



An Oracle White Paper
January 2014

Driving Outsourced Manufacturing Best Practices with Oracle

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Executive Overview

Manufacturing outsourcing has become a global phenomenon as more and more companies continue to join the bandwagon. Lowering costs, servicing local markets, reducing order cycle times, focusing on core competencies and more importantly, maximizing return on investment have been some of the compelling reasons why companies have adopted this collaborative approach as a strategic alternative to in-house manufacturing. Despite such compelling benefits, companies continue to face several challenges in managing processes that span beyond the four walls of their factories. To derive the real benefits of outsourcing, companies must deploy appropriate IT systems to deal with these challenges.

This paper discusses how Oracle Applications can help businesses respond to these challenges and significantly improve overall competitiveness.

Introduction

Outsourced manufacturing, interchangeably referred to as “Collaborative” or “Contract” manufacturing or “Subcontracting” in some industries, is rapidly emerging as a practice adopted by most industries. Traditionally, manufacturers have outsourced their manufacturing functions to reduce costs and improve margins. Of late, companies have adopted this approach to also offer their products and services in emerging markets, such as Brazil, Russia, India, and China. Transferring the onus of in-house manufacturing has allowed brand owners and Original Equipment Manufacturers (OEMs) to concentrate more on their core competencies like brand building, product innovation, customer service, and sales and marketing.

The results have been quite obvious – reduced costs, shorter cycle times, enhanced ability to deal with demand and price pressures, broader product portfolios, greater global market share and, increased margins that significantly influence a company’s bottom line.

Commonly Observed Outsourced Manufacturing Practices

There are several different ways in which enterprises outsource their manufacturing activities. These variations are driven by the strategic decisions that are made mostly on the following factors:

Extent of Outsourcing

An enterprise may opt to outsource its entire manufacturing process or a portion of it by collaborating with a Manufacturing Partner (MP).

Case 1.1: OEM completely outsources manufacturing to a MP

This is one of the basic forms of outsourced manufacturing, which typically starts with a customer placing an order¹ on an OEM (or a brand owner) for supply of an assembly. The OEM in turn, outsources the complete manufacturing of the assembly to a MP by raising a purchase order for supply of the assembly. Upon completion, the MP ships the assembly to the OEM. In this specific case, the OEM receives the assembly and ships it to the customer.

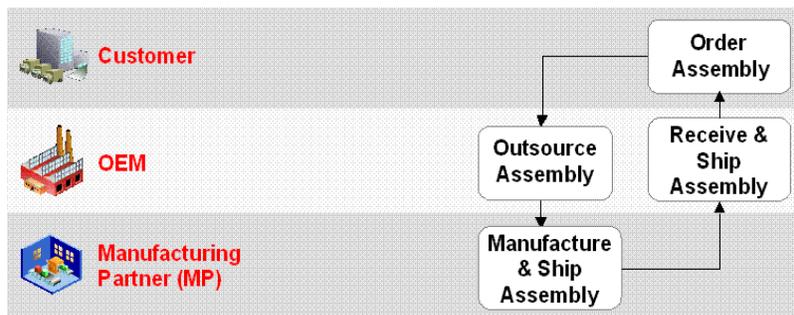


Figure 1 OEM Completely Outsources Assembly to MP

¹The OEM can also initiate outsourcing of an assembly based on a forecast.

Case 1.2: OEM outsources a portion of manufacturing to a MP

In this scenario, an OEM handles a portion of its manufacturing operations by itself and outsources the rest to either a single or multiple MPs. This scenario is commonly referred to as “Outside Processing” where the MP generally gets paid for the value added services. Figure 2 depicts an example of an outside processing scenario where one of the operations (Op 20) in the assembly’s routing is processed at the MP’s facility. In this example, the OEM sends the partially finished assembly (PFA) that was processed in- house at Op 10, to the MP for further processing. The MP then processes the PFA, and ships it for final processing at the OEM’s facility.

