Successful Strategies for Implementing SaaS/Cloud Solutions in Healthcare
Executive Summary

As healthcare organizations struggle with competing priorities such as HITECH/ARRA, Meaningful Use, ICD-10, 5010, and ACA, providers are struggling to determine cost efficient ways to provide accessible health information. With the rising healthcare costs, tight budgets, insufficient IT staff, and lack of IT infrastructure, many healthcare organizations are finding cloud/SaaS solutions an attractive option to meet their changing needs.

A 2011 Gartner survey of chief information officers (CIOs) reveals that almost half of all CIOs expect to operate their applications and infrastructures via cloud technologies within the next five years. According to Gartner, “This change will necessitate that CIOs re-imagine IT and lead their organizations through a process of creative destruction.”

According to the survey, CIOs will have to think rethink several key factors:

- Using IT to support growth and competitive advantage
- Understanding what it means to be digital enterprise
- Gaining value from an outside perspective
- Seeing the impact of people from inside the IT organization
- Understanding IT’s influence on business success

Addressing these key factors require highly specialized software development skills and advisory experience few healthcare organizations possess in-house. As a consequence, successful healthcare organizations rely heavily on third party developers proven methodologies and tools. This white paper will examine some of the benefits/risks of healthcare SaaS/cloud adoption and how specialized software development firms such as SoftServe can help healthcare organizations create a successful strategy, solution, and development approach.

What is Cloud Computing?

Cloud computing is defined by the National Institute of Standards and Technology (NIST) as “a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.” The five key defining characteristics are as follows:

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<th>Standardized</th>
<th>Standardized Information Technology (IT) services configurations are implemented in order to leverage the capabilities of cloud computing.</th>
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<tr>
<td>Easily accessible</td>
<td>Easy access via the Internet from any computer: Cloud services can be conveniently accessed by using a standard Web browser</td>
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<td>Available on-demand</td>
<td>Cloud computing is highly available and scalable: Replication is part of the cloud framework.</td>
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<td>Scalable</td>
<td>Capabilities are easily scaled and can be automatically adjusted to meet demand</td>
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<td>Pay as you go</td>
<td>Pay only for what you use and only while you use it</td>
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Deployment & Service Models

Cloud computing is also defined by several deployment models based on service based adoption factors, each of which provides distinct trade offs for healthcare organizations who are considering migrating their applications/services to a cloud environment. Service based adoption factors deployment models are defined as follows:

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<th>Model</th>
<th>Description</th>
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<td>Private Cloud</td>
<td>Private Clouds that connect fully secure extensions of an organization’s network are the standard for delivery of SaaS to hospitals. Physicians and patients access important information enabled by SaaS through portals which are essentially private cloud solutions hosted by the hospital or their IT service provider. Adoption of the SaaS model that supports private cloud delivery for Healthcare Information Systems is most frequent around the Electronic Health Record.</td>
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<td>Community Cloud</td>
<td>The cloud infrastructure is shared by several organizations and supports a specific community that has shared concerns (e.g., mission, security requirements, policy, and compliance considerations). It may be managed by the organizations or a third party and may exist on premise or off premise.</td>
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<td>Public Cloud</td>
<td>Many hospitals also use public clouds to consume or deliver services that are otherwise impractical to consider. Outpatient diagnostic centers share results via public cloud access by hospitals. Public cloud delivery of SaaS is also prevalent in physician offices.</td>
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<tr>
<td>Hybrid Cloud</td>
<td>The cloud infrastructure is a composition of two or more clouds (private, community, or public) that remain unique entities but are bound together by standardized or proprietary technology that enables data and application portability (e.g., cloud bursting for load balancing between clouds).</td>
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Service based Models for Healthcare

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<td>Cloud Software as a Service (SaaS)</td>
<td>SaaS is emerging in healthcare most visibly in physician EMRs or EHRs, as noted previously, but also in web-based portals to more traditional HCIS applications, in Healthcare Information Exchanges, and in applications as diverse as materials ordering and fund raising.</td>
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<td>Cloud Platform as a Service (PaaS)</td>
<td>Some physician portals and HIEs are being built in the PaaS model by specialized healthcare IT service providers who then use PaaS tools to adapt the platform to their actual healthcare provider customers’ requirements.</td>
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<tr>
<td>Cloud Infrastructure as a Service (IaaS)</td>
<td>Includes virtualized servers, storage, networking, firewalls, backup, recovery, archiving, and associated management tools. IaaS providers create a dynamic, managed technical environment that includes one or more of these services. Healthcare organizations that need or want extensive applications customization can still benefit from the scale and flexibility of the cloud model by considering IaaS as a means of hosting some or all applications.</td>
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Main Business Drivers for Healthcare SaaS/Cloud Adoption

- Lowered Cost of Ownership. Healthcare organizations can pay for what they use while saving on repair and maintenance, software and licensing, and physical space.
- Efficiency of Resources. SaaS/Cloud can increase the utilization percentage of resources owing to time sharing making collaborating/sharing easier between disparate offices, remote workers, and suppliers. Also, SaaS is eco friendly in reducing the consumption of energy and the need for multiple data centers.
- Increased Business Agility. Highly automated and fast to deploy with the ability to create scalable services and applications instantly.
- Information Ubiquity. Accessibility 24/7 to applications and services from anywhere
- Disaster Recovery Capabilities. Resilience achieved through ultra-redundant architecture creating a virtual disaster recovery solution for organizations.

