

Digital transformation: Start simple to generate low-risk, immediate returns

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As digital transformation plays a growing role in today's business decisions, organizations must consider what they hope to transform, where to invest their resources, and what technologies best serve their strategic needs. Fifty percent of companies see productivity goals (improving efficiency) and operational goals (reducing risks) as the top factors driving their digital transformation initiatives, with more than 57% seeing most digital innovation occurring in operations and production.

The digital footprint in the refining business has been changing ever since integrated digital instrument and control systems began replacing earlier pneumatic and analog systems in the early 1980s. Digitalization, along with cheaper data storage,

spawned vast collections of stand-alone digital data. Today, Industry 4.0, along with its big data, robotic process automation, the Industrial Internet of Things (IIoT) and sensor technologies are driving an ever-expanding demand for new tools, and refineries are looking to upgrade. Those who adopt these new technologies will realize a competitive advantage over those who do not.

Determining investment levels. Embracing these new digital initiatives requires not only a giant leap of faith by management, but also significant up-front costs in equipment, infrastructure and manpower. While major downstream companies plan to invest an average of 30% of their operational/IT budgets on digital transformation, many small-to-mid-sized refineries are unable to match this investment level.

No matter how large or small the facility, all refineries will eventually be implementing digital transformation to remain competitive. While digital transformation promises to significantly improve safety, production and profit margins, it will also greatly increase the volume of data

that organizations must confront, understand and respond to.

How can the smaller refiners, with fixed margins and limited manpower, benefit from the digital transformation movement while minimizing the associated high costs and risks? The easiest solution, with a proven return on investment (ROI), is to install a data aggregation (DA) platform. This sophisticated software resides on the enterprise layer of a facility's IT network, and interfaces with the stand-alone systems and extracts information from a wide range of sources, including:

- Data historians
- Alarm journals
- Lab databases
- Handheld device databases
- Controlled document management systems
- Asset databases.

Results are made available to users via an intuitive and intelligent human-machine interface (HMI), as modeled in FIG. 1.

Features and benefits. The data is filtered to display queried results to all users with proper authorization. This also allows workers to openly comment on this information and collaborate on tasks and job assignments using their mobile devices. Workers can be given daily assignments, managers can track key performance indicators (KPIs), operators can manage production targets and maintenance crews can easily monitor equipment performance. It opens data up to the creativity of its users with customizable report templates, filters and email options, and forms a solid foundation enabling raw digital information to be refined into value-added products.

A DA platform should provide the following features:

- Uses existing hardware
 - Can be used on any device (desktops, laptops, pads and handhelds)
 - Is available to everyone with a valid connection to the company's intranet
 - Requires no additional manpower
 - Generates user-created and managed reports
 - Is scalable to include other data sources over time
 - Protects source integrity and authenticates who can access the data.
- Benefits include:

- Increased efficiency
- Improved safety
- Managed production targets
- Better business decisions
- A searchable record of worker actions and responses
- Reduced energy use
- Reduced nuisance alarms
- Improved internal

communication across independent work groups.

Facilities using DA technology have seen significant and positive results in daily operations and productivity.

Examples. Remote platforms in the Gulf of Mexico and North Sea, as well as the world's largest floating natural gas production vessel, use a data-rich process visualization and worker collaboration DA platform to monitor and manage production, deliver job assignments, maintain targets, create shift handovers and mitigate nuisance alarms. A large refinery in Louisiana saw significant improvement in safety metrics using simple communications apps that afforded workers instant access to safety meeting minutes and past safety audits, as well as group text/chat messaging for safety topics and reporting. A US refinery specializing in processing heavier crudes saw a significant increase in its light ends production by using a DA platform to monitor and manage daily production targets.

Takeaway. The goal of digital transformation is to uncover new and untapped information that promises to improve productivity, enhance performance, increase safety and provide a competitive advantage. As the amount of data increases, it must also be filtered to meet the specific needs of the workers. Since data must be shared, collaboration is a key factor in leveraging digital information that, in return, leads to increased cost savings and significant improvements. A properly implemented DA platform can start simple and, almost immediately, begin to generate low risk and positive returns. ■

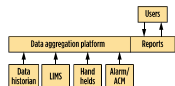


FIG. 1. DA platforms extract real-time queried data to users via custom report templates.

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