cloudticity

Why You Should Migrate Epic EHR to the Cloud

Five ways that the public cloud offers tangible business value

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Epic In The Hospital Infrastructure

If you use Epic EHR in your hospital or clinic operations, you are not alone. Epic Systems is the largest commercial provider of EHR systems (see figure 1).

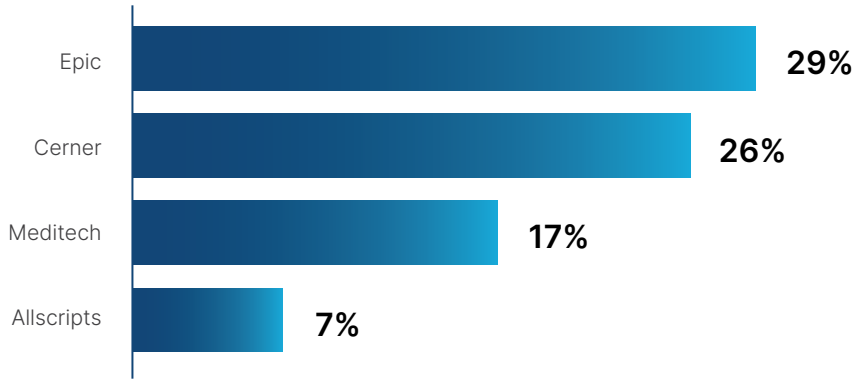


Figure 1. Top EHR Vendors by Market Share (source: KLAS)

EHR software systems are massive and complex, requiring significant investments in computer hardware and software, employee training, and IT staffing. For those reasons, changing EHR vendors is a big deal. At the same time, many organizations are doing so to improve care coordination, provide workflow efficiencies, and help providers better meet the needs of their patients. Therefore, the decision to deploy Epic in the cloud takes place in two different settings, either migrating an existing Epic deployment from a local data center to the cloud or switching from another EHR vendor to Epic. Fortunately, the considerations about how and where to host the Epic Systems software are basically the same. So the recommendations in this paper apply to both cases.

Epic Systems EHR can be considered an ecosystem in several dimensions:

- Modularity
- Integration
- Workflow

Modularity

The Epic software offering is modular by design, meaning that every deployment is tailored to the specific needs of the organization by choosing the right combination of modules. For example, clinicians in a hospital interact with an EHR system in different ways than an ambulatory clinic or emergency department. Accordingly, Epic offers three clinical modules, EpicCare Ambulatory, EpicCare InPatient, and EpicCare ASAP. Epic has products for medical specialties from anesthesia and cardiology to ophthalmology and radiology – 24 in all. Epic also helps hospitals to securely share personal health information (PHI) between Epic-based organizations and even extends Epic capabilities to associated clinics and small practices (see figure 2).

