



**Real-Time MES:
Putting precision
into your plant**



It is real-time data that is forging an extraordinary change in the Manufacturing industry. From the shop floor to the top floor, every role and process in manufacturing is being transformed at the hands of real-time data—from executing work orders with pinpoint precision to providing visibility into inventory, ensuring that customer demands are met with Amazon-like Available-to-Promise (ATP) dates and calculating production costs with unprecedented accuracy.

Why real-time data makes sense

Think of a plant that manufactures bottles for your favorite beverage, say almond milk or a beer. Typically, plant operators work 12-hour

shifts to manufacture the bottles. At the beginning of the shift, the operator is provided a sheet of paper that specifies the number of bottles that need to be manufactured and the workstations that can be used for the purpose. Let us assume that each operator uses three workstations to manage the target production for the shift and at the end of 12 hours, we have 10,000 bottles ready to ship. However, as everyone in manufacturing knows, often, the next glitch is just right around the corner. Our bottling plant is no different—the supervisor finds that the bottle caps available are short by 200. For that shift, the target 10,000 bottles can't be shipped. As a direct consequence, a business commitment is derailed.





Recent changes in technology and the pressure from time-sensitive business environments is making it necessary for manufacturers to adopt real-time systems that can meet customer requirements.

A simple mismatch between production and inventory has caused the problem. This is not a new scenario for plant supervisors. From automotive to furniture and from electronics to petroleum—and every other manufacturing business in between—the availability of real-time data could fix the problem. In fact, real-time data can have a positive impact right across sales/ quoting, inventory, warehousing, manufacturing systems, Human Capital Management (HCM), logistics and ERP. For manufacturing, real-time data is the holy grail.

There is an additional complication that needs attention. In the new world of complex commercial constructs, customers are increasingly asking for transparency in what they pay for. Real-time data has a crucial role to play here as well.

Here is how it works in our example of the bottle manufacturer and the beverage company. Let us assume the beverage company has signed up to pay for the manufacturing cost of the bottles topped with a service charge (margin). The beverage company will want to see the manufacturing costs calculated accurately based on raw materials and the effort (labor) of each operator across the workstations used. It is almost impossible to accurately capture these types of activity-based metrics. Efforts are made to capture the data in multiple excel sheets by harried shop floor operators, but the data is at best an approximation.

It is even more difficult to complete the calculations if the costs need to be included in the invoice that accompanies the shipment at the end of the shift. There just isn't enough time to collate all the paperwork and get the calculations done.

Getting ahead of key challenges

Manufacturers today face these, and a number of other business challenges, that need to be resolved. Among the top three are:

- **Absence of robust Procure to Pay, Order to Cash, Forecast to Plan, and Business Intelligence:** The solution is to integrate ERP and deploy automated processes across finance, supply chain, HCM, and maintenance and sales along with inbuilt analytics for sharp, quick decision-making, real-time ATP and accurate product costing.
- **Lack of 360-degree view and challenges in generating MIS reports:** Ensuring a 360-degree view ensures operational efficiency, enhanced customer centricity and improved customer service.
- **Manual supply chain process with heavy reliance on Excel for day-to-day business:** Data-based real-time manufacturing and supply chain visibility can improve supply chain performance and reduce out-of-stock or over-stock scenarios.

The overall impact of managing the three challenges is a reduction in lead times between manufacturing, shipping and delivery (to customer).

Real-Time MES: A successful example

In one such transformation for a client in the Middle East, Wipro designed a real-time Manufacturing Execution System (MES) on Oracle Cloud 13. Phase 1 involved the implementation of 18 Cloud R 13 modules (Finance, HRMS, SCM, Product Development, CX, etc.). Phase 2 involved implementation of the next 6 modules (BI, Asset Maintenance, Warehouse Management, Planning Central, Global Order Promising, Planning & Budgeting, Production Scheduling, etc.). A total of 24 modules are part of the complete implementation that leverages DBCS along with Oracle Java Services to build the solution on a Platform as a Service (PaaS) foundation.

The client's manufacturing plant has been equipped with sensors that capture operator,

production and plant equipment performance. Sensors process the data to a multi-protocol gateway that is connected to an Internet-of-things (IoT) platform. The IoT platform displays real-time metrics and processes the data to a manufacturing execution system (MES) which transforms and processes the data to Oracle Cloud Manufacturing. Data from other devices like Gravimetric can be processed to capture raw material feeds, finished goods and scrap (waste). Devices like SCADA can be integrated to process data from human-machine interfaces (HMI) and monitors used by operators. Practically all manual processes to capture data have been automated.

The MES is designed to receive real-time inputs from the plant (raw data). The data is shipped to cloud for manufacturing analytics that uses business logic and rules relevant to the plant. The intelligence generated by the data is then integrated with supply chains and other applications.



The benefits of Real-Time MES

The Real-Time MES has a transformational impact.

- **Operator/ Supervisor impact:** In the old-school process, the operator would be given a sheet of paper with production details and requirements and at the end of the 12-hour shift, a supervisor would collect an Excel sheet from the operators and punch the data into Oracle. Now, the operator has a tablet or a kiosk near the workstation. This is used by the operator to acquire production targets and other shift details. The operator also uses the same device (tablet or kiosk) to punch in production details at regular intervals during the shift. Supervisors, too, can post resource and operation completion details in bulk. This has brought an end to inaccurate and time-consuming paper-based processes.
- **Inventory impact:** Based on shift targets and the actual production during the shift, inventory is automatically and dynamically bumped up or reduced. This means production will not have any unexpected shocks due to the non-availability of material.
- **Commercial impact:** The system automatically captures detailed data on resource hours for each work order, the workstations used, raw material consumed, finished product manufactured and the scraps generated. The system is able to accurately cost every aspect of production (and additionally ensure that raw material is accurately procured for the next shift).
- **Production impact:** Most plants are designed to manage engineer-to-order processes and are relatively inflexible in their production capabilities. However, a Real-Time MES changes that, enabling manufacturers to break order and complete random manufacturing needs (a feature that is otherwise not supported in Oracle Manufacturing).
- **Financial impact:** With Real-Time MES using IoT applications integrated with the Oracle footprint, manufacturers reduce the cost of delivery. The automation not only improves the quality of delivery but also shaves off dollars and cents from processes.

Our experience has shown that a well-implemented Real-Time MES can deliver 28% improvement in manufacturing transaction posting in ERP systems. This ensures faster inventory visibility to planners and shipping teams and helps attain higher schedule accuracy. The system also delivers more than 22% improvement in operational efficiency.

Among the new capabilities that the system provides are real-time Available-To-Promise (ATP) and Capable-To-Promise (CTP) capabilities. This helps in higher conversion of sales quotes and proposals into orders.

MES has always been a critical component of manufacturing. Recent changes in technology and the pressure from time-sensitive business environments is making it necessary for manufacturers to adopt real-time systems that can meet customer requirements, improve production quality and boost margins. The Real-Time MES provides these gains through IoT, automation and data, enriched by analytics and insights of the kind that were unthinkable until a few years ago.

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