Is Your Practice Head in the Cloud? Perhaps It Should Be

Pat Maykuth, MS, PhD

1. Introduction
The term Cloud is used as a metaphor for the internet. In the past, a line drawing of a Cloud represented the telephone network in a flowchart; in the early days of networking computers, IT geeks used a line drawing of a Cloud to represent where data were stored over the virtual memories of networked computers. Later, the line Cloud was the depiction of the internet in computer network diagrams. Basically, it is an abstraction of the underlying infrastructure of the location where applications, data, and software reside. Typically, Cloud computing providers deliver common business applications accessed through a local computer through the web from an external server where the software and data are stored.

Accessibility, availability, and scalability are the salient features of Cloud computing. Levels of computing from infrastructure through platform to software are outsourced to companies with large banks of servers and IT professionals who manage them. These services are readily accessible through any web-enabled computing device. They are available anywhere that you can connect to the internet. The capacity to increase and decrease use time with your business needs is available on a fee for service basis. It does not require large investitures to grow or wasted capacity, which is an expense during company slow times.

Cloud computing allows efficient access to medical history and records in the field. Real-time availability to core medical and lab processes, radiology/imaging, and clinical information to every practitioner in the practice establishes a quality and consistency of care difficult to obtain today unless the horse gets seen by the same individual.

Instantly sharing diagnostic impressions, treatment results, and images with owners can result in better decision-making and more informed treatment choices. Collaborative work with remote veterinarians or specialists is enhanced by timely access to X-rays, videos, images, and test results. This information can be viewed simultaneously in Cloud conferences. The potential for practitioners to be involved in scientific clinical research from remote locations becomes a viable option.

Accounting, word processing, and office management tasks easily migrate to the Cloud. Many businesses bold enough to make the shift to the Cloud are still risk-averse enough to want to stick with tried, tested, and familiar technologies rather than navigate unknown waters with relatively new Cloud offerings. Although many of the Cloud’s business offerings are improving quickly, some
small businesses are not yet ready to commit to unfamiliar software. The growth to online account-
ing and word processing packages will be slower. Most of us do not use all of the attributes bundled into the accounting or office software packages that we currently use in our work. There are a variety of options that apply to a wide range of business needs so that the complete package can be sold at a substantial price to almost every consumer. The stripped down Cloud versions may ultimately become more the standard than the exception.

The way that medicine is practiced is being changed by access to collaborative thinking and timely transfer of information that is currently not even considered in today’s practice. With webcams, video conferencing, and advances in technological equipment and monitoring devices, the use of the virtual veterinary visit cannot be ignored. The first passes at the process will likely be cumbersome and restricted. However, the use of the business trend may not be too much of a stretch, because we will all become more comfortable with the strengths and weaknesses of virtual medicine.

This presentation will analyze costs, benefits, and problems with Cloud computing.

2. What Is Cloud Computing?

Wikipedia defines Cloud computing as “software, data access, and storage services that do not require end-user knowledge of the physical location and configuration of the system that delivers the services.” Rather than owning six networked computers, six sets of office and practice software, six internet connections, a server, back-up system, phone contracts, library, medical records storage, imaging storage, etc.

If you have used e-mail, retrieved cell phone messages, played internet video games, banked online, own a website, read an ebook, or purchased something from Amazon, you have used the Cloud. All of these services are available, because large companies have developed consumer products on the web that did not exist a generation ago. In the process, they have made access to these online experiences intuitive, easy, convenient, relatively inexpensive, and immediate. The Cloud has already changed the way that we consume.

Cloud Computing for Small Businesses

For small businesses, including service businesses such as large-animal veterinary practices, Cloud computing hits a particular sweet spot. With Cloud services, small businesses reap the benefits of not having to invest in physical infrastructure like file and e-mail servers, storage systems, or office management software. The anywhere and anytime availability of Cloud technology solutions means hassle-free collaboration among veterinarians in the field, office personnel, clients, and referral consultants simply by a browser. Aside from a locally installed device operating system and browser, much of a practitioner’s technology and communications needs can be fulfilled by Cloud-based offerings. Cloud computing is helping to shape today’s truly mobile workforce. Although you work locally, you communicate and collaborate globally.

