

HIMSS Analytics



2016 HIMSS Analytics Cloud Survey

Sponsored by  **ClearDATA**
SECURE • HEALTHCARE • CLOUD

October 2016

Contents

Executive Summary | 3

Methodology/Respondents | 4

Findings | 6

 What are Cloud Services? | 6

 Use of Cloud Services | 7

 Users of Cloud Services | 9

 Summary of Cloud Services Models | 10

 Cloud Solution Providers Summary | 12

 Future of Use of Cloud Services | 17

Conclusion | 21

Appendix | 22

Executive Summary

As demonstrated in previous industry research, such as the 2014 HIMSS Analytics Cloud Study, healthcare organizations have steadily adopted cloud-based solutions. The 2016 HIMSS Analytics Cloud Study, sponsored by ClearDATA, serves to continue past research, focusing on the largest hospitals and healthcare systems in the nation. Responses from 50 healthcare IT executives are within, containing the status and perspectives of their organizations use of cloud-based services. In addition, the research covers some of the challenges and concerns with moving to cloud-based models.

In 2014, approximately 83% of respondents reported using cloud services. The total number of responding organizations using cloud services increased one percentage point to 84% in 2016. When grouping cloud usage areas into categories, IT and administrative functions are most in use. IT functions include backups and disaster recovery, hosting archived data and virtual environments. Administrative functions are financial, operational and human resources applications. With nearly half of participating organizations using cloud-based analytics applications and data, it is the most reported single area of cloud usage. In addition, three-quarters of this year's respondents state that their organization has plans to move new or existing workloads to the cloud.

Software as a Service (SaaS) and Infrastructure as a Service (IaaS) models are the most in use by participating organizations. Three or more SaaS service providers and two or less IaaS service providers tend to be in use. Cloud computing models are most often private clouds. Approximately three-quarters of organizations' cloud computing is on private clouds.

The factors healthcare organizations consider when selecting solution providers, reasons for moving applications and data to the cloud, challenges with service providers in this area and concerns before utilizing cloud services are next uncovered in the 2016 study. Adherence to regulatory requirements is the highest ranked factor healthcare organizations consider when selecting a cloud provider. The top reasons for adopting cloud solutions include performance and reliability and ease of management. The most challenges with cloud service providers are around cost and fees. However, 18% of respondents report no challenges with their cloud providers. Being able to meet organization expectations and openly communicating could help reduce issues that come up with service providers. Finally, to measure the value of cloud service adoption, organizations are most frequently augmenting technical capabilities, although financial metrics is the top way to measure value. In the context of costs and fees being the biggest challenges organizations experience, there should be ways to measure those aspects when working with a service provider.

This report summarizes the findings around cloud-based usage and adoption in the healthcare industry to monitor progress and challenges organizations face.

Methodology/Respondents

Methodological Approach:	Web-based survey
Dates of Data Collection:	October 6 through October 27, 2016
Target Audience(s):	IT Directors and Executives from Healthcare Provider Organizations
Total Respondents:	50 individuals

Organization Type

- Approximately the same amount of respondents of this study work at stand-alone hospitals (36%) or hospitals part of a delivery system (34%). The remaining 30% work at the corporate offices of a healthcare system.

Table 1: Organization Type

By what type of organization are you employed?

Organization Type	Frequency	Percent
Stand-alone Hospital	18	36.0%
Hospital that is Part of a Delivery System	17	34.0%
Corporate Offices of a Healthcare System	15	30.0%
Total	50	100.0%

Organization Size

- Over two-thirds (68%) of participants work at organizations with over 250 beds, representing the larger healthcare systems and hospitals across the country.

Table 2: Organization Size

Which of the following describes the number of beds in your organization?

Organization Bed Size	Frequency	Percent
50-100 beds	6	12.0%
101-250 beds	10	20.0%
251-500 beds	16	32.0%
More than 500 beds	18	36.0%
Total	50	100.0%

Respondent Title

- The vast majority of respondents (94%) are at a director level or above with over half (58%) holding a director level position and another 32% are at a senior executive or c-suite level.

Table 3: Respondent Title

Which best describes the level of your title?

Title Level	Frequency	Percent
Director	29	58.0%
Senior Executive or C-Suite	16	32.0%
Analyst	3	6.0%
Vice President	2	4.0%
Total	50	100.0%

Area of Primary Responsibility

- Over half (56%) of participants primarily work in or have responsibilities over IT, infrastructure and networks.

