

# Chapter 2.1

## E–Business Reference Models

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### **ABSTRACT**

A number of reference models have been proposed to facilitate the development of e-business systems and applications. A comparative analysis of existing models and their pertinent characteristics should be the first step in selecting the right one to be used as the foundation for the system being developed. This chapter addresses that goal through an exposition of different reference models to be used for the development of e-business systems and applications, as well as of suitable quality evaluation frameworks to be used for their assessment.

### **INTRODUCTION**

Electronic business (or e-business, for short) may be succinctly defined as the ability to perform exchanges of goods, services, content, assets and money, using electronic tools and techniques (Zwass, 1994). E-business transactions may be conducted by individual customers, businesses

(including non-profit organizations) and various governmental agencies and departments. The main promises of e-business include cost reduction, new ways of accessing customers and the ability to overcome geographical distance and other physical obstacles. In order for all these benefits to be realized, and for the development of e-business systems to be ultimately successful, proper foundation is needed—part of which is the use of suitable *models*.

The concept of a model has at least two meanings in the study of e-business. Those meanings are distinct yet not altogether mutually exclusive, as will be seen from the following. From the business perspective, an e-business model is “a description of the roles and relationships among a firm’s consumers, customers, allies, and suppliers that identifies the major flows of product, information, and money, and the major benefits to participants,” according to Weill and Vitale (2001). This concept does not differ in essence from the more traditional view of a business model as “the organization (or ‘architecture’) of product, service, and information flows, and the

sources of revenues and benefits for suppliers and customers” (Timmers, 1999). Thus defined, the business model provides the vision and the foundation upon which strategies to pursue their respective business goals are developed and implemented in practice.

From the definitions given above, it may seem that e-business is just another form of business, having the same goals as any other business and requiring the convergence of business capabilities in order to achieve those goals. However, the prefix “e-” is more than a simple designation for a convenient vehicle to be used in the pursuit of those goals—it is the indication that another kind of convergence is needed, the “convergence of multiple technologies into an integrated electronic infrastructure” which is a *sine qua non* for conducting e-business (Weill & Vitale, 2001). The synergy of business and technology is the single most important characteristic of e-business.

From the technology perspective of the IS and computer science, on the other hand, an e-business model can be understood and employed as a reference model for the development of e-business systems and applications. A reference model, as defined by the ISO 7498 standard (ISO, 1984), describes a standard decomposition of a known problem domain into a collection of interrelated parts, or components, that cooperatively solve the problem; furthermore, it describes the manner in which the components interact in order to provide the required functions. In this manner, a reference model provides a shared mental model that facilitates learning, improves understanding and leads to better communication among all the stakeholders (Osterwalder & Pigneur, 2004). A reference model can also be used to develop more specialized models that support specific requirements and scenarios, such as specialized markets or business applications. It also provides the foundation for the development of e-business systems and applications. Finally, a reference model provides the contextual framework to identify the need for, develop and coordinate

related technology standards, without which flexible and interoperable e-business systems would be impossible to build (Mišić & Zhao, 2000). It is this latter meaning of the concept of an e-business reference model that we will focus on in this chapter.

We stress that the need for reference models exists regardless of the particular strategy and implementation path (or paths) chosen for the development of e-business applications. Ideally, such systems and applications should be developed in a structured, top-down and architecture-centric fashion (Bass, Clements, & Kazman, 2002). In practice, however, few businesses have the luxury of being able to develop their respective systems and applications in this manner, starting from zero (although some projects may be developed in that manner). Most of the others already utilize a multitude of existing systems and applications—often referred to using the qualifier “legacy”—that were developed over the years on heterogeneous hardware, software and application platforms. While sometimes inadequate and most often incompatible with one another, legacy systems cannot simply be discarded since they encapsulate crucial business logic and manage vast quantities of operational data; instead, they should be integrated with one another and with newly developed e-business systems. (Such development is often referred to as evolutionary.) In both cases, the availability of a suitable model to govern the development is a necessary precondition for success.

A number of reference models for the development of e-business applications have been proposed over the years. Developed by both individual companies and organizations and industrial consortia, they offer markedly different perspectives and different sets of features. Selecting the most appropriate one under a given set of requirements and constraints that hold in a given environment is a non-trivial undertaking. Therefore, the study of e-business reference models should help both researchers and practitioners to develop better and

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