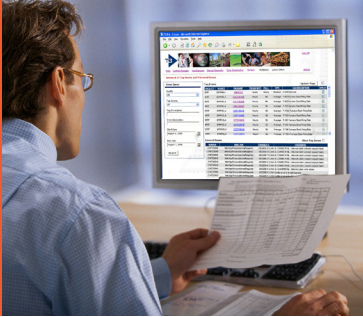


Data Integration and Automation Application



SEAMLESS DATA INTEGRATION

An important function of an Environmental Management Information System (EMIS) is the collection of facility process data. Automating this data is critical to calculating emissions and demonstrating compliance with operating limits or permit conditions on a real-time basis.

T3®, a division of Trinity Consultants, developed a Data Integration and Automation (DIA) application to automatically retrieve client specified data from process historians and transmit the results to a third-party EMIS. The DIA application can also perform the compliance related calculations and reporting functions as a standalone software product allowing users to:

- Manage the system hierarchy
- Organize emission sources for multiple sites
- Set system control information
- Add/modify process data tags
- Enter manual user activity data
- Create/update calculation equations and maintain constants
- Set limits for tag values and calculated results
- Generate reports

Reduce the data and validation burden of emission calculations by automating the emissions calculation process for various reporting requirements with the DIA application. It can also send emails regarding data errors and changes made to equations, sources, and limits to designated recipients.

Data Collection

The DIA application can pull data from the following data historians: Honeywell's Uniformance® PHD, OSIsoft's PI System®, Aspen InfoPlus.21®, Microsoft Excel®, or any ODBC supported system. Process data can be collected on any polling frequency (every minute, 15 minutes, hourly, daily, etc.) and the data are collected and aggregated in user-specified format (raw, snapshot, minimum, maximum, or average). In addition, tag data can be reconciled for each individual tag by a user-defined method during historian server malfunctions.

Processing Data

The DIA application can calculate averages from raw data or use data historian averages, cleanse data before averaging based on other single or multiple "fault" tag values or quality code, and track calibration times based on a calibration tag. Data processing is also extremely fast, cleansing and converting up to 50,000 raw values to 1,300 averages in less than 7 minutes.

Aggregation and Validation

A complementary benefit of the DIA application is the ability to perform processor-intensive data aggregation and validation based on business rules established by the user and performed prior to transmitting the results to the EMIS. Specifically, the application uses a set of fault tags to validate or invalidate raw and minute data to create "valid" averages; and from these valid averages, to create valid block averages. Averages and snapshots of data can also be pulled from data historians without validation.

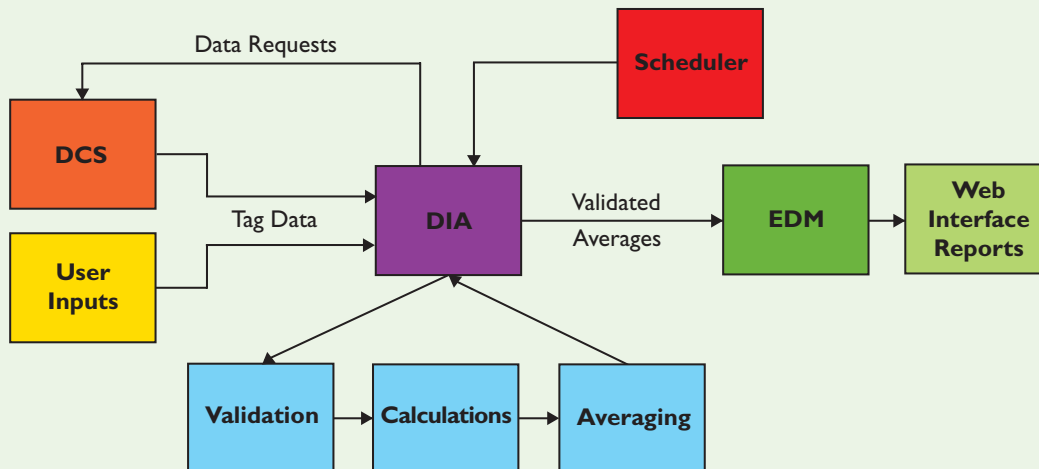
Easy to Use Functionality

The DIA application supports both scheduled and manual requests. Scheduled requests are those automatically generated by the application each time it runs. Manual requests and other data entry to the DIA application are entered via the EMIS solution or Web interface. The Web interface is designed to assist users with managing lists of environmental tags, establishing averaging and validation rules, and scheduling data collection requests. The DIA application also sends emails of tag errors and miscellaneous errors at runtime or daily. Users can set up custom email notifications using standard database queries.

TECHNICAL ELEMENTS

- Designed for Microsoft SQL Server® 2008 R2 or newer
- Requires Microsoft .NET Framework 4.X
- Designed in Microsoft Visual Studio® .NET

DATA INTEGRATION AND AUTOMATION APPLICATION METHODOLOGY



APPLICATION SUCCESSES

Project Snapshot: DIA Horsepower

A large U.S. based refinery must frequently record data to document compliance with the New Source Performance Standard (NSPS) for its continuous emissions monitoring system. Data must be collected on a block 15-minute and hourly basis. This large refinery needed an application that monitors, validates, and averages data in a near real-time environment before integrating it into an EMIS solution. T3 implemented its DIA application to process the large volume of data required to document compliance. The challenge was collecting, validating, and storing potentially tens of thousands of monitoring results every 15 minutes.

Timing requirements were a major concern during development. If the data retrieval time was longer than 15 minutes, the application would not be able to keep up with the averaging pace. Fortunately, the application can process large manual requests while finishing well under the 15 minute mark. As a result, the refinery's EMIS solution is able to calculate emissions faster and more accurately due to the DIA data cleansing procedures.

Project Snapshot: Emissions Inventory Automation

A gas processing plant in the Middle East implemented T3's DIA application to automate its emissions inventory process to track and calculate greenhouse gas (GHG) emissions verified by third party auditors. The facility needed to calculate hourly process

fuel usage data combined with fuel property sample data from a non-routine schedule. For verification purposes, the calculations were documented in the application to facilitate raw data reporting and auditing.

In addition to emissions inventory automation, the DIA application sends alerts when process data was out of the user-defined range and creates customized reports for data quality validation, corporate sustainability reports, and required local reporting.

WHY CHOOSE T3?

T3 was launched in 1995 when Trinity Consultants, a nationwide leader in environmental consulting, responded to client needs by focusing on the specialized area of EH&S information management solutions. Today, T3 is an industry leader with a rare mix of EH&S professionals and Information Technology (IT) experts. This powerful combination gives T3 unmatched capability in applying technology to solve industry's EH&S information management challenges. We have developed the broadest range of solutions, all designed to save you time and money.

In every way, T3 is committed to helping you achieve the highest standards - of business performance, and environmental responsibility. Visit trinityconsultants.com/T3 to learn more.



Information Technology for EH&S Management

972.661.8121 ■ Fax: 972.385.9203 ■ sales@tthree.com ■ tthree.com

T3 is a division of Trinity Consultants and a registered trademark of Trinity Consultants, Inc. Copyright 2013. All rights reserved.