

# Optimizing the Supply Chain:

## Gaining Competitive Advantage through Supply Chain Management

SPE Online Presentation

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# Presentation Outline

- Introduction- Changing face of manufacturing and customer needs
- What is the “supply chain”
- Productivity in the supply chain
- Developing a supply chain strategy
- Role of information technology
- Tips for getting started

# Introduction

- Why is Supply Chain Management becoming an important competitive tool?

# Trends in Manufacturing

- OEM manufacturers made 75 percent of a product's components 25 years ago
- Today make only 25 percent of those components
  - Balance produced by strategic supplier/partners
  - Increasing reliability on design partners to help to develop new products
  - Distributors are playing a more important role

# Trends in Manufacturing

- Manufacturing base shifting from traditional regions to emerging economies
  - 85% of business machine and telecommunication manufacturing has migrated to the Far East
  - 75%+ of small appliances are produced in Far East
  - 60% of housewares are manufactured outside NA
  - More and more automotive components are sourced from Eastern Europe, Brazil or China.

# Trends in Manufacturing

- All industry groups have experienced some degree of migration
  - Manufacturing is evolving to a global enterprise.



# Trends in Manufacturing

- Concept design and development is still controlled from the product marketer

# Trends in Manufacturing

- Partnering in manufacturing and design has increased the need for better sharing of product information-from initial design through manufacturing, future design modifications and revisions



# Challenges

- Most industry sectors are experiencing increased pressure to:
  - Reduce costs
  - Improve efficiency
  - Increase innovation rate
  - Uncover opportunities around outsourcing and collaborative product development
  - Improve “time to market”

# Problem/Opportunity

- Faced with slow growth and pricing pressures manufacturing companies
  - Have undergone increasing mergers and acquisitions to achieve economies of scale
  - Reduced supplier base

# Problem/Opportunity

- New technology must offer performance benefits at no increased cost
- Quality and service are increasingly regarded as givens

# Problem/Opportunity

- R&D budgets are reflecting more co-developments with suppliers
- More outsourcing

# Paradigm Shifts for End Product Requirements (Electronics )

## Past

- Specifications unique for each intended market
- Specifications geared to specific manufacturing plants
- Agency regulations not harmonized for here and overseas
- Products specifications geared to trained installation professionals
- Energy efficiency and recyclability recommendations not furnished
- Requirements referenced extensive documentation

## Present

- Specifications describe global products
- Specifications not over constrained, manufacture anywhere
- Agency regulations harmonized to a greater degree
- Ease of installation, use and servicing (lower weight, cost, complexity)
- Expectations of lower operating costs( lower total cost of ownership)
- Products with diagnostics, intelligence (high electronic component)
- Environmental regulations in place (take back requirements)
- Product data management (PDM) files replace paper documentation

# The Changing Manufacturing Landscape- OEM Logic

## **Economies of Scale** **Recent Year's Technology**

### **Common Objectives**

- Economy of scale
- Experience curve
- Task specialization
- Work as a social activity
- Separable variable costs
- Standardization
- Expensive flexibility and variety

### **Desired Characteristics**

- Centralization
- Large Plants
- Smooth Flows and balanced lines
- Standard Product design
- Mass Production
- Inventory used as buffer

## **Economies of Scope** **Today's Global Technology**

### **Common Objectives**

- Economy of scope
- product life cycle
- Disaggregated supply
- Joint costs
- Unmanned systems

### **Desired Characteristics**

- Outsourcing
- Disaggregated supply
- Flexible lines
- Mass customization
- Innovation and responsiveness
- Production on demand
- External flow systems

Source: Jack Dispenza, Lucent Technologies

# As OEMs Continue to Outsource

- R&D organizations
  - Need to remain innovative
  - Provide knowledge reservoirs outside corporate limits
  - Provide state of the art quality measures

# As OEMs Continue to Outsource

- Contract Manufacturers
  - Handle lower volume and custom made products
  - Compliment their manufacturing technology with that of traditional and highly specialized suppliers

# As OEMs Continue to Outsource

- Traditional suppliers
  - Need to forge relationships with global manufacturing suppliers
  - Continue to implement new process and material technologies to create new competitive space
  - Provide more services

# Tactical to the Strategic

- Understanding your customers and markets can help you determine where to look in the supply chain for efficiencies and opportunities.
- Provide value-add either in manufacturing technology or services- bring “solutions”

# Thus...

- With the trend toward global marketing and manufacturing
  - *Short term*, the “extended supply chain” presents an opportunity for competitive advantage
  - *Longer term*, managing the supply chain efficiently and effectively will need to become a critical core competency for most companies

What is the Supply Chain?

