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Replacing The Patchwork

Improving technology will allow the industry to replace old, patchedtogether systems of the past as it transitions to a younger, tech-savvy staff.

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The profound effect of process automation on the oil and gas industry will continue being felt as there is no sign of slowing—evidenced by many of the industry’s largest firms dedicating the majority of current information technology (IT) budgets to comprehensive automation strategies that optimize performance.

Many of today’s oil and gas companies were built upon a foundation fashioned when resources were slim and speed to market was king. During these early times, demand was high and resources were hard to develop. As the complexity of the industry’s organizations increased, centralized functions were regularly built on top of already aging infrastructure and eventually resulted in lagging productivity that, many times, compounded on itself.

The process maze

In response to exponential growth and breakneck speed, infrastructure footprints continued to expand, compounding into a maze of processes and technological weight that drained precious time and resources in the name of functional maintenance and the occasional enhancement. This stifled technical process innovation and also added a level of complexity when businesscritical decisions needed to be made. This has left organizations with little time and resources to look back critically at the very foundation upon which their business depended.

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But optimism, optimization and automation are changing that.

Industry change is being driven from the bottom up, and IT is feverishly responding to directives to dive into even the most foundational of processes in the hopes of optimizing cost through improving efficiency. Also, this major shift in overall operations could once again make the industry appealing to today's younger, digitally savvy rising workforce. "Understanding the importance of automation and its transformative powers is setting the tone for a complete overhaul in how the industry does business," said Ragan Shawell, DISYS managing director for energy services. "It is truly an exciting time to be working in the industry."

Automation buy-in

Estimates are that from 2016-2025, the automation of critical operations within the oil field will more than double year-over-year—with many plans not seeing full implementation until 2030. This far-reaching outlook is a true testament of the buy-in automation has garnered from the top down within large and small oil and gas organizations and speaks to the current industry optimism that is energizing operational change.

Within these automation plans and their supporting budgets, resources have been allocated to allow for analysis of where critical improvements can be made, from back-office practices to rig operations. These process improvement mandates, to be carried out over many years, also take into account the increasing amount of data being generated and the necessary resources to interpret it.

Because of this, budgets have loosened up a bit and now have built-in wiggle room for the inevitable innovation that follows when automation is deployed.

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Funds formerly earmarked for regulatory compliance are being reallocated to innovative automation, often powered by the recent regulatory rollbacks. This reallocation allows those tasked with process innovation to not only think about what could be done more efficiently but also to think about what needs to be done to position an organization for future growth.

Regulatory changes

"Regulatory compliance really had a stranglehold on this industry," Shawell said. "Recent regulatory changes have reinvigorated oil and gas and finally allowed stakeholders to look at equipment updates and process evaluations—when both had seemed nearly impossible before."

Early research in oil and gas automation led experts to draw upon the manufacturing industry's automation expertise and rooted efficiencies. Process maps in energy resemble the assembly lines, automated practices and workflows in the manufacturing space, so these models were studied, determining what could be transformed into actionable intelligence within the oil and gas industry. While the face of automation has certainly changed in manufacturing, the principles still remain—and that is what oil and gas leaders were drawn to. In one word: efficiency. "Manufacturing has long been the leader in automation, even in the very beginning," Shawell said. "Manufacturers have always had their eyes on how to get the most done in the shortest amount of time, at an efficient cost—utilizing man and machine. Energy is looking to mimic that kind of success."

As more individual processes become automated, those remaining do have a largely digital component but require specialized human and machine interaction—especially when it comes to the automated generation of data. In this area especially, fundamental

experience and knowledge of the industry win out over machine learning, not only because of gut instinct but also because the industry is unpredictable.

It is already understood that the advent of the digital oil field has opened up a continuous waterfall of data. Currently, the industry captures and manages more data than ever before—and that information is being churned out more quickly.

Gigantic data

The current digital oil and gas universe now includes more than 5 zettabytes of data stored and accessed via multiple entry points in the cloud. (A zettabyte equals 1 trillion gigabytes.) This amount of data, which is beyond comprehension, can then be combined with advanced business intelligence and analytics to be processed, parsed and interpreted before being passed on for human interaction for further interpretation, process error monitoring and necessary business action.

“Data and demand will always be the primary drivers behind the critical decisions within oil and gas,” Shawell said. “All that has changed is how much data is now being collected and how it is being used to improve agility in the industry.”

Business intelligence, automation and other digital advancements finally allow the industry to close the skills and knowledge gap that has been generated by an older workforce that is now retiring, which has left industry-critical positions open for extended periods of time. These digital operations, throughout the entire lifecycle of their implementation, finally address the inevitable demographic shifts that take place when a new generation becomes employable.

As that new generation impacted entirely by a digital universe takes over the executive helm of the industry, the digital oil field and the automation and analytics practices implemented leading up to the workforce shift will lay the fundamental groundwork for the up-and-comers to innovate further in technology, accountability, efficiency and collaboration.

“These long-overdue shifts in technology and in overall digital strategy will hopefully garner new interest in the rising workforce and reinvigorate an industry that has struggled with finding top talent and with keeping up with demand,” Shawell added. “These innovations have been a long time coming and will truly change the current oil and gas landscape.”

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