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The Path to Digitization:

Robotic Process Automation for Gas and Oil

There's valuable data lurking within all those paper documents that your company has locked away. Learn how **intelligent business** and **robotic process automation** can unleash the power of your data.

Few industries are as primed as oil and gas for the time savings, cost reduction, and increased efficiency that automation can bring. With its traditionally high level of human involvement, lengthy transport times, and complex logistics, the oil and gas sector has jumped on the AI bandwagon to automate many of its systems, streamlining its processes considerably.

In oil and gas, "technologies like artificial intelligence and machine learning can improve the quality of decision-making for [exploration and production], improve service equipment reliability, further reduce cycle times, improve productivity, and reduce overall costs for the customers due to less human intervention," the 2017 Goldman Sachs report "Shale Innovation: Brawn to Brains to Bytes" reads, in part.

In the sections that follow, we'll explore how robotic process automation, or RPA — software with the capability to make machines perform specific, previously human-done tasks — is being used in oil and gas businesses to change the landscape for the better.

The Growing Need for Digitization in Oil and Gas

If there were a magic bullet that could cut human-safety risks, operational costs, and the incidence of errors, what might it look like? Probably a lot like process automation.

"One of the largest expenses for oil and gas companies is drilling," Peter Maier, co-lead at SAP Industries, writes in an op-ed for Rigzone. "Not only is drilling costly, [but] it is also highly technical, and involves considerable safety risks for workers. Automating manual portions of that process, like pipe handling and pressure drilling, can significantly reduce safety risks, and speed up the overall drilling process."

Work in the oil and gas industry can be physically dangerous as well, particularly on the upstream (exploration and drilling) side. With the advent in recent years of Internet of Things (IoT) platforms that connect oil-field plant locations to one another, workers are no longer required to be present at dangerous spots to monitor operations. Various mobile applications make possible remote pipeline inspections, eliminating the need for humans to be onsite at potentially hazardous sections.

Since its birth in the early 1990s, the 'smart pig' robotic inspection device, designed to evaluate the condition of the interiors of pipelines, has come a long way. "Automated pigging systems are now being developed and implemented to handle primary functions like cleaning, separation, recovery, and inspection with less human interaction and fewer valve cycles," reads a blog post from oil and gas engineering, procurement and construction management provider Audubon Companies.

"While an automated pigging system and its pigs can handle the same functions as a manual system, what are the advantages of going automated? Simply put, manual systems are more labor- and maintenance-intensive. They require more valve use, draining, and venting. Valve systems can deteriorate more rapidly, and workers are placed in more situations that require safety vigilance. When implemented well, automated pigging systems reduce manual work hours (as well as exposure), cut down on valve cycles, and shrink maintenance costs."

Document Management: Making Money and Saving Money in Gas and Oil

Oil and gas companies face major challenges on two fronts in the area of document management. First, companies are often awash in legacy documents containing largely untapped data. Second, documentation requirements continue to grow as this highly regulated industry evolves. Digitized document management enables gas and oil companies to both make money and save money.

