Avera Health simplifies the operation of multistate oncology service lines by moving MOSAIQ® Oncology Information System and METRIQ® databases to a cloud-hosted environment.

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Avera serves South Dakota and surrounding areas of Minnesota, Iowa, Nebraska and North Dakota at six regional centers in Aberdeen, Mitchell, Pierre, Sioux Falls and Yankton, SD, and Marshall, MN through 33 hospitals, 208 primary and specialty care clinics, and 40 senior living facilities in addition to home care and hospice, sports and wellness facilities, home medical equipment outlets and more.

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Sioux Falls-based Avera Health, the health ministry of the Benedictine and Presentation Sisters, is a regional partnership of health professionals who share support services to maintain excellent care at more than 300 locations in eastern South Dakota and surrounding states. Avera Health and Elekta have been collaborating since 2014 in a partnership to deploy METRIQ® cancer registry, MOSAIQ® Oncology Information System (OIS) and other Elekta solutions across the Avera Cancer Institute, a network of six regional cancer centers over a vast geography.

While MOSAIQ provided an exceptional OIS for both radiation oncology and medical oncology, Avera Health’s growth began to put a strain on the organization’s ability to maintain this complex oncology IT infrastructure. Over three months in the summer of 2015, Avera Health moved three MOSAIQ and four METRIQ databases to Elekta Cloud Solutions, easing the organization’s software management burden while facilitating access to the MOSAIQ application and databases.

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Growing pains

Serving a population of nearly one million throughout a geographical footprint of 72,000 square miles and 86 counties, Avera Health truly is a monolithic, and growing, healthcare provider in the Upper Midwest. Although the implementation of MOSAIQ standardized its oncology EMR under one OIS, the task of maintaining both this system and the massive hospital EMR (HIS) was becoming unwieldy.

“From a database perspective, there was a much larger patient population that was involved with the larger hospital system and the HIS,” says Robert Butler, BS, MLS, Avera Health Sr. Systems Analyst and a member of the in-house team tasked to gather information on transitioning MOSAIQ to a remotely hosted application. “Most of the IT resources, including myself, have been mainly dedicated to the larger system. In some of our regions we did have dedicated MOSAIQ IT support, whereas in other facilities we did not. When we were smaller—four to six departments spread across two sites—it was manageable, but as Avera Health kept expanding its reach, it became more difficult to manage that infrastructure and the databases.”

Avera Health’s radiation oncology and medical oncology service lines were distributed among the Minnesota cancer center in Marshall and the five South Dakota centers in Sioux Falls, Pierre, Mitchell, Yankton and Aberdeen, and in multiple MOSAIQ and METRIQ databases, which represent the five radiation centers and six medical oncology sites.

The IT staffing included a single-server analyst who worked on MOSAIQ issues on an ad hoc basis, focusing mainly on non-MOSAIQ-related duties. Two other Avera staff members were available to deal with connectivity issues, but these two also were not designated as MOSAIQ-only employees. Because not all regions had dedicated support, Elekta Cloud Solutions and the move to a single database allowed Avera to use existing IT resources to service the whole health system versus a few regions.

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“It wasn’t consistent and standard across the enterprise,” she reports. “It was much more difficult for us to maintain because of those inconsistencies. The Yankton facility, for example, was actually on an older MOSAIQ version that our analyst team had never worked with before. Standardizing all of it would have created a significant extra cost in the absence of another solution.”

Timely suggestion

For several months, John Fitzgibbon, the Elekta Regional Sales Manager for Avera Health, had heard anecdotes about the center’s challenges. He knew that IT personnel were doing their best to juggle the demands of the enterprise’s overall IT infrastructure, while keeping on top of MOSAIQ maintenance and dealing with associated connectivity issues and system slowness. In early 2014, Fitzgibbon, along with the local sales representative, approached the center’s IT management team with the idea of oncology hosting through Elekta Cloud Solutions.

“John explained that cloud hosting would help us with application stability and slowness issues and give us a standardized MOSAIQ format and setup of the application,” Butler recalls. “He knew that we had long-range plans to integrate the radiation oncology, medical oncology and cancer registry databases into a single database to provide patients with consistent care across all regions. We were also shown how cloud hosting would be the perfect marriage between what we were looking for in day-to-day OIS management and in terms of application stability, data control and change control.”

The most attractive aspect from Butler’s perspective was that cloud hosting would lift the burden of MOSAIQ supervision from Avera Health’s IT staff and shift it to Elekta.