Each requires initial investment, updating, servicing, training, downtime, and restoration costs; all that is necessary to access Cloud computing is a laptop or mobile device and an internet connection. The lack of internet connectivity in your mobile practice area is a deal breaker for participation in the web 2.0 computing while on the road. However, it remains a viable discussion for an office where broadband connectivity is presently available for the practice.

In Practical Terms, What Accessible Services Are Out There?

ExplainingComputers.com’s white board presentation: three reasons to Cloud compute (http://www.youtube.com/watch?v=Sguja1zkwrE&feature=relmfu) clarifies the layers of Cloud computing.

Some Terms Useful for Understanding Cloud Services

Infrastructure as a service (IaaS) is a model in which an organization outsources all of the equipment used to support its operations, including storage, hardware, servers, and networking components. The service provider owns the equipment and is responsible for housing, running, and maintaining it. The client typically pays on a per-use basis. IaaS is currently being used by drug companies, hospital systems, telephony companies, and utilities.

IaaS provides users with additional computing power whenever they require it. For instance, if a retailer has a short-term need to process a high volume of point of sale (POS) transactions on the Friday after Thanksgiving, applications can be set up to share the processing across additional computers as necessary. The Boston Marathon site traffic is fairly stable 10 mo of the year. However, during the month of registration and the month of the race, there is huge demand and traffic on the site. Without planned extra capacity, the site would crash when most people are attending to it.

Platform as a service (PaaS) is the designers’ playground. PaaS targets developers and facilities deployment of applications without the cost and complexity of buying and managing the underlying hardware and software and provisioning hosting capabilities, providing all of the facilities required to support the complete life cycle of building and delivering web applications and services available entirely from the internet. Facilities are available for application design, application development, testing, deployment, and hosting as well as application services such as team collaboration, web service, integration and marshalling, database integration, security, scalability, storage, persistence, state management, application versioning, application instru-
mentation, and developer community facilitation. These services may be provisioned as an integrated solution over the web. Applications developed on one Cloud company’s platform are generally not portable to other company’s platforms. PaaS is used by web and network designers and IT professionals developing industry applications. PaaS is a rapidly growing enterprise, because developers expand web capacity through mash-ups and other inventive growth. These shared hosting systems provide an environment for developers to build their own applications using pre-built modules or custom code.

Software as a service (SaaS) targets the end-user who will get the benefits of internet connectivity, collaboration, support, and upgrades. SaaS is referred to as on-demand software, because it is accessed on the internet and/or is deployed to run behind a firewall on a local area network or personal computer. With SaaS, a provider licenses an application to customers (sometimes without charge) when there is opportunity to generate revenue from streams other than the user, such as from advertisement or user list sales. SaaS reduces the need to install and upgrade software on users’ devices. The user always opens the most up to date copy of the software, because it is maintained at all times. Some systems provide an offline mode for times when users are not connected to the internet. Their files are uploaded as soon as their devices are reconnected. This approach to application delivery is part of the utility computing model, where all of the technology in the Cloud is accessed over the internet as a service.

Cloud Advantages
Accessible from anywhere with an internet connection.
No local server installation.
Pay per use or subscription-based payment methods.
Rapid scalability.
Decreased need for a computer whiz kid in the practice.
System maintenance (back-up, updates, security, etc.) is often included in service.
Possible security improvements, although users with high-security requirements should thoroughly investigate capacity and responsibility to assure adequate coverage.
Reliability.
Many work with web-enabled phones, iPads, and personal assistants.

How Does the Cloud Work for Veterinary Medical Services?

Medical Records
The benefits of efficient access to medical history and records in the field are obvious. Real-time access to core medical and lab processes, radiology/imaging, and clinical information to every practitioner in the practice establishes a quality and consistency of care difficult to obtain today unless the horse gets seen by the same individual.

