



THREE RULES FOR MANAGING YOUR MANUFACTURING DATA

Whitepaper



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Thanks to the Internet of Things (IoT), every work center, device and piece of equipment in your manufacturing facility has the potential to collect information. Devices such as your PLCs, machine controllers, thermostats, chillers, extruders, vision systems and paint lines now have the ability to extract detailed process and production information while in use.

This recent ability to leverage volumes of data is creating waves of change within the manufacturing industry. With process monitoring and serial traceability, manufacturers can now tie together product information end to end, from the initial manufacturing stages through to final shipping. This improved data collection and analysis is increasing accountability, traceability and changing the decision-making process, as manufacturers are able to capture a realistic picture of what is occurring on the shop floor in real time.

A big data initiative in your manufacturing facility can greatly assist your organization. But the increase of information does not come without challenges. For example, once you have the data, what do you do with it? Collecting data for data's sake, especially outdated data, can cause more harm than good without a plan for using the data as failure to correctly analyze and apply the data can produce a negative outcome.

When embarking on a big data initiative, here are three rules to follow to make the most of your newly acquired information:



RULE NO. 1: JUST BECAUSE YOU CAN COLLECT EVERYTHING DOESN'T MEAN THAT YOU SHOULD.

Production and process monitoring is about more than just collecting data for data's sake. With rule number one in mind, how do you decide which data is important and which is not? The most important answer is: Any information that you collect should be actionable.

Other considerations when collecting data include: Does this increased knowledge inform you about areas you have control over and can change? Is this specific information required by a customer to do business? Does it improve quality control or increase customer service? Does it satisfy a compliance regulation? Will this data lead me to potential liability in the future? Below are a few real world examples of how the right data collection can improve your business.

Production Improvement:

You have a work center, dutifully manufacturing parts 24/7, with a quality issue. At around 2 AM every night, about 10 minutes worth of parts coming off the machine are rejected. Why is this failure consistently occurring? By tracking environmental data at the work center, you are able to show that an ambient temperature drop (attributed to an employee propping open a back door for his smoke break) directly affected the cure time on the product, resulting in the defects.

Process Control:

You have a series of paint lines that color products as they pass underneath. By measuring the quantity of paint leaving each nozzle on the line, you are able to automatically determine whether enough paint is being applied to your products. If the paint is distributed unevenly, it is easy to quickly identify which nozzle is the culprit and adjust accordingly to maintain the quality of the product.

Quality Control:

Your company extrudes wire. Through an optical measuring device, you record the top and side dimensions of the wire to measure the width and height of the extrusion. With that data, you automatically calculate the roundness of the wire and determine if the ovality meets your customer's specification. Any out-of-spec events are quickly realized and questionable material contained before it goes to the customer.

Customer Service:

You have a customer questioning the production details of a specific order. You can either manually respond to their phone or email query or you can give them the ability to log into a personalized web portal to get detailed data about each lot or batch they have ordered. This data has been captured and analyzed directly from the machine controllers or PLCs with no human interaction so the customer can inquire at their leisure.



RULE NO. 2: DON'T SETTLE FOR ANYTHING LESS THAN REAL-TIME COLLECTION.

If you want your data to be actionable, it needs to be displayed in real time. Batch uploads, end of shift production reports or even two hour interval reporting is not enough. When you pull information from your shop floor and back office, your reports should be run against live data. Too many manufacturers miss out on critical decision-making elements because of a lack of timely production details.

When something begins to go wrong on your shop floor and no one is made aware for several hours, what is the cost? Actual real-time information can prevent inaccurate scheduling, products trending out of specification, late shipments, incorrect inventory and unplanned downtime. Take this example:

One of your work centers is processing a long running, automated job with no operator. Because you only receive data every couple of hours, it is halfway through a shift before you see any production information. You review the data and a quarter of the products have been rejected for not meeting specification!

If only you could have accessed that data in real time. How many tens of thousands of dollars were lost in corrective actions because your data was old? Add in the expense of wasted material, rework, lost hours and the cost of your next job starting late and the lack of real-time, actionable data comes at a high price.

Business activity monitoring is another benefit of real-time information. A customizable, query-based advisory system can automatically alert you (through text or email) of critical events and issues based on the capture and evaluation of your manufacturing data. This ability to interpret data in real time and turn it into actions and advisories allows you to become proactive about time sensitive issues.

At some manufacturing facilities, there is a one to one relationship between an operator and a work center. That operator is responsible for managing the current job. But imagine if you could have one cell manager overseeing six different work stations, rather than six separate operators. With real-time information and business activity alerts, that scenario can be a reality as your manager will immediately be alerted to any issues in his cell.

Finally, real-time information doesn't lie. No matter how hard you try, you can't hide from real-time data and the accountability that accompanies it. Ignoring rule number two can do more harm than good, so don't settle for old data.



RULE NO. 3: ANALYZE, ANALYZE, ANALYZE.

The final data collection rule may seem obvious, but properly analyzing and correlating your data is the most important best practice of the three. Unfortunately, managing, analyzing and interpreting data in a meaningful way is easier said than done without the right tools. Fortunately, enterprise resource planning (ERP) software solutions are designed to handle a broad range of information.

In the past, translating data from your shop floor to your ERP solution has brought its own set of challenges. Interface issues, batch uploads and data duplication are just a few. But with a comprehensive ERP and MES solution, managing your data is straightforward because the entire system is built in one central database. From your PLCs on the shop floor that talk with your process monitoring system that relay information to your SPC module which ties the data to a specific lot, batch or serial number, a comprehensive ERP/MES solution is the way to go.

What are some of the most useful tools in your ERP software when it comes to managing and analyzing data?

- Business Intelligence Dashboards: An interactive way to organize, navigate, link and display a variety of different charts and Key Performance Indicators (KPIs).
- Real-Time Process Monitoring: Gather machine performance and process data at the PLC level and display charts and graphs with alerts in true real time.
- Statistical Process Control (SPC): Track the quality of your parts with variable and attribute data displayed in a variety of charts and graphs.
- Business Activity Monitoring: Automatically be alerted (through text or email) of critical events and issues based on the capture and evaluation of your manufacturing data.
- Lot, Batch and Serial Traceability: Data gathered is automatically tied to lot, batch and serial numbers to provide end to end traceability for every step in the production of a part.

The future of manufacturing lies in the hands of the businesses that can best capture and manage their shop floor data. With these three rules in mind, plus a comprehensive ERP and MES solution, you are on your way to implementing a successful big data initiative in your manufacturing facility.

For more information, please visit www.3ds.com/delmiaworks or call 1.866.367.3772

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