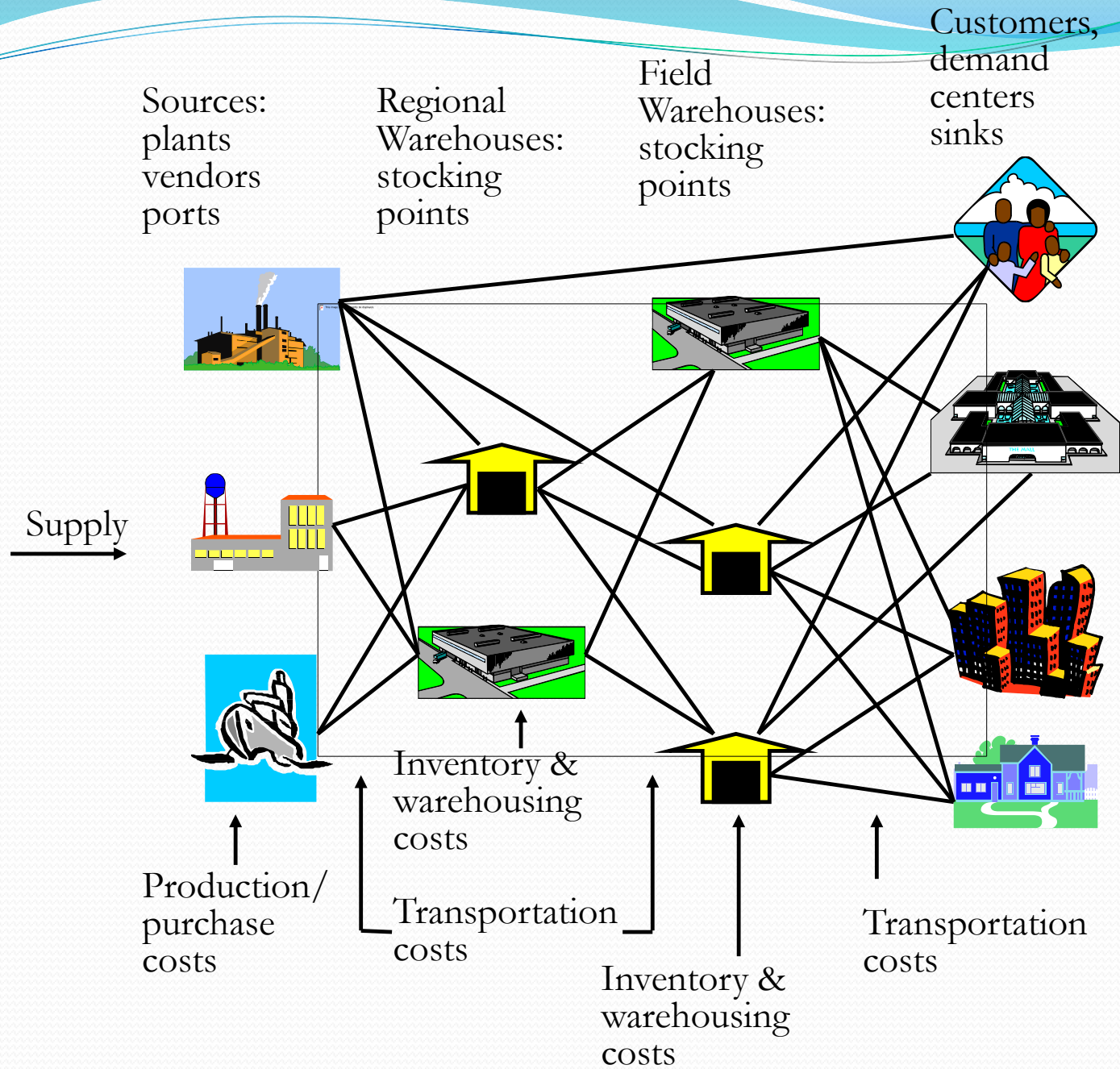
