



2014 HIMSS Analytics Cloud Survey

June 2014

Introduction

Cloud services have been touted as a viable approach to reduce operating expenses for healthcare organizations. Yet, engage in any conversation surrounding cloud services and the discussion invariably touches on concerns about the security of the hosted data.

Recognizing the growing number of healthcare organizations starting to use cloud services to host applications and data using a

Healthcare organizations are starting to use cloud services to host applications and data with their vendors using “Software as a Service” (SaaS).

“software as a service” (SaaS) model, HIMSS Analytics wanted to understand the challenges, barriers and successes healthcare organizations may be having with cloud services.

This study was designed to address such questions, as well as detail the value healthcare organizations are getting from their currently implemented solutions and uncover ways in which healthcare organizations are planning to use cloud services in the future.

The majority of data in this study focuses on hospital-based organizations. However, respondents included information technology (IT) executives from medical practices, hospitals, and corporate offices of healthcare systems.

In addition, the sample population of healthcare organizations not presently using cloud services is small. As such, the data should be considered as informational and not necessarily representative of the industry as a whole and should be used to promote conversation.

Contents

Executive Summary		4
Methodology/Respondents		6
Findings		7
What are Cloud Services?		7
Summary of Use of Cloud Services		8
Users of Cloud Services		10
Future of Use of Cloud Services		22
No Plans to Use Cloud Services		29
Conclusion		30
About HIMSS Analytics		31
How to Cite This Study		31
For More Information		31

Executive Summary

Healthcare organizations are adopting cloud services as a viable alternative to traditional information technology (IT) services. More than 80 percent of the 150 respondents of the 2014 HIMSS Analytics Cloud Survey reported their healthcare organization currently uses cloud services. Half of respondents presently using cloud services reported using these services to host clinical applications, with the majority of respondents hosting data using Software as a Service (SaaS). Other key areas in which respondents reported that cloud services are being used include health information exchange, hosting human resources (HR) applications and data, and back up and disaster recovery. Three-quarters of respondents reported using either a private cloud service or hybrid cloud services.

The future of cloud services is positive, especially among those healthcare organizations that already use cloud services. Nearly all of the healthcare organizations presently using cloud services reported plans to expand use of cloud services in the future. Areas in which respondents were most likely to identify future expansion of cloud services included hosting of archived data, back up and disaster recovery and hosting of operational data.

Notwithstanding these positive findings, not all healthcare organizations are willing to embrace cloud services. Indeed, healthcare organizations not presently using cloud services were less open to using cloud services in the future. While two-thirds of respondents working for healthcare organizations not presently using cloud services planned to begin using cloud services in the future, only four percent of these respondents reported plans to engage in use of cloud services in the next year. Furthermore, less than 20 percent of these healthcare organizations reported being in contract negotiations with a cloud services provider. Security issues, such as the physical or technical security of cloud services providers, and a cloud services provider's willingness to enter into a Business Associate Agreement (BAA) were identified as key factors healthcare organizations expect to take into consideration when deciding to move forward with a cloud services provider.

A handful of survey respondents (six percent) noted their healthcare organization would not use cloud services in the future. Nearly half of these respondents cited security concerns as a key factor keeping their healthcare organizations from using cloud services at this time.

Other key survey results include:

- Cost was identified as a key driver for adopting cloud services. However, less than half of respondents reported getting the data needed from their cloud services provider to measure the value of cloud services.
- Half of respondents working for healthcare organizations that use cloud services reported that their organization upgraded their network infrastructure and/or monitoring capabilities in order to implement cloud services.

- Security concerns, such as the vendor's willingness to enter into a BAA, and the physical and technical security of the cloud services provider were top factors healthcare organizations evaluated before selecting a cloud services provider.
- Vendors can be doing a better job in meeting the needs of their healthcare clients. Approximately two-thirds of respondents reported challenges with their current cloud services provider(s). Most often, these challenges included lack of visibility into ongoing operations, customer service and costs/fees associated with the solution.
- Half of respondents have experienced issues with their cloud service provider's ability to meet promised service levels. The item most commonly identified as an issue was slow responsiveness to hosted applications and/or data.
- Healthcare organizations are likely to attempt to remediate issues with their cloud services provider rather than making a decision to switch cloud services providers in the event that service level agreements are not met. Few respondents reported that they would move away from their current cloud services provider in the event that promised service levels were not achieved. Instead, half of respondents indicated that their healthcare organization would either accept service level credits or give their cloud services provider another chance to perform satisfactorily, namely, meeting the promised service levels.

Methodology/Respondents

Methodological Approach: Web-based survey
Dates of Data Collection: March 26 through April 30, 2014
Target Audience(s): IT Executives from Healthcare Provider Organizations
Number of Respondents: 150 (Number invited = 4,400; Response Rate = 3.4 percent)

- The majority of survey respondents represented Senior IT executives working for hospital-based organizations.

Respondent Title

Table 1: Respondent Title

Which of the below best describes your title?	Frequency	Percent
Chief Information Officer	79	52.7%
IT Director	49	32.7%
Vice President of Information Services	4	2.7%
Chief Security Officer	2	1.3%
Other	16	10.7%
Total	150	100.0%¹

**Other titles include Administrator, Chief Executive Officer, Chief Health Information Officer, Chief Technology Officer, IT Manager, Office Manager and Practice Administrator.

Organization Type²

Table 2: Organization Type

By what type of organization are you employed?	Frequency	Percent
Stand-alone Hospital	83	55.3%
Hospital that is Part of a Delivery System	33	22.0%
Corporate Offices of a Healthcare System	22	14.7%
Medical Practice	8	5.3%
Other	4	2.7%
Total	150	100.0%

¹ Due to rounding, the percentages in this paper may equal more than 100.0 percent.

