Cloud Leading the Change in Health IT

by Ramesh Kannan

TRIGENT

OVERCOMING LIMITS

Health IT has helped to improve data flow across the health care system and technologies such as electronic health records (EHRs) and personal health records (PHRs) are growing in usage. By enabling health information, the health care industry can benefit from transparent systems, enhanced care delivery, and better payment systems.

Barely a decade ago, healthcare organizations captured information on paper and shared this with the help of fax machines. This system was cumbersome and prone to errors. Recognizing that the delivery and the efficiency of health care could be improved through stronger integration of an electronic health information infrastructure, Congress passed the Health Information Technology for Economic and Clinical Health (HITECH) Act as part of the American Recovery and Reinvestment Act of 2009 (ARRA), launching an unprecedented effort to spur the adoption and use of information technology (IT) throughout the health system.

Since the passage of the HITECH Act, the Health IT landscape has dramatically evolved and hospitals/health care providers are adopting technology solutions at unprecedented speed. A reason for this could be that Health IT is facilitating the increased use of functionalities that have real-world clinical impacts. Health IT has also improved communication among health care providers, as well as increased sharing electronic health information with their patients and their caregivers, by facilitating the electronic exchange of health information. In the last decade, the number of e-prescriptions has nearly doubled to 1.41 billion, all of which indicates the power of Health IT to bring about transformation to this vital sector.

Trigent Software Inc. ■ 2 Willow Street, Suite 201, Southborough, MA 01745 ■ 877-387-4436 ■ www.trigent.com
All trademarks, marked and unmarked, are the property of their respective owners.

2

Barriers to Health IT adoption

Change brings about its own challenges. While not many will question the need to incorporate information technology into key clinical and administrative processes, the confluence of various technologies has made it difficult for healthcare organizations to discern and decide. Healthcare organizations are, therefore, at a crucial juncture where they are deciding between the benefits of digitalization and the pains of transformation. Their fear is not baseless as more often than not, a series of systemic failures reveal themselves when attempting to introduce for example, an Electronic Health Record in a hospital. In fact, several prestigious hospitals, with the best equipment and medical technology, large staffs and intense research activity, demonstrate significant delays in the adoption of information technologies. These centers are aware of the need to reduce their lag in the use of eHealth systems in order to remain competitive but the leap into the dark can be overpowering.

On the other hand, there are those organizations that think that the best way to do it is by taking a "technological leap", acquiring the most complete and complex systems. Unfortunately, they often fail to consider the enormous risk that skipping the necessary steps in the technological adoption process supposes.

Modernization processes launched by imposition, guided by minority political interests, or with very few participatory mechanisms, slow down technological adoption, even when the chosen product or technology solution offers quality. Many hospitals have been accompanied in their growth by partial technological solutions, either outsourced or developed internally as they became necessary, without a clear overall strategy. As a consequence, it is common to find disintegrated systems, with duplicate and contradictory data, with siloed information that is difficult to control and govern, to the point that obtaining the most basic hospital production indicators is almost a heroic act.

Initial and Maintenance Cost

Cost of implementing Health IT includes acquiring licenses, training staff, procuring hardware, short term reduction in productivity resulting in revenue loss. All these add up to make it difficult for healthcare organizations to decide on how much to spend and what would the actual ROI be on their spend.

In 2012, nearly three-quarters of office-based physicians (72 percent) had adopted any EHR system. Forty percent of physicians adopted a "basic" EHR with certain advanced capabilities, more than double the adoption rate in 2009. The percent of new and renewal prescriptions sent electronically between 2008 and 2012 increased ten-fold to approximately 47 percent.

In 2012, only one-quarter of hospitals provided patients with the ability to electronically view their information; today, 95 percent of hospitals have this capability. The ability of patients to download their information increased from 14 percent in 2012 to 87 percent in 2015; and the ability to transmit information has increased from 12 percent in 2013 to 71 percent in 2015.

