



*Texmark* USHERS  
IN THE  
*Refinery of the*  
*Future*

**How human-focused  
technology solutions are  
evolving an industry**

In certain ways, the oil and gas industry is a very tech-savvy business, but it has long been reluctant to change. Hesitation centers around altering any part of a refinery's operations, because of the inherent safety repercussions. However, companies that avoid implementing digital innovations altogether can miss opportunities to improve profitability. For Doug Smith, CEO of Texmark Chemicals, the rewards far outweigh the risks. "Texmark and its people are committed to change," he says. "Affecting change, accepting change, and acting on change gives us a competitive advantage."

That change culture is what spurred the deliberate decision to transform Texmark, a privately-owned chemical manufacturer specializing in the production of dicyclopentadiene, alcohols, aromatic solvents, and contract manufacturing, into a Refinery of the Future—one that is committed to providing technological tools to employees that enable them to do their jobs more effectively, efficiently, and safely.



## *Beginning* THE *journey*

For Linda Salinas, VP of Operations at Texmark Chemicals, one of the first challenges was learning about digital enablers and how the new technologies could improve processes the company has been doing for 40 years.

Through an existing relationship with Hewlett Packard Enterprise (HPE), Texmark was introduced to the power of advanced analytics, edge computing, augmented and virtual reality, and the Industrial Internet of Things (IIoT). Salinas recalls, “Once I learned about how IIoT and other digital enablers could impact our vision for the Refinery of the Future, it was my responsibility to figure out how to use it in the plant responsibly and strategically.”

# THE *importance* OF AN *ecosystem*

At the start of the Refinery of the Future initiative, it became clear that an end-to-end solution would require multiple resources. Deloitte’s experience with the oil, gas, and chemicals industry made them a crucial addition to the solution team. Rachael Goydan, managing director, Deloitte Consulting LLP, explains, “We do a great deal of research and development around new technologies and how they can be used in different operational settings. That first-hand knowledge truly benefitted Texmark during their journey.”

“Deloitte was a big part of educating us on how technology would, in fact, enhance what we are doing, not get in the way or complicate things, but instead streamline our operations.”

**Linda Salinas**  
VP of Operations  
Texmark Chemicals

In total, eight companies worked together to bring the Refinery of the Future to life—Deloitte, HPE, PTC, Allied Reliability, National Instruments, OSIsoft, Spark Cognition and Flowserve. Mahesh Chandramouli, senior manager, Deloitte Consulting LLP, emphasizes, “A project of this scale without an ecosystem is going to be impossible. Bringing the right team together is primarily driven by the value you’re seeking to create—in this case, reducing asset and

plant downtimes for Texmark.” Not only is bringing the right team together a critical component for success, but it’s even more important that the ecosystem players are aligned to create that value for Texmark. Deloitte orchestrated the end-to-end plan, working with the ecosystem to harmonize the strengths of each player to achieve Texmark’s vision.

The ecosystem team began by focusing on evolving the refinery’s existing maintenance processes, which incorporated a combination of reactive maintenance, responding to an immediate asset outage; planned maintenance, performing updates on a routine schedule; and proactive maintenance, tending to certain pumps based on historical utilization patterns. All of these options required Texmark employees to spend nearly 1,000 hours a year conducting walkdowns and vibration analysis to determine when a pump might malfunction. By implementing digital enablers, Texmark could shift toward smart predictive maintenance, utilizing data to drive their decision making to predict and prevent asset failure, reduce risk, increase productivity and improve costs. Just as this required a multi-disciplinary team, it also called for a multi-phased approach to achieve a true digital transformation.

# LEVERAGING THE *power of* *data*

## ● PHASE 1

focused on installing a digital foundation via a secure, wireless network.

## ● PHASE 2

enabled high-speed data capture through edge-to-core connectivity.

## ● PHASE 3

connected the entire puzzle together with an innovative asset monitoring solution.

Chandramouli elaborates, “We attached smart sensor technology to specific, critical assets within the refinery. Those sensors provide information on how the pumps are performing.”

Texmark employees were an integral part of the process from day one, working with Deloitte to install the wireless sensors, which provided employees with an opportunity to develop and build new skills of their own. Salinas describes the impact on Texmark’s employees: “Our workers care about their jobs and the equipment. They care that the process is uninterrupted, on spec, and on time. So they really appreciate being involved in developing the tools to help them do that.”



With pumps now wired to deliver data, the Deloitte team worked to ensure that the information received was actionable for the employees that would personally be using it to do their jobs. Dipankar Das, managing director, Deloitte Consulting LLP, notes, “Historically, technology was driving people to change their processes and ways of working. Today, it’s the other way around.” Goydan echoes this saying, “Deloitte designed personas based on the different job types that interact with the refinery. What kind of information does the plant manager, millwright or operator need and in what way will they best consume that data and react to it?” This human-centric approach resulted in digital dashboards tailored to each persona that allowed employees to access the real-time conditions of assets from whichever device they desired.

## Impact



### PREDICTIVE MAINTENANCE

Predictive maintenance increases mean time between failures and helps identify root causes



### REDUCED MAINTENANCE COSTS

Expected 50% reduction in planned maintenance costs



### TIME SAVED

Potential to reduce the 1,000 hours per year currently spent conducting walk-downs and vibration analysis to determine malfunctions



### IMPROVED SAFETY

Target 0 safety incidents and unplanned outages



# *industry-agnostic* impact

The implications of the data are far reaching, given that predictive maintenance solutions will ultimately help Texmark to anticipate and prevent asset failures before they happen. Chandramouli notes, "Within the Refinery of the Future project, we focused primarily on unplanned downtime, with a goal of reducing it by 20 percent. The cost savings are going to be immediate, but at the same time, it's also a journey." That journey includes additional phases that will continue to build on the established foundation of digital manufacturing enablers, such as advanced video analytics, safety and security improvements, connected worker and full lifecycle asset management.



Beyond the walls of Texmark, the lessons learned from the Refinery of the Future can also apply to other companies and industries who face similar concerns. How does a business maintain its assets? How can a company collect the right information? Are workers utilizing the best tools to make the most informed decisions? Smith agrees, "It's a real challenge for me to keep my excitement in check when I'm explaining the power of this technology to others and how it can be transformative within any number of industries." By looking at new technologies and processes, any industry has the potential to become more efficient operationally, and more appealing to a new generation of workers looking to incorporate cutting-edge tools into their skillsets.

## *innovating & improving* NEVER ENDS

Both Smith and Salinas plan to continue to embrace uncertainty, despite operating within an industry reluctant to change. Fear has no place within the walls of Texmark. And while a refinery will always house elements of the past—utilities, boilers, cooling towers, reactors, storage tanks—the Refinery of the Future will continue to evolve and Texmark will be at that leading edge. But they won't be moving forward alone.

“

Deloitte was absolutely focused on business outcomes. They had such a wealth of knowledge of the economics of digital manufacturing leveraging IIoT and what we're trying to accomplish here at the Refinery of the Future. What we're trying to do here was something that hadn't been done before and they're really well suited to do that.

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**Doug Smith**  
CEO of Texmark Chemicals

**Deloitte.**  
Digital

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