# Definition of Supply Chain

- Needs clarification
  - Some see it as leveraging suppliers
  - Largely event based

# Beyond Sourcing Tools

- Manufacturers have realized a quick and measurable ROI from simple, tactical event based e-sourcing tools
  - 15% savings and cycle time reductions of 90%
  - 35% of firms with \$100MM or more spend use e-auctions but only still less than 5% of the spend
- More strategic sourcing can sustain these improvements, add value and competitive advantage.

# Manufacturing and the Supply Chain

- Initial efforts were to assist the procurement function and the selling function with little integration
- Portals- buying and design- made an effort to enhance collaboration but did not sufficiently educate to the benefits or adequately meet need
- Inventory management and logistics have come to the forefront
  - Re-think JIT

*The “extended supply chain” offers untapped potential for improved profitability and competitive advantage*

# Supply Chain

- The linked set of resources and processes that begins with the sourcing of raw material and extends through the delivery of end items to the final customer.
- It includes the transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers.

# Supply Chain

- It includes vendors, manufacturing facilities, logistics providers, internal distribution centers, distributors, wholesalers and all other entities that lead up to final customer acceptance

# Supply Chain

- The extended supply chain for a given company may also include secondary vendors to their immediate vendors, and the customers of their immediate customers

# Supply Chain

- Supply chains exist in both service and manufacturing organizations, although the complexity of the chain may vary greatly from industry to industry and firm to firm.

# Definition of Supply Chain

- Any function internally or externally that impacts the customer
  - Sourcing
  - Manufacturing
  - Operations
  - Marketing
  - Asset/Inventory management
  - Distribution
  - Customer service
  - Technical support

# Broader Definition “Extended Supply Chain”

- Offers potential opportunity at every step
  - R&D/Collaboration
  - Order management and fulfillment
  - Invoicing and payment
  - Capacity utilization
  - Inventory and work in process
  - Strategic management of the customer portfolio

