

cloudticity

The Business Case for Managed Cloud Services

Determining ROI for Healthcare in the Public Cloud

Table of Contents

ABSTRACT 4

MAKING THE CLOUD DECISION 5

- Cloud Roadblocks and Challenges 5
  - Lack of Skills/Resources 5
  - Controlling Cloud Costs 6
  - Cloud Security 6
  - Cloud Strategy 6
- Measuring ROI 7

THREE FINANCIAL CONSIDERATIONS
FOR BUILDING YOUR CLOUD PROGRAM 8

1. THE COST OF CLOUD EXPERTISE 8
   - Building Internally and Hiring Additional Resources 8
     - Hiring Considerations 8
     - H-1B Visa Candidates 9
     - Cross-training Existing Employees 10
   - The Cost of the First Year of Productivity 11
   - Team Size 13
   - Outsourcing 14

2. THE COST OF TOOLS AND SERVICES IN THE CLOUDE 15
The Cost Centers Reduced by the Cloud 15
Potential Areas For Cloud Advantages 18
The Basic Cloud Tools Everyone Will Use 18
Advanced Services and Third-Party Tools 20
3. THE COST OF ONGOING MANAGEMENT AND OPTIMIZATION 21
Compliance 21
Security 21
Cloud Operations 22
WHY CONSIDER CLOUDTICITY AS A MANAGED SERVICE PROVIDER 23
Cloud expertise and credentials 23
Ownership and access to your resources 24
Proven Technology 24
Proven Process 26
A CUSTOMER EXAMPLE 27
Standard Budgeting 27
Personnel Considerations 28
Budgeting Reality 29
CONCLUSION 32

ABSTRACT

Several key elements must be considered when moving resources to the cloud. Public or private or hybrid cloud? Build or Buy? Internal IT or Managed Service Provider (MSP)? Each decision determines a cloud project's effectiveness, cost, and success. This paper dives into the return on investment (ROI) considerations for each of these decisions. It makes the case that partnering with a trusted cloud advisor provides the best overall ROI and success.



MAKING THE CLOUD DECISION

There are many reasons that healthcare organizations are looking to the cloud for future innovation and cost reduction over existing on-premises infrastructure. Promises of near-instant scalability, pay-as-you-go pricing, and reduced operational costs are enticing. This is in addition to the increased speed of innovation that development teams gain when they can quickly deploy and test new ideas or access emerging technologies that enable them to build new solutions and solve new healthcare challenges.

Cloud Roadblocks and Challenges

That said, there are also several reasons organizations delay going all in on the cloud.

Lack of Skills/Resources

According to one Robert Half Recruiter, cloud computing remains the number one most sought after skill on the market. And a recent survey found that 78% of IT leaders experience a skills gap for implementing and managing cloud. Without the right resources to manage cloud environments, organizations can accrue unnecessary costs and put sensitive data at risk.

78%

of IT leaders experience a skills gap for implementing and managing cloud.



Controlling Cloud Costs

The same survey found that 82% of IT leaders listed managing cloud costs as a top cloud concern. Although incredibly flexible, cloud pricing structures completely differ from traditional buying patterns, making them difficult for newcomers to navigate, plan, or forecast with. Cloud environments also need to be optimized and maintained regularly, or risk running up the bill with unnecessary expenses.

This explains all the news coverage about organizations not getting ROI from cloud. Without the right architecture, governance and management patterns, you're going to leave money on the table.

Cloud Security

The healthcare industry alone accounted for 79% of recorded breaches in 2020. Cloud environments are developer-driven and easy to change, making them great for innovation, but creating blindspots for Security Teams. Without the right tools and governance, it's not uncommon for developers to spin up new resources without any oversight from the Security Team, often putting sensitive data at risk.

That's why so many cloud security failures you hear about in the news were simply the result of someone leaving default permissions on a resource.

Cloud Strategy

Another challenge is creating a strategy that will position you to grow safely and efficiently in the cloud. Many organizations jump into the cloud without any strategy at all. Without a holistic plan, organizations lose control of costs, accumulate security risks, and fail to capitalize on potential cloud advantages.

That's why it's essential to create a holistic cloud strategy, know your options in today's labor market, and have a clear picture of the resources that will be necessary for a successful cloud journey.

Measuring ROI

In order to measure the success of your cloud journey you first need to understand which metrics you will be tracking.

Traditional on-premises models focus primarily on the ROI (Return on Investment) of a project. They are buying physical servers that will depreciate over time and want to ensure that value is gained on that investment.

For the cloud, resources are purchased on an as-used basis, meaning you only pay for what you use. In this way, a monthly AWS or Azure bill is more like a utility than a physical asset. Therefore, many will look to the TCO Total Cost of Ownership (TCO), which factors in all the various costs involved in the project, to get a better view of all the costs involved.

Whether using TCO, ROI, or a combination of the two, defining what numbers need to be considered to measure the impact of cloud is essential. Then it's important to understand all the associated costs so you can make an informed decision on whether to build internally or work with an MSP for your cloud operations.

	ROI	TCO
Goal	Increased Profitability	Predictable Cost
Strategic Focus	Long-term Benefits of Investment	Understand Expected Price
Fundamental Question	What Value do we Gain?	What is the Total Lifetime Investment?

Figure 1.

THREE FINANCIAL CONSIDERATIONS FOR BUILDING YOUR CLOUD PROGRAM

1. THE COST OF CLOUD EXPERTISE

Building Internally and Hiring Additional Resources

Hiring Considerations

When looking at the actual cost of labor, there are many more factors to consider than just a salary. Cloud engineering talent is challenging to find across industries and is particularly difficult in healthcare. Financial Technology firms and cloud providers offer high salaries that are often complimented by stock options, unlimited PTO plans, robust benefits, and paths to quick promotion. The Healthcare industry requires knowledge specific to the industry, such as understanding the FHIR file protocol and how to abide by the strict compliance requirements of HITRUST. Finding talented people with this mix of industry knowledge and talent typically involves active recruitment from either internal recruiting staff or from an external agency, which on average charges around 25% of the employee's first-year salary as a fee.

Once this talent is found, it must also be retained since utilizing the cloud is an ongoing affair. New cloud services come out constantly, and many are industry-specific, requiring deep understanding to use. This means that employee attrition is vital to address. One study showed that in 2022 the average turnover rate in IT was 10.9%, and in healthcare was even higher at 13.07%. For startups, these rates are even higher.

H-1B Visa Candidates

For some organizations, the consideration of engineers pursuing H-1B visa status may be evaluated to expand the pool of potential candidates. This comes with a number of its own costs. Each year approximately 200,000 people apply for H-1B visas, and only 65,000 are issued. Figure 2 shows the costs associated with an H-1B petition. Since most applicants will have to go through multiple applications, the cost of an H-1B application ranges from $7,300 - $31,800, with no guarantees that the visa will be granted.