Mining Legacy Data to Make Money

Digitizing legacy documents unleashes the power of their data. Digitizing old well maps and surveys and storing them in the cloud makes them both searchable and accessible from anywhere at any time by authorized personnel. This eases the way for gas and oil professionals to find new mining opportunities, in essence finding new pay on old wells. This is just one example of how document management can grow revenue for gas and oil.
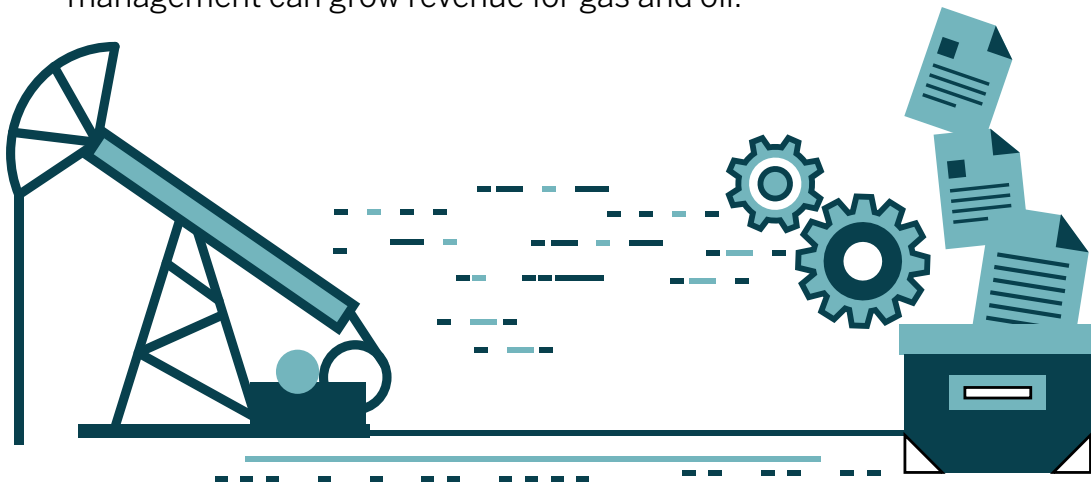
Managing Documentation to Save Money

Then, there is the matter of regulatory compliance. To say that there is some paperwork involved in the oil and gas sector would be a massive understatement. The regulatory frameworks in place to ensure the safety of workers and minimize environmental impact, among other requirements, make careful compliance an absolute requirement for success in the industry.

Non-compliance comes with the direct cost of high fines and indirect costs in the form of loss of production, loss of share price, and brand reputation damage. Document management in the cloud helps companies avoid these costs.

Given the oil and gas industry's reliance on written documentation for regulatory compliance, the switch to digitization can lift an enormous burden off employees and executives alike. With Ripcord's Canopy software, for example, project documents, whether scanned in by our revolutionary robots or created digitally in the first place, can be accessed and edited anytime, anywhere in a secure, cloud-based data instance. No longer do hours of company time need to be wasted while human workers search physically through paper files; a simple typed-in query will instantly sift through thousands of files and find a specific term. Audit trails become instantly accessible and regulatory audits are no longer a time-intensive endeavor. It turns out that the oil and gas industry and the cloud go together like bread and butter.

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"Cloud computing technologies are particularly well-suited for oil and gas companies looking for a proactive approach to meeting industry challenges, including the need for better workforce collaboration within global organizations … and the need to improve production operations in high-risk drilling locations," according to the IBM white paper *"Shaping the future of the oil and gas industry with smarter cloud computing."*

"At the same time, oil and gas exploration continues to grow more expensive, while companies must meet ever-changing security, availability and compliance requirements. … Implementing a cloud can help oil and gas organizations reinvent how they go to market and how they innovate— while providing economical operations."

In an industry in which even the smallest of errors can cost companies many millions of dollars, removing the reliance on people to ensure federal-, state- or local-law compliance can save a project — and that's prevention for which it is well worth paying.

How AI and Machine Learning Free and Enrich Unstructured Data

To be sure, a quick, human-error-free way to search, analyze, and manipulate data is a boon to a complex industry like oil and gas. But AI and machine learning can do wonders when it comes not just to structured data (the kind often found in reports and other text-based files) but unstructured data (the sort that composes audio and video) as well.