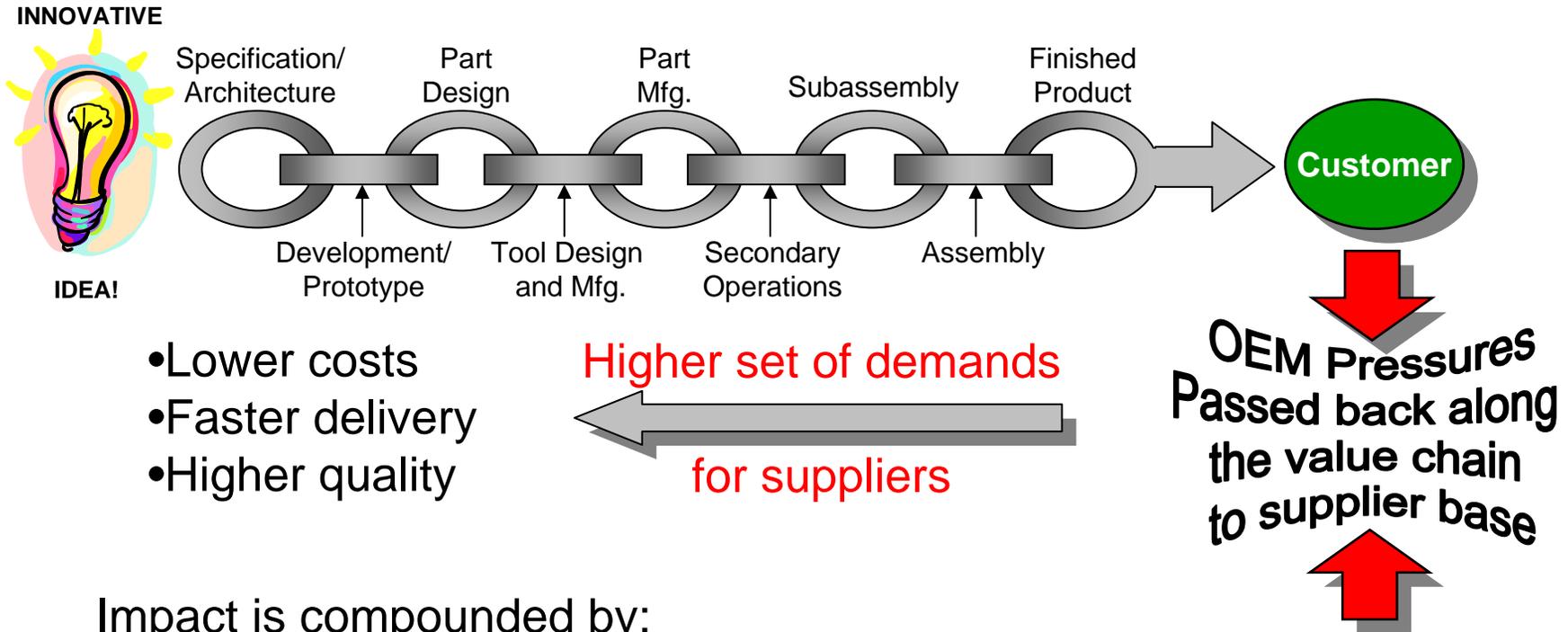
# Manufacturing Supply Chain

- Optimizing the supply chain requires understanding the market and analyzing the areas that have the greatest impact on the business process

# Supply Chain Management(SCM)

- Two sets of processes with different time horizons
  - Supply chain planning –process of managing the strategic and tactical operations
  - Supply chain execution-involves the tactical steps necessary to meet the demands of the plan

# Product/Part Delivery Value Chain

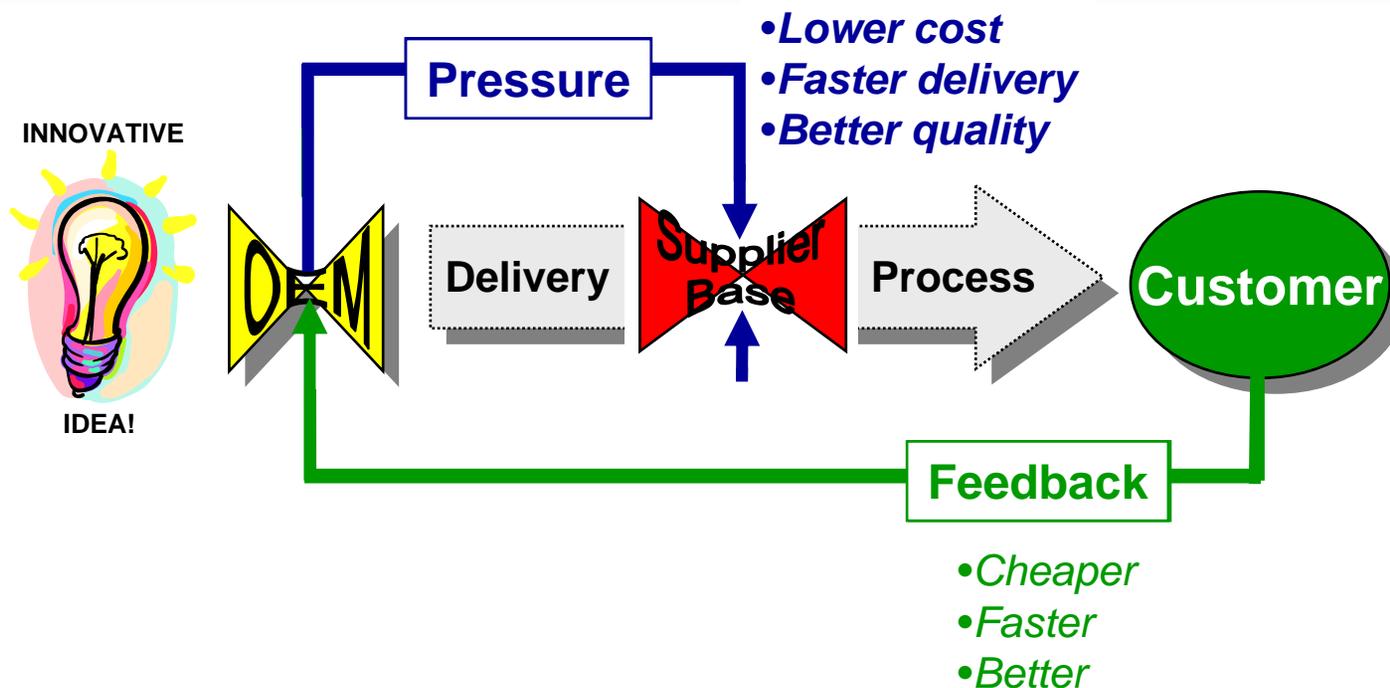


- Lower costs
- Faster delivery
- Higher quality

Impact is compounded by:

