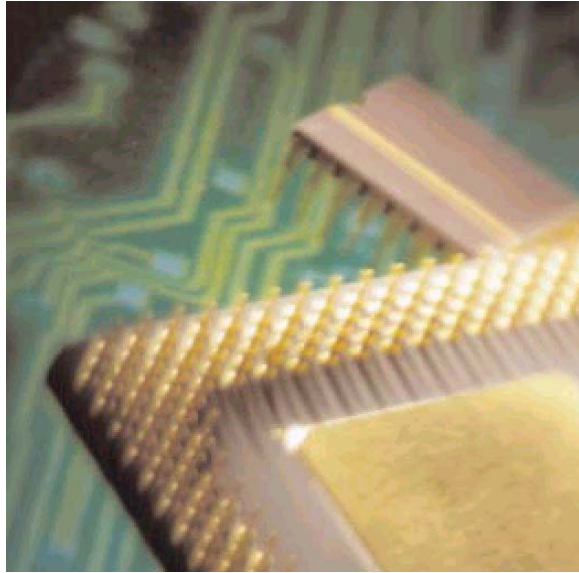


# Oracle & the Semiconductor Industry

*Respond to Unpredictable Shifts in Your  
Customer Demand*



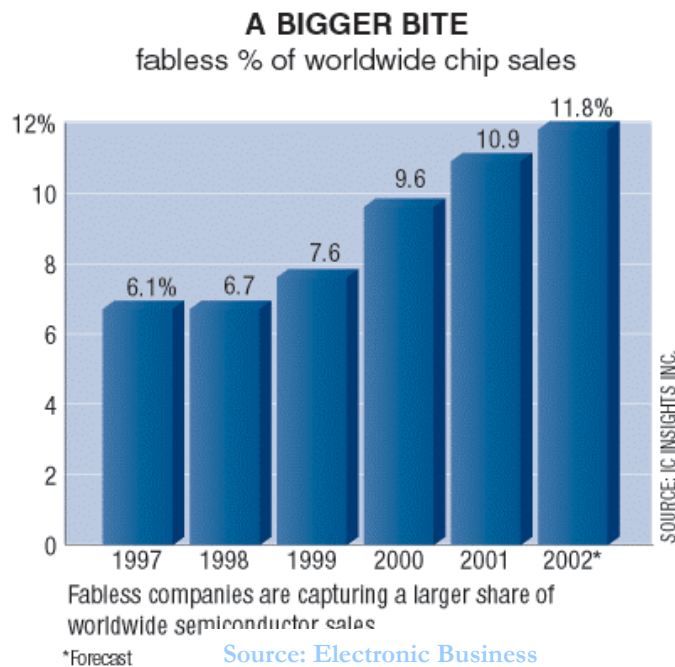
# Oracle & the Semiconductor Industry

## *Respond to Unpredictable Shifts in Your Customer Demand*

The high technology supply chain has always been largely fragmented. After the demand downturn that resulted in huge inventory write-offs, even the semiconductor sector, which thrives on innovation and has taken the supply chain for granted, is now more acutely aware of supply chain issues. Declining prices and shortening lifecycles are pressuring semiconductor supply chains to be flexible and more customer focused. However, increasingly complex and highly integrated product designs demand tightly integrated downstream supply chain extensions. With semiconductor companies outsourcing everything that is not proprietary to manage margins and ensure profitability, supply chain integration has now become intricate and collaboration a strategic necessity.

**“Any new semiconductor companies going forward are all going to be fabless,” predicts Chuck Byers, director of worldwide management for Hsinchu, Taiwan-based TSMC, the world’s largest foundry. TSMC expects at least 40% of all chip manufacturing to be outsourced by 2010.**

**Source: Electronic Business**



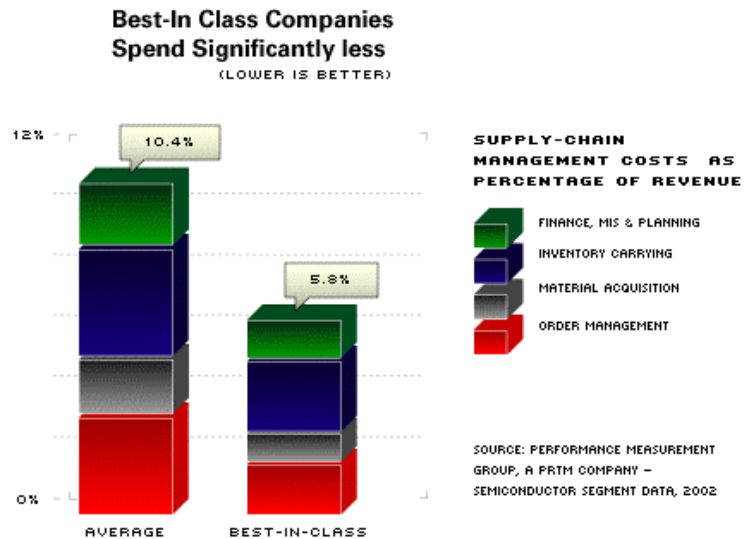
The fabless business model of outsourcing production while concentrating on design and marketing has proven so successful that it's rapidly being adopted around the globe. Today, an estimated 1,000 fabless chip companies are operating in at least two