“It would allow the Elekta Cloud Solutions personnel—who are experts in delivering MOSAIQ and METRIQ—to manage both the database and infrastructure and be there for us 24/7/365 to give us that full support we needed,” he remarks.
Because we’re dealing with private patient medical records, Avera is cautious about change,” Oncology EMR Manager Nathan Hruby adds. “Knowing that Elekta Cloud Solutions would give us a team that was specifically designated to manage MOSAIQ and the other Elekta products gave the administration that level of comfort we needed in this case.”

Avera Health opted to bring MOSAIQ to the Elekta cloud and scheduled implementation from July to September 2015. The final major step in Avera Health’s conversion—merging the three databases in the cloud—would occur in June and July 2016.

Launch countdown

Preparing for remote hosting is arguably the most challenging step in the migration of MOSAIQ records to the cloud, reports Butler. In each of the three databases were records dating back to before 2012. While some of these data could be copied over to Elekta’s primary data center electronically, the majority needed to be physically transferred to a solid-state drive and flown to the data center due to the volume of data that needed to be uploaded.

“Just preparing that hard copy, getting it into someone’s hands and on a flight to the data center on time so we could get it tested and running, was a big job that required a lot of project planning,” Butler recalls.

In calls with other sites exploring the migration of MOSAIQ databases to the cloud, he stresses the importance of appreciating the scope of the project in the planning stages.

“One of the most important things is understanding the sheer size of your database or databases, so you can better appreciate the timing of the switch, and also the number of user connections you’ll need,” he says. “Doing that pre-implementation work better can prevent surprises on go-live.”

Into the cloud

On July 20, 2015, Avera Health went live with the first database. When the second database went live in August 2015, they ran into one of those surprises.

“We had mistakenly given Elekta an estimate of 100 users expected to access the system at any given time, so Elekta dedicated Citrix server resources to accommodate 120 users to provide a little leeway,” Butler says. “That first morning we had 250 users trying to connect. But Elekta was extremely responsive. They were spinning up Citrix servers left and right all morning long. By noon that same day, we had at least resolved the issue to the point where users were able to work; then overnight we were able to clean it up so that by the next day we saw much cleaner rollout in the morning.”

By the following week, Butler adds, everything was “completely calm,

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everyone could access exactly how they needed to without any issues.”

“We were really pleased with the way Elekta stepped up to the plate to address that issue,” says Kris Gaster, Assistant Vice President of Outpatient Cancer Clinics, Avera Cancer Institute. “They acted like a true partner and that spoke volumes among our senior leadership at Avera. It did cost us more, because the scope of our server needs was bigger than we thought, but just being able to have a partner that actually works with us demonstrated to me that we were in a true partnership—not the typical vendor-customer relationship. It speaks to the partnership and Elekta’s commitment to it.”

By November 2015, Avera Health and Elekta had repeated the patient record upload and go-live process for the other Avera Health database; the organization’s MOSAIQ medical oncology and radiation oncology applications and METRIQ cancer registry were all in the cloud.

The first indication that remote hosting was having a beneficial impact was when Butler checked data from the Elekta error reporting system. One month post launch, the error rate had been reduced by more than half, Butler notes.

The switch from local hosting to remote hosting also was relatively easy for the front-end users of Elekta software, according to Hruby.

“They’re aware we’re on a cloud server and that there was a switchover, but I don’t think they saw a change in the way they do their daily work,” he says. “One thing they may have noticed would have been a standardization in the way they access the application. In our previous state, we had some locally hosted who could just log into MOSAIQ right from their computer. Others had to go through a virtual machine and still others had to go through our Citrix setup. Now, everyone goes through the same portal to access MOSAIQ the same way every time.”

Gaster observes that accessing MOSAIQ in the cloud was a victory, since it was essentially “invisible” to users, adding, “I believe it really says a lot about the success of the whole project.”

Day-to-day

Although Avera Health has offloaded the daily burden of managing its OIS infrastructure to Elekta, continual surveillance is critical to head off any issues. For the foreseeable future, IT will always be that way whether it’s remotely or locally hosted.

“Since we adopted remote hosting [Elekta’s Premium Oncology Hosting], we are in contact with our Elekta Cloud Solutions team on a near daily basis for troubleshooting or issue resolution any time we have even an inkling that it has something to do with the remote hosting environment,” Butler reflects. “My direct supervisor has a weekly call with the head of Elekta Cloud Solutions for a high-
level overview of cases, issue resolution, upcoming needs for meaningful use and tracking the performance indicator.”

