



FOUR STRATEGIES TO A STRONGER DATA FOUNDATION

Digital transformation can be difficult to navigate, but proven strategies can build sustainable transformation



Manufacturing organisations that store and transport product over long distances are spending more resources and energy than ever to track, trend, and analyse processes and product. This dedicated monitoring and analysis is critical as companies try to do more with less in the face of a changing global economy and workforce.

The organisations having the most success in this arena are doing more than just adding instrumentation to devices across the plant. They are fundamentally altering the people, behaviour, and processes they employ across facilities to improve decision support. Rather than focusing on individual initiatives, highly successful organisations are finding unique ways to incorporate digital technologies and advanced data analytics as part of a comprehensive digital transformation programme.

For one North American midstream company, a strong digital transformation programme delivering reliable data analytics wasn't just about sustainability, but also survivability. Discrepancies in record keeping and product tracking had the potential to result in claim settlements in the millions of dollars. The organisation worked with Emerson's data integration team to design and implement strong data analytics to comprehensively redesign how they handled and analysed data. The change helped them avoid a \$2.5 million claim in the first few months. Four key strategies that helped them can benefit any organisation beginning its own digital transformation journey and looking at data integration is a key enabler.

STRATEGY ONE – IMPROVE DATA QUALITY

Whenever a customer filed a claim that required tracking quantity and locations of product at a certain time, the midstream organisation's management would have to spend many hours looking back through old data – stored in spreadsheets and the data historian – to see if they could reconstruct the timeline and track the product.

The reliability team collected plenty of data, but like many organisations, that data was collected by different people using different methods with little or no validation. Lack of validation led to records that were inconsistent or incomplete, leaving investigators with missing or misplaced data. Because any current state was based on previous states, when they were missing records in the middle, the organisation effectively had no records at all. This created situations where management was unable to definitively prove that a stated volume of product was delivered to an expected storage location within the contractual time period. Without adequate proof to support the correct delivery, the organisation had no way to dispute customer claims – almost always requiring a settlement.

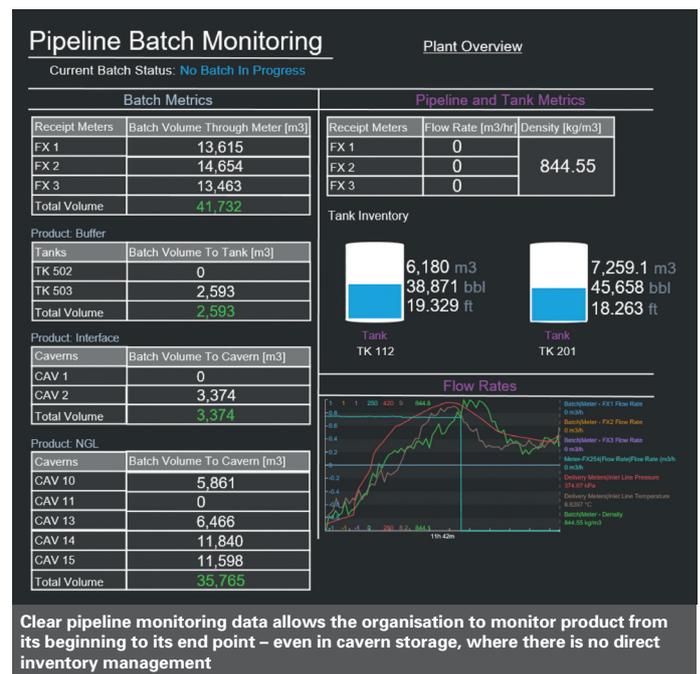
As part of its move to a strong analytics programme, the organisation worked closely with Emerson's data integration team to ensure better quality data. The team designed flowsheet graphics to monitor flowmeter data and collect that data across different timeframes. As the graphics

began to aggregate data, the team could visually identify errors. In many cases, the data was far off and could not be reconciled. In another case, temperature profiles identified inconsistencies in gradients among other problems with the incoming data.

Once the problems with data became visible, the team could clearly see the issues they had with data quality and identify the appropriate solutions. From the beginning, the organisation knew it would need to invest in some new instrumentation and IoT devices, but by examining their data and evaluating exactly what they had and what they lacked, the team could be much more targeted in where to spend resources to build the best datasets for future analytics initiatives. With a combination of a few new devices and a new thoughtful, comprehensive data collection strategy, the organisation began to see real value in its data.

Shortly after cleaning up the data they collect, a customer made a claim that the organisation underdelivered on product. In this case, delivered product was stored in caverns, which have no direct inventory measurement. The only way to accurately measure delivery is to closely measure inflow and outflow.

With access to clear, consistent data, the investigation team was able to use valve status, flow, and density history to precisely track the batch



from its beginning to its end point. Management was able to show the customer exactly when, where, and how much product flowed into their facility and defend against a nearly \$2.5 million claim.

