

Oracle Manufacturing Operations Center

ORACLE® E-BUSINESS SUITE MANUFACTURING

KEY FEATURES

- Industry rich operational metrics delivered on state of art business intelligence framework
- Role based dashboards for Plant Managers and Production Supervisors
- Comprehensive drilldowns to pre-built reports
- Comprehensive dashboard on Overall Equipment Effectiveness (OEE) and related metrics
- Persistent data model based on ISA-95 reference model
- Contextualization rules engine to capture shop floor data in the proper context.
- Extensible attribute framework to capture process parameters
- Single and multi-plant support (local versus centralized deployment)
- Flexible hierarchies for calendar, equipment, product, plants
- Integration with PLCs, SCADA, DCS and other shop floor control systems to collect real-time shop floor data
- Event Management Framework to capture shop floor events in real-time
- Flat file templates for data upload
- Leverages Oracle's powerful ETL tools to integrate with any existing ERP and shop floor system
- Out-of-the-box integration with Oracle

Today's leading manufacturers demand insight into real-time shop floor performance. Rapid analysis of equipment performance and the impact on production is critical to continuous improvement and Enterprise Manufacturing Intelligence (EMI) initiatives. Based on the ISA-95 reference model, Oracle® Manufacturing Operations Center delivers the ability to monitor production performance with pre-built performance dashboards and reports – all working together to provide real-time business information to plant managers.

Introduction

Over the last two decades, many systems and processes have been implemented to eliminate excess inventory and waste from the overall supply chain. Those lean strategies have been successful and matured; now the focus has shifted to improving the responsiveness of the manufacturing process itself, which is now the weak link in the ability to adapt to the increasingly complex demands of the global marketplace. This requires dramatically improved interaction and connectivity between manufacturing shop floor systems and the back office ERP. While this is a challenge, it also provides a unique opportunity to deliver quality, flexibility and efficiency, linked to a lean and demand-driven supply value chain, and through that, new opportunities to differentiate from the competition.

Several challenges that typically need to be solved are:

- Increased customer and regulatory compliance requirements create additional needs for data capture, analysis and reporting
- The drive for higher returns on invested capital means that more must be done with less equipment, yet there is no tolerance for unplanned downtime
- Manufacturing may now be global, yet manufacturing systems are often locally developed, supported and maintained, and not standardized across the enterprise
- Manufacturing equipment is increasingly instrumented, yet the data that it provides is difficult to link back to the business applications, often requiring expensive and one-off integrations.

E-Business Suite™ Discrete, Flow, Process Manufacturing and Shop Floor Management

- User interface to re-process error data

KEY BENEFITS

- Real-time shop floor intelligence for plant managers
- Analyze production loss and overall equipment effectiveness (OEE)
- Increase production throughput
- Improved manufacturing service levels
- Single source of truth for all shop floor data – eliminate discrepancy between manual and machine data
- Contextualization rules engine
- Open and extensible adapters for integration with ERP and plant management systems
- Achieve improved visibility for lean and six-sigma programs

Oracle's Solution – Oracle® Manufacturing Operations Center

Oracle® Manufacturing Operations Center (MOC) addresses needs for accurate and timely information about product and process quality, insight into manufacturing operations, and performance of manufacturing assets. It solves the complex problem of connecting fragmented disconnected shop floor data to the business context of back office systems. This combination delivers real-time monitoring and analysis of shop floor operations – a foundation for running Continuous Improvement (CI) programs such as Lean and Six Sigma.

Oracle® Manufacturing Operations Center is a pre-built, flexible and extensible solution that provides:

- A data model based on ISA-95 industry standard and extensible attribute framework
- Pre-built extensible adapters for manufacturing execution systems (MES) and ERP systems
- A robust contextualization rules engine to convert raw shop floor data into meaningful business information
- Pre-built key performance indicators, sustainability metrics and analytics, delivered in Oracle's industry leading, easy to configure and extensible Business Intelligence (BI) technology.



Figure 1. Performance to Schedule Measures using Plant Manager Dashboard.

RELATED PRODUCTS

Oracle Manufacturing Operations Center is dependent on following Oracle Products:

- Oracle® Discrete Manufacturing
- Oracle® Flow Manufacturing
- Oracle® Process Manufacturing
- Oracle® Data Integrator(ODI)
- Oracle® Business Intelligence Enterprise Edition (OBIEE)

Real-Time Intelligence for Plant Managers and Production Supervisors

Oracle® Manufacturing Operations Center enables Plant Managers to monitor production performance in real-time through pre-built analytical dashboards and reports. It provides aggregate level analysis on key performance indicators such as production throughput, equipment availability, overall equipment effectiveness (OEE), and production cycle times.