Table 4: Areas of Responsibility

Which of the following best describes your primary role/area of responsibilities?

Area	Frequency	Percent
IT/Infrastructure/Network	28	56.0%
Operations	8	16.0%
Informatics	7	14.0%
Security/Compliance	4	8.0%
Other ¹	3	6.0%
Total	50	100.0%

¹ Other areas of responsibility include project management, quality and regulatory

Findings

What are Cloud Services?

Items Included in Cloud Services Definition

The study begins by establishing how IT executives define cloud services.

- **Hosting of applications, disaster recovery/backup and hosting of primary data storage were key areas included in respondents' definitions of cloud services.**
- **Two-thirds (68%) to three-quarters (78%) of participants think of one of these areas as part of a cloud services definition.**

Table 5: Definition of Cloud Services
When you think of cloud services, which of the below come to mind as part of that definition?

Area	Frequency	Percent
Hosting of Applications	39	78.0%
Disaster Recover/Backup	35	70.0%
Hosting of Primary Data Storage (e.g. Application	34	68.0%
Hosting of Archived Data	31	62.0%
Hosted E-Mail Services	30	60.0%
Virtual Servers	26	52.0%
Managed Database Services	23	46.0%
Managed Services	21	42.0%
Other	1	2.0%
Don't Know	0	0.0%
Total	50	100.0%

Number of Items Included in Cloud Services Definition

- Healthcare organizations have very inclusive definitions of cloud services, including an average of 4.8 of the items in their definition.
- 16% of respondents include eight or more items as part of their definition.

Table 6: Number of Areas Considered as Part of Cloud Definition

Number of areas in Table 5 above in which organizations include in a cloud services definition.²

Number of Areas Selected	Frequency	Percent
1	7	14.0%
2	1	2.0%
3	6	12.0%
4	9	18.0%
5	7	14.0%
6	7	14.0%
7	5	10.0%
8	7	14.0%
9	1	2.0%
Total	50	100.0%

Use of Cloud Services

Summary of Cloud Use

Respondents were then asked a series of questions identifying their current and future use of cloud services.

- The answers to these questions were consolidated to create a single metric of cloud use revealing that the majority of respondents (84%) report their healthcare organizations presently use cloud services.
- In addition, three-quarters (76%) of respondents indicate their organization is moving an existing or new workload to the cloud.

Table 7: Summary of Cloud Services Use

This table represents an aggregation of data on current and future cloud use.

Status	Frequency	Percent
Currently Use Cloud Services	42	84.0%
Existing or New Workloads Moving to Cloud	38	76.0%
Total	50	100.0%

² The numbers below represent the total number of areas for which an IT executive reports using cloud services at their healthcare organization. For example, if a respondent identified both “hosting of primary data storage” and “hosting of archived data”, they would have received a score of a “2” in this table.

Present and Future State of Cloud Services

Respondents were asked how their healthcare organizations use cloud services now, as well as workloads they were planning to move to the cloud in the next year. Respondents not using cloud services for an area currently were asked to identify which areas their healthcare organization expected to use cloud services for in the future.

- Respondents most commonly report that their healthcare organizations use cloud services for hosting analytics applications.
- The most plans for a new workload moving to the cloud is the hosting of archived data followed by backups/disaster recovery and hosting of back office applications.
- Hosting of back office applications and server virtualization are existing workloads most likely to move to the cloud in the next year.
- Cloud services are least likely to be used for hosting development environments, virtual networks and desktop virtualization.

Table 8: Current Areas of Cloud Applications

How is your organization using cloud services now?