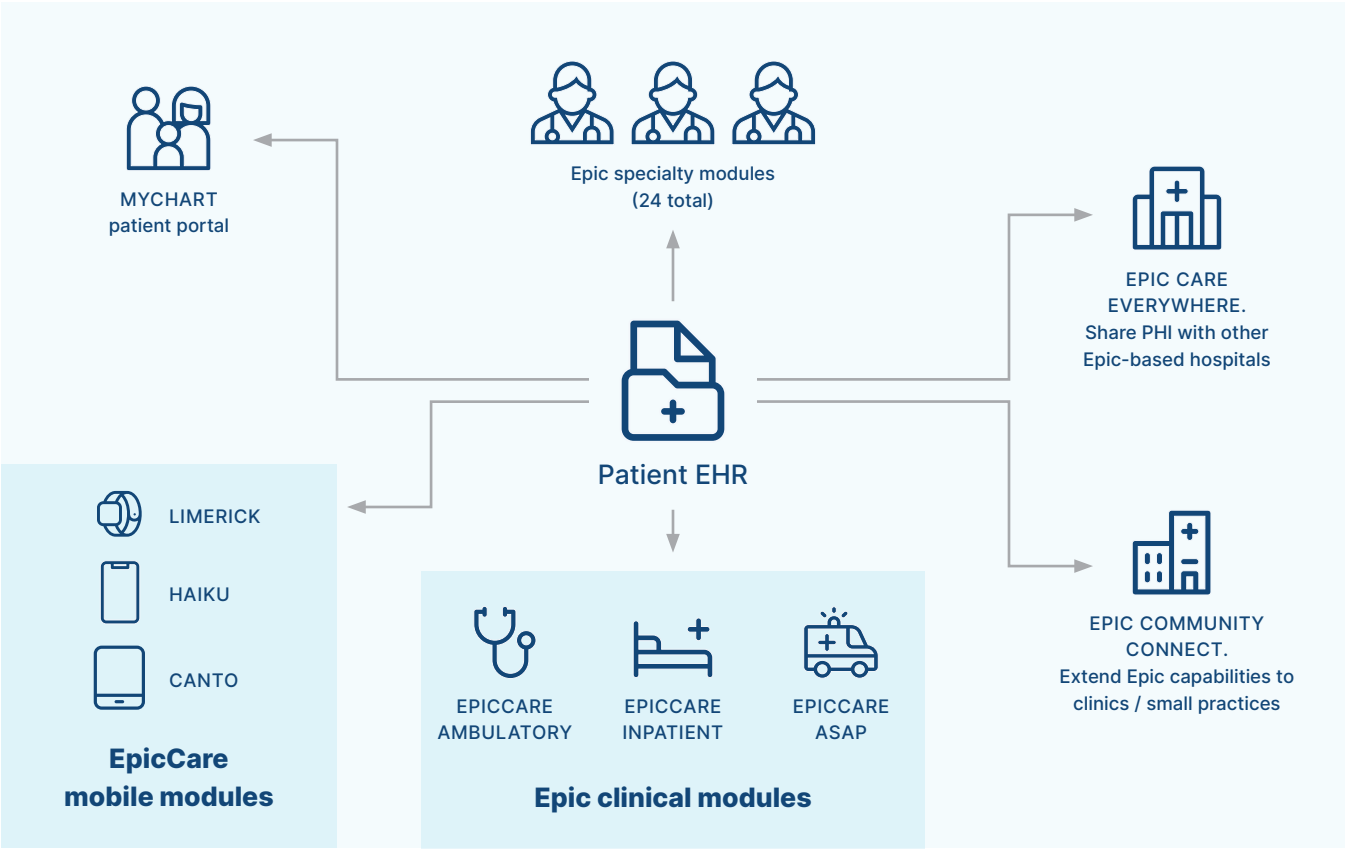


Figure 2. Typical Epic EHR deployment

Third-party Integration

Virtually every Epic deployment involves integrations with other healthcare software products. One category is large healthcare software applications such as medical imaging software and pharmacy practice management, which generate critical PHI that must be aggregated into the patient's EHR. A second category is applications created outside the Epic corporate structure that enhance EHR functionality in areas such as telehealth, patient experience, analytics, and population health.

The company facilitates the ecosystem approach through App Orchard, a marketplace where Epic community members can search for apps in a range of categories. The Epic App Orchard currently lists more than 480 apps that interface smoothly with Epic EHR using application programming interfaces (APIs) provided by Epic. APIs act as hooks that allow third-party apps to connect easily to the main Epic software.

Hospital Workflow

Yet another sense of ecosystem is the central role that Epic plays in the business of healthcare, tying together providers, pharmacies, labs, and payers. From registration and treatment through discharge and billing, Epic touches every aspect of the hospital workflow (see figure 3).

