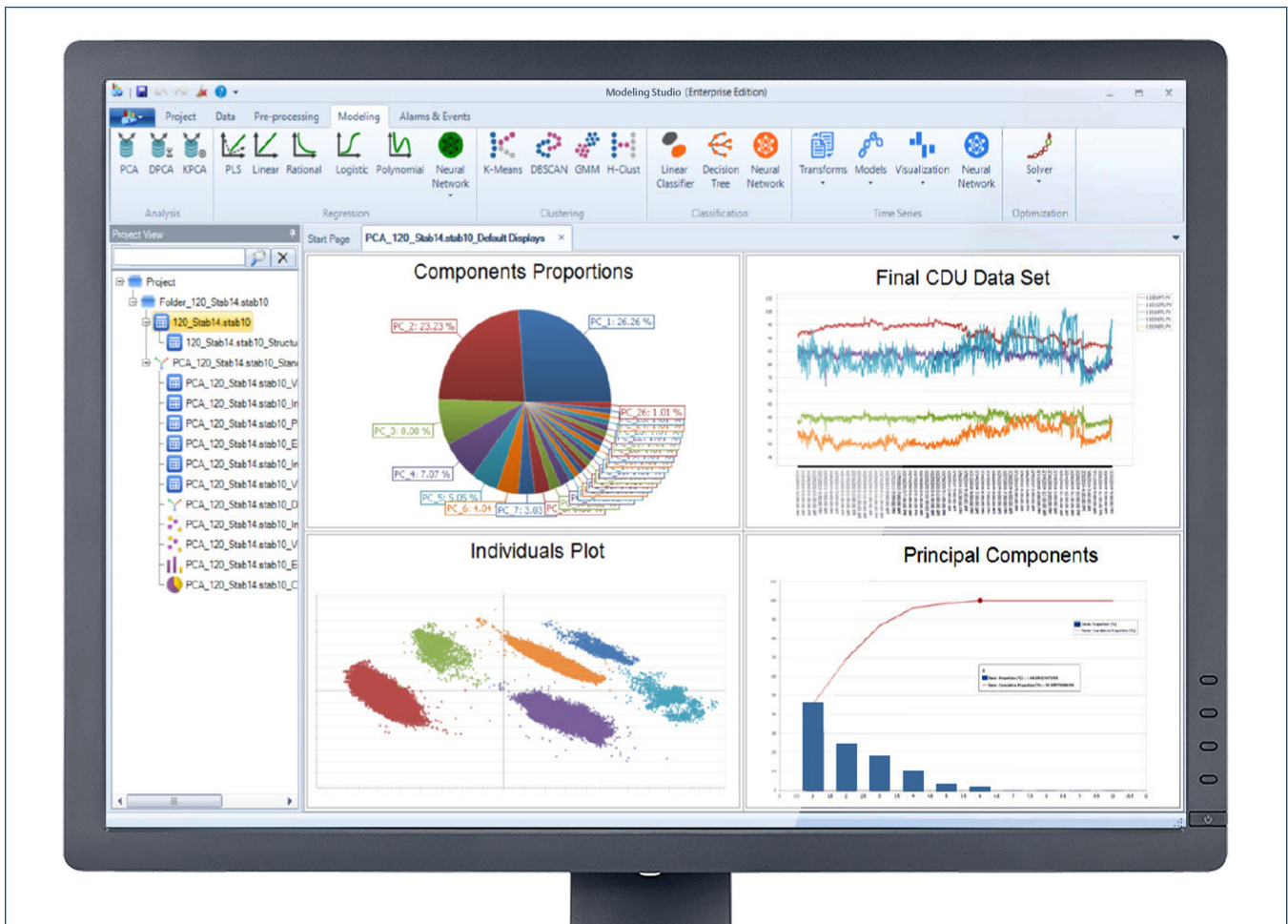


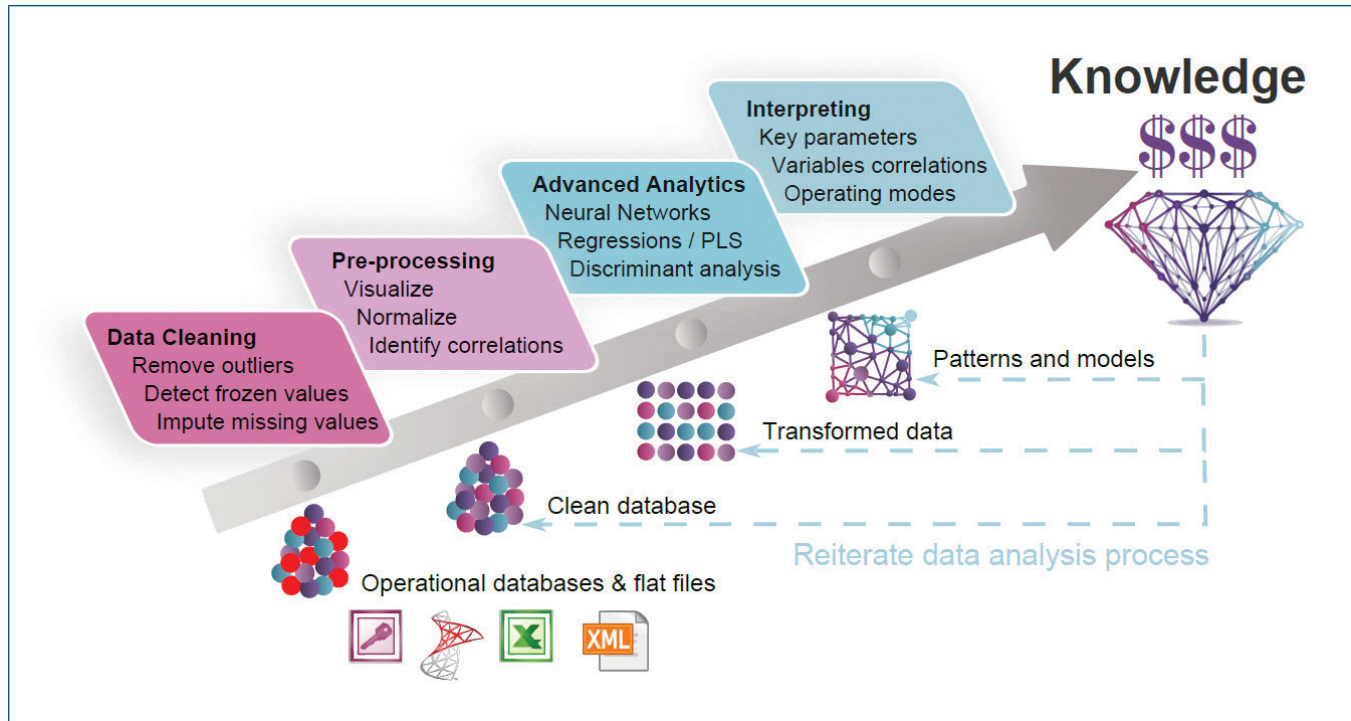
# Plantweb Optics Analytics Modeling Studio



*Transform data into knowledge and profits.*

In the manufacturing and energy industries, new challenges are pushing managers to optimize and improve operational efficiency. From the obvious challenge of managing a finite resource to the ever changing environmental regulations and the competitive pressures, it is easy to understand why industry leaders are continually striving to find ways to maximize productivity. In order to sustain the performance and profitability of their plant operations, they have to make informed decisions which are dependent on the ever increasing massive amount of data scattered in many sources. The efforts of collecting, cleaning, aggregating and analyzing such data is laborious without the guarantee of any results.

To address this challenge, Emerson is pleased to offer Plantweb Optics Analytics Modeling Studio which takes away the burden of processing millions and trillions of data measurements such as sensor readings, lab data, simple and complex events, and automatically extract knowledge and predictive models, identify optimization opportunities and behavioral patterns.



Plantweb Optics Analytics Modeling Studio is an out of the-box process data analytics software that allows endusers without extensive domain expertise to:

- Inspect, clean and transform raw data into information and knowledge.
- Create predictive models that can be deployed in real time.
- Eliminate erroneous data and pinpoint problem areas.
- Perform proactive decision making to prevent abnormal conditions and identify opportunities.
- Recognize behavioral patterns and correlate data with events.

## Benefits

- Maximize efficiency and profitability to gain competitive advantage.
- Discover new opportunities for time and money savings.
- Gain more flexibility in anticipating changes.
- Make efficient decisions with confidence.