² For the purposes of this research, the data has been analyzed by facility type. The data was organized into three categories: Stand-alone hospital, Corporate Organization (hospital that is part of a delivery system and corporate offices of a healthcare system) and Other (medical practice and other).

Findings

What are Cloud Services?

The survey commenced by attempting to establish how IT executives define cloud services.

- Hosting of applications, disaster recovery/back up and hosting of primary data storage were key areas included in IT executives' definitions of cloud services.

Items included in cloud services definition

Table 3: Definition of Cloud Services

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

	Frequency	Percent
Hosting of Applications	129	86.0%
Disaster Recover/Backup	119	79.3%
Hosting of Primary Data Storage (e.g. Application Data)	118	78.7%
Hosting of Archived Data	116	77.3%
Hosted E-Mail Services	98	65.3%
Virtual Servers	79	52.7%
Managed Services ³	79	52.7%
Other	1	0.7%
Don't Know	0	0.0%
Total	150	100.0%

There is no statistically significant difference in definition of cloud by type of organization.

³ This study provided several examples for managed services to provide context. These were outsourced services for network monitoring, data analytics and/or security monitoring.

Number of items included in cloud services definition

- Healthcare organizations have very inclusive definitions of cloud services, including an average of 4.9 of the items presented in Table 3 above in their definition.

Table 4: Number of Areas Considered as Part of Cloud Definition

When you think of cloud services, which of the below come to mind as part of that definition? ⁴	Frequency	Percent
None	0	0.0%
One	13	8.7%
Two	8	5.3%
Three	15	10.0%
Four	21	14.0%
Five	27	18.0%
Six	16	10.7%
Seven	50	33.3%
Total	150	100.0%

There is no statistically significant difference in definition of cloud by type of organization.

Summary of Use of Cloud Services

Present and Future State of Cloud Services

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 (83 percent) reported their healthcare organizations presently use cloud services. Only six percent of respondents reported that their healthcare organization does not plan to use cloud services in the future.

Table 5: Summary of Cloud Services Use

This graph represents an aggregation of data collection about current and future use.	Frequency	Percent
Currently Use Cloud Services	124	82.7%
Plan to Use Cloud Services	14	9.3%
Do Not Intend to Use Cloud Services in the Future	9	6.0%
Don't Know	3	2.0%
Total	150	100.0%

There is no statistically significant difference in use of cloud by type of organization.

⁴ The numbers below represent the total number of items that an IT executive included in his/her definition. For example, if they included both "hosting of primary data storage" and "hosting of archived data", they would have received a score of a "two".

Summary of Cloud Use

Respondents were asked how their healthcare organizations use cloud services now, as well as in the future. Respondents not using cloud services were asked to identify which areas their healthcare organization expected to use cloud services in the future.

- Respondents most commonly reported that their healthcare organizations use cloud services for hosting clinical applications.
- In the future, respondents reported their healthcare organizations will use cloud services for backups/disaster recovery, hosting operational applications or hosting archived data.
- Cloud services were least likely to be used for account provisioning/deprovisioning, identity management purposes and virtual networks.

Table 6: Current Areas of Cloud Applications

	Current Use	Planned Use ⁵	No Use ⁶	Total
Hosting of Clinical Applications and Data	43.6%	14.1%	42.3%	100.0%
Health Information Exchange	38.7%	20.0%	41.3%	100.0%
Backups and Disaster Recovery	35.1%	31.1%	33.7%	100.0%
Hosting of HR Applications and Data	34.9%	16.8%	48.3%	100.0%
Hosting Financial Applications and Data	32.9%	18.8%	48.3%	100.0%
Hosting Operational Applications and Data	27.7%	28.4%	43.9%	100.0%
Hosting of Archived Data	26.8%	38.9%	34.3%	100.0%
Hosting Back Office Applications and Data	22.1%	22.1%	55.8%	100.0%
Managed Services	22.1%	17.4%	60.5%	100.0%
Hosting Communications Services	20.3%	20.3%	59.4%	100.0%
Server Virtualization	14.9%	12.2%	72.9%	100.0%
Desktop Virtualization	8.1%	14.2%	77.7%	100.0%
Virtual Networks	6.1%	8.8%	85.1%	100.0%
Accountable Care Organization	6.0%	13.5%	80.5%	100.0%
Identity Management	2.0%	8.1%	89.9%	100.0%
Timely Provisioning or Deprovisioning Accounts	2.0%	6.1%	91.9%	100.0%

N = 150

⁵ Planned Use includes plans for healthcare organizations currently using cloud services and plan to extend use to a particular cloud service in the future, as well as plans for healthcare organizations not currently using cloud services, but with plans to use a particular service.

⁶ No Use includes the following: (1) healthcare organizations currently using cloud services but not using this particular cloud service and not planning on using this particular cloud service, (2) those that plan to use cloud services but have no plans to use this cloud service and (3) healthcare organizations that will not use cloud services at all in the future.

Users of Cloud Services

How Cloud Services are Currently Being Used

The individual items in Table Six were grouped into four categories to evaluate broad areas of use. The categorization of each element into a broader group is described below.

- Most respondents reported using cloud services for administrative functions, such as the hosting of financial, operational, or HR data, as well as for more traditional IT functions, such as hosting archived data or virtualization.

