

**Challenges To Enterprise  
Systems Manufacturers:  
Delivering Flexibility,  
Managing Complexity, and  
Providing Optimal Service**

# Challenges To Enterprise Systems Manufacturers: Delivering Flexibility, Managing Complexity, and Providing Optimal Service

## **THREE CHALLENGES FACING ENTERPRISE SYSTEMS MANUFACTURERS**

In high tech, the term “Enterprise Systems” means large-scale servers, storage systems, networking equipment and accompanying software primarily targeted toward the Enterprise market. Enterprise Systems is a very intricate business, as the term suggests. One piece of equipment can have commodity hardware, custom ASICs, embedded software, and operating system and third party hardware and software components. Enterprise Systems manufacturing companies tend to be mid-volume businesses with a large product mix. Volumes are typically larger than a semiconductor capital equipment company but smaller than a personal computing company. Enterprise Systems companies have traditionally been among the high gross margin sectors in high tech, with some running in the 55%-65% range.

However, as margins have eroded and orders have dropped due to mass commoditization -- Huawei in networking, Dell in storage, Intel/Linux in server systems -- Enterprise Systems manufacturing companies have struggled to adapt to a changing market. These companies are faced with three challenges: delivering flexibility in their supply chains, managing configuration complexity efficiently, and optimally servicing their installed base.

### **First challenge: delivering flexibility**

The first challenge, delivering flexibility, stems from the way Enterprise Systems manufacturing companies are being forced to respond to fast changes in customer requirements and technology. This has placed huge demands on the flexibility of supply chain systems. Key issues revolve around managing outsourced manufacturing partners and suppliers, product transition (NPI, new products introduction), exception handling and change management in orders, forecasting for capacity planning and long-lead time components, product quality amongst others.

### **Second challenge: managing configuration complexity**

The second challenge, configuration complexity, has been a growing issue since the 1980s. Before then, most elements of the systems configuration – the hardware, operating system, database and storage, and applications – were simple and easily tied together in one system. Now, however, the typical configuration consists of several separate mini-systems. For example, a complex high-end server solution has separate storage area networks, networking equipment, and software stacks for the middleware, database, portals, application servers and web servers. Managing this

explosion in complexity (especially the software components) has become a nightmare for Enterprise Systems manufacturers.

Another reason for the increase in system complexity is that customers demand more exact specifications, and more customization, than ever before. Yet another is that the software complexity has increased. And finally, solutions to today's complex requirements tend to emphasize hardware and software equally, rather than one or the other as in the 1980s.

### **Third challenge: optimally servicing the installed equipment base**

The third challenge, optimally servicing the installed equipment base, revolves around the difficult task of support and warranties and servicing them cost-effectively, both proactively and reactively. The installed base is a huge potential source of upgrade revenue, especially for software upgrades.

## **THREE SOLUTIONS TO THESE CHALLENGES: SPEED, AGILITY AND OPTIMIZATION**

How can Enterprise Systems manufacturing companies meet these three challenges? They must be able to (1) scale production up or down as quickly as the demand changes in real time, (2) speed up the order-to-delivery cycles of complex configurations, and (3) identify their installed equipment base and provide optimal service. Moreover, they must meet these three objectives without accumulating huge amounts of inventory that will quickly become obsolete.

## **Agility: Responding quickly to changes in customer demand**

### **Constantly-changing customer requirements**

Enterprise Systems companies deliver mid-volumes of equipment and operate in environments of constant change. The parts initially selected to configure a system change before the completed equipment order is delivered. The order may need to be expedited/prioritized based on the customer. Or orders are cancelled or quantity changed. Therefore, one of the biggest challenges for a Enterprise Systems company is to plan for parts (and sub-assemblies) inventory in a way that lets the company meet changes in customer requirements while still reducing lead times.

### **Long lead times for parts and components**

Another unique aspect of this industry is that the lead times for parts and ASICs are usually much longer than the order-to-delivery timeframes, sometimes by a factor of 8. On average, ASICs can have 12 to 16-week lead times, compared with only days to 4 weeks for the finished equipment itself. Two factors contribute to this situation: (1) it is very time-consuming to custom-design for the specific Enterprise Systems type, and (2) the parts used are less available than standard parts such as those used to configure personal computers.

