

# Chapter 12

## Innovating Healthcare through Remote Monitoring: Effects and Business Model

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### ABSTRACT

*Information technology has been suggested to improve patient health outcomes and reduce healthcare cost. This study explored the business model and effects of collaborative innovation between caregivers and patients on healthcare delivery through remote patient monitoring by interviewing caregivers and surveying atrial fibrillation patients. Findings indicate that remote monitoring enhanced early detection of potential risks and quality of clinical decision-making with patients feeling more empowered and involved in their own care. The remote monitoring system which consisted of a home-based ECG and a web-based service and was offered free to patients, brought together caregivers, patients, service provider and the government as actors. The introduction of remote monitoring increased the workload of caregivers and facilitation of timely diagnostics and decision-making were not realized. IT is an enabler of innovation in healthcare, but it must be integrated into work processes with a viable business model to realize potential benefits and sustain it.*

### 1. INTRODUCTION

Information technologies (IT) have been acknowledged as an enabler to facilitate consumerism in a digital world where information is available with just a click. Organizations strive to integrate information systems that support many business processes, including communication, operations, marketing, customer service, quality assurance, management, and healthcare organizations are no exception. Healthcare is continually evolving with new technologies, organizational arrangements, changes in regulations and

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policies inherent to this industry. Information technologies have the potential to transform the delivery of care by providing timely and accessible information at the point of care (Hincapie et al., 2011) to improve operational performance, reduce cost and medical errors, and improve patient outcomes (Menachemi & Collum, 2011; Resnick & Alwan, 2010). Nonetheless, the adoption of IT innovations in healthcare lags behind other industries and may be attributed to the complexities intrinsic in healthcare (Daim et al., 2008; Shortliffe 2005).

Innovation drives the pursuit of reduced cost and improved quality of healthcare. Technological innovation offers immense opportunities for process innovation. According to Omachonu & Einspruch (2010), process innovation involves the implementation of a new or significantly improved production or delivery method and includes significant changes in techniques, equipment and/or software” (p.2). Innovating established processes entail a reduction in process cost and/or time and improvement in internal capabilities including quality, service levels and business objectives (Davenport, 2013). As healthcare migrates from organizational to patient centricity, the need for collaboration between patients, caregivers and other stakeholders in healthcare has become essential now more than ever. In essence, the introduction of new technologies in healthcare organizations creates the opportunity for novel means of delivering care and various forms of collaboration to be established between care givers and patients with a shared vision of improved quality and outcomes. Thus, information technologies (IT) may serve as an enabler for collaborative innovation between care givers and patients to innovate the process of healthcare delivery.

Chronic cardiovascular diseases, including atrial fibrillation, present a growing burden on healthcare because they are associated with increased mortality and morbidity (Braganca et al., 2010; Khoo, 2010). They are also associated with a large percentage of cost due to the relatively high frequency of hospitalizations, emergency visits (Wolowacz et al, 2011; Kim et al, 2011) and extended length of hospital stays (Gaikwad & Warren, 2009). The progressive introduction of IT as a tool to innovate healthcare delivery and improve patient outcomes is becoming increasingly significant in the management of chronic diseases (Clifford & Clifton, 2012; Free et al, 2013) for its contribution to enhancing clinical decision-making, physician-patient communication, and administrative efficiencies through the automation of manual processes. For instance, the use of a home-based electrocardiogram in the management of cardiovascular diseases has received positive reaction (Piotrowicz et al., 2012). The application of IT in the management of chronic cardiovascular diseases has been previously discussed in several studies. However, most focus on the contribution of IT to clinical outcomes or indicators, including quality of life, mortality, hospitalization, emergency department visits (Martin-Lesende et al., 2011; Takahashi et al., 2010; Mortara et al., 2009; Seto et al, 2012; Chaudhry et al, 2010; Bowles et al., 2009; Winkler et al., 2010; Scherr et al, 2009; Wilkins et al., 2007; Bowles & Baugh, 2007; Zarter et al., 2008; Trief et al., 2007). Again, while a number of studies on the innovation process in healthcare have been conducted (Fleuren et al., 2004; Berwick, 2003; Plsek, 2003) little is known about the effects of innovation enabled through IT on work processes in healthcare organizations. Nevertheless, it is imperative to understand the relationship between innovation and the capacity of healthcare organizations to adapt to technological changes and integrate them in routine processes in order to create and exploit new knowledge essential for innovative delivery of care. The aim of this study is to explore the business model and effects of collaborative innovation between caregivers and patients on healthcare delivery using remote patient monitoring. The knowledge generated will illustrate the need to have coherent expectations from the relationship between IT-innovations and organizational contexts, and can be used by decision makers when identifying expected outcomes of the integration of IT applications into healthcare organizations.

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