TYPE OF FEE	AMOUNT
Application Fee	$460
New Supplemental Fee*	$500
Attorney Fees	$1,500 to $4,000
Added Attorney Fees if a USCIS Request for Evidence	$2,000 to $4,500
Scholarship and Training Fee	$1,500 ($750 for employers with 25 or fewer employees) (initial petition and extension)
Anti-Fraud Fee	$500 (on initial petition)
Premium Processing (optional but generally necessary)	$2,500
"50/50" Fee (for employers with workforce over 50% H-1B/L-1)	$4,000 (on initial petition)
Visa Application (cost based on reciprocity)	$190 ($0 - $800)
TOTAL	$3,900 to $18,150 (For initial H-1B petition $7,300 to $31,800 (Combined cost of initial H-1B petition and extension)**

Figure 2

Cross-training Existing Employees

Besides hiring new employees, the other option for organizations looking to upskill their IT for the cloud is to cross-train current staff in cloud technologies. This comes with its own cost and risks. For existing employees to cross train, they will typically follow a set of certification courses with increasing difficulty and scope. An example of a common starting point is the AWS Solution Architect Associate exam. It's suggested that 50-60 hours be spent in study over a three month period to prepare for this exam. That's equal to 1.5 weeks of productivity.

Once this step is achieved, it's advised to spend two years working with the AWS cloud before taking the higher level Solutions Architect certification. There is simply no substitute for real-world experience.

There are also numerous specialty certifications in subjects such as security, advanced networking, and database management, representing skills that are likely to be needed for a journey to the cloud.

Having the right cloud security skills is essential. There are significant risks around putting Protected Health Information (PHI) into an environment if it's not entirely secure and fully compliant. The average cost of a healthcare breach in 2022 was 10.1 million dollars, up 40% from the year before. A breach leads to increased cyber security insurance premiums in the future, not to mention extensive reputational damage.

The final risk to consider when cross-training an existing team is the cost of potential failure. Most CIOs won't pay to take on a cloud project a second time if the first attempt does not go to plan. Additionally, even if a major cloud initiative is not a complete failure but is poorly architected, there is a strong chance that the organization will not realize the ROI from the cloud that they were initially anticipating.

With these considerations in place, let's now look at what a healthcare organization can expect when hiring a cloud team.

The Cost of the First Year of Productivity

The perfect candidate with the right skills, industry knowledge, and experience has been identified. The search is over, but now it's time to make an offer and predict the costs that will be accrued to get the first year of productivity from the new hire. With the average software engineer having a tenure of around three years at a given organization, it's crucial to get the new employee up to speed. What should an organization expect to pay for the first year of productivity?

Salary

Cloud engineers demand high salaries, and there will be a range of different experience levels that a healthcare organization will want to hire. Although a Senior Cloud Architect will be able to handle any issue they come across, it is wasted money to have them handle lower-level tasks that a support engineer at a lower salary can handle.

Employee Costs	Jr Cloud Engineer	Sr Cloud Engineer	Mid Career Architect	Sr Cloud Architect
Average Salary	$55,000-$110,000	$120,000-$175,000	$135,000-$240,000	$170,000-$275,000
Recruitment Cost	$11,000-$29,700	$24,000-$47,250	$27,000-$64,800	$34,000-$74,250
Onboarding	$4,700	$4,700	$4,700	$4,700
Overhead	$13,750-$27,500	$30,000-$43,750	$33,750-$60,000	$42,500-$68,750
Time to Productivity (3-6 Months)	$13,962-$55,846	$30,416-$88,846	$34,269-$121,846	$43,153-$139,615
Total Cost for One Year Productivity =	**$98,412-$227,746**	**$209,116-$359,546**	**$212,239-$438,566**	**$264,873-$500,085**

Figure 3. Cost Example

One of the strongest attributes that cloud computing offers is the ability to use automation to replace menial and repetitive tasks. Senior-level resources should focus on these efforts as well as on optimization of cloud resources for further cost reduction of cloud spend. With that said, Figure 3 shows some of the general salary ranges of these positions as well as the costs to expect in addition to the salary itself.

Recruitment fees

Since cloud engineers with a healthcare focus are difficult to find, a third-party recruitment firm will likely need to be engaged. While industry average rates range from 15-30% of the first-year salary, Cloud engineers typically run in the 20-27% fee range. This process normally takes 35-65+ days, depending on the specific requirements of the position.

Onboarding

The average onboarding cost for a new employee is around $4,700, but this does not account for soft costs. Interviews, screenings, decision-making meetings, and the impact on productivity due to the disruption are all soft costs that are incurred.

Benefits and overhead

For each employee that joins the organization, there are several factors that are part of the overhead accrued by the individual. Benefits, payroll taxes, insurance, payroll management, 401k matching, and employee devices all must be taken into consideration. If relocation is expected, this can significantly increase the initial overhead as well. For a new hire, relocation can vary from $19,309 to $97,166, but only 22% of cloud talent is open to relocation. This does not include any cost related to office space rental or ongoing work travel that may be required.

Ramp time

A final item that is often overlooked is the ramp-up time to productivity, that will vary from employee to employee. Although 3 to 6 months is typical for a new role, some engineering positions require as many as 11 to 12 months to ramp into a position fully.

Team Size

Once these costs are taken into consideration, it must be determined which roles should be hired to execute an organization's cloud strategy. Based on interviews with cloud architects, clients, and industry experts, Cloudticity has found general guidance for team size based on a monthly cloud spend of 10k, 25k, and 100k. (Figure 4)

