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EXECUTIVE VIEWPOINT

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Slow uptake of new technologies: Is the criticism justified?

Technology advances are widely cited as a main driver of profitability in the E&P industry. And yet, this industry has long been criticized for its slow uptake and poor deployment of new technologies. But are these criticisms justified?

OTM's research, together with our work over the last 22 years on helping companies improve their technology deployment efficiency and effectiveness, suggest that the answer to the above question is far more subtle than some have realized.

On the one hand, there is no doubt that the E&P industry has failed to capture huge swathes of value because it failed to deploy new technologies in a timely manner. While few deny the potential benefits that new technologies might bring to the industry, efficient and timely deployment is often inhibited by poorly designed technology maturation, qualification and deployment processes; inappropriate metrics and behaviors; and a lack of team-work between technology users and providers. Nowhere is this more evident than in the billions of dollars of "R&D investments" that seem to lie at the end of some E&P companies' R&D pipelines, but which still await deployment, years (or sometimes decades) after their initial development.

On the other hand, however, there are sometimes good reasons for the apparent slower uptake of new technologies than might be the case in many other industries. These reasons make comparisons such as "time from idea to 50% market penetration" highly misleading. For example, the longevity of E&P assets (decades rather than months or years); the huge amounts of capital irrevocably "at risk" (often billions of dollars); large free-rider effects (a major disincentive to applying pioneering innovations); and the difficulty in gaining sustainable competitive advantage from new E&P technologies—all help to promote (quite reasonably) a very conservative attitude toward applying new technologies.

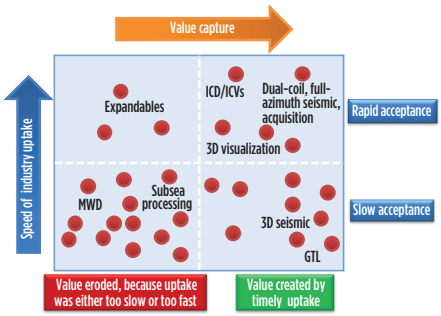
To illustrate, we have drawn on recent OTM studies that examined the extent to which speed of application had impacted value creation. All of the technologies considered have created value for E&P companies; our studies merely examined whether this value had been increased or decreased through the time taken to widely apply each technology. Although not a comprehensive set of every major E&P technology advance, **Fig. 1** is insightful.

Not surprisingly, the single-biggest group of technologies were those where value had been lost to the industry because of excessively long uptake times. These appear in the bottom left cell of **Fig. 1.** Many companies (and industry associations) are now focusing on how technology deployment can be accelerated.

Interestingly, however, our studies also saw many examples of technology advances where "long times to widespread application" appeared to be sensible. Sometimes, this was true, because other technologies were needed to reach acceptable performance levels. Others in this bottom right-hand cell included technologies that required very thorough de-risking (e.g., because of huge amounts of capital at risk, or HSE implications) and also those where major process re-designs, changes in working practices, or supply chain disruption would have been required.

Despite widespread criticism, we also see some examples of where the E&P industry has nimbly applied new technologies and created value by doing things quickly (top right-hand cell). However, these tend to occur when the technology is "stand-alone" from other capital-intensive activities, or when there is pressing urgency for an immediate solution (e.g., ICDs). Not surprisingly, few examples exist where value has been lost by applying new E&P technologies too quickly, although, in some cases, the magnitude of the benefits was much less than originally anticipated.

Fig. 1. Impact of "speed of uptake" on value created by new E&P technologies.



At a more micro-level, OTM also observes significant variations between the relative proportion of technologies in each matrix segment—both by company and by region. In particular, some E&P companies appear to have a far lower proportion of technologies in "value eroded by slow uptake" (bottom left cell) than others. The best seem to have:

- Well-defined and logical technology development, qualification and deployment processes
- A supportive culture, behaviors and metrics (for timely application of technologies)
- Challenging, objective setting (for BUs, as well as for technology development)
- A focus on purposefully driving, external innovation in ways that benefit that company
- Appropriate resources, with strong intelligence, evaluation, integration and adaptation capabilities.

To this end, OTM recently developed a diagnostic tool that helps companies to understand their relative strengths and weaknesses in developing, qualifying and deploying technologies. This enables them to reduce the number of technologies in "inappropriate" segments.

We hope, and suspect, that these best practices will begin to diffuse around the whole E&P industry in the coming years. To excel in a low-oil-price environment, more timely capture of the value available from technology advances will be necessary. WO

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