## Methodology

### Automated Knowledge Capturing

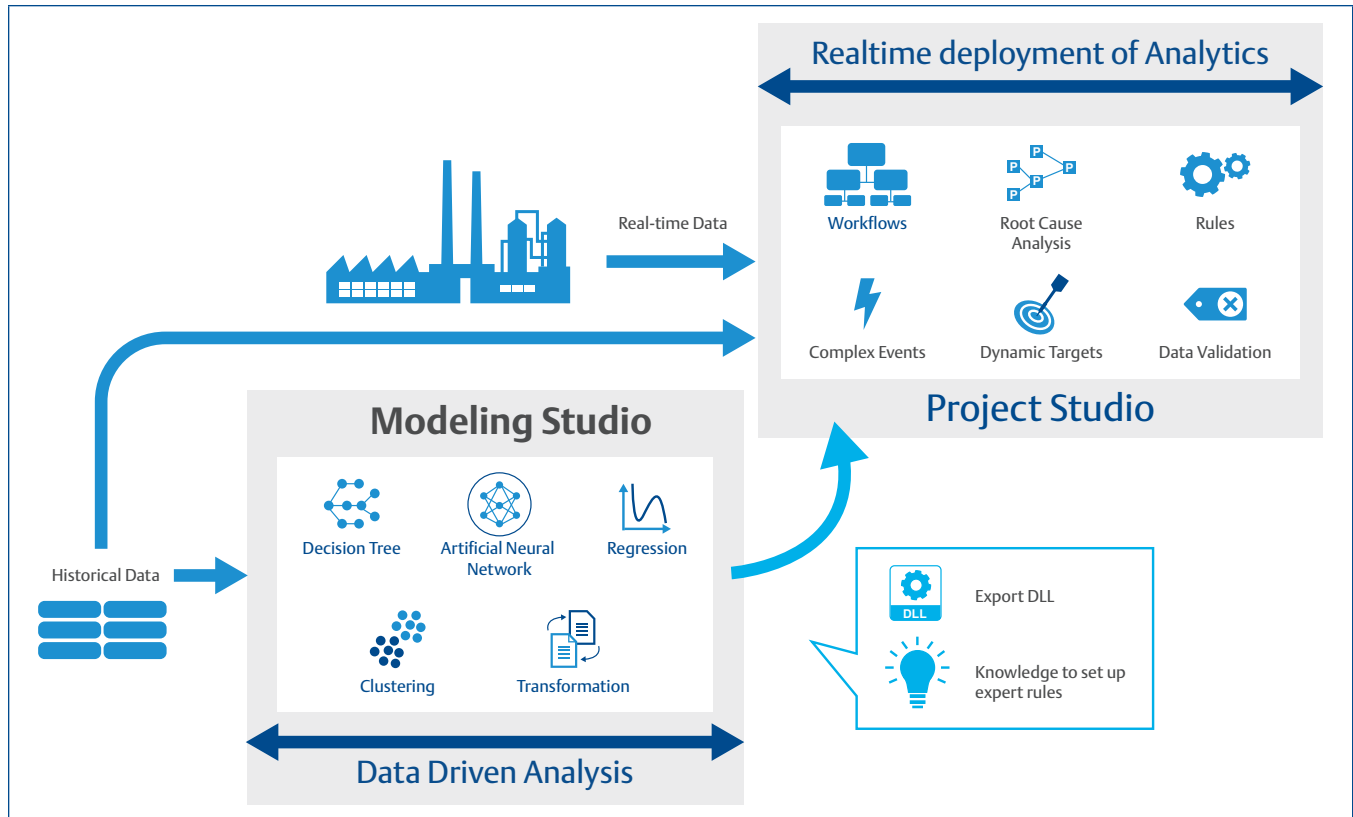
The procedure adopted by Plantweb Optics Analytics Modeling Studio consists in acquiring raw data from the plant, cleaning the acquired dataset, building models and interpreting them. This process can lead to the extraction of highly valuable knowledge in form of expert rules and hybrid models that detect special operating modes and states, abnormal plant behavior, and best operating conditions. Plantweb Optics Analytics Modeling Studio automates knowledge capturing without the need to interview the experts and document the knowledge manually.

### Beyond Analytics

Not only can Plantweb Optics Analytics Modeling Studio help you uncover hidden process knowledge, build predictive models, correlate data but it also allows you to determine the relationship between the dynamic behavior of the plant and complex events.