Instantly sharing diagnostic impressions, treatment results, and images with owners can produce better decision-making and informed treatment choices. Collaborative work with remote veterinarians or specialists is enhanced by timely access to X-rays, videos, images, and test results. These items can be viewed simultaneously in Cloud conferences. The potential for practitioners to be involved in scientific clinical research from remote locations becomes a viable option.

You can manage your practices’ storage within a single name space and offer subaccounts (not unlike multiple e-mail accounts under one address) that provide designated users with quick and secure access to medical files, expediting both treatment and collaborations. The Cloud will reduce the cost and complexity of long-term retention with automatic migration of data to new disks on standard refresh cycles. Secure, accessible, cost-effective storage that enables your clinics, labs, and imaging centers as well as associate providers to fully use medical records anywhere is an unquestionable practice asset.

Office
The small private practice needs require design that streamlines its daily operations. Because of its size and nature, a solo or small practice is more likely to gravitate to PaaS than a client-server model because of the computer hardware and networking needs associated with multiple practitioners and locations. However, practices will be able to use offsite backup in real time without the actual practice needing to be involved. All the practice requires to install the system is an internet connection on a business-quality DSL line. Larger practices requiring more bandwidth may need a T1 or thicker line.

Accounting, word processing, and office management tasks may migrate to the Cloud. Most of us do not use all of the attributes bundled into the accounting or office software packages that we currently use in our work. They contain a variety of options that apply to a wide range of needs so that the complete package can be sold at a substantial price to almost every consumer. The stripped-down Cloud versions may become more the standard than the exception. The continual updating of the programs precludes learning a new software system every 4 years. You have the revisions as they happen and use them immediately.

Calendar functions, including scheduling and appointments, can be accomplished practice-wide. Although there is a learning curve and a mapping component essential to efficient travel and time management, these activities are easier and more accurate in the Cloud. Clients can request appointments, and any time of day or night, they can send status updates for chronic issues and request follow-ups. Veterinary assistants can organize the day, doctor, equipment, and responses with text or e-
mail. This process is commonly used by out of office business folks. Many of you are already using the apps on your handheld devices. It is not a big leap for practice-wide coordination. Cloud calendars, scheduling, and booking are key components of an efficient practice. The capacity to generate reminders, validate addresses, and obtain billing information as the client schedules online saves time and can build loyalty. There is a free app for that: http://checkappointments.com/pricing.htm. It can be embedded in your website as well.

ExplainingComputers.com’s white board presentation “Top Free Cloud Applications” (http://www.youtube.com/watch?v=IJcs7muN9XE&feature=player_embedded#at=143) gives a review of some of the assets of leading free applications. Microsoft and other software vendors are fighting back with a renewed focus to selling web-based products.

Banking and Merchant Services

Some of you are banking online, and some never will. However, you might not want to underestimate using your cell phone or other handheld device to accept bank payment or credit cards in the field. The ability to accept credit card payment when your service is provided and produce an e-receipt by email or text message is currently available for most devices.

Back-up

I recently visited a medical practice that was moving its medical records online. Every night, one of the physicians was taking a physical back-up disk of the practice activity home and bringing it back each morning. I was struck by the irony of backing up Cloud data using 1990s technology. Basically, the proprietary medical records software vendor did not want the responsibility for the transitional records, and they did not want a competitor to have access to their proprietary work. It did not take long for the practice to contract with another Cloud server for overnight back-up during the transition for less than $10/mo. Many veterinary practices (even those practices that have not moved to electronic records) do not have adequate and systematic back-up. At some time or another, you will lose 1 mo of data in a crash, storm, or mistake. The time wasted restoring your practice to the pre-disaster functioning is generally staggeringly expensive. Daily back-up online is fast, cheap, and a real no brainer. I have been there, and many of you have too.

Practice Building

There are numerous ways to use your website to connect with your clients, potential clients, and the internet world. It is extremely simple and fast to enter to Cloud computing, and this reason is the explanation that makes it the primary preference of the users. Users are in a position to share the resources quickly. The Cloud is a gadget and placement-independent application. Your target audience can use any gadget for Cloud computing anytime and from any part of the world. The multitenancy of the Cloud allows users to share a number of resources with a massive group of users. Although you may not see the value of having massive groups know or friend your practice, having a creditable internet presence is a necessity of the 21st century practice. It is worth learning these lessons, and there is a new sheriff in town. We all will have to learn to play by the internet commerce rules.