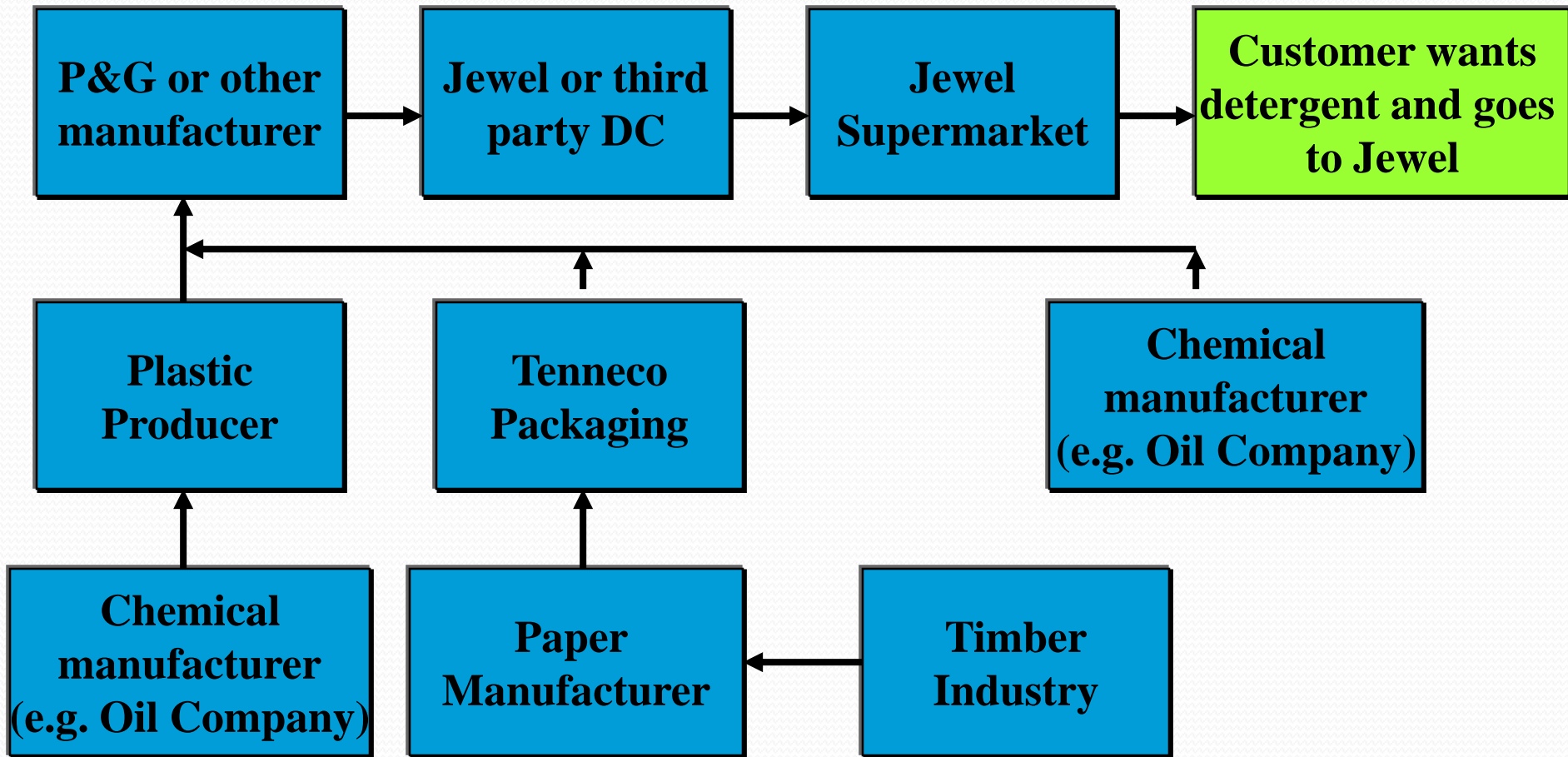