Areas of Usage	Currently in Use	Existing Workload Moving to Cloud	New Workload Moving to Cloud	Not in Use and No Plans ³
Hosting of analytics applications and data	48.0%	8.0%	12.0%	32.0%
Hosting of financial applications and data	42.0%	10.0%	8.0%	40.0%
Hosting of operational applications and data	42.0%	4.0%	14.0%	40.0%
Hosting of human resources applications and data	40.0%	12.0%	6.0%	42.0%
Backups and disaster recovery	38.0%	8.0%	16.0%	38.0%
Hosting of clinical applications and data	34.0%	8.0%	12.0%	46.0%
Hosting of archived data	32.0%	10.0%	20.0%	38.0%
Hosting of communications services	32.0%	12.0%	8.0%	48.0%
Managed Services	32.0%	8.0%	14.0%	46.0%
Health Information Exchange	30.0%	12.0%	6.0%	52.0%
Server Virtualization	24.0%	14.0%	12.0%	50.0%
Hosting of back office applications and data	22.0%	14.0%	16.0%	48.0%
Accountable Care Organization	18.0%	8.0%	12.0%	62.0%
Desktop Virtualization	16.0%	8.0%	10.0%	66.0%
Virtual Networks	14.0%	12.0%	8.0%	66.0%
Hosting of development environments	12.0%	6.0%	12.0%	70.0%

N = 50

³ Calculated from the percentage remaining that were not using the cloud and did not have plans to move a new or existing workload to the cloud.

Uses of Cloud Services

How Cloud Services Are Currently Being Used

The individual areas for cloud usage from the study are grouped into five categories to evaluate broad areas of use. The categorization of each element into the broader group is described below.

- While nearly half (48%) of organizations use cloud services for analytics applications, when grouping the cloud usage areas, over three-quarters of organizations use cloud services for IT and administrative functions (85.7% and 81%, respectively).

Table 9: Areas of Cloud Services Use

How is your organization using cloud services now?

Cloud Usage Area	Frequency	Percent
IT	36	85.7%
Administrative	34	81.0%
Analytics	24	57.1%
Clinical	17	40.5%
External Data Sharing	17	40.5%
IT	36	85.7%
Total	42	100.0%

Administrative Functions and, in particular, applications and information include:

- Hosting of financial applications and data
- Hosting of operational applications and data
- Hosting of HR applications and data
- Hosting of back office applications and data

IT Functions include the following:

- Backups and disaster recovery
- Desktop Virtualization
- Hosting of archived data
- Hosting of communications services (e-mail, voice, etc.)
- Hosting of development environments
- Managed Services (outsourced services for network monitoring, data analytics, security monitoring)
- Server Virtualization
- Virtual Networks

Analytics Applications & Data include:

- Hosting of analytics applications and data

Clinical Applications & Data include:

- Hosting of clinical applications and data

External Data Sharing includes:

- Health Information Exchange
- Accountable Care Organizations

- Hosting analytics applications is the most common area healthcare organizations rely on cloud services.
- Half of organizations using cloud services today have financial or operational applications and data in the cloud.
- The vast majority of respondents using cloud services (93%) indicate that their healthcare organization use cloud services to support two or more functions.

Table 10: Areas of Cloud Services Use

How is your organization using cloud services now?

Area	Frequency	Percent
Hosting of analytics applications and data	24	57.1%
Hosting of financial applications and data	21	50.0%
Hosting of operational applications and data	21	50.0%
Hosting of human resources applications and data	20	47.6%
Backups and disaster recovery	19	45.2%
Hosting of clinical applications and data	17	40.5%
Hosting of archived data	16	38.1%
Hosting of communications services	16	38.1%
Managed Services	16	38.1%
Health Information Exchange	15	35.7%
Server Virtualization	12	28.6%
Hosting of back office applications and data	11	26.2%
Accountable Care Organization	9	21.4%
Desktop Virtualization	8	19.0%
Virtual Networks	7	16.7%
Hosting of development environments	6	14.3%
Other	1	2.4%
Total	42	100.0%

Table 11: Areas of Cloud Services UseNumber of areas in Table 10 above in which organizations are using cloud services.⁴

Number of Areas	Frequency	Percent
1	3	7.1%
2	4	9.5%
3	7	16.7%
4	5	11.9%
5	5	11.9%
6	5	11.9%
7	2	4.8%
9	5	11.9%
10	2	4.8%
More than 10	4	9.5%
Total	42	100.0%

⁴ The numbers below represent the total number of areas for which an IT executive reports using cloud services at their healthcare organization. For example, if a respondent identified both "hosting of primary data storage" and "hosting of archived data", they would have received a score of a "2" in this table.

Summary of Cloud Services Models

Cloud Solution Models

The number of cloud service providers by service model was provided from responding organizations. The following types of service models and examples were presented and defined.