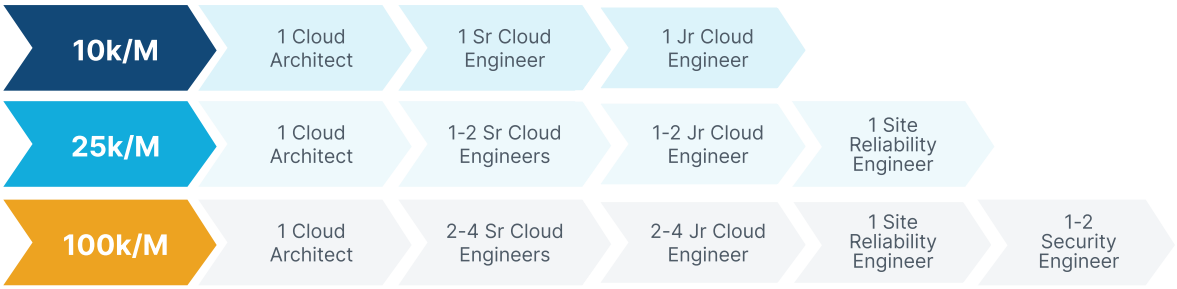


Figure 4. Typical Cloud Team – Health Tech

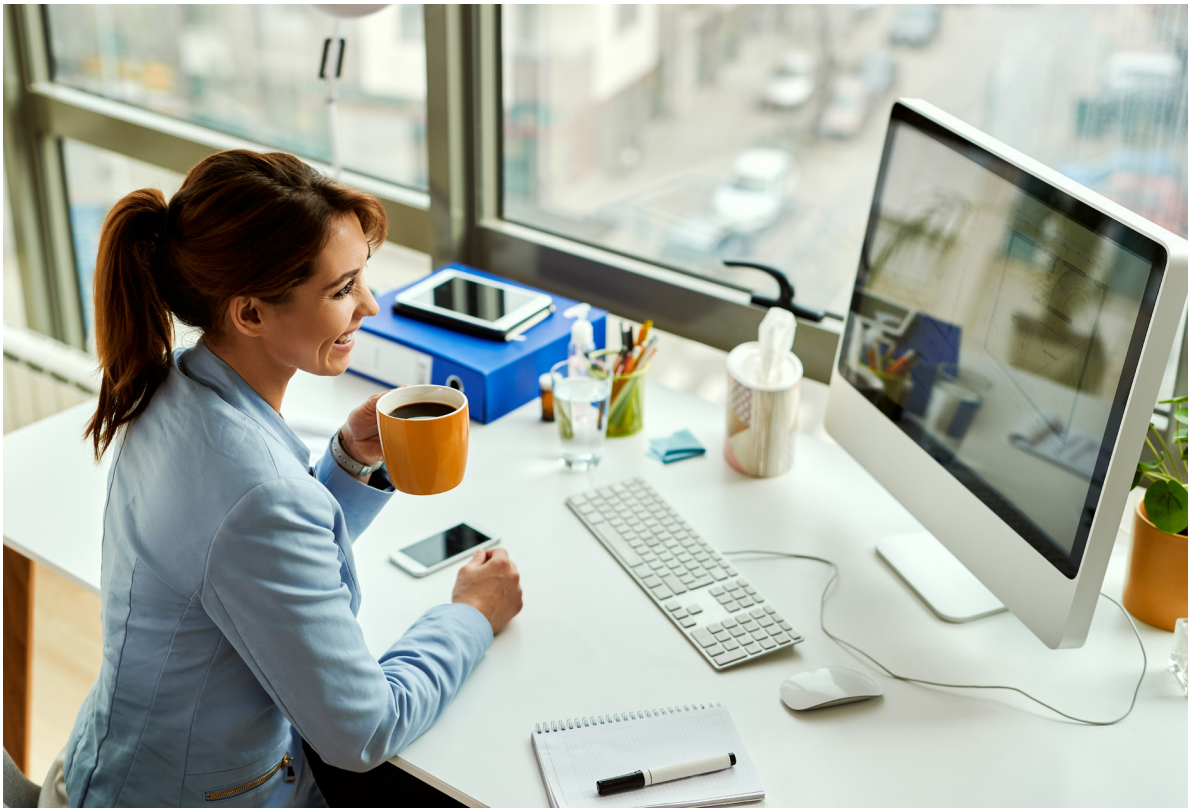
Note: Feedback in this study suggests that for small and medium sized organizations, it's common for engineers to wear multiple hats. There may or may not be engineers dedicated to security or site reliability on a full-time basis. There will also commonly be teams that employ junior level employees who both work in the day to day as well as are learning from senior level engineering talent.

This also does not account for large development teams who may have DevOps engineers or similar roles that interface with the cloud team on a regular basis. Every team will be different, but this example gives a solid starting point to determine basic needs.

Outsourcing

Even with the best team, there still may be tasks that require outside expertise. Many functions of cloud building, like infrastructure provisioning or configuring backups, are undifferentiated, meaning they apply to any company or industry building in the cloud. For these tasks, it may make sense to look to outside help. This will lower the number of required full time employees so that a smaller internal team can achieve the same results with greater simplicity.

In conclusion, there are many hidden costs that must be considered when building out a cloud team. In the next section, we will look beyond the people factor to evaluate the tools and other cost centers that play an impact on the overall value of the cloud.



2. THE COST OF TOOLS AND SERVICES IN THE CLOUD

While team size and composition can be modeled with relative accuracy, there is a large degree of variability in the costs associated with the cloud services, third-party tools, and overall usage of the cloud resources themselves. There are also many internal costs that will shift based on the move to the cloud.

The Cost Centers Reduced by the Cloud

There are physical equipment costs that involve everything from servers to cables. There are also items like windows licensing or cooling systems at physical facilities that are likely to disappear completely.

To evaluate these factors, there are five major cost centers to consider for IT. Each of these have on-premises costs that will change or disappear in the cloud as well as areas of potential benefits and efficiencies. There's a great deal of variability here, as cloud advantages are greatly dependent on how well the cloud is architected, configured, and managed.

With that in mind, consider figure 5 to consider existing on-premises costs that will be eliminated or altered by the move to the cloud.

Infrastructure	Physical Location	Staff	Licensing	Operations
Servers	Rent	Hiring	Windows	Hardware, software, and networking support
Storage Devices	Electricity	Training	Oracle Database	IT Training
Networking Equipment	Disaster Recovery Location	Employee Turnover	Security Tools	IT Staff Turnover
Configuration	Cooling	Overhead	Vulnerability Scanning Tools	System Administration
		Salaries	Patch Management	
		Governance Employees	DR Licensing	

Figure 5. On-Premises Costs Affected by Cloud

Infrastructure

Public cloud companies like AWS consistently promote savings on infrastructure costs of approximately 30% just by moving resources to the cloud. This comes through eliminating the individual costs of servers, storage, networking equipment, and baseline configuration by using physical infrastructure that is already prepared and provisioned in an AWS facility. It also eliminates the need to track physical assets and account for depreciation over time.

Physical Location

Moving away from the on-premises facility eliminates the need for rent, electricity, and cooling at physical locations with the additional benefit of allowing clients to easily spread to multiple locations. This is beneficial when considering Disaster Recovery, which requires full backups of IT resources in case of natural disasters or man-made emergencies. By selecting multiple regions and availability zones, it is possible to increase overall uptime and reduce cost. In areas of the country where facilities sell at a premium, this can be a significant advantage. Savings plans are also in place for companies who are willing to commit to a certain threshold of usage, meaning that these benefits will scale for companies with higher usage.