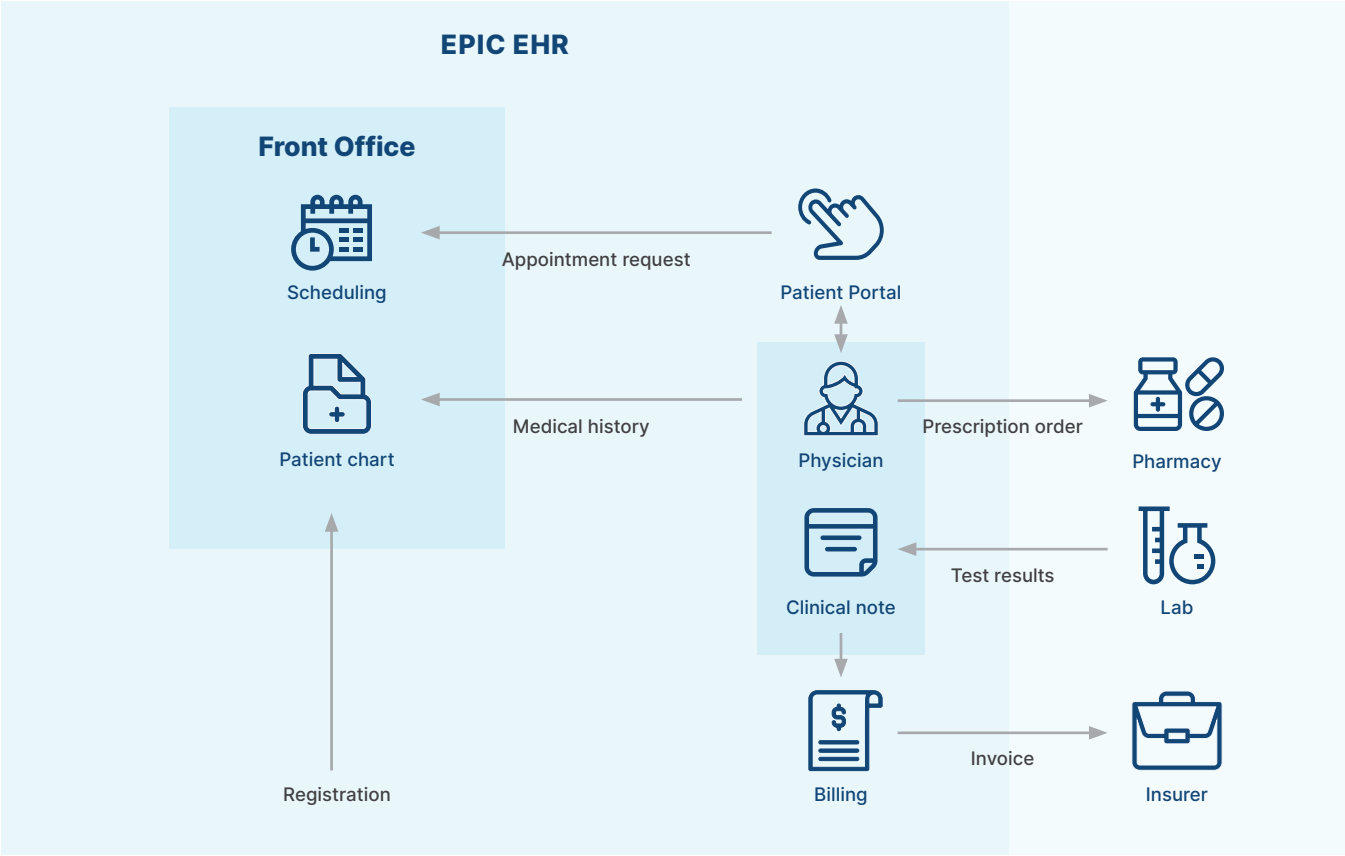


Figure 3. EPIC EHR as the hub of the hospital workflow

What Does Moving To The Cloud Mean?

Unless you are an IT professional, you may not be completely clear on what it means to move Epic from on-premises to the cloud. All three terms are somewhat imprecise, so let's start by unpacking each one.

For starters, Epic looks the same to users whether it's running on-premises or in the public cloud. Of course, a lot is different under the hood and that affects your in-house IT team significantly. As used in this paper, Epic refers not only to the Epic EHR software but also to a number of necessary ancillary functions such as disaster recovery, training, and development. This distinction is important for planning which parts of Epic to migrate to the cloud and in which order. A common strategy for starting the migration process is to launch a proof of concept with one of the associated functions such as training before tackling the core Epic software itself – more on this topic later.

Epic refers not only to the Epic EHR software but also to a number of necessary ancillary functions such as disaster recovery, training, and development

On-premises means having your own data center. In this setup, you are responsible for every aspect of the infrastructure, including architecture design, procurement, installation, configuration, security, compliance, operations, maintenance, and upgrades. Another way to look at on-premises is that, in addition to being in the healthcare industry, you are also in the information technology industry. A key appeal of moving Epic to the cloud is to get out of the IT business and instead focus more resources – human and financial – on getting the most business value from the Epic application itself.

Put simply, cloud means any technology that delivers computing services such as computation, data storage, and networking – all the things that you currently do on-premises – via the internet. There are two basic business models for cloud providers, public and private cloud. Epic running in a private cloud has the same essential characteristics as an on-premises deployment, and therefore is not discussed here. Going forward, all references to cloud in this paper mean public cloud.

How Cloud Impacts Hospital Operations

Given the centrality of Epic to hospital operations, a key question on the minds of many decision makers is, what's going to change if we move Epic to the cloud? The answer depends on your role in the organization (see table 1).