IaaS (Infrastructure as a Service): raw storage, backup and/or computing resources

PaaS (Platform as a Service): development environments

SaaS (Software as a Service): hosted Electronic Health Record (EHR) applications

CaaS (Containers as a Service): Docker, Kubernetes

Enterprise Resource Planning (ERP) applications⁵

- **Software as a Service (SaaS) providers are most in use. Organizations tend to have three or more SaaS providers.**
- **Infrastructure as a Service (IaaS) providers are the second most in use. Organizations usually have one or two providers for this model.**
- **Cloud service providers are least likely to be in use for a Containers as a Service (CaaS) model. Nearly half of participating organizations have zero service CaaS providers.**

Table 12: Number of Cloud Service Providers by Service Model

Approximately how many cloud service providers are you currently using for each type of cloud service model?

Model	Frequency Selecting					
	1 or more ⁶	0	1	2	3	4+
IaaS	33	10.9%	37.0%	23.9%	4.3%	6.5%
PaaS	17	33.3%	21.4%	11.9%	4.8%	2.4%
SaaS	34	14.9%	12.8%	17.0%	19.1%	23.4%
CaaS	6	47.5%	2.5%	7.5%	2.5%	2.5%
ERP	21	32.6%	32.6%	9.3%	4.7%	2.3%

N = 42

Next, the adoption of public and private cloud computing models is explored.

- **Cloud computing models tend to be private clouds with nearly three-quarters (74.4%) of cloud computing on average to be on this model.**
- **Nearly one-quarter (24%) of respondents indicate that their organization does not use public clouds while over half (54%) have 76% or more of their cloud computing on a private cloud.**

Table 13: Average Percentage of Cloud Computing by Model Type

Approximately what percentage of your organization's cloud computing model is public versus private?

	Private Cloud	Public Cloud
Average Percent	74.4%	25.6%

⁵ No additional details were provided for this model.

⁶ Respondents were also able to indicate if they did not know the number of service providers for each model.

Table 14: Distribution of Percent for Service Model

Approximately what percentage of your organization's cloud computing model is public versus private?

Percentage of Cloud Model Range	Private	Public
0%	2.0%	24.0%
1-25%	4.0%	32.0%
26-50%	16.0%	36.0%
51-75%	24.0%	4.0%
76-100%	54.0%	4.0%
Total	100.0%	100.0%

Cloud Solution Providers Summary

Factors Considered When Selecting a Cloud Services Provider

Respondents report on the top factors considered when selecting cloud service providers⁷.

- Adherence to regulatory requirements such as HIPAA and HITECH is the most frequently reported factor considered when selecting cloud service providers. Over half of respondents indicate it as one of the top three factors their organization considers. Thirty (30) percent rate it as their top consideration factor.
- At the other end of the spectrum, only two percent give consideration to a cloud service provider's availability of micro services.

Table 15: Top Factors Considered When Selecting a Cloud Services Provider

What are the top 3 factors your organization considers when selecting a cloud services provider?⁸

Factor	1	2	3	Total
Adherence to regulatory requirements (HIPAA, HITECH)	30.0%	18.0%	6.0%	54.0%
Willingness to meet your BAA requirements	6.0%	16.0%	16.0%	38.0%
Technical security of cloud service provider	12.0%	10.0%	10.0%	32.0%
Industry reputation and/or peer references	12.0%	10.0%	8.0%	30.0%
Service Level Agreement (SLA)	6.0%	14.0%	8.0%	28.0%
Healthcare focus or exclusivity	12.0%	6.0%	6.0%	24.0%
Physical security of cloud service provider	10.0%	8.0%	6.0%	24.0%
Administrative security of cloud service provider	2.0%	8.0%	12.0%	22.0%
Certifications (HITRUST, SOC1, PCI DSS)	6.0%	2.0%	12.0%	20.0%
Availability of managed services or automation	0.0%	2.0%	8.0%	10.0%
Other	0.0%	0.0%	4.0%	4.0%
Availability of micro-services	0.0%	2.0%	0.0%	2.0%

N = 50

⁷ Respondents selected the top 3 factors ranking 1 to 3 with 1 being the biggest factor.

⁸ Percentages show the number of respondents selecting the reason as 1 of the top 3 factors.

Reasons for Adopting Cloud Solution

The reasons for an organization adopts cloud solutions are next rated by respondents⁹.

