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WHITE PAPER

YOU CAN'T FIX WHAT YOU CAN'T SEE ON THE FACTORY FLOOR

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INDUSTRY 4.0

The benefits of adding MES to your ERP

The Manufacturing Execution System (MES) is the channel of information from the shop floor to the top floor in a manufacturing organization. An Enterprise Resource Planning system (ERP) is often not enough to understand what is actually happening in the factory.

The Black Box

A common process at a factory floor starts with downloading sales orders to Excel (the most common "MES" in the world), making a production schedule and printing out orders to workstations on shop-floor. Once the order is completed and ready to be dispatched, the sales order is updated in ERP to be invoiced.

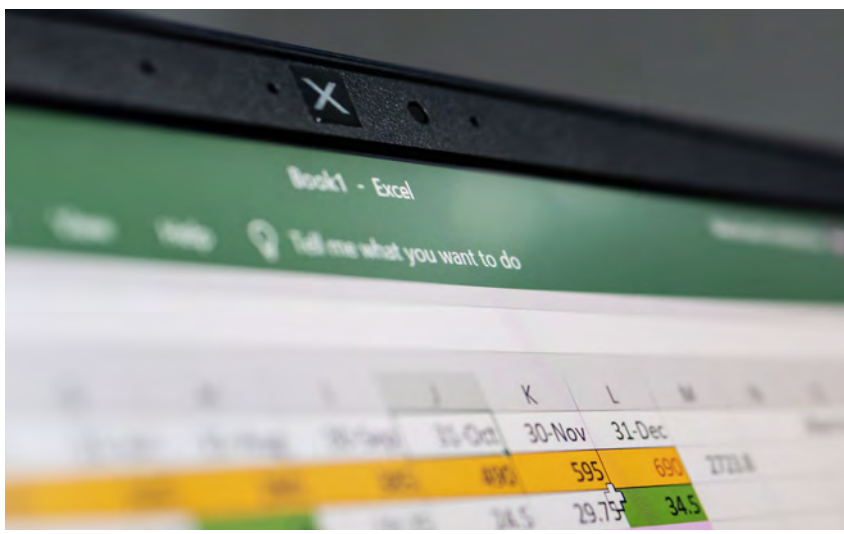
In this age of virtual reality, 3D printing and drones, shouldn't we have something to help our people do their tasks in a smarter way?

ABC, TCM, LP, CAE… Modern digitalization is changing the manufacturing industry fast and it is challenging to stay up to speed with all the system abbreviations and new innovations. However, many of these industrial IT systems are business-critical in each step of the supply chain.

One of the most familiar abbreviations in modern manufacturing is ERP – Enterprise Resource Planning. ERP integrates the management of core business processes like production planning, sales, shipping, payment and financial reporting. It is already a commonly held principle that an ERP is a requirement for any larger manufacturing company to manage its flow of cash and resources. It safeguards the operations taking orders and processes them to deliveries through the value chain. There is no room for trial and error.

What about the shop floor? The area of the factory where most of the human work is done. Surprisingly, many companies just print out orders for their factory employees and the manufacturing process becomes a black box with input and output and no visibility in between.

What is each of your employees working on? What are the bottlenecks? If you don't know, you might have a black box in your hands.



Excel is not a Manufacturing Execution System. Any surprises to your orders and this "system" is kaput.