Electricity Analogy

Computer professionals use an electric power utility analogy to make sense of the Cloud. Early industrial manufacturers had to generate their own power. They located near rushing rivers to generate hydropower and mined coal to make coke to power steel mills. Eventually, a national electrical grid was established to provide reliable power to businesses and consumers alike. It was the democratization of electricity (where electric energy was not solely the providence of industry that self-generated it) that allowed for the possibility of individual quality of life improvements and manual labor-saving devices.

With the Cloud, it could act as the democratized provision of computing power. The highly technical and specialized responsibility and the investment in building and maintaining the international computing power grid has been undertaken by innovative IT companies. The responsibility for generating computing power no longer has to reside within your practice. You no longer have to depend on the one tech (or spouse) who has the hotline to your computer consultant so that every glitch, crash, upgrade, and training does not derail your capacity to work, bill, and get appointments. Also, you do not have to wait until your kid comes home to fix the printer or get the new remote electronic toy hooked up without crashing the router.

The exceedingly cheap costs of Cloud computing will have you using more computing capacity within your practice. Where texts once sufficed, you will be using video. Where you waited for a paper bill to come in the mail (and appreciated the slush time), you can now get immediate third-party payment at the time of service delivery. There are and still will be problems of service, customization, and applications. Cloud companies, for the past 5 or 6 yr, have focused on selling scalable computer time to IT professionals who are experienced in configuring in house servers and networks. Those IT folks simply moved the servers out the door and continued creating the firewalls, security, upgrades, networks, and back-up functions that they had been doing previously. Now, however, they could take a weekend off, go on a vacation, or get a full night’s sleep. Most veterinary practices did not have an in-house dedicated IT person. Many resented paying a consultant to come in and partly satisfy the promise of that really cool machine that the salesperson...
showed you at a meeting. The hardware and software manufacturers oversold products that never quite functioned as expected and needed ongoing maintenance from an electronics specialist.

This same issue will remain as the migration to the Cloud continues. Initially, Cloud companies only sold really inexpensive computing time. The software, customization, and maintenance was the customer's domain. Some of the larger (or older) Cloud-providing companies are starting to establish service for a fee. Now, smaller companies (that never had dedicated IT departments) can purchase service plans, get help and direction about setting up business on the Cloud, and begin to enjoy some of the benefits.

We can learn from what pioneers in ecommerce discovered. Whatever Cloud services you consider for your practice, they must be user-friendly, easy to master, and relatively goof-proof. If users are afraid to play around to quickly figure out how to accomplish a task or if the learning curve for using the Cloud service is more than 1 min, look for another vendor or application. You remember the days of computer manuals in awful English. (If you do not, you are young enough to be a Cloud native). Use has to be very simple. This lesson was a hard one, but it changed the customer service section of business. Market-savvy computer business leaders had hundreds of thousands of customer complaints and used them to develop solutions to their service problems. Remember that a few years ago, when you had a problem with some piece of electronics, you would call an 800 number and then get transferred to Roshan in Mumbai. Neither of you was speaking English comprehensible to the other. The problem you were having did not match anything on his script. He kept apologizing for the inconvenience, repeating the script, and getting nowhere. It was not customer service, your problem rarely got addressed, and no one was satisfied. Now, you go on live chat where, likely as not, you type in the problem and it gets answered from a list of frequently asked questions. If not, the live chat person is (most likely, a dedicated user with really good knowledge) freely sharing knowledge. On rare occasion, you will get a delayed response from a technician paid by the company. This whole system of customer help, developed by the computing community, is not yet available on the Cloud. The level of customer service associated with consumer electronics is not yet available on the Cloud.