### Online Deployment

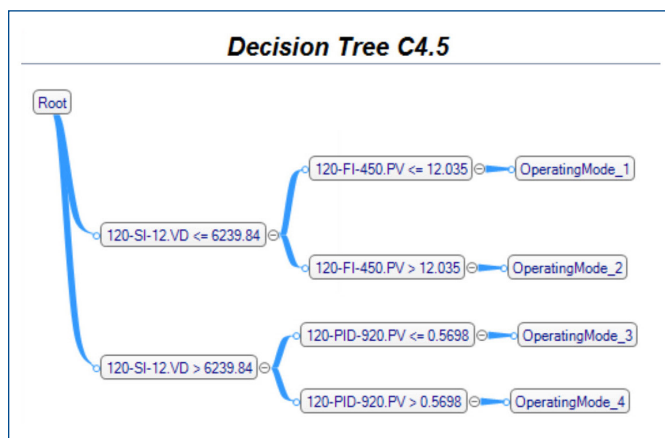
Uncovered knowledge and models built in Plantweb Optics Analytics Modeling Studio can be deployed online to deliver real-time visibility and insight into operations for optimized performance management, maximized throughput, efficient management of abnormal conditions, and tight control of operating costs.



## Features

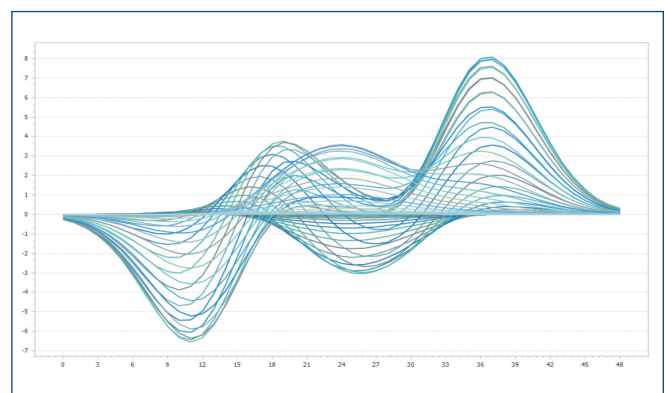
### Machine Learning

Machine learning generates models that can capture and mimic the behavior of a plant. These models can be used to predict failures and recognize operating modes. Plantweb Optics Analytics Modeling Studio offers several algorithms for machine learning such as Neural Networks, Decision Trees, Linear Classifier, and others.



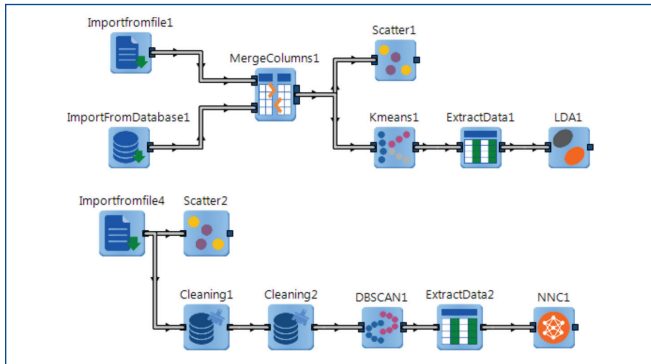
### Optimization

Optimization consist of finding the best available values of an objective function given a set of constraints. With this feature, Plantweb Optics Analytics Modeling Studio helps operations maximize productivity and optimize costs.



**Workflow**

Workflow in Plantweb Optics Analytics Modeling Studio is a powerful feature that allows you to build and automate sequential process made of data analysis, learning, clustering, and modeling. Once the workflows are built, they are automatically memorized and can be later deployed generically and applied on multiple data sets without the need of human intervention.



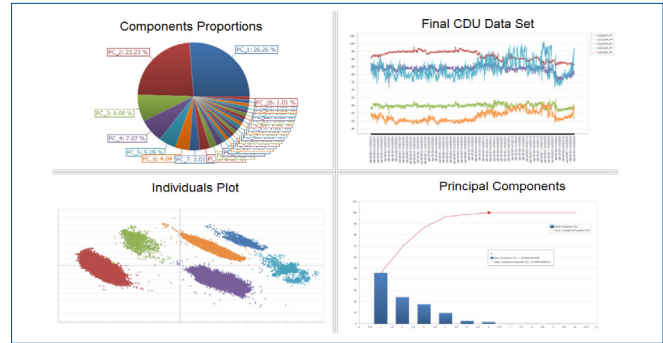
**Graphical Environment**

Unlike traditional data analytics technology, Plantweb Optics Analytics Modeling Studio offers a highly intuitive and user-friendly environment with a Microsoft look and feel featuring drop down menu, drag and drop graphical icons without the need of scripting or programming.