[Source:https://www.healthit.gov/]

Trigent Software Inc. ■ 2 Willow Street, Suite 201, Southborough, MA 01745 ■ 877-387-4436 ■ www.trigent.com
All trademarks, marked and unmarked, are the property of their respective owners.

3

Security concerns

Healthcare organizations are concerned about security as they deal with sensitive patient related information. While there are many stakeholders who may access this information within the organization, digitalization essentially means this data moves online and this causes a relative concern when considering Health IT.

Data Silos

Healthcare organizations are complex eco systems with many stakeholders who create and own data. This information is trapped in systems and healthcare organizations are not sure how these data silos can be seamlessly integrated without disruption.

Lack of Medical Informatics Workforce

The medical industry is clearly focused on what it does best. It, therefore, may not have the kind of trained IT workforce to carry out operations and make innovations to support rapidly changing requirements. Looking at external partners can also be challenging as the IT partners need to have strong healthcare domain knowledge.

Data Storage

Healthcare organizations are seeing a rapid growth in data created by systems such as Picture Archival and Communications Systems (PACS), MRI images and so forth. They believe that the best way to store these will need additional investment in storage hardware. They are not completely sure or confident about the process to follow to manage diverse, heterogeneous environments that exist in real-world data centers.

Internal Resistance

Research indicates that nearly fifty percent of the expenditure for implementation of technology involves educating clinicians, obtaining their support and supporting them through the transition.

Trigent Software Inc. ■ 2 Willow Street, Suite 201, Southborough, MA 01745 ■ 877-387-4436 ■ www.trigent.com
All trademarks, marked and unmarked, are the property of their respective owners.

4

Cloud Computing Can Be the First Step Forward in Health IT

There is substantial growth in demand for healthcare services because of aging populations, the increasing prevalence of chronic diseases and so forth. Concurrently, there are cost pressures stemming from the need to do more and higher quality work with fewer and more costly resources and also reduced revenue. Expectations for better outcomes, higher quality treatment and more value from the healthcare services provided, increase the need for point-of-care access to medical data and the parallel evolution and adoption of mobile devices, both for medical staff and for patients, are forcing the need for IT systems to adapt.

A trending technology innovation which healthcare organizations can leverage for immediate benefits is cloud computing. The economic benefits of cloud computing can be significant since cloud computing provides cost flexibility and the potential for reduced costs. Heavy capital expenditure can be avoided, because IT resources are acquired on demand as needed and paid for as an operating expense. Also, the cost of staff resources required to deploy and maintain IT resources are included in the cost of cloud computing. Therefore, the need for additional skilled IT staff resources and related costs may be reduced when using cloud services for IaaS and PaaS platforms but even more so for SaaS solutions where the cloud service provider takes the lion's share of responsibility.

The capabilities offered by health cloud services can be expected to facilitate personal health maintenance, improve diagnoses, obtain better case outcomes, optimize healthcare delivery operations and facilitate the transformation from volume- to value-based care.

Also, healthcare provider systems leveraging cloud-based computing and cloud services offer an array of benefits in comparison to in-house client-server systems; including economic, operational and functional advantages.

From an operational perspective, cloud services offer scalability and the ability to adjust to demand rapidly. Cloud services can offer better security and privacy for health data and health systems. Cloud service provider data centers are typically highly secure and well protected against outsider and insider threats using administrative, physical and technical methods implemented and maintained by expert professional staff. Cloud services can offer sophisticated security controls, including data encryption and fine-grained access controls and access logging. Medical systems built using cloud services can provide web access to data, avoiding the need to

The US Agency for Healthcare Research and Quality (AHRQ) commissioned an evidence report/technology assessment of the costs and benefits of health IT from the Southern California Evidence Based Practice Center. The purpose of the study was to assess the evidence base regarding the benefits and costs of health IT systems, that is, the value of discrete health IT functions and systems in various healthcare settings. The researchers screened 855 studies, of which 256 were included in the final analysis. The results of the studies analysed were variable. A number of studies supported a role for health IT in improving the quality of paediatric care. The ability of EHRs to improve the quality of care in ambulatory care settings was demonstrated in a several studies. These studies demonstrated improvements in provider performance when clinical information management and decision support tools were made available within an EHR system.

