

Is Desperation the Mother of Innovation? Why Technology Flourishes Best in Bad Times

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It might seem that technology advances the fastest during boom times, especially in capital-intensive industries such as upstream oil and gas, but actually, just the opposite is the case. Historically, widespread economic and social dislocations and uncertainty for the future drive collective determination to overcome adversity and bring about lasting change. Even in prehistoric times, the Egyptians, Chinese, Aztecs, and other early cultures created technological wonders many millennia before the word “technology” was invented.

What we call “technology” today has always been about humankind’s need for greater good in overall living conditions. It is also usually desperate times that trigger the most major technological strides. A prime example of this occurred with horizontal drilling technology. Although the first horizontal wells were drilled in the US in the 1920s, it was not until the 1970s—amid the energy supply and intermittent prices shocks of that era—did serious technology development progress. Yet it was not even during this relatively high-priced market that horizontal drilling technology moved to the point of mainstream adoption. Rather, it was after oil prices collapsed in 1986 to as low as USD 6/bbl, then stayed weak and wavering in the USD 20/bbl range for years, that the E&P sector became desperate to drive down finding and lifting costs. A pioneering collaborative industry effort rallied companies to participate in a nonprofit consortium that took directional drilling technology from early development to mainstream adoption by the early 1990s.

During these same years, a number of other advanced technologies progressed in record time, including underbalanced drilling, diamond drill bits, “designer” drilling muds, automated oilfield equipment, and, by the 1990s, specialized engineering and geoscience technical software. The full-scale commercial adoption of these technologies positioned the upstream sector to handle sharp swings in oil prices and economic trends, as has happened again just within the past year.

Today’s “Desperation-Driven” Innovation Trends

Never before has the world seen oil market instability as profound as during the past year. In sustained high-price/high-demand periods, such as were experienced between 2003 and mid-2008, producers have no choice but to focus on maximizing output and meeting consumer, commercial, and industrial demand. With strong capital spending budgets, the E&P sector was better able to afford applying the most advanced technologies already available, such as drilling deeper offshore wells in high-potential frontier areas, developing more challenging onshore wells in remote locations, drilling longer horizontal and multilateral wells, and expanding the use of advanced information technology systems, services, and software. However, as has happened in other high-price/tight-supply periods in the past, development of newer technologies still in their infancy, while hardly ignored, was not the overriding emphasis; keeping reliable supplies flowing was.

By contrast, in tough times like now, the focus quickly shifts back to how to do everything better/faster/cheaper. Companies examine process improve-



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ments to achieve cost savings, ways to do more with less staff, and how better to capture and preserve the knowledge of lessons learned. Already, a huge next wave of innovation and technology adoption is clear, directed at accelerating advances in the application of Internet-based technologies, such as collaboration, immersive technology, and even basic, little-or-no cost interactivity tools that recently arose from social networking.

Interactivity: The Emerging Productivity and Profit Driver

Interactive technologies, some of which are as simple and cost-free as maximizing use of familiar Internet tools, such as newer professional networks that sprang from the mostly teenage phenomenon of social networking within the past 5 years, as well as serious business blog tools, have already reached significant commercial penetration, if mostly by younger professionals. Professional workers can utilize blogs, discussion boards, and very brief “Twitter” postings to keep current on whatever or whoever they are following, and record their own updates on nonconfidential work they are doing. This level of collaboration is highly effective for professionals seeking other people with the understanding and perspective in crossing similar technical hurdles. Solutions can be found in hours or even minutes by using these tools to cultivate an active online knowledge-sharing network.

Using more specialized professional networking sites, for instance, members can, at no cost, post their professional profiles, direct viewers to their personal or employer’s websites, interconnect to their blogs to update interested parties on nonproprietary work of interest, and even keep viewers posted on their schedules.

SPE has launched the new My SPE Network (mynetwork.spe.org), a networking site exclusive to SPE members. Members can share E&P knowledge, stay in touch with colleagues, create profiles and blogs, and gain access to technical experts. Blogs—perhaps the single most underutilized communication tool by all businesses and older professionals—are extreme-

ly valuable mediums for directing other professionals to a brief listing of a company’s or person’s key new technical papers, conference presentations, technical and trade journal articles, professional awards, and even summarizing key work in progress and mini case studies. Other professional networks, such as LinkedIn, also have active discussion forums.

Meanwhile, formal collaboration platforms, i.e., technology for sharing proprietary technical and business information between a company’s and partner’s technical staffs and management in different locations, have been growing for years. While now at a mature stage of adoption, much growth is seen ahead. Well-known commercial platforms include Microsoft SharePoint, Oracle’s Collaborative Suite, and IBM Lotus Domino. As is well known, within 10 years up to half of the technical workforce in E&P will have reached retirement age. When these employees leave, they will be taking a lifetime’s worth of institutional knowledge with them, so it is important for professionals nearing retirement age to understand the range of collaborative tools out there.

The Virtual Oilfield Emerges

Immersive technology is a seemingly space-age, yet down-to-Earth, hybrid Internet technology that combines gaming and virtual world technologies, with 3D and social culture components. Former Forrester Research analyst Erica Driver and her husband, Sam Driver, started independent research and consulting firm ThinkBalm in June 2008 and a couple of months later launched the ThinkBalm Innovation Community. The mission of the ThinkBalm Innovation Community is to propel forward enterprise adoption of the Immersive Internet—virtual worlds and campuses, immersive learning environments, and 3D business applications.

Cost-effective, prototype demo results are published on www.thinkbalm.com. Conceivably, advocates believe, every business, large or small, will play grown-up but serious business games via the Internet, meeting in “you are there,” IMAX-like set-

tings for board meetings, training seminars, crisis or other simulation scenarios, and interactive business planning, with a fully engaging and spontaneous experience.

In the petroleum sector, for instance, BP and Chevron are “first movers.” Chevron has created virtual versions of portions of its Salt Lake City refinery and worked on similar virtual 3D replicas of two of its offshore Gulf of Mexico platforms. A participant with Chevron says that ultimately, companies should be able to develop to-scale, 3D virtual Earth models, where users can zoom in or out to entire offshore-to-onshore production, pipeline, processing plant, transportation, supply chain, and refining infrastructures. Erica Driver forecasts that immersive technology will be in the early stages of mainstream adoption by 2012–13. Right now, the focus is upon working out interoperability issues between partnered “first mover” companies and suppliers, platform, system, software, and integrators.

In conclusion, today’s seeming economic desperation is poised to become tomorrow’s new ground-breaking, labor-and-cost-saving watershed series of Internet-based technological innovations and new best practice standards for applying longstanding Internet technology much more effectively at the corporate and departmental levels.

Knowledge is dynamic. When people interact spontaneously and free up the creative engines we all have, there is no such thing as getting stuck in the mud for very long. **JPT**

Barbara Saunders, principal of SB Media Services, Houston, provided historical, economic, and Internet technology research for this article as well as editorial collaboration with the coauthors.



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