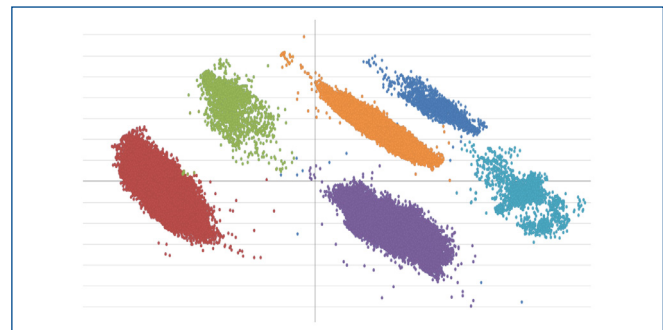
**Modeling**

Plantweb Optics Analytics Modeling Studio offers tools to perform descriptive and predictive models based on actual data. Descriptive models are used to better understand the process behavior by identifying key variables and their relationships, while predictive models are used to predict the system behavior using hybrid models and combining multiple techniques.



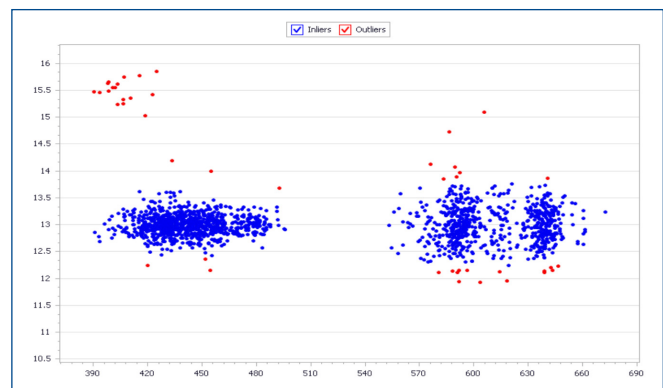
**Pattern Recognition**

This feature allows the recognition of patterns and regularities in data. It consists, for example, in identifying operating modes by detecting clusters with related data in scatter plots or in discovering recurrent sequences in alarms and events databases.



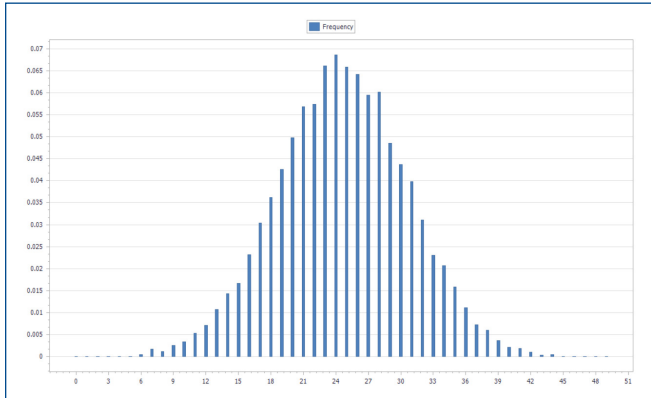
**Exploration**

The exploration step is important to clean the input data set before performing advanced analysis. Plantweb Optics Analytics Modeling Studio provides different tools to explore data such as cleaning, sampling, smoothing, correlation, and others.



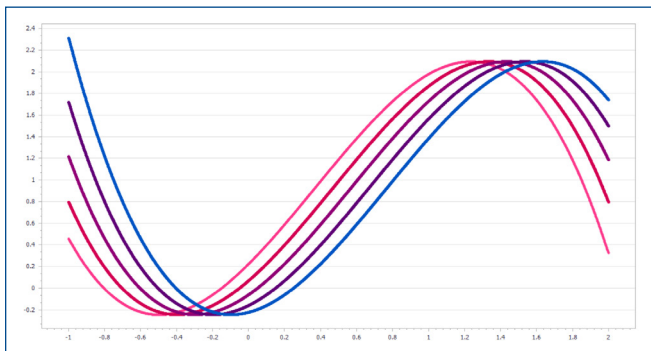
**Time Series**

Time Series features in Plantweb Optics Analytics Modeling Studio allow transforming time series and analyzing their behavior for trends, seasons, and correlations with past values. Time series models include AR, MA, ARMA and GARCH models as well as time series Neural Networks.



**Visualization**

Plantweb Optics Analytics Modeling Studio embeds different tools offering efficient data visualization such as scatter plot, line chart, pie chart, area chart, box plots, radar chart, and polar chart.



