American Dental Partners & LED Apteryx: The Epitome of Cloud-Based Imaging Success

Abstract

Dental Support Organizations (DSOs) are increasing in the dental industry, with larger, geographically dispersed infrastructures becoming more commonplace. Due to the number of component practices involved in each DSO, these businesses have specific hardware and software considerations that directly affect the efficiency and profitability of their organizations. However, no matter how robust the DSO organization is, the overhead and investments associated with digital imaging software, hardware, and computing technology can significantly affect its bottom line.

Fortunately, in a cloud-based computing model, rather than investing in the hardware and software outright, practices can access and use resources and applications from LED Apteryx on their own equipment, no matter where they are. This white paper explains how American Dental Partners (AMDPI) recently turned to XVWeb® by LED Apteryx, Inc.—a leading dental cloud-based image management system—when faced with upgrading, replacing and maintaining 340 imaging servers.

Introduction

Dental Support Organizations (DSOs) are increasing in the dental industry, with larger, geographically dispersed infrastructures becoming more commonplace. Due to the number of component practices involved in each DSO, these businesses have specific hardware and software considerations that directly affect the efficiency and profitability of their organizations. Effectively managing numerous imaging acquisition devices and their integration into image management software has become increasingly more challenging, as manufacturers often prioritize closed-systems and proprietary integrations over workflow efficiency. In addition, single provider practices and DSOs are shouldering increasing IT costs for the required hardware and software systems that manage their imaging data.

An attractive benefit of the DSO model is that these large groups can use an economy of scale to secure excellent pricing on supplies and equipment, including imaging hardware and software, with terms that are affordable.[1] However, despite their ability to leverage substantial purchasing power, large DSOs that support hundreds of practices must still bear the substantial overhead costs involved with digital imaging hardware and software. In particular, software systems that traditionally have operated on in-office computers according to a client-server model power and connect imaging technologies.[2] No matter how robust the DSO organization is, the overhead and investments associated with digital imaging software, hardware and computing technology can significantly affect its bottom line—and from multiple fronts.

Why Client-Server Models Don't Serve DSOs

For decades, the software connecting various operations in dental offices has been installed directly on the computers—and more recently the organization's own servers—that physically reside in the practice. With these client-server systems, it is the responsibility of the practice to download and install the core software program and any necessary updates from the supplier's website. In addition to upfront costs for the software, installation, and training—which could approach $10,000 per practice, depending upon the system, monthly maintenance fees that cover software updates and technical support could range from $100 to $150 or more per month.[2]

Therefore, although acquiring state-of-the-art technology enhances DSO practice efficiency and the overall patient-care experience, the capital costs of outfitting multiple offices, as well as the IT staff time spent migrating data and properly integrating the systems, can outweigh the benefits. Additionally, the inevitability of software upgrades and potential hardware incompatibility issues beg consideration of the need for future expenditures to accommodate necessary adjustments for continued seamless operation and scalability. For example, as updates are introduced for servers and their components (e.g., processors, video cards, memory chips)—all of which must be compatible with a practice's digital imaging software—it's not uncommon for dental practices to postpone annual software upgrades based on difficult experiences installing vendor software patches.[2]

What's more, given the heavy emphasis on inter-practice or DSO dentist collaboration, the need for secure communication and information sharing is essential at a time when HIPAA compliance is simultaneously more challenging—and scrutinized—than ever.[2] DSO practices relying on client-server hardware and software may not have encrypted databases, and their software also may not enable transmission of secure emails to their colleagues.[2] Combined, all of this places a heavy burden on DSOs, both financially and in terms of in-house IT staff time.

Look to the Cloud

Now, however, more and more dental professionals are discovering that the same type of internet-based computing—more commonly referred to as cloud-computing—that enables their personal digital experiences can also support their general and specialty practice operations.[2,3] With a cloud-based imaging system, gone are the requisite in-office servers for hosting and storing imaging data. Instead, the backbone architecture of a practice's digital imaging technology is located remotely, along with all of the computers, hardware, software, servers and storage required to meet its processing needs.[2,3]

In a cloud-based computing model, rather than investing in the hardware and software outright, DSOs and large group practices engage in a subscription-based service agreement that enables their locations to access and use resources and applications from a specific cloud-computing vendor on their own equipment.[2,3] Without the need to purchase client-servers or the software to power them, initial investments become more

affordable. In the long term, DSO practices stand to benefit from several features that cloud-based digital imaging software can provide.