dozen countries, with about half of those companies based outside the United States and Canada, according to the FSA. (Source: Electronic Business)

It's hardly surprising that electronics entrepreneurs outside North America are adopting the fabless model, since fabless companies have been significantly outgrowing the rest of the semiconductor industry. IC Insights estimates that about \$15 billion, or nearly 12% of worldwide chip revenue, came from fabless companies in 2002. That's double the \$7.3 billion, or 6%, of industry revenue generated by fabless companies in 1997. During that five-year period, fabless chip sales had a 15% annual compound growth rate, compared with just 1% for overall chip industry sales. (Source: Electronic Business)

“The cost of doing these offshore designs has dropped dramatically. This is going to dramatically change the way business is done in the semiconductor industry.”

Robert Bailey, CEO, PMC-Sierra Inc.  
Source: Electronic Business



Oracle’s supply chain solution helps semiconductor companies drive bottom- and top-line performance by removing communication latency and enabling real time collaboration between trading partners across the extended supply chain. It enables comprehensive visibility from customer order to shop floor execution in real time, combining manufacturing excellence with customer responsiveness. And, it can coexist with other ERP or planning products to help you maximize existing investments.

With RosettaNet support built into its solution Oracle is the only vendor that can seamlessly integrate your business processes with your supply and manufacturing partners. Oracle can help reduce your operational costs, increase speed and efficiency, and improve your decisions based on more timely data. With Oracle you can truly institutionalize business process integration. From accepting the fact that your customers give you bad data and knowing what to do about it, to sustaining lead time reduction while reducing inventory, to achieving continuous access to real-time shop floor information, with Oracle you can truly respond to unpredictable shifts in your customer demand.

## ACCEPT THE FACT YOUR CUSTOMERS GIVE YOU BAD DATA

Because of an extraordinary amount of latency built into their processes, semiconductor companies are often forced to calculate their production plans based upon a number of factors in the hopes of correctly measuring demand 60 to 90 days in advance. These companies experience “bull whip” information distortions both from suppliers and customers. During the last boom cycle, OEMs provided overly optimistic forecasts and engaged in inflated ordering and strategic stockpiling of key components when they were hit with the allocation limit. To compound the problem, semiconductor companies were advised by the foundries to book early to avoid delays due to the approaching capacity shortage. These companies know their forecasts are wrong. Monthly data is data they can't trust. The bottom line is that your customers can give you bad data. But what can you do about it? Oracle helps you to take the guesswork out of your demand planning process by capturing demand variability early enough in the process.

“As the trend towards outsourcing continues and semiconductor suppliers drive more of the system expertise and technology, OEMs and suppliers will need to rely more heavily on the tools and real-time software that connects and enables both to evaluate and pursue the right efficiencies and time to revenue.”

Shane Rau & Mario Morales, IDC,  
September 2002

## Leverage Demand Variability and Improve Your Customer Service

With Oracle, you work with your raw customer data without having to manipulate it. You can leverage your demand variability to overcome the limitations of deterministic optimization techniques. Allowing for all demand variability allows you to precisely determine the levels of inventory investment required to meet your customer service objectives at the lowest possible cost.

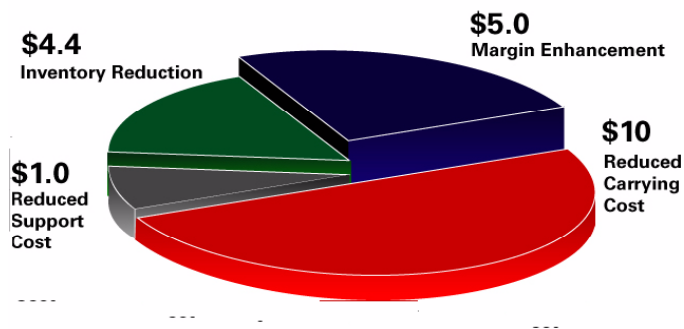
## Improve Predictability and Velocity of Your Demand Signals

Oracle's semiconductor supply chain solution can improve the predictability and velocity of your demand signals by enabling collaboration at multiple customer levels. It can help you streamline your complex demand planning process and improve predictability by involving all your necessary stakeholders. Oracle can improve your forecast accuracy by enabling ubiquitous information sharing among foundries, assembly and test facilities, OEMs, contract manufacturers, distributors, and suppliers around the world.