Thanks to machine learning and natural language processing, the AI capability of document understanding can be used to extract specific data points even from unstructured files.
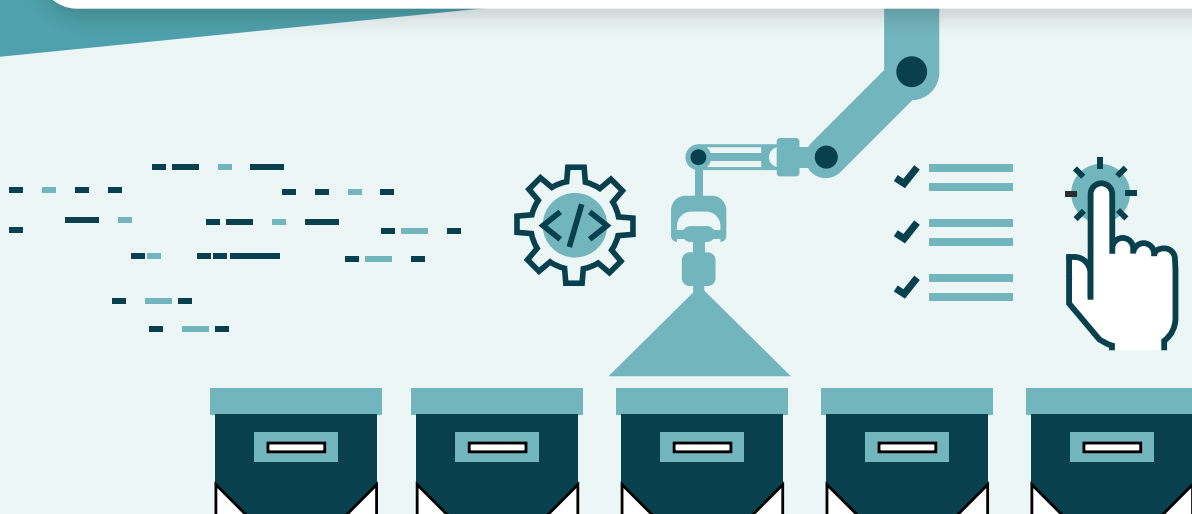
> *"Such technological advances can "be used to troubleshoot underperforming wells, enhance reservoir modeling, carry out preventive maintenance before problems arise, optimize well design, drilling and completion, and even use machines to carry out tasks on unmanned, automated drilling platforms and well pads," Jason Bordoff, a former special assistant to President Obama and founding director of Columbia University's Center on Global Energy Policy, wrote in The Wall Street Journal in 2018.*

AI can highlight important but previously unnoticed connections among data points. "Machine learning tools can reveal the relationship between the recorded data more efficiently, specifically for the recent case of dealing with huge datasets," Mehdi Mohammadpoor and Farshid Torabi write in the 2018 white paper "Big Data analytics in oil and gas industry: An emerging trend." The piece cites the seismic analysis of one oil and gas researcher who "employ[ed] machine learning tools to train a prediction tool," the results of which were then successfully used "to identify … important geological features."

Three Use Cases for RPA in the Gas and Oil Industry

Not surprisingly, there are numerous applications for RPA in oil and gas. Below we highlight three with particular potential.

Sensors

Automated sensors are helping reduce the need for feet on the ground for the monitoring of certain processes, and eliminating room for human error. Recently, Australian liquefied natural gas company Woodside Energy, for example, used data culled from the hundreds of thousands of automatic sensors installed in its LNG plant to prevent a ruinous "foaming" process that would have shuttered the $10-billion facility, costing the company untold sums of money and destroying equipment. This prescience wouldn't have been possible without the sensors; Woodside's engineers were unable to tell when such foaming occurs," according to a piece on Woodside in Australian news outlet iTnews.

Self-driving trucks

The oil and gas sector leans heavily on long-haul road transport to move its products. "The U.S. has ... about 100,000 tanker trucks that move oil and gas from wells to processing facilities or refineries, and finally to consumers," a recent report from the American Geosciences Institute reads. Yet tanker trucks in the U.S. are involved in thousands of accidents annually, with an eight percent fatality rate. Many of these deadly accidents occur at night, typically the time when human drivers are prone to falling asleep at the wheel. Also enormously hazardous to both humans and the environment is the fuel oil, gasoline, and other flammable liquids that frequently spill from tanker trucks involved in serious crashes.

