Information Technology Prescription for Small, Medium, and Large Hospitals: An Exploratory Study of Acute Care Hospitals in Texas

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ABSTRACT

Hospitals invest in information technology to lower costs and to improve quality of care. However, it is unclear whether these expectations for information technology are being met. This study explores information technology (IT) in a hospital environment and investigates its relationship to mortality, patient safety, and financial performance across small, medium, and large hospitals. Breaking down IT into functional, technical, and integration components permits the assessment of different types of technologies’ impact on financial and operational outcomes. Findings indicate that both IT sophistication (access to IT applications) and IT sophistication’s relationship to hospital performance varies significantly between small, medium, and large hospitals. In addition, empirical investigation of quality, safety, and financial performance outcomes demonstrates that the observed impact of IT is contingent upon the category of IT employed.

Keywords: Financial Performance, Healthcare, Information Technology, Patient Safety, Quality Assurance

INTRODUCTION

By several measures, healthcare and healthcare information technology spending continues to rise at the fastest rate in our history. In 2005, total national health expenditures rose by 6.9 percent—two times the rate of inflation. Total spending was $2 trillion in 2005, or $6,700 per person (Catlin, Cowan, & Heffler, 2006). Total health care spending represented 16 percent of the gross domestic product (GDP), and U.S. health care spending is expected to increase at similar levels for the next decade reaching $4 trillion in 2015, or 20 percent of GDP (Borger, Smith, Truffer, Keehan, Sisko, Poisal, et al., 2006).

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Concurrently, the expenditure on Information Technology in healthcare continues to grow. According to new research by Datamonitor (2006), Healthcare providers will spend as much as $39.5 billion on information technology by 2008 (Monegain, 2006). Fueled by the desire to reduce medical errors and improve clinical work processes, the Health Information Technology (HIT) industry is flourishing. The HIT market growth is led by picture archiving computer systems (PACS) and computerized physician order entry (CPOE) buying and followed by the purchase of other clinical information systems such as computerized patient record, pharmacy, surgery, emergency department, radiology, and document management systems, to name a few (Dorenfest, 2005). With such rapid growth in HIT and the vast and diverse array of alternative technologies, there has become a pressing need to better understand what role these advancements play within the operational aspects of our healthcare system and how to most effectively utilize these resources.

In addition, healthcare organizations are encountering more competitive environments and their success may hinge on the information technology they adopt. While the importance of IT in healthcare has often been emphasized, there has been very little theory-based, empirical research that examines healthcare information technology (HIT) and its effects. Previous studies have tended to take a management perspective and concentrate mainly on the adoption, implementation, and acceptance of technologies. In fact, the most common examples of empirical analysis have been case studies that examine the costs and benefits of specific IT applications (i.e. telemedicine, computer physician order entry, electronic health records, etc.). While these investigations provide a much needed evaluation and contribute to the growing body of HIT literature, this type of research lacks perspective on how the actual HIT systems tie together and how they perform in a healthcare environment. Therefore, we proposed that by looking at HIT and its infrastructure across different hospital environments we could ascertain their impacts on operational performance.

Further, we contend that this insight provides guidance to practitioners regarding the types of information technology applications that will best benefit them based on their hospital characteristics.

**HEALTHCARE INFORMATION TECHNOLOGY**

The role of IT in the services sector is currently the subject of considerable scholarly reflection. Empirical results of studies of the link between IT investment and performance have generally been mixed, though recent evidence shows some support for a positive relationship. Several studies have recognized the tremendous room for growth in the use of HIT to enhance patient care quality and safety (Plebani, 2007; Ammenwerth, Ehlers, Kutscha, Kutscha, Eichstadter, Resch, 2002; Bates, 2002; Brooks, Menachemi, Burke, & Clawson, 2005). The healthcare industry has suffered compared to other industry sectors such as banking and finance from sluggish IT investment and acquisition. Thus, the healthcare industry has less developed IT applications. In recent years, however, there has been a 9% annual increase in national expenditures on HIT (Dorenfest, 2004).

Two different reports by the Institute of Medicine (IOM) and the Government Accounting Office (GAO) reached similar conclusions on the importance of technology in reducing costly medical errors. The 2001 GAO report indicates that medication-related injuries result in 1.4 and 2 million annual hospitalizations and visits to physician offices, respectively. The 2000 IOM study, To Err Is Human, reports that approximately one hundred thousand patients die each year in U.S. hospitals from medical errors. A subsequent IOM report, “Crossing the Quality Chasm,” underscored the importance of patient safety as a key dimension of quality and identified information technology as a critical means of achieving this goal. Additionally, the availability of IT applications in hospitals has been identified as a means of improving patient safety and reducing the number of adverse
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