Building the Business Case for Moving Healthcare Data to the Cloud

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As healthcare reform continues to put new pressures on hospitals and physician providers, savvy organizations are quickly turning to cloud computing services to gain competitive advantages. Cloud-based tools can enable a wide range of innovative capabilities and efficiencies, from enhanced big data analytics and streamlined clinical workflows to lower storage costs and more robust security for Protected Health Information (PHI).

The cloud Software as a Service (SaaS) market is growing rapidly. IDC predicts SaaS will garner two-thirds of all public cloud spending in 2017, and 60% in 2020.[1]

"The cloud will become more distributed (through Internet of Things edge services and multicloud services), more trusted, more intelligent, more industry and workload specialized, and more channel-mediated," forecasts Frank Gens, senior vice president and chief analyst at IDC. "As the cloud evolves these important new capabilities … the use cases for the cloud will dramatically expand."

This whitepaper will explore cloud opportunities for the healthcare industry, the benefits of transitioning and how Microsoft® Azure® can help organizations stay compliant.

Taking data storage and analytics to the Azure cloud

In the healthcare industry, an effective digital business strategy must take into account the entire continuum of patient data. Data flows from the Electronic Health Record (EHR) to the organization's storage infrastructure, out to payers, business partners and research organizations, and back to the patient through portals or other messaging tools.

Inefficiencies, data silos or security issues on the back end can significantly disrupt these critical pathways, leaving organizations vulnerable to revenue losses, fines due to regulatory noncompliance with the Health Insurance Portability and Accountability Act (HIPAA), and frustrations among internal users.

Healthcare organizations can simply not afford to suffer downtime or restricted access to patient data. In a hospital setting, the ability to share data quickly across the entire organization could mean the difference between life and death for vulnerable patients. Relying on outdated architecture or siloed storage is a risk providers simply cannot afford to take.

A modernized cloud-based data storage infrastructure can limit these potential pitfalls while positioning healthcare organizations to succeed in a data-driven, consumer-focused care environment, according to the Cloud Standards Customer Council.

"Around the globe, healthcare reform has mandated that it is time for healthcare IT to be modernized; and that cloud computing is at the center of this transformation," states the multi-stakeholder organization.[2]

"Cloud computing provides an IT infrastructure that allows hospitals, medical practices, insurance companies, research facilities and other organizational entities in the healthcare ecosystem to leverage improved computing capabilities at lower initial capital outlays than previously required by purchase or long-term licensing."

In addition to lowering the barrier to entry for beginners, "cloud computing offers an IT platform that is collaborative to facilitate information sharing, knowledge management and predictive analytics across the healthcare ecosystem, enabling cross-industry services," the council adds.

Healthcare providers looking for a cloud-based solution to get their data to the right people at the right place at the right time will need a platform that offers rock-solid reliability and manageable implementation costs — as well as a full suite of disaster recovery and business continuity features. These features can ensure the smooth delivery of patient care in the event of a disruption.

While many cloud solutions are available, the integrated collection of cloud services in Microsoft Azure has become the first choice for organizations seeking a comprehensive, HIPAA-compliant, and flexible cloud storage and analytics platform without the burdensome costs and lengthy implementation processes of in-house hardware, says Carl Payne, technical solution associate for office productivity at Insight.

"When you buy a piece of hardware, you're stuck with only what that piece of hardware can do. The sooner you get out from under it, the sooner you can be agile and start doing amazing things," he explains.

"Azure is like having a data center with every single physical thing you ever needed, plus a genius bar with every single process that would work with those infrastructure pieces to do whatever it is you want to do. You could have a complete range of services available without being tied down to hardware. The sooner you get into that, the better."

Delivering lower costs, faster setup and more agility

As the healthcare industry continues to evolve, organizations will need to adapt to infrastructure changes quickly. They will work to keep costs as low as possible, especially with value-based reimbursement bringing uncertainty into the revenue cycle.

After spending tens or hundreds of thousands of dollars on EHRs in recent years, many healthcare organizations are reluctant to add to their bills by piling on more infrastructure. Storage arrays to adequately support even a small organization's patient data assets can seem prohibitively expensive, especially if the organization is hoping to equip itself with enough hardware to meet its long-term needs.

A cloud-based solution can reduce these costs by allowing organizations to spend incrementally without overcommitting to hardware, Payne says.

"Baking a cake can be pretty cheap, except that you have to buy all the ingredients at once the first time you do it," he explains. "That can be very expensive. With Azure, you can use some of their ingredients instead of buying your own. You don't need to purchase the whole bag of flour or a dozen eggs if you're not going to use them immediately."

Cloud infrastructure also reduces pain points stemming from large projects or seasonal spikes in storage requirements, adds Insight Technical Solution Associate Shawn Armstrong.

"With Azure, you don't have to build to your peaks," he says. "Organizations can increase their infrastructure almost immediately, utilize those assets until the project or peak period is over, then turn them off and not incur any of the cost anymore.

"Larger healthcare organizations often have research projects that operate over a finite period," Armstrong continues. "They can utilize Azure for the length of the research project, and then turn it off once they're done. It's a scalable and flexible way for healthcare organizations to increase and decrease their costs as needed."

Cloud-based infrastructure also accelerates the speed with which organizations can react to sudden changes in requirements.

“Traditionally, to get a specification on a server, organizations had to send the server to the manufacturer, and the manufacturer would build it,” Armstrong explains.” That could take two to three weeks. With Azure, organizations can spin up a server in eight minutes and be ready to go. An organization’s time to market is a lot faster with cloud infrastructure.”

