INDUSTRY 4.0

HOW A DATA READINESS STUDY SAVED NEARLY $1 MILLION FOR OUR CLIENT

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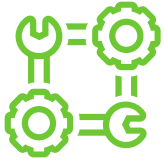
STRIVING FOR INDUSTRY 4.0

The company had ambitions for several digital transformation initiatives and engaged TQS to provide a multi-year strategy for Industry 4.0 enablement.

The scope included a requirement for rapid, turnkey data streaming in Phase 1. To facilitate this, TQS evaluated access to the existing data collection, reporting, and analysis platforms, as well as skills across the organization.

TQS analyzed the company's existing infrastructure and capabilities — with the specific aim of drafting a standard data acquisition methodology and implementation strategy across 8 manufacturing sites.
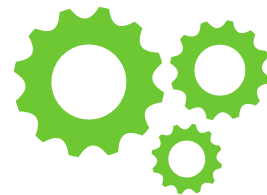
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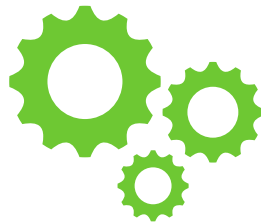
High Availability Architecture

IIoT deployment

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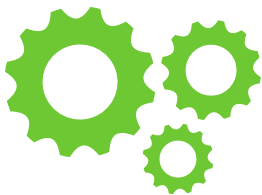
THE SOLUTION

Extensive Research to Probe Deep

The initial action was a Data Readiness Study, by way of a comprehensive review of the sites with regards to the availability and acquisition of data into a centralized data platform (to be used as a global data concentrator for all platforms requiring real-time data).

First, a review was carried out of all existing PCS, DCS, CMS, BMS, and other stand-alone systems in all 8 sites — then, the requirements for the data acquisition architecture were established.

This was followed by an evaluation of the current infrastructure, including:

→ Current automation infrastructure.
→ Current automation/IT initiatives.
→ Current reporting and visualization systems and platforms.

These were evaluated alongside the proposed IT infrastructure.

Following this, "Blue Skies" analysis was conducted — an exhaustive exploration of every possible capability, solution and outcome.

Finally, the OSIsoft PI tag naming convention was proposed, critical element to align with other site systems.

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Solution at a glance

→ **Review of all existing PCS, DCS, CMS, BMS, and other stand-alone systems at the eight sites.**

→ **Define the data acquisition architecture requirements.**

→ **Evaluation of Current Infrastructure:**

    Current Automation Infrastructure.
    Proposed IT Infrastructure.
    Current Automation / IT initiatives.

→ **Evaluation of Current Reporting and Visualisations.**

→ **Current reporting platforms.**

→ **'Blue Skies' analysis / reporting requirements. Every possible solution and outcome explored.**

→ **Proposed PI Tag naming convention (how we name data sources)**

Head of Operations, Top Global Pharmaceutical Company:

"We are very happy that TQS recommended and implemented a Data Readiness Study for us before we engaged with any extensive data infrastructure and integration changes. Not only did it save us valuable time and effort, it also saved us a lot of money. Recommendations put in place by TQS also simplified our data processes so that we can access our data more easily which allowed us to make more optimal business decisions."

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THE RESULTS

A Complete Set of Recommendations

A report was generated for each site with a complete set of recommendations.

Recommendations were made regarding batch context/event frame configuration, analysis and visualization; the networking and system architecture; the data validation approach to be undertaken; and how to best conduct historical data migration.

Recommendations were also made on IIoT (industrial internet of things) deployment and data gathering. A deployment plan following the TQS Rapid Deployment was modelled. This was followed by staffing, training, and SPC/IQS recommendations. Then an MES (manufacturing execution system) integration strategy was devised — to monitor and control the manufacturing process.

Finally, guidance was provided on how to implement an effective security system, as well as how to maintain daily operational excellence — with system and module overview and business issue resolution.

This report allowed a discussion in greater detail about what the client's requirements were and what the best course of action was.

Following the recommendations provided to the sites, it was agreed to move ahead with a local historian per site in a full High Availability Architecture.

Recommendations at a glance

→ **Batch Context/Event Frame Configuration, Analysis & Visualization**

→ **Security implementation**

→ **Networking & system architecture**

→ **Validation approach**

→ **Training & SPC/IQS recommendations**

→ **Staffing**

→ **Historical Data Migration Options**

→ **Daily operational excellence – system and module overview and typical business issue resolution**

→ **MES Integration Recommendations**

→ **Deployment Plan Recommendation**

→ **IIOT Overview**

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Below is a list of the data types captured into the historian and a list of the ongoing initiatives to use this data:

Process Data

Process Data is data that can take any value (within a range) which updates frequently.

→ **Continuous data (data that can take any value): temperatures, pressures, etc.**

→ **Discrete data (data that can only take certain values): reject counts, valve openings, etc.**

Alarm & Event Data

Alarm & Events data arises from process or equipment alarms and events, operator actions, or sequence events generated during system operation.

Batch Context Data

Data from batch or control system generated information to frame events on the system identifying the start and stop of runs, operations, phases.

Audit Trail Data

Data that has to conform to FDA's 21 CFR Part 11 & 11.10(e) for US jurisdictions and EudraLex Volume 4 Annex 11 for EU jurisdictions (Data integrity, GMP compliance).

IIoT Sensor Data

Data collected from connected IIoT sensors, e.g., vibration sensors.

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KEY TAKEAWAYS

COST SAVINGS:

A number of savings were made from this approach with regard to standardization of integration, a minimized least intrusive integration plan, and a structured rollout.

In particular, one of the sites had huge savings within hours of the Data Readiness Study. A local vendor had been brought in to evaluate connectivity to a number of control systems. They recommended an upgrade to several of these systems
— which had a cost impact of $950k.

$905K

The equipment pieces had an end of life and are to be decommissioned in 2024; however, due to the criticality of the data, it was deemed by the site that the data was necessary. TQS reviewed the control systems in question and were able to identify access to the data through text-based files.

After an initial test to ensure the correct data was available, it was determined that the upgrade was no longer required as the necessary data was available. The integration to the text based had a cost of only $45K, resulting in a total saving of $905K for the client.

WHO WE ARE

TQS Integration, a Cognizant company, is a global technology consulting and digital systems integrator. We provide you with expertise for the digitization of your systems and the digital transformation of your enterprise -- helping you become leaders in Industry 4.0.

With clients across the pharmaceutical, process manufacturing, oil and gas, and food and beverage industries, we make your data work for you — so you can maximize its potential to make smarter business decisions.

With over 300 projects completed every year from our offices in Ireland, Spain, India, and the US, we have garnered considerable knowledge and experience around our clients' data requirements.

We have 200+ highly trained, specialist engineers to help you with all aspects of your data intelligence needs, as well as our own software development team to provide you with custom-made solutions. Our power comes from our people.

Authorized Distributor for OSIsoft Ireland, UK and Europe
Global EA Premium Partner with OSIsoft
Global OSIsoft Select-Partner for Life Sciences
Managed Services Solution and Training Provider
Partners for Sartorious, Seeq, SynTQ and Trendminer
Digitalization, IOT and Smart Factory Innovators.

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