How Utilities and Related Services Can Use Technology to Improve Operations and Save Money
P Construction Services, Inc. (RPCS) has done a remarkable number of things right in its four-plus years of operation. Based in Monterey, California, RPCS has become the go-to designer and installer of distributed generation and utility market solar projects that utilize Array Technologies’ single-axis trackers. This equipment moves solar panels to track the sun throughout the day, allowing power plants to generate as much as 25% more electricity than those attached to fixed-tilt mounting systems.

Since its launch in 2014, RPCS has installed hundreds of projects totaling over 450 megawatts of solar, including over 165 megawatts in 13 states just last year. The company’s success designing and building projects earned it a place on a list of the top solar contractors of 2018. One big reason RPCS has had such success and explosive growth is because the company is always looking for ways to improve how it operates, particularly through the adoption and use of technology.

One recent example can be seen in how RPCS vastly improved its operational efficiency by adopting a custom-built mobile application. The app can track the real-time progress of the company’s many projects and also analyze data, which is used to improve how RPCS estimates the cost of projects and deploys resources to complete them. Before embracing the use of technology to streamline its operations, RPCS relied on an inefficient manual approach.
“RPCS printed a site plan on paper, laminated it and mailed it to the field with different colored dry erase markers,” said Randy Batchelor, the principal and owner of Sol Rebel, a company that worked with RPCS to implement lean management techniques and software to bolster its efficiency. Then, managers in the field marked up the site plan each day with different colors to reflect the status of each individual row of solar panels. One color showed that piles were being driven; another showed the racking system was being installed; and another showed when modules were being installed.

Managers in the field then used their smartphones to snap a photo of the marked-up site plan and upload it to Dropbox, where a project manager at company headquarters could examine it, add the information into spreadsheets and share updates with clients. While the approach worked well enough, it made analyzing data to improve short- and long-term operations cumbersome.

“There was a lot of manual math and emailing stuff around,” said Batchelor. “It also made it hard to gather data about how much time on a project was spent doing piles, racks and modules. That productivity information is what was needed to improve estimating, scheduling and forecasting how many workers were needed for projects.” It was also difficult to tell if projects were on track or falling behind, and so it was challenging to motivate crews to move faster.

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Utilities use software and technology to address big challenges

By no means is RPCS alone in its efforts to harness the power of technology to improve its operations, lower its costs, and make better and faster short- and long-term decisions. For renewable energy developers, oil and gas companies, and utilities of all sizes, digital technologies offer a powerful tool to speed automation, empower field workers and adapt to changes in the labor landscape.

For its part, the utility industry has been comparatively slow in its implementation of technology to improve operations and productivity. Ross Smith, U.S. Digital Energy Lead at PA Consulting, says that utility companies initially lagged behind companies in industries such as pharmaceuticals and financial services in embracing digital technologies. That has been changing over the past five years as utilities have become more attuned to the importance of responding to customer expectations. Indeed, in a world where packages can be delivered in a day, utility customers expect equally proactive and fast communications.
But utilities and related services are also financially motivated. “There is significant pressure on operational expense,” said Smith. “How to use technologies like robotics, natural language processing, artificial intelligence and all these other things to drive down operational expense and become more efficient has become a keen interest for utilities.”

While momentum is gathering among utilities in adopting digital technologies, there is also evidence that moving quickly can provide a real advantage. Recent research by McKinsey & Company indicates that early movers will reap the largest benefits. McKinsey estimates that operating expenses can be reduced up to 25% and asset performance can be improved as much as 40%.

“In the utilities industry, there are all kinds of opportunities for gains in safety, compliance and operational efficiencies,” said Nate Allen, Solution Consulting Manager for TrackVia, a Colorado-based company that provides a low-code application platform that enables customers to quickly build and deploy apps that streamline critical workflows.

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The need to drive costs out of operations is especially important for utilities and related services today. As load growth slows and the amount of customer-owned renewable energy increases, utilities face mounting pressure to operate more efficiently. Their ability to cut costs and maintain healthy margins is threatened by two long-bubbling trends: an aging workforce and aging infrastructure. According to the U.S. Department of Energy, 28% of the electric power generation workforce is over the age of 55, compared to 22% of the workforce across the rest of the economy.

America's energy infrastructure is also aging. In fact, the American Society of Civil Engineers gave the nation's energy system a D+ grade in its 2017 infrastructure report card, noting that most electric transmission and distribution lines were constructed in the 1950s and 1960s with a life expectancy of 50 years.

This is a worrying combination for utilities. As experienced and savvy workers near retirement, there is understandable concern that they will take the knowledge about how to maintain and repair critical equipment with them. If that translates into delays in maintaining or fixing transformers during a power outage — when both customers and regulators demand fast action — the immediate and long-term reputational damage to utilities could be extreme.