How does an Enterprise Systems company address these problems? In a perfect world, no inventory would be held, and at the last minute all the right parts, including custom options, would somehow come together. Since this scenario is impossible, Oracle provides unique capabilities to improve predictability (ensuring that the right parts are planned ahead of the actual demand) and to reduce delays in communicating real-time changes to the entire supply chain.

### **Solution: Optimizing inventory**

Oracle improves the predictability of changes by holding optimal inventory levels of safety stock and the most commonly used configuration options. First, it lets you plan the optimal plant location for the inventory using the “strategic network optimization” capability. Second, it uses “risk-pooling” methodology to determine these optimal levels of parts and sub-assemblies. If the company is holding a large amount of inventory higher upstream in the supply chain, Oracle lets it push the inventory farther downstream the supply chain. This process increases the ability to provide the right parts in real time and fosters good supply chain partner relationships.

### **Solution: Tight communication within the supply chain**

Oracle also cuts down delays in communication with the entire supply chain. Whenever the configuration options are changed, Oracle automatically generates the right notifications – reschedule messages, quantity changes, source changes, shipment messages and so on – to the appropriate supply chain partners, and does so at minimal cost. Oracle uses a multi-tier collaboration module that is unique in the industry. Oracle also provides a tight coupling between the planning engine and the execution system. As a result, when a configuration change is triggered, the planning cycles are drastically shortened, and the company can quickly propagate the changes throughout the supply chain. It can also leverage Fusion Middleware stack to enable easy communication between Enterprise Systems companies and multiple suppliers.

### **Solution: Improving demand accuracy**

Another area that Oracle is unique is in the entire sales and operations planning process. This is especially relevant when it comes to doing capacity planning on a global basis (including outsourced manufacturers) and components planning for long lead-time items, including ASICs built by third parties. Only Oracle provides an easy, seamless way to automate the integration of sales forecasts, which can be cumbersome; marketing forecasts and operations forecasts.

## **Speed: Accelerating the order-to-delivery cycle of custom Configurations**

Two key factors contribute to the current inefficiency of the order-to-delivery cycle: inefficient configuration processes and the lack of a unified data source.

To mitigate these factors, companies have begun using product configurators. According to a Gartner report, a high-tech equipment company that uses a product configurator can save 50 to 70% in rework expenses for enterprises with a 25% or greater order error rate. These factors, and how a product configurator can help, are discussed in detail below.

### **(1) Streamlining the configuration process**

#### *Too many parts; misconfigured orders*

As stated earlier, a piece of Enterprise System can have many modules – hardware, ASICs, PCBs, software. Configuring a system with so many modules is very difficult. It is hard even to capture the customer’s requirements correctly. For any piece of Enterprise System, customers must provide detailed technical specifications. The specification process introduces many errors; for example, some parts may be incompatible, the configuration may not meet the performance

requirements, parts may be missing, or parts may not fit. Misconfigured orders lead to expenses such as staff maintenance for order checkers, rush orders on parts, rework in manufacturing, and field service calls.

#### *Communication delays among departments*

The second problem in configuring Enterprise systems is long order processing times. In the typical Enterprise Systems manufacturing company, several functional organizations are involved in processing orders, but are not able to work together efficiently. For example, the salesperson may have to verify certain requirements with the engineering department before confirming the order. A special team in the order-entry department may have to review the order manually. Yet another group may verify the order. To make order processing more efficient, these functional organizations need to streamline the ways they work together.

#### *“Base model” solution*

The Oracle Configurator solution is unique. It lets Enterprise Systems companies start by planning for the standard models, referred to as “base” models that may be needed to fulfill custom configuration requirements. Oracle Configurator provides a modeling environment in which product specialists can create a wide variety of these base models, each with multiple options. The base models are modular designs and increase the utilization of common components, assemblies and platforms.

To handle the configuration complexity of this industry, base models can be multi-level (parent models containing child models) and multi-organizational (child models made by different companies). Super-models (a superset of base models, or a collection of parent models) can also be created. For example, a high-performance computing configuration is a super-model containing separate models for the storage equipment, server equipment and software.