Right now, the Cloud is a small portion of the computing market place: in 2010, it represented about 5% of the $1.5 trillion of corporate IT spending (according to industry data amassed by International Data Corp. [IDG]). However, the phenomenon of businesses moving their most important and innovative work into the Cloud is real and profoundly changing how companies buy computing power. If you intend to migrate your practice to the Cloud, there are some things that you can do immediately that require very little investment and computing skill. One is file sharing. If you have a case that you are consulting on with an expert in Australia, you can establish an account with Cloud service for $5 to $6/mo where you can link to and hang images, data, test results, etc. in a password-protected file folder. These files can individually be too large to e-mail and collectively be larger than any mailbox will accept. The link and password are passed along to the expert who can download the files and post others, very much like moving files around a computer network in your office.

There are advantages of such short-term accounts, like for transferring information from a pre-purchase exam directly to a buyer’s veterinarian. Similarly, if a sport horse in your practice is on the circuit, the local treating veterinarian can post files to your account for your timely review and consultation. I consider these types of accounts communication accounts. A select group of individuals can have access to a limited amount of data on the Cloud for a limited amount of time. The information may be there for 1 day, 1 wk, or 1 mo. Individual files have different passwords, and they are removed at the end of the engagement period. In our business, we often obtain huge files with medical, personal identification, or financial information in them. These files may only remain in the communication folders for a few hours before being transferred to folders with greater security for ongoing analysis.

If you choose to migrate your business, finance, and office functions to the Cloud, you will need to select hosts that use software (or a web version of it) that is compatible with your current processes. Otherwise, the migration will take a bit more time. Many Cloud hosts are rapidly expanding their small business- and consumer-level services. If you choose a host with fewer services that fits your long-term needs better, then you may want to engage an IT professional to set up your systems. There are several advantages to this selection. The IT pro, knowledgeable of the strengths and opportunities of the Cloud, can set up your practice for optimum use based on understanding of your needs and growth capacity/efficiencies. Just as you could use an architect and an electrician to wire your office for specific needs of a 21st-century veterinary practice, the investment in a web architect that understands our communication goals can be dollars very well spent.

When thinking about migration to the Cloud, let your imagination run. Can you foresee using and making YouTube-style whiteboard presentations, hanging rotating video on your webpage, doing live endoscopic examinations to share with others, hosting a webinar for clients, creating a science class for the local middle school, having a virtual open house for you and your colleagues from around the country, housing genetic information until it can be analyzed (or allowing your Cloud capacity to be used for the analysis), or hosting your American Association of Equine Practitioners committee work? Because the Cloud is scalable, available, and acces-
sible, new opportunities of computing power are yours. Because there is no capital investiture until you use it and you only pay for what you are using, long-term and large projects are now possible at very reasonable prices.

**Medicine Will Be Changed by the Cloud—Beyond Medical Records**

The way medicine is practiced is being changed by access to collaborative thinking and timely transfer of information currently not even considered. Eric Topol, who speaks in the linked video at http://www.eyeonthecloud.com/2010/02/medicine-in-cloud.html, is Director of the Scripps Translational Science Institute and chief medical officer of the West Wireless Health Institute. The National Institutes of Health (NIH) announced that Scripps Translational Science Institute is one of 14 research centers to receive a highly competitive $20 million Clinical and Translational Science Award. This video is an example of how patient interaction and participation with real-time information have an active participant in the health relationship.

This video raises the very real possibility of online veterinary visits. With webcams, video conferencing, and advances in technological equipment and monitoring devices, the use of the virtual veterinary visit cannot be ignored. The first passes at the process will likely be cumbersome and restricted. However, the use of the business trend may not be too much of a stretch as we all become more comfortable with the strengths and weaknesses of virtual medicine.

Human medicine is seeing portable doctor’s offices. There is a movement in 2011 to eschewing the traditional doctor’s office, and some are visiting patients in their homes. With a hosted EMR and the portable laptops and iPad-like technologies that we have today, some doctors are running part of their office out of a car. Although large-animal veterinarians have always had to make barn calls, the opportunity to enhance the quality of medicine that you practice through using these new technologies is on the horizon. Many lessons may be learned at the intersection of medicine and the Cloud.

