

The Cloud Computing Guide for Healthcare



Table of Contents

Cloud Computing Basics	3
Industry Trends/Drivers	4
How the Cloud can Transform your Business	6
Use Cases	9
Cloud Economics	12
Moving to the Cloud	15
Choosing a Cloud Computing Partner	19
Authors	22

Cloud Computing Basics

Most people are already using the cloud in their daily lives, whether they realize it or not, according to Hallie Wheeler, Business Development Director at Webformed. Wheeler explains that cloud software and storage are “something you can access from anything that has an Internet connection. Think of your Yahoo, Gmail, or Hotmail account. You alone have the password, and you can access your email from any computer, smartphone or tablet as long as it has an Internet connection. Isn’t it convenient? In its simplest form, that is cloud software (sometimes called Software as a Service). You are already using the cloud in your day-to-day life!”

The Cloud has become an everyday resource that helps enable our daily routines.

The Cloud has become an everyday resource that helps enable our daily routines. Consider how things such as electricity, water, natural gas, telephone service, and television are provided by companies that specialize in delivering those services, and you can begin to wrap your mind around the parallels with cloud computing. As Robert Keahey, IT business and social strategist/commentator at SummaLogic explains it, utilities and telecoms provide services on a scale “that makes it economically feasible for large numbers of customers to consume at a lower price. And, the customer doesn’t have to buy, build, and maintain all the equipment required to provide the service. Simply put, this is what cloud computing does for the digital age. And just like the power grid that delivers electricity to your house, the Internet delivers these cloud computing services to your home, business, mobile phone, or car.”

In this cloud computing guide, Andrew Baker and other industry experts walk through why the Healthcare industry is choosing the cloud, how your business can benefit, and what you can do to compete more effectively.

Industry Trends/Drivers

The term “cloud computing” is very broad, and covers a wide array of technologies. A full definition could take up pages and pages of paper, but at its most basic, cloud computing is simply a different way to obtain and implement technology services, infrastructure and applications. Instead of buying and maintaining servers and applications in your own building or campus, cloud computing services – available from many enterprise vendors – allow you to gain access to servers, storage, applications and networks that can be made available when you need them, at a size that reflects where your organization is today. These services and applications are paid for as you use them, much as you would pay for a utility such as electricity or water. Let’s take a look at the drivers and benefits of cloud computing within the Healthcare industry.

The healthcare industry is facing significant pressures to lower the costs associated with providing healthcare, adopt new systems that support electronic medical records (EMR), and share data quickly and securely with other healthcare and government agencies.

Traditionally, the healthcare industry has not been quick to adopt new technologies as it relates to infrastructure to support back-office operations. Many hospitals and medical care organizations keep their servers and desktops 2-3 years longer than average for non-healthcare organizations.

The push to adopt electronic medical records (EMR), the push to squeeze out all unnecessary costs in providing healthcare services, along with the need to overhaul aging technology infrastructures to support these initiatives, has led to an increasing interest and adoption in cloud computing services and solutions. Additionally, healthcare organizations are finding it necessary to collaborate with other organizations in order to effectively provide services for their patients. This means a change to the legacy, on-premise systems of the past.

Reducing service time for patient care is another aspect in the fight to keep costs low, and every delay in getting back results from a lab, or having to manually convert patient information from one format to another, creates more problems for the healthcare provider.

Many healthcare organizations are finding it harder to get/stay in compliance with newer government

regulations when they are relying on legacy technology, vs newer technology which was built with such regulations in mind. Large healthcare providers are looking for ways to consolidate their technology infrastructure which is spread across multiple geographic regions, and small healthcare providers are looking to access the technology they need to stay in business, without the costs that are typically associated with the hardware and software approved for use in medical environments. Increasingly, healthcare organizations are finding it necessary to encrypt data on servers, desktops and mobile devices – not only to comply with current healthcare and government regulations such as HIPAA and HITECH, but because it is prudent and vital to avoid the exposure of patient data should a laptop or other mobile device become lost. Managing security and privacy of patient information is no simple task for any organization, much less for healthcare organizations with overburdened technology teams. The cloud can actually be a means of reducing exposure risks, as cloud providers make significant investments in implementing physical, technical and administrative safeguard technologies to help protect patient information.

