Chapter 2
Integrating Technology with the Creative Design Process

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ABSTRACT

In our fast-paced world, it is necessary for organizations to continually innovate in order to stay competitive. At the same time, technology is continually advancing, and tools to facilitate work are frequently changing. This forces organizations to stay abreast of current technologies, and also puts pressure on employees to utilize the technologies available to them in order to devise innovative solutions that further the organization’s goals. To date, there has been little research on how such technologies may best be used to facilitate such creative performance. The present chapter addresses this gap by integrating a model of the creative process from the psychology literature with technology literature from engineering and information technology. This chapter examines how specific technologies may influence performance at each stage of the creative process, and provides specific recommendations for how technology may be used to facilitate the development of creative solutions.

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**INTRODUCTION**

We live in a continually advancing, fast-paced world. Computers and technology have become ingrained in our society and pervade every aspect of our lives. They shape how we interact with our friends, family, and colleagues, how we share information, receive entertainment, and do our work. In everyday life, there is a strong pressure to remain up to date with the latest technology. This pressure is only stronger in the business world, where organizations must continue to develop and adopt new technologies to keep pace with their peers and remain competitive (DeFillipi, Grabher, & Jones, 2007). Similarly, this competition provides a driving force for organizations’ own continual need for innovation; in many industries, companies must continually innovate or lose their share of the ever-narrowing market.

As technology continues to advance, the demand that organizations “innovate or die” will only grow stronger, a pressure that passes on to employees. As such, the future of organizational innovation will in large part be dependent on how employees interact with technology. Indeed, Edmonds and Candy (2002) note that “the use of complex tools, such as computers, forms a significant part of the context in which the conditions for creativity exist” (pp. 94). Therefore, as organizations move into the 21st Century, it is becoming increasingly vital that they stay up-to-date on field-relevant technologies, and ever-developing new tools that can enhance creative performance and keep them abreast of the competition.

Given the ingrained relationship between technology and creativity in the modern workplace and the necessity of both for organizational survival, it is essential to understand how technology implementation functions in the workplace, and how it may support creativity. In order to understand this, the present chapter addresses several key components associated with technology used to facilitate innovation: (1) the relevant technologies, their use and implementation, (2) the psychological aspects of the creative process, and (3) the social framework in which the technology is implemented and the creative process occurs. This chapter seeks to build an integrative framework to describe how specific technologies may be used to facilitate the creative design process, as well as some of the potential pitfalls associated with relying on technology. Such a framework provides valuable insight into how organizations may harness both their employees’ abilities and specific technologies in order to maintain a competitive edge through innovation.

**THE EMERGENCE OF PROCESS MODELS IN THE STUDY OF CREATIVITY**

In order to understand creative performance at work, as well as how it may be influenced by technology, is crucial to consider that creativity is not a set outcome, but rather a multistage process, composed of interlinked steps, with different social and cognitive processes operating at each stage. In order to understand how technology may influence creativity, it will be necessary to examine each step individually, considering what psychological processes are active, what specific technologies may be effective, and how they may best be implemented.

For much of its early study, creativity was thought to occur in a “black box,” with the steps leading up to production of a creative product being thought of as unobservable (Ward, Smith, & Finke, 2009). As such, examinations of creativity focused primarily on initial inputs and situational factors that might influence creativity, and finished products, without consideration of how such inputs lead to creative outcomes. Such intervening steps were largely thought to be unobservable.

An early attempt to examine creativity as more of a process than simply an input-outcome relationship was a basic model by Dewey (1910).