- Plastics industry is now starting to mature (consolidation within and along value chain, etc.)
- Increased globalization of customer base.
- Intense competition from overseas.
- Increased costs (e.g. energy, labor) squeezing plastics suppliers' profitability.

# Product Delivery Value Chain and Cycle

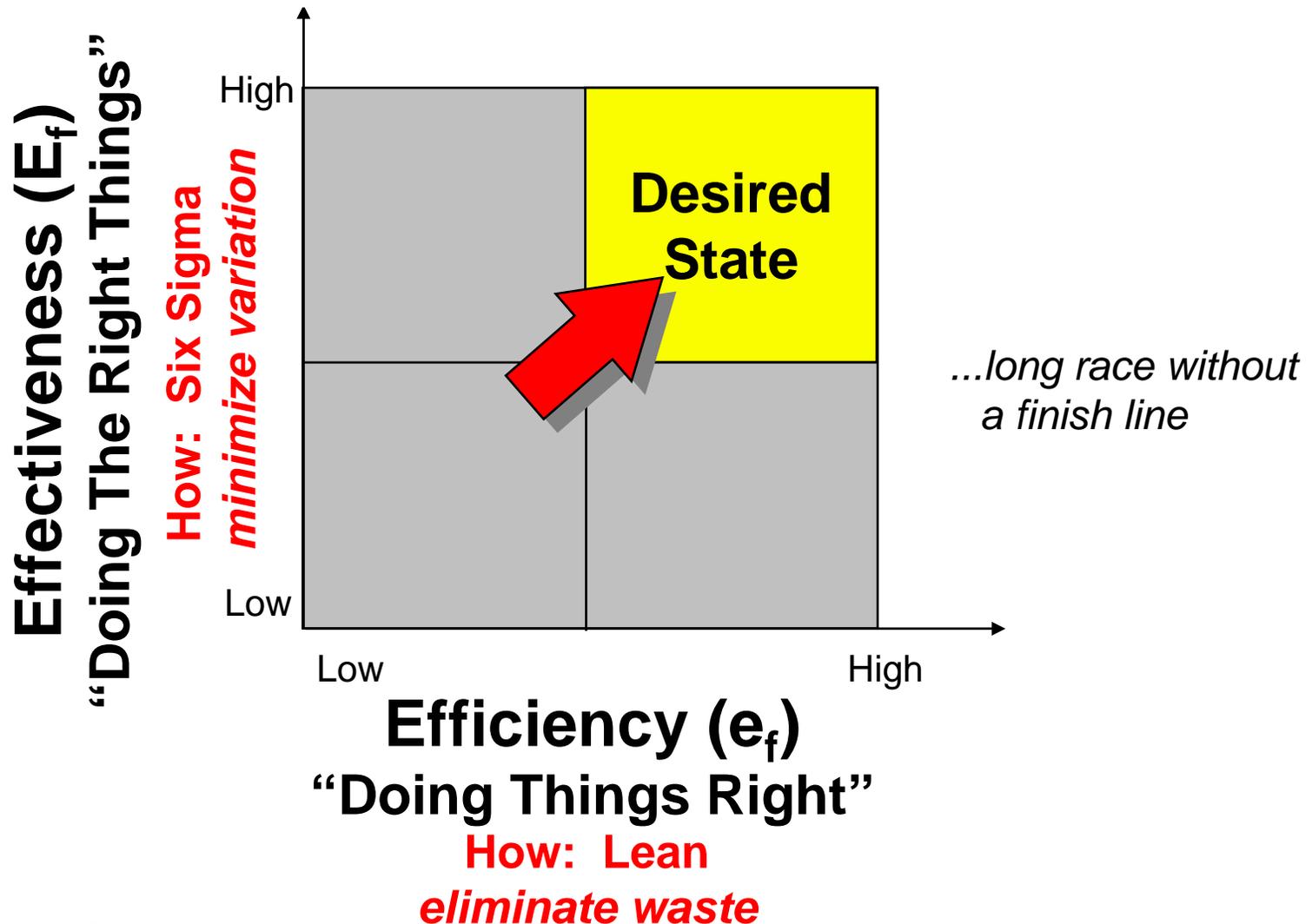


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# Today's Productivity Paradigm

