Chapter XIII

Evolving Legacy Systems Towards E-Business

Lerina Aversano, RCOST – University of Sannio, Italy
Raffaele Esposito, RCOST – University of Sannio, Italy
Teresa Mallardo, RCOST – University of Sannio, Italy
Maria Tortorella, RCOST – University of Sannio, Italy

ABSTRACT

In e-business, addressing the technical issues alone is not enough to drive the evolution of existing legacy applications, but it is necessary to consider problems concerning the strict relationship that exists between the evolution of the legacy system and the evolution of the e-business process. To fulfill this purpose, this chapter proposes a strategy for extracting the requirements for a legacy system evolution from the requirements of the e-business process evolution. The strategy includes a toolkit composed of a set of decision tables and a measurement framework, both referring to the organization, business processes, and legacy software systems. The decision tables allow the identification of the processes to be evolved, the actions to be performed on them and their activities, and the strategies to be adopted for evolving the information systems. The measurement framework aims at achieving a greater understanding of the processes and related problems, taking into account organizational and technological issues.

INTRODUCTION

In the past, development and maintenance of monolithic applications were carried out with relatively few tools, and integration problems were less relevant. Today, technology continuously changes with innovative development environments, new
communication platforms, and new architectural solutions, and so an enterprise cannot ignore the need for renovation of its information systems (Sneed, 2000). The renovation process has to consider the existence of legacy applications that need to be integrated with new applications, and evolved toward innovative technologies (Berztiss, 2001; Steven et al., 2002).

Fast change of business requirements encourages enterprises to evolve their business processes and organizations by considering the future of the legacy systems. The evolution requirements for business processes and legacy systems reciprocally influence each other and, therefore, these have to be analyzed and considered together. When an enterprise addresses organizational issues, business processes, and supporting software applications, it then can successfully transform its legacy systems.

The joint usage of Business Process Reengineering (BPR) (Hammer & Champy, 1993; Jacobson et al., 1995), and legacy system evolution approaches should provide a comprehensive means for transformation by recovering the experience, expertise, and knowledge contained in the processes and legacy systems, and converting them into an effective evolution strategy. BPR approaches involve the business process evolution in terms of fundamental rethinking and radical redesign of an enterprise’s business practices and processes to maximize value by creating activities (Hammer & Champy, 1993); while legacy system evolution approaches assess the enterprise’s systems and develop a conversion strategy consistent with the enterprise’s future business objectives and technology strategies. In this chapter, a strategy is proposed that combines needs and goals of organizational improvement, business processes and legacy system evolution activities.

The strategy specifically targets the evolution of legacy systems by considering business assets coming from the analysis and assessment of the organization and business processes. It can be used to identify suitable business and technological solutions and evolution strategies to meet emerging business needs. The final goal is to analyze an existing operational information system embedded in the organization and business processes to be evolved, and recommend the best combination of strategic alternatives for each legacy component. The strategy takes into account the following three aspects:

- **Business.** To analyze whether the technology is properly applied for accomplishing the business needs, redesigning the business processes to satisfy the new business goals, and identifying the legacy information systems that should be changed to accommodate new business functionalities. These aspects have an impact on business performance by introducing meaningful improvements in productivity, speed, and quality.

- **Technology.** To identify the innovative technology that needs to be considered in the evolution of business towards e-business and in the future environment of the legacy applications. The technological aspects together with the business process evolution allow for linking of the legacy system evolution activities to the business objectives.

- **Legacy Software System.** To assess the software system and identify the requirements for evolving the legacy software components in order to exploit the new technologies and meet the business process evolution requirements. The assess-
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