# Introduction to Supply Chain Management



# What is a Supply Chain?



# What Is A Supply Chain?

- The system of suppliers, manufacturers, transportation, distributors and vendors that exists to transform raw materials to final products and supply those products to customers.
- That portion of the supply chain which comes after the manufacturing process is sometimes known as the distribution network.

# What Is the Goal of Supply Chain Management?

- Supply chain management is concerned with the **efficient integration** of suppliers, factories, warehouses and stores so that merchandise is produced and distributed:
  - In the right quantities
  - To the right locations
  - At the right time
- In order to
  - Minimize **total system** cost
  - Satisfy customer service requirements

# Dell's Supply Chain as an example

- Bypasses distributors and retailers and sells directly to end customers
- Centralizes manufacturing and inventories in a few locations and postpones final assembly until orders arrive
  - Faster to the market (if Intel introduces a new chip)
  - No inventory held for certain items (Sony monitors)
  - Defects are not introduced into a large quantity of products (due to low inventory)

# Decision phases in a supply chain

## 1. **Supply chain strategy or design** (several years)

- products to be produced
- chain configuration
- resources to be allocated
- facilities and relevant capacities
- markets to be served

## 2. **Supply chain planning** (a quarter to year)

- which markets will be supplied from which locations
- make or buy
- inventory policies to be followed
- timing and size of marketing

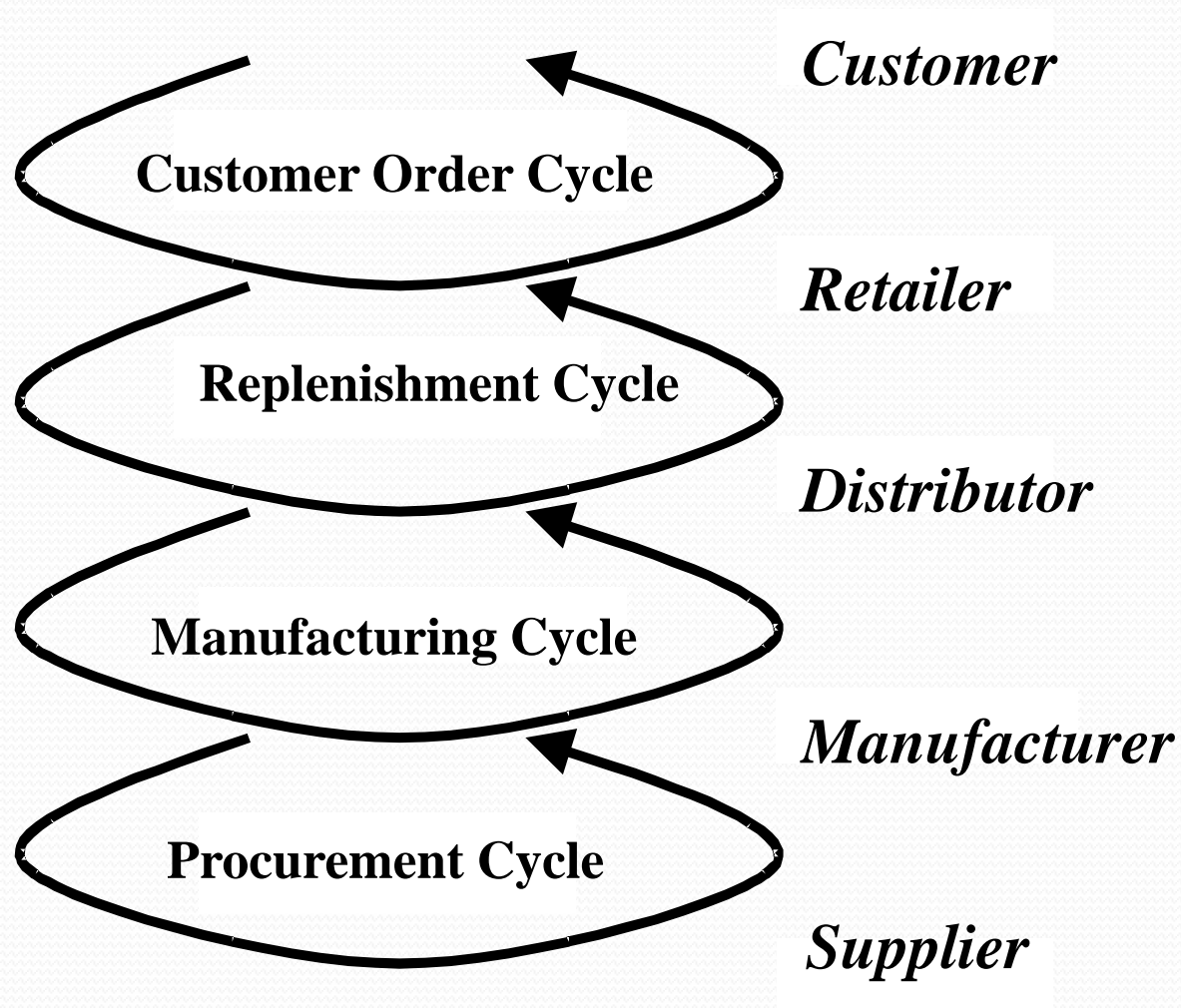
## 3. **Supply chain operation** (weekly or daily)

- handling incoming customer orders

# Process View of a Supply Chain

- Cycle view: processes in a supply chain are divided into a series of cycles, each performed at the interfaces between two successive supply chain stages
- Push/pull view: processes in a supply chain are divided into two categories depending on whether they are executed in response to a customer order (pull) or in anticipation of a customer order (push)