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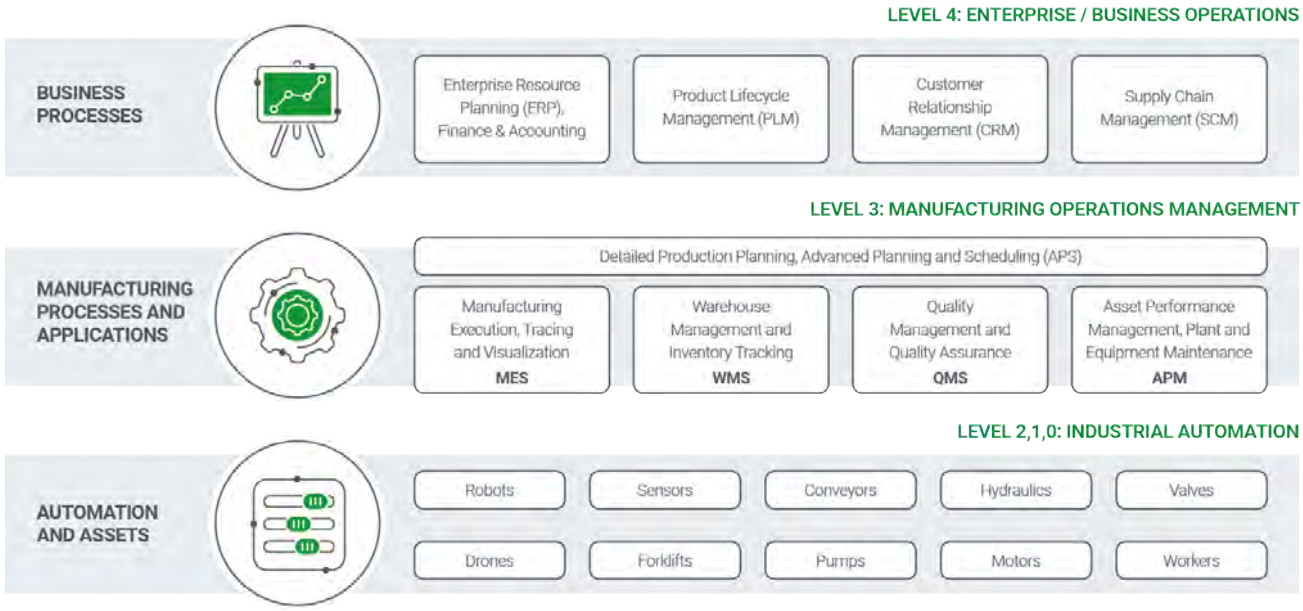
Smarter manufacturing starts with knowing what is actually happening on your factory floor

This brings us to the Manufacturing Execution System (MES). In short, the MES is a platform designed to be used on the shop floor to execute planned production orders and to report activities done during the manufacturing process. The platform can also be connected to automation systems. Under ISA-95 industrial standards, MES is a part of Manufacturing Operations Management (MOM) like in the chart below.

Manufacturing operations management



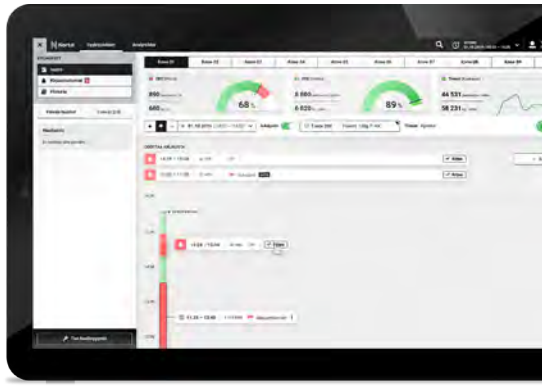
Based on ISA-95 standard levels

Can you get return on your MES investment?

The simple answer would be yes. MES is a platform that lets you see your operations in real-time and have more information on what has happened and when. It will not change your ways of working, run equipment faster, increase product quality or reduce waste on its own. What it does do, is help you understand what is concretely happening in the factory based on the information from the machinery and operations.

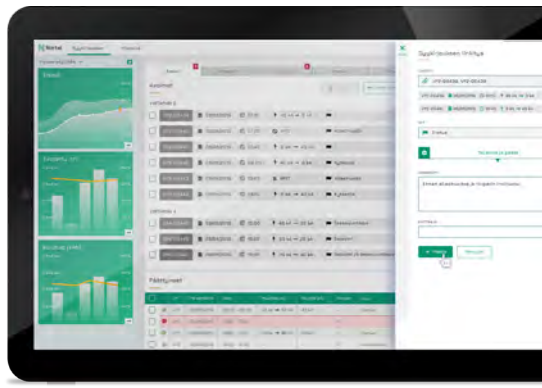
When you grasp what people are actually doing every day and where the bottlenecks and problems are, you can make smart improvements and get real return on your investment. ERPs tend to be owned by IT and Finance. MES bridges the gap in the manufacturing process. There are several things you can do by adding MES to your ERP.

1. See shop floor tasks in real-time



With MES there is no need to print out work instructions and production orders on the shop floor. The orders and instructions are in digital format and they are always up to date. One of the biggest waste in the factory is people walking after information and doing non-productive tasks due to the lack of information. People inherently want to work smarter and concentrate on productive tasks instead of wasting their time on trivialities. Modern digital tools help to achieve that and motivate people.

2. Plan and manage production orders flexibility



Customers, regulators and suppliers demand shorter lead times, high quality and full delivery accuracy. Seeing the progress of sales orders in real time lets you react to unexpected events before delays or delivery accuracy issues happen. Ideally the production schedule is fixed as early as possible and everyone sticks to the plan. However, when unexpected equipment failures, raw material problems or resourcing problems occur, they happen so fast that the only way to deal with them while still securing the sales orders is to change the production schedule. ERPs offer static data from the recent past for analysis purposes. Real-time visibility and trending data in MES make fast reactions possible and ideally customers will not notice any difference in deliveries.