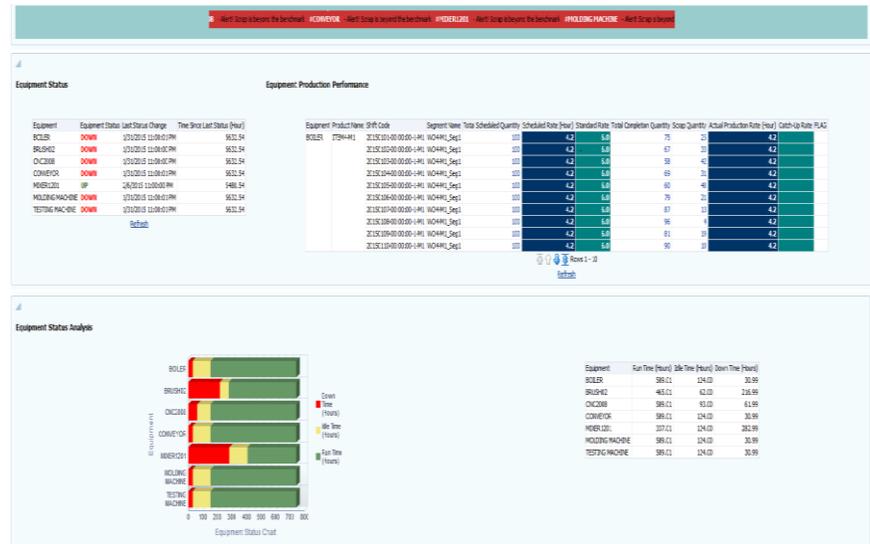


Figure 2. Real-Time Shop floor monitoring using Production Supervisor Dashboard

Extensible Role-based Dashboards and Key Performance Indicators (KPIs)

Oracle® Manufacturing Operations Center provides pre-built analytical dashboards with key plant performance indicators and many drill downs to seeded reports. Built with Oracle’s proven Business Intelligence Enterprise Edition (OBIEE) platform, it allows users to quickly personalize and extend the dashboards and reports.

Analyze Production Loss and Overall Equipment Efficiency (OEE)

While sensors and underlying control technology often change quickly, equipment often remains in place for many years. To make better use of existing assets, there is a need for real-time insight into production performance and Overall Equipment Effectiveness (OEE measures asset performance by combining availability, speed and first pass yield into a single key performance measure).

Increase Production Throughput

Oracle® Manufacturing Operations Center helps to monitor production volumes and throughput from anywhere in the enterprise. It is possible to keep track of targets for the hour, shift, day, week or month and monitor production backlog for each piece of equipment to expose bottleneck resources. This provides the right information to take action and increase production throughput.

Improve Manufacturing Service Levels

Oracle® Manufacturing Operations Center collects production execution data and relates it to plans and schedules in ERP and back office systems. Depending on how to determine service levels, tracking on-time completions or production against customer order shipment dates is most common choice. By providing consistent information to both manufacturing operations and customer facing organizations such as Sales and Marketing, improvement overall service levels are enabled.

Monitor Production Processes and Equipment Performance

Different departments are interested in different aspects of equipment performance. For example, production supervisors care about production output and quality of output whereas maintenance supervisors care about equipment downtime and mean time between failures. Using Oracle® Manufacturing Operations Center, analysis of all aspects of equipment performance from availability to status, output and process parameters is possible, all in a single plant management dashboard.

Correlation between process parameters and equipment output and status

Process Engineer dashboard enables correlation between equipment output, status and the manufacturing equipment process parameters. It helps the plant engineers to answer questions on anomalies or deviations that influence the production output or equipment status.

Repository for Manufacturing Operations Data – Single Source of Truth

At the core of the Oracle® Manufacturing Operations Center is a generic Manufacturing Operations data model. The data model leverages business object definitions and other constructs from the ISA-95 reference model. Many different types of production environments can be modeled and the Extensible Attribute Framework can be leveraged to define user defined attributes that vary from one environment to another. By collecting, cleansing and processing different pieces of data from disparate sources and storing it in a transactional data model, Oracle® Manufacturing Operations Center provides consistent information to all manufacturing users across the enterprise.

Contextualize Plant Floor Data and Synchronize with ERP

Oracle® Manufacturing Operations Center provides an abstraction layer between ERP and the shop floor. The system continuously collects high-resolution data from the shop floor and adds meaningful business context from the ERP, such as the work order, routing operation, shift, work day, customer order, dates, and so on. In addition, it enables the contextualized transactional data to be synchronized with ERP thereby eliminating manual data entry and reducing inaccuracies and adding value to the information.