First, hardware costs are reduced and the need for IT staff to continually upgrade equipment to satisfy software requirements is eliminated. While maintenance and updates may still be necessary to ensure sufficient processing power to accommodate cloud-based applications,[3] the need to house and maintain in-office hard drives is eliminated because data is securely stored remotely by the service provider.[3]

As a result, the processing and storage potential for any practice—and any individual within the practice who wants to use cloud computing, for that matter—is practically limitless.[2] Even more empowering for individual practices and their DSO counterparts is the fact that cloud computing enables instant scalability. At any given location, more computer workstations can be connected to and/or removed from the cloud at any time, without affecting day-to-day operations or the digital imaging system itself.[3]

Additionally, whereas software updates in the client-server model must be performed manually by IT professionals in the practice, the process is automatically managed in the cloud by the service provider.[2] This ensures that all practices in the DSO organization have the latest version of the digital imaging software.

Although some may question the security of cloud-based data storage, its reliability is ensured via redundant processes at remote locations. A group of servers (otherwise known as a server cluster) with multiple backups provides confidence in the real-time synchronization of data that is processed in the cloud.[3] Further, without the physical storage of private personal patient data in the practice, HIPAA compliance becomes much simplier.[2] Yet, the data can be securely accessed at any time and from anywhere there is an Internet connection and a web browser.[2]

Unfortunately, not all of the recently introduced cloud-based service providers have the strength and wherewithal to develop and support the solutions that today's DSOs need. Many may introduce purportedly new options. However, for maximum confidence, it's important for DSOs to consider several key differentiating factors before migrating from a client-server platform to a cloud-based system.

No Two Clouds Are Alike

For example, the leading true cloud-based dental image management system currently available is XVWeb® by LED Apteryx, Inc., a company based in Akron, Ohio, that provides the latest in cloud computing. Formally founded in 1995, LED Apteryx specializes in developing custom applications for dental imaging, processing, data encryption and security, and other applications. The company's XrayVision product, which was originally released in 1996, is now the premier dental image capture and management software suite available, with more than 80,000 users at over 30,000 practices. XVWeb has been used to acquire and store more than 75,000,000 million images in the cloud with 25,000 images captured each day.

Establishing LED Apteryx as dental image management and integration specialists, the core foundation of

XrayVision and XVlite is state-of-the-art, open architecture digital dental x-ray software that incorporates numerous imaging devices and different hardware manufacturers into one application. Its next generation of dental DICOM server and client software—DCV—has been used extensively within the United States military, as well as other institutions.

Today, LED Apteryx's XVWeb enables an individual practice or those within a DSO to view their images from most web-enabled devices. Designed to work with existing imaging applications via secure DICOM TLS, XVWeb allows dental practices to both store and retrieve images from a webpage or any DICOM-compatible imaging program over a secure connection.

XVWeb supports all types of dental image acquisition devices, including digital intraoral sensors, phosphor plates, intraoral cameras, extraoral cameras, panos, cephs and CBCT systems. In fact, a 3D viewing module for CBCT datasets is in the final stages of development and a module for CAD/CAM data storage via XVWeb is currently being researched to enable transfer of such patient records between DSO practices.

Supporting its use across all imaging devices—regardless of the manufacturer—is XVWeb's secure, open architecture. Security is ensured through the use of 256 bit AES encryption, as well as SSL and TLS encryption across different communications. All imaging devices are essentially modules that can be added to the main program. Numerous practice management companies that maintain relationships with LED Apteryx build data bridges between their products and many communicate directly and seamlessly with XVWeb for clinical image management, processing and analysis, while providing access to clinical images from any web-connected device. XVWeb is imaging device agnostic, so practices and DSOs have the freedom to use most imaging acquisition devices from major manufacturers.

American Dental Partners—A DSO Case in Point

Such freedom—and the cost-effectiveness associated with cloud-based image management—was exactly what American Dental Partners (AMDPI), one of dentistry's largest DSOs, needed. With 340 dental offices in select markets across the United States, AMDPI was recently faced with upgrading, replacing and then maintaining 340 imaging servers.

AMDPI's original digital imaging implementation had been planned and designed around initial commercial offerings that were introduced near the time of clinical acceptance and intended primarily for single practice use. In fact, when AMDPI was founded in 1995, the dental profession was fragmented, decentralized and not positioned for the future. Over 80% of dentists practiced alone, struggling with balancing the day-to-day demands of running a practice.

Therefore, each practice within the AMDPI organization required its own server, software, corresponding database and all required virtual and physical infrastructure necessary to support those systems. Monitoring, maintaining and refreshing those systems as AMDPI's practice base grew had become a time consuming and expensive undertaking.

Although AMDPI's ability to streamline operations and maximize profitability has enabled it to continually invest in the latest server technology, at an average cost of $5,000 each, in addition to annual maintenance fees, total expenses to upgrade the DSO's servers would exceed $1 million. Considering the high hardware and IT costs, lack of central storage and closed systems with limited imaging hardware choices, AMDPI investigated other alternatives.