## Intersil Goes From Vertical to Virtual

### Anticipated Benefits

Present Value Of Benefits in \$ Millions over 5 years

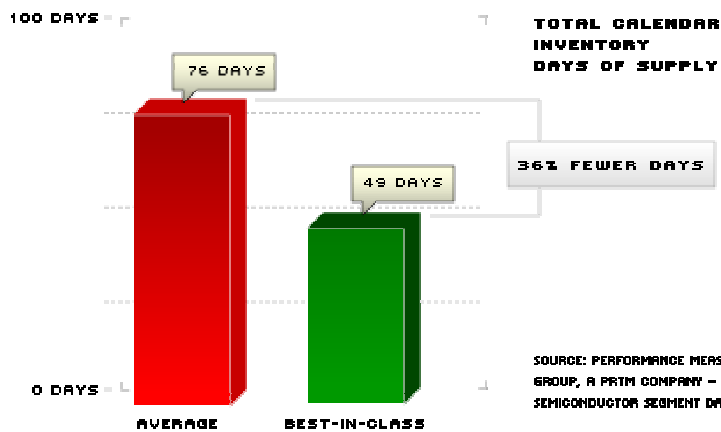


## SUSTAIN LEAD TIME REDUCTION WHILE REDUCING YOUR INVENTORY

Historically, semiconductor companies have used multistep planning processes that result in longer planning cycles and multiple plans to reconcile. Wafer foundries and assembly/test houses work in relative isolation. With semiconductor companies increasingly outsourcing their wafer processing to Asian foundries, the biggest and the most common complaint across the extended supply chain is the timeliness of relevant information. From foundries to OEMs, planning cycles vary, and sending information in between cycle times can cause confusion and apathy.

### Best-In Class Companies Have Significantly fewer Inventory Days Of Supply

(LOWER IS BETTER)



“With the incorporation of key planning components from iLog and prior experience with fast Material Requirements Planning (MRP), Oracle has come into its own in SCP and is making it more difficult to other SCP vendors to sell into its installed base. With a novel pricing strategy based on the number of Stock-Keeping Units (SKUs) planned, Oracle can be affordable to a broad cross-section of APS large and midsize enterprises.”

John Bermudez, AMR

Oracle allows you to generate a single holistic supply chain plan that provides both long-range aggregate planning across foundries, test and assembly houses, contract manufacturers, and OEMs as well as short-term detailed scheduling. It allows planning of all material requirements, capacity requirements, distribution requirements, and replenishments in one planning run, which enables sustainable lead-time reduction while reducing your inventory.

### Create Strategic Inventory Points to Maximize Supply Chain Responsiveness

Most semiconductor companies use a mixed mode supply chain model, with some configurations build-to-forecast and others assemble-to-order. The critical issue is determining how far forward in the supply chain to hold inventories and still maintain customer service levels. Die banks, assembly/test facilities, or vendor managed inventory hubs could be that strategic inventory point, based upon target service levels to maximize the responsiveness of the semiconductor supply chain. Semiconductor companies can then build-to-forecast into the strategic inventory point and configure-to-order downstream from that point. This supply chain tactic, known as Postponement, is based upon generic inventory pushed to the crossover point in the supply chain, where it may be staged for multiple routings and configuration options.

**“Introduced around a year ago, Oracle already has 75 semiconductor customers leveraging its Oracle Shop Floor Management (OSFM) solution. OSFM has strong integration capabilities and helps semiconductor manufacturers to drastically reduce latency (unresponsiveness and slow turnaround on customer orders). With Oracle, OSFM is both the execution and planning model, allowing single model maintenance.”**

**Sheldon Porter, Plant-Wide Research**

Oracle’s semiconductor supply chain solution takes into account forecasting errors and inventory risk and optimizes postponement strategies, enabling generic products to be quickly configured and routed to different sales channels and customers, resulting in an overall higher level of response to customer requests. It will enable you to manage inventory levels in your supply chain and quickly respond to changes in even unforeseen demand for your unique products, thereby minimizing inventory and maximizing your customer service. And it can be deployed completely standalone as a strategic component that will coexist with your current planning applications.