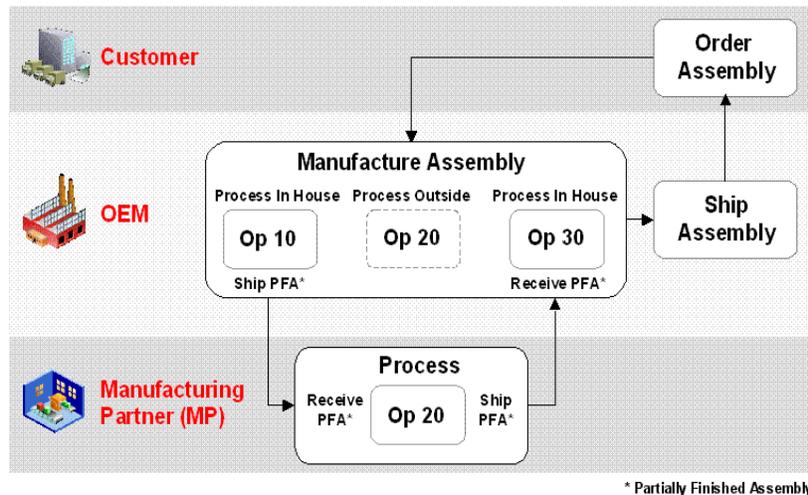


Figure 2 OEM Outsources a Portion of Manufacturing to MP

Once completed, the finished assembly is shipped to the customer against the sales order.

Supply of Components

For components that are consumed during the manufacturing of an outsourced assembly, there can be three possible scenarios related to their supply:

Case 2.1: MP manufactures or procures components

In this scenario, the MP either manufactures or procures the components that are consumed at the partner’s premises. Usually in such cases, the components costs are factored into the outsourced assembly’s price.

Case 2.2: OEM supplies components to the MP

In other scenarios, the OEM may control the supply of critical components (e.g., in highly regulated industries) by either shipping the components directly to the MP or by engaging a supplier to drop ship these components to the MP’s facility. The figure below represents a case where the OEM supplies the components directly to the MP’s facility.

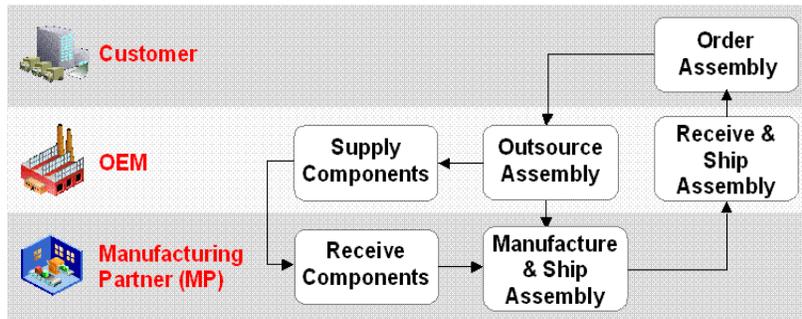


Figure 3 OEM Outsources Assemblies, Supplies Components to the MP

In a case where the OEM engages a third party supplier to drop ship the components to the MP's facility, the supplier invoices the OEM for the supply and drop shipment of components.

Ownership of Components

An enterprise may elect to either own and manage the components for consumption at the MP's facility, or engage a supplier to own and consign inventory at the MP's facility, or charge the MP by registering a sale of the components resulting in a complete transfer of ownership.

Case 3.1: OEM owns and manages component inventory at the MP facility

In this scenario, the OEM owns and manages component inventory at the MP facility and periodically replenishes stock based on consumption.

Case 3.2: Supplier consigns inventory at the MP facility

In this scenario, the OEM engages a component supplier to consign and manage inventory at the MP's facility.

Case 3.3: OEM sells the components to MP resulting in a complete transfer of ownership

In this type of outsourcing, the OEM ships the components used to build the assembly at the MP's facility and registers a sale of the components to the MP by raising an invoice. The MP pays against the invoiced amount resulting in a complete transfer of ownership of the components.

