Bright spark

New technologies in the oil and gas industry ignite a rethink in protection strategies

The rapid advancement of technology and innovation in oil and gas recovery and extraction has forced a fundamental rethink of protection strategies, the valuation of intellectual property rights, and how best to exploit them in an increasingly competitive global market.

First, we'll start with a bit of history. By the end of the 1970s easy oil and gas was already a thing of the past. While reserves of oil and gas remained plentiful in many parts of the world, the expense of extraction and recovery was becoming increasingly prohibitive and existing technology to effect that recovery was at the limits of its capability.

Rapid technological advancement and innovation have since enabled the industry to re-consider what was once thought to be impossible and to assess alternative sources for oil and gas extraction. For example, over the course of the last decade, the world has realised significant reserves of gas held in shale rock through the process of fracking. This new source has helped to fuel a boom in the gas markets, in particular in the US.

Today, the keys to technological advancement lie in areas such as artificial intelligence (AI) and advanced computer simulation. Pre-extraction simulation is prompting a rethink of what is possible in oil and gas recovery and extraction.

New technologies are also ensuring that companies can effectively work within regulatory confines and minimise the potential for a negative impact that extraction of natural resources could have on the environment. Gas flares or stacks are increasingly disappearing from the oil and gas skyline, as they are harnessed to power support activities rather than simply be wasted.

Against this backdrop of accelerated innovation, companies are looking at reviewing and revising their intellectual property strategies, in particular outside the traditional patenting model. Competition is fierce, and having a formulated and focused protection strategy is vital for maintaining market advantage.

New wave of tech innovation in oil and gas

Historically, mechanical improvements in technology have powered the ability to extract and recover oil and gas. It will, therefore, come as no surprise that intellectual property rights in the oil and gas space have largely focused on patent protection for the downhole and surface equipment and machinery: drill bits, drill strings and control systems enable drilling operations, in combination with seismic survey technology, to better understand the geological formations prior to drilling commencement. For example, we have seen the development of high-pressure water jets that have the power to cut through particular rock formations, allowing for faster and more targeted drilling operations.

While advances in mechanical technology remain key for all companies in the sector, today a new revolution in technology is firmly underway. This combines advances in mechanical technology with the accelerated use of computer and artificial intelligence platforms. AI-driven computer-controlled simulations have transformed the pre-drilling processes ahead of excavation and recovery. Geological assessments are now able to provide much clearer appraisals of what's needed in terms of access and infrastructure requirements, minimising environmental impacts. The result is a radical reduction in the cost and time associated with both recovery and extraction of valuable reserves and the environmental impact.

This has meant that software applications and controls, to be candid things that were often ignored in terms of market value in the past, are now redefining the way in which extraction and recovery is approached, reducing cost and driving up the return on investment. Geography is no longer limiting. Engineers no longer need to be on site, with the human resource cost that entails. Today, an expert based in the UK is able to work with an on-the-ground engineer in Texas by using computer control applications, helping to mitigate problems and rectify them all at the touch of a button.

In short, developments in software and machine learning are enabling the oil and gas industry to truly automate.

Software as a 'real' IP asset

With this background in mind, let's look a little closer at software and its increasing importance in the oil and gas sector, where the use and implementation of computer-driven technology did sometimes lag behind other industries.

Traditionally, companies active in the oil and gas sector did not

protect their developments in software, as they would their mechanical advances in downhole and surface technology.

However, increasingly this sentiment is shifting. Companies now increasingly identify themselves as technology companies active in the oil and gas sector. Their business is exploitation of their software applications. Their thoughts turn to how best to protect those software applications. Patents remain a focus, particularly in the US, although recent developments in patent eligibility are, and will, impact the potential for patent protection for pure software applications. Patents are particularly effective to combat reverse engineering as functionality will be apparent through use and this means that, with a competent software engineer, companies can look at that functionality and write their own code to replicate it. Increasingly important are trade secrets, with companies looking not at publishing their know-how through patent filings, but keeping it safe and confidential within an organisation, examining internal network and confidentiality processes to ensure that there is no technology leakage. The source code to software applications is treated equivalent to a state secret and the know-how around making the application work effectively is vital to a company's bottom line. That trade secrets, and internal confidentiality processes are key, is exemplified by the rise in litigation by companies against former employees and others who, it is alleged, seek to misappropriate these trade secrets and take them to new employers or to market in other ways. An effective litigation strategy, a recognition for the need to move quickly to secure injunctive relief, as well as well-formed procedures for departing employees, are vital parts of any company's trade secret protection policy and it is no different in the oil and gas sector. The importance of these things will only increase as AI, and computer-controlled processes for extraction and recovery, as well as business optimisation, continue to develop and become ever more important.

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A strengthening oil price will accelerate innovation

So, what of the future? Supply constraints and increasing geopolitical uncertainty are likely to combine, increasing the cost of oil in the coming years. This could bring previously uneconomic oil ventures, such as deep-water drilling, back into play. Automation will play a key role in this too. Potentially, the more automated the process, the more cost effective it becomes. Infrastructure and human resources can be reduced, and of course, the key is that there is likely to be more efficient and greater extraction and recovery, with innovations that have been tried and tested onshore playing a role in offshore operations too. One trend that we also expect to play out in the coming years is a shift in the size and scope of the organisations recognising the value in protecting their intellectual property rights. Traditionally, the companies that focused on intellectual property protection were the service companies; those that make the tools, the fluids, the cement. It was rare that independent operators looked at intellectual property protection strategies.

Traditionally, oil and gas operators, particularly the smaller ones, never really saw themselves as owning any intellectual property. However, those companies are now trying to optimise their processes and, as a consequence, are looking at their own technologies, particular in the software field, and recognising the value in protecting and exploiting their own process-driven intellectual property.

The rapid advancement of technology and innovation in oil and gas extraction and recovery, and in particular, the optimisation and automation of process, has forced a fundamental rethink of intellectual property rights, their value and how best to exploit them in an increasingly competitive global market. This trend will only accelerate in the coming years.

Protecting oil and gas IP: four critical questions to ask

Do you have critical software that operates part of your business?
Think carefully about proprietary software that may have been developed right across the organisation. Consider the impact of that software being replicated by a competitor and the potential costs to your business.

Is your software protected? If so, how?
Be sure to think beyond merely keeping secrets. Go beyond making sure you retain protection through agreements with employees and contractors. Consider where your weaknesses lie, eg, systems, departing employees, key engineers, scope of restrictive covenants. Consider applying for a copyright registration for your software. In the US, you can submit substantially redacted copies of your software code with your application for registration, and therefore still protect the trade secret aspects of your software. A copyright registration comes with certain statutory rights, including statutory damages and the ability to recover you attorneys' fees in enforcement proceedings.

Have you reviewed your IP portfolio?
Take a holistic approach to protection. There is no one avenue that works for everything. Look at alternative protections: patents, trade secrets, copyright.

Have you looked at your patent portfolio?
Does your patent portfolio (a) protect what you are actually doing, and (b) operate as a block to your competitors? Often, a published patent gives pointers to competitors to develop their own software functionality. Might trade secrets be a better route?

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