Initial attempts to resolve these issues involved a virtual desktop infrastructure (VDI) configuration, which was quickly disqualified due to device compatibility shortfalls, specifically with intraoral sensors. The next alternative involved centralization of legacy software in a private cloud environment. Although early testing was successful and promising, AMDPI quickly found that the application was unable to operate under latencies expected at practice locations farthest from this centralized presence.

Realizing that an entirely new solution was required, AMDPI assembled a list of technical and clinical requirements and approached LED Apteryx, as well as several other competitors in the digital imaging space. The majority of competing vendors presented cloud based imaging system solutions that were integrated into their own Electronic Dental Records (EDR) systems. However, because AMDPI had already developed its own EDR system, many of the original competitors were disqualified based on the requirement to be independent of an EDR system.

Why XVWeb Was the Right Choice

Removing the dependency on localized hardware and software at each AMDPI practice location could have easily been facilitated with a private cloud solution. However, LED Apteryx presented its XVWeb solution, which would operate independent of any on-site presence and ensure compatibility with AMDPI's future technology strategy. As a result, AMDPI could continue to empower its affiliated practices with the equipment and support needed to stay on the leading edge.

XVWeb met the initial requirements and was able to deliver more than expected for the technical requirements. AMDPI felt confident in the product early on, but it was the initial test, pilot and customization request delivery that solidified their faith in LED Apteryx's ability to deliver not only as a software vendor, but also as experts in digital radiography.

Additionally, one of AMDPI's initial technical requirements specified sizing appropriate for a DSO; specifically hosting up to 100 practices in a single database. XVWeb was the only solution identified in their search with existing production databases that met these scalability requirements. This isn't surprising, especially considering that LED Apteryx software is used by other large-scale dental organizations, including Park Dental and Samson Dental, and by the United States Army and Navy.

AMDPI is currently well underway and on track to complete its ambitious plan to convert 300 practices in approximately 425 standard work days. To date, more than 100 practices have already completed their

conversion. The technical aspects of the conversion have become second nature for members of AMDPI's technology team, as well as LED Apteryx's support staff.

User acceptance, software, and equipment tuning have been the most time consuming hurdles, but both AMDPI and LED Apteryx continue to collaborate to continuously improve the support and training process. Training has thus far included a "train the trainer" model, custom training videos for use and sharing by AMDPI trainers in converted practices, and onsite, per-request training by LED Apteryx to address optimizations related to image quality.

However, AMDPI has already begun to realize simplification of particular business processes that require image sharing outside of referrals as a result of the conversion. Additionally, although the full conversion is not yet complete, AMDPI estimates that it will save the DSO approximately 70% in overall support time.

These efficiencies supplement the 29% cost savings the organization has experienced. In particular, an estimated $1.7 million in server costs was saved.

Conclusion

Adopting new technology is a daunting task, especially when part of that adoption involves a migration or conversion from an existing solution. It's easy to identify many reasons why adopting new technology is a poor choice when existing solutions are working. Regardless of initial thoughts, it's critical to determine what your business can gain by making a change.

Therefore, consider the flexibility that is lost with proprietary systems and work toward adopting a standard for potential future conversions. Evaluate the total cost of all solutions, including supporting infrastructure. Complete end-to-end testing during the test and pilot phases with clinical and technical staff and ensure appropriate reviews of testing against your requirements are completed. Finally, ensure that the team understands the differences between on-premise and cloud computing; understanding these differences goes a long way during the training and user acceptance stages.

In the case of AMDPI, the conversion and development staff at LED Apteryx were eager to partner with the DSO and, more than halfway in, continues to lay 110% on the table every day in conversion expertise, support and customization delivery. As a result, converting to the XVWeb cloud-based image system has thus far resulted in the simplification of AMDPI business processes involving shared images, simplified referrals, cost savings, an increase in support efficiency and the flexibility to expand the organization's practice base, without difficult on-premise implementations.

References

1. Association of Dental Support Organizations. The role of dental support organizations in an evolving profession; the executive summary of a recent ADSO report on changes in dentistry. *Inside Dentistry*. February 2015; 11(2).

2. Lavine L. Floating on the cloud: New technology and software present varied options for dental offices. *Inside Dentistry*. September 2015; 11(2).

3. Meyer E. Cloud computing: Is it time to get onboard? *Inside Dental Technology*. February 2012; 3(2).

4. Miles DA. The state of the art: innovations in CBCT and digital x-ray imaging. *Inside Dentistry*. May 2017; 13(5).

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