**Productivity=Effectiveness x Efficiency**



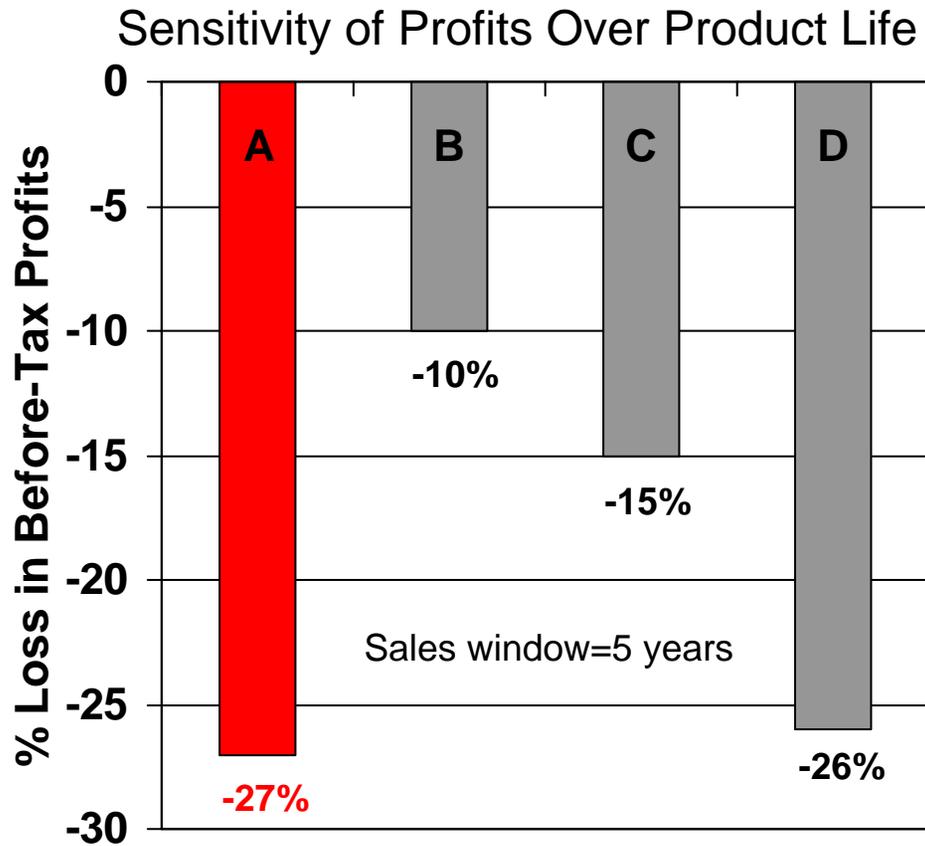
# Lean Manufacturing

- An overall methodology that seeks to minimize the resources required for production by eliminating waste (non-value added activities) that inflate costs, lead times and inventory requirements, and emphasizing the use of preventive maintenance , quality improvement programs, pull systems and flexible work forces and production facilities.
- Principles of lean include zero waiting time, zero inventory, scheduling (internal customer pull instead of push system), batch to flow (cut batch sizes), line balancing and cutting actual process times.
- Focus is eliminating waste: unnecessary motion, overproduction and work in process

# Six Sigma

- A vision of quality which equates with only 3.4 defects per million opportunities for each product or service transaction.
- An increase in performance and decrease in process variation lead to defect reduction and improvement in profits, employee morale and quality of product.
- A continual improvement process- strives for perfection