Table 7: General Areas of Use of Cloud Services

How is your organization using cloud services now?	Frequency	Percent
Administrative Functions	91	73.4%
IT Functions	91	73.4%
Clinical Applications & Data	65	52.4%
External Data Sharing	60	48.4%
Total	124	100.0%

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

- 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:

- Hosting of archived data
- Backups and disaster recovery
- Hosting of communications services (for example, e-mail, voice communications, etc.)
- Identity management
- Timely provisioning and deprovisioning of user accounts
- Desktop virtualization
- Server virtualization
- Virtual networks
- Managed services

Clinical Applications & Data includes the following:

- Hosting of clinical applications and data

External Data Sharing includes the following:

- Health Information Exchange
- Accountable Care Organizations

- **Hosting clinical applications was identified as the most common area for which healthcare organizations rely on cloud services.**
- **Respondents were least likely to indicate that their healthcare organization would use cloud services for identity management or provisioning/deprovisioning of user accounts.**
- **The vast majority of respondents indicated that their healthcare organization uses cloud services to support a multiplicity of functions, as identified in Table Nine below.**

Table 8: Areas of Cloud Services Use

How is your organization using cloud services now?	Frequency	Percent
Hosting of Clinical Applications and Data	65	52.4%
Health Information Exchange	58	46.8%
Hosting Human Resources Applications and Data	52	41.9%
Backup and Disaster Recovery	52	41.9%
Hosting of Financial Applications and Data	49	39.5%
Hosting of Operational Applications and Data	41	33.1%
Hosting of Archived Data	40	32.3%
Hosting of Back Office Applications and Data	33	26.6%
Managed Services	33	26.6%
Hosting of Communications Services (e.g. e-mail, voice, etc.)	30	24.2%
Server Virtualization	22	17.8%
Desktop Virtualization	12	9.7%
Virtual Networks	9	7.3%
Accountable Care Organization	9	7.3%
Identity Management	3	2.4%
Timely Provisioning/Deprovisioning of User Accounts	3	2.4%
Other	7	5.7%
Total	124	100.0%

Table 9: Areas of Cloud Services Use

Number of areas in Table Eight above in which organizations are using cloud services. ⁷	Frequency	Percent
One	12	9.7%
Two	21	16.9%
Three	25	20.2%
Four	23	18.6%
Five	16	12.9%
More than Five	27	21.8%
Total	124	100.0%

⁷ The numbers below represent the total number of areas for which an IT executive reports using cloud services at his/her healthcare organization. For example, if a respondent identified both “hosting of primary data storage” and “hosting of archived data”, he or she would have received a score of a “two” in this table.

Reasons for Adopting Cloud Solution

Respondents were then queried about their decision to adopt cloud services⁸.

- Cost savings (i.e., the ability to host a solution at a cost that is lower than their current maintenance costs) was the most frequently reported reason for adopting cloud services.
- At the other end of the spectrum, nearly half of respondents (46 percent) indicated that mobility of workforce was given limited consideration at their healthcare organization.

Table Ten: Reasons for Adopting Cloud Services

What was your organization's reason(s) for adopting a cloud solution?	Frequency	Percent⁹
Less Cost than Maintaining Current IT Maintenance Costs	69	55.7%
Speed of Deployment	66	53.2%
Lack of Internal Staff and/or Expertise	64	51.6%
More Robust Disaster Recovery	62	50.0%
Need for On-Demand, Scalable, Always On Solution	56	45.2%
Regulatory Compliance	52	41.9%
Better Information Security	33	26.7%
Mobility of Workforce	33	26.7%
Total	124	100.0%

There is no statistically significant difference in factors considered by type of organization

⁸ This question used a one to seven scale, where one is no consideration and seven is a high degree of consideration.

⁹ The percentages above represent the number of respondents that selected a six or seven, indicating that they gave these factors a high degree of consideration.

Preparation for Use of Cloud Services

Respondents were asked what preparations or changes, if any, their healthcare organization made to use cloud services.

- Almost 90 percent of respondents reported their healthcare organization took some type of preparatory action.
- The most frequently cited action was a change in their healthcare organization's network infrastructure (e.g., network bandwidth and/or reliability) and/or network monitoring capabilities.
- Respondents were least likely to report their healthcare organization made preparations in the area of IT staffing. Only one-quarter of respondents provided staff members with cloud services training; eight percent hired staff with cloud services experience.

Table 11: Preparations Made for Adopting Cloud Services

What changes, if any, did your organization make to prepare for the implementation of cloud services?	Frequency	Percent
Upgrading of Network Infrastructure and/or Monitoring Capabilities	61	49.2%
Engagement with the Solution Provider (e.g. Metrics, Problems, Outages, etc.).	53	42.7%
Creating New/Modifying Existing Business Processes for Cloud Services and the Architectural Solution	46	37.1%
Analyzed Business Impact of Cloud Services as Contracted and on the Architectural Solution	44	35.5%
Enhancing Security and Visibility Within the Cloud Solution	38	30.7%
Specific Disaster Recovery/Business Continuity Processes to Support Cloud Services	38	30.7%
Training Workforce Members on Cloud Services and the Architectural Solution	31	25.0%
Hiring Workforce Members with Relevant Cloud Experience	10	8.1%
Other	6	4.8%
None of the Above	14	11.3%
Total	124	100.0%

There is no statistically significant difference in preparation for cloud use by type of organization.

Evaluation of Cloud Services Providers

Respondents were asked to identify which factors their healthcare organization considered when selecting a cloud services provider.

- Willingness to enter into a BAA and security issues, such as physical/technical security of a cloud services provider and/or data center, were top areas of consideration.
- Respondents working for stand-alone hospitals were more likely to identify regulatory compliance as a factor of high consideration than were those at corporate organizations.
- Human factors, such as whether or not the cloud service provider's staff was U.S.-based, were least likely to be considered when evaluating a cloud services provider.