#### *Interactive guided selling solution*

Oracle Configurator provides an interactive guided selling solution that insulates the customer from low-level technical definition, minimizing the time the customer and the sales department must spend hammering out specifications. The customer only has to specify high-level requirements. Oracle then maps these requirements to a set of product options. As the customer provides information, follow-up questions and options are focused to include only the choices that satisfy the customer requirements. During the configuration session, Oracle’s interactive engine provides real-time feedback, ensuring that the final solution is valid. This process results in the delivery of an accurate, configurable order that meets the customer’s unique requirements.

Oracle's use of base models also speeds up the order-processing times of custom configurations. These base models guide the selection of valid options. Oracle Configurator’s real-time, interactive configuration engine supports configuration rules written against model structures provided by Oracle Bills of Material (BOM), and provides instant feedback on the impact of any product selection. The engine’s constraint-based reasoning ensures that each configuration results in a valid order that can be fed to manufacturing and supply chain applications.

## **(2) Providing a single unified data source**

A critical factor in managing configuration complexity is the need to coordinate the customer order (front end) with the manufacturing BOMs (back end). However,

most Enterprise Systems companies have multiple data sources rather than a single source. This leads to inconsistent information, which increases order errors and maintenance costs. Moreover, Enterprise Systems companies typically fail to integrate their applications, which slow down order processing times and reduce the re-use of product information.

Oracle Configurator also offers a single enterprise data source. The tight front- to back-end integration lets companies automatically generate manufacturing BOMs from customer orders. It also eliminates the need to keep multiple copies of a configuration in order to synchronize customer data, pricing data, item data, etc. Competing software suites typically lack this seamless integration, and instead use multiple configuration technologies to support front- and back-end operations.

Thus Oracle's solution lets an Enterprise Systems company deliver accurate, configurable orders quickly and easily. This dramatically accelerates the order-to-delivery cycles.

## **Optimization: providing optimal service**

### **Managing service contracts, warranties and entitlements**

A key reason for lost service revenue is that most companies cannot manage the service contracts efficiently. Initiation and amendments, the first step in contracts set up, takes too long. Delays occur in identifying covered equipment and adding terms/entitlements, historical and future pricing. Pricing and renewals, the second setup, is not accurate due to unreliable reporting -- repair/revenue reports and period-to-date reports. Third problem is the time wasted with inquiries. Over 50% of time is spent on invoice inquiries and some time spent on repair/payable inquiries instead of monitoring, dispatching and maintaining equipment. This is caused due to a lack of an integrated contract system with service/repairs. Fourth, delays in invoicing and collections due to a lack of link between contracts and billing. Lack of clear entitlement (as noted above) to uniquely identified equipment in the service contract delays the verification of incoming invoices as well.

### **Inability to track the installed base**

Another reason for lost service revenue (for software upgrades etc.) is that most Enterprise Systems companies cannot track their own worldwide base of installed equipment.

## **Solution: Improve customer intimacy: link service to the ERP system**

### **Service Contracts, Warranties:**

Oracle provides a unique service solution that improves the knowledge management of the equipment. Oracle's service module is linked to the ERP system. This linkage enables Oracle to facilitate and manage the easy creation and tracking of service contracts and agreements (SLAs).

### **Billing and Invoicing:**

The second benefit of Oracle's linkage between the service and ERP systems is the ability to automate the invoice and repair/payable inquiry process, link contracts with billing and accelerate the billing cycles.

For more information on Oracle's solution for meeting the challenges of Enterprise Systems manufacturers, please visit [www.oracle.com/industries/high\\_tech](http://www.oracle.com/industries/high_tech) or call your oracle representative at 1-800-ORACLE1.



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Author: Jay Goyal, Vice President, Oracle

Contributing Authors: Stan Stopka, COO Alcatel eND, Steve McKay, VP Sun Microsystems

Oracle Corporation  
World Headquarters  
500 Oracle Parkway  
Redwood Shores, CA 94065  
U.S.A.

Worldwide Inquiries:  
Phone: +1.650.506.7000  
Fax: +1.650.506.7200  
[oracle.com](http://oracle.com)

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