

Delivering Real World Awareness to production personnel in lean operations

Adaptive Manufacturing

Despite having embraced lean and Six Sigma, manufacturers are challenged to take these practices to the next level and become “adaptive” – having the capability to sense and respond to exceptions and drive lean Six-Sigma management by exception. Adaptive Manufacturing is SAP’s vision for profitably replenishing the supply chain by delivering high-quality products rapidly and cost-effectively through lean Six-Sigma best practices, while responding to unpredictable change based on real-time, actionable intelligence from the plant floor.

In today’s turbulent economic environment, manufacturers are constrained in delivering innovative products to customers while operating in lean environments to lower their cost of production, time-to-market, and volumes. SAP’s vision of Adaptive Manufacturing, realized through the SAP Manufacturing solution, enables manufacturers and their production personnel to deliver high-quality products rapidly and cost-effectively by using lean Six-Sigma best practices, and real-time, actionable intelligence from the plant floor. This real world awareness is critical for production personnel to sense manufacturing exceptions and variances in real time and respond with decisions and actions to deliver superior performance.

Disconnect between the shop floor and the top floor

As companies respond to competitive pressures, supply chains continue to grow leaner every day. Inevitably, though, the leaner your inventory, the more exposed your supply chain is to production issues or unexpected changes in customer demand. To alleviate these risks, the burden of replenishing customer orders without a drop in service levels continues to shift to the factory, and real-time visibility into

the shop floor is becoming critical.

Although manufacturers in multiple industries have embraced lean and Six Sigma with varying degrees of success, they find themselves challenged to drive this to the next level and become “adaptive” – that is, to sense and respond to exceptions and drive lean Six-Sigma management by exception. This demands real-time visibility into the plant floor – visibility to unforeseen demand and supply exceptions and performance variances as and when they happen, with relevant analysis and the ability to resolve them rapidly and cost-effectively through automated workflows that use solutions for enterprise resource planning (ERP), supply chain management (SCM), and manufacturing. The ability of a factory to profitably replenish the supply chain while dynamically responding to unpredictable change is termed “adaptive manufacturing.”

Adaptive Manufacturing in lean operations

A key goal of SAP Manufacturing’s development has been to make manufacturing more adaptive. SAP Manufacturing gives managers and production personnel real-time visibility into supply, demand, and manufacturing processes. It also makes it possible to drive deci-

sion making to the shop floor and empower people to take quick, appropriate action to deliver on customer expectations more effectively than the competition.

The SAP Manufacturing solution helps companies manage processes in three fundamental areas: manufacturing operations, manufacturing integration, and manufacturing intelligence.

Manufacturing Operations

SAP Manufacturing gives discrete and process manufacturers the full range of capabilities needed to plan, schedule, sequence, execute, and monitor production with embedded lean Six Sigma – as well as comply with complex health and safety standards on the factory floor – in one integrated ERP system.

Manufacturing Planning and Scheduling enables production sequence optimization based on actual material and capacity constraints on the shop floor. Manufacturing Execution lets you manage workflow, labor, resources and documentation on the shop floor to meet planned production targets. Quality Management lets you address production problems quickly with statistical process control (SPC) monitoring of critical product and process characteristics to drive improved quality and lower

costs. Maintenance Management enables you to perform predictive and preventive maintenance, and maximize capacity utilization, minimize breakdowns, and reduce maintenance costs. Environmental Health and Safety Management simplifies labeling, compliance (MSDS generation), and data exchange with sophisticated workflow tools and a rules-based engine to manage business specifications for manufactured and procured products. Lean Manufacturing offers capabilities for flow manufacturing, Just-in-Time (JIT) supply to production, demand-driven and make-to-order manufacturing, advanced repetitive manufacturing, safety stock and buffer planning, and customer and supplier collaboration planning. Six-Sigma capabilities include support for the DMAIC (design, measure, analyze, improve, and control) cycle, project, resource and portfolio management, quality management, and advanced analytics for variance monitoring, analysis, and control.

Manufacturing Integration

SAP Manufacturing is built on the open-standard, flexible, and scalable SAP NetWeaver platform. With SAP’s recent acquisition of Lighthammer, it now offers the SAP xApp Manufacturing Integration and Intelligence. This SAP xApp delivers real-time transactional integration through standard, pre-built connectors with manufacturing execution systems (MES) and supervisory control and data acquisition (SCADA) systems on the shop floor. xMII also offers the ability to do unified, real-time analytics and visualization within the SAP manufacturing intelligence dashboards or similar solutions.

SAP NetWeaver and xMII support the ANSI/ISA S95 (S95) standard for integrating ERP systems with MES and process control systems. They also support connectivity within plants, between plants, and with suppliers, and enable collaboration and business

