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Using Data to Explore the Impact of Technological Change in a Hospital Emergency Department Environment

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Abstract

By a 2004 White House mandate hospitals, including their emergency departments, must implement the technology required to maintain electronic patient health records. Because medical doctors, nurses and other staff in hospitals are not necessarily technologists this mandate has led to a number of challenges. This research explored the impact of mitigation techniques and their application on those challenges by deriving learning rates and evaluating the time required for users to fully, accurately utilize a new technology. This research acquired data in emergency departments in the Washington, DC and northern Virginia metropolitan area. Results of this research indicate that the way mitigation techniques are applied, i.e. proactively, reactively or passively, is as important as the mitigation techniques themselves. Findings of this research demonstrate that individuals in organizations experience the highest overall learning rates when mitigation techniques are proactively applied throughout the technology project.

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1. Introduction

In April 2004, President Bush signed Executive Order 13335, setting into motion mandated nationwide implementation of electronic medical records by 2014 (Bush, 2004). Now, many medical facilities have implemented,

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or are in the process of implementing, a variety of new technologies, hardware or software, to handle electronic medical records (EMRs) as part of tracking and monitoring patient activity. This type of technological change can have significant impacts on individuals in an organization. How each medical facility implements the change, what techniques are used to mitigate the impact of technological change, and how these techniques are applied affect the individuals in the organization and may have a direct effect on the overall success of the project. Virtually all literature and prior studies show that is important that hospitals and particularly emergency departments (EDs) effectively manage technological change.

Considering technological change from the perspective of project management, prior research has demonstrated that investments in computer-based technologies in organizations have always been inherently risky (Davis et al, 1989). Technology transition or the implementation of new technology within an organization affects individuals in the organization (Grady, 2005). This is true even if the technological change is perceived to be helpful to the organization. Therefore, it is important to the success of a technology project and the organization to think about the human aspect – the impact on those individuals within the organization that are affected by the technological change.

Technology acceptance deals with the relationship between attitudes, intentions and behavior regarding technology. It supports a direct relationship between a good attitude and good intentions regarding future behavior, specifically technology utilization (Davis, 1986). Research also notes that that past behavior has a direct effect on future behavior and shows evidence of a direct relationship between past behavior and intentions (Jasperson & Zmud, 2005; Nelson & Cheney, 1987). Therefore, if technological changes in an organization have not done well in the past, employees are likely to remember the negative effects of the change. This can mean the next technological change will be met with increased apprehensive and resistance, or in sum a negative attitude. In a report by the Gartner Group (Averett, 2001):

In the planning phase of a strategic application project, up to 40 percent of the total cost should be allocated to people issues. Organizations that do not focus up-front on employee commitment, understanding and capabilities run the risk of spending too much time and money at the back end trying to resolve internal problems.

Organizations have taken varying approaches to alleviate the effects of a technological change. For many years, people have known that the way an organization responds to the effects of a technological change can lead to the success or failure of a project. Gaining awareness of a technology change, considering the human aspects of the change, and intervening will help lead to a successful technology transition (Bartoli & Hermel, 2004; Crow, 2001). To further explore and document the ability to mitigate the impact of technological change, this research considered mitigation techniques and their application at a number of emergency departments currently undergoing some type of technological change. The matrix of mitigation techniques and their applications is shown in Figure 1 below along with the categorization of the emergency departments included in this study.

Mitigation Technique	Application of Technique		
	Passive	Reactive	Proactive
Communication	ED1	ED2	ED3
Leadership	ED1	ED2	ED3
End-User Involvement	ED1	ED2	ED3
Training and Education	ED1	ED2	ED3

Fig. 1. Matrix of Mitigation Techniques and the Method of Application

This paper reports the results of this research that show there is a benefit to organizations in utilizing different mitigation techniques and a further benefit based on the way these techniques are applied. For example, some survey respondents said they were able to adopt and fully utilize a new technology in less than one month – when mitigation techniques, particularly end user involvement, were applied proactively. In fact, this research documented that this

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