- **Almost 60% of respondents rate performance and reliability with a high level of consideration when adopting cloud solutions. Performance and reliability also has the highest average consideration rating.**
- **Ease of management receives the second highest average consideration rating at 5.41 (out of 7).**
- **Lack of internal staff or expertise has the lowest average consideration rating although this reason still has a mid-level of consideration overall.**

Table 16: Top Reasons for Adopting Cloud Solutions

What was your organization's reason for adopting a cloud solution?

Reason	No to Low Consideration ¹⁰	Mid-Level Consideration ¹¹	High Consideration ¹²	Average Rating
Performance and reliability	4.8%	31.0%	59.5%	5.50
Ease of management	4.5%	38.6%	56.8%	5.41
Total cost of ownership (TCO)	9.5%	33.3%	57.1%	5.12
Infrastructure agility	7.3%	43.9%	48.8%	5.10
Managed services	4.8%	52.4%	40.5%	5.10
Speed of deployment	9.5%	45.2%	45.2%	5.10
Security	9.5%	52.4%	38.1%	4.95
Compliance	11.9%	42.9%	45.2%	4.86
Data accessibility	14.3%	38.1%	47.6%	4.86
Lack of internal staff and/or expertise	17.5%	40.0%	42.5%	4.50

N = 50

⁹ Respondents rated the reason their organizations adopted cloud solutions on a using a 1 to 7 scale, where 1 is not considered as a reason and 7 is highly considered as a reason for adopting cloud technology.

¹⁰ Sum of respondents rating reason with a 1 or 2.

¹¹ Sum of respondents rating reason with a 3, 4 or 5

¹² Sum of respondents rating reason with a 6 or 7.

Measuring Value of Cloud Services Providers

Respondents report on how their organization measures value as a result of adopting cloud services¹³.

- **Augmentation of technological capabilities of capacity is the most frequently reported way to measure the value of cloud service providers. Forty-six (46) percent of respondents indicate it as one of the top three ways their organization measures value of cloud services.**
- **However, financial metrics is the most selected top (number one) way organizations measure value as a result of adopting cloud services. Twenty (20) percent of all respondents ranked this as the top method of measuring value.**

Table 17: Top Ways to Measure Value of Cloud Services Adoption

In what ways has your organization been able to measure value as a result of your adoption of cloud services?¹⁴

Measure	1	2	3	Total
Augmentation of technological capabilities or capacity	18.0%	18.0%	10.0%	46.0%
Speed to market with new clinical initiatives	16.0%	10.0%	14.0%	40.0%
Better regulatory compliance	4.0%	16.0%	20.0%	40.0%
Greater workforce productivity	8.0%	14.0%	16.0%	38.0%
Streamlining of business processes	18.0%	8.0%	12.0%	38.0%
Financial metrics	20.0%	4.0%	12.0%	36.0%
Improved information security or reduced risk posture	12.0%	20.0%	4.0%	36.0%

N = 50

¹³ Respondents ranked the top 3 areas of measured value ranking 1 to 3 with 1 being the biggest area of measure.

¹⁴ Percentages show the number of respondents selecting the area as 1 of their top 3.

Challenges with Cloud Service Providers

Respondents report whether or not their healthcare organization experiences any challenges with their cloud service providers and in what ways.

- Nearly one-fifth (18%) of respondents claim their healthcare organizations have no challenges with their cloud services provider(s) to date.
- Costs and fees are most frequently identified areas in which healthcare organizations have had a challenge.
- Very few respondents report that their organization experience either data loss or breach of data by a cloud services provider.
- Most organizations (44%) report only one or two challenges with their cloud service providers.

Table 18: Challenges with Cloud Service Providers

Has your organization had any challenges with your cloud provider in any of the areas below?

Challenge	Percent of Cloud Users ¹⁵		
	Frequency	Percent	
Costs and fees	20	40.0%	47.6%
Customer service	14	28.0%	33.3%
Migration of services or data	11	22.0%	26.2%
Availability and uptime	10	20.0%	23.8%
Contractual issues (including BAA)	7	14.0%	16.7%
Visibility into ongoing operations	7	14.0%	16.7%
Data loss	3	6.0%	7.1%
Data breaches	1	2.0%	2.4%
Other	3	6.0%	7.1%
Don't Know	10	20.0%	23.8%
None of the above	9	18.0%	16.7% ¹⁶
Total	50	100.0%	100.0%

Table 19: Number of Challenges with Cloud Service Providers

Number of area in Table 19 above in which organizations face challenges.¹⁷

Number of Challenges	Frequency	Percent
1	9	22.0%
2	9	22.0%
3	7	17.1%
4	5	12.2%
8	1	2.4%
Total	41	100.0%

¹⁵ Percent calculated out of only respondents using cloud services

¹⁶ 7 of the respondents who indicated cloud usage did not report any challenges with cloud providers.