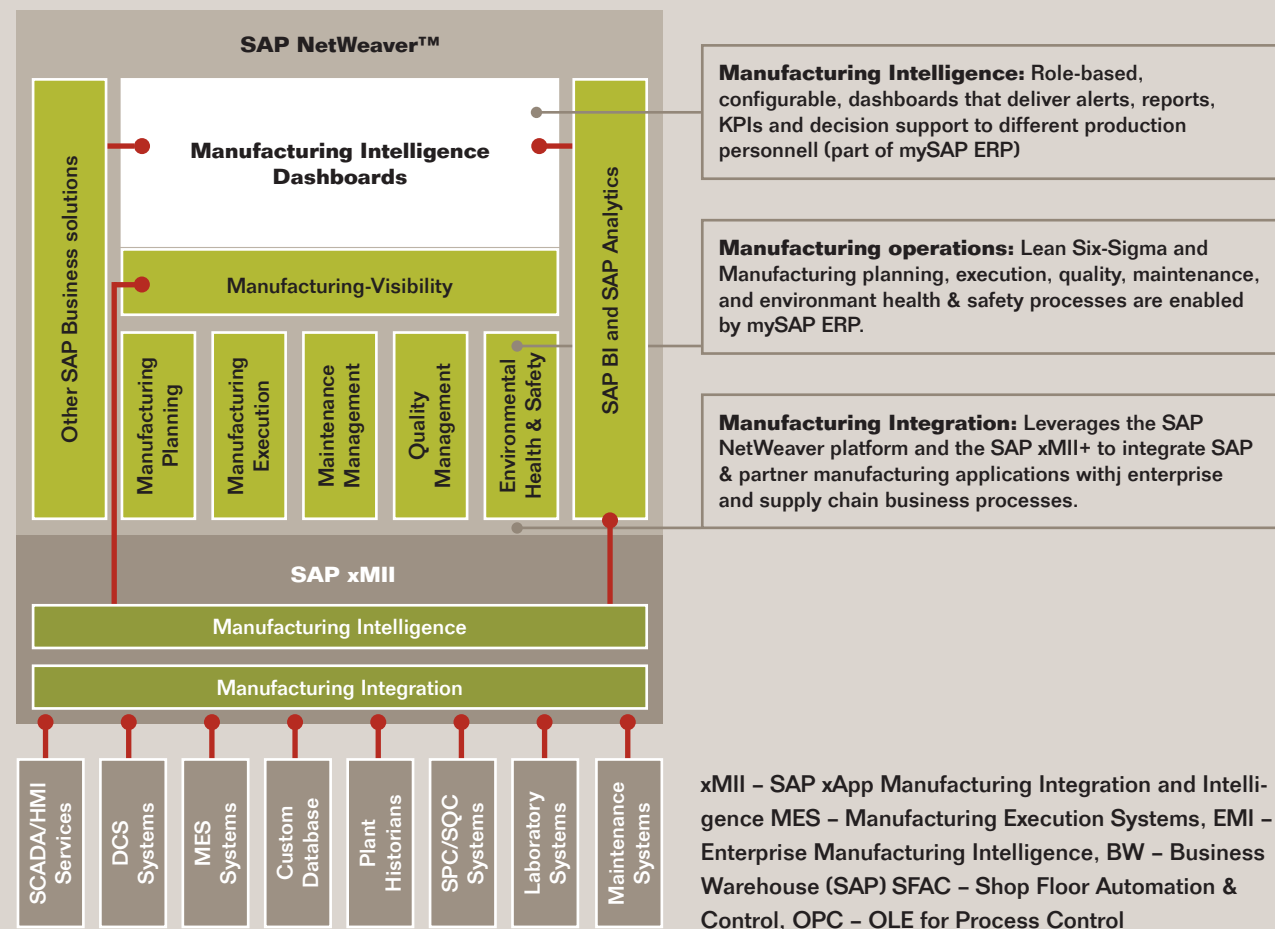
process management (BPM) between trading partners.

Manufacturing Intelligence

Manufacturing intelligence dashboards are role-based configurable dashboards that deliver integrated production decision support and enable production personnel to detect manufacturing exceptions when they happen – before they become customer issues. They offer task lists, exception-driven alerts, rich analytics, and a pre-built library of reports. They let employees monitor and control key performance indicators (KPIs) to drive improvements in performance. A ready-made dashboard for the Plant Manager role is currently available; versions for the Production Supervisor, Quality Inspector, and Maintenance Technician roles will be available in the near future.

SAP Manufacturing already provides a range of analytical capabilities with further enhancements planned.





xMII – SAP xApp Manufacturing Integration and Intelligence
 MES – Manufacturing Execution Systems, EMI – Enterprise Manufacturing Intelligence, BW – Business Warehouse (SAP) SFAC – Shop Floor Automation & Control, OPC – OLE for Process Control

The SAP Manufacturing solution delivers a comprehensive solution for managing manufacturing operations, integration, and intelligence

Team Training NET

► These will include additional prepackaged manufacturing business content (for example, views, reports, and KPIs with drill-in/drill out capabilities) with the manufacturing intelligence dashboard to enable delivery on production performance targets.

SAP plans to provide mobile device extensions for its manufacturing intelligence dashboards that offer a subset of the dashboard's capabilities, such as alerts, limited KPI visibility, and the ability to trigger some workflows. The primary goal of providing mobile capabilities in a manufacturing environment is to free production personnel from their desktops, while empowering them with the mission-critical visibility that they need to monitor and detect manufacturing exceptions in a timely manner.

Real-time visibility enables rapid response and superior performance
 Manufacturers in most industries are confronted with the challenge of delivering innovative products to market faster and at lower cost, using lean Six-Sigma capabilities, contract manufacturing partners, and distant suppliers. Lack of real-time visibility into exceptions and performance deviations inhibit their production personnel from responding rapidly and cost-effectively to these exceptions and meeting their performance targets.

SAP delivers a comprehensive ERP solution for managing manufacturing operations with lean Six-Sigma capabilities. SAP NetWeaver and the SAP xApp Manufacturing Integration and Intelligence (xMII) enable transactional

integration with real-time plant floor systems as well as the ability to deliver rich unified, real-time analytics to production personnel via role-based manufacturing intelligence dashboards and mobile devices. This actionable intelligence is mission critical for production personnel to make right-time decisions and respond rapidly and cost-effectively to exceptions and target variances to ensure customer satisfaction and deliver superior performance. Productized integration into real-time plant floor systems enables rapid time-to-value as well as lower total-cost-of-ownership for SAP's manufacturing customers.

Andy Dé, Director of Applications Solution Management, SAP Manufacturing ■