Finally, with the level of reliance on technology that we see in business today, comes a need to provide redundancy and backups to ensure that patient care activities are not adversely impacted by natural disasters, pandemics, or interruptions to power or communications infrastructure. Paying for this internally requires significant investments in hardware, software and staff. Building out redundancy for multiple offices, and integrating it with existing systems, is not for the faint of heart. Besides issues of complexity, the startup costs for building infrastructure that will scale to deal with increased demand due to emergencies or rapid growth is not insignificant.

All this, and more, is driving healthcare organizations to look at cloud computing solutions as a means of addressing these concerns.

How the Cloud Can Transform Your Business

Most healthcare organizations are in the right place to reap significant benefits from cloud computing, because they have aging technology infrastructure that has not seen significant investments in some time, and they are being asked to implement major new technology-based initiatives such as EMR. Instead of buying their own servers and software for providing general office productivity functions, managing patient records, handling patient billing, or tracking patient care, healthcare organizations can purchase applications from an external provider with experience in the Healthcare industry. They can take the opportunity to migrate away from older servers and applications that are outside of their support contracts, and identify and implement solutions that will facilitate better flexibility, faster provisioning of services, and better interoperability with their partners. This approach will give them access to the newest technologies impacting their industry, and can help them remain in compliance with the ever-changing government regulations for healthcare services.

Rather than embarking on an internal infrastructure modernization project that can cost hundreds of thousands (at the low end) to millions of dollars (at the high end), and take 18-24 months to fully implement, healthcare organizations can begin to implement tailored solutions for their industry in a fraction of the time, and at a fraction of the startup costs. There is a huge difference between building the infrastructure for, and rolling out the software for a patient care tracking system that will ultimately support 1000 patients over 3 states, vs implementing that same functionality from a software-as-a-service vendor in the cloud. The difference in startup costs are even more dramatic if the number of patients that need to be supported initially is much smaller than what will ultimately need to be supported. It is harder to build a small system that will grow large, if you build it internally, than it is to buy into a small part of a large system externally.

Healthcare organizations can also achieve some advantages in information security and compliance through the use of cloud providers that serve the healthcare industry. This is not to suggest that privacy, security and compliance are now someone else's problems. Whether on-premise or in the cloud, the healthcare organization is the entity that is ultimately responsible for ensuring that security and privacy are maintained. But it does help if the infrastructure and applications are being

maintained in a secure fashion, and if they are updated to reflect changes in the regulatory climate as needed.

Because of the stringent security and privacy needs, it is important for healthcare organizations to carefully select vendors that specialize in the Healthcare industry, and are compliant with the various regulations and guidelines relevant to this industry, including HIPAA (Health Insurance Portability and Accountability Act), PSQIA (The Patient Safety and Quality Improvement Act), and the HL7 EHR Interoperability Model. Because of the aforementioned security, privacy and compliance concerns, many solutions from the public cloud will not be effective or appropriate for the healthcare industry. Cloud providers will either have to be healthcare specific, have a strong track record securely serving healthcare organizations, and/or be able to partner with healthcare organizations to provide private or hybrid cloud environments. For example, some of the cloud providers that claim to support healthcare organizations are not prepared to sign a Business Associate Agreement (BAA) which is essential to HIPAA compliance. Others may put forward a business associate agreement that was not developed with industry participation, while some vendors might sign a BAA put forth by a covered entity without proper due diligence to win the business, on the hopes that they will never be audited.

Cloud computing applications for the Healthcare industry are typically less expensive than the legacy applications that they replace.

Cloud computing applications for the Healthcare industry are typically less expensive than the legacy applications that they replace, and offer organizations much more flexibility in where and when they can be used. Cloud computing also makes it less challenging to grow your health care organization, including setting up new offices, forming partnerships with other healthcare organizations, or setting up a brand new practice.

