Learning Objectives

Upon completion of this unit, students should be able to:

1. Relate the systems view of organizations to the development of information systems.
2. Identify business process reengineering as an application of systems thinking.
3. Analyze various techniques for systems analysis and design.
4. Compare the main categories of e-business and how they operate.
5. Identify the competitive forces associated with e-business.
6. Summarize the history of e-business including the role of the dot-com era in its development.

Written Lecture

E-Business: Where We Have Come From, and Why?

In the early 1990s, it was not unusual find conferences for technology and engineering professionals touting themes such as "the coming commercial opportunities on the Internet". At the time such seminars were exciting, interesting, yet mysterious—simply because few at the time really understood what the Internet was and what you could do with it. This was because early efforts at developing what became the Internet were not focused on the commercial aspects at all—rather, it was a defense project that was seeking a way to design a network that would not fail even when some nodes were taken out in the heat of battle. The simple yet powerful design of communication using independent nodes that communicated by sending brief messages or packets between them eventually transformed businesses in ways that could not be imagined at the very beginning.

Consider the example for instance of the transformation of the household once electric power was attached to it. Electric power at one time had only one purpose—to power the electric light bulb. Soon however, once the electric power infrastructure was established, new applications for power were recognized. The electric light bulb was soon joined by the iron, the toaster, the refrigerator, the washing machine, the stove, and the list continues to this day.

To continue the analogy comparing the evolution of network connectivity with electric power, notice first how the emphasis was placed squarely on communication. Communication in this early phase of the network consisted primarily of what is known as today as email. Communication continued to evolve and applications such as newsgroups, and server connectivity became of interest—especially within the academic and scientific community. Once this infrastructure was in place—it was only natural to consider the development of a standard means for viewing the contents of servers. This was accomplished via the Web browser and HTML. The Web browser bequeathed upon individuals the power to “see the world” from living room desktop PCs, and the excitement
associated with using this newfound power was infectious—both for firms as well as individuals. The connectivity that now existed between millions of individuals and thousands of firms helped the world to do at a distance what was previously done primarily face to face—engage in transactions.

With Web sites and browsers in place at a large scale—why settle for just viewing the contents of a server? Why not offer applications to support commercial transactions? How about supporting common business applications and ecommerce? In fact, why not use the architecture of the Internet and the Web to enable companies to operate seamlessly using a client-server model and a standard interface regardless of geographical distance? Once again, we see the transformative power of connectivity in business in the same way that electric power transformed the household.

Today, e-business appears to be rapidly moving toward the next generation, and this generation is known as m-commerce. M-commerce is fueled by the rapid increase in wireless bandwidth for mobile data communications, the continued large-scale integration of semiconductor devices, and finally, the rise of the affordable color touch screen. If you have ever downloaded an application, or bid on a product on eBay on a smartphone or a wireless tablet PC, you have experienced m-commerce.

“To ‘E’ or not to ‘E’… That is the Question!”

Just because a business can engage in e-business, does this mean it should? This is a question of strategy. Strategy relates to the consideration of how a business intends to reach customers, how a business competes with other firms, and how e-business does or does not improve the competitive position of a company. The dot-com boom of the late 1990s and early 2000s illustrates the role of strategy in e-business. During this period, there were thousands of companies rushing to the Web to market their wares. (For evidence of this, take a look back at time at Web pages archived since 1996 at the “Wayback Machine” http://www.archive.org/, then click on “Wayback Machine” in the top center of the page.) Many, if not most of these companies no longer exist. In fact, only a few Dotcom companies that were popular back then are still popular today. These include eBay, Yahoo!, and Amazon to name but a few.

What is the strategic lesson to be learned from the dot-com boom? The lesson is that the barriers for entry to doing business on the Web are very low, if it is not difficult to start an e-business with a single server in a garage. The problem is that if anyone can do it, the chance of your particular business being successful is very low. Further, it pays to consider carefully why your business should exist. In the case of eBay, most transactions are one to one, and are done between individuals separated by distance. The eBay business model seems ideally suited for the Internet as it effectively brings individuals together that otherwise could never connect physically. Given the ideal nature of the business model, why aren’t there more eBay’s? One possible reason is that there is more to e-business than connectivity and associated applications. Because of the geographic separation of buyers and sellers, the element of trust must be maintained. The established eBay brand and its associated mechanisms to maintain the integrity of each transaction make eBay difficult to compete with.

Should an established business engage in e-business? In most cases, all businesses today engage in some form of it. A great deal of e-business today takes the form of “B2B” or Business to Business where suppliers have a direct link to their clients’ inventory and purchasing functions for the automatic
replenishing of inventory. Many businesses today supplement traditional brick and mortar physical operations with information, advertising, and even sales via the Web. Although common, should all businesses have an e-business component? The answer is, “it depends”. Things to consider include the potential impact on brick and mortar sales, and the integration of e-business systems with the overall company operation.

**Concepts and Tools for System Design**

It is easy to see how complicated business can become when physical operations, business systems, and the component of e-business are implemented together. Significant software and systems development are required to ensure that businesses run smoother. Such systems are designed and they include a network, hardware components, and a number of hardware modules. Because of the complexity of the underlying components, and the simplicity required for the day to day operation of such systems by employees, a number of standard analysis and design tools have evolved. Although there are a number of different analysis methodologies that we will examine in this unit, they all have one thing in common—and that is to provide a standard framework to guide the hand of engineers involved in the design and implementation of the system.