**Applications**

**Automatic Identification of Plant Operating Modes and States**

Plantweb Optics Analytics Modeling Studio combines clustering methods with classification and modeling to build expert rules. These expert rules can be deployed online to automatically identify plant operating modes or to detect and predict abnormal situations, for example drop in RON (Research Octane Number) and high energy consumption.

**KPI Dynamic Targeting**

Plantweb Optics Analytics Modeling Studio offers methods to set dynamic targets that consider process behavior in terms of operating modes, equipment availability, valves line-ups, special process scenarios, and others.

**Sensors Validation**

Plantweb Optics Analytics Modeling Studio includes a sensor validation module that identifies the faulty sensors and validates the values. In addition, Plantweb Optics Analytics Modeling Studio enables determining soft sensors for complex measurements such as analyzers or labs.

**Optimization**

Based on the system configuration, Plantweb Optics Analytics Modeling Studio provides users with appropriate configuration for an optimal system performance and reduced downtime.

**Asset Performance Modeling**

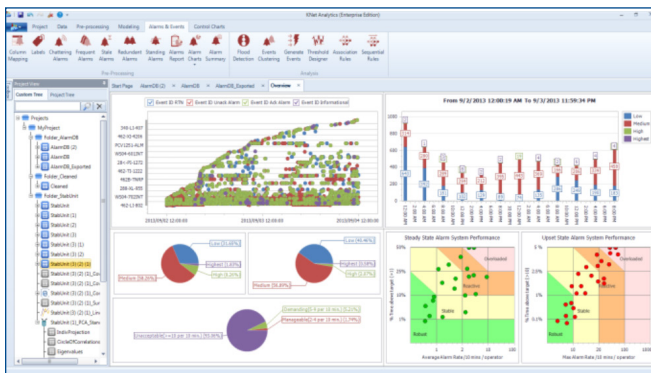
Plantweb Optics Analytics Modeling Studio allows modeling the performance of the asset as a function of key process inputs. This model might be used to identify the reference performance curve to be used to identify performance gaps.



**Alarm Analytics**

The alarm analytics module combines several data analytics and advanced techniques allowing end users to extract knowledge from alarm data and go beyond classical alarm management. This module allows the user to:

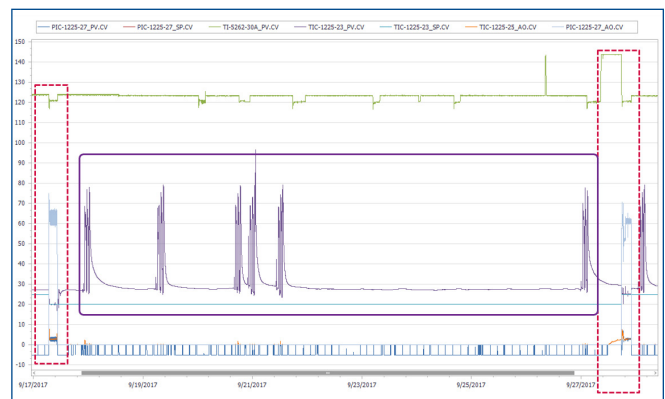
- Audit the performance of alarm systems and pinpoint nuisance alarms such as frequent, chattering, stale and standing alarms.
- Identify alarm correlations and clustering to remove redundant alarms and reduce alarm floods.
- Use pattern recognition tools such as sequence mining and association rules to predict the future behavior of alarms for increased safety and reliability.
- Correlate alarm data and process data for a better troubleshooting and root cause analysis.



**Batch Analytics**

Plantweb Optics Analytics Modeling Studio Multivariate Analysis feature monitors the production process and delivers key insights into process variability issues. Plantweb Optics Analytics Modeling Studio batch specific algorithms help with:

- Maintaining product quality by preventing waste on high quality batches.
- Identifying the variations in batches by monitoring key batch variable contributors in real-time.
- Predicting process faults early on and determining the root cause behind any process deviations.



## Minimum Hardware/Software Requirements

Operating System	Windows 7, Windows 8, Windows 8.1, Windows 10	Windows Server 2008, Windows Server 2008 R2, Windows Server 2012, Windows Server 2012 R2, Windows Server 2016
Processor Speed	3 GHz (higher recommended)	3 GHz (higher recommended)
Memory	8 GB	16 GB
Disk Space	10 GB	10 GB

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