**Costs**

If just using for storage (secure file sharing of X-rays and videos images), back-up and retrieval can be as little as $10 a month.

SaaS (software, interactive and cooperative space, webinar etc.) using multiple locations and users starts at $30 a month and varies with scalable use.

**Negatives**

Requiring functioning high-speed internet connection.

Investing time in understanding new technology.

Guaranteeing security of personal, confidential, and financial information.

Finding a reliable company the fits your needs and budget.

Getting comfortable with your data not residing within your practice.

Missing the boat.

Using companies with a bad track record (go to social media to identify buzz about company difficulties and how they were handled). Criticism from social media is very important to internet companies, and they respond to that pressure. Of course, the history is searchable and does not go away.

**3. Take Home Message**

**Why Should the Cloud Matter to an Equine Practitioner?**

Cloud computing is about the virtualization of your practice. Virtualization is the creation of a virtual (rather than actual) version of something. In the Cloud case, it includes the virtualization of your computing: the hardware platform, operating system, a storage device, network resources, medical and business records, and processes. The computing functions of your practice are outsourced, and management includes autonomic computing, where the system manages itself based on perceived activity, and use computing, in which computer processing power is seen as a use that clients can pay for only as needed. The usual goal of virtualization is to centralize administrative tasks while improving scalability and work load distribution.

On a fee for service basis, all of your computing processes not on your laptop or Blackberry are conducted on the web. This ability makes all of the information available to you and your practice from any internet connection at any time. The information can be shared, updated, worked with collaboratively, secured, and stored in moments. This process allows for fast, accurate communication with colleagues and clients (if they are close by or remote). All office and accounting functions are real time, and the software is updated on the Cloud. Images from your X-rays, endoscopes, and lab reports are uploaded directly from the machine, saving numerous intervening steps and reducing the opportunity for data corruption.

The Cloud provides new opportunities for medical practice as well as continuing education. For small businesses (under 50 people), the Cloud provides the same opportunities that have historically only been available to organizations with IT departments, and it is at a reduction in costs of your current computing hard- and software.

Accessibility, availability, and scalability are the salient features of Cloud computing. However, when you boil it down to brass tacks, Cloud computing is just a new take on an old idea. The old mainframe computer used to interface directly with the programs and data through dumb terminals. Now, any computing device connected to the internet allows access to all of your programs data and back-ups as well as the web. Because there are banks of servers, they are used maximally and managed by the best IT professionals; costs per hour are
reduced substantially. The initial investment in hard- and software (updates, training, and downtime) at the individual computer or server level is smaller.

In locomotion, the energy necessary to move results in 80% heat and 20% motion, we are only interested in moving. Removing the heat is a problem to be solved to continue moving. In computing, 80% for IT time, effort, and energy is focused on enabling the platform that allows the application to function. We are only interested in the application: office uses, games, communication, or equipment functions. The promise of the Cloud is that the 80% that we are not interested in that enables the application gets outsourced and managed by IT professionals. This promise leaves us more time and capacity to use the applications of computing. Although this promise is not yet a reality, we are moving in that direction. The momentum and direction are clear.

Resources

Cloud-Hosting Companies

Storm: https://www.stormondemand.com/cloud-server/
Rackspace: http://www.rackspace.com/index.php
Netsuite: https://forms.netsuite.com/app/site/crm/externalleadpage.nl?compid=NLCORP&formid=1436&h=110449732c94408d9d57&subsidiary=1&ck=Yh1G8XV5AT-vPF87&vid=Yh19nC9XAbIhwakq&ctime=96629&redirect_count=1&did_javascript_redirect=T

Gogrid: http://www.gogrid.com/
Amazon: http://aws.amazon.com/free/what-is-aws-free-usage-tier
IBM: http://www.youtube.com/watch?v=5qR5mm2NtQo&feature=channel
EMC: http://www.emc.com/solutions/
Cloud.com: http://cdn.cloud.cm/features.html
Migrating+to+the+%60Cloud%BF.xml
SAS: http://www.sas.com/presscenter/ccf09/
Salesforce: https://www.salesforce.com/

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