# Impact of Time To Market on Profits



“A”=Six Month Delay in Introduction

“B”=10% Higher Product Cost

“C”=10% Lost Sales Volume

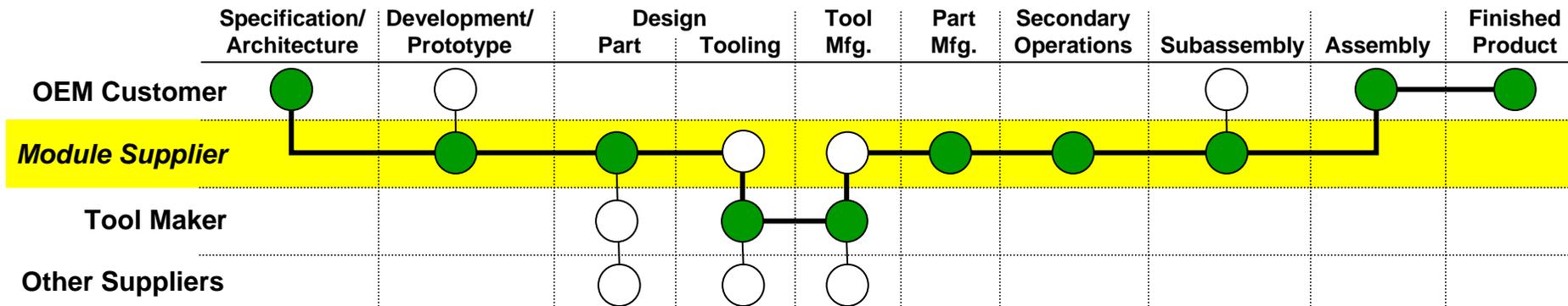
“D”=50% Increase in Development Cost

- Higher product cost and lost sales volume have marginal impact on profitability
- Six month introduction delay had biggest impact (27% reduction in profits)

Therefore, companies need to place a priority on keeping projects on schedule due to high value of time in the market place

# Extended Enterprise Delivery Process

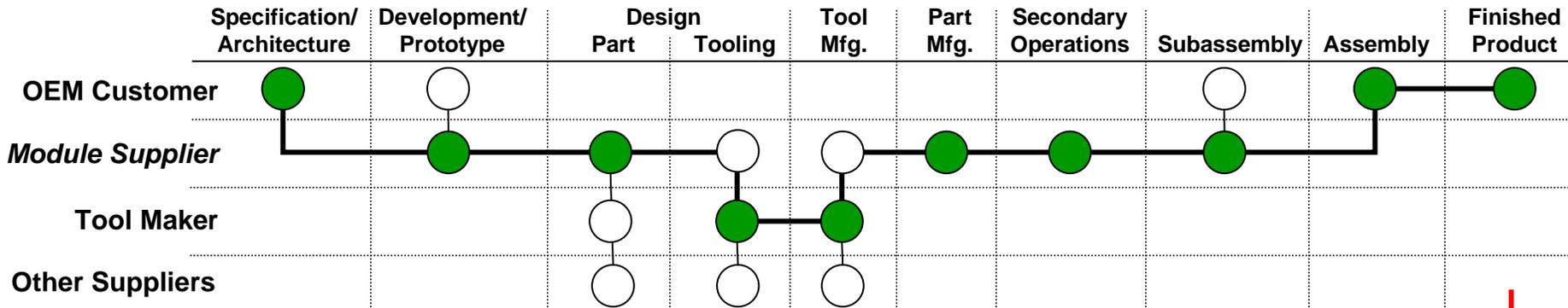
## Extended Enterprise environment



Shift of responsibility from OEM to a qualified “module supplier”

- “Molder” has prototyping capability, design competency and assembly operations
- Integration backward and foreword in value chain
- Responsibility stays with one group longer through value chain
- Hand-offs are minimized, therefore less opportunity to fail.
- Assuming same or lower price at end, the “profits” or “margins” are distributed back along the value chain to those who add value from parts to assemblies.
- Example show faster overall delivery at lower “total acquisition cost”

# Flexibility of the Supply/Value Chain



**Flexibility**  
 How fast the value chain can react to changes from consumer

- Must be able to react to OEM's customer environment with goal that the cost of change is zero
- "Lean" principles<sup>1</sup>
  - Value: only defined by customer; specific product, need, price and time
  - Value Stream: identify value added, eliminate waste in / between each step
  - Flow: remove impediments/barriers to continuous material flow
  - Pull: "pull" products through value chain; what, when and how they want it
  - Perfection: continuous radical and incremental improvements
- Strive for shortest pipeline; the more uncertainty in predicting product demand, the shorter the pipeline needs to be.
- Requires efficient and effective communication along value chain