Licensing

The pay-as-you-go (or OpEx) licensing model dramatically changes the cost structure of licensing. This license type is typically easy to allocate, highly scalable, and cost-efficient. Costs are only accrued when a service is utilized, meaning unused resources such as disaster recovery do not require ongoing fees. Right-sizing resources to avoid overpayment is also a simple task.

Some licenses, such as Windows or Oracle Database, will be eliminated, and others will be replaced in part or in full with a cloud-native service. Many third-party software companies now offer pay-as-you-go cloud pricing, but costs may vary greatly depending on configuration and use, which will be discussed momentarily.

Staff

The cloud offers potential for significant savings. Through automation, infrastructure as code (IaC), and optimization efforts, the ongoing cost of operations can be reduced by up to 50 percent just by reducing the need for human interactions in daily tasks and maintenance. There can also be overall staff reductions for governance and system administration roles, leading to reduced staffing costs. Finally, as the future of AI supported technologies continues to develop, the number of tasks that can be accomplished through cloud technologies will only increase.

Operations

When it comes to daily operational costs, an organization must look at the time spent by staff and efficiencies in day-to-day tasks. Through the implementation of automation, many of the mundane and repetitive tasks such as performance monitoring and logging can require less human interaction. Maintenance can be performed from any location, and the time spent on maintaining physical equipment will be largely eliminated since those elements will be handled by the public cloud service provider (CSP).

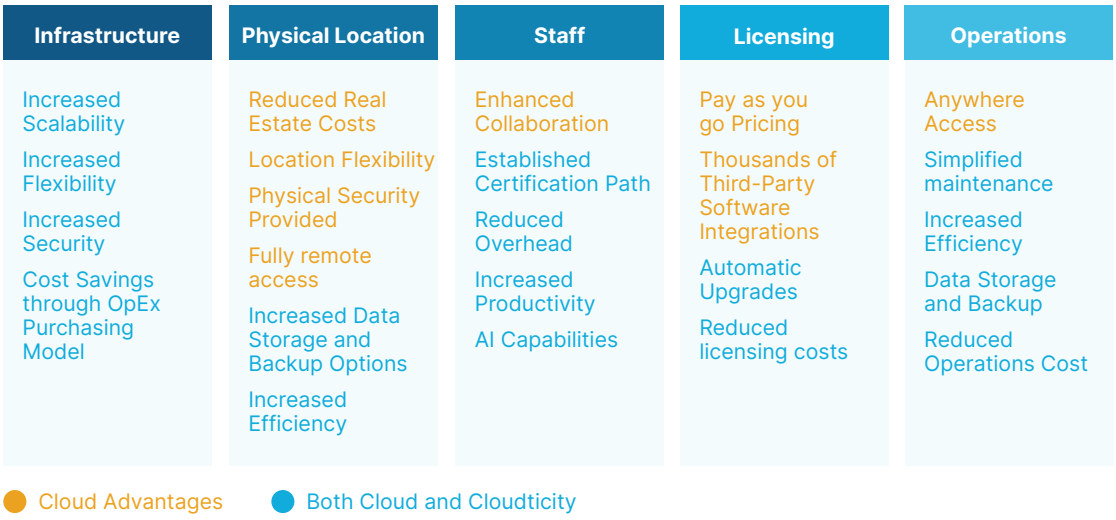


Figure 6. Advantages with Cloudticity Managed Services

Potential Areas For Cloud Advantages

Looking now at the positives the cloud can bring, figure 6 outlines some potential advantages the cloud presents. Numerous benefits are not automatic. Items such as full remote access and physical security are put in place by default by the CSP, so you won't have to worry about that anymore. But advantages like reduced operations costs and increased productivity will depend on how well the cloud is managed and used.

Items labeled in gray will be automatic cloud advantages for all users. Those in green are potential advantages that will deliver value relative to how optimally the cloud is used.

The Basic Cloud Tools Everyone Will Use

Next, it's important to understand the costs of cloud services and third-party tools needed to effectively manage the cloud.

CSPs such as AWS offer a variety of services, which makes it difficult to scope out an initial migration. Although there are many niche and exotic healthcare services that will be used situationally, such as Comprehend Medical, there are many which will be standard to most cloud configurations.

Below is a common example of an initial configuration for a healthcare cloud client. All costs are estimations and will vary based on use, creating the main reason that budgeting cloud projects can be tricky. Standard guidance for an EC2 instance is to include security, storage, resource management, backup and recovery and networking. You must also pick which locations you wish to deploy in, which can affect the cost greatly. All these add up to the bottom line, and you're just getting started!

Service	Upfront	Monthly	Yearly
AWS CloudFormation	$0.00	$26.48	$317.76
Amazon EC2	$247.03	$0.00	$247.03
Amazon EC2	$273.31	$0.00	$273.31
Amazon EC2	$798.91	$0.00	$798.91
AWS Lambda	$0.00	$0.00	$0.00
EBS	$0.00	$10.00	$120.00
RDS	$0.00	$0.00	$0.00
S3	$0.00	$15.00	$180.00
S3 Standard	$0.00	$6.90	$82.80
S3 Glacier Deep Archive	$0.00	$0.15	$1.80
Amazon CloudWatch	$0.00	$15.00	$180.00
AWS CodeDeploy	$0.00	$0.80	$9.60
Amazon Elastic Block Store (EBS)	$0.00	$71.90	$862.80
AWS Key Management Service	$0.00	$11.00	$132.00
	Upfront cost	**Monthly cost**	**Yearly cost**
	$1,319.26	**$157.23**	**$3,206.02**

Figure 7. Sample AWS Calculator Information

Advanced Services and Third-Party Tools

In addition to the core services provided by AWS, Azure, and Google Cloud, there are many popular niche services designed specifically for healthcare as well as numerous third-party integrations, each with differing levels of complexity. Products such as Crowdstrike or Trend Micro are commonly used for security. Datadog and Fortinet for Log Analysis. The list goes on with almost 3,000 potential vendors to choose from.

Knowing which stack will be most effective while maintaining a budget is extremely difficult without an experienced hand guiding you. Additionally, resource planning for the ongoing operation of these often-expensive tools must be factored in.

Consider Prisma Cloud by Palo Alto Networks, a popular security service suite with numerous API integrations. Figure 8 shows that a fair amount of time is needed to learn, plan, deploy, and configure the tool, but that is just in the implementation phase. For ongoing operations, tuning, and upgrades, an expert with a background in Prisma Cloud is necessary.

Without expert guidance, it's easy to fall into a cycle of alert fatigue leading to a failed operationalization of the product. If there are thousands of alerts without someone to manage these alerts efficiently, you have an expensive product with limited use.