Table 12: Factors Considered When Evaluating a Cloud Services Provider

What factors did your organization consider when selecting a cloud services provider?	Frequency	Percent
Willingness to Enter BAA	81	65.3%
Physical Security of Cloud Service Provider and/or Data Center	79	63.7%
Technical Security of Cloud Service Provider and/or Data Center	79	63.7%
Compliance with Regulations and Laws ¹⁰	75	60.5%
Customer Service	74	59.7%
Administrative Security of Cloud Service Provider and/or Data Center	71	57.3%
Number of Healthcare Entities as Customers	64	51.6%
Compliance with Established Standards, Reports and Control Frameworks ¹¹	63	50.8%
Offering of Solution that Organization Does Not Have	52	41.9%
Scalable Technology Solutions	49	39.5%
Number of Years in Business	48	38.7%
Network Operations Center	44	35.5%
Revenue Model and/or Financial Performance of Company	38	30.7%
Peer References	37	29.8%
Geographic Location of Cloud Provider and/or Data Center (e.g. non-US Site)	30	24.2%
Geographic Location of Cloud Provider's Disaster Recovery Site	22	17.7%
Human Factors (e.g. non-US Employees/Contractors)	17	13.7%
Other	6	4.8%
Don't Know	1	0.8%
Total	124	100.0%

¹⁰ Examples provided included HIPAA, Payment Card Industry's Data Security Standards (PCI DSS), Sarbanes-Oxley, etc.

¹¹ Examples were provided included International Organization for Standardization (ISO), Control Objectives for Information and Related Technology (COBIT), Statement on Standards for Attestation Engagements No. 16 (SSAE 16), Service Organization Control 2 (SOC-2), National Institute of Standards and Technology (NIST) Special Publication No. 800-53, Revision No. 4, etc.

- Respondents generally considered a multitude of the factors identified in Table 12 when evaluating a cloud services provider.
- Those working for a corporate organization were more likely to evaluate a wider variety of factors compared to their counterparts at a single hospital system.

Table 13: Number of Factors Considered When Evaluating a Cloud Services Provider

How many factors identified in Table 12 did your organization consider when selecting a cloud services provider ^{12?}	Stand Alone Hospital	Corporate Organization	Other	Total
None	0.0%	0.0%	11.1%	0.8%
Fewer than Five	37.3%	19.2%	22.2%	29.3%
Five to Nine	26.9%	42.6%	22.2%	32.5%
Ten or More	35.8%	38.3%	44.4%	37.4%
TOTAL	100.0%	100.0%	100.0%	100.0%

Usage Model

Respondents were also asked to identify the type of cloud services their healthcare organization used to host cloud services.

- Two-thirds of respondents reported that their healthcare organization used SaaS to host cloud services.

Table 14: Current Usage Model for Cloud Services

What is your current usage model for cloud services?	Frequency	Percent
SaaS (Software as a Service) ¹³	83	66.9%
IaaS (Infrastructure as a Service) ¹⁴	19	15.3%
PaaS (Platform as a Service) ¹⁵	3	2.4%
Other	8	6.5%
Don't Know	7	5.7%
None of the Above	4	3.2%
Total	124	100.0%

There is no statistically significant difference in usage model by type of organization.

¹² The numbers below represent the total number of factors IT executives reported their healthcare organization took into consideration when selecting a cloud services provider. For example, if a respondent identified both “number of years in business” and “revenue model and/or financial performance of company”, they would have received a score of a “two” and be grouped in the “fewer than five” category in this table.

¹³ Example provided was hosted EHR applications or enterprise resource planning applications.

¹⁴ Example provided was raw storage, backup and/or computing resources.

¹⁵ Example provided was development environments such as Amazon/Azure

Public or Private Cloud

Respondents were asked to indicate if they would classify their healthcare organization's cloud environment as public, private, or hybrid cloud.

- Almost three-quarters of the respondents relied on some type of a private cloud environment (albeit completely private or a hybrid solution encompassing a combination of a public and private cloud).

Table 15: Public or Private Cloud Environment

Would you classify your organization's cloud computing model as public or private?	Frequency	Percent
Private Cloud ¹⁶	46	37.1%
Hybrid Cloud (combination of public and private cloud)	45	36.3%
Public Cloud ¹⁷	29	23.4%
Don't Know	4	3.2%
Total	124	100.0%

There is no statistically significant difference in use of public or private cloud by type of organization.

Availability Requirements

Respondents were asked to identify the power, network and availability requirements their healthcare organization requires of their cloud service provider.

- Healthcare organizations reported extremely stringent power, network and availability requirements of their cloud services provider; nearly half mandated requirements at or above 99.99 percent. The difference between 99.0 and 99.99 percent availability yields a substantial difference in potential downtime – 99.0 percent availability represents almost four days of downtime a year, compared to less than one hour for a 99.99 service level.

Table 16: Power, Network and Availability Requirements

What power, network, and availability requirements of the cloud provider does your organization have?	Frequency	Percent
Over 99.99%	27	21.8%
99.99%	31	25.0%
99.90%	24	19.4%
99.00%	13	10.5%
98.00%	4	3.2%
Other	2	1.6%
Don't Know	23	18.6%
Total	124	100.0%

There is no statistically significant difference in factors considered by an organization by type of organization

¹⁶ A private cloud was defined as dedicated hardware, network, and storage resources for a single organization

¹⁷ A public cloud was defined as a logical separation of shared resources that does not require physical separation of resources such as computing, network or storage resources.

