Chapter 2.6
The Enterprise Systems Approach

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ABSTRACT

The enterprise system approach is defined by its evolution and major milestones of architectural planning. The ES architectures are multi-faceted solutions, hence it is defined in the scope of the enterprise organization architecture (EOA), enterprise functional architecture (EFA), enterprise processive architecture (EPA), enterprise information architecture (EIA), enterprise software architecture (ESA), enterprise network architecture (ENA), enterprise service architecture (ESA), business component architecture (BCA), enterprise information infrastructure (EII), and enterprise configurations. A composite ES architecture is presented as a transitional architecture, which is currently practiced by most enterprises. The near future of the ES approach will be rather limited to the ways of delivering ES' applications within a framework of service-oriented architecture (SOA) and the cloud computing, which satisfies effective large-scale operations. The progressive process of organization/business virtualization and the urgent need for more sustainable enterprise development should lead to new development of enterprise systems.

INTRODUCTION

The purpose of this study is to define the Enterprise Systems approach, its evolution, and major milestones of its architectural planning. The former is done mostly in a graphic manner and based on graphic models, which should be self-explanatory. The ES architectures are multi-faceted solutions, hence they will defined in the scope of the Enterprise Organization Architecture (EOA), Enterprise Functional Architecture (EFA), Enterprise Processive Architecture (EPA), Enterprise Information Architecture (EIA), Enterprise Software Architecture (ESA), Enterprise Network Architecture (ENA), Enterprise Service Architecture (ESA), Business Component Architecture (BCA), Enterprise Information Infrastructure (EII), and Enterprise Configurations. Such enterprise architectures concerning hardware and data have been left undefined due to the limits of this chapter.

The ES approach became necessary in the 1990s when the complexity of enterprise systems became the major issue in systems development and was integrated into thousands of IT solutions. It was necessary to provide a general, well-modeled map of IT systems and services thatcould help in understanding the rising enterprise complexity, which had to be contained and explored for the sake of enterprise operations.

Trends of Enterprise Systems Development

The process of IT-driven enterprise formation will take sharp turns in the 21st century while more technologies and standards will be developed and further challenge business and IT executives. The single major question for application acquisition in the past was "make or buy?" It was assumed that whether an application was "made" or "bought," it would almost inevitably be run inside the enterprise firewall. But in the 21st century the IT industry is entering a period of massive innovation and growth in alternative delivery models, ranging from

- EAI through to full-blown BPI, SaaS, and SOA. So now, the costs, risks, benefits, and sustainability associated with each one must be carefully evaluated. A 21st-century enterprise systems portfolio will contain an eclectic mix of delivery models as the economics of delivery change and technology progresses. It is extremely important that any enterprise application strategy is fully informed about current capabilities of different delivery models and is aware of how these may develop over time.

Before Ford revolutionized carmaking, automobiles were assembled by teams of skilled craftsmen in custom-built workshops. Similarly, most corporate data centers today house armies of "systems administrators" who are the craftsmen of the Information Age. There are an estimated 7,000 such data centers in America alone. It is not surprising that that they are inefficient. On average, only 6% of server capacity is used and nearly the 30% that are no longer in use at all, no one has bothered to remove. Many data centers will be consolidated and given a big reengineering. For example, Hewlett-Packard (HP) used to have 85 data centers with 19,000 IT workers worldwide. One can expect that it will be cut down to six facilities in America with just 8,000 employees by the end of 2008 and the budget cut from 4% to 2% of revenue (*The Economist*, October 28, 2008, p. 6).

- As a result of such operations integrations, data centers are becoming factories for computing services on an industrial scale. Software is increasingly being delivered as an online service and wireless networks are connecting to more and more devices.. All these allow computing to be disaggregated into components or "services," in IT terminology. This trend leads to the development of *cloud computing*, in which information is permanently stored in servers on the Internet and cached temporarily on clients that include desktops, entertainment centers, table computers, notebooks, wall computers, handhelds, sensors, monitors, etc. Cloud computing is a general concept that incorporates software as a service (SaaS), Web 2.0, and other technology concepts in which the common theme is reliance on the Internet for satisfying the computing needs of the users. For example, Google Apps provides common business applications online that are accessed from a user's web browser, while the software and data are stored on the Google's servers farms. Since *cloud computing* applies the Internet for data transportation, it

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