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# Calgary Scientific's solution allows sharing of images from all sources

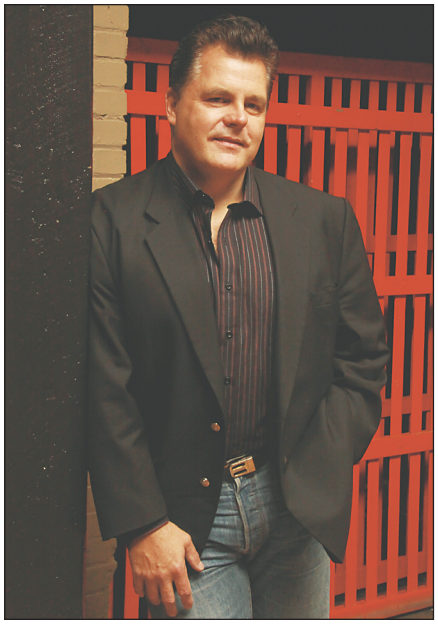
BY ANDY SHAW

Imagine you're a radiologist taking a much needed break from your relentless schedule to play a round of golf. But suddenly on the golf course, you're stung with remorse realizing you'd forgotten to have a look at a critically important work-up. You know all too well how anxious the referring doctor and her patient are to get your interpretation. So you find a bench under a shady tree at the next tee – and you whip out your iPad.

Calling up the dedicated website, you tap the study you want to see, and instantly there's the 3D CT scan of the patient's head you needed to take a closer look at. With your thumb and forefinger – golf glove removed, of course, because you remember that the iPad screen is not touch but heat sensitive – you enlarge the image of the skull, you flip it, rotate it, add the flesh and the grey matter inside, take them away again, all in your search for an elusive lesion.

And thanks to the stunning clarity of the images you are manipulating, you find it, or more happily for the patient, you conclude there isn't one. All this done in real-time, without any significant delay in the rendering of the images, despite their enormous size.

So you then touch an email link on your special mobile imaging app and that wings off an alert to the referring physician to join you in your under-the-tree session. The physician is not playing golf but is in her office, using her laptop. When she answers, you say to her, via your iPad's built-in microphone, that you'd like her to have a look at the suspected lesion location – and take your fingers off the screen, relinquishing control of your collaborative session to the office-bound doctor. She grabs her mouse and you both watch as she moves and manipulates the same images you just did.



Byron Osing is a co-founder of Calgary Scientific.

Satisfied with your interpretation, she wishes you a good game. You pull that big new driver you just bought and stride confidently off to the tee.

An imaginary scenario about the future of imaging?

No. In effect all that breathtaking capability was on display, including iPads, at the Calgary Scientific booth during the annual Radiological Society of North America (RSNA) trade fair and conference in Chicago last November.

The six-year-old company, spun out of radiology research at the University of Calgary, has made seven-league strides to the forefront of mobile healthcare, partly through showing up at RSNA every year.

"We started out as a software developer who simply wanted to create radiology apps that didn't need a lot of horsepower and that could be used on a laptop," said Calgary Scientific's CEO, Byron Osing, PhD, at RSNA 2010. "But about three years ago we came here and realized that the medical world was still back in the IBM era of computing, never mind near the Microsoft age, nor today's Google age. So we decided, hey, let's take a shot at finding a way to modernize this industry."

Dr. Osing and the other two founding shareholders of the company were aware they were taking on a huge challenge.

"Everyone in healthcare knew they had

to get interoperable, but with the infrastructure that was supporting them, it was clear that it couldn't work for imaging – given the heavy data sets and intensive processing it entails. The huge security requirements in healthcare were also a big barrier."

So Calgary Scientific and its developers went another route and aimed for a fully web-enabled solution that ideally only required a simple browser and could be accessed even by mobile devices. And they also went after an app that would be affordable and easy to implement.

"So that's how we ended up with what we have here at the RSNA, our PureWeb platform, which is really the foundation of all our technology," said Osing. "It enables you to take any imaging you have and transform it rapidly with one of our software development kits. That will embed it in the PureWeb platform."