Achieving reliable security in the age of unpredictability

Healthcare organizations have largely moved past their fears that cloud technologies are inherently insecure. In fact, many organizations turn to the cloud precisely because it offers better disaster recovery tools and stronger data protection.

But that does not mean healthcare data — no matter where and how it is stored — is free from other threats. Data breaches and ransomware attacks are relentless, and the strict requirements of HIPAA make it essential for organizations to be able to identify when and where PHI is unintentionally exposed.

Microsoft Azure for healthcare offers the protection of a HIPAA-compliant Business Associate Agreement (BAA) alongside its other data access and security features.

HIPAA requires that covered entities and their partners enter into contracts that ensure the latter adequately secure PHI. These contracts lay out guidelines and limitations for the business associate, including the associate’s responsibilities around handling and securing PHI.

Once the BAA is signed, the business associate must adhere to all privacy and security provisions outlined in HIPAA and the Health Information Technology for Economic and Clinical Health (HITECH) Act. The protection of a BAA allows Microsoft customers to use its services to process and store PHI.

Although no official certification is currently available for HIPAA or HITECH compliance, Microsoft services covered under the BAA have completed audits by accredited independent auditors for the Microsoft ISO/IEC 27001 certification.

Once an organization identifies which services it requires, it can begin to leverage more of the cloud as a covered entity. Ultimately, the Azure instance can be used for physician offices, hospitals, health insurers and other stakeholders to service, process, store and even deliver PHI. Other core security elements include:

- **Granular identity and user access** — Federated user access into the Azure Active Directory® is a must. Organizations can leverage multifactor authentication for tailored, highly secure access.
- **Communications and operation process encryption** — Encryption is offered for data both in motion and at rest. The IT department is able to control the entire flow of the information between the data center and in the Azure cloud.

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- **Advanced network segmentation and security** — Network segmentation is vital for covered entities. With Azure, organizations can secure their Virtual Machines (VMs) and control all traffic flowing into the HIPAA-compliant cloud ecosystem. This allows organizations to securely extend an on-premise network directly into the cloud framework.
- **Managing and mitigating risks and threats** — Azure employs security measures for cloud traffic, data points and VMs within its cloud platform. Organizations can also take advantage of Distributed Denial of Service (DDoS) prevention services, intrusion detection, penetration testing against the cloud ecosystem, and even data analytics and machine learning.

These features can give providers confidence their data will be accessible to clinicians at all times while remaining in compliance with the HIPAA regulations that govern healthcare organizations.

Establishing strong governance for continued cloud growth

Most healthcare enterprises already run a Windows® environment, which makes Azure integration easier. But organizations excited by the possibilities of leveraging the cloud must still pay close attention to how they get there — and how quickly they grow their cloud-based data assets.

“The number one mistake organizations make is rushing into implementation without taking the time to establish a governance plan and road map,” says Payne. “Azure requires organizations to establish a hierarchy, and that means they need to clearly define their departments and the roles within them so that everyone is able to access the resources they need to get their jobs done. Organizations that don’t understand their internal hierarchy try to move everything into the same space at the same time, and that can cause significant problems.”

Microsoft suggests organizations leveraging Azure work to establish a road map, or “scaffold,” that will guide the deployment process.

“In real life, scaffolding is used to create the basis of a structure,” Microsoft explains.[3] “The scaffold guides the general outline and provides anchor points for more permanent systems to be mounted. An enterprise scaffold is the same: a set of flexible controls and Azure capabilities that provide structure to the environment, and anchors for services built on the public cloud. The enterprise scaffold enables administrators to ensure workloads meet the minimum governance requirements of an organization without preventing business groups and developers from quickly meeting their own goals,” Microsoft adds.

When creating a governance model, organizations should naturally include representatives from the IT department, but they should also involve stakeholders from security, risk management and the different business groups whose functions are moving to the cloud.

“In the end, an enterprise scaffold is about mitigating business risk to facilitate an organization's mission and objectives,” Microsoft points out.

Establishing a strong and comprehensive governance program can be a difficult task for healthcare providers, especially larger organizations with many departments or sites and components to account for.

Armstrong suggests providers looking to avail themselves of the potential of Azure seek out an experienced development partner to ensure the process is completed smoothly from start to finish.

"A deployment partner can help organizations through the process much more easily," agrees Payne. "Someone with a background in healthcare is key, especially because healthcare providers have such unique and high-demand requirements for data access. I have heard so many success stories where Azure has helped healthcare providers reduce costs and develop personalized, proactive, higher-quality care for their patients," he adds.

"Cloud can be the differentiator that will allow providers to spend less on infrastructure and put more money into the care and management of their facilities and their operations. There is no limit to what a hospital or physician group can do if they take advantage of what the cloud has to offer."

Conclusion

With the right governance in place, healthcare organizations can take advantage of the many benefits Azure has to offer. Robust security, tailored growth, speedy deployment and flexible spending options will allow providers to achieve their goals of having access to the right data at the right time.

Moving to the cloud may help providers avoid many of the downsides of server-based architecture while opening new opportunities to seamlessly improve patient care and informed decision-making across the entire organization.

[1] IDC. (2017, Feb. 20). Worldwide Public Cloud Services Spending Forecast to Reach $122.5 Billion in 2017, According to IDC.

[2] Cloud Standards Customer Council. (February 2017). Impact of Cloud Computing on Healthcare.

[3] Dendtler, R., FitzMacken, T. and Bourque, C. (2017, March 31). Azure Enterprise Scaffold — Prescriptive Subscription Governance. Microsoft.