

## Supporting Next Generation Manufacturing

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PERSPECTIVE #UNDEFINED  
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### IN THIS PERSPECTIVE

This IDC Manufacturing Insights Perspective highlights how system integrators are starting to address the shop floor environment to support manufacturers towards next generation manufacturing.

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### Supporting next generation manufacturing

What is emerging in our conversations with manufacturers is a trend towards a profound rethinking of production models and operational processes. The volatile global economy has put renewed emphasis on disciplined operations management. Companies have come to realize that consistent and integrated processes, informed people, and open lines of communication can go a long way to delivering market share gains, improving profitability, and encouraging innovation in the way manufacturers interact with their customers.

Plant floor operational processes are at the very heart of the industry and are considered the centerpiece of this transformation. The execution of manufacturing processes is where strategies become reality and customer orders are fulfilled. In other words, it is where customer satisfaction – or dissatisfaction – originates.

Manufacturers are changing their mindset as to the role of their production operations. In contrast to the past, factories and their related processes are not considered "isolated entities" with respect to the rest of the company. They are considered part of a network of assets focused on fulfilling customer needs. A recent IDC Manufacturing Insights worldwide survey confirms this view:

- About 60% of manufacturers think that having common processes and systems across multiple sites will be very significant to support the factory of the future.
- Nearly 45% of global manufacturers declared they have a formal process in place to look at how factories and plants will be organized in the near future.

The major obstacle manufacturers have to overcome to hit this target is the extremely diversified and disconnected IT applications on the plant floor. To support this transformation, manufacturers have to create a more direct connection between the corporate-level IT backbone —

typically the ERP system — and the physical production assets located in each factory.

IDC Manufacturing Insights feels the industry needs a new operational platform that can augment the value of the ERP. We believe a modern "operational ERP" is needed to achieve that goal — a separate enterprise-wide operational platform that is as important as the corporate ERP. Supporting a customer fulfillment driven approach to operations management in globally integrated organizations, the new platform dictates an evolution and elevation of the existing applications deployed to support operational processes.

The technology underpinning of the operational ERP will have to reconcile what is frequently a mash of best-of-breed applications across silos of process domains. The operational ERP will see the convergence — in a tight, integrated, and coordinated environment — of customer order, manufacturing operations, and supply chain management.

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### **The role of IT Services**

Many system integrators understand this dramatic industry shift and are expanding their IT services to include global plant floor initiatives. This is significantly different to what we have seen over the past few years. Many system integrators tended to focus only on high-revenue generating services such as ERP implementations or desktop services. Along with volume they also brought to their company lower profit margins. More importantly they lost any competitive differentiation with their clients. Plant floor initiatives represent an opportunity to re-establish industry specific credibility and deliver higher profitability.

An interesting example of service providers addressing the shop floor is Tata Consultancy Services (TCS) — part of the Indian industrial group Tata. We were recently briefed by TCS about their strategy toward creating what they call their "Next Generation Manufacturing Excellence" offering.

Being part of a manufacturing group itself brings some advantages. TCS can focus its capabilities on the manufacturing industry — particularly automotive, aerospace, industrial equipment and chemicals which are the industries core to its own corporation. Automotive represents the largest share of revenues in manufacturing (47.3%). In addition to serving its sister company, TCS is active in a number of Fortune 500 manufacturers, including Chrysler, GM, Toyota, ABB, Boeing, Airbus, and Dow Chemicals.

TCS covers the entire stack of IT that is needed at a modern manufacturing enterprise, both corporate and plant floor related. Interestingly enough, TCS has developed their offering over time with proprietary intellectual property for addressing both these dimensions.

We can summarize TCS' offering by saying they provide services for both "vertical" (from shop floor to top floor) and "horizontal" (along the source-make-deliver chain: where shop floor activities interconnect with the whole value chain) IT deployments:

- **From shop floor to top floor** – TCS provides services covering all the shop floor levels, starting from plant systems integration (such as SCADA or PLCs) up to integrating operations and assets management applications (covered by MES and EAM) with corporate systems such as ERP, SCM, and PLM. This provides the basis for integrating plants horizontally with the overall value chain.
- **Along the value chain** – TCS offering is also targeted to solve the manufacturers' problem of creating a direct demand-supply linkage. This is critical to improve operational processes, increase throughput and optimize inventories. Moreover, TCS helps companies meeting customer expectations by controlling product quality, tracking products and components throughout the value chain. TCS provides also services for manufacturers willing to enhance their product design and manufacturing process with voice-of-the-customer strategies.

