'Are we there yet?'

DONNA MARCOTTE, Drilling & IT Editor can be reached at *dmarcotte@hartenergy.com*

We have made great strides in technology to optimize and enhance production. When it comes to information technology and the digital oil field, we are getting closer, but we aren't quite there yet. We need to focus more on the people in the process.

Summer is approaching here in Houston and the Northern hemisphere, and I'm starting to think about my summer vacation, among other things. When I was a child growing up in the northeast United States, large working-class families like mine didn't fly to vacation destinations, we drove. And for us children, the several hours crammed in the back of the car, attempting to share space with our siblings and the week's worth of clothes, food and other vacation provisions, seemed endless, prompting us to frequently ask our parents, "Are we there yet?"

This month's feature on enhanced oil recovery (EOR), coupled with a panel discussion on the digital oil field at this year's Offshore Technology Conference (OTC), got me to thinking about how successful our industry has been at maximizing the value of technology. It also had me asking the same question, "Are we there yet?"

My answer: not quite, but we're getting closer.

For this discussion, I consider production-improving technologies in two broad categories. The first I'll classify as "hardware," which includes all the physical engineering technology used to get reserves out of the ground. These include all the various mechanical and chemical technologies like CO_2 injection, a strategy being pursued by one of the companies in our feature, Denbury Resources Inc., (see "Winning at EOR," page 58), and alkaline-surfactant-polymer (ASP) flooding, which is the EOR method of choice for Cano Petroleum, also appearing in this month's feature (see "Economics right for ER," page 53).

The second broad category I'm calling "software" or information technology (IT), which includes a vast variety of computer visualization, simulation and monitoring technology designed to help us better model and understand reservoir characteristics, fluid flow and a myriad of other phenomenon so we can better apply the hardware technologies. For example, we have technology like the new carbonate porosity detection process being developed by Focus Energy in ongoing work with Sandia National Laboratory. This technology, along with some compelling images, is also included in the feature (see "A new look at an old field" on page 49).

Based on the panel discussion at OTC and other events I've attended since joining *E&P*, it's the technologies of the digital oil field — the collection of hardware monitors, flow meters and sensors linked to the software that gathers, moves and analyzes the data, as well as all the various software that simulates the under-the-earth environments and events — where we seem to be having the most difficulty realizing the greatest return on investments.

I think a large contributing factor, in very broad terms, is the complexity of the environment — not the physical oilfield environment, though that is by no means simple. Not even the technical computing environment, though also not simple. I'm talking about the psychological, social, cultural and business environment of the companies, departments and people that comprise our industry.

We have great information and computer technology. We are no longer limited by the capability of computers — the processing speed and other underlying technology has improved at speeds far faster than we've been able to take real advantage of. However, we still do not properly take into account the "human" when we talk about human-computer interaction when designing and implementing information technology.

People get tired and stressed. Their departments have been downsized in recent years, and now there's a shortage of qualified people to hire to help. Market forces are changing, and now being first to market isn't enough to be successful. We are operating offices and locations worldwide — which isn't new for our industry — but we are now expected to be always online, always connected, always with the answer at our fingertips. And now I have to learn new software?

There are two things I'm hearing repeatedly that encourage me that, as an industry, we are beginning to recognize and address the issue of human-computer interaction.

The first thing I'm hearing from speakers at many of the conferences and events I've attended is, "We all need to speak the same language." There is recognition at a very high level that IT people developing and implementing software intended for use by professionals in our industry must clearly understand the problems that the intended users — the geologists, geophysicists and engineers — are trying to solve.

The second thing is the focus on standardizing workflow. People are not computers, so no two of us will solve a problem in the same way. But we must understand how we do what we do, incorporate lessons learned and apply best practices, then communicate that information to get the most value from our information technology.

To get to the bits, bytes and barrels, first you have work through the complexity and nuances of people's individual and collective psychological, social and cultural behavior. And I'll argue that is tougher than any sand or water control problem, any high-pressure, high-temperature hostile environment you may encounter 20,000 ft (6,100 m) below the Earth's surface. **E&P**