¹⁷ The numbers below represent the total number of areas for which an IT executive reports challenges with cloud service providers. For example, if a respondent identified both "cost and fees" and "customer service", they would have received a score of a "2" in this table.

Concerns that Slow Cloud Solution Adoption

Respondents comment on any concerns that slow their organization in adopting cloud computing services.

- The vast majority (92%) of respondents have concerns that slow their adoption of cloud computing. Security concerns, such as the protection of health information (PHI), is a concern for more than half of organizations.
- Most organizations (61%) have two to three concerns which factor into their level of adoption of cloud solutions.

Table 20: Concerns That Slow Healthcare Organization Adoption of Cloud Computing

What concerns, if any, slow your adoption of cloud computing?

Concern	Frequency	Percent
Security (protection of PHI from breach)	27	54.0%
Performance (availability, latency)	21	42.0%
Compliance (adherence to regulatory requirements)	19	38.0%
Migration (moving existing workloads)	19	38.0%
Financial (depreciation of existing assets or ongoing costs)	19	38.0%
Support (response times, time to resolution)	19	38.0%
Other	2	4.0%
I have no concerns	4	8.0%
Total	50	100.0%

Table 21: Number of Concerns That Slow Cloud Adoption

Number of areas in Table 20 above in which organizations have concerns.¹⁸

Number of Concerns	Frequency	Percent
1	7	15.2%
2	13	28.3%
3	15	32.6%
4	8	17.4%
5	2	4.3%
6	1	2.2%
Total	46	100.0%

¹⁸ The numbers below represent the total number of areas for which an IT executive reports challenges with cloud service providers. For example, if a respondent identified both “security” and “performance”, they would have received a score of a “2” in this table.

Future of Use of Cloud Services

Planned Areas for Expanding Use of Cloud Services

When an organization did not indicate current use of one of the cloud services areas, they were asked a follow-up question about their plans to move existing or new workloads in these areas to the cloud in the next year.

The following definitions were used for the study:

Existing workload(s) are areas that your organizations host locally and are not currently hosting in the cloud and are planning to move to the cloud in the next year.

New workload(s) are areas that your organization does not host locally or in the cloud and are planning to deploy in the cloud in the next year.

- Just over three-quarters (76%) of responding organizations have plans to move a new or existing workload in at least one area.
- Hosting of back office applications and server virtualization are existing workloads most likely to move to the cloud in the next year.
- Hosting of archived data have the highest plans of a new workload moving to the cloud followed by backups and disaster recovery and hosting of back office applications.

Table 22: Planned Areas of Cloud Applications Use

How is your organization planning to use cloud services in the next year?

Planned Area	Existing Workload Moving to Cloud	New Workload Moving to Cloud
Hosting of back office applications and data	14.0%	16.0%
Server Virtualization	14.0%	12.0%
Hosting of communications services	12.0%	8.0%
Virtual Networks	12.0%	8.0%
Health Information Exchange	12.0%	6.0%
Hosting of human resources applications and data	12.0%	6.0%
Hosting of archived data	10.0%	20.0%
Hosting of financial applications and data	10.0%	8.0%
Backups and disaster recovery	8.0%	16.0%
Managed Services	8.0%	14.0%
Accountable Care Organization	8.0%	12.0%
Hosting of analytics applications and data	8.0%	12.0%
Hosting of clinical applications and data	8.0%	12.0%
Desktop Virtualization	8.0%	10.0%
Hosting of development environments	6.0%	12.0%
Hosting of operational applications and data	4.0%	14.0%

N = 50

Planned Cloud Services Areas

The individual areas for cloud plans from the study are grouped into five categories to evaluate broad areas of plans, as done above for current cloud usage.

- IT functions have the highest level of cloud services plans.

Table 23: Areas of Cloud Services Use

How is your organization planning to use cloud services in the next year?

