Chapter 7.10
Aligning Business Processes with Enterprise Service Computing Infrastructure

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ABSTRACT

Multisourced and federated business operations and IT services are the backbone of today's enterprise. However, in most companies, there exists a natural gap and disconnection between the decision and evaluation at the business level and the execution and metrics at the IT level. This disconnection can lead to end-user dissatisfaction, diminished profit, and missed business objectives. In this chapter, we study the problem of this disconnection and provide the following frameworks and techniques toward bridging the gap: (a) We provide a model-transformation framework that effectively transforms business-level decisions documented as business-process models into IT-level executable representations based on service-oriented infrastructure, (b) a framework is described that is able to monitor and synthesize IT-level performance and metrics to meet service-level agreements between business management and end users, and (c) techniques and experiments are discussed that enable dynamic adaptation of IT infrastructure according to business decision changes.

INTRODUCTION

Multisourced and federated business operations and IT services are the backbone of today's enterprise. However, in most companies, there exists a natural gap and disconnection between the decision and evaluation at the business level and the execution and metrics at the IT level. This disconnection can lead to end-user dissatisfaction, diminished profit, and missed business objectives. In this chapter, we will discuss some frameworks and techniques to bridge the gap.

First of all, we define the scope of businesses that are of particular interest in this chapter. The content of this chapter is suitable for a particular kind of business that is called dynamic e-business (DeB; Keller, Kar, Ludwig, Dan, & Hellerstein, 2002), although traditional types of business might also benefit from this chapter with some adaptation. Dynamic e-business, also called the virtual enterprise (Hoffner, Field, Grefen, & Ludwig, 2001), consists of an interconnection of loosely coupled and dynamically bound services provided by possibly different service providers with long and short business relationships. Those services together offer an end-to-end service to customers.

There are three aspects of the disconnection: how the business decisions are executed by the IT professionals, how the IT services are evaluated and synthesized according to business needs, and how to effectively reflect changes from one side of the gap to the other.

1. On one hand, senior management and lines of business tend to prescribe their decision on business operations in the form of informal drawings and policy rules, while IT-level professionals execute these decisions, after a manual translation, in terms of IT-domain technologies such as objects, classes, procedure calls, databases, and so forth. We first describe a model-transformation architecture that effectively transforms business-level decisions documented as business-process models in a DeB environment into an IT-level executable representation based on service-oriented infrastructure. This IT infrastructure utilizes the Web and the Internet as the underlying operation environment and the Web-service technology family to realize the execution.

2. On the other hand, the IT department usually gauges its IT services based on individual IT components such as database transaction rate, Web-server response time, and network bandwidth availability, while business managers measure their business supported by those IT components in terms of overall business services such as overall user experience and supply-chain management. Our work on system dynamics modeling (SDM; Sterman, 2002) offers a comprehensive framework for service-level agreement (SLA) management (Bitpipe, 2005). SDM establishes SLA contractual commitments at the business level, continuously monitors the IT services delivered, and synthesizes IT performance metrics against business commitment.

3. Change management is always a hard problem. How the IT system responds to the changes in the business environment is called the moving-target problem (Schach, 2005). The agility of an enterprise depends on the responsiveness of its IT infrastructure. On the other side of the mirror, how the enterprise tolerates the changes in the IT environment is called technology drift. In this chapter, we are only concerned with the first problem. We discuss techniques that enable the dynamic adaptation of IT infrastructure with realignment to the changed business decisions and reconciliation with the existing running infrastructure. These techniques are particularly useful for a business that is mission critical and has high availability requirements.

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