Researchers concluded that health IT 'has the potential to enable a dramatic transformation in the delivery of healthcare, making it safer, more effective, and more efficient and that some organisations have already realised major gains through the implementation of multifunctional, interoperable health IT systems built around an HER.

[Source: 'Barriers and success factors in health information technology: A practitioner's perspective']

Trigent Software Inc. ■ 2 Willow Street, Suite 201, Southborough, MA 01745 ■ 877-387-4436 ■ www.trigent.com
All trademarks, marked and unmarked, are the property of their respective owners.

5

store information on client devices. The need for scarce IT security skills within the healthcare organization also is minimized. Cloud service providers typically operate on such a scale that they have all the necessary IT skills, with the costs of those skills spread across many customers.

The significant increase in digitization of medical records - including the accelerating increase in adoption of electronic medical records (EMR), electronic health records (EHR) and personal health records (PHR) - and the increasing prevalence of digital outputs from scanning and monitoring devices, such as magnetic resonance imaging (MRI) scanners and bedside monitors and infusers, provide more voluminous and varied digital data to maximize the potential benefit of cloud solutions.

Healthcare functionality can be enhanced by cloud-based healthcare IT systems that offer the potential for broad interoperability and integration. Healthcare cloud services are Internet-based and generally use standard protocols, so connecting them to other systems and applications is typically straightforward, although EHR/EMR vendor contractual and technical impediments continue to present a challenge. The ability to share information easily and securely is a critical capability, and cloud services are good enablers for this. Cloud services also support rapid development and innovation, especially for mobile and Internet of Things (IoT) devices; thereby satisfying the demands placed on healthcare IT systems by these new and rapidly advancing technologies. Cloud services can enable remote access to applications and data via the Internet using wired and wireless systems to enable access at anytime from anywhere that internet connectivity can be established. Support for access by mobile devices is often a feature supported by healthcare cloud services. Also, cloud services offer access to a much larger ecosystem of healthcare provider, payer, life sciences and IT solution partners; all of which increase the potential for a wide range of services to healthcare provider organizations.

Arguably, the greatest functional benefit of healthcare cloud services is the wide range of new capabilities that they are able to offer. These services offer the opportunity to extend the capabilities available to health organization staff, in order to implement better ways of working and to offer new services to patients. Sophisticated analytic capabilities can be brought to bear to improve both patient-specific and population-based assessment and management. Some cloud services such as intelligent business process management suites (iBPMSs) and case management frameworks (CMFs) can support healthcare provider staff cognitive capabilities, which in turn can mitigate medical mistakes and minimize patient adverse events (PAEs). Some of the most advanced analytic services could enable healthcare provider subject matter experts (SMEs) to access a vast body of medical knowledge to better deal with such problematic healthcare provider use cases as differential diagnosis and treatment planning, the potential for which has not been realized to date owing to the cost and complexity of analytics solutions that cloud availability can obviate.

Why Trigent?

Trigent is a CMM Level-4 technology solutions company with its US office at Southborough, MA, and India office at Bangalore. Trigent provides comprehensive solutions for business problems via outsourced software product and applications design, development and quality assurance. Trigent serves customers like Independent Software Vendors (ISVs), enterprises and SMBs in the Healthcare, High Tech, Education, E-Commerce and Manufacturing areas. Trigent's solutions help clients overcome budget, schedule and resource constraints.

Over the last couple of decades Trigent Software has partnered with leading healthcare providers and healthcare ISVs to develop innovative solutions in the healthcare space.