# Paradigm Shifts for the Manufacturing Company

## Past

- Get material, make stuff, stock the warehouse, done (The good old days)
- Development was sequential
- Manufacturing had a component focus
- Products manufactured for specific customers / regions
- Vertical integration

## Present

- Collaborate on design, get material, create product, distribute
- Development is concurrent
- Manufacturing has a system level focus
- Products manufactured for global markets
- Advanced manufacturing integrates people, process and technology

# How to Develop a Supply Chain Strategy

# Where do you start?

- What is your customer's supply chain?
- How are your customers segmented-by market, by needs, etc.?
- What is your supply chain?
- How can you play a more significant role in your customers supply/value chains?
- Are there opportunities where you can bring a “solution” to a need- alone or through collaboration with another participant in the chain?

# Where do you start?

- Do a thorough analysis of the market, competition and customer profile
  - Using an experienced outside research firm to support and guide the management team
  - Shift paradigms/ “Think outside the Box”
  - Think “solutions”

# Where do you start?

- Develop and formulate strategies to predict outcome of real world effects
  - Changing customer needs
  - Manufacturing capability
  - Raw material quality and supply
  - Shipment times
  - Inventory levels

# Modeling

- Requires identifying and measuring the critical variables:
  - Market dynamics
  - Customer needs
  - Optimal inventory levels
  - Understanding critical core competencies
  - Establishing supplier partnerships to provide non-core but critical service needs.

# Embrace Philosophies of Continuous Improvement

- First- Lean Manufacturing
- Then - Six Sigma

# Role of Information Technology

# Operations vs. Technology

- Technology is a **tool** not an end in itself
- Operation focus is critical to understand how to benefit from IT
- IT assists in enabling speed and flexibility

# Operations vs. Technology

- Since the Internet bubble burst, companies have been event focused- they demand a faster return from IT companies
- In 2004, manufacturing companies are beginning to invest again in technology solutions that address the edge of the enterprise

# Tools

- Philosophies that provide framework- e.g. Lean Manufacturing ([www.mep.org](http://www.mep.org))
- Decision support tools (modeling), e.g. Ronamax ([www.ronamax.com](http://www.ronamax.com))
- Supply Chain Council ([www.supply-chain.org](http://www.supply-chain.org)) developed the SCOR reference model (Supply Chain Operations Reference)

# Tools-Technology

- ERP software- e.g. IQMS
- Supply Chain management- examples
  - IFS
  - I2
  - Manugistics
  - SAP
  - Ingenuus
- Collaborative software- e.g. Co-Create

# Ten Traits of Outstanding Supply Organizations

(Purchasing Magazine, G.H.Associates March 2003)

- Commitment from the CEO/President to Supply Chain importance
- Understanding role in creating and satisfying customers
- Suppliers are our friends –not adversaries
- Best practices are in place and followed
- Seamless supply chain management
- Team-based decision making
- A culture of value engineering/value analysis
- Openness to innovation
- Focus on best suppliers
- Continuous quality improvement

# Opportunity to Create a New Value Proposition

- Suppliers are driven to compete predominately on a unit manufacturing cost (UMC) basis by OEMs against formidable offshore competitors.
- As an industry, we need to find that new competitive plane and offer a value proposition that will yield a new and more robust competitive advantage.

“..I believe that the pure product era is coming to a close. **Products wrapped in services are what will provide sustainable revenue and profit for business in the net economy.** We are looking at every product and seeing how we can wrap that in service to make it more valuable to our customers, more efficient for us to distribute, more powerful in the market place.”

Carly Fiorina  
CEO, HP  
E-service World 2000  
Paris, France, March 13, 2000

# “How to” Conclusions

- A thorough understanding of customers and markets served is needed to identify supply chain opportunity
- Lean Manufacturing and Six Sigma philosophies need to be in practice
- Technology is a tool to enable supply chain flexibility and speed.

# “Strategic” Conclusions

- Supply chain management needs to become an integral part of the business strategy
  - Developing a supply chain strategy will improve profitability
  - Managing the enhanced supply chain offers opportunities for sustainable competitive advantage
- Better to seize the opportunity than play catch up!

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