Because the infrastructure (but not the data) that supports the cloud applications is shared across

many customers, the costs for each customer are much smaller than if that customer was purchasing the infrastructure alone. This makes it easier to evaluate and implement services that would have been costly to build out internally. It also provides more timely access to new features and services – including security features and compliance services – than healthcare organizations can manage on their own.

This approach not only makes it easier to start up a new office, but it facilitates easier adjustments to sudden growth or sudden departures that cannot easily be addressed by owning the infrastructure.

With the use of cloud computing solutions from strong industry players, a new health care organization with a staff of 5 can startup a new office without having to factor in the space and costs associated with properly managing servers on site. Not having to account for server space also provides costs benefits in the leasing of real estate.

This same organization can immediately begin to use a robust, industry standard application for managing its patient records – only paying for the number of users or patients that it currently supports – yet, being able to support growth of the business generally over a 3-5 year period. If, after 4 or 5 years, a medical practice with a staff of 12 decided to split into two separate organizations, both could immediately scale down their cloud computing solutions, along with the associated costs, to accurately reflect the new size of their operations.

As technology advances are made within the healthcare industry, organizations using cloud computing solutions would be better positioned to take advantage of these features, as they would be more readily integrated into their vendors' offerings. This cuts down on data migration costs and complexity, and allows the health care organization to focus on providing excellent customer care. They can take advantage of a cloud provider's data security offerings to help ensure that not only is the data of their patients secure in transit, but also while at rest. Given the increase in security breaches and data loss by healthcare providers over the past few years, it is critical that the security features of a cloud provider be evaluated and implemented by healthcare organizations.

In the same way that doctors used telephone call centers to extend their office hours and give their patients access to them round the clock, they can now use cloud computing services to expand their technology reach, and compete on a more even footing with larger organizations.

Use Cases

The healthcare industry is only now beginning to look at cloud computing, but there are some specific areas where they can use cloud computing solutions to enhance their operations and provide better, more cost-effective patient care.

Electronic Medical Records (EMR)

Several vendors are providing their EMR solutions as cloud-based offerings, which will be a boon to hospitals and clinics which would otherwise have to make significant IT investments to build that technology in-house. The primary benefits of EMR in the cloud will be:

- Reduced implementation time
- Much lower initial costs, especially for smaller organizations
- Partnership of compliance
- Better scalability, without initial over-provisioning of equipment

Evaluation, testing and implementation times can be reduced to a few months (vs years), and costs can be more closely controlled as they will be based on usage and growth.

Office Productivity

Instead of hosting email, file and document sharing and office collaboration technologies in-house, healthcare organizations can make use of a cloud-based solution that will enable them to get up and running quickly and with robust security. Solutions such as Office 365 provide value to organizations of all sizes, but are especially valuable to smaller organizations that would otherwise have to purchase, and install and manage licenses locally just to be able to create and share spreadsheets, documents and calendars. The cloud is also a great place to obtain unified communications services – where telephone, email, instant messaging, audio conferencing and video conferencing can all be unified

with robust security, if desired, to provide on-demand communications for a healthcare organization. This lowers the bar for smaller healthcare firms to make use of cutting edge technologies.

Health Information Exchange (HIE)

There are several dozen vendors in the process of building cloud-based Health Information Exchanges, which are essentially information clearing houses where health systems, physicians, hospitals and other healthcare organizations can more easily share pertinent information. This is one of the hardest things to build internally, because it requires cooperation from all the other organizations that will make use of the exchange.

Physician Collaboration Solutions (PCS)

There is a considerable growth in the evaluation and adoption of technologies that allow physicians to remotely visit patients via video conferencing. These telehealth solutions are now being offered in the cloud, and provide an extremely cost-effective way to improve healthcare services into rural areas or as part of a disaster response scenario.