A move away from manual processes to digital tools can be a way for utilities to attract and keep the younger talent they will need to replace retiring workers. “It’s about the digital workers and giving them the opportunity and tools to operate in a more effective way and to have better access to data and mobility,” said PA Consulting’s Smith. “In looking at the future, making sure utilities have a modern work environment, where it’s not all paper-based, can help attract and retain young people. They live their lives with a digital capability and need to have it to have good job satisfaction.”
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The benefits of mobile workflow technology

Customized and sophisticated mobile workflow technology can help utilities quickly and effectively fix and maintain their assets while also capturing the expertise and institutional knowledge of experienced workers.

Here’s how it works with TrackVia’s platform: Imagine that a worker is sent out to evaluate a piece of equipment that has either failed or is at risk of failure. Instead of driving out alone with a truck full of tools, clipboards and manuals to guide and record their work, they go armed with a mobile device. “One of the things utility and utility-related companies are looking to do is equip their field workers with mobile devices. With them, they can capture information at the point of origin, access the right technical instructions and take pictures to send to the control center to show whether it was installed correctly or incorrectly,” said TrackVia’s Allen.

By relying on TrackVia’s mobile workflow technology, field workers have the institutional knowledge of the entire utility literally at their fingertips. Sometimes, the field worker who diagnoses the problem isn’t the one who actually fixes it. With TrackVia’s workflow solution, that original identification of a problem can trigger a new workflow to repair a piece of equipment. “There’s a sign off when it’s done, and you take a picture when it’s completed so that you have an audit trail of the fix. All that information is then fed into a database, where it can be accessed and analyzed at the press of a button,” said Allen.
A use case similar to a utility can be found in the work of a company like KS Industries (KSI), a 5,000-plus-employee, single-source provider in the energy sector. KSI, which provides sophisticated engineering, design and construction services to oil and gas projects around the U.S., had long relied on clipboards and pencils to manage projects — most of which were located hundreds or thousands of miles away from company headquarters.

The reliance on manual workflow approaches had many problems and potential risks. When projects were delayed, it was impossible to keep clients up-to-date on the status of their projects. Equally troubling, the dependence on clipboards and paper also made it hard to meet safety requirements, leading to a risk of worker injuries. Though KSI had attempted to employ new workflow technologies, the implementation failed because they were too lightweight and inflexible.

KSI eventually began working with TrackVia to deploy a mobile app that allows workers in the field to quickly and easily collect or access job site information. The mobile app, which can be used with or without an Internet connection, could be customized without expensive and time-consuming custom development. The ease with which data is inputted and shared also provides real-time visibility to KSI managers and executives at headquarters, as well as customers. The implementation of TrackVia has made a difference: Within just six months of its implementation of TrackVia, KSI reduced at-risk behavior by up to 50%. At the same time, KSI reduced the number of safety incidents because the speed and accuracy of the company’s safety operations has accelerated.

By working with TrackVia, companies like KSI can also benefit from the best in workflow technology without having to devote excessive resources to developing technology. The company’s low-code platform makes that possible. “A lot of the companies that we work with are large enough to have complex business processes, but not so big that they have an army of IT developers to build apps for them,” said Allen. “Many businesses are caught between a rock and a hard place, and they need something more robust than online smart sheets. But they don’t have the IT resources to build something valuable.”
Good things happen when manual processes are replaced

When Batchelor was working to develop a workflow solution for RPCS, he looked at a lot of technology options. He opted to use TrackVia because of its mobile-native and low-code features. It provided him with the foundation he needed to create a solution that uniquely met RPCS’s needs. “I was the architect of the whole thing, and I defined what all of our tables, fields and functionalities would be,” he said. “We built the whole thing from the ground up using TrackVia as the platform.”

The results and benefits have been transformative. No longer does the company have to send out dry erase markers and paper to the field to track the progress of its many projects. Instead, project managers can use their mobile devices to provide quick and easy project updates.

“The site supervisor can enter row status updates with an easy interface, which then gets displayed on a color-coded and interactive digital map. The supervisor can also add site notes and upload photos, safety observations and information about equipment that has been shipped to the site,” said Batchelor. It’s simple to document whether individual workers spent their hours on the job driving piles, mounting the racking system or installing modules. This allows for the creation of productivity scorecards — metrics are modules installed or piles driven per man-hour — that can be used to reward efficient workers.

“Giving everybody real-time visibility into what is going on has huge benefits across the organization,” he added. “If projects fall behind, they can easily be triaged. It saves project managers tons of time reporting and processing data. It saves the human resources team time because the time-tracking system is used to pay employees and check the billing from the temp agencies they use for workers on their projects.”
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TrackVia™, the leading low-code workflow platform for operations, helps companies build applications that improve on-time performance and reduce costs. TrackVia offers operations leaders the fastest and easiest way to build powerful applications that are business led and IT approved. Companies like Honeywell, KS Industries, and RP Construction Services, rely on TrackVia to digitize their operations.