Chapter VII

A Composite Application Model for Building Enterprise Information Systems in a Connected World

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Abstract

The Web, as a ubiquitous distributed computing platform, has changed dramatically the way we build information systems, evolving from monolithic applications to an open model that enables real-time and federated information access, unifying the user experience across business processes. The industry has coined a new term for this latest evolution: connected systems. Unlike distributed systems, they are not just about distributing workload or ensuring fail-over; but rather about leveraging connectivity to enable specialized software agents to perform units of work cooperatively and opportunistically by exposing and consuming each other’s services to fulfill a common goal. To reach their fullest benefits, connected systems require a new application model that relies exclusively on the consumption and...
composition of autonomous services. This new blueprint is poised to reshape the information systems’ architecture, infrastructure, delivery technologies, programming languages, deployment, and management models. The goal of this chapter is to help you understand why and how IT should evolve the enterprise architecture toward a service-oriented composite application model.

Introduction

Connectivity has been at the foundation of human innovation and progress for the last 5,000 years. Transportation and communication infrastructures have enabled a specialization and composition of human activities empowering each economic agent to use and contribute the best of its abilities. In the last hundred years, this movement has accelerated, and today, vertical industrial conglomerates have all but disappeared under the economic pressure of an agile, layered, and dynamic fabric of enterprises of all sizes offering composable services to each other. Indeed, this fabric is itself creating tremendous competitive strains on its constituents by globally propagating innovations and optimizations, creating a constant need to reengineer design, sourcing, production, delivery, marketing, and support processes. Furthermore, technological advances have shown their ability to wipe out century-old industries within a few years. In this now global fabric, an enterprise must secure a decisive capacity to innovate, adapt, and optimize or else one of its competitors will quickly gain the ability to sell an equivalent product in its markets to its customers.

Paradoxically, the advent of the richest and fastest communication network combined with the use of the most powerful computers and high levels of automation have revealed a crying lack of adaptability and composability of IT organizations, hindering new business models and relationships while slowing productivity gains. The software industry has efficiently produced a software-construction model based on assemblies of technologies and frameworks; however, the systems produced with these technologies are not composable as requirement changes or new systems need to be built. As a result, IT, one of the major vectors of change for the past 30 years, can no longer be perceived as much of a competitive differentiator as the costs of innovating, adapting, or optimizing cannot often match the business cycles of an organization.

In the last 3 years, the software industry has started a major overhaul of the concepts and technologies used to build information systems to both adapt to the connected world and restore IT’s leadership in driving business value. The foundation of this evolution is service-oriented architectures (SOAs), and its flagship is composability, that is, enabling the enterprise to build assets that can be reused in contexts unknown at the time they were designed. This ability of reusing assets in new business con-
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