Clinical Information Systems (CIS)

At a time when so many people use specialists in conjunction with a primary care physician, it is vital that patient information can be quickly and accurately managed with robust security technologies by the healthcare organizations. A Clinical Information System allows healthcare providers to schedule and order lab tests, quickly access test results, send prescriptions directly to the pharmacy and manage all the critical notes from the doctors and specialists without unnecessary double data entry.

Having these systems in the cloud can facilitate better operability between healthcare providers, resulting in a faster, more seamless experience for the patient. It can also streamline billing and other services associated with patient care. Having these solutions in the cloud makes it easier for a large healthcare provider to keep up to date with the technology, and allows a small healthcare provider to have access to the same level of robust services as their larger competitors, without a correspondingly large investment.

Clarity from the Clouds

These are just a few of the cloud-based solutions that are available to healthcare organizations of all sizes. Both large hospitals and small clinics can benefit from these solutions, not to mention all the other players in the healthcare industry.

Now is the time to evaluate and make a move with a solid, experienced cloud provider, and reap the benefits of efficiency and increased flexibility.

Cloud Computing Economics

Moving to the cloud can help your business realize efficiencies and savings that were once reserved for big enterprises. The cloud has become democratized, as vendors have wised up to the fact that there is money to be made by catering to a full range of businesses, regardless of size. So ample rewards are available for the smart SMB that knows where it's headed, and the best way

to get there. But it's not all blue skies—the level playing field that cloud computing enables can be fraught with dead-ends and gotchas, especially when it comes to the all-important bottom line. How can your organization avoid ROI missteps and mistakes that can turn your dream opportunity into a nightmare initiative?

Moving to the cloud can help your business realize efficiencies and savings that were once reserved for big enterprises.

Checklist

1. Do your homework and know what you're currently spending.
2. Define your business needs before evaluating pricing models.
3. Understand the difference between CAPEX and OPEX.
4. Apply cost benefit analysis, impact assessment, and due diligence to your cloud initiative.

1. Do your homework and know what you're currently spending.

"First, have a clear scope and user expectations before beginning. Have a clear cost structure for existing services. Let's use email, for example: the cost of servers, energy, resources, software, service levels, disaster recovery—all things that must be identified prior to undertaking an ROI. I believe you will find that commodity activities are the best candidates for cloud opportunities."

(Dion Alley, President, International Business Partners)

2. Define your business needs before evaluating pricing models.

"It is paramount to clearly define your needs before you start shopping for a cloud solution. The similarities in cloud offerings would begin and end at the need for increased value and better redundancy. For example, clouds for Software-as-a-Service (SaaS) would be focused on resource availability. Hosting clouds would emphasize scalability. Storage clouds would rely on fast hardware and data capacity.

"When comparing our options, we looked at what was being charged and evaluated them against our goals. We settled on a company that does not charge solely per-time-unit, but rather, charges a base rate and only charges for usage which is beyond that included in our base package, which is more consistent with traditional web hosting companies. So we know what our resource limits are, and if we ever cross those lines we know what to expect from it. As a result, we save about 60 percent per month on our hosting costs and we still have instant scalability when it is needed."

(Christopher Ryan, Business Consultant & Project Manager, Prime Logic Consulting)

3. Understand the difference between CAPEX and OPEX.

"Cloud services don't require capital investments (CAPEX) to be made by the client, so using a pure OPEX model can be attractive for some organizations, as it will allow them to expand and contract quickly with immediate impact to the books. This may be hard to stuff into an ROI model, but it's an

important intangible. Most cloud vendors are going to charge a rate called 'consumption.' If you don't know what your consumption is on a continual basis then get ready for something similar to the first cell phone bill you get when your teenager started texting (this is circa unlimited texting plans)."

(Scott Archibald, President, Accelerated Business Consulting)

4. Apply cost benefit analysis, impact assessment, and due diligence to your cloud initiative.

"Common business practices such as cost benefit analysis, impact assessment, and due diligence must be applied as you would in any assessment of business change.

