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## Watson: From quiz show to oil field

### Technology is key to oil industry's future

By MICHAEL BRULÉ

IBM

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A few months ago, two of the top-winning players on *Jeopardy* squared off against a computer system named Watson — and lost. Watson was able to navigate the puns and word games that are typical in a *Jeopardy* question, pore through 200 million pages of natural-language content stored in its memory, and find answers in less than three seconds. This feat may sound like an entertaining bit of trivia, but Watson actually has serious and potentially transformational implications for many Houstonians who work in the oil industry.

The oil industry has been receptive to innovation, especially when it is able to address significant industry challenges. In fact, eight out of 10 global oil and gas executives in a recent IBM study named technology progress as the oil and gas industry's most important external force in 2030. In fact, one of the biggest challenges

technology can help resolve is the sheer volume and velocity of information.

At a recent Society of Petroleum Engineers Digital Energy conference held in The Woodlands, an exploration and production company executive cited the challenge of processing ever-growing volumes of real-time drilling data and then interfacing with multiple interdisciplinary parties on the drilling rig to interpret what is happening or about to happen. The executive went on to say that information technology must address this data challenge, and therefore IT will have the biggest impact on the field of drilling in the future.

That is why a question-and-answer system like Watson that can collect, process and understand data based on natural language within a matter of seconds could have far-reaching implications for the oil and gas industry.

During drilling and completion operations, for example, Watson can take data being collected while a well is being drilled and use sophisticated modeling and scoring techniques, faster than any human, to provide answers such as what is the most efficient way to continue drilling the well, without mishap, and where should the well be completed in the reservoir to optimize production at a reasonable cost. To enhance exploration, Watson could integrate and analyze data from multiple sources and across multiple disciplines, including geophysical/seismic, geological/petrophysical and engineering/operations. This allows engineers and geoscientists more time to adjust and interpret their predictive models rather than collecting data. They can then make decisions more accurately and faster to discover the most efficient way to drill multiple wells, develop the entire field and achieve faster time-to-oil safely and cost-effectively.

Given the staggering cost of drilling a new well, which can exceed \$100 million, and the complexity of managing production facilities, even modest gains in exploration and production efficiency can improve energy availability and affordability and add up to multibillion-dollar cost savings.

Incident management is another critical area that the oil industry faces every day. A system like Watson can estimate the likelihood of an event occurring, access massive banks of information on how similar incidents occurred and were handled in the past and, most importantly, offer recommendations. For example, Watson could help an engineer quickly identify the cause and solution for a problem like a drop in oil flow or a stuck pipe incident by analyzing real-time data and comparing with models of similar incidents and solutions that occurred in the past.

Watson represents a real breakthrough in how well computers can understand natural language. The *Jeopardy* match was not about a face-off between human and machine. Instead, it represents a huge step forward in our struggle to make meaningful use of the vast volumes of data that surround us.

Oil reserves are getting harder to find and the demand for this form of energy is not going away any time soon. As this industry continues on its quest to make energy production more efficient and sustainable, a technology that can understand human language and analyze the equivalent of a million novels in a few seconds to produce usable business recommendations is a game-changer for the oil and gas industry.

*Brulé is an upstream energy industry expert and an associate partner in IBM's business analytics and optimization practice. IBM, which is celebrating its centennial this year, has been involved in the oil industry since 1938.*

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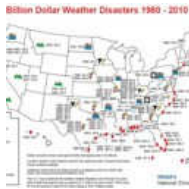
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