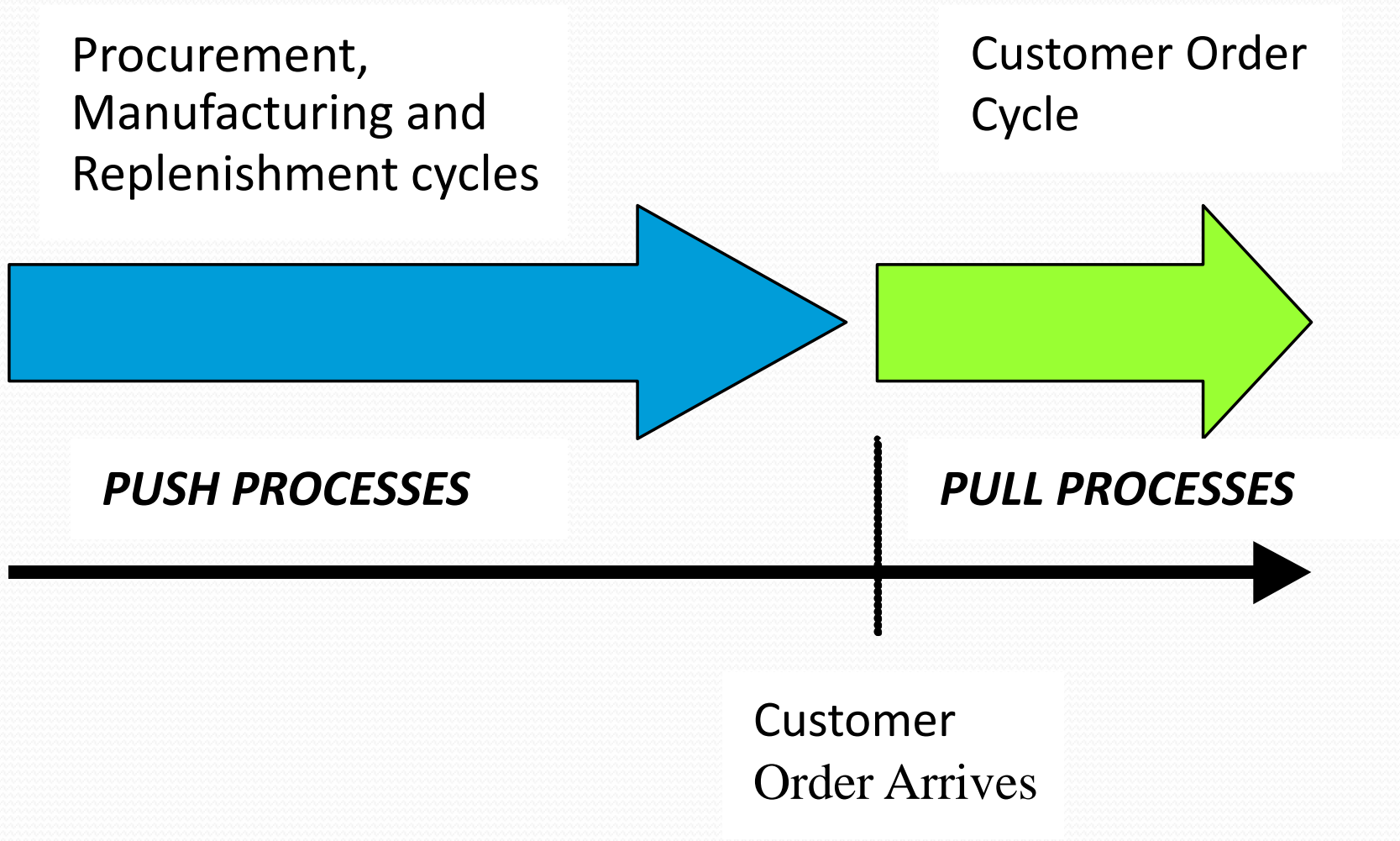
# Cycle View of Supply Chains



# Cycle View of a Supply Chain

- Each cycle occurs at the interface between two successive stages
- Customer order cycle (customer-retailer)
- Replenishment cycle (retailer-distributor)
- Manufacturing cycle (distributor-manufacturer)
- Procurement cycle (manufacturer-supplier)
- Cycle view clearly defines processes involved and the owners of each process. Specifies the roles and responsibilities of each member and the desired outcome of each process.