- "Cost benefit analysis: Does this make financial sense aligned with short and long term goals?"
- "Impact assessment: How will my business processes change, what new skills and expertise will I need, what resources will be freed up?"
- "Due diligence: What are the legal implications for using the cloud, what jurisdictions would cover the data, what are the associated risks and how can I make them acceptable?"

(Andrew Rice, Business Development EMEA, HP Information Security)

Moving to the Cloud

Moving from one home to another is a chore. You must consider your new location carefully, choose a reputable realtor, inventory your possessions, decide what to keep and what to pitch, pack carefully, hire a mover, and mentally prepare for life in your new surroundings. Curiously, it's not unlike moving your business to cloud computing. When your company is ready to "pick up and move" to the cloud, keep the following best practices in mind—from deciding what to "pack" and engaging a "realtor" to preparing for the culture shock of your new environment—to make your migration smooth and successful.

Checklist

1. Carefully consider what you intend to move to the cloud to avoid subpar performance.
2. Scope the resources needed for your deployment thoroughly.
3. Be prepared for the cultural shifts that accompany moving to the cloud.
4. Migrate to the cloud as you would to a larger on-premises server.
5. Purchase high-quality monitoring software for your virtual environment.

1. Carefully consider what you intend to move to the cloud to avoid subpar performance.

"You need to be thoughtful about what you put into the cloud, what level of expectations to set around it being in the cloud, and what provisions to make to mitigate performance issues.

"Perhaps the answer is to add/improve your bandwidth. Perhaps the answer is to add some caching services to your connectivity. Perhaps the answer is to set the right expectations for usage. Perhaps the answer is to alter the configuration of the data set so that it's not one big massive chunk.

“No matter what combination of the above turns out to be helpful, the underlying answer must include a thoughtful look at what your organization will move, why it will move it, and what the ramification of that move will be. Migrating to the cloud is not the same as simply moving data or apps to a location that is farther away from you than it is now. Not unless you’re looking to relive the days of modem and ISDN connections, as it pertains to larger data sets.”

(Andrew S. Baker, Information Security & IT Operations Consultant, BrainWave Consulting Company)

2. Scope the resources needed for your deployment thoroughly.

“Most any VAR that you are purchasing your hypervisor from should have capacity planning tools that you can use to assist in planning your deployment. Make sure you purchase enough resources to cover a full year of server/data sprawl and determine what the costs are to add resources later.”

(Steve Heusser, Operations Manager, SolutionPro)

3. Be prepared for the cultural shifts that accompany moving to the cloud.

“Cloud computing has the potential to lead significant cultural changes in an organization, but in and of itself does not have to have any change in the way the organization operates.

However, if change does not follow, then costs and benefits will not be realized.

Some cultural changes that cloud can bring about include:

Cloud computing has the potential to lead significant cultural changes in an organization.

- Better communications between engineering and operations (DevOps)
- Greater emphasis on sharing and collaboration
- Reduction in redundancy
- Greater focus on continuity of business in face of disaster
- Greater operational efficiency
- Less reliance on internal IT
- More agility”

(JP Morgenthal, Principal, Ranger, Cloud & VDC Services, EMC Consulting)

“Today, there are a whole host of good ideas and initiatives that can be dreamed up by business units that cannot be realized quickly because IT cannot move fast enough. How many times has a product manager thought to himself, ‘You know, we should take advantage of this market opportunity,’ only to dismiss the idea a few seconds later with, ‘Never mind. We could never move fast enough.’ The biggest impact that cloud computing has on the whole organization is that it lowers the bar for the execution of ideas. More things get tried because the cost to execute them is lower (where cost = time, hassle, energy, etc.—not just money). Now, many of those ideas will be failures. But many will be successes. By lowering the cost of failures (you tried it, it didn’t work out, but so what because it was so easy to do), you end up with more successes. And those successes will translate into higher profit, greater market share, and more passionate customers.”

(Dave Roberts, Vice President, Strategy, ServiceMesh)

“With more orgs allowing people to work from home and also employing remote teams as part of their workforce (local or international), true cloud computing (i.e. with IaaS and SaaS) will allow flexibility, around-the-clock development and support, and more productivity.”

