Chapter 12
Health Information Technology: Anticipating, Recognizing, and Preventing Disruptions in Complex Adaptive Healthcare Systems

Patrick Albert Palmieri
A.T. Still University, USA & Association for the Accreditation of Ambulatory Health Care Services, USA & Universidad San Ignacio de Loyola, Perú

Lori T. Peterson
Cleveland State University, USA

Miguel Noe Ramirez Noeding
Clinica Santa Isabel, Perú & Association for the Accreditation of Ambulatory Health Care Services, USA

ABSTRACT

Healthcare organizations are increasingly willing to develop more efficient and higher quality processes to combat the competition and enhance financial viability by adopting contemporary solutions such as Health Information Technology (HIT). However, technological failures occur and represent a contemporary organizational development priority resulting from incongruent organization-technology interfaces. Technologically induced system failure has been defined as technological iatrogenesis. The chapter offers the Healthcare Iatrogenesis Model as an organizational development strategy to guide the responsible implementation of HIT projects. By recognizing the etiology of incongruent organizational interfaces and anticipating patient safety concerns, leaders can proactively respond to system limitations and identify hidden process instabilities prior to costly and consequential catastrophic events.

DOI: 10.4018/978-1-4666-4546-2.ch012

INTRODUCTION

Globally, healthcare organizations harm 10% of all patients (World Health Organization, 2006) and in the United States about 200,000 patients die annually as a result of unsafe care (Andel, Davidow, Hollander, & Moreno, 2012). The Society of Actuaries estimates the cost of medical errors to be $19.5 billion, with about 87% or $17 billion directly related to caring for individuals affected by the estimated 6.3 million medical errors (Shreve et al., 2010). Other researchers estimate that the economic impact of medical errors is actually much higher, perhaps over $1 trillion annually when quality-adjusted life years (QALYs) are applied to those individuals who die (Andel et al., 2012). However, these estimates may be significantly under reported since as many as 90% of medical errors are not documented (Classen et al., 2011). Regardless of the exact numbers, it is clear that the current healthcare system "frequently harms [patients] and routinely fails to deliver the appropriate standard of care" (Palmieri, Delucia, Peterson, Ott, & Green, 2008: 34).

As patient safety is "a national problem increasingly difficult to ignore" (Devers, Pham, & Lui, 2004:103), healthcare leaders are forced to identify opportunities for organizational improvements in an attempt to reduce the number of adverse events (Berta & Baker, 2004; Wachter, 2004). Patient safety efforts are not new, however, they are receiving increasing international attention from respected establishments such as accreditation agencies, health departments and ministries of health, the World Health Organization. Health information technology (HIT) is one possible solution to affect the impact of patient safety and quality outcomes.

Expert panels from the Institute of Medicine (IOM) believe that HIT is an essential organizational prerequisite for the delivery of safe and reliable health services (Aspden, Corrigan, Wolcott, & Erickson, 2004; Aspden, Wolcott, Bootman, & Cronenwett, 2007; Institute of Medicine, 2001). The current agenda to increase organizational effectiveness in healthcare delivery is premised on adopting innovative technologies to streamline system processes (Thompson, Osberoff, Classen, & Sittig, 2007) and to facilitate increased human performance (Page, 2004). However, it is important to note that there are inherent difficulties in measuring performance related to HIT. Measures for health and quality are often drawn from administrative data (Jones, Heaton, Rudin, & Schneider, 2012), however a majority of the metrics are not appropriate for measuring HIT, with the number of appropriate metrics perhaps even as low as 2% (Kern et al., 2009).

New technological systems and innovative software packages are believed to be among the tools necessary to tame the complexity experienced by clinicians at the human-system interface (Harrison, Koppel, & Bar-Lev, 2007). With time, metrics for appropriately reporting quality will become standardized, however, recently researchers identified over 1,060 different potential metric sets (Kern et al., 2009). Despite future prospects, HIT delivers the proverbial double-edged sword in generating solutions to minimize healthcare error (Battles & Keyes, 2002) while facilitating novel iatrogenic issues (Ammenwerth et al., 2006; Koppel, Wetterneck, Telles, & Karsh, 2008).

Organizations develop over time by planning and adopting strategies to increase the effectiveness of organizational processes (Tucker & Edmondson, 2003), which in turn, improves work outputs (Bohmer & Edmondson, 2001). Technology can contribute much to improve healthcare delivery; however, organizational issues are seldom eliminated with the silver bullet approach often attributed to new HIT products. For example, the well-publicized and often cited HIT successes at the Veterans' Administration hospitals face increased scrutiny as significant errors and malfunctions were not adequately disclosed (Kuehn, 2009). Furthermore, Kitzmiller et al. (2010) found multiple HIT studies identified unanticipated system issues, such as