**RPA's answer to these deadly problems is self-driving trucks.**

"The personnel and financial costs of these accidents are quite substantial," energy blogger Anu Antony writes. "Auto-pilot or complete unmanned vehicles can allow the driver to have a snooze without causing severe accidents. Some AI trucks even have a special feature of predicting accidents as well as health issues of people around the truck, like detecting a heart attack and alerting the emergency services automatically with the location and details of diagnosis."
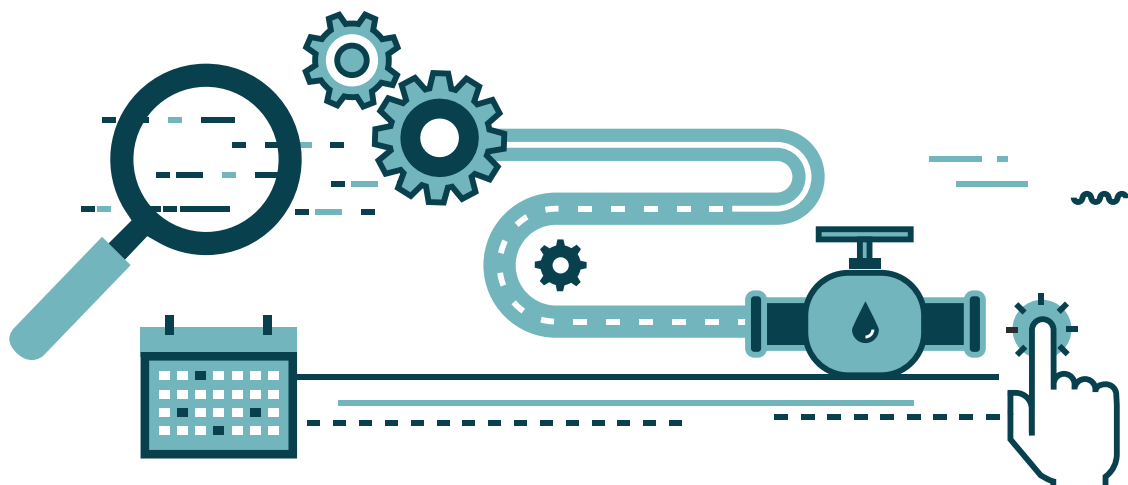
Scheduling