Issues with Meeting Promised Service Levels

Respondents were also asked to identify what issues, if any, their healthcare organization has had with their cloud services provider's performance in meeting promised service levels.

- Just over half of respondents reported their healthcare organization has had no issues with their cloud services provider's ability to meet promised service levels.
- Respondents with performance concerns were most likely to indicate that their healthcare organization had issues with response time of hosted applications/data.
- Nearly one-quarter of respondents report that their healthcare organization has experienced downtime or unavailability of applications and/or data.

Table 17: Issues with Cloud Service Provider Meeting Promised Service Levels

What issues, if any, have you had with your cloud provider's performance in meeting promised service levels?	Frequency	Percent
Slow Responsiveness of Hosted Applications/Data	39	32.5%
Downtime/Unavailability of Applications/Data	28	23.3%
Response Rate Too Slow for Data Backed Up in Cloud	4	3.3%
Other	11	9.2%
None of the Above	62	51.7%
Total	124	100.0%

There is no statistically significant difference in factors considered by an organization by type of organization

Remedy for Failure to Meet Promised Service Levels

Respondents were asked to identify the remedy their healthcare organization is prepared to implement if their cloud service provider fails to meet promised service levels.

- One-third of respondents reported their healthcare organization accepts service level credits or other similar remedy in the event their cloud services provider does not meet promised service levels.
- One-quarter of respondents reported that their healthcare organization was prepared to move forward with an alternate solution, such as moving the solution in-house, using an alternate cloud services provider, or terminating the business relationship.

Table 18: Remedy if Cloud Service Provider Does Not Meet Promised Service Levels

What is your organization's remedy if the cloud provider fails to meet promised service levels?	Frequency	Percent
Accept Service Level Credits (or Other Remedy Provided By the Cloud Provider) and Continue on with the Cloud Solution Until the End of the Contract	42	33.9%
Give Cloud Provider Another Chance to Satisfactorily Perform	23	18.6%
Terminate the Business Relationship	19	15.3%
Leverage Alternative Solutions for High Availability (e.g. In-house or Alternative Cloud Provider)	14	11.3%
Other	8	6.5%
Don't Know	16	12.9%
Total	124	100.0%

There is no statistically significant difference in factors considered by an organization by type of organization

Challenges with Cloud Services

Respondents were then asked to indicate whether or not their healthcare organization has experienced any challenges with their cloud services provider.

- More than one-third of respondents claimed their healthcare organizations had no challenges with their cloud services provider(s) to date.
- Visibility into ongoing operations and customer service were most frequently identified as areas in which healthcare organizations have had a challenge.
- Very few respondents reported that their healthcare organization had experienced either data loss or a breach of data hosted or otherwise maintained by a cloud services provider.

Table 19: Challenges with Cloud Services Provider

Has your organization had any challenges with your cloud provider in any of the areas below?	Frequency	Percent
Visibility into Ongoing Operations	26	21.0%
Customer Service	25	20.2%
Costs and Fees	24	19.4%
Availability and Uptime	20	16.1%
Migration of Services or Data	19	15.3%
Contractual Issues (Including BAA)	7	5.7%
Data Loss	6	4.8%
Data Breaches	3	2.4%
Other	7	5.7%
Don't Know	8	6.5%
None of the Above	47	37.9%
Total	124	100.0%

There is no statistically significant difference in factors considered by an organization by type of organization

Metrics for Evaluating Value of Cloud Services

Respondents were asked whether or not their cloud services provider supplies them with the metrics/visibility into operations needed to measure value from their adoption of cloud services. Respondents that indicated that their cloud services provider supplies such information were asked whether or not their healthcare organization has been able to measure value as a result of their healthcare organization's adoption of cloud services.

- Approximately half of respondents indicated their cloud service provider shares metrics or data that can be used to measure the value of use of cloud services.

Table 20: Provision of Metrics to Measure Value of Cloud Services to Healthcare Organizations

Does your vendor provide you with the metrics/visibility into operations that you need to measure value from your adoption of cloud services?	Frequency	Percent
Yes, Our Vendor Provides Us with this Data	56	45.2%
No, Our Vendor Does Not Provide Us With This Data/We Don't Measure This	38	30.7%
Our Vendor Does Not Provide, But We Try to Measure Value on Our Own	22	17.7%
Other	8	6.5%
Total	124	100.0%

There is no statistically significant difference in factors considered by an organization by type of organization

- Respondents that have access to metrics from their cloud services provider were most likely to report their healthcare organizations were able to measure augmentation of capacity, improvement of financial metrics and improvement of time to deploy the healthcare organization's solution by using the cloud services.
- Respondents working for corporate organizations were more likely to be able to measure value than were their counterparts at stand-alone hospitals.

Table 21: Areas in Which Healthcare Organizations are Measuring Value Derived From Use of Cloud Services

How has your organization been able to measure value as a result of your adoption of cloud services?	Frequency	Percent
Augmentation of Technological Capabilities or Capacity	27	48.2%
Financial Metrics	26	46.4%
Time to Deploy Solution	25	44.6%
Greater Workforce Productivity	19	33.9%
Streamlined Business Processes	19	33.9%
Improved Information Security/Reduced Risk Posture	16	28.6%
Better Regulatory Compliance	12	21.4%
Other	8	14.3%
Total	56	100.0%

- Respondents were most likely to report measuring value in only one or two areas identified in Table 21 above.
- A number of respondents indicated that even though their cloud services provider supplied metrics, they were unable to demonstrate the value of use of cloud services.