Case 3.4: Chargeable Subcontracting

“Chargeable Subcontracting” or “SHIKYU” is a contract manufacturing practice observed in Japan and is also being adopted by other countries in APAC such as Korea and Taiwan. In this practice, the OEM ships and makes a provisional sale of components used to build the assembly at the MP's facility. The ownership of the components still lies with the OEM and the inventory is reported under OEM's inventory valuation. When the assemblies are completed and returned to the OEM, the MP invoices the OEM for the gross price of the assembly. The OEM periodically nets payable and receivable invoices and makes payment to the MP only for the value addition done by the MP. The payables and receivable invoices used in this type of outsourcing serve as documentary evidence related to transactions with MPs and are maintained to comply with the local regulatory norms (e.g. SHITAUKE Law).

Shipment of Finished Goods

An enterprise may decide to either supply finished goods directly to the customer or enter into a contractual agreement with the MP to drop ship the finished goods to the customer's facility.

Case 4.1: OEM outsources assembly to MP and ships assembly to customer upon receipt from the MP

As seen in all the above cases, the OEM outsources manufacturing of an assembly to a MP and upon receipt of the finished assemblies, the OEM ships them to the customer.

Case 4.2: OEM outsources assembly to MP, MP drop ships assembly to customer

In this model, the OEM outsources manufacturing of an assembly to a MP similar to the above scenarios with the exception that instead of sending the finished assembly to the OEM, the MP directly drop ships it to the customer.

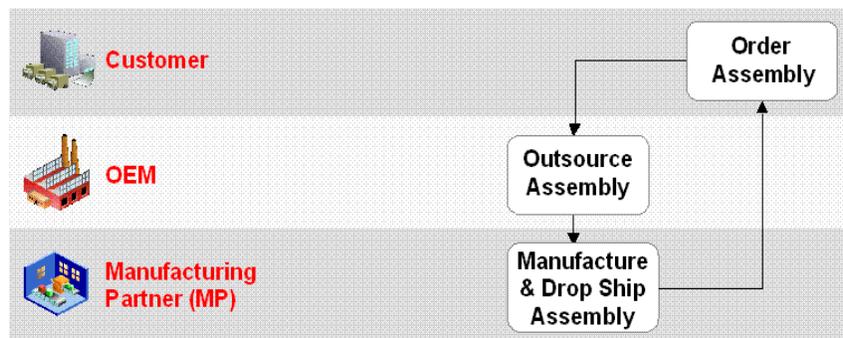


Figure 4 OEM Outsources Assembly to MP, MP Drop Ships Assembly to Customer

Based on the above factors, an enterprise deploys an outsourcing model suitable to meet its overall objectives.

Outsourced Manufacturing Challenges

Although outsourcing is being increasingly embraced as a strategic alternative to in-house manufacturing, OEMs continue to grapple with numerous challenges. The extent to which an enterprise outsources its manufacturing activities, determines the degree of the complexities and challenges that are involved in managing its extended enterprise with collaborative partners.

The figure below (adopted from AMR Research²), illustrates the major business and technical challenges that brand owners and OEMs face in outsourcing their manufacturing function – “Planning and managing inventory throughout the supply chain” being the most challenging of all.



Source: AMR Research, 2005

Figure 5 Top Business or Technical Challenges to Managing Contract Manufacturing Relationships

Companies that can effectively respond to these challenges are bound to stay competitive by reaping the potential benefits offered by outsourced manufacturing.

² Bill Swanton, Dineli Samaraweera, Eric Klein: “Contract Manufacturing at a Crossroads: Brand-owner Need for Visibility”, AMR Research, April 2005

Flexibly Model Outsourced Manufacturing Business Practices Using Oracle

Oracle Applications provide flexibility in modeling outsourced manufacturing business practices. Key Components of Oracle's solution footprint for Outsourced Manufacturing include Oracle Inventory, Oracle Order Management, Oracle Shipping, Oracle WIP, Oracle Quality, Oracle Advanced Supply Chain Planning (ASCP), Oracle Collaborative Planning, Oracle Strategic Network Optimization (SNO), Oracle Purchasing, Oracle Sourcing, Oracle Procurement Contracts, Oracle Internet Supplier Portal (iSupplier Portal), Oracle Receiving, Oracle Workflow Management and Oracle Transportation Management.

The following sections describe how the different outsourced manufacturing practices that were discussed previously can be modeled using Oracle Applications.