# Push/Pull View of Supply Chains



# Push/Pull View of Supply Chain Processes

- Supply chain processes fall into one of two categories depending on the timing of their execution relative to customer demand
- Pull: execution is initiated in response to a customer order (reactive)
- Push: execution is initiated in anticipation of customer orders (speculative)
- Push/pull boundary separates push processes from pull processes

# Supply Chain Macro Processes

All supply chain processes discussed in the two process views can be classified:

- Customer relationship management
- Internal supply chain management
- Supplier relationship management



# Dell.com

Corporate strategy

E-commerce

Supply chain

# Overview of a company

- Company sells build-to-order computer systems directly to a wide range of customers – from the largest enterprises and government agencies to individual home PC enthusiasts.
- Company's innovations are driven by customer needs, cutting edge solutions and strategic partnerships:
  - ★ Listen → Solve → Impact
- Dell helps drive the course of future industry innovation through a time-tested process that puts customer needs first.

# About the company

- “We do businesses directly with customers, one at a time, and believe we do it better than anyone in the planet.” – Dell
- Dell’s focus is to make computing easy like it should be, so that even regular people will be able to use computers.
- Company’s climb to market leadership is a result of its persistent focus on customer.
- Dell teams work hard to meet the needs of each customer with carefully tailored computing solutions.
- “We communicate directly to our customers – in person, via the internet or by phone, so our understanding of their need is instantaneous.” – Dell
- Focusing on customer helps Dell efficiently and effectively deliver the products and satisfy the customers.
- Dell.com is one of the world’s leading web sites.
- Nearly one out of every five standards-based computer system sold in the world today is a Dell.

# Facts about Dell

- Uniquely enabled by its direct business model, Dell sells more systems globally than any computer company, placing it No. 34 on the Fortune 500.
- Dell's climb to market leadership is the result of a persistent focus on delivering the best possible customer experience by directly selling standards-based computing products and services.
- The company is based on a simple concept: by selling computer systems directly to customers, Dell could best understand their needs and efficiently provide the most effective computing solutions to meet those needs.
- This direct business model eliminates retailers that add unnecessary time and cost, or can diminish Dell's understanding of customer expectations.
- The direct model allows the company to build every system to order and offer customers powerful, richly configured systems at competitive prices.
- Dell also introduces the latest relevant technology much more quickly than companies with slow-moving, indirect distribution channels.