### **Manage Vendor Managed Inventory**

For high tech OEM’s the benefits associated with Vendor Managed Inventory (VMI) are substantial. Consumption of material from the VMI hub is matched to production cycle times and demand. The supplier cannot invoice the material until it is pulled from the hub. From the semiconductor companies’ perspective, VMI is a very difficult and potentially costly customer requirement to deal with. These companies bear the overhead associated with establishing, stocking, replenishing, and maintaining the VMI hub. Oracle’s supply chain solution provides global visibility to demand and supply across the extended semiconductor supply chain, giving you the opportunity to reduce your inventory, turning the challenges of VMI into competitive differentiators.

### **ACHIEVE CONTINUOUS ACCESS TO REAL-TIME SHOP FLOOR INFORMATION**

The critical factor in customer-driven manufacturing is the need to increasingly coordinate planning and manufacturing execution processes in a more integrated fashion. But for most semiconductor companies, integrating their planning and execution systems is a nightmare. Supply chain transparency is a difficult proposition, as Manufacturing Execution Systems (MES) systems are relatively isolated and only loosely integrated to enterprise applications. Latency is introduced at the batch interfaces that are susceptible to old data making real-time inventory visibility a distant dream. Today, customers frequently ask manufacturers to produce wafers at specific locations and on specific equipment. They demand visibility into the status of their orders, drilling down to actual lots on the shop floor.

Oracle’s supply chain solution is built for the semiconductor industry and now has more than 75 customers. With this solution, you can manage complex shop floor lot transactions, enable dynamic routings, provide end-to-end genealogy of your products, and model and track operation yield based cost for your products. With Oracle you can enable seamless integration of your ERP system with third party MES systems, eliminating all your multiple points of integration.

### **Track Your Customer Orders to the Shop Floor**

With Oracle you can track wafer and die through multiple suppliers and processes, including fabrication, sorting, assembly, and test. Each process incorporates many

**“Oracle’s OSFM solution addresses a major challenge associated with managing a network of manufacturing operations. Through an integrated model that links shop floor execution with supply chain planning, semiconductor manufacturers can reduce cycle times and improve customer service.”**

**Michael Dominy & John Derome, Yankee Group**

steps that are mapped to higher level manufacturing stages. Oracle's solution can be the catalyst that moves your manufacturing from fabs to foundries, enabling you to have enterprise-wide supply chain transparency with front-end to back-end visibility across all your facilities. Oracle's solution also gives you the ability to model co-products, as well as speed sorts and binning in a way that can be leveraged by your planners to improve customer service, allowing real-time corrective actions on the shop floor. Unlike traditional manufacturing environments are limited in their ability to track finished goods from raw material at the ERP level, Oracle's semiconductor solution can provide complete lot genealogy for backward and forward visibility across your extended enterprise.

### **Enable Real-Time ERP/MES Integration**

**“Oracle’s OSFM solution closes the void between shop floor manufacturing and supply chain planning systems. The planning model is dynamically updated in memory when changes are made at the shop floor level, allowing manufactures to manage their own operations and a network of contract manufacturers.”**

**Michael Dominy & John Derome, Yankee Group**

Oracle is a single vendor solution that eliminates the need for custom MES solutions and minimizes the effort of designing and integrating MES systems with the ERP environment. With seamless integration into your ERP system, customer and shop floor transactions are captured in a single repository facilitating customer demand and supply synchronization, and supply chain planning and analysis. With Oracle, your planning system is now your execution system. This gives you continuous access to real-time production information. Oracle's supply chain solution provides faster, simpler implementation, higher data integrity, and lower total cost of ownership. It enables quick detection and collaborative resolution of problems at all locations and tiers within a semiconductor supply chain. And it offers the ability to drive continuous improvement through a closed-loop plan-execute-measure-improve process.

### **SUMMARY**

With industry cycles getting deeper and faster, industry leaders are struggling to find ways to survive and master increasingly turbulent cycles. Oracle's semiconductor supply chain solution helps companies make real business improvements that drive bottom and top line performance by removing communication latency and enabling real-time collaboration between trading partners across the extended supply chain. Oracle's solution delivers a holistic view of your supply chain to help you achieve accurate consensus forecasts, optimized inventory, faster planning cycles, optimized postponement strategies, increased on-time delivery, and extended visibility across all the tiers of your supply chain. With Oracle, you can truly respond to unpredictable shifts in your customer demand.

Changes to planning and execution systems often paralyze semiconductor manufacturers because the change must be tediously replicated across several systems. Oracle's supply chain planning solution uses Oracle Shop Floor Management as the execution system, so change is trivial because it is made once, centrally, and propagated to all systems. With Oracle, change becomes an enabler, not a roadblock.



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