Table 22: Number of Areas in Which Healthcare Organizations are Measuring Value Derived From Use of Cloud Services

What are the number of ways your organization has been able to measure value as a result of your organization's adoption of cloud services?¹⁸

	Frequency	Percent
None	7	12.5%
One	8	14.3%
Two	16	28.6%
Three	7	12.5%
Four	10	17.9%
Five	5	8.9%
Six	1	1.8%
Seven	2	3.6%
Total	56	100.0%

There is no statistically significant difference in factors considered by an organization by type of organization

¹⁸ The numbers below represent the total number of areas for which an IT executive reports measuring value as a result of healthcare organizations adoption of cloud services. For example, if a respondent identified both “financial metrics” and “greater workforce productivity”, they would have received a score of a “two” in this table.

Planned Areas for Expanding Use of Cloud Services

Respondents were also asked to identify the additional areas in which their healthcare organization planned to use cloud services in the future.

- Current users of cloud services were most likely to expand into the area of hosting archived data.
- Current users of cloud services were least likely to indicate plans to timely provisioning/de-provisioning of user accounts.
- Very few users of cloud services presently have no plans to expand their healthcare organization's use of cloud services.

Table 23: Areas in Which Healthcare Organizations Expect to Use Cloud Services in the Future

In what areas do you anticipate using cloud services moving forward?	Frequency	Percent ¹⁹
Hosting of Archived Data	50	40.3%
Hosting of Operational Applications and Data	39	31.5%
Backups and Disaster Recovery	38	30.7%
Health Information Exchange	29	23.4%
Hosting of Back Office Applications and Data	27	21.8%
Hosting of Communications Services	26	21.0%
Hosting of Financial Applications and Data	25	20.2%
Managed Services	23	18.6%
Hosting of HR Applications and Data	22	17.7%
Desktop Virtualization	20	16.1%
Accountable Care Organizations	19	15.3%
Hosting of Clinical Applications and Data	17	13.7%
Server Virtualization	17	13.7%
Virtual Networks	12	9.7%
Identity Management	12	9.7%
Timely Provisioning/Deprovisioning of User Accounts	8	6.5%
Other	4	3.2%
No Additional Areas	3	2.4%
Don't Know	6	35.3%
Total	124	100.0%

¹⁹ Percent represents the percent of all healthcare organizations that presently use at least one cloud service.

Future of Use of Cloud Services

Healthcare organizations not presently using cloud services were asked a series of questions surrounding their plans to use cloud services in the future.

Reasons for Not Currently Using Cloud Services

Respondents not currently using cloud services were asked why their healthcare organizations have chosen not to adopt cloud services at this time.

- Security concerns was the main reason identified by nearly two-thirds of respondents.
- Respondents were least likely to identify human factor considerations and uncertainty about which vendor to select as reasons for not adopting cloud services at this time.
- Respondents also identified several reasons not included in the list shown below as a reason for not adopting cloud solutions at this time, including cost/funding and technology concerns, such as bandwidth.

Table 24: Reasons Healthcare Organizations Do Not Currently Use Cloud Services

If you have not adopted a cloud solution at this time, what are the reasons for not doing so?	Frequency	Percent
Security Concerns	16	61.5%
IT Operations are Solely Internal to Organization	11	42.3%
Availability and Uptime Concerns	10	38.5%
Risks Outweigh the Benefits	9	34.6%
Cloud Provider Does Not Have Own Data Center (Uses a Third Party)	8	30.8%
Geographic Location of Cloud Provider and/or Data Center	5	19.2%
Contractual Issues with Cloud Providers	5	19.2%
Geographic Location of Cloud Provider's Disaster Recovery Site	3	11.5%
Human Factor Considerations	2	7.7%
Not Sure Which Provider to Select	2	7.7%
Other	7	26.9%
Don't Know	0	0.0%
Total	26	100.0%

Because of the small sample data should be treated as informational and differences by organization type could not be tested

Timeframe of Future Adoption

Respondents working for healthcare organizations not presently using cloud services were asked to identify when their healthcare organization planned to adopt cloud services.

- Only 30 percent of the respondents stated that their healthcare organizations have some timeframe surrounding their organization's adoption of cloud services.
- Of those that identified a timeframe, only four percent of respondents reported that their healthcare organization planned to adopt cloud services within the next year.
- One-third of respondents reported that their healthcare organization does not plan to implement cloud services.

Table 25: Timeframe for Adopting Cloud Solutions in the Future

In what timeframe do you plan to adopt a cloud solution in the future?	Frequency	Percent
Within One Year	1	3.9%
Within One to Three Years	3	11.5%
Within Three to Five Years	3	11.5%
Beyond Five Years	1	3.9%
Timeframe Not Yet Determined	6	23.1%
No Plans to Adopt a Cloud Solution	9	34.6%
Don't Know	3	11.5%
Total	26	100.0%

Because of the small sample data should be treated as informational and differences by organization type could not be tested

Contract Negotiations

Respondents were asked to indicate whether their healthcare organizations were presently in negotiations with a cloud services provider.

- The vast majority of respondents stated that their healthcare organization is not currently negotiating with a cloud services provider.
- Those in contract negotiations reported evaluating the cloud service provider's security practices and operational and/or security performance.

Table 26: Negotiating Contract with Cloud Services Provider

Are you presently in negotiations with a vendor to provide cloud services to your organization?	Frequency	Percent
Yes	3	17.7%
No	12	70.6%
Don't Know	2	11.8%
Total	17	100.0%

Because of the small sample data should be treated as informational and differences by organization type could not be tested

Planned Areas of Use for Cloud Services

Respondents that reported plans to use cloud services at their healthcare organizations in the future were asked to identify the areas of planned use.