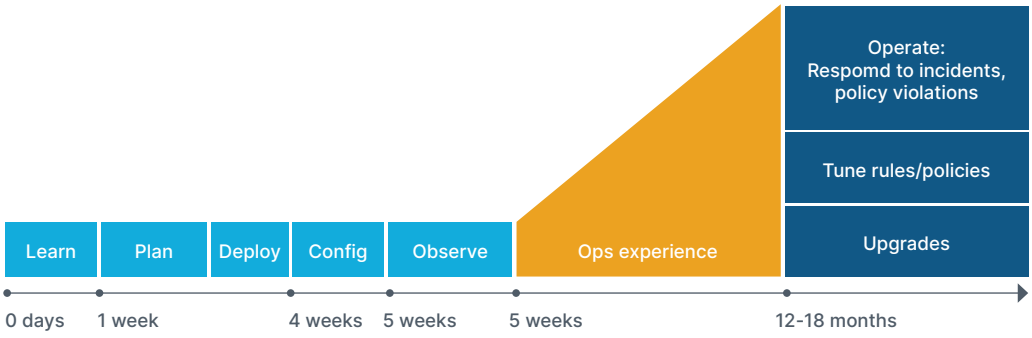


Figure 8. Source: Palo Alto Networks

3. THE COST OF ONGOING MANAGEMENT AND OPTIMIZATION

The third and most often overlooked area for consideration is the steps that will be necessary after initial cloud deployment for long-term success. Reaching the point where organizations can be confident that the cloud is secure, compliant, and agile takes long-term planning and continuous effort. In addition, new cybersecurity threats are deployed regularly and so security must be continually evaluated and redefined.

Compliance

Healthcare organizations are often bound to multiple compliance requirements, such as HIPAA, HITECH, HITRUST, FISMA, NIST, FedRAMP and more. You'll have to continually manage those requirements or face heavy fines.

If HITRUST certification is a requirement, it must be renewed every two years and involves a significant investment. This can be somewhat alleviated through programs like The Cloudticity HITRUST Inheritance Program, but otherwise will be largely manual.

Security

When looking at security, the healthcare industry is the most hacked because PHI records are precious on the black market. A recent report shows these records are worth $250 on average and sell for as high as $1,000 each. This means that security must be a priority both in its ability to keep out would-be intruders as well as the to identify threats and act on them quickly.

This is why it's also essential that automation is used for policy enforcement as often as possible, so human capital is not wasted on mundane tasks that software could do faster, with fewer errors.

Infrastructure as code (IaC) should be used to deploy resources to ensure they're secure compliant. Development teams tend to create a large number of instances for testing that may have vulnerabilities if security enforcement processes aren't in place.

Cloud Operations

Cloud environments must be continually monitored and updated to maintain optimal performance and cost savings. Without continuous auditing and managing of your cloud, unnecessary costs will accumulate.

In addition, as new and emerging capabilities come out around PaaS (Platform as a Service) services, there are going to be significant savings and performance opportunities for those who are prepared to use these technologies. But, to take advantage of these without incurring unnecessary expenses or negatively affecting performance, the environment needs to be architected correctly. For example, it should leverage automated scaling and measure up to the principles of the Well Architected Framework.

Taking in account all of these challenges and complexities, it makes sense to look for help from experts who can simplify the process, alleviate costs, and help you maximize the value you get from cloud.



WHY CONSIDER CLOUDTICITY AS A MANAGED SERVICE PROVIDE

Rather than go through the strenuous efforts described previously, in many cases it makes more sense to find a cloud partner who can guide you through the planning, implementation, and ongoing support needed for a successful cloud experience. Below are 4 things to consider when choosing an MSP partner for your healthcare cloud.

Cloud expertise and credentials

Cloudticity was designed from day one to be a 100% public cloud healthcare resource. To help healthcare organizations in their journey to the cloud, Cloudticity has invested in some of the best cloud engineers in the industry, with a large range of certifications and capabilities. Figure 9 shows the current certifications throughout the organization, with most of these being held by multiple individuals in the company. Whether there is a security incident that needs immediate attention, a compliance audit on the horizon, or a custom project requiring professional services, Cloudticity will always have resources available to help.

Cloudticity Certifications Service
(AWS) AWS Certified Cloud Practitioner (CLF)
(AWS) AWS Certified Developer - Associate (DVA)
(AWS) AWS Certified Solutions Architect - Professional (SAP)
(AWS) AWS Certified DevOps Engineer - Professional (DOP)
(AWS) AWS Certified Security - Specialty (SCS)
(AWS) AWS Certified Solutions Architect - Associate (SAA)
(AWS) AWS Certified Solutions Architect - Professional (SAP)
(AWS) AWS Certified SysOps Administrator - Associate (SOA)
(Microsoft) Azure Administrator - Associate (AZ-104)
(Microsoft) Azure Developer - Associate (AZ-204)
(Microsoft) Azure DevOps Solution (AZ-400)
(Microsoft) Azure Fundamentals (AZ-900)
(Microsoft) Azure Network Engineer Associate (AZ-700)
(Microsoft) Azure Security Engineer - Associate (AZ-500)
(Microsoft) Configuring and Operating Microsoft Azure Virtual Desktop (AZ-140)
(Microsoft) Microsoft 365 Certified: Fundamentals (MS-900)
(Microsoft) Windows 2019 Hybrid assessment (18872)
(Other) ITIL Certification
(Other) Project Management Professional (PMP)
(Other) VMware VCP
(Other) HashiCorp Certified: Terraform Associate
(Other) Deep Security 10.0 Certified Professional Exam



Figure 9

Cloudticity also has the advantage of being long-term partners with both AWS and Azure, in many cases helping to drive the development of healthcare-specific technologies, such as the APIs for Azure healthcare cloud.

For organizations considering an MSP to build and manage cloud resources, partner programs are a great way to vet their capabilities. To become a Premiere Tier Services Partner at AWS for instance, an organization must have a large number of certified resources, vetted planning capabilities, and a history of customer success.

Ownership and access to your resources

Many MSPs restrict how client clouds are built, requiring a ticketing system to access your resources. Cloudticity does not operate this way. The cloud is custom-built for each client, allowing both flexibility in design and complete ownership of resources for the customer. Pricing is scaled based on cloud spend, so there is no nickel or diming over access to our services.

Most importantly, because Cloudticity is hyper-focused on healthcare, every employee will understand the client's specific situations related to PHI protection, large Electronic Health Records (EHR) systems, HL7 FHIR data specifications, and the conversations that happen at healthcare organizations to get projects approved and operational.

Proven Technology

Does the MSP use a set of services and third-party software that makes sense together? Do they offer proprietary technologies that help manage the day to day needs of your organization? Is there a track record of these technologies being efficient and effective for organizations like you?

