The Benefits of Wireless Enabled Applications to Facilitate Superior Healthcare Delivery: The Case of DiaMonD

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ABSTRACT

Globally, both wired and wireless technologies have been used for healthcare delivery. However, in the frenzy to secure the best solutions and applications, few have delved deeper into the key issues of how to successfully assimilate these new technologies into the whole healthcare delivery process. The authors focus on wireless healthcare solutions, specifically examining a single exemplar case study, the diamond solution that describes a pervasive technology solution of a diabetes monitoring device. They contend that a key barrier for preventing the full realization of the true potential of wireless solutions lies in the inability of information and necessary data to pass seamlessly from one platform to another. In addition, the authors suggest ways to integrate data from wireless healthcare solutions with the existing electronic health records (EHR) systems, and discuss the impact of wireless enabled solutions on the meaningful use of EHRS.

Keywords: Diabetes, E-Health, Electronic Health Records (EHR), Knowledge Management, M-Health, Pervasive Technology

INTRODUCTION

The need for improvement in the delivery of healthcare is paramount. Today, much of the literature pertaining to healthcare continually discusses the many severe challenges such as exponentially increasing costs, pressures to provide appropriate quality and access as well as to incorporate best practice and recent new findings at the point of care. Specifically, healthcare expenditure as a percentage of Gross Domestic Product (GDP) by the 29 members of the Organization for Economic Cooperation and Development (OECD) rose from 5.0% to 8.1%,

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between 1970 and 1997 (Huber, 1999). Moreover, since 2000, total spending on healthcare in these countries has been rising even faster than economic growth, with the US having the worst figures (OECD, 2010a, 2010b).

Government agencies and the private sector are alarmed with rising costs, and the decline in quality, access and availability of care, in particular to the underinsured and underserved segments of the population (Geisler & Wickramasinghe, 2009). In addition, we are now witnessing the increased role of chronic diseases as a major contributor to cause of death and morbidity, replacing communicable diseases, and sapping the resources of an already strained health care delivery system (Wickramasinghe et al., 2012).

Without a question there is a clear need for short and long term solutions to this current crisis in the delivery of care. Such a search for a solution has led to the growing focus on technology, especially telemedicine and remote care, as a useful alternative to the prevailing models of inpatient care (Geisler & Wickramasinghe, 2009; Wickramasinghe et al., 2012). The utilization of information and communication technologies (ICT) seems particularly attractive given its allure in the support of- and enablement of a cost-effective model of care to the underserved population of patients with chronic diseases.

Given this in-flux of technology into health-care delivery, the most recent Obama healthcare reform identifies that a key consideration of the use of technology in healthcare delivery should be concerned with meaningful use. It is the contention of this paper that meaningful use of the technology as well as its full potential can only be realized when a specific solution is assimilated and integrated into the context of care so that data and information can pass seamlessly from one platform to another. To illustrate, this paper describes a specific case study of DiaMonD (diabetes monitoring device) and how this ICT provides support for clinics and hospitals to achieve meaningful use with wireless technologies. This paper concludes with business models for revenue generation using wireless monitoring solutions as well as other ICTs in healthcare contexts.

**CHRONIC DISEASE MANAGEMENT**

Many have noted that the US has an unparalleled capacity to treat, especially in the context of trauma and infectious diseases (Gibbons et al., 2010; Porter, 2006). However, and sadly, the US healthcare system too often fails to provide appropriate and adequate healthcare delivery for patients with chronic diseases such as diabetes and hypertension.

Today, chronic diseases have replaced infectious diseases as the leading global causes of deaths and morbidity (Centers for Disease Control and Prevention, 2006; Zimmet, 2000; Zuvekas & Cohen, 2007); further non-communicable diseases—such as cardiovascular disorders and strokes, respiratory illnesses such as asthma, arthritis, and diabetes—now account for more deaths, and for a disproportionate burden on healthcare budgets of governments, than infectious diseases such as tuberculosis, HIV/AIDS, and malaria (ibid). This trend is magnified by the demographic realities of this century including the aging of the population and the increased longevity of major segments of the American population which are key contributors to the emerging picture of a crisis in the delivery of health services today; thereby leading to a situation where more patients afflicted by chronic diseases will continue to be a burden on an already drained health care delivery system (Windrum, 2008; Wickramasinghe & Geisler, 2008).

Chronic diseases such as diabetes, asthma or hypertension if detected early can be contained and the sufferers from these diseases can continue to lead high quality lives (Geisler & Wickramasinghe, 2009; Wickramasinghe et al., 2012). Conversely, if these diseases are not well managed, they can develop into more complicated healthcare problems and life for such patients becomes less than satisfactory. Critical to effective chronic disease manage-
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