- Nearly half of respondents reported plans to use cloud services for backup and disaster recovery.
- None of the respondents indicated that their healthcare organization will use cloud services for identity management purposes.
- A substantial portion of respondents do not know the area in which their healthcare organization plans to use cloud services in the future.

Table 27: Areas of Interest for Future Cloud Service Provider Users

How does your organization plan to use cloud services in the future?	Frequency	Percent
Backups and Disaster Recovery	8	47.1%
Hosting of Back Office Applications and Data	6	35.3%
Hosting of Archived Data	6	35.3%
Hosting of Clinical Applications and Data	4	23.5%
Hosting of Communications Services (e.g. e-mail, voice)	4	23.5%
Hosting of Financial Applications and Data	3	17.7%
Hosting of Operational Applications and Data	3	17.7%
Hosting of HR Applications and Data	3	17.7%
Managed Services	3	17.7%
Timely Provisioning/Deprovisioning of User Accounts	1	5.9%
Server Virtualization	1	5.9%
Desktop Virtualization	1	5.9%
Virtual Networks	1	5.9%
Accountable Care Organizations	1	5.9%
Health Information Exchange	1	5.9%
Identity Management	0	0.0%
Don't Know	6	35.3%
Total	17	100.0%

Because of the small sample data should be treated as informational and differences by organization type could not be tested

Type of Cloud Services

Respondents not presently using cloud services were asked to identify the type of cloud environment their healthcare organization anticipates using in the future.

- Over half of respondents working for healthcare organizations not using cloud services anticipated their healthcare organizations would use private cloud services in the future.
- A sizeable portion of respondents reported their healthcare organization has not yet determined the type of cloud environment that will be implemented.

Table 28: Future Use of Public or Private Cloud Model

In the future, what type of cloud environment do you anticipate using?	Frequency	Percent
Private Cloud	9	52.9%
Hybrid Cloud (combination of public and private cloud)	2	11.8%
Public Cloud	1	5.9%
Don't Know	5	29.4%
Total	17	100.0%

Because of the small sample data should be treated as informational and differences by organization type could not be tested

Cloud Service Types

Respondents were then asked to identify the cloud service types their healthcare organization anticipated using in the future.

- Nearly half of respondents reported intentions to use SaaS to host their cloud services in the future.
- However, one-third of respondents were not sure of the type of cloud service type their healthcare organization will use in the future.

Table 29: Future Usage Model for Cloud Services Provider

Which of the below usage models for cloud services do you anticipate using in the future?	Frequency	Percent
SaaS (Software as a Service)	8	47.1%
IaaS (Infrastructure as a Service)	3	17.7%
PaaS (Platform as a Service)	0	0.0%
Other	0	0.0%
Don't Know	6	35.3%
Total	17	100.0%

Because of the small sample data should be treated as informational and differences by organization type could not be tested

Preparation for Cloud Use

Respondents were asked to identify what changes, if any, their healthcare organization would make to prepare for the implementation of cloud services.

- Approximately half of respondents reported that they expect to offer staff training on cloud services at their healthcare organizations.
- A small number of respondents indicated that their healthcare organization will not make any changes in preparation for implementing cloud services.

Table 30: Preparations for Future Use of Cloud Service Technologies

What changes, if any, will your organization make to prepare for the implementation of cloud services?	Frequency	Percent
Training Workforce Members on Cloud Services and the Architectural Solution	8	47.1%
Specific Disaster Recovery/Business Continuity Processes to Support Cloud Services	7	41.2%
Analyze Business Impact of Cloud Services as Contracted and on the Architectural Solution	6	35.3%
Creating New/Modifying Existing Business Processes for Cloud Services and the Architectural Solution	5	29.4%
Upgrading of Network Infrastructure and/or Monitoring Capabilities	4	23.5%
Engagement with the Solution Provider	3	17.7%
Enhancing Security and Visibility with the Cloud Solution	3	17.7%
Hire Workforce Members with Relevant Cloud Experience	2	11.8%
Other	3	17.7%
None of the Above	2	11.8%
Total	17	100.0%

Because of the small sample data should be treated as informational and differences by organization type could not be tested

Evaluation of Cloud Services Provider

Respondents were asked to identify the factors their healthcare organization will consider when selecting a cloud services provider.

- The physical security of a cloud service provider was identified as a top of mind consideration for healthcare organizations as they evaluate which cloud services provider to use in the future.
- Willingness to enter into BAA was also identified as a top factor healthcare organizations will consider when evaluating a cloud services provider.
- More than a quarter of respondents have not yet determined what factors their healthcare organizations need to consider when evaluating a cloud services provider.

Table 31: Factors Healthcare Organizations will Take Into Consideration When Evaluating Future Use of Cloud Services

What factors will your organization consider when selecting a cloud services provider?	Frequency	Percent
Physical Security of Cloud Service Provider and/or Data Center	10	58.8%
Willingness to Enter into a BAA	10	58.8%
Number of Years in Business	9	52.9%
Customer Service	9	52.9%
Compliance with Established Standards, Reports, and Control Frameworks	9	52.9%
Compliance with Regulations and Laws	9	52.9%
Number of Healthcare Entities as Customers	8	47.1%
Technical Security of Cloud Service Provider and/or Data Center	8	47.1%
Network Operations Center	7	41.2%
Administrative Security of Cloud Service Provider and/or Data Center	7	41.2%
Peer References	7	41.2%
Scalable Technology Solutions	7	41.2%
Revenue Model and/or Financial Performance of Company	6	35.3%
Human Factors (e.g. non-US Employees)	5	29.4%
Geographic Location of Cloud Provider and/or Data Center	2	11.8%
Geographic Location of Cloud Provider's Disaster Recovery Site	2	11.8%
Offering of Solution that Organization Does Not Have	2	11.8%
Other	1	5.9%
Don't Know	5	29.4%
Total	17	100.0%

Because of the small sample data should be treated as informational and differences by organization type could not be tested

Demonstration of Value of Cloud Services

Finally, respondents were asked to identify the areas in which their healthcare organization expected to be able to demonstrate value as a result of their organization's use of cloud services.

