Production Process Optimization at Your Fingertips!

Integrating All of Your Industrial Plant Data Is the Key

Manufacturing plants generate huge amounts of different kinds of data. If you work in a plant, you know what I'm talking about. This industry has the most data points than any other industry, even more than Google and Amazon, but ranks at the bottom of translating these data points into actual information.

Data is important! Most people know this, but what they don't know is how to connect and thus use all of the operational data to its full potential.

Here's a simple example: consider yourself, the triathlete, as the factory and the coach as the process expert.

Let's say you are a training for an extremely difficult and expensive triathlon race: 4k swim/180k bike/42k run. (Some crazy people actually do this race!) You will need to train hard, buy specialized gear and equipment, and prepare mentally. The race is high risk in terms of time, money, and personal commitment, so you hire a coach to get you across the finish line. In order to design a training program to guarantee your success, the coach will combine different types of data: personal data (contextual data) like age, athletics and injury history, and race experience and heart rate data during training (time-series data). By integrating all of your data, the coach can optimize your training (the process) while preventing injury (no down time). In essence, the coach will maximize your performance.

Now, visualize all of the data types that your plant captures and stores. Think about it: What if there was a tool for your process experts to use to combine all of the plant's data enabling them to more effectively address issues and solve problems, to make data-driven decisions, and to gain insights to improve operations? Actually, there is one: a self-service analytics platform – production process optimization at your fingertips.

Give Experts the Proper Tool to Optimize their Production Processes

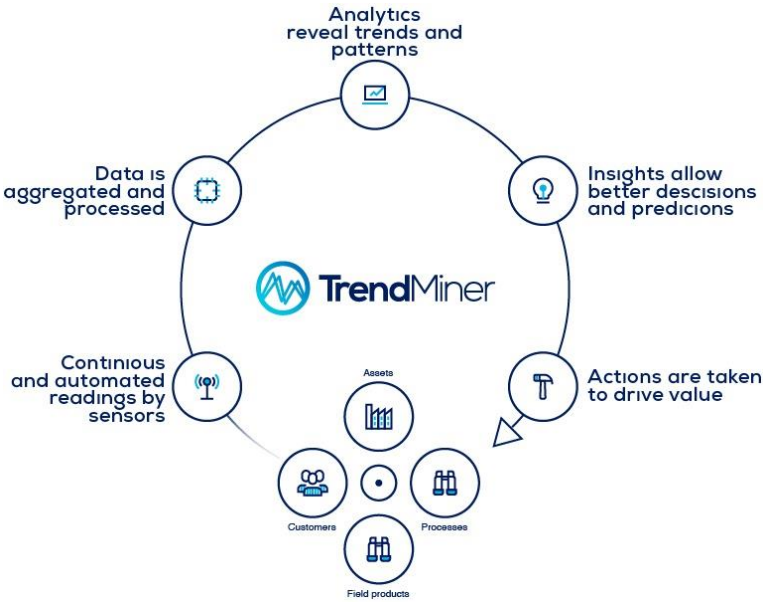
Data always tells a story – all you have to do is capture it. And data is extremely important to process and asset managers. It can be used to find anomalies in process and asset performance, to test and verify hypotheses, and to solve performance issues. With this information, process experts can increase yield, control product quality, and reduce production costs.

Process experts understand the data. They've got the day-to-day experience with it. They are the ones who know what the information means, for example, which sensors are of interest to investigate production performance. When using self-service analytics, process experts can truly use the data to its full potential. Now, going back to the race example. By analyzing and understanding all the data, the coach (the process expert) can get the most out your training (the process) and improve your performance (improve plant operations) and thus your race outcome (manufacturing products). Whether coaches or process experts, they just need the right tool, one that uses all the data to get the best possible performance.

Use Time-Series Data in Conjunction with Contextual Data

Time-series data is created by continuously recording a value at different time intervals which can be from minutes to hours. This data type is captured in an historian, and after

aggregation and processing, can be analyzed. Now through the use of self-service analytics, process experts can use the information to solve problems and monitor processes. And they can do this without the help of a data scientist because a tool like TrendMiner uses pattern recognition and machine learning to identify trends. Experts can use this information to gain insights into complicated operational processes and base their decisions on facts which will result in better manufacturing outcomes.