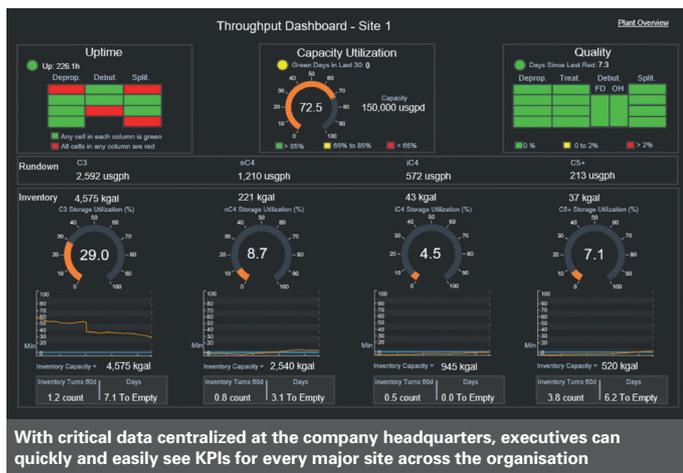
STRATEGY TWO – CENTRALISE DATA

When the midstream organisation tried to track its product as it traveled across the continent, analysts trying to reconcile data found that key information was frequently lost as production crossed between different areas. Moreover, many sites had labs that performed critical testing, but the test data was isolated in separate systems that made it difficult to access quickly and easily.

The data team worked closely with management at numerous sites across the continent to collect, organise, and store data from siloed locations in a central repository at company headquarters. Nearly all the new infrastructure was built using the historian that the organisation already had in place by simply leveraging integration tools using web API components.

Centralising data that the organisation already had made it easy for personnel at all levels to deliver, track, trend, and recover critical data quickly. Easier access to data also enables new organisation-wide initiatives, such as an energy tracking programme. Engineers from multiple sites across the organisation are currently collaborating to track key performance indicators (KPIs) in order to improve energy conservation, saving each plant a great deal of money.

For more complicated transfers, such as the data from proprietary lab systems, Emerson’s data integration team built a customised web-based solution that integrates with the historian to collect all data in one place. Now analysts can draw clean, thorough data for analysis, and executives at headquarters can view KPIs for every major site across the organisation.



With critical data centralized at the company headquarters, executives can quickly and easily see KPIs for every major site across the organisation

STRATEGY THREE – CONTEXTUALISE DATA

The organisation knew how to collect and analyse data but struggled with repeatability of results. As it tried to make use of the data it was collecting across multiple facilities, the reliability group quickly discovered that they struggled with putting critical data in context. Problems tracking timelines and the functional location where issues began were regular roadblocks in the reliability team’s quest to turn data into actionable information.

Typically, the organisation collected data approximately once a month. This meant that when it identified issues, it would have to deal with them long after the problem occurred. Often, the reliability team was unable to identify critical elements, such as operating conditions, asset status, and control configurations that were present at the time of the issue. To ensure accurate context, the team began to put an emphasis on timely collection of data. Moving to real-time collection of data across all sites not only made analytics more accurate, but it also meant less confusion caused by new problems appearing between the time when data was collected and when it was generated.

In addition, the team identified standardisation as a key area that needed attention. Installers always named data sources at the time of

installation, but not always using a standardised system. This meant that reconciling data required the additional steps of tracking down exactly where it came from, which was a cumbersome, time-consuming process that had the potential to lead to errors in analysis.

The team developed a management-supported, documented set of standards to be used for data across the organisation. New organisational mandates dictated that all personnel collect and format data using the exact same systems and conventions at all locations, helping immediately identify problem attributes, as well as the specific assets they were tied to. Standardised, contextualised data in turn meant the organisation could standardise collection and distribution much more easily, making data reusable, reliable, and trendable.

STRATEGY FOUR – ESTABLISH STRONG DATA POLICIES

Once the midstream organisation had established a set of high-quality contextualised data for its analytics programme, the reliability team put in place a governance system to keep the data quality at the high level necessary. Instead of focusing solely on a top-down approach, the organisation focused instead on changing the culture around data collection and analytics.

Because governance programmes thrive in environments where they are clearly and enthusiastically supported by management, each site has a data quality team that works to ensure that the proper processes and standardisations are followed. These teams set the standards and monitor systems regularly to ensure that collected data falls in line with corporate policies.

Management has also worked hard to ensure that the people on the plant floor – those closest to the data that is being collected – understand the benefits of a strong digital transformation initiative. Plant personnel are continually made aware of the successes and performance increases that their strong data collection efforts create. Personnel at every level of the organisation are expected and encouraged to participate; users of the data are aware that quality data makes their jobs easier, and that they need to speak up if there is a data quality problem.

By keeping a close eye on the company’s data, different groups are also identifying the need for more data, or places where things can be better clarified or improved. Those requests are fed back through the governance and support organisations to be implemented and updated according to engineering and IT change policies and processes. For example, one group recently started using collected data to analyse wait-time data on its trucking system. The data that group began creating (using data already generated as part of the programme) is beginning to spin off other projects that are even more advanced.

This is analytics in action, made possible by a sustainable transformative programme that fosters change management and that touches everyone across the organisation.

STRIVING FOR THE BEST ANALYTICS

Running a highly successful company is no longer about the systems and procedures of the past. Peak performance comes from aggregating, organising, clarifying, and comprehending data to squeeze every bit of performance potential out of the hardware and software solutions that plants rely on for visibility of operations. More and more organisations are now analysing their data collection guidelines and working with Emerson’s data integration specialists to build a strong data foundation for their digital transformation initiatives. The real numbers such initiatives generate translate directly into performance improvement and safety enhancement organisation wide. When the foundation of data that supports a digital transformation initiative is strong, data analytics empowers personnel with the insights and decision support to make the most effective decisions for operations regardless of circumstance – and that translates into real-world results.

FOR MORE INFORMATION

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