Through the last decade, Cloudticity has worked to create IaC so that most instances that are commonly used in healthcare can be deployed quickly and easily with the click of a few buttons. This includes security controls and compliant design so that clients can be confident that new resources will be safe and secure.

Automation scripts are also heavily leveraged so that redundant tasks which are typically performed by people can be automatically taken care of, reducing mistakes related to human error. This is all tied together into the Cloudticity Oxygen™ platform.

Oxygen is a first-of-its-kind platform that is purpose-built for healthcare. It uses automation and AIOps to centralize security, compliance, availability, and cost information into a single dashboard. This system performs remediation on over 90% of compliance and security events in our customs public cloud resources, allowing them to focus on those issues which are most important.

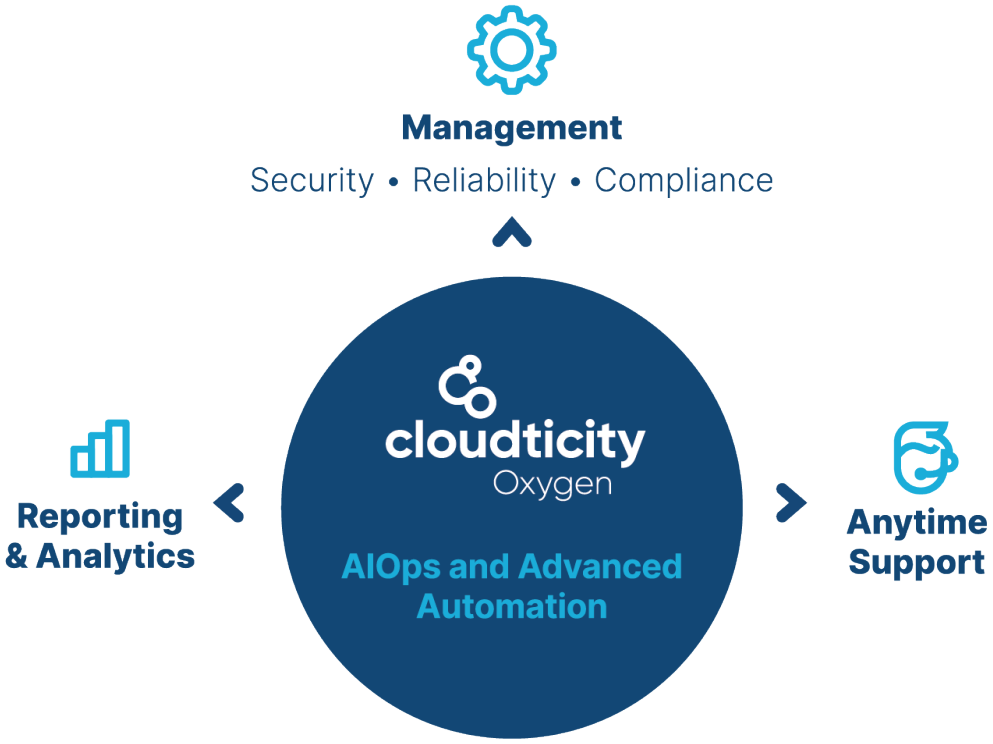


Figure 10.

Proven Process

Make sure the provider has processes in place for long term-growth and sustainability. Will Well-Architected reviews be included as part of the service, or will that be a separate engagement? What plans are put in place for growth and optimization over time? Is the provider going to build the infrastructure and then leave the rest up to you or are they going to be a long-term partner? These are all important questions to ask because not all MSPs are built the same.

At Cloudticity, we have identified a 5-step process called the Customer Value Journey (figure 11) that identifies where a client is in their current cloud journey and designs steps to transform them to a cloud experience that is fully optimized, efficient, and ready for any emerging technologies that come to market. Whether completely new to the cloud or looking to create a more efficient, more secure cloud, Cloudticity can identify what is needed and create a long-term plan. This means that cost savings can be fully realized, and processes will be created that require a minimal labor footprint on the client's side.

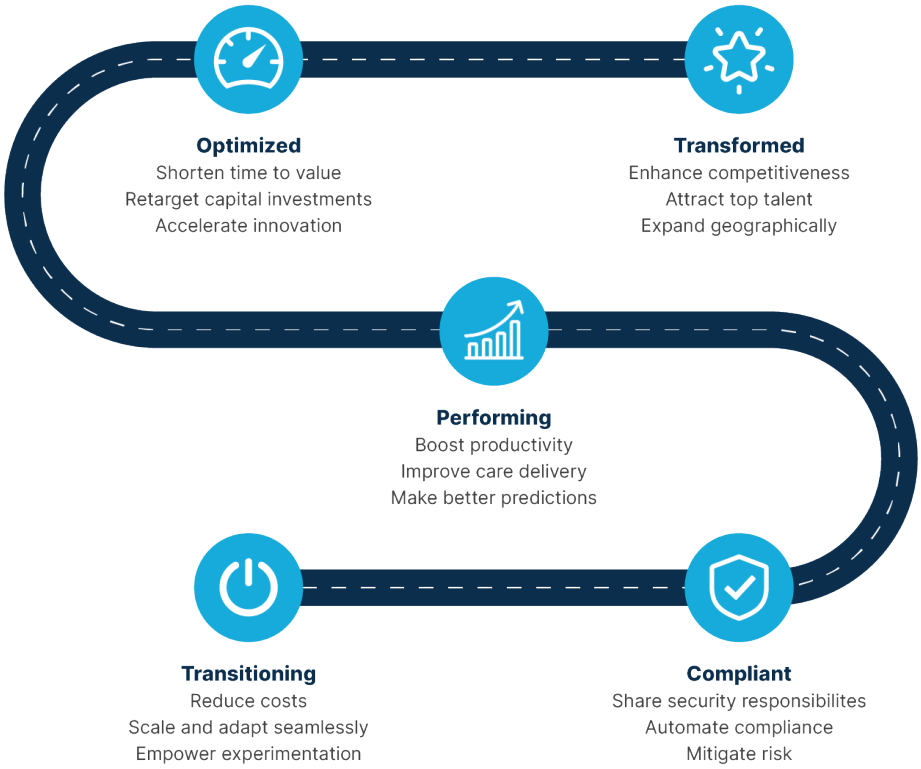


Figure 11

A CUSTOMER EXAMPLE

Now that the advantages of an MSP have been examined, let's look at a couple of examples of what a customer might expect from an engagement with Cloudticity.

When undertaking a new cloud initiative, clients will typically plan a budget that calculates both the upfront costs of moving into the cloud and a model for what the monthly expenditure will look like. For modeling purposes, let's look at an organization that expects to spend about ten thousand dollars per month with a fifty thousand dollars upfront budget.