Another aspect of oil and gas logistics being made easier by RPA is scheduling. Scheduling software, including the kind made by the Texas-based SigmaFlow, helps energy companies make their delivery schedules more efficient. Another Texas firm, Actenum, offers schedule-streamlining software the company says ups the efficiency of well deliveries. Indian IT giant Infosys sells "Pipeline Scheduling and Optimization" solutions that boast the ability to improve both pipeline capacity and inventory management.
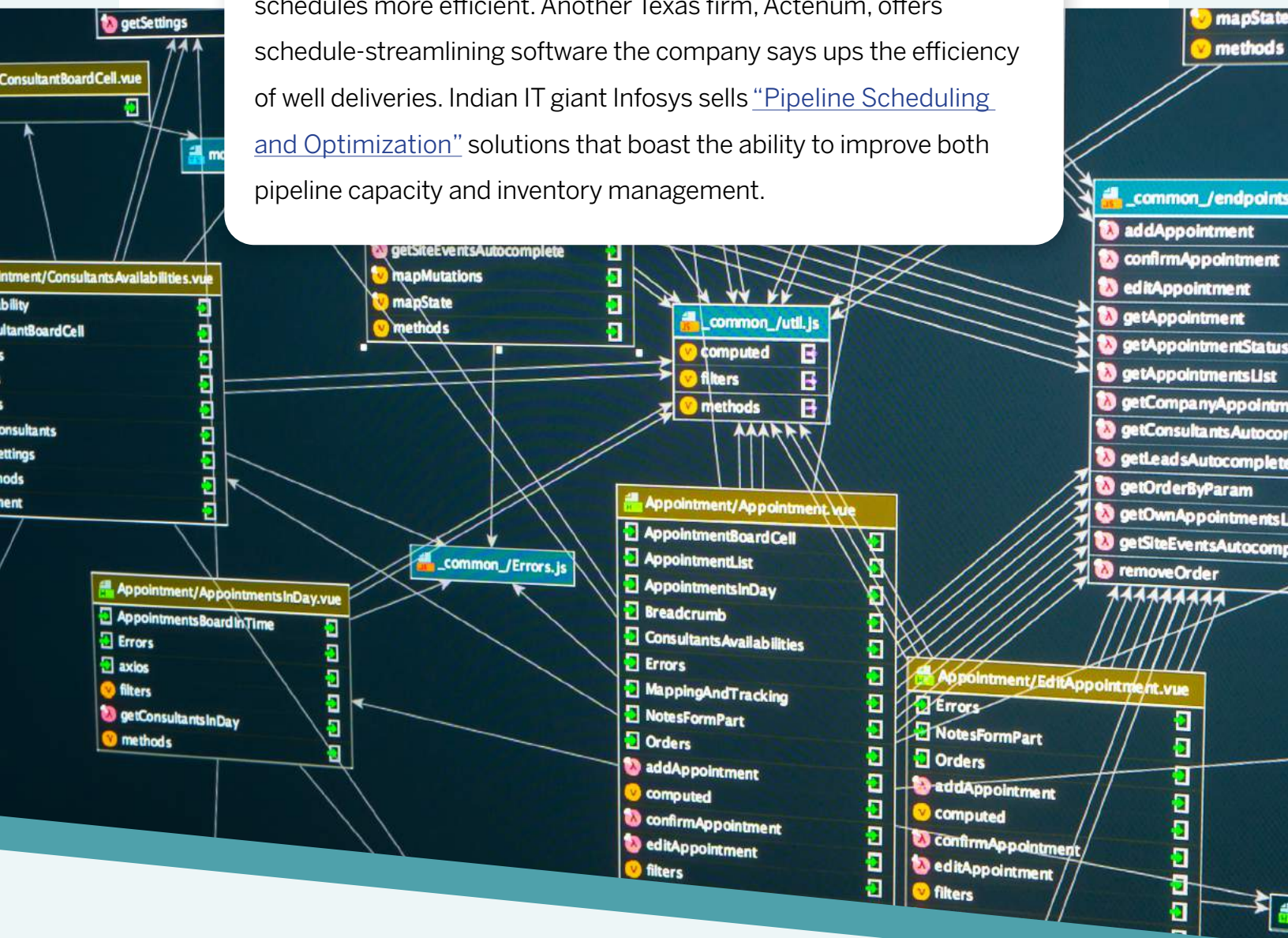
Getting Started with RPA in Your Business

You don't have to be a multinational petroleum company to reap the benefits of RPA. The average organization spends approximately $20 to file every paper document, $120 in labor costs looking for each misplaced or misfiled paper document, and about $220 in labor to recreate each of the documents it isn't able to find, according to the PricewaterhouseCoopers network.

Dependence on paper documentation also takes up valuable office real estate, often being of such volume that it requires its own room or rented storage space. Within all those reams of paper likely sit pieces of information that, in the event that they remain on paper, will never be mined. Even if an exhaustive employee search is undertaken to locate specific information within large backlogs of paper, there is always ample room for human error. That means the opportunity for useful data to be missed is enormous.

Turn, instead, to RPA for your document-storage needs. Ripcord's Canopy platform, for example, allows huge amounts of paperwork – even fragile, antique paperwork – to be scanned, classified, and made fully, quickly searchable, preserving the content. Plus, since your documents are stored in the cloud, you will be able to access the information from any of your wireless devices, at any time. We use machine learning and AI so Canopy gets to know you and your documents, getting 'smarter' as more documentation enters the system.

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About Ripcord

Ripcord is on a mission to digitize the world. Using vision-guided robots, AI and machine learning, we scan, enrich, and organize an entity's most important paper documents, no matter the volume. Our proprietary cloud software, Canopy, enables the instantaneous categorization, indexing, search, and retrieval of every part of an entity's scanned documentation. Ripcord saves companies time and money and frees up human employees for more of the work they truly enjoy.

We're digitizing Earth, industry by industry.

Going paperless but drowning in paper? Pull the cord – the Ripcord. We're on a mission to take the world paperless with our end-to-end, robotic process automation and business process solutions, no matter what your industry. Lose the paper; keep the data. See for yourself by scheduling a demo today.

Demo →