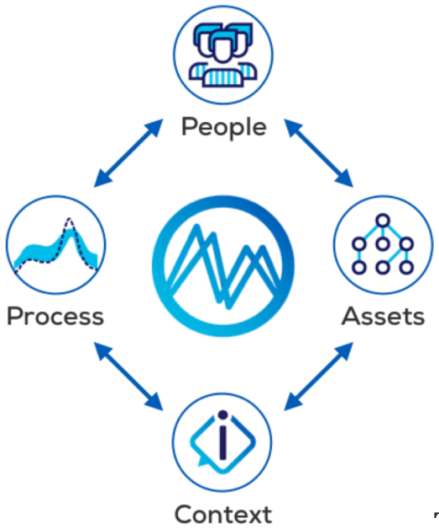
Just like the coach used contextual data to design a program suited to your background and ability, process experts can use contextual data to help run plants more efficiently. This data includes information about quality, maintenance events, operational events, environmental conditions, and process performance. However, since this data type typically resides in external business applications, it is siloed or held separately in its own applications and is separately reviewed and monitored by other teams. Also, it is usually not used in conjunction with time-series data – which is a huge loss of potential.

In the past, analytics mainly revolved around the use of time-series data, but all the data from industrial processes is valuable and can give insights into production performance. In fact, to operate and stay competitive in today's fast-paced modern world, companies can use time-series data in conjunction with contextual data. Going back to training for the crazy triathlon. The coach can use all of the athlete's available information to enhance training and increase race performance, resulting in a much higher probability of success.

You can do the same with your plant – reach production process optimization through data integration.

Translate All the Data into Actual Information

How can you translate all of a plant's data points into actual information to improve operations? The answer is a tool like TrendMiner. First, before integrating other data sources, you need to leverage historical sensor-generated time-series data which often resides in plant historians but could also be stored in SQL databases or data lakes.



Then by using the plant breakdown structure (asset framework), you will have a very good basis for a better analysis of asset performance resulting in a deeper understanding of process performance. TrendMiner gives you several options for creating an asset framework. You can create your own , or you can integrate it with OSIsoft's PI asset framework. If you don't have one but have some type of file that organizes your assets, we can input that file into our software to build up an asset framework.

Lastly, our software can disclose events (contextualize data) from other business applications. Key are the start and end times of the events for use in analyzing operational performance. All this information is rich and valuable for analysis. Given an easy-to-use self-service analytics platform that integrates all of your plant's data, experts can get a 360° view of the operation.

Check out this webinar for more details about how self-service analytics integrates data: How to Leverage Data Integration & Streamline Self-Service Analytics

Data Integration Can Help with Production Process Optimization

TrendMiner combines time-series and context data. This integration helps process engineers and operators easily search for trends and question their process data directly, monitor production, predict issues, and build up cockpits for live viewing of the manufacturing process.

Answer Process Questions

Process experts like to get answers to very common production questions. If they get these answers, they can achieve faster production process optimization. Typical questions are:

What has happened? TrendMiner offers various ways to investigate the data and visualize the search and filter results on screen. The engineers can immediately understand what their search and filter actions mean and can add extra sensor data to the visualization to quickly assess the operational situation.

How often did this happen? In the past, to figure out what happened, engineers overlaid performance patterns on paper and looked for behavior similarities or deviations on windows or lightboxes. Today, engineers can have a more efficient tool. Our software searches for similar situations through pattern recognition and overlays periods on screen. This digital representation allows engineers to identify the frequency of the issue.

What is the root cause of the performance issues? Either the engineers can search for correlations themselves using our software, or they can ask TrendMiner for recommendations of the potential root causes. With the answers to these questions, process experts can make soft sensors and monitors to improve operational performance.

Can I get early warnings before issues arise? Events that occur “once” will likely occur again. Our software helps to prevent repeating production issues by guarding live data like a watchdog. It monitors processes 24/7 sending notifications when patterns of interest are

detected and can customize messages to alert operators about possible issues and to prescribe the best response for the given circumstances. With this monitoring feature, process experts can take appropriate actions before there is a problem.

Build Production Cockpits to assist with production process optimization

Data integration also allows process experts to create specific dashboards which together make up production cockpits for live viewing of your plant's operations. These cockpits can provide live insight and a better understanding of operational performance, so process experts can adjust field settings or plan maintenance. Using production cockpits, all plant stakeholders, from the board room to the control room, can contribute much more effectively. For example:

Process engineers – can grasp business outcomes by keeping all information in check.
Maintenance engineers – can establish better organizational collaboration by monitoring processes, predicting maintenance events, and sending information to people in the field via comments on context items.
Production managers – can create a learning organization because all information and collaboration is stored within the system and can be shared and discussed.
Control room operators – can gain real-time operational insights allowing them to take action when an issue occurs.

Connect the Dots – Integrate to Innovate

Your process experts can connect the dots using TrendMiner to easily integrate all of your plant's data. Data integration streamlines analysis and lets your process experts make decisions based on facts resulting in better outcomes. They themselves can analyze the

data and understand the story it is telling without the help of data scientists. Give your process experts the tool they need to run the plant in the best possible way.

You have nothing to lose and a whole lot to gain. And what you get is production process optimization at your fingertips.