3. Analyse historical data from equipment and manual workflows

The complete manufacturing process usually contains multiple work phases and runs through various machines and warehouses. At first, it is easy to understand and analyze simple routes, limited work phases and sparse orders, but add some complexity or volume to one or more of those factors and the picture gets fuzzy.

Any improvement first requires identifying what the current state is and what goal you want to reach. These are evaluated through your key performance indicators (KPIs), which require metrics and measurable data. MES offers a way to collect and store the relevant data from workflows and equipment. The value of a MES comes ultimately from knowing where you have room for improvement and having the tools to set new targets and goals for improving your manufacturing operations and your supply chain.

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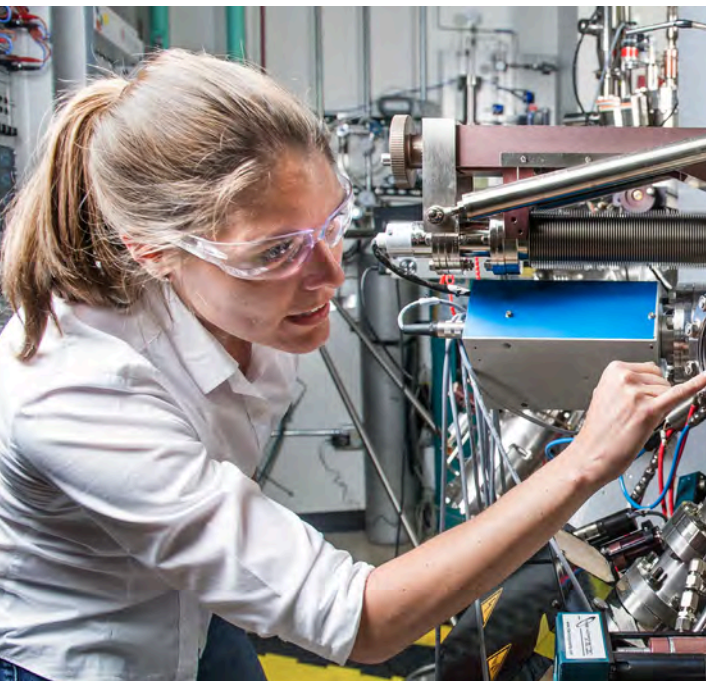

Worker safety increases when you have clear visibility to what is happening minute by minute on the shop floor.

You can only improve what you can see

MES provides various benefits and tools to improve the little things that get done daily. Each one of those operations can be a competitive advantage or a bottleneck. You can't have smart manufacturing though, if you leave out the human in the process.

Manufacturing sites, companies and industries are not copies of each other, so the easiest and smartest way to get started is to do pilots and trials in your key areas and see what the tools and features are that your people value the most.

Employees are happier, feel respected and are more motivated with modern tools in their hands.

Does one size fit all?

Monitoring manufacturing execution is more of a strategy than an individual tool or platform. It can mean many different things to different companies, since there are many different needs ranging from the volume of goods produced to the amount of labor involved in the process. A MES that fits one production process or customer type well is ill-suited for another. Some customers are a perfect fit for a manufacturing execution strategy based on a gigantic single platform vendors, whereas others should use best-of-breed modules or highly customized solutions. Either way, an MES approach based on API architecture makes it easy and cost-effective to find suitable solutions for every factory and use case. It also allows the step-by-step expansion of manufacturing operations management systems whenever new needs are recognized.

No matter how automatized the production process is, clear tasks and the right management system make a difference.

The best way to learn is by doing

Using a MES in addition to your ERP gives you the tools to understand how your decisions affect your workflow. You can therefore also be agile and correct your course towards operational excellence if you take a step in the wrong direction.

Efficient and effective administration of your factory floor includes integrating your machinery with the Industrial Internet of Things (IIoT) and Asset Performance Management (APM). This enables you to develop new service business around your equipment and get the relevant information out of machinery data. Companies are doing a great deal of pilots with small companies and start-ups to discover new angles for their business, but these pilots are usually not business-critical on a large scale yet.

Your end-customers' needs form your business needs. Those needs can be translated into systems and integrated into high-class technology solutions. It just requires the right translators. Find out step by step what smarter manufacturing can mean for your business with the help of our experts.

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