Table 1. How The Cloud Changes Epic Operations

	ON-PREMISES	CLOUD
User experience 	Patients, providers, staff, and management see little or no operational difference. Doctors and nurses enter practice notes, find patient information, prescribe therapies, order tests, and collaborate with other Epic users in exactly the same way as before. The patient portal works the same way (although perhaps a little faster). Administrative staff and executive managers do what they have always been doing. In fact, one of the hallmarks of a successful migration from on-premises to the cloud is minimal impact on users.	
Cybersecurity 	Your IT team is 100% responsible for the security of all applications and information as well as the entire data center infrastructure.	You and the cloud provider share security responsibilities. The provider secures the hardware and system software, and you secure your applications, often with the help of provider tools for vulnerability management.
Reliability 	Your IT team must ensure the reliability of the underlying infrastructure that supports Epic, including setting up and maintaining disaster recovery systems.	Cloud providers invest heavily in reliability and achieve at least 99.9% uptime. They also offer prepackaged disaster recovery services ranging from simple backup to complex strategies spanning multiple geographics.
Staffing 	You need to hire or contract for pros with expertise in cybersecurity, virtualization, cloud-native development, and more. The demand for these skills routinely outpaces the supply, making it difficult to fill positions.	Cloud providers attract the best and the brightest, so they are always well-stocked in expertise. On your side, your staff will need some training in how to manage a cloud environment, but a next-gen cloud MSP can help them shift much of their attention from technical to business considerations.

The Benefits Of Epic In The Cloud

As a group, healthcare executives are on board with moving to the cloud – eventually. In a recent survey, 70% of healthcare professionals agreed with the statement "cloud is where the IT industry is going." Asked to identify the areas where cloud is superior to traditional on-premises deployments, the top answers were fewer internal resources needed for support, shifting expenses from capital to operational expenditures, and easier to deploy and upgrade (see figure 4).

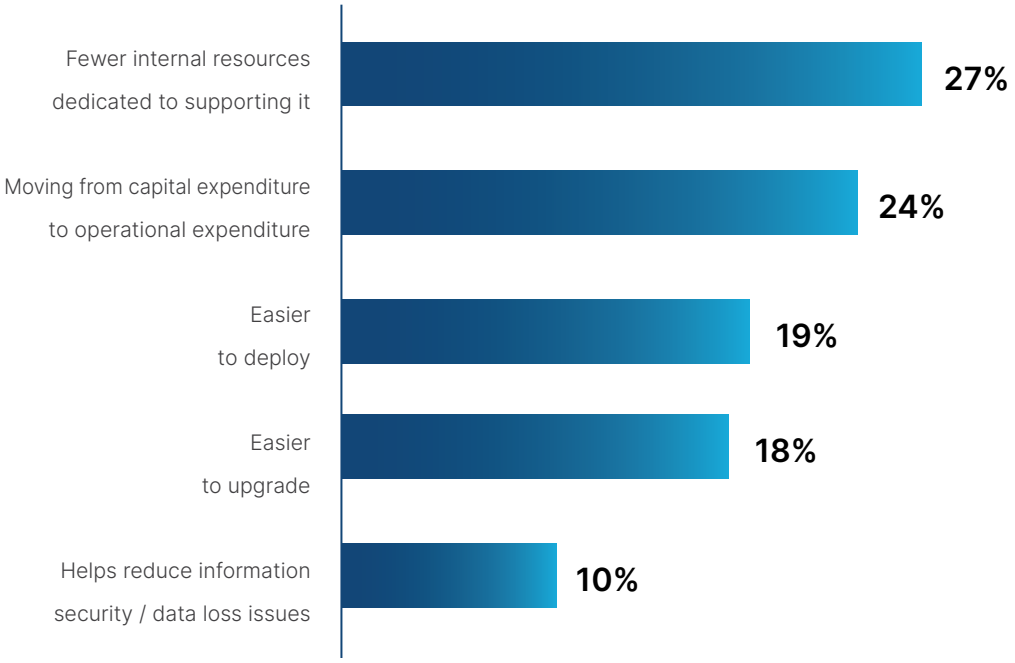


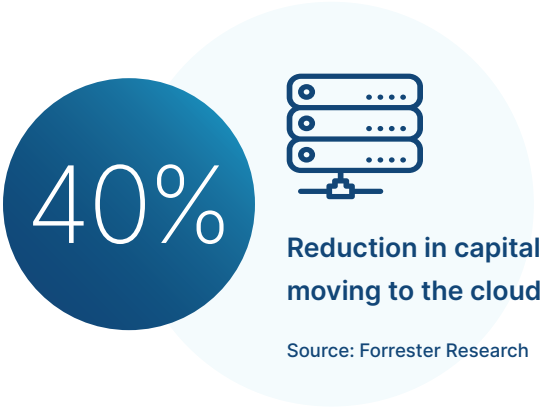
Figure 4. Top benefits of moving from on-premises to public cloud, survey results

However, the general trend in the industry is not enough to drive your decision about when and how to switch to the public cloud. This section discusses five ways in which moving Epic to the cloud delivers tangible business value.

