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Chapter XXIII
Integrating Mobile Technologies in Enterprise Architecture with a Focus on Global Supply Chain Management Systems

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ABSTRACT

This chapter investigates opportunities to integrate mobile technologies within an organization's enterprise architecture (EA), with an emphasis on supply chain management (SCM) systems. These SCM systems exist within the overall EA of the business. SCM systems are further influenced by the increasing modern-day need for information and communications technologies (ICTs) within a business, to bring together all of its disparate applications. The resultant enterprise application integration (EAI) also stands to benefit immensely from the incorporation of mobile technologies within it. Traditionally, supply chain management systems have involved management of the flows of material, information, and finances in a complex web of networks that include suppliers, manufacturers, distributors, retailers, and customers. Thus, these traditional supply chain management systems have a great need for integration under the umbrella of EAI. Mobile technologies can provide time and location independence to these EAIs in terms of information in the supply chain systems, creating the possibility of multiple business processes that traverse diverse geographical regions. This chapter, based on the research conducted by the authors at the University of Western Sydney, discusses the opportunities that arise in supply chain management systems due to the time and location independence offered by mobility, and the resultant advantages and limitations of such integration to the business.

INTRODUCTION

A business enterprise uses a suite of different software applications to fulfill its various activities. These systems include supply chain management (SCM) systems, customer relationship management (CRM) systems, enterprise resource planning (ERP) systems, business intelligence (BI) systems, and other supporting financial and business systems. These enterprise systems do not operate in isolation. In fact, each of these systems depends on other systems, as well as large amounts of data in the background, to fulfill their own requirements. Specifically, supply chain management systems involve management of the flows of materials, information, and finance in a complex web of networks that include suppliers, manufacturers, distributors, retailers, and customers. The complexity of an SCM system requires it, as per Poirier (1999), to offer the right combination of data, products, and services to customers at the right time, right place, and right price. With rapidly increasing Internet access and business-to-business (B2B) connectivity, users of SCM are able to get their information needs easily—leading to what can be called electronic supply chain management (E-SCM) systems. E-SCM (Internet-based) systems are integrated together with all other enterprise applications, resulting in a comprehensive enterprise architecture (EA). Such an EA delivers the company a competitive advantage by opening up opportunities to streamline processes, reduce costs, increase customer satisfaction, and enable thorough strategic planning (Unhelkar & Lan, 2006). In today's modern business environment, it is important to further extend the advantages by incorporating wireless technologies and handheld devices in the organization's overall enterprise architecture. As Barnes (2002) mentions, the impact of wireless telecommunication on the Internet has taken a new turn. We use the mobile technology application for communications, working, banking, and shopping. The "time and location" independence provided by mobile technologies leads us into the era of mobile supply chain management (M-SCM) systems. It is important to understand these M-SCM systems within the context of the overall enterprise architecture. This chapter starts with a brief review of enterprise architecture and the issues related to enterprise application integration (EAI). This is followed by an understanding of the traditional SCM systems, together with the study of mobile technologies and applications. The chapter then describes the details of E-SCM and M-SCM. Finally, an outline of a model for integration of mobile technologies with SCM processes is then presented, together with its advantages and limitations.

ENTERPRISE ARCHITECTURE

An enterprise architecture represents the enterprise's key business, information, application, and technology strategies, and their impact on business functions and processes. EA consists of four key components: enterprise business architecture (EBA), enterprise information architecture (EIA), enterprise solution architecture (ESA), and enterprise technology architecture (ETA). The overall EA comprises software systems that may have been created using different programming languages and databases, and may be operating on different technology platforms. Figure 1 presents how EA is composed of different enterprise systems. However, Figure 1 also shows that users of the system want to see a unified view of the EA. This need for a unified view requires the enterprise to bring these various applications together, in an integrated fashion, resulting in enterprise application integration.

An enterprise business architecture that defines the enterprise business model and process cycles and timing also shows what functions should be integrated into the system. The enterprise information architecture focuses on which data and the corresponding data model should be integrated into the system. The enterprise solution architecture, also referred to as an application portfolio, is the collection of information systems supporting the EBA, which helps the user to easily understand and use the interface and components. Enterprise technology architecture is a consistent set of ICT standards which use infrastructures to support the EBA, EIA, and ESA. The infrastructures span across various different technical domain architectures, and include databases, applications, devices, middleware,