engineering is a way to provide process models ready for improvement or usage in other stages of the business process lifecycle. This chapter proposes a method for business process reverse-engineering fulfilling these requirements. It consists of a multi-view metamodel, covering all perspectives of a process, and a detailed approach to guide the business process modeler. The approach was tested on a web application from the French academic Information Systems.*

### INTRODUCTION

The Business Process Management (BPM) approach is gaining a lot of success (Trkman, 2009) and technologies supporting BPM are evolving continuously. This is related to the fact that the success of an organization depends on its control of its business processes throughout their lifecycle. But in some cases, business

processes are running in the enterprise without being based on formal models. They could be based on out-of-date or unstructured documents and on knowledge of process participants. Then it is essential for these enterprises to reorganize information about processes in order to generate process models useful for the following steps of the lifecycle like automation and monitoring. As a consequence, relevant modeling methods are needed like reverse-engineering which is a solution to model existing business processes. The word

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reverse-engineering has been defined in 1990 by Chikofsky and Cross (Chikofsky & Cross, 1990) as “*the process of analyzing a subject system to: a) identify the system’s components and their interrelationships and b) create representations of the system in another form or at a higher level of abstraction*”. Reverse-engineering is only a starting point in the lifecycle. A business process is never stabilized and it will be subjected to continuous improvements that are part of the Business Process Reengineering (BPR) approach. BPR aims to reform and redesign existing systems or applications to reach new ones more efficient and more adapted with the environment (Langer, 2007; Barothy et al, 1995; Tsalgatidou & Junginger, 1995).

The approach of “process mining” defined by Van der Aalst et al (2003) should not be confused with reverse-engineering. The goal of the two approaches is to provide process models from running processes, but process mining uses events triggered during the execution of the process to build a scheduling of the process, while reverse-engineering Reverse-engineering use several types of information to build different perspectives of the business process.

This chapter proposes a method for business process reverse-engineering motivated by the need to collect and reorganize the existing knowledge and to generate models while considering the differences between the strategies of the enterprises and their vision of processes. Goals for modeling business processes may vary from one organization to the other. We summarized these goals in four major points:

**Enhancing comprehension and communication.** Some organizations need to model their processes to cope with communication problems between the participants in the process. Actually, some processes in organizations are yet considered as black boxes. The distribution of work is not clearly defined between actors who have no knowledge of their real position and the

contribution of their work in the scheduling of the business process. The proposed solution is to give structured process models consisting of different levels of details and that are understandable by the participants.

**Facilitating process management.** The purpose of modeling and particularly our purpose in this chapter are to provide structured processes which are modeled from different viewpoints and which are consequently well documented. Naturally, these processes are easier to maintain than executable processes based on theoretical models that no longer match with the real process. For example, when the different relations and flows between processes are modeled with fine details, it is possible to predict the influence of an eventual modification of a process on the others.

**Facilitating process execution.** Execution constitutes an essential phase in the lifecycle of a business process. As explained by Muehlen and Ho (2006) this phase may fail as a consequence to a number of risks including the lack of a high implementation view and the lack of a common language between stakeholders. Thus comprehensive models of business process facilitate the implementation and the automation of business processes.

**Adapting easily processes with their environment.** Other organizations are involved in the current context of globalization which has created a competitive climate. Thus, they are forced to innovate which explains the need for flexible models of business processes ready for improvement. We note also the current tendency to adopt Service Oriented Architecture (SOA). The evolving number of virtual enterprises on the web demonstrates the increasing aim of organizations to exchange their services. Other organizations choose to merge for strategic reasons. Therefore they need to model their internal processes to plan and structure external interactions. For example the purpose of the University of Grenoble is to merge the different administrative processes of the different institutions of university educations

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