1. Reduced Costs

Cost reduction continues to be a primary driver for moving Epic to the cloud. Data centers are not static entities – they require constant maintenance and upgrades. Hospital executives may cringe when they see giant delivery trucks full of new servers, storage units, and other IT equipment pull up to their loading docks. These capital investments in data center hardware and software consume significant financial resources that could be redirected to strategic initiatives that drive the digital transformation of the hospital experience.

Moving to the cloud means eliminating the need for these massive expenditures because the cloud provider bears the entire cost of the infrastructure – users pay only for the resources they use through a pay-as-you-go model. In addition, the cloud provider can afford to invest in specialized equipment such as high-powered graphics processors that would have low utilization rates in an on-premises setting and therefore would be cost-prohibitive. For healthcare developers, that trend translates into gaining access to new technologies early in their lifecycle and thus driving innovation that otherwise would have to wait until the funding to purchase new technology is available.



Reduction in capital expenditures due to moving to the cloud

Source: Forrester Research

2. Increased Reliability

As the hub of the hospital infrastructure, the Epic EHR system must be highly reliable. Application slowdowns or outages can compromise patient care, increase the risk of lawsuits and regulatory sanctions, and incur substantial expense (see breakout box "Downtime: How Much Does It Matter?").

Unfortunately, unplanned downtime is not an unusual occurrence in the healthcare industry. According to a recent study published in Health Informatics Journal,

> The risk of a hospital experiencing an EHR downtime event is ever-present and potentially growing.... While a downtime event is complicated and chaotic, the risk in waiting to determine the origin before reacting – especially when there is potential breach of patient data ongoing – places patients' information and the hospital at significant financial risk.

The severity of reliability issues ranges from performance slowdowns that impact productivity to shutdowns that force hospital staff to go back to writing on paper patient charts – a ponderous and error-prone process.

Public clouds are among the most reliable business services available. The reason is simple: outages are costly and disruptive to their customers. Potential customers often examine the outage records of cloud providers as one of their selection criteria. As a result, cloud providers invest heavily in best practices such as redundancy, rapid failover, and geographic dispersion.

To be clear, you can implement similar measures in an on-premises environment and expect to realize similar levels of reliability, albeit at a very high level of capital investment. The big difference is that reliability is integral to the cloud provider's business model, and therefore is integrated into the architecture, not bolted on.

3. Improved Cybersecurity

Cybersecurity goes hand in hand with reliability – half of all downtime events are due to a successful cyberattack. For that reason, many decision makers wonder if their healthcare information would be safer in the public cloud or on-premises.

The answer is the maddeningly familiar "it depends." No matter which entity – you or the cloud vendor – implements security, the quality of the protection depends critically on the people who configure and manage security. That said, many organizations find that when they move to the cloud, the security level eventually exceeds on-premises. Key reasons are resources, motivation, expertise, and experience.

Resources

Cloud providers simply have far more money to invest in cybersecurity than virtually any enterprise. Their complement of security equipment is always top-notch and up to date, and informed by the latest threat intelligence reported by multiple third-party sources.

Expertise

Cybersecurity requires people with highly specialized expertise – a scarce resource in the IT world today. When you manage your own data center, your organization must hire cybersecurity talent to manage your physical infrastructure. When you move to the cloud, you don't need to worry about securing the physical infrastructure. Cloud providers attract and retain top cybersecurity talent to ensure that their security is as good as humanly possible.

Motivation

To a healthcare organization, a data breach is a nightmare. To a cloud service provider, a data breach is an existential threat. Public cloud is a highly competitive marketplace, therefore, if a provider got the reputation of being vulnerable to cyberattacks, their business could literally dry up. Therefore, it is no surprise that providers are highly motivated to implement the best security possible.

Experience

The intensity and sophistication of cyberattacks have been growing exponentially in recent times. By virtue of their size and ubiquity, cloud providers have seen and parried virtually every kind of exploit and attack strategy imaginable. This experience is invaluable in defending against highly sophisticated advanced threats that make use of artificial intelligence and other leading-edge technologies.