Integration with Manufacturing and Shop Floor Systems and Equipment

Oracle® Manufacturing Operations Center provides a wide range of options to collect shop floor data directly from Programmable Logic Controllers (PLCs), Supervisory Control and Data Acquisition systems (SCADA) and Distributed Control Systems (DCS). Partner solutions from companies such as Mitsubishi Electric, Kepware Technologies, ILS Technologies and Matrikon Inc. can be leveraged to collect, aggregate and feed real-time sensor data into Oracle® Manufacturing Operations Center.

- Mitsubishi Electric offers the MESInterface IT, a hardened factory data appliance that provides secure and reliable connectivity with Oracle Databases and Manufacturing Operations Center. It eliminates integration challenges across Mitsubishi and a range of other brands of factory control systems. MESInterface IT improves system simplicity and maintainability, providing essential functionality such as store and forward data buffering to avoid data loss and a role-based security infrastructure that facilitates effective collaboration.
- Kepware Technologies have developed Oracle Connectivity Suite for communication to shop floor equipment and devices. The foundation for the connectivity suite is KEPServerEX, delivering access to over 130 manufacturing protocols (Drivers). The list of drivers includes PLC and device drivers, and U-CON, a User-Configurable driver for serial and Ethernet data acquisition delivering connectivity to a myriad of devices, from barcode scanners to scales and RFID.
- ILS Technology's award winning deviceWISE™ provides secure, direct and easy to configure connectivity from plant floor devices to the Oracle MOC. For device connectivity, deviceWISE can communicate either with native devices or OPC devices. Other key features include device aggregation, edge processing, role-based security and scalability from embedded devices such as PLCs and RFID to UNIX, Linux or Windows servers.
- Shop Floor Connector (SFC) from MatrikonOPC is built with industry-leading MatrikonOPC components, and is fully scalable and includes complete functionality such as secure OPC connectivity, data processing (analytics), store and-forward (guaranteed data delivery), and event triggered Transaction writes.

Fully Integrated with Oracle E-Business Suite™

Oracle E-Business Suite™ adapter can provide immediate benefit for a company using Oracle's Manufacturing Solution. The adapter is designed to periodically collect key master and reference data for objects such as shifts, items, item hierarchies, resources, resource instances(equipment), resource hierarchies, production schedules, production operations, activities, resource instance schedules, resource requirements, material consumed, linked sales order lines and cost. The equipment output and status records collected from the plant automation systems can be processed and interfaced to Oracle EBS as move transactions, completion transactions and resource transactions in case of Discrete Manufacturing and as batch material transactions and batch resource transactions in case of process manufacturing environments.

The adapter supports Oracle Discrete, Flow, Shop Floor Management and Process Manufacturing.

Integrate with non-Oracle systems

Oracle E-Business Suite™ adapter and the surrounding infrastructure have been designed so that these can be leveraged to integrate with other ERP or legacy systems.

Oracle Business Intelligence Mobile Support

This feature allows viewing Oracle Business Intelligence Enterprise Edition content on supported mobile devices such as tablets and smart phones. You can view and analyze BI content such as analyses and dashboards, BI Publisher content, scorecard, etc.

Event Management Framework

Event Management Framework reduces reaction time between event happening in shop floor and response for the same event, either automatically or initially manually. Some of the key capabilities that Event Management Framework provides are as follows:

- Setup and configuration of event conditions, based on KPI thresholds or real-time data from shop floor.
- Handling actions based on both internal and external events in MOC, such as sending mobile alerts, e-mails, or calling an external API to initiate the process of creating a maintenance work request.
- Persistent storage of events for review and reporting

Summary

Oracle® Manufacturing Operations Center enables the manufacturing companies to gain insight into real-time shop floor performance. Built on ISA-95 reference model, MOC contextualizes the shop floor data collected from a variety of PLCs, SCADA or DCS systems with the enterprise system data and offers pre-built dashboards. Using event management framework, the shop floor alarms and exceptions can be routed to plant personnel in form of e-mails or mobile alerts.

MOC is a powerful Enterprise Manufacturing Intelligence (EMI) tool in the hands of shop floor engineers and managers to achieve operational excellence.

CONTACT US

For more information about [insert product name], visit oracle.com or call +1.800.ORACLE1 to speak to an Oracle representative.

ORACLE®

CONNECT WITH US

-  blogs.oracle.com/oracle
-  facebook.com/oracle
-  twitter.com/oracle
-  oracle.com

Integrated Cloud Applications & Platform Services

Copyright © 2015, Oracle and/or its affiliates. All rights reserved. This document is provided for information purposes only, and the contents hereof are subject to change without notice. This document is not warranted to be error-free, nor subject to any other warranties or conditions, whether expressed orally or implied in law, including implied warranties and conditions of merchantability or fitness for a particular purpose. We specifically disclaim any liability with respect to this document, and no contractual obligations are formed either directly or indirectly by this document. This document may not be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without our prior written permission.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group. 0915

