ARC VIEW

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Synchronize Automotive Production among the OEM and Suppliers

By Ralph Rio

Keywords

Assembly Line, Synchronize, Application Integration, Plant-in-a-Box, TCS

Summary

Automotive assembly plants require precise timing, synchronization of incoming materials from over a hundred suppliers, and agility for customer demands. OEMs require short response time and assign financial penalties when a supplier commits an error. Software integration and communications among the OEM and suppliers can help solve this problem, but support and management often consumes the budget. Proven and supported software could provide a way out of this trap.

The software for managing automotive assembly line production that synchronizes 100+ suppliers is complex and difficult to support. Those involved from IT and operations will be interested in a proven and supported solution. TCS's PIB can help avoid errors and the associated costly penalties.

Tata Consultancy Services (TCS) offers a "Plant in a Box" (PIB) accelerator solution designed for synchronizing an automotive assembly plant with its suppliers. The automotive industry faces many major concurrent technology disruptions: mobility, cloud, SaaS, analytics, Internet of Things (IoT), and more. TCS designed its PIB to free up scarce IT resources to help automotive companies address adoption of these major technology forces.

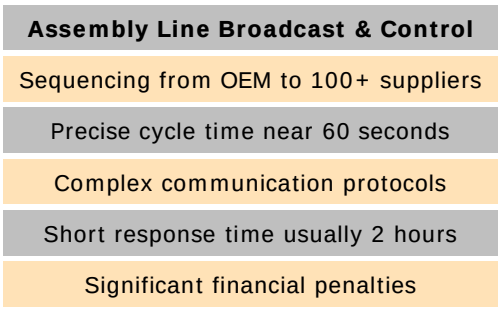
Agile Accelerator for Faster Time-to-Benefit

With today's rapidly changing conditions driven by both business and technology dynamics, integrating and sustaining software have become increasingly problematic. In many IT organizations, the portion of the budget going to sustaining existing conditions has grown to overwhelm resources for new applications. Due to this investment constraint, many users have become frustrated with the slow pace of improvement. Controlling costs and demands for scarce IT talent requires a sustainable IT

strategy. Tata Consultancy Services' (TCS) Plant-in-a-Box approach was designed to address these issues for automotive assembly lines.

Extensive Integration in a Dynamic Environment

In the automotive industry, the original equipment manufacturer (OEM) and its Tier 1 suppliers must synchronize production activities. Sequencing the cars into the assembly line becomes complex and must consider the models and options to assure even workload for each station. This sequencing extends beyond the line to each of the suppliers that feed parts into a station. The associated synchronization usually extends to over 100 companies. A Ford assembly plant, for example, has 179 Tier 1 suppliers[1] that must sequence component deliveries to match the OEM or face significant financial penalties.



Drivers for Robust Software across an Extended Enterprise

For each plant, this synchronization has its own precise cycle time – usually near a minute. The design of an automotive assembly line balances the workload across the stations while meeting production capacity needs. This becomes a specific cadence. A Toyota plant, for example, moves the cars along the assembly line in 55 second cycles.

The OEM broadcasts the planned car configurations for each slot in the line. Each OEM has a standard for the format and for sending these messages, and each assembly plant has its unique variations. Often, the configurations become frozen just two hours before they enter the real assembly line. Missing a change triggers significant financial penalties.

These issues – sequencing across 100+ suppliers, precise cycle time, complex communication protocols, short response time and financial penalties - demand robust application integration among many software applications across an extended enterprise.

Dynamic Conditions

In addition to the complex sequencing among numerous business entities, the product design undergoes changes that fold into the sequence. The

[1] "Economic Contribution of the Ford Motor Company Michigan Assembly Plant to the Michigan Economy," Center for Automotive Research, 2012

changes go beyond the OEM to affect the suppliers and occur at two levels. One involves minor changes that occur during a model year to improve product design, reduce costs, and improve reliability. The second, which involves more significant changes, occurs as part of the annual model change. Model changes and new assembly plants often present startup issues for both the OEM and suppliers.

Meanwhile, IT faces technology adoption-related demands from users for new capabilities and from management to reduce costs. These new technologies involve cloud, mobility, IoT, big data, and analytics to improve workflow and transaction execution speeds.

Establish Stability

Often, the current approach involves custom integration and point solutions across multiple enterprises. This becomes rather complex both within the OEM and among its suppliers; creating a fragile environment susceptible to frequent failures with costly penalties. Choosing a common integration and application deployment platform provides a stabile architecture and proven integration framework with rapid deployment. Success can be repeated by reusing the framework for multiple plants.

Benefits

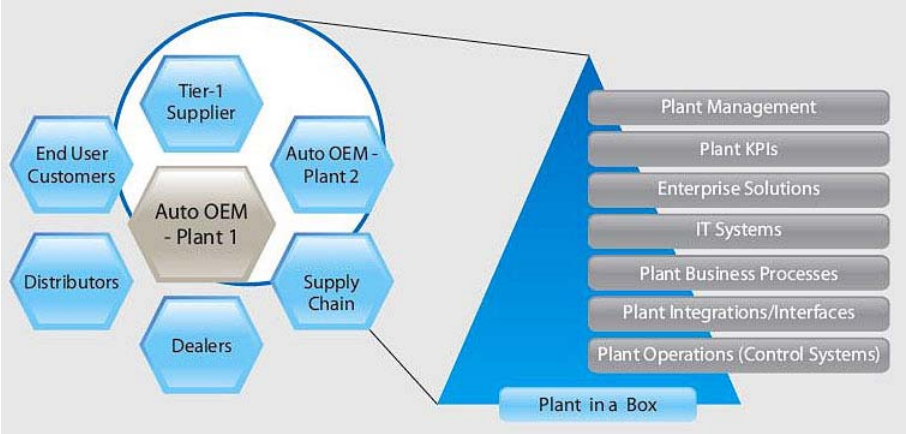
Synchronizing production among the assembly plant and the many tier 1 suppliers involves tremendous complexity for the business processes, sequencing rules, service level agreements (SLA), and penalty risks. Using a proven accelerator can help reduce application development and support costs since the architecture and much of the software has been applied at other assembly plants. New users build on existing software capabilities and best practices. For new plants and model changes in existing plants, the user obtains faster implementation using preconfigured business processes. The faster speed usually results in increased ROI and/or market share gains.

About Tata Consultancy Services and PIB

As a well-known global service provider, TCS provides IT services, consulting, and business solutions. The company is part of the Tata Group, one of

India's largest industrial conglomerates. TCS was established in 1968 as a division and became incorporated as a separate entity in 1995.

TCS' Plant in a Box (PIB) provides a rapid deployment solution specifically designed for the needs of OEMs and Tier I organizations in the automotive industry. This includes pre-configured business processes, and lean manufacturing methods specific to the automotive industry such as Just-in-Sequence and Kanban. This SAP-based solution has a comprehensive process framework, and interfaces to select MES and PLM systems.



Scope of TCS' "Plant-in-a-Box" Accelerator

TCS's accelerators contain pre-configured lean manufacturing processes and users start with business processes that have already moved along the learning curve. Company-specific business processes are added to the accelerator and replicated across multiple plants. This helps assure consistent operations with lower support costs.

Conclusion

Using existing software can help reduce implementation costs and lower project risk from unexpected issues. This applies to the design and software development effort in new and existing plants. In new plants, using a proven solution can provide a huge advantage for start-up and commissioning. In existing plants, a more tactical approach targets the specific areas being upgraded for implementation, and incremental additions later.

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