49%

Percentage of downtime events due to cyberattacks

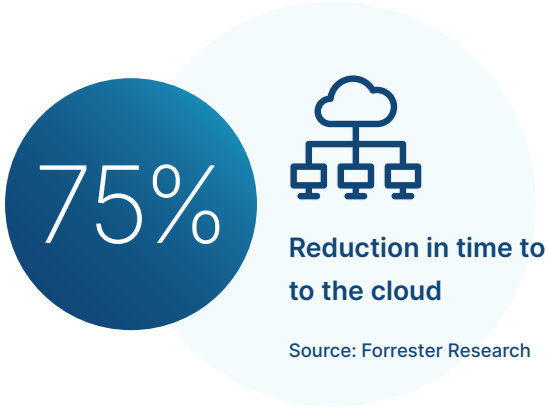
Source: Forrester Research

4. Faster Time To Market

Healthcare IT systems need continual upgrades to help the organization remain competitive, so time to market is crucial for success. In particular, hospital CIOs are driving integration and automation to both cut costs and roll out new features for patients, clinicians, and staff. Often, the Epic EHR and its ecosystem are at the center of these initiatives.

Running Epic in the cloud speeds development in two ways. First, software engineers can spin up their own development and test environments themselves using self-service portals, without IT involvement. This approach cuts the time to bring up an environment from days or weeks to minutes. As a result, engineers save time and also can afford to try out more alternatives than would be possible with an on-premises data center.

In addition, all the major cloud providers have service catalogs showing hundreds of functions such as text-to-speech engines, image recognition for diagnostic support, customer contact centers, and enterprise search. By using these off-the-shelf, pretested modules, developers can cut down development cycles and improve the overall quality of the applications.



Reduction in time to market due to moving to the cloud

Source: Forrester Research

5. Enhanced Focus On Healthcare

The best way to understand this benefit is with an analogy. What if your organization had its own electricity generation plant? Think of the hundreds of decisions that your executive staff would have to make about procuring the fuel, installing power generation machinery, staffing the facility, and of course, how to pay for it all. But that's not the case because you get your electricity from a utility – when you need power, you just flip the switch.

Your hospital infrastructure can be thought of in the same vein. Moving Epic – or any other software application – to the cloud represents another step in getting out of the IT business. That shift has implications throughout the organization, especially in the boardroom. Imagine how much management time would be freed up if you moved your entire IT infrastructure to the cloud. Healthcare organizations that embrace the cloud can better focus scarce resources, from executive staff to systems administrator, on initiatives that more directly improve patient care, employee safety, business growth, and profitability.

Downtime: How Much Does It Matter?

EHR systems are critical for patient care, staff safety, and profitability. When the system goes down, everything switches over to backup policies and procedures, many of which are manual and time-consuming compared to their online counterparts. Patient admissions can be delayed and provider and staff schedules disorganized. Taken all together, downtime is enormously expensive – by one estimate, as much as $1 million per hour.

The causes of Epic downtown on-premises vary from facility problems (for example, accidental triggering of the fire suppression system) to failure of key infrastructure components such as local area networks and servers. Storage systems are particularly vulnerable to degraded performance and a number of high-profile EHR failures.

How much downtime does the average hospital have? A recent study found that 166 U.S. hospitals experienced a total of 701 days of downtime between 2012 and 2018. At the individual hospital level, these findings translate into an average of 72 minutes per month. For a critical system such as EHR in a life-or-death institution that works around the clock every day of the year, 72 minutes is an eternity.

Using the industry-standard way of quoting uptime by percentage, the study findings of 72 minutes work out to an average uptime of 99.83%. That figure may sound high to the average person but is mediocre at best in the IT world. By comparison, the big cloud service providers all quote standard uptimes of at least 99.9% (informally referred to as “three 9s”) and can offer service level agreements (SLAs) that promise up to 99.99% (four 9s) – for a premium, of course.

Is there really that much difference between 99.83% and 99.90%? You bet there is. A few hundredths of percentage difference translates into a substantial difference in downtime. In this case, increasing reliability from 99.83% to three 9s reduces downtime by 45%, from 78 to 43 minutes. Then choosing the premium SLA of four 9s cuts downtime by 95% to just 4.3 minutes per month (see figure 4).

