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Chapter I

Engineering Issues in Internet Commerce

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ABSTRACT

Engineering Internet Commerce is about building Web-enabled enterprise information systems to carry out business transactions over the Internet. This engineering task is related to three aspects: the requirement specification, the Internet technology, and the development methodology. In the requirement specification, the business analysis and design is conducted to create a semantic business model that will reflect both the business and the system requirement. With the Internet technology, the modern information technology infrastructure is investigated in order to transform a business model into an implementation model. The system analysis and design will be performed and the architecture issues should be discussed. With respect to the development methodology, an efficient way to build enterprise information systems is addressed. This chapter is to provide an overview of the problems, concerns, and the background in an effort to rationalize the Internet Commerce Engineering.

INTRODUCTION

From an engineering viewpoint, we are dealing with three worlds, the **real world**, the **perceptual world,** and the computerized **virtual world**. The real world is every thing existing in the physical world. The perceptual world exists in human brains. And the virtual world is existing in the Internet. The engineering activity is to transform ideas in the perceptual world into the real world (e.g., electronic engineering) or into the virtual world (e.g., information engineering).

The real world is objective. It changes and evolves. The perceptual world is subjective. It is individual and cognitive. It is configured in the best interests of human desire and survival. The perceptual world is intangible and reflects human understanding of and interactions with the real world. To an enterprise, the perceptual world is an asset that will

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control and guide business planing and strategic decisions. On the other hand the virtual world is reflective. It is an implementation of our perceptual world. In the virtual world, the digital signals are interchanged as an efficient way of information exchange.

The concept of the three-world is to help the understanding of the relationships between the objects that are considered in the Internet Commerce (IC) Engineering. The success of business is becoming more dependent on the successful applications of information technology. An unrealistic perception of the business world may result in unfruitful business systems on the Internet, and consequently cause business failure. In general, the perceptual world should be proactive, that is to interpret the real world in the best way to satisfy business goals.

This chapter is to address the high level issues of IC Engineering for building IC systems. IC Engineering is considered in three aspects: the requirement specification, the Internet technology, and the development methodology. We will discuss the problems, concerns, and background related to these three aspects in an effort to rationalize IC Engineering. Figure 1 illustrates this idea.

The **requirement specification** is a process that generates business requirement specifications and other necessary documents such as the explanatory files. The outcome is regarded as a business model. The process is for the business analysis and design that maps business information needs to the Internet technology.

The **Internet technology** is characterized by the object-oriented technology, Internet working, and the Client-server architecture (Umar, 1997). The system analysis and design techniques are used to derive an implementation model that is a mapping between the business model and the technological details with regard to the system components and the architecture.

The **development methodology** is applied to give a map that shows the path of the system development. It provides answers on how to apply what technology on which business applications. There is a phenomenon that both business and the Internet may experience rapid changes. This requires growth management to be built into the system development. Currently many development methodologies rely on the underlying software tools supplied by the major software market players.

An **IC system** is an information system that provides Web-enabled services including:

- the operational business transactions carried out over the Web;
- the ability to maintain system security and data integrity in a Web environment; and
- the strategic business planning and decision support in advanced Web-applications such as data warehousing, on-line analytical processing, data mining, and enterprise knowledge management.

The growth of the Internet has been exponential in every aspect, including its size and the capacity. Many businesses are now engineering their information systems onto the Internet. Despite the Y2K problem in the legacy systems, the information system evolution towards the Internet is not a trivial problem. **IC Engineering**

Figure 1. The Engineering Process of Internet Commerce Systems