These solutions include:
- Practice Management
- Clinical Data Management
- Patient Portals
- Analytics & Reporting Solutions
- Integration Solutions (HL7, HIPAA)

Our Healthcare domain experience focuses on:
- Data accuracy, reliability, and security
- Secure access and authentication
- Highly effective user interfaces
- Leveraging Web 2.0 technology
- Healthcare and the Cloud
- Integration with popular EMR and PHR systems
- Biometric data collection
- Tracking and implementation of Industry Standards
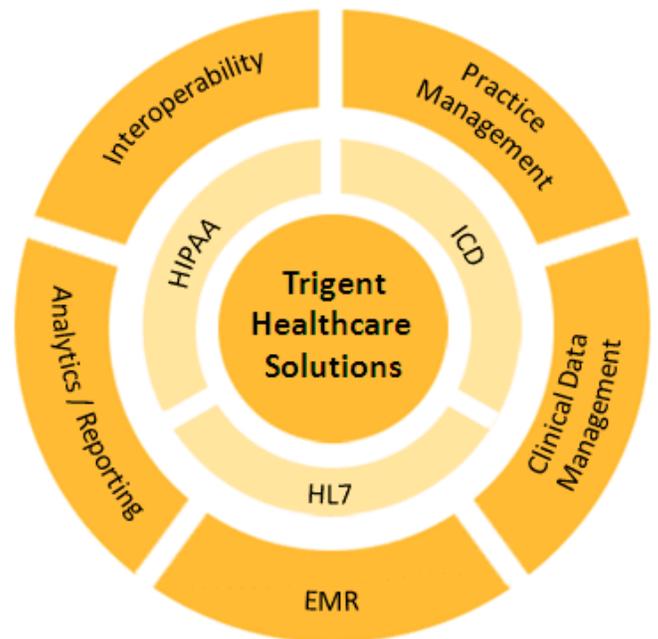
Trigent's Solutions for Healthcare Providers, RCMs and ACOs

Patient Engagement Modules (mobile based) to access personal health records, contact care team, receive physician instructions and schedule appointments.

Population Health Modules to aggregate data from disparate systems, analyze patient data to increase engagement.

Structured Data Analytics using standard tools in Machine learning, Predictive modelling, Big Data, statistical software and Visualization and **Unstructured Analytics** using proprietary tools/ internal processes

Visual Analytics to implement dashboards that track average cost and quality measures by linking multiple data sources

Data Analytics of medical and pharmaceutical claims to identify cost savings and opportunities in in pharmaceutical drugs and physician and facility referrals

Trigent Software Inc. ■ 2 Willow Street, Suite 201, Southborough, MA 01745 ■ 877-387-4436 ■ www.trigent.com
All trademarks, marked and unmarked, are the property of their respective owners.

7

Clinical Analytics to simulate, monitor and evaluate efficacy of intervention programs, evaluate multiple intervention programs; monitor, track and evaluate progress of a chosen program

Survey Analytics to track patient satisfaction on quality of care from providers to better understand patient population and focus on specific provider areas in need of improvement

Patient Medical Insights from EMR by analysing unstructured doctor notes for better care coordination including sentiment analysis, expression classification on a 4 point scale, Continuous Learning System and On Demand Root Cause Analytics

Customization Options Scalability to scale out for distributed computation systems and periodic, large data feeds

Patient Tracking Analytics using Real Time Location Services and Event capture technologies like (Patient Tracker)

Patient Experience Modules Search, Ratings and scheduling

About Trigent

Trigent is a CMM Level-4 technology solutions company with its US office at Southborough, MA, and India office at Bangalore. Trigent provides comprehensive solutions for business problems via outsourced software product and applications design, development and quality assurance. Trigent serves customers like Independent Software Vendors (ISVs), enterprises and SMBs in the High Tech, Healthcare, Education, Ecommerce and Manufacturing areas. Trigent's solutions help clients overcome budget, schedule and resource constraints.
To learn more about Trigent visit www.trigent.com

Our Headquarters

Trigent Software Inc.
2 Willow Street, Suite #201
Southborough, MA 01745
+1 (877) 387-4436
sales@trigent.com

Other Location

Trigent Software Ltd.
Khanija Bhavan, 1st Floor
#49, West Wing, Race Course Road
Bangalore - 560001, India
+91 (80) 2226-3000

TRIGENT
OVERCOMING LIMITS