The performance indicator—an Avera Health tool—tracks Elekta software uptime and is on a repeating 180-day cycle, i.e., the number of days between periods of downtime. Complete system downtime is when a user cannot access MOSAIQ at all, but smaller issues—users seeing errors or slowness that impact patient care—also factor into the performance score.

“We do this to make sure that system performance is always foremost in our mind and Elekta’s mind,” Becker says. “It also gives us a representation that we can give to the operations team to show that we haven’t had an issue in a given number of days. Elekta promised us system uptime of 99.95 percent. I would say that—with the exception of a couple of hiccups that were resolved quickly—they have definitely exceeded that at this point. It’s very close to 100 percent.”

To add even greater focus to system performance, Avera Health is working to implement the user experience tool with Elekta, Butler adds. This system constantly monitors speeds within MOSAIQ itself, in addition to checking speeds across the fiber optic connections to the primary data server.

“If there are any complaints, we can always instantly check the connection between ourselves and the remotely hosted servers,” he says.

While Avera Health’s change control protocols have always been good, transferring this function to Elekta was another advantage that reduced workload.

“Elekta also has a good change control process,” Butler says. “Everything is documented, requested and scheduled on their end, and then passed along to us so we can do the same on our end and have that good, clean documentation. We’re not seeing anyone here able to log in and make changes at any time without specific authorization, which had been an issue before. Elekta has a tight control on it just like we would want them to.”

Disaster recovery

With its dual data centers, Elekta Cloud Solutions provides the healthcare enterprise with a robust disaster recovery solution in its Premium offering. In Avera Health’s case, there is a primary data center, but the organization’s data also are stored in a secondary data center. With the MOSAIQ Premium hosting option, Avera’s data are protected by systems that allow for Clinical Operations to resume with less than one hour of data loss given a complete data center or network link failure event.

“In the event of a disaster or emergency that affects our connection to the primary data center, we could switch over to the secondary database without missing a beat,” Becker says. “That is a really difficult challenge for health systems to maintain financially and resource-wise on
their own. It gives you peace of mind knowing that there is that redundancy."

The fiber optic connection is completely separate from the primary data center, so even if the fiber optic line was cut in the middle of the country and they couldn't access the data center there, they would have the secondary connection.

Remote hosting facilitates database merge

By the summer of 2016, Avera Health was ready to merge the three databases they had uploaded to the cloud as distinct stores of patient information. A single database would help ensure consistent care across the large, distributed healthcare system and unify all MOSAIQ users by providing access to all patient records across the system with one login.

“Remote hosting made merging the databases much more feasible,” Hruby observes. “In fact, without remote hosting the database merger would have been next to impossible given the amount of access we needed and resources it would take to do that, both from Elekta’s end and ours. It could have been done, but it would have been extremely difficult, requiring the manual migration of patient information—literally people sitting down with paper charts on one computer and transcribing the information into another computer.”

On July 16, 2016—with the merge of the Yankton database—Avera Health began operating from a single, all-inclusive MOSAIQ database.

Ongoing improvements

On the horizon at Avera Health are enhancements designed to increase the speed and functionality of the cloud-based MOSAIQ application, in particular, and cloud hosting, in general—a plan springboarded by the network-wide upgrade from MOSAIQ 2.6 to MOSAIQ 2.64 in November 2016.

“Elekta is constantly trying to improve on the infrastructure that it offers, so we can improve on the product we roll out to users,” Butler says.

“Because we control the design and deployment of Elekta’s oncology software in our cloud, there is always a continuous improvement loop that positively affects our customers’ user experience,” says Chuck Martin, Director of Global Cloud Solutions at Elekta.
Looking back

Despite an initial challenge in quantifying the scope of the project, the consensus at Avera Health is that converting to the cloud was the right thing to do at a pivotal time in the organization’s growth stage.

“Cloud hosting has allowed our infrastructure teams and server teams to free up their focus back to the larger health system and gave us a larger, dedicated Elekta resource to support MOSAIQ,” Butler says.

“We identified remote hosting as a good solution,” Becker says. “It has met the objectives we set out to accomplish. Our partnership with Elekta is really solid, and because of that partnership if there are issues or challenges that come up, we are really able to work together to resolve them.”

“Remote hosting is probably the way of the future for large healthcare organizations,” Hruby adds. “It shifts capital resources away from maintaining those IT resources locally. It liberates you to focus on your own general infrastructure versus having to maintain those servers locally and having to assume all of the risk associated with that. Yes, you are relinquishing a certain level of control, and it won’t be the right solution for every site. However, if you look at the future of IT and healthcare, it definitely seems to be the direction that healthcare and other industries are going.”