Model Outsourced Manufacturing Practices based on the extent of Outsourcing

Case 1.1: Complete outsourcing of assemblies to MP

Consider a situation where the MP supplies the required components and the OEM ships the finished assemblies to the customer after they are manufactured at the MP's factory. This can be executed through a normal purchase order for procuring the assemblies from the MP. The component costs are factored into the outsourced assembly's purchase price.

If it is essential to track production at the MP's facility, the MP can also be modeled as an inventory organization³. This requires organization parameters, shipping networks, and subinventories to be setup and the outsourced assembly's bills, and routings to be assigned to this "MP" organization with appropriate sourcing rules defined. Additionally, a supplier and a supplier site (representing the MP) need to be defined and associated with the MP organization. By creating and running a single supply chain plan in ASCP, it is possible to generate an external purchase order for procuring the assembly from the supplier (representing the MP) and a WIP job in the MP organization. The status of the WIP job in the MP organization can be periodically updated either manually or through open interfaces to reflect the production status at the MP's factory.

In the above case, since a supplier is defined to represent the MP, iSupplier Portal can enable online collaboration with MP by providing the MP's personnel access to review information and respond to purchase orders for the outsourced assemblies.

³The MP organization needs to be in the same operating unit as the OEM organization.

Case 1.2: Outside processing of operations at MP's facility (partial outsourcing)

Oracle WIP's outside processing feature can be used to perform outside processing of operations at a single or multiple MPs. Through seamless integration with Oracle Purchasing, Oracle WIP facilitates manufacturing collaboration with partners. Leveraging the strengths of Workflow and iSupplier Portal, Oracle WIP supports automated approval routings and shipment notifications. This provides an interactive, end-to-end, process to support a company's outsourcing needs.

Model Outsourced Manufacturing Practices based on the mode of supply of components**Case 2.1: MP manufacturers or procures components**

This scenario needs no additional setup other than factoring the cost of the components (consumed at the MP's facility) into the price of the assembly or the value added services.

Case 2.2: OEM supplies components to MP

In a situation where the OEM supplies the components to the MP, the MP organization needs to be setup similar to Case 1.1 and replenishment controls (like min-max and safety stock) can be defined for managing component supplies in the MP organization.

In scenarios where the OEM engages a supplier to drop ship the components to the MP facility, a MP organization needs to be setup and sourcing rules are defined in the MP organization for the components to be supplied by the component supplier. By creating and running a single supply chain plan in ASCP, it is possible to generate external purchase orders for procuring the components from the supplier.

Model Outsourced Manufacturing Practices based on the ownership of components**Case 3.1: OEM owns and manages component inventory at the MP facility**

This scenario can be modeled by setting up replenishment controls for components in the MP organization such as min-max and safety stock.

Case 3.2: Supplier owns and consigns inventory at the MP facility

To model a situation where an OEM engages a supplier to consign inventory at the MP's facility, a MP organization needs to be setup and the standard supplier consigned inventory and the "pay on use" functionality be used to pay suppliers when the MP consumes the material.

Case 3.3: OEM sells the components to MP resulting in a complete transfer of ownership

This scenario can be modeled using standard Order Management functionality where sales orders can be manually created to register a sale of the components to the MP resulting in a complete transfer of ownership.

Case 3.4: Chargeable Subcontracting

Oracle provides full support for chargeable subcontracting practices for Japan, Korea and Taiwan including the implications on planning, procurement, and shipping and related accounting transactions. On hand balance and valuation of the OEM components at the MP is also supported. The Chargeable Subcontracting Workbench gives users an end-to-end visibility into the subcontracting process.

Model Outsourced Manufacturing Practices based on the mode of shipment of outsourced assemblies

Case 4.1: OEM outsources assembly to MP and ships assembly to customer upon receipt from MP

The modeling and execution approach is same as what has been recommended for Case 1.1 that relates to complete outsourcing of assemblies.

Case 4.2: OEM outsources assembly to MP, MP drop ships assembly to customer

This scenario can be executed through the standard drop ship functionality available in Oracle.

If tracking of production at the MP facility is desired, a MP organization needs to be setup and a WIP job for the outsourced assembly needs to be created and updated in the MP organization either manually or through open interfaces to reflect the production status at the MP's factory.

