Chapter 11
Enabling Vendor Diversifiable Enterprise Integration: A Reference Architecture

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ABSTRACT
Without effective architectural oversight, enterprises risk stifling their ability to innovate, because vendor products are too tightly woven into their key business processes, which impedes the evolution of their technology environment in support of business needs. Vendors gain negotiation leverage due to monopoly on the technology that supports key enterprise processes and capabilities. The goal of this chapter is to provide practical guidance on business flexibility advantages through carefully managed vendor diversification options for enterprises that are implementing Service-driven applications and integration solutions. The approach presented in this chapter recommends adherence to four basic principles, namely, owning the ability to control delivery channels and integration, compartmentalizing concepts into fulfillment roles in the Service-driven enterprise, using a vendor agnostic enterprise service interface, and owning the key data. The dual reinforcing concepts of ownership and control underpin the vendor diversification opportunities. A reference architecture is presented that distills these principles into a conceptual model that can be applied to any enterprise. A real world transportation and logistics business enterprise integration project is used as an example to illustrate the advantages of using vendor agnostic principles in a Service-driven environment.

INTRODUCTION
Vendor dependencies that are not carefully managed can limit an organization’s vendor diversification options which inhibit its business flexibility, putting the organization at a negotiation disadvantage for contracts and system enhancements. As described by Vivek Kundra, former US Federal CIO, “vendor lock-in include reduced negotiation power in reaction to price increases and service discontinuation because the provider goes out of business” (Kundra, 2011).
Organizations that have undergone large integrated package migrations or that have attempted
to modernize legacy systems to be repurposed for Web or mobile environments, will have at least in part experienced the challenge that this chapter aims to address. Vendor negotiations start from a position of disadvantage when vendor’s products and solutions are so tightly woven into the key business processes of the enterprise that the organization no longer has any leverage to negotiate with.

These organizational technology challenges are captured in software architecture anti-patterns (Koenig, 1995), which result from the mismanagement of vendor dependencies within the architecture. The Vendor Lock-in anti-pattern occurs when the organization becomes completely dependent on the vendor’s implementation. When upgrades are done, software changes and interoperability problems occur, and continuous maintenance is required to keep the system running...In addition, expected product features are often delayed, causing schedule slips and inability to complete desired application software features” (Vlissides, Brown, & Meszaros, 2012). The authors cite an increase in risk and cost and potential inability to deliver on necessary business outcomes. The solution they offer is to introduce an isolation layer between the applications and the vendor software, which in modern computing is consistent with service-oriented architecture infrastructure (backplane) acting as a mediation and isolation layer.

The Stovepipe Enterprise anti-pattern results from “Multiple systems within an enterprise are designed independently at every level. Lack of commonality inhibits interoperability between systems, prevents reuse, and drives up cost; in addition, reinvented system architecture and services lack quality structure supporting adaptability” (Vlissides, Brown, & Meszaros, 2012). The authors cite brittle, monolithic system architectures that cannot be extended to business needs and cannot be reused or interoperate with the rest of the enterprise driving up costs and reducing the value of technology investments. The authors suggest that a combination of strategic planning (enterprise architecture) and open standards adoption to effectively manage this problem which is consistent with the approach expressed in this chapter.

The combination of an isolation layer, open standards, and enterprise architecture practices, will put the organization in a better position to manage the aforementioned challenges; however, it will not provide the assurance that they will have the necessary business agility required to succeed in their respective markets. In the modern multi-vendor scenario with architectures developed over decades, there are so many different options (with varying levels of effectiveness) for both the isolation layer and the practices of the enterprise architecture. The isolation layer and enterprise architecture approaches can in general be complimented by considering the technology architectures from a few key perspectives to ensure the desired architectural quality is achieved. This chapter aims to provide one such perspective, the perspective of vendor management in the architecture through service driven approaches, which results in higher levels of vendor diversification options, and can be considered a measure of architectural quality.

The proposed solution starts with service orientation, and the application of a few key principles to maintain vendor boundaries in the enterprise systems, to build a highly flexible business solution platform with Service Oriented Architecture (SOA). These principles include owning the ability to control delivery channels and integration, compartmentalizing concepts into fulfillment roles in the Service-driven environment, using a vendor agnostic enterprise service interface, and owning the key data.

This chapter presents a way to consider a key value perspective (vendor diversification) so as to ensure flexibility by managing vendor dependencies effectively. This will also translate directly into more general purpose architectural and busi-