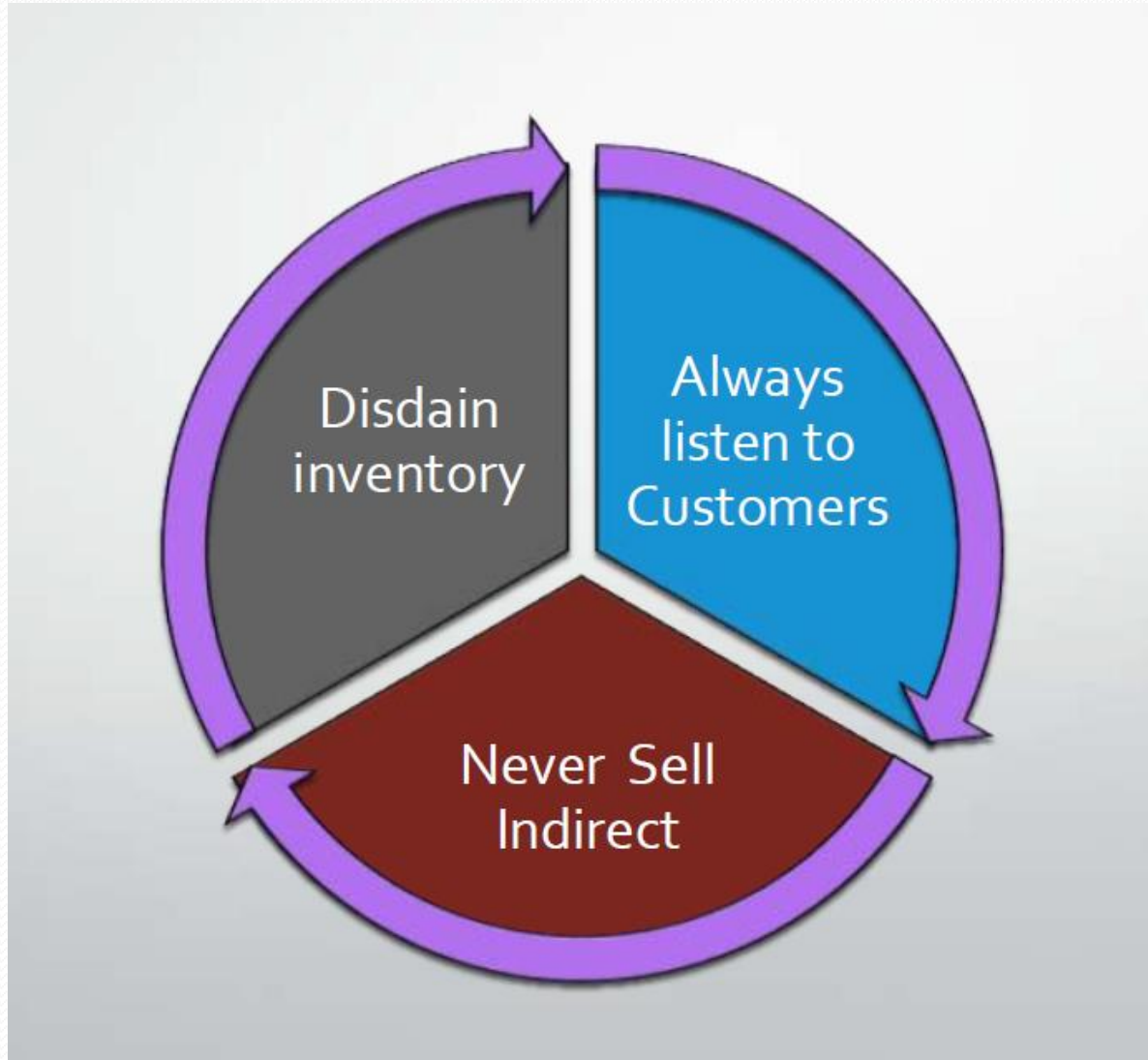
# History

- 1984 - Michael Dell founds Dell Computer Corporation.
- 1985 - Company introduces the first computer system of its own design; the Turbo, featuring Intel 8088 processor.
- 1987 - Dell is first computer systems company to offer next-day, on-site product service. International expansion begins with opening of subsidiary in United Kingdom
- 1988 - Dell conducts initial public offering of company stock, 3.5 million shares at \$8.50 each
- 1990 - Manufacturing center in Limerick, Ireland, opened to serve European, Middle Eastern and African markets
- 1991 - Introduces its first Latitude notebook computer
- 1992 - Dell included for first time among Fortune 500 roster of world's largest companies
- 1993 - Subsidiaries in Australia and Japan are company's first entries into Asia-Pacific region
- 1995 - \$8.50 shares of Dell stock worth \$100 on presplit basis
- 1996 - Customers begin buying Dell computers via Internet at [www.dell.com](http://www.dell.com).
- 1997 - Dell joins ranks of the top-five computer system makers worldwide. Dell ships its 10-millionth computer system. Per-share value of common stock reaches \$1,000 on presplit basis.
- 1998 - Dell opens a production and customer center in Xiamen, China.
- 1999 - Dell opens manufacturing facility in Eldorado do Sul, Brazil, to serve Latin America. Dell introduces "E-Support Direct from Dell" online technical support

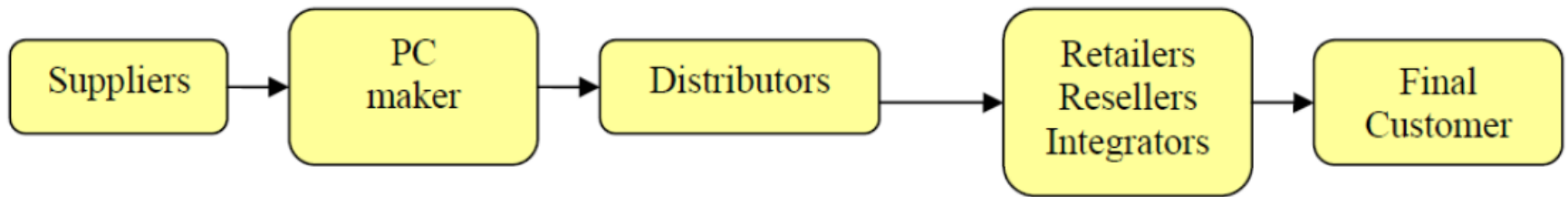
# History (cont'd)