- Respondents reported that their healthcare organizations expect to be able to measure and report augmentation of capacity, improvement of financial metrics and streamlined business processes.
- Respondents also indicated their healthcare organizations were less likely to expect to derive value from the length of time it takes to deploy a solution or improvements in regulatory compliance.

Table 32: Expected Areas of Future Demonstration of Value of Cloud Service Providers

In what areas does your organization expect to be able to demonstrate value as a result of your future use of cloud services?	Frequency	Percent
Augmentation of Technological Capabilities or Capacity	10	62.5%
Financial Metrics	8	50.0%
Streamlining of Business Processes	7	43.8%
Improved Information Security	7	43.8%
Greater Workforce Productivity	6	37.5%
Time to Deploy Solution	4	25.0%
Better Regulatory Compliance	4	25.0%
Other	0	14.3%
Don't Know	3	18.8%
Total	17	100.0%

Because of the small sample data should be treated as informational and differences by organization type could not be tested

No Plans to Use Cloud Services

No Plans to Use Cloud Services

There were a few respondents who indicated their healthcare organization does not presently use cloud services and has no plans to do so in the future. These respondents were asked to identify why their healthcare organization has no plans to use cloud services.

- Security concerns were identified as a key barrier.
- These respondents also identified a host of other barriers to use of cloud services, including concerns about cost, bandwidth, connectivity and a lack of sustainability of cloud service providers.

Table 33: Reasons Healthcare Organizations Will Not Use Cloud Services

Why will your organization not plan on using cloud solutions in the future?	Frequency	Percent
Concerns Regarding Privacy/Security	4	44.4%
Cloud Service Provider Not Willing to Enter Into BAA	3	33.3%
Cloud Service Provider Not Willing to Comply with Laws and Regulations	3	33.3%
Cloud Service Provider's Backup and Disaster Recovery Policies/Procedures	2	22.2%
Inability to Audit the Cloud Service Provider and/or Data Center	1	11.1%
Other	7	77.8%
Total	26	100.0%

Because of the small sample data should be treated as informational and differences by organization type could not be tested

Conclusion

Healthcare organizations are using cloud services and use is expected to grow in the future. Eighty-three (83) percent of respondents use cloud services in some capacity at their organization, with the most frequent use being to host clinical applications and/or data. Most healthcare organizations use a SaaS model to support their cloud services. Nearly all of the healthcare organizations presently using cloud services plan to expand use of cloud services in the future.

Healthcare organizations are taking a wide variety of factors into consideration when evaluating cloud services providers, suggesting that these healthcare organizations are conducting due diligence prior to putting applications and data in a cloud environment. Despite this high level of preparation, healthcare organizations have taken relatively few steps with regard to staffing. Among current users of cloud services, respondents were least likely to indicate that their healthcare organizations undertook initiatives related to staffing in preparation for implementing and using cloud services. This suggests that they expect their cloud service providers to have a “turnkey” solution that does not require special training of their staff.

At this time, healthcare organizations reported challenges with their cloud service providers. While two-thirds of healthcare organizations using cloud services reported having challenges with their cloud service providers, many of these challenges have surrounded issues such as visibility into ongoing operations, customer service or cost. Very few respondents reported that their healthcare organizations suffered a data loss or data breach as a result of their use of cloud services. Additionally, half of respondents have indicated issues with their cloud services provider’s ability to meet promised service levels.

In this context, the majority of healthcare organizations reported plans to transition additional data and/or functionality to cloud services. This suggests that when a healthcare organization takes the first step to implement and adopt cloud services, the healthcare organization is already considering expanding their use of cloud services as the healthcare organization gains confidence with hosting data and/or functionality in the cloud.

Healthcare organizations, however, that are not currently using cloud services do not appear overly anxious to begin the implementation and adoption of cloud services. One-third of non-users do not anticipate using cloud services at all, and only a handful of non-users plan to implement and adopt cloud services in the next year. Additionally, many of these respondents were unsure of the future direction of their cloud services. Finally, for these respondents, security concerns were paramount, and must be overcome if these healthcare organizations are going to implement and adopt cloud services in the future.

About HIMSS Analytics

HIMSS Analytics is a wholly owned not-for-profit subsidiary of the Healthcare Information and Management Systems Society. The company collects and analyzes healthcare data related to IT processes and environments, products, IS department composition and costs, IS department management metrics, healthcare trends and purchase-related decisions. HIMSS Analytics delivers high quality data and analytical expertise to healthcare delivery organizations, healthcare IT companies, state governments, financial companies, pharmaceutical companies, and consulting firms. Visit www.himssanalytics.org for more information.

How to Cite This Study

Individuals are encouraged to cite this report and any accompanying graphics in printed matter, publications, or any other medium, as long as the information is attributed to the 2014 HIMSS Analytics Cloud Survey.

For More Information, Contact:

Joyce Lofstrom
Senior Director, Corporate Communications
HIMSS
33 West Monroe
Suite 1700
Chicago, IL 60603
312-915-9237
jlofstrom@himss.org