Companies usually deploy a combination of the various models discussed above, and continuously evaluate and change their overall outsourced manufacturing model for adapting to changing market conditions. Supporting the above scenarios, Oracle offers a single system that allows companies to quickly transition from one outsourcing approach to another to meet their overall business objectives.

Respond to Outsourced Manufacturing Challenges Leveraging the Robust Capabilities Offered By Oracle

The subsequent sections deal with specific product capabilities that can additionally help in addressing the challenges discussed in the previous chapter.

Plan and Manage inventory throughout the extended supply chain

Since MPs can be modeled as inventory organizations, through a single holistic plan in the Oracle Advanced Supply Chain Planning module, OEMs can manage their demand and supply based on the current inventory of assemblies and components throughout their “virtual” enterprise.

If an OEM sources the components from a supplier and supplies to the MP, Oracle Collaborative Planning’s Vendor Managed Inventory (VMI) feature can be used to automate inventory replenishment and reduce costs for holding inventory. Component suppliers can receive proactive notifications when inventory needs to be replenished. They can immediately post the replenishment information and a purchase blanket release can be generated automatically.

Additionally, the “Chargeable Subcontracting” feature (available for Japan, Korea and Taiwan) supports external confirmation reports that can be used for reconciling inventory at the MP site. In the reconciliation process, the OEM prints the confirmation to estimate the on-hand quantity and the consumption of components for each subcontracting order based on the simulated MP organization records. This report is sent to the MP for confirmation. The MP in turn verifies the records and reports variations in the consumption if any. The OEM then adjusts the simulated MP organization inventory by making consumption adjustments and processing those variations. This helps in reflecting the actual inventory at the MP for better planning and execution.

Manage Outsourced Product Quality

Companies can leverage on the robust capabilities offered by Oracle Quality and iSupplier Portal to proactively manage the quality of the products that are manufactured at the partner’s premises. While raising a purchase order for outsourcing an assembly, OEMs can publish the manufacturing standards and quality specifications for MPs to review by logging in to the iSupplier Portal. On the other hand, quality plans can be defined for MPs to enter product or manufacturing related quality data through iSupplier Portal prior to shipping of the assemblies. OEMs can evaluate the results and stop the shipment of the assemblies should they not meet the required specifications. iSupplier Portal supports quality results entry for both outside processing of operations as well as complete outsourcing of assemblies.

Provide Visibility of Demand/Demand signals to Manufacturing Partners and Suppliers

As a brand owner or an OEM, companies can use Oracle Collaborative Planning to communicate supply and demand signals across all tiers of their extended supply chain synchronously. For example, OEMs can decide to publish customer's order forecast to their MPs (tier-1 suppliers) as well as their tier-2 component suppliers. Similarly, OEMs can publish their own forecast to both MPs and key tier-2 component suppliers, to proactively identify problems that may occur in their downstream supply chain. This can enable them to report the impacts more quickly, in terms of committed capacity, back to the OEMs, thereby speeding up the overall planning process.

Manage Material Sourcing

Oracle Sourcing lets companies browse the wealth of contract manufacturers and supplier information that exists within the company and easily invite new partners and suppliers to ensure highly competitive bids. Online collaboration and negotiation facilitates choosing the right partner or supplier by making it easy for participants from multiple organizations to exchange information, conduct bidding processes, and create and implement agreements. Professional buyers, business experts, and suppliers exchange information online for a more agile and successful sourcing process. Online competition saves time by allowing partners and suppliers to improve terms without time-consuming back and forth negotiation. Agreements negotiated in Oracle Sourcing can be implemented immediately in Oracle Purchasing. Oracle Sourcing dramatically reduces sourcing cycle time and creates a complete audit trail of supplier commitments.

Additionally, Oracle Strategic Network Optimization (SNO) can be used to generate the best sourcing strategy as an output that can be used for the downstream supply and inventory planning processes. Considering all the complex costs and constraints related to transportation, operating, sourcing, storage, and labor, Oracle SNO helps companies to optimize their supply chain network design and decide on the best possible network configuration to run their businesses.