- 2000 - Company sales via Internet reach \$50 million per day. For the first time, Dell is No. 1 in worldwide workstation shipments. Dell ships its one millionth PowerEdge server.
- 2001 - For the first time, Dell ranks No. 1 in global market share. Dell is No. 1 in the United States for standard Intel architecture server shipments.
- 2002 - Consumers choose Dell as their No. 1 computer systems provider.
- 2003 - Dell introduces printers for businesses and consumers. Dell launches Dell Recycling to enable customers to recycle or donate to charity computer equipment from any manufacturer. The name change to Dell Inc. is official, reflecting the evolution of the company to a diverse supplier of technology products and services.
- 2005 - Dell tops list of "America's Most Admired Companies" in Fortune Magazine. Opens third major U.S. manufacturing location in Winston-Salem, North Carolina.
- 2006 - Dell ships more than 10 million systems in a single quarter (Q4, FY06) for the first time in its history.
- 2007 - Michael Dell returns as Chief Executive Officer. Dell opens manufacturing facility in Chennai, India.

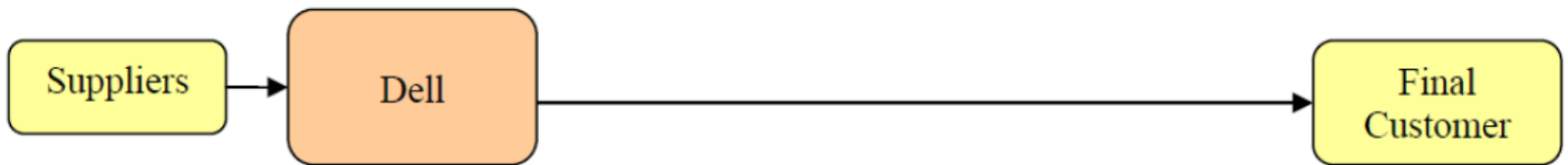
# Three golden rules of Dell



# Dell and direct sales



*Indirect Distribution Channel of the PC Industry*



*Dell's Direct Distribution Channel*

# Dell and direct sales

Dell Computer's direct model departed from the industry's historical rules on several fronts:

- The company outsourced all components but performed assembly.
- It eliminated retailers and shipped directly from its factories to end customers.
- It took customized orders for hardware and software over the phone or via the Internet.
- It designed an integrated supply chain linking Dell's suppliers very closely to its assembly factories and order-intake system

# Dell and direct sales

- Dell started the direct-sales approach, eschewing the then-dominant indirect model that interposes a network of distributors, value-added resellers, and retailers between PC makers and PC buyers.
- Selling direct lowered Dell costs by 25-40% compared to competitors.
- Dell passed these savings to customers.
- Dell believed that this could help best understand customers' needs and provide the most effective computing solutions to meet these needs.
- Dell's model is based on build-to-order process, where company builds each PC on demand.
- Customers can choose what components they want for their computer, Dell then assemble the order and ships it.
- This strategy improves customer satisfaction and reduces costs and risks to the company.

# Benefits of direct sales method

- Direct sales in conjunction with build-to-order is a powerful model for both Dell and its customers.
- Customers get what they want, rather than be forced to choose among a fixed set of options.
- Dell wins because by developing and building only those systems that customers want, it eliminates the excess cost of buying too many components, having high storage and inventory costs, and having to sell the surplus at a loss.
- Dell can use savings in other areas such as web site improvement, marketing and distribution.

# Goals and strategies

- Dell's emphasis on tech-savvy PC buyers is making online selling easy, because high-end PC buyers were obvious users of internet and early adopters of e-commerce.
- In order to succeed in online selling Dell needed a configurator, which let buyers select among computer models and variety options and components. When a customer clicked on an option the exact cost was immediately added.
- The Configurator also records buyer's preferences, giving Dell immediate access to buying patterns.
- By 2000, online sales were running at \$50 million per day and made up more than half of all Dell product sales.

# Confusion and need of change

- Although Dell.com is undeniably successful, two studies of online PC buying gave company confusing picture of the effectiveness of its online sales efforts.
- Only 1 out of every 100 visits to Dell.com resulted in sale – 99 percent of visitors left before buying.
- This fact was confusing because Dell enjoyed over 70 percent market share among online PC vendors.
- Dell needed to carefully analyze this and understand buyer behavior and focus on best possible opportunities for online sales growth.

# Understand customer needs and behavior

- Study revealed extremely high attrition rates among visitors to Dell.com.
- Online PC buying involves three phases: browsing, configuration and checkout.
- 50 visitors out of 100 leave the site in the browsing phase, 48 leave in configuration and 1 leaves checkout phase.
- Only 1 percent of customers is converted to a paying customer.
- Converting even a few percent more visitors into customers could have a massive impact on sales.
- These visitors are not just buying from competitors.
- The question is how to get people to buy computers online?!
- Buyers want to compare different products, so they shop around, visiting multiple sites multiple times before buying.
- Although 99 percent of visitors leave Dell.com before buying, many of them come back later.
- The average buyer from Dell visits website six times before buying.
- Among visitors are competitors who visit website numerous times.
- 90 percent of visitors to Dell.com never bought PC online.