At IDC Manufacturing Insights, we've talked extensively over the past few years about making better, faster decisions. This really is about creating an integrated decision environment where there is alignment between the highest-level strategic decisions and the lowest-level operational decisions. To assist manufacturers achieve this, TCS provides companies with collaboration tools and role-based accessibility (based on the framework known as "manufacturing 2.0") and with Enterprise Manufacturing Intelligence tools and capabilities. The ultimate goal is building a single view of the enterprise performance along the value chain, integrating shop floor operations with the corporate infrastructure. A couple of examples of recent TCS projects:

- **MES Roadmap and implementation with a global engine manufacturer** – TCS supported a large US engine manufacturer in defining their manufacturing operations management strategy. The key goal was to simplify and harmonize multiple manufacturing practices that were followed across different plants. At the time, the company had no shop floor IT strategy, with hardware, software and development environments being different among each individual manufacturing site. This eventually caused a number of issues:
  - Longer time taken for introducing new products, due to non-standard systems and solutions
  - Higher maintenance and support cost
  - Site-specific KPI's limiting the comparison of inter plant performances

- Loss of critical data due to manual data collection process
- Lack of defect-tracking capabilities in case of product recall

The company had to find a way to capture and retain voluminous manufacturing process data for reporting and analysis for identifying processes bottlenecks and problems root causes.

The initial consulting engagement culminated with the selection and global roll out of new MES (Manufacturing Execution System) and EMI platforms. TCS helped the company to integrate the MES data across all plants and achieve an integrated view of enterprise-wide manufacturing processes for local and consolidated analysis. In particular, TCS provided near-real time operational reporting and developed and delivered more than 60 out-of-the-box KPI-related metrics.

- **"Business Best Practices" framework for an automotive manufacturer** – Another example comes from the automotive sector. A "Fortune 100" automaker needed to benchmark its plants performances on multiple parameters with those considered best in class. TCS developed and deployed a "Business Best Practices" framework. This helped the client to track benefits from lean projects and present a consolidated view to management.

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### **Essential Guidance**

Manufacturers today understand the inadequacy of their IT systems in place in respect to the necessary transformation of their operational processes. In particular they know that they need to:

- Better integrate top floor with plant floor processes
- Create common process and IT systems across their network of factories
- Create a real-time, collaborative decision-making environment

To implement this transformation, leading manufacturers have to establish a new manufacturing strategy and design their factories of the future. To do so, manufacturers need to leverage modern IT architectures and the support of experienced system integrators.

We believe manufacturers will make foundational investments during 2012 to prepare for fundamental changes in the industry that will last for the next generation.

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### Related Research

- *Perspective: Rockwell Automation's Chicago Automation Fair 2011* (IDC Manufacturing Insights #MI231752, December 2011)
- *People Make The Difference: Optimize Your Workforce* (IDC Manufacturing Insights #MIVC67T, November 2011)
- *ERP Is Dead, Long Live ERP* (IDC Manufacturing Insights #MIVC66T, September 2011)
- *Tablet PCs on the Manufacturing Shop Floor: Unleashing the Potential* (IDC Manufacturing Insights #MIOT51T, June 2011)
- *Business Strategy: Know Your Enemies: IDC's EMEA Manufacturing Security Survey Results* (IDC Manufacturing Insights #MIVC01T, May 2011)
- *The Automotive Assembly Plant of the Future* (IDC Manufacturing Insights #MIOT57T, April 2011)
- *Taking Plant Floor Security Seriously* (IDC Manufacturing Insights #MIOT53T, April 2011)
- *Mastering Complexity, Driving Out Complication* (IDC Manufacturing Insights #MIVC58T, April 2011)
- *Best Practices: Lean Manufacturing and IT* (IDC Manufacturing Insights #AP9397207T, March 2011)
- *Active Decision-Making Environments* (IDC Manufacturing Insights #MIVC57T, March 2011)

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