In doing so, assures Osing, you don't need to tear down or rebuild your software at great expense.

"The transformation doesn't touch any of the business logic in your application. It will continue to do what it always does, but what you have done is to create a new user interface with it that is virtual."

Being virtual, the user interface is so light that a normal web browser will access the application and its data readily and the user can also easily re-factor the interface so that it will run on any mobile device. Just what you, the imaginary golfing radiologist, a few moments ago were doing under that shade tree.

"But even though it is virtual, the PureWeb platform enables you to have all the app's controls and other workflow tools right on your mobile device, be it an iPad or an iPhone or a new Android phone," said Osing. "That means you can operate the app with the regular finger-pinching, sliding, and other touch techniques you normally do on that device."

Osing feels PureWeb and Calgary Scientific's products developed from it, deserve to be put in the "breakthrough" category for more reasons than one.

"They're breakthrough because people in the healthcare industry are not going to spend millions simply to have their apps torn down and made interoperable with mobile devices," said Osing. "With our software, they can do it themselves. They don't have to outsource it. We just sell them a software disk."

Osing added that because everything the PureWeb platform does is on a central server, PureWeb is both scalable and affordable.

"If you have one of our ResolutionMD servers (built with zero-footprint Intel Xeon architecture), for instance, it will support up to 50 users doing a mix of 2D, 3D, and other advanced imaging on a 2-gigabyte server. So it is also very low cost per user on the hardware side too."

One natural concern for any prospective buyer would be how well PureWeb would work in a low-bandwidth environment that might freeze or make the handling of images jerky.

"That was one of our goals – to make PureWeb deal with low bandwidth restrictions and latencies that are built into telephone lines. So we've poured a lot of new technology into it to make sure it does. We have 10 patents on the platform alone," said Osing. "In short, we've given it the ability to do advanced imaging in real-time, no matter where you are, what technology you are using, or where the data sets are."

At RSNA 2010, Calgary Scientific introduced two enhancements to PureWeb.

"We've added a video capability, so that if a remote patient in Northern Ontario, say, has a camera on him, one doctor in Toronto and another somewhere else can both be talking to and looking at the patient and each take turns zooming the camera in to see what each doctor wants to look at more closely.

"On the collaboration front, users can now put any of their applications on PureWeb and make them collaborative, remembering that they are virtual so that you never have to move the data sets, you never have to copy them, and from a security point of view, they never leave the protected server they are on. That is the key to our whole technology," said Osing.

Key to their whole business future at Calgary Scientific, however, may well be the hundreds of stand-alone individual data repositories healthcare organizations have built in the United States.

"We're in better shape in Canada because we have fewer albeit usually far bigger data repositories being built. But in either case how do you access them if you are trying to build an interoperable electronic health record, as we all are?" wonders Osing.

The answer in Canada so far has been to make the repositories "PACS neutral" so that they can exchange pictures and data regardless of the brand of PACS equipment that generated them. But it is a technically challenging and expensive thing to do.

"I believe we have made the whole idea and need for a PACS neutral archive go away," observed Osing. "All you need to do now is to put one of our simple servers beside every data repository. And it will go out and search for whatever patient record, lab report, or image you're looking for and bring it to you – virtually."

Stunning, when you think of its implications for all investing that's going in making healthcare technology inter-operative, perhaps now in an out-dated fashion.

Small wonder Osing says he hears from venture capitalists every week telling him Calgary Scientific and its PureWeb platform are the hottest of the hot in the industry right now. No surprise that Siemens Healthcare has already incorporated PureWeb in one of its mobile offerings. And not a shock that the American research firm Frost & Sullivan applauded the company and its software with its 2010 in Best Practices Award.

But that all leaves one wondering if, like so many Canadian entertainers who are also good at connecting with Americans, Calgary Scientific will have to prove itself with audiences south of the border before it gets much appreciation up here.