Chapter 15
Demystifying Quality of Healthcare in the Cloud

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ABSTRACT

Healthcare services have experienced a sharp increase in demand while the shortages in licensed healthcare professionals have formed one of the toughest challenges that healthcare providers face. In addition, illness has become more complex while advancement in technology and research have expedited the rise of modern and more effective diagnoses and treatment techniques. Cloud computing allows healthcare professionals to share medical records, including all sorts of image and accuracy while new applications or workloads can be started much faster, without going through the entire procurement process or testing the interoperability of the entire infrastructure. Moreover, although the notion of organizational culture is now routinely invoked in organizations and management literature, it remains an elusive concept. However, it is clear that managing the culture is one path towards improving healthcare, and cloud computing introduces a dynamic system adaptation, affecting the quality of care. This is explored in this chapter.

INTRODUCTION

Healthcare services experience a sharp increase in the demand while the shortages in licensed healthcare professionals form one of the toughest challenges, which healthcare providers confront. In addition, illness becomes more complex while advancement in technology and research have expedited the rise of contemporary and more effective diagnoses and treatment techniques (Singh et al., 2008). Furthermore, contention among the healthcare industry has become apparent (Douglas & Ryman, 2003). Different healthcare arrangements specify differing models of services to suit the needs of various budget categories and disease levels. The marketplace is intensely competitive while the guidance from supervising authorities obligates vulnerable and non-performing hospitals out of business.

In this context, the healthcare industry is transformed to an information centric model, characterized by collaborative workflows, infor-

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mation sharing, and open standards that support cooperation. Information is harvested and repurposed for more appropriate referrals and medical research to keep the promise of personalized health and care. This availability ensures that the most current, complete insights and clinical expertise are available to deliver comprehensive, integrated and coordinated care focused on value creation rather than consumption.

Health information technology has evolved over the years from departmental solutions to incorporate larger solutions at the venture level, and from stand-alone systems that accommodate bounded and local solutions to more complementary ones that support inclusive and unified solutions (Lenz & Reichert, 2006). The complexity of health information technology has also evolved from passive and reactive to more interactive and proactive systems with more focus on the quality of care (Saranummi, 2008; Saranummi, 2009; Saranummi, 2011; Vasilakos & Lisetti, 2010).

Overall, an ecosystem evolves that continually generates and exchanges insights and brings relevant insights into health and care decisions. It is efficient, with the flexibility to respond dynamically to changing needs and the latest medical breakthroughs. Cloud computing, information management, and business analytics are the key enablers of these capabilities.

Cloud computing allows healthcare professionals to share medical records, including all sorts of image and accuracy. Moreover, healthcare providers pay per use; with no long-term costs; hardware installation is not required, and the software set-up takes only a short period. Finally, the recipient may securely check results without downloading any software while records can be uploaded, viewed or forwarded from any DICOM source.

In general, cloud computing provides three additional aspects from a hardware provisioning and pricing point of view:

- The appearance of infinite computing resources available on demand.
- The elimination of an up-front commitment by cloud users.
- The ability to pay for use of computing resources on a short-term basis.

By the same token, cloud computing results in shifting costs from capital expenditures to operational expense, which helps cash flow, and consolidates different management systems permitting all elements of the data center to be controlled by a single management system. Additionally, rapid provisioning allows administrators to commission or decommission computing resources with a few mouse clicks. Finally, new applications or workloads can be started much faster, without going through the entire procurement process or testing the interoperability of the entire infrastructure. However, cloud latency is adequate for many common applications, but it may not be suitable for applications that must be hyper-responsive. Beyond any doubt, unwinding the sound integrations of the healthcare system could cause the entire system to fail if the wrong component is removed. Moreover, data could be disseminated across time zones and continents, revealing a whole assortment of latent issues for organizations dealing with privacy laws.

Cloud computing has made tremendous strides forward while experts predict a profuse number of firms joining the cloud or developing their own; new services arising to lead the clouds and the data within them, and the clouds' expansion transforming information technology and work life worldwide. There are many explanations why businesses and organizations are flocking to the clouds. Cloud services can be deployed in much less time than usual ones, so information technology undertakings are completed and delivered to market much sooner. Those activities will also