Cloud Usage Area	Frequency	Percent
IT	31	81.6%
Administrative	26	68.4%
External Data Sharing	12	31.6%
Analytics	10	26.3%
Clinical	10	26.3%
Total	38	100.0%

- Over three-quarters (79 percent) of respondent organizations with cloud usage plans will support two or more functions.

Table 24: Areas of Cloud Services Use

Number of areas in Table 22 above in which organizations are using cloud services.¹⁹

Number of Areas	Frequency	Percent
1	8	21.1%
2	8	21.1%
3	4	10.5%
4	6	15.8%
5	2	5.3%
6	2	5.3%
7	1	2.6%
8	1	2.6%
10	2	5.3%
More than 10	4	10.5%
Total	38	100.0%

¹⁹ The numbers below represent the total number of areas for which an IT executive reports using cloud services at their healthcare organization. For example, if a respondent identified both “hosting of primary data storage” and “hosting of archived data”, they would have received a score of a “2” in this table.

Conclusion

While some concerns and hesitations have surrounded the dialogue around the use of cloud-based services at healthcare organizations, a high-level of usage exists with 84% of responding organizations using cloud services. Use is expected to grow in the future especially as three-quarters of participants indicate plans to move additional workloads to the cloud in the next year. The most frequent use for the organizations in this study is for analytics applications and data. The most category of cloud use is for IT functions such as virtual environments, archival data and backups/data recovery. Most healthcare organizations use a SaaS model to support their cloud services. The majority of cloud computing is on private cloud models.

Healthcare organizations have many reasons for considering cloud services providers and must take into account a number of different considerations. Performance and reliability, as an example, has the highest rating for being a reason a healthcare organization would move applications to the cloud. But performance also presents as one of the top concerns that contribute to slow adoption of cloud computing. Security and the protection of protected patient information is the top concern in this study and often heard antidotally as a main concern of using cloud-based solutions. However, respondents from participating organizations do not indicate challenges with data losses or data breaches with their cloud service providers. Finally, total cost of ownership, while not the top reason for adopting cloud solutions in this study, is still a highly considered reason. Yet, costs and fees are the greatest challenges with service providers that healthcare organizations face.

There appears to be an inconsistency in what organizations perceive to be a concern and the performance experienced with cloud solution providers. Perhaps as healthcare organizations fulfill their plans of moving new and existing workloads to the cloud, expectations on security levels or service reliability will be reflected in changing concerns of using cloud solutions.

Appendix

Cloud-Based Solutions and Cloud Hosting in Healthcare Survey

Thank you for your time today! We are researching to what extent and for what reasons hospitals and healthcare organizations utilize cloud-based solutions. The study should take less than 5 minutes to complete.

- 1. By what type of organization are you employed?**
 - Stand-alone hospital
 - Hospital that is part of a delivery system
 - Corporate offices of a health care system
 - Other (Please specify.) _____

- 2. Which of the following describes the number of beds in your organization?**
 - Fewer than 50 beds
 - 50-100 beds
 - 101-250 beds
 - 251-500
 - More than 500 beds
 - Other (Please specify.) _____

- 3. Which best describes the level of your job title?**
 - Senior Executive or C-Suite
 - Vice President
 - Director
 - Other (please specify): _____

- 4. Which of the following best describes your primary role/area of responsibilities?**
 - IT/Infrastructure/Network
 - Security/Compliance
 - Operations
 - Informatics
 - Other (please specify): _____

- 5. When you think of cloud services, which of the below come to mind as part of that definition?**

Please select all that apply.

 - Hosting of primary data storage (e.g., application data)
 - Hosting of archived data
 - Hosting of applications
 - Disaster Recovery/Backup
 - Managed database services
 - Virtual servers
 - Hosted e-mail services
 - Managed services
 - Other: (Please specify.) _____
 - Don't Know

6. How is your organization using cloud services now?

Please select all that apply.

Hosting of clinical applications and data

Hosting of analytics applications and data

Hosting of financial applications and data

Hosting of operational applications and data

Hosting of human resources applications and data

Hosting of back office applications and data

Hosting of archived data

Hosting of communications services (e-mail, voice, etc.)

