

Chapter 34

Tools That Drive Innovation: The Role of Information Systems in Innovative Organizations

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ABSTRACT

The purpose of this chapter is to examine computer technology as a tool to support innovation and innovative processes. The primary problem that this chapter is intended to address is the multitude of widely held misconceptions that seem to exist regarding technology and innovation; technology is not innovative in and of itself. The primary method of research for this chapter is a literature review and case study method examining how technology is being successfully integrated into innovative processes in industry. Specifically this chapter focuses on technology's role in communication and creativity, two of the many activities found in an innovative process. Findings indicate that while directly connecting technology use to innovation is difficult, technology can play a substantial role in facilitating the innovative process. Thus, technology is a qualifier for many innovative processes, a resource that is necessary for the work of innovation to take place.

INTRODUCTION

In modern, developed countries around the world commerce, and by extension life itself, have changed dramatically in the past few decades. Commerce ultimately touches every aspect of life.

Businesses produce the goods that people need to live and provide the jobs that people work to earn money to purchase what they need. People's incomes and spending habits, in capitalist markets, drive businesses in what they do to capture market share and generate profits. While this connection

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between people and economic activity is certainly not new, the way in which much of this interaction occurs is.

The rise of ecommerce and the globalization of commerce have changed not only the methods by which people consume goods and services, but the very development of those goods and services. Innovation is central to this change as, “ICTs (information and communication technologies) foster a broad spectrum of innovation activities which involve the individual, organizational, industrial, and national levels of economic productivity” (Ho, Kauffman, & Liang, 2008, p 1). Markets of all types are more dynamic now than at any time in the past. Product development moves more quickly, products change more often, and consumer expectations are for this to happen and continue to happen. Brynjolfsson and Schrage (2009) explain that, “Technology is transforming innovation at its core, allowing companies to test new ideas at speeds—and prices—that were unimaginable even a decade ago.”

In today’s digital age innovation and technology are inexorably linked. Baldwin and von Hippel (2009) explain that technologies like the personal computer and the Internet provide more opportunities for innovative activities to occur in more forms. Many people may feel that technology by virtue of its existence is innovative, and that applying technology to any situation means that innovation is taking place. While perhaps understandable this is not at all accurate. This chapter will discuss technology as a tool, an aid to the innovative process. There are many different ways that technology can be appropriately applied to innovation, and innovation has benefitted from these applications, but an innovative process must exist before technology can serve as an aid to it. Technology in this sense is not in itself a creator of competitive advantage, but it does serve as a facilitator to innovative activities through which advantage can be gained. The focus of this chapter is to introduce ideas of technology applications

as tools through which innovative activities can be fostered, and with which efficiencies and effectiveness can be improved.

TECHNOLOGY AS A TOOL

Technology is an incredibly powerful force in the developed world. Compounding not only technology’s importance but also its impact, the rise of digital technology and its penetration into the market has been unrivaled in human history. In just a few short years personal computers moved from very expensive diversions for a limited number of technically-engaged hobbyists to a common household appliance. In just a few more years they moved from being stand-alone devices to networked devices that brought the world into living rooms and offices. Ultimately, such connectivity moved from full-sized computers to handheld devices in the form of smartphones.

Such devices are constantly changing and the highly competitive marketplace brings new features and new models to customers on a frequent basis. Technology is inherently innovative, particularly where competition among technology providers is concerned. Where misunderstanding often occurs is the idea that just by having technology in a process that process becomes innovative.

Technology is, and always has been, nothing more than a tool. Dosi (1988) explains that, “In very general terms, technological innovation involves the solution of problems—for example, on transformation of heat into movement, shaping materials in certain ways, producing compounds with certain properties—meeting at the same time some cost and marketability requirements” (p 1125). Notice that not only does technology solve problems, but it solves problems within the bounds of what is acceptable in the marketplace. The innovation is not the technology, rather the technology helps to find the answers as part of an innovative process.

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