The business impact that cloud computing has on the whole organization is that it lowers the bar for the execution of ideas.

(Raj Menon, Program Manager, Healthcare IT Services Company)

4. Migrate to the cloud as you would to a larger on-premises server.

“For the most part, the same underlying deployment and migration processes should be employed for migration into the cloud as would be used to upgrade to a larger server on premises (or in a traditional hosting situation). The cloud doesn’t make this initial migration any easier or harder than other types of migrations, although it will lower the cost, and is easier to practice beforehand.” (Baker)

5. Purchase high-quality monitoring software for your virtual environment.

“Virtual/cloud environments have monitoring needs that differ greatly from traditional deployments. A good monitoring system will alert you to issues before they become problems and allow you to focus on your core business and not reacting to IT issues. ” (Heusser)

Choosing a Cloud Computing Partner

Migrating your company to the cloud can be a perplexing proposition. You've predicated your success on being a nimble upstart, not a bulging behemoth. Without a bevy of skilled staffers and deep pockets, getting a piece of the cloud action is a bit trickier for a smaller organization than it is for a large enterprise. While the proposition of adopting cloud computing seems daunting at first, rest assured that you don't need to go it alone. A well-selected provider can answer questions, provide guidance, and help shoulder the burden of cloud migration. Find your perfect match by following these best practices, and you'll begin your search for a trustworthy partner on the right foot.

Checklist

1. Ask yourself the tough questions before selecting a partner.
2. Be ready to ask potential vendors tough questions.

1. Ask yourself the tough questions before selecting a partner.

Making the business case

- How will this move help me reach my business goals?
- Is the cloud actually going to be more cost effective and/or provide an advantage over a traditional/current model? Some cost/benefit analysis would be needed.
- Are there cloud-based resources I can leverage right now that don't require going to an additional vendor? (You'd be surprised.)

Making the move

- What changes do I need to make in my organization to support this service?
- If the cloud provider is down, how will my business handle the outage? An alternate cloud provider? High availability and disaster recovery scenarios?

- Are there low risk functions that could be moved to a cloud platform in order to test how the organization adjusts/supports their applications/services on the cloud?
- What impact will this have on my industry or regulatory compliance obligations?
- Does my technology-before-the-cloud (on-premise workstation hardware, Internet provider, telecom/phone/PBX solution, Web/database servers/hosting company) meet the demands a SaaS solution will require?

Data

- How much control will I have over the vendor's upgrade schedules, and what will it mean for the integration with the other portions of my business?
- What are the security/privacy implications of using this technology?
- What contingencies do I have for my business if this technology is unavailable for a day or a week?

Resources and backup

- Who do I have on staff that can manage this process?
- Will this free up personnel resources to work on more business-critical projects?
- Am I prepared to accept that there's going to be a learning curve? Just because it's in the cloud, doesn't mean I can 'flip the switch' and everything's exactly what I want/need.
- Have I really taken a hard look at the long-term impact and costs over the life of usage? This includes training, implementation, data backup and retrieval, management, and licensing.

2. Be ready to ask potential vendors tough questions.

Background

- How stable is your organization?
- What is your product roadmap?
- Can you provide references that reflect my particular business?
- Can you address industry-specific compliance requirements; encryption levels and authentication

protocol details?

Product

- What does the interface look like?
- Do you offer a Service Level Agreement (SLA)?
- Is there financial compensation for breaking your SLA?
- Do you have a public site listing issues and outages?
- How do you schedule maintenance and handle upgrades?
- What are the support options?

Data

- How do I get my data back out in a way that is useful to me, beyond simply reporting?
- How long will you retain my data, even if I am done with you?
- How can I be assured my data will be protected?
- How do I get my data if I decide to leave?

In case of emergency

- What is your security policy and related insurance coverage in the event of a breach?
- If you are breached, are you liable for customer/user data loss?

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