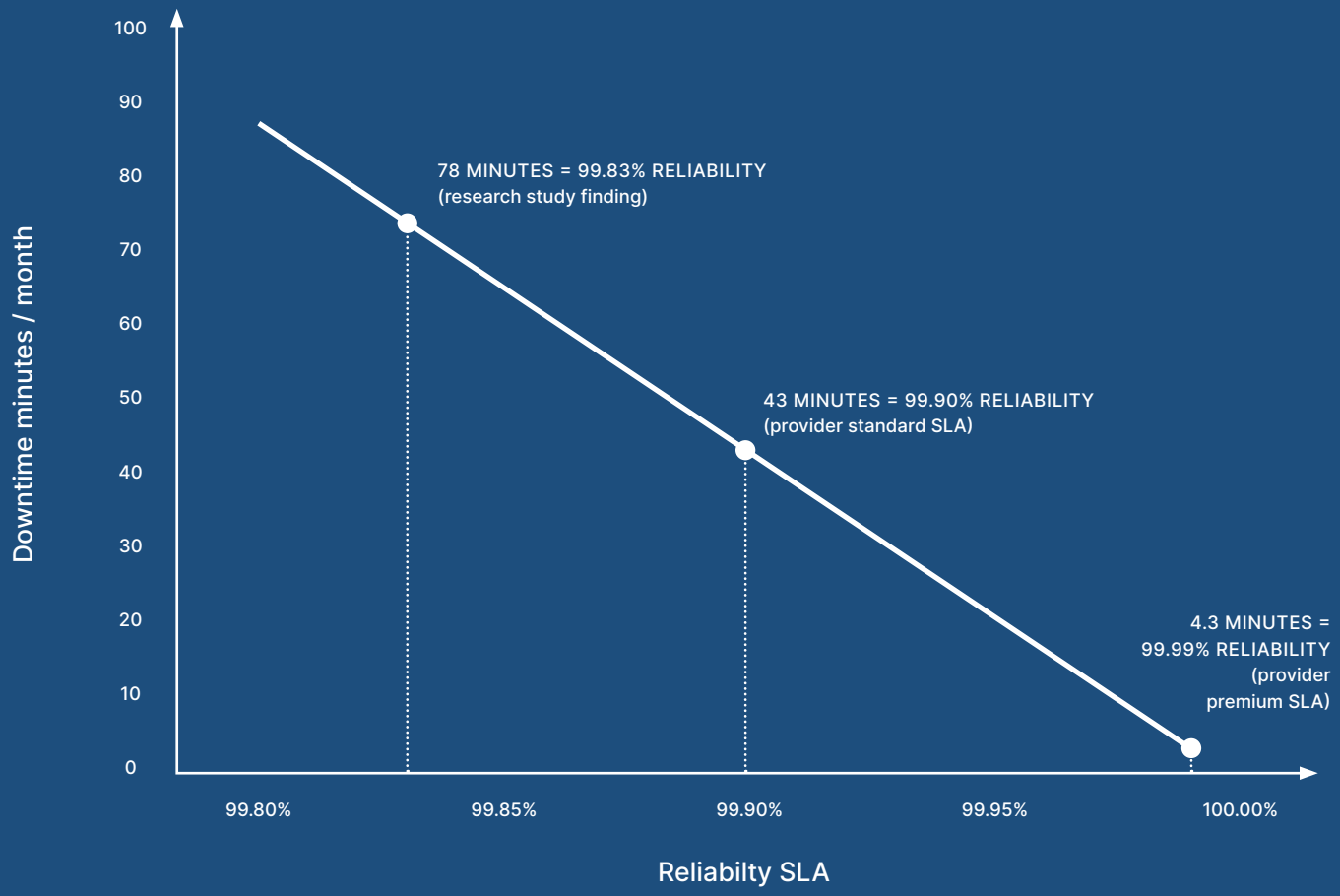


Figure 4. Minutes of downtime per month for selected SLAs

Hosting Options

This discussion makes the case for hosting Epic in the public cloud, however, other models are available.

Epic Hosting

Epic offers a hosting service, so it may seem logical to simply migrate from your on-premises Epic EHR to the software developer itself. When you choose this option, Epic handles the entire IT stack, from backend development to application support, which essentially replaces your own Epic staff. Many organizations have made substantial investments in acquiring and training this specialized talent and are understandably reluctant to let that hard-to-find talent leave the company. Also, most Epic EHR deployments have various third-party applications such as OnBase and RightFax integrated with Epic. So you need to find hosting solutions for these applications.

Traditional Hosting Provider

Traditional hosting providers run Epic in a data center that looks very much like your on-premises data center, with all the same limitations and headaches around hardware refreshes. Customers report unanticipated downstream costs and support problems.