Standard Budgeting

A typical budgeting exercise may look like what is presented in Figure 12 and is what many clients perform. There are calculations for training and migration costs as well as discretionary spending. The monthly costs will consider additional overhead for IT Management and Third-Party software. An MSP such as Cloudticity will be able to save on some of the upfront costs based on their experience but may cost a bit more monthly in fees to have continuing access to their expertise. This is where many organizations start their budgeting process, but it tends to grossly underestimate the cost of having a team that can properly execute this vision.

Upfront Costs

Category	Without MSP	With Cloudticity	Savings
Migration Costs	$20,000	$16,000	$4,000
Training Costs	$15,000	$10,500	$4,500
Software Licenses	$10,000	$8,500	$1,500
Other Upfront Costs	$5,000	$4,000	$1,000
Total Initial Investment	**$50,000**	**$39,000**	**$11,000**

Monthly Costs

Category	Without MSP	With Cloudticity
AWS Service Costs	$25,000	$22,500
IT Management & Support	$7,500	N/A
Cloudticity MSP Fees	N/A	$20,250
Third-Party Software Licenses	$3,750	$3,375
Total Ongoing Monthly Costs	**$36,250**	**$46,125**

Figure 12. Cloud Investment – 25k Monthly Cloud Spend

Personnel Considerations

Based on the feedback from Figure 3, consider the personnel numbers that should be assumed in this example when calculating the cost of people. A team for a twenty five thousand dollar per month deployment would require approximately five engineers: two Junior Cloud Engineers, a Senior Cloud Engineer, a Site Reliability Engineer, and a Cloud Architect. If the client chose an MSP such as Cloudticity, a smaller team would be needed to interface with the Cloudticity team (Figure 13).

10k/m Assumptions	25k/m Assumptions	100k/m Assumptions
AWS Monthly Spend: $10,000 Up front cost: $50,000 Team if pursued alone: • 1 Cloud Architect • 1 Junior Cloud Engineer • 1 Senior Cloud Engineer Team with Cloudticity • 1 Junior Cloud Engineer	AWS Monthly Spend: $25,000 Up Front Cost: $50,000 Team if pursued alone: • 1 Cloud Architect • 2 Junior Cloud Engineer • 1 Senior Cloud Engineer • 1 Site Reliability Engineer Team with Cloudticity • 1 Junior Cloud Engineer • 1 Senior Cloud Engineer	AWS Monthly Spend: 100K Up front cost: 275K Team if pursued alone: • 1 Cloud Architect • 2 Junior Cloud Engineer • 4 Senior Cloud Engineer • 1 Site Reliability Engineer • 2 Security Engineers Team with Cloudticity • 2 Junior Cloud Engineer • 2 Senior Cloud Engineer

Figure 13. Assumptions Combined

Once calculating the cost of the cloud team necessary to build and maintain the cloud environment, the project's true cost can change significantly. Accounting for recruitment fees for cloud engineers, a three-month employee ramp time, and the overhead that comes in addition to the employee salaries, the numbers start to paint a different story (figure 14).

Upfront Costs

Category	Without MSP	With Cloudticity	Savings
Recruitment Fees	$185,000	$57,500	$127,500
Ramp Time	$187,844	$58,385	$129,459
Internal Costs	$23,500	$9,400	$14,100
Total Initial Investment	**$396,344**	**$125,285**	**$271,059**

Monthly Costs

Category	Without MSP	With Cloudticity	Savings
Salaries	$61,667	$19,166	$42,501
Overhead	$15,416	$4,792	$10,624
Internal Costs	$1,958	$783	$1,175
MSP Fee	$0	$20,250	$ - 20,250
Total Ongoing Monthly Costs	**$79,041**	**$44,991**	**$34,050**

Assuming 5-man team composed of Junior Cloud Engineer ($85,000), 2 Senior Cloud Engineers ($145,000), Cloud Architect($190,000), and Reliability Engineer ($175,000)

Figure 14. Personnel Investment – 25k Monthly Cloud Spend

Budgeting Reality

With the cost of team building considered, utilizing the experience of an MSP like Cloudticity becomes more financially sound. There is a gap between the perception and the reality of a project when combining the initial projections with the personnel figures (figure 15). The cost of time, personnel, and risk of failure add up quickly. This is why many organizations find themselves drastically over budget and lagging on timelines as they search for cloud talent or have to train existing employees. This holds true for organizations with larger cloud footprints (figure 16 & 17). As the cloud need grows, the complexity of needs, and therefore specialized talent, increases as well.

On a final note, it is common for organizations to take on a cloud initiative

Based on 10k/M

PERCEPTION

Costs	Solo	With MSP
Upfront	$50,000	$39,000
Monthly	$14,500	$19,275
Year 1 Total	$224,000	$270,300

REALITY

Costs	Solo	With MSP
Upfront	$274,100	$86,526
Monthly	$60,050	$29,194
Year 1 Total	$994,700	$436,854

Assuming 3-man team composed of1 Junior Cloud Engineer ($85,000), 1 Senior Cloud Engineer ($145,000), and 1 Cloud Architect($190,000)

56% Potential Savings

Figure 15

Based on 25k/M

PERCEPTION

Costs	Solo	With MSP
Upfront	$50,000	$39,000
Monthly	$36,250	$46,125
Year 1 Total	$485,000	$592,500

REALITY

Costs	Solo	With MSP
Upfront	$446,334	$164,285
Monthly	$115,291	$70,886
Year 1 Total	$1,829,826	$1,041,917

Assuming 5-man team composed of1 Junior Cloud Engineer ($85,000), 2 Senior Cloud Engineer ($145,000), 1 Cloud Architect($190,000), and 1 Reliability Engineer ($175,000)

44% Potential Savings

Figure 16

Based on 100k/M

PERCEPTION

Costs	Solo	With MSP
Upfront	$275,000	$206,250
Monthly	$145,000	$178,500
Year 1 Total	$2,015,000	$2,348,250

REALITY

Costs	Solo	With MSP
Upfront	$1,060,401	$453,164
Monthly	$302,562	$227,982
Year 1 Total	$4,691,145	$3,188,948

Assuming 5-man team composed of1 Junior Cloud Engineer ($85,000), 2 Senior Cloud Engineer ($145,000), 1 Cloud Architect($190,000), 1 Reliability Engineer ($175,000), and 2 Security Engineer ($180,000)

34% Potential Savings

Figure 17

internally only to find themselves in a situation where cloud costs have skyrocketed, and the existing team is struggling to get them under control. Many conversations start at this point, which does not mean that all is lost.