Review Information on Production and Inventory status

As discussed earlier, manufacturing partners can be modeled as Inventory organizations. Replicating the routing of the outsourced assembly can simulate the production processes at the MP's factory. Periodic updates from the MP (enforced through contractual agreement) can be posted through open interfaces to represent the exact status of the production by updating the WIP jobs created in the MP organization for the outsourced assembly. Inventory status reports can be generated for components in the MP organization for reconciliation in the event of any discrepancies against actuals.

Manage and Coordinate Contractual Agreements, Protect Intellectual Property and ensure Regulatory Compliance with Partners and Suppliers

Oracle Procurement Contracts allows taking control of contract lifecycle, from authoring and negotiation through implementation, enforcement, evaluation and closeout. Procurement and legal professionals can quickly author contracts that comply with corporate standards, and measure compliance to ensure that negotiated savings reach the bottom line. OEMs can define policies that mandate the use of specific clauses (such as, protection of Intellectual Property, sending periodic reports on material and production status, etc) while entering into a contractual agreement with partners. It enables contracting organizations to establish enterprise standards and implement them globally from a library of standard contract terms and pre-approved templates. Regional administrators may tailor standards for local or country-specific regulations or translate them to a local language. A comprehensive revision process maintains a complete audit trail that prevents unpleasant and costly disputes about what was agreed to and when.

Partners and suppliers are required to acknowledge amendments and, if required, can sign amendments digitally or manually. Both parties can easily compare changes between revisions. Since Oracle Procurement Contracts is an integral part of Oracle Advanced Procurement, contracts are consistently executed through Oracle Purchasing, Payables and other E-Business Suite applications. Supplier invoices are validated against the negotiated pricing before making a payment. With Oracle Procurement Contracts, contract administrators can access the complete record of purchase documents and interactions related to a contract through a centralized contract repository. They can track deliverables, view purchase orders, and drill into all relevant supporting documents such as meeting minutes, technical specifications, work breakdown structures and project plans. Contracting organizations such as OEMs can review current spend and real-time Key Performance Indicators (KPIs) to understand the current contract performance. Oracle Procurement Contracts ensures that partners and suppliers are performing against the agreements they have signed.

Manage Performance Variability and Uncertainty with Partners and Suppliers

By integrating with Oracle Business Intelligence, iSupplier Portal allows contracting organizations to view and share feedback with partners and suppliers quantitative measures on their performance. The flexibility built into the tool allows brand owners and OEMs to tailor the KPIs in Oracle Business Intelligence for each partner and supplier with an ability to configure to the supplier site level. This feature provides a one-stop location for relevant and reliable partner and supplier performance information and a complete view from aggregated data to granular details on KPIs. Both parties can perform comparisons across supplier sites, review trend data over various time periods and collect results by time period. With this ability, partners and suppliers can continuously improve their processes and reduce variability and uncertainty.

Reduce IT Burden on Partners and Suppliers for Manufacturing Collaboration

iSupplier portal enables partners and suppliers to communicate and share information with OEMs at a lesser cost as all they need is just a browser and minimum infrastructure. This helps in reducing the burden on partners and suppliers to deploy and maintain expensive IT systems for collaborating with their contracting organizations.

Control Logistics, Logistics Related Costs and Cross Border Trade

Oracle Transportation Management (OTM) provides a complete logistics platform to plan and execute the movement of materials throughout the extended supply chain. The parameters used in planning are not based on abstract assumptions, but rather the history of proven supply chain flows and the real operational rates and capabilities of trading partners and service providers. When coupled with real demand signals, OTM provides the unique capability of planning and executing movements of goods very close to the operational window. This capability ensures that the right amounts of the right goods show up on time and facilitates running a tightly synchronized, rapidly moving materials network without large inventories and hence at lower costs. For components or goods sourced internationally, OTM provides the benefits of understanding and managing the uncertainty of shipment times and compliance documentation. It serves as a single source for all the information required for import compliance and documentation required for cross border trade.

Outsourced Manufacturing Process Visibility with Endeca Information Discovery

Outsourced Manufacturing application with Endeca Information Discovery provides enriched capabilities in identifying the real time process metrics, bottlenecks and helps in taking corrective actions for improving the health of outsourcing process.