As with any new technological shift there are a lot of challenges in the adoption of a SaaS/Cloud model in the healthcare space. There are a variety of business, regulatory, and technical challenges. Key implementation challenges/risks are:

- Data Security. Security of patient sensitive data is a top concern for healthcare organizations when healthcare is turned over to a vendor or move to SaaS/Cloud. SoftServe’s approach to healthcare cloud adoption can ensure your data is secure.
- Regulatory. Ensuring regulatory compliance is another key challenge healthcare organizations face as they must be cognizant of compliance measures such as ISO27001, HITECH Act, HIPPA, and SAS 70 Type II. SoftServe has significant experience in meeting all healthcare regulatory and compliance.
- Vendor Management. Healthcare organizations should obtain assurance on the cloud vendor’s solution such as SoftServe’s SaaS/Cloud development and delivery portfolio that will meet their performance, portability, and interoperability needs.
- Data Protection. Effectively manage access to the appropriate levels of patient data working in collaboration with SoftServe to implement data storage and retention policies.
- Access Control. Ensure that healthcare organizations have the appropriate access controls for SaaS/Cloud management interfaces for appropriate staff. SoftServe will work with you on your "due diligence" prior to assignment of access privileges.

Healthcare SaaS/Cloud Benefits

Some of the key benefits of cloud/SaaS include:

- Cost Efficiency. Improved deployment of EMRs and EHRs to gain ARRA/meaningful Use funding incentives, avoid penalties, and improved hospital reimbursement. Underlying IT resources are can be pooled and shared to achieve tremendous cost savings.
- Less Upfront Investment. Healthcare providers with limited budget and infrastructure can quickly gain access to IT services they need without the time and expense of establishing their own IT capabilities.
- Business Focus. IT resources can be shifted to activities that create more value for their organizations since they only pay for what they actually use when utilizing SoftServe’s SaaS/Cloud.
- Interoperability. With Soft Serve’s SaaS/Cloud, healthcare providers have the ability to share data across hospitals, clinics, insurance companies, and others without the additional burden of storage. The data quality of patient information is greatly improved while reducing errors, redundancy, and rejected insurance claims.
- Accelerated Exchange Development. Provides quick start ups of regional health information exchanges in a shorter time frame with limited IT investment and physical resources allowing states with limited budget constraints to adopt SaaS/Cloud solutions at an accelerated rate.
- Seamless Integrated Healthcare Delivery. SaaS/Cloud solutions can enable new healthcare delivery models that are more flexible, efficient, and seamless across patient care, providers, and insurance companies.

Key Considerations When Evaluating SaaS/Cloud

There are four main areas healthcare organizations should consider when evaluating options for SaaS/Cloud adoption in healthcare. Figure x illustrates these key areas:
SoftServe’s Approach to Healthcare SaaS/Cloud Delivery and Development

SoftServe has developed three distinct solution packages outlining their strategy, solutions, and development approach that addresses the unique challenges associated with Healthcare SaaS/Cloud delivery and development. Figure x illustrates SoftServe’s portfolio of services.

Cloud Explorer

This strategic, exploratory service assists businesses with creating a Cloud strategy and roadmap include:
- Assessment of healthcare application portfolio to select applications (e.g. EHR, patient portal, HIE, suitable for SaaS/Cloud migration
- Impact to regulatory compliance, such as HITECH, Meaningful Use, HIPAA, ICD-10/5010, etc
- Impact to data privacy and protection standards, data locations/segregation standards
- Define cloud computing architecture, migration, and operations plan

Cloud Enhancer

This enhancing service provides businesses with assessments and solutions for existing SaaS/Cloud applications that require technology enhancements and optimization.
- Consulting
- Assessment
- Solutions

Source: SoftServe Inc.
Cloud Enabler

This enabling service assists businesses with the SaaS/Cloud application development and deployment include:

- Assist with installation, configuration, and testing; migration, and operational transition
- Conduct review of logs/audit monitoring, vulnerabilities/controls mitigation/remediation
- Periodic security activities for cloud related components to evaluate for vulnerabilities

The following figure illustrates how SoftServe’s services align with the SaaS/Cloud development and delivery lifecycle for potential healthcare organizations:

Figure 3: SoftServe Services

Source: SoftServe Inc.

Figure 3 shows how SoftServe’s services align with the SaaS development and delivery lifecycle.
Summary and Conclusion

With the rising costs and increased government regulation for the adoption of EMRs that automates with health information exchanges, cloud computing maybe the best viable option.

Overall, the value proposition of SaaS/cloud adoption boils down to TCO (Total Cost of Ownership). Healthcare leaders should begin by looking at specific ways to cut costs while improve processes. In summary, the potential benefits include:

- Improved patient care, better health for patient population
- Puts the focus back on patient care rather than IT
- Eliminates redundancy and allows information to easily be shared across multiple entities
- Increases infrastructure up and down for private practices, ACOs, and patient centered medical homes
- Large healthcare provider can further strengthen their relationships between referring physicians & patients

Creating a successful integrated SaaS/Cloud roadmap requires specialized skills that most healthcare organization lack. It is recommended that healthcare organizations partner with experienced third parties, such as SoftServe, that will mitigate those risks and accelerate the rollout of SaaS/Cloud solutions.

About Fred Pennic

Fred Pennic is a Senior Advisor with Aspen Advisors LLC with over 7 years of healthcare information technology assessment, business development, management consulting, and implementation experience managing multiple vendor solutions.

References

1 Source: The NIST Definition of Cloud Computing (Draft) January 2011, Page 2

2 Source: Gartner: Gartner Survey of More Than 2,000 CIOs Identifies Cloud Computing as Top Technology Priority for CIOs in 2011, January 2011, Page 1