Cloudticity has helped countless organizations to get costs under control and create a plan for success. Consider Figure 18, which shows actual client data from a company with this problem. This client found themselves in a situation where their monthly bill had skyrocketed over time, and they needed quick action to alleviate the situation. After engaging with Cloudticity optimization and cost reduction efforts significantly reduced the monthly cloud cost in a matter of a few months. This trend continued in the following months, and the client is now in a much safer position that is optimized for future projects. This is why Cloudticity is in the business it is and can be a valuable resource for most organizations

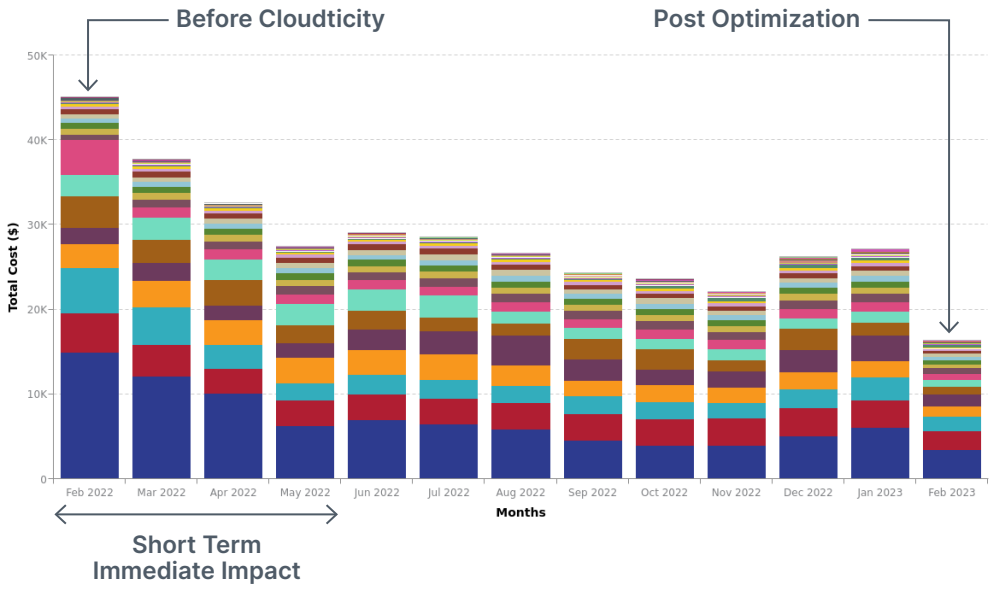
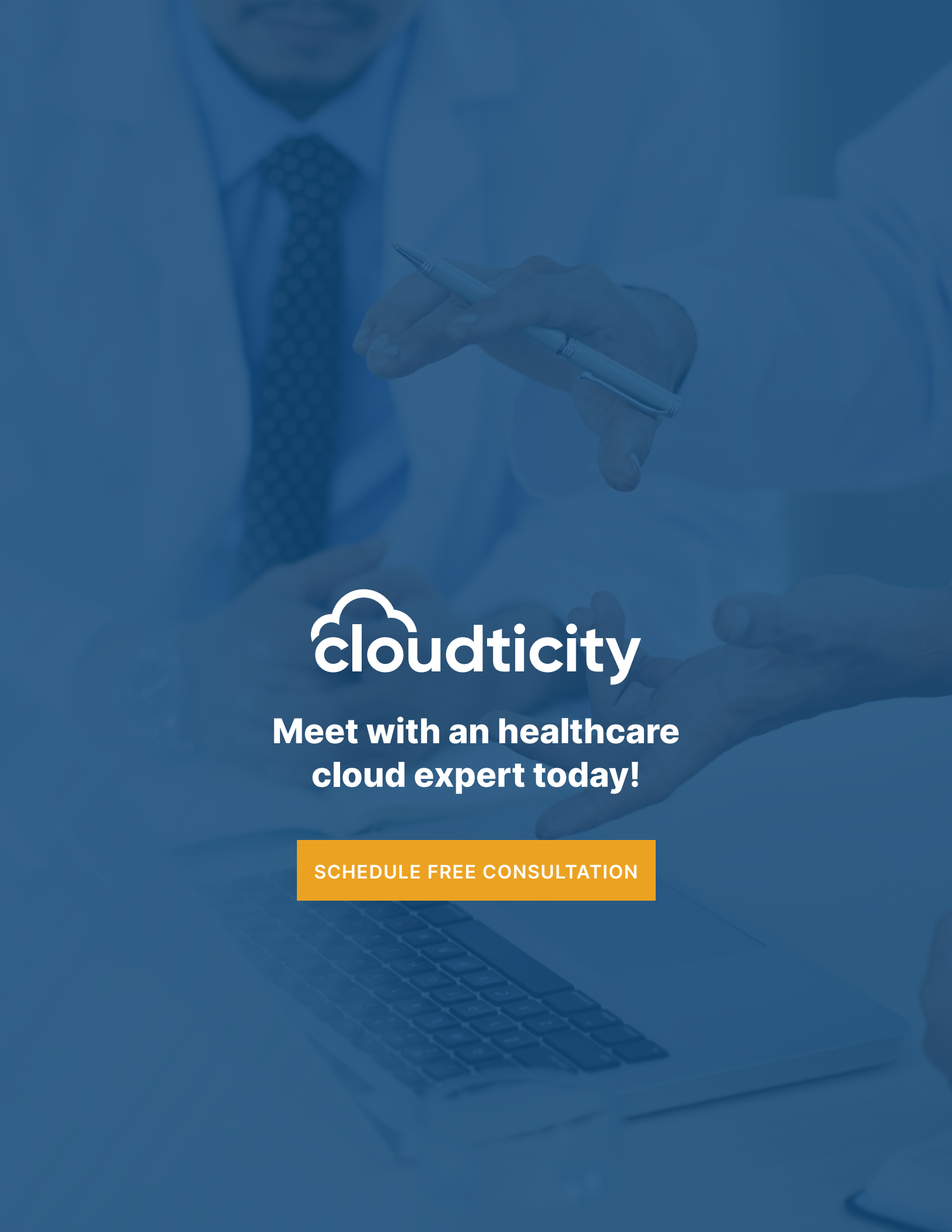


Figure 18. ROI - A Practical Example

CONCLUSION

There is only one opportunity to build the cloud right the first time. With experienced talent, the right tools, and the right plan, it will be easier to get the expected return from your cloud investment. And with the right partner, you can avoid pitfalls and realize all the potential benefits from cloud.

Cloudticity has over a decade of proven experience and currently protects over 150 million patient records. Fill out our contact form to schedule a free consultation with a healthcare cloud expert today.


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