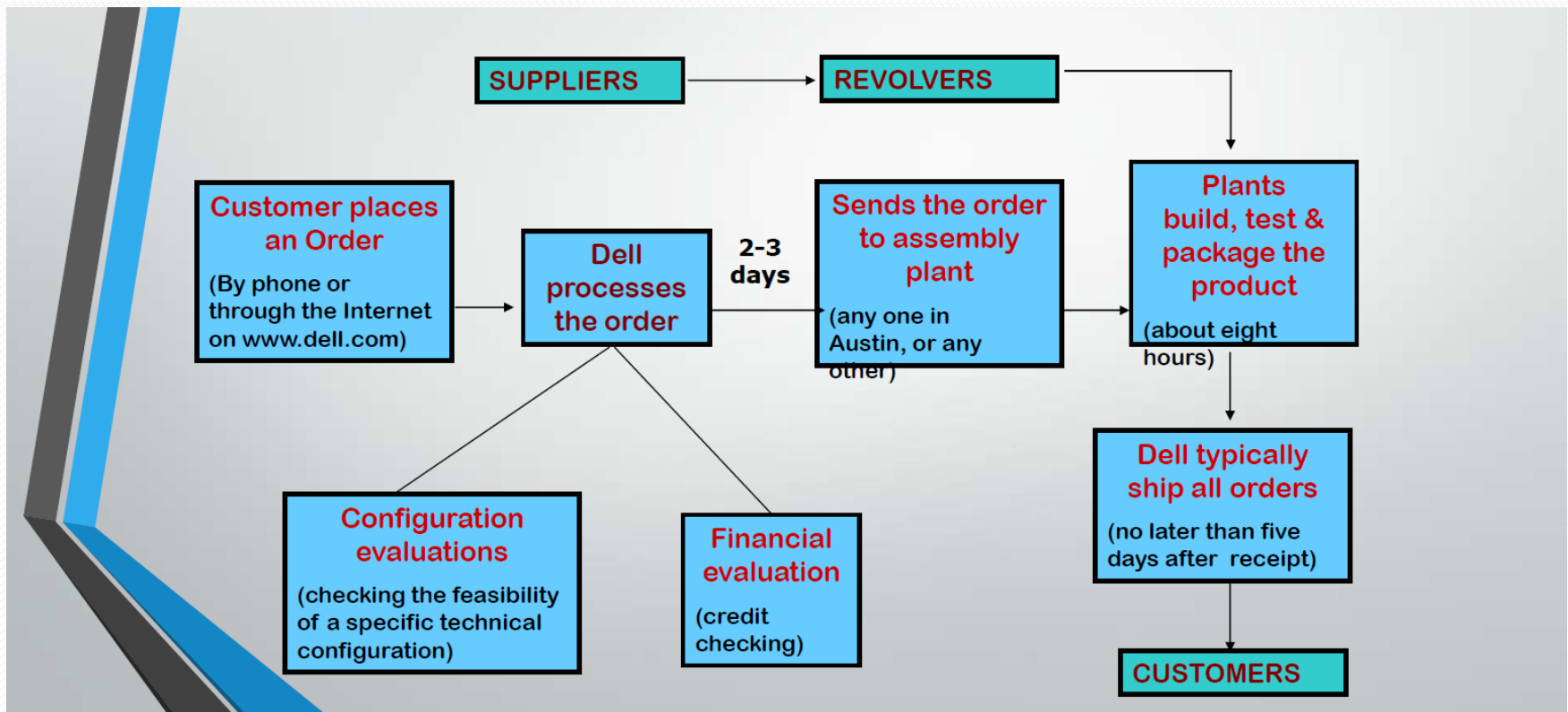
# Converting visitors to customers

- Targeted customers and actual customers don't match. Targeted customers were tech-savvy people who knew what they wanted and knew what each component does to your computer. On the other hand potential customers that were visiting site were 90 percent people who never bought PC online.
- First of all it takes more than 5 clicks to get to actual component selection which is in configuration phase.
- Second, there is lack of practical information about each component that customer chooses.
- Third, it takes too long to get to checkout phase. There are so many components and services available that customer can just lose patience.