Community Connect Model

In this case, a larger hospital system serves out their Epic EHR to you for a fee. One advantage is that these large Epic implementations tend to have more modules and features than you could afford on your own, although often they are of little value. The downside is that your data is stored on the larger organization's database, with little or no isolation. You also have limited ability to customize the workflows of the parent hospital.

Public Cloud

For many organizations, the best option is to migrate to a public cloud provider such as AWS or Microsoft Azure. These organizations offer high reliability, predictable pricing, and early access to advanced technologies. Public cloud providers have dedicated Epic practitioners who work closely with Epic staff to ensure that the cloud platform is optimized for Epic EHR requirements. Their standards for data security are extremely high and constantly being upgraded to protect the platform against the latest threat vectors. Cloudticity strongly recommends the public cloud over the other possible solutions.

Moving Forward

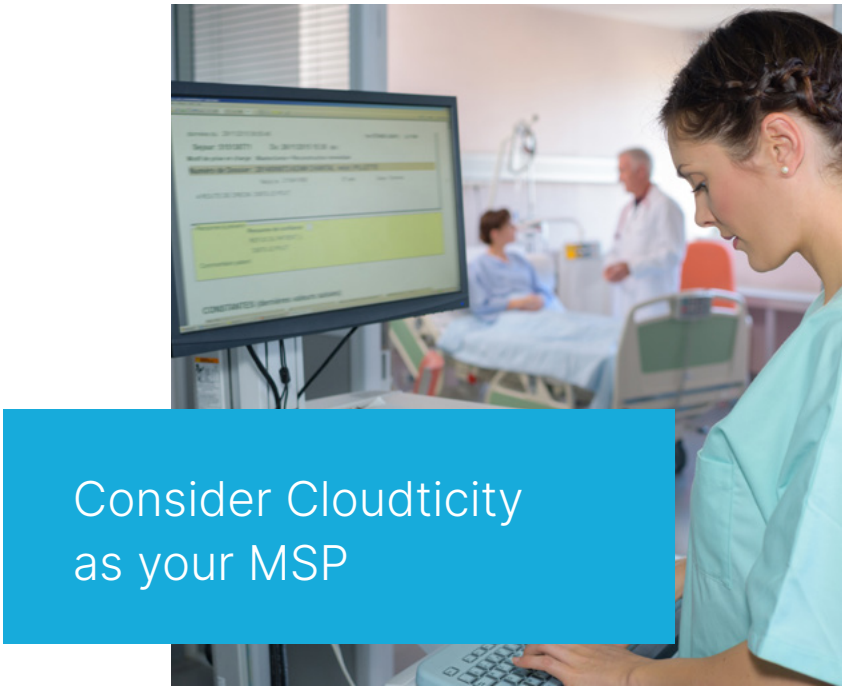
For many healthcare organizations, the case for moving Epic to the public cloud is compelling. A key reason is cost reduction, that is, eliminating massive expenditures for capital equipment in favor of a pay-as-you-go model. Public cloud implementations offer high reliability, a critical need in hospital and clinic settings to ensure uninterrupted care delivery and maintain high levels of clinician and staff productivity. Cloud providers ensure the security of PHI and proprietary data by investing heavily in cybersecurity and attracting top talent. Finally, migrating Epic EHR to the public cloud allows the organization to sharpen its focus on innovation and digital transformation and drive competitive advantage. For these and other reasons, a move to the public cloud is just a matter of time.

Once you've made the decision to move to the cloud, you will need expert assistance – an Epic migration is not a job for the uninitiated. Virtually every published case study of a successful transition talks about the key role played by their managed service provider (MSP) or other third party. MSPs are uniquely positioned to help because they are specialists in the infrastructure components.

Consider Cloudticity as your MSP. Cloudticity is a digital enablement partner for the healthcare industry generating measurable business and clinical outcomes by unlocking the full potential of the cloud. Through groundbreaking automation and deep cloud expertise, Cloudticity solutions empower healthcare organizations to create and scale the next generation of healthcare solutions. We have built some of the earliest and largest health systems on the cloud, including:

- The first patient portal
- The first health information exchange (HIE)
- The first and only FISMA high deployment on AWS GovCloud
- The first Meaningful Use 2 (MU2) compliance attestation for a large hospital system
- The first COVID-19 registry on the public cloud for a state health department

Cloudticity transforms healthcare IT into a driver of business and clinical value. For more information about how Cloudticity can help with your public cloud migration, visit us here.

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