Hosting of development environments

Backups and disaster recovery

Desktop Virtualization

Server Virtualization

Virtual Networks

Managed Services (outsourced services for network monitoring, data analytics, security monitoring)

Health Information Exchange

Accountable Care Organization

Other (Please specify.) _____

None of the above

Don't Know

7. How is your organization planning to use cloud services in the next year?

Please indicate if the area is an existing workload or a new workload

Existing workload(s) are areas that your organizations host locally and are not currently hosting in the cloud and are planning to move to the cloud in the next year.

New workload(s) are areas that your organization does not host locally or in the cloud and are planning to deploy in the cloud in the next year.

Area/Workload	Existing Workload Moving to Cloud	New Workload Moving to Cloud
Hosting of clinical applications and data		
Hosting of analytics applications and data		
Hosting of financial applications and data		
Hosting of operational applications and data		
Hosting of human resources applications and data		
Hosting of back office applications and data		
Hosting of archived data		
Hosting of communications services (e-mail, voice, etc.)		
Hosting of development environments		
Backups and disaster recovery		
Desktop Virtualization		
Server Virtualization		
Virtual Networks		
Managed Services (outsourced services for network monitoring, data analytics, security monitoring)		
Health Information Exchange		
Accountable Care Organization		
Other (Please specify.) _____		

8. Approximately how many cloud service providers are you currently using for each type of cloud service model?

Cloud Model – Number of Service Providers	0	1	2	3	4+	Don't Know
IaaS (Infrastructure as a Service)(for example, raw storage, backup and/or computing resources)						
PaaS (Platform as a Service) (for example, development environments)						
SaaS (Software as a Service) (for example, hosted Electronic Health Record (EHR) applications)						
CaaS (Containers as a Service) (for example, Docker, Kubernetes)						
Enterprise Resource Planning (ERP) applications						
Other: (Please specify.) _____						

9. Approximately what percentage of your organization's cloud computing model is public versus private?

Please slide the bar to indicate the percentage for each model.

If the organization uses strictly a public or private model, please select 100% for that model.

Public cloud (logical separation of shared resources; does not require physical separation of resources – for example, computing, network, and/or storage resources)

Private cloud (dedicated hardware, network, and storage resources for a single organization)

10. What are the top 3 factors your organization considers when selecting a cloud services provider?

Please select the top 3 ranking from 1 to 3.

- Industry reputation and/or peer references
- Healthcare focus or exclusivity
- Willingness to meet your BAA requirements
- Adherence to regulatory requirements (HIPAA, HITECH)
- Availability of managed services or automation
- Availability of micro-services
- Service Level Agreement (SLA)
- Physical security of cloud service provider
- Administrative security of cloud service provider
- Technical security of cloud service provider
- Certifications (HITRUST, SOC1, PCI DSS)
- Other (please specify): _____
- Don't Know

11. What was your organization's reason for adopting a cloud solution?

Please rate each of the below using a 1 to 7 scale where 1 is not considered as a reason and 7 is highly considered as a reason for adopting a cloud solution.

- Infrastructure agility
- Speed of deployment
- Ease of management
- Lack of internal staff and/or expertise
- Total cost of ownership (TCO)
- Security
- Compliance
- Data accessibility
- Managed services
- Performance and reliability
- Other (please specify): _____

12. In what ways has your organization been able to measure value as a result of your adoption of cloud services?

Please select the top 3 areas of measured value ranking from 1 to 3.

Financial metrics
Augmentation of technological capabilities or capacity
Speed to market with new clinical initiatives
Greater workforce productivity
Improved information security or reduced risk posture
Better regulatory compliance
Streamlining of business processes
Other: (please specify): _____

13. Has your organization had any challenges with your cloud provider in any of the areas below? Please select all that apply.

Availability and uptime
Data loss
Data breaches
Contractual issues (including BAA)
Costs and fees
Visibility into ongoing operations
Customer service
Migration of services or data
Other (please specify): _____
None of the above
Don't Know

14. What concerns, if any, slow your adoption of cloud computing?

Please select all that apply.

Security (protection of PHI from breach)
Compliance (adherence to regulatory requirements)
Migration (moving existing workloads)
Financial (depreciation of existing assets or ongoing costs)
Performance (availability, latency)
Support (response times, time to resolution)
Other (please specify): _____
I have no concerns

You're done! Please click the Previous Page button if you need to locate a question to review and/or revise a response. Otherwise, click "Next" and to submit your responses. Thank you for your time and input.