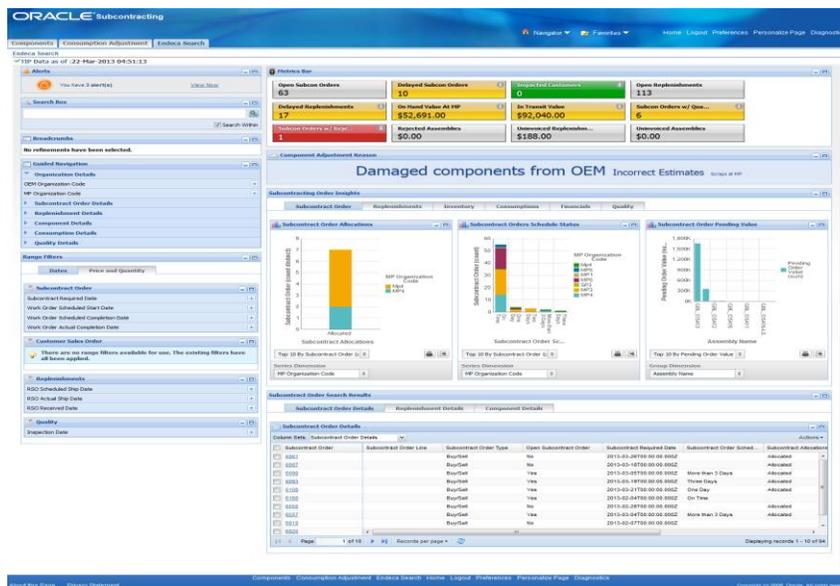


Figure 6 360 Degree View of Outsourced Manufacturing Process

Outsourced manufacturing process visibility with Endeca Information Discovery provides simple, intuitive data discovery and analysis capabilities for complex outsourcing process data. It provides unique, easy to use powerful search capability for the buyers and purchase managers at OEMs to instantly find answers for ad hoc questions that are otherwise hard to find answers in real time. For example:

- How many subcontracting orders are delayed and which customers are impacted?
- What is the value of our material at manufacturing partner locations?
- What is the value of defective finished goods received from manufacturing partners?
- What is the value of un-invoiced subcontracting orders and replenishments?
- What are the reasons leading to quality defect and which finished good and supplied components are affected?

In a traditional search, user would need to specifically know the exact search criteria on what they were looking for and had a limited view of the results. The revolutionary search interface guides the buyers to visualize and diagnose the real time health of the outsourcing process. The user is empowered by gaining full visibility into the overall outsourcing process in a single view. The 360 degrees view of the process spreads across multiple OEMs and MPs, as well as mapping the entire supply chain of a subcontracting order, from the associated customer sales order, replenishments to the drop ship supplier of components. The Endeca search allows the buyer with a shopping type of user experience to explore all relevant data to uncover the manufacturing bottlenecks and take corrective action quickly. The new dynamic and modern user interface guides the user towards discovering the answers to questions of specific interest in the context of managing current challenges on the floor faster. The figure below gives you the bird's eye view of the Endeca search.



Figure 7 Bird's Eye View of Endeca Search

Conclusion

Outsourcing has become a reality for global manufacturing organizations operating in almost every industrial segment. Although manufacturing outsourcing continues to grow, enterprises that have adopted this strategic approach face several challenges in managing the processes and resources that are not under their direct control. In order to realize the true benefits of outsourced manufacturing, brand owners and OEMs need to implement appropriate processes and supporting solutions to manage their partner relationships.

Oracle provides a fully integrated suite of core business applications that facilitate real time collaboration and execution with outsourcing partners that are part of a company's extended supply chain. Through flexible modeling options, enriched with features specifically for manufacturing outsourcing, Oracle Applications allow companies to quickly configure and rapidly adapt to a collaborative model as appropriate to their businesses.

With Oracle Applications, companies outsource their manufacturing function with confidence, stand to reap the benefits and gain a competitive advantage over others by focusing more on their key differentiators.



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Hardware and Software, Engineered to Work Together