

Lamont: Supercomputing marks seismic shift in geophysics

Introduction

For this installment of *TLE's* Technology Leaders interview series, managing editor Steve Brown sat down with Matthew Lamont, founding partner and managing director of DownUnder GeoSolutions, at the 2015 SEG International Exposition and 85th Annual Meeting in New Orleans, Louisiana.

Brown: When you incorporated DownUnder GeoSolutions in 2003, was there a particular hole in the marketplace that you believed needed to be filled?

Lamont: I had spent the previous four years in Houston, and I saw these fantastic small geophysical companies working out really well. When I shifted back to Perth, I saw a very different landscape where there weren't any of the small geophysical players, and I could see no reason why one wouldn't work in Perth. So, in a way, I was emulating some of the fantastic companies of the late '90s and early 2000s in Houston.

Brown: As you're here this week at the SEG Annual Meeting, listening to presentations and walking through the exhibit hall, what are some of the technology trends you're seeing that are getting you excited about the future?

Lamont: There are several individual technologies, such as FWI, that have become really important and have stormed into the arena. We've also seen broadband data for several years now. I think the really exciting thing that the industry is just starting to realize is that these two technologies, when they're brought together, mean that we no longer have a frequency notch for our absolute inversions. We get accurate velocity data up to 8 or 15 Hz, whatever you like, with FWI; and we get much lower frequencies coming in from the seismic, down to perhaps 3 or 4 Hz. So, now, the traditional notch where we had to build these sophisticated models and where all the uncertainty came from in our inversion work has gone away. That's going to play out very significantly in the coming years, I think.

Brown: DownUnder Geosolutions has two massive supercomputers. One named "Bruce" in your Perth, Australia, office and another named "Bubba" which will come online in the new office space you're going to be moving into in Houston. Can you tell us a little about those two computers and the role supercomputing plays in the geophysics industry?

Lamont: It's fun. I enjoy these big computers. Traditionally, perhaps half the cost of a company like ours would go on people and half the cost would be on computing. So getting the computing cheaper is very important for the health of the company.

Also, Professor Claerbout came out with a lot of stuff in the '70s that we're only now able to apply just because of the computers being available. Geophysicists have been hankering after big compute to run a lot of technologies being developed for decades now.

So they're very important, and we've been very fortunate to get a technology partnership with Intel on some of their new



Dr. Matthew Lamont
 Founder and Managing Partner
 DownUnder GeoSolutions

coprocessing equipment. We're putting in these really large machines, and we've worked very hard to get our total cost of ownership down to enable us, as a small company, to put in these machines. Bruce, in Perth, is five-and-a-half petaflops which is more than five times the size of the next biggest computer in the southern hemisphere. Bubba, in Houston, will be about the same size. But the new office facility has computer-room space, power, and cooling for up to a 20-petaflop machine. So, we're planning big things in Houston.

Brown: The elephant in the room right now is that we're experiencing a fairly significant downturn in the oil and gas markets. What are some ways technology can help companies weather this downturn?

Lamont: In our case, our total cost of ownership of computing is very low, and therefore we've been able to weather the storm by including more compute in our jobs, in our proposals, and tender responses as opposed to competing purely on price. So we can compete very heavily based on cheaper compute, but we can also do things that otherwise you wouldn't be able to do and that our competitors may not be able to do.

So, in terms of us being competitive, there's still work out there, you've just got to get your share. The other thing that has happened is that, in the last 12 months, tenders are much more often rewarded based purely on price. In the past, they would be based on relationships and trustworthiness, which are things that take time to build up as a new player in the market. Now it's price and bang for the buck; it's price for what you deliver.

About Matthew Lamont

Matthew Lamont is founding partner and managing director of DownUnder GeoSolutions, which he started in 2003. Lamont holds a Ph.D. in Geophysics from Curtin University of Technology where he is currently an adjunct associate professor. His working career spans more than 15 years starting in Woodside's geophysics group. Later he was the technical lead for the seismic processing and imaging team for BHP Billiton in Houston. At stages during his career he also has been involved in quantitative

interpretation studies. Along with DownUnder GeoSolutions cofounder Troy Thompson, Lamont was a recipient of the 2014 Cecil Green Enterprise Award.

Watch the video

The complete interview with Matthew Lamont, of which the preceding is an excerpt, is available in three locations:

- SEG Digital Library at <http://library.seg.org/toc/leedff/35/2>
- SEG's YouTube station at <https://www.youtube.com/user/segeophysicists/playlists>
- The *TLE* Digital Edition at http://www.tleonline.org/the-leadingedge/february_2016

Look for the next installment of this interview series in the April 2016 issue of *TLE*. **TLE**

Instant access to the video

Scan the QR code on the right with your mobile device to view the video on your smart phone or tablet immediately.

Don't have a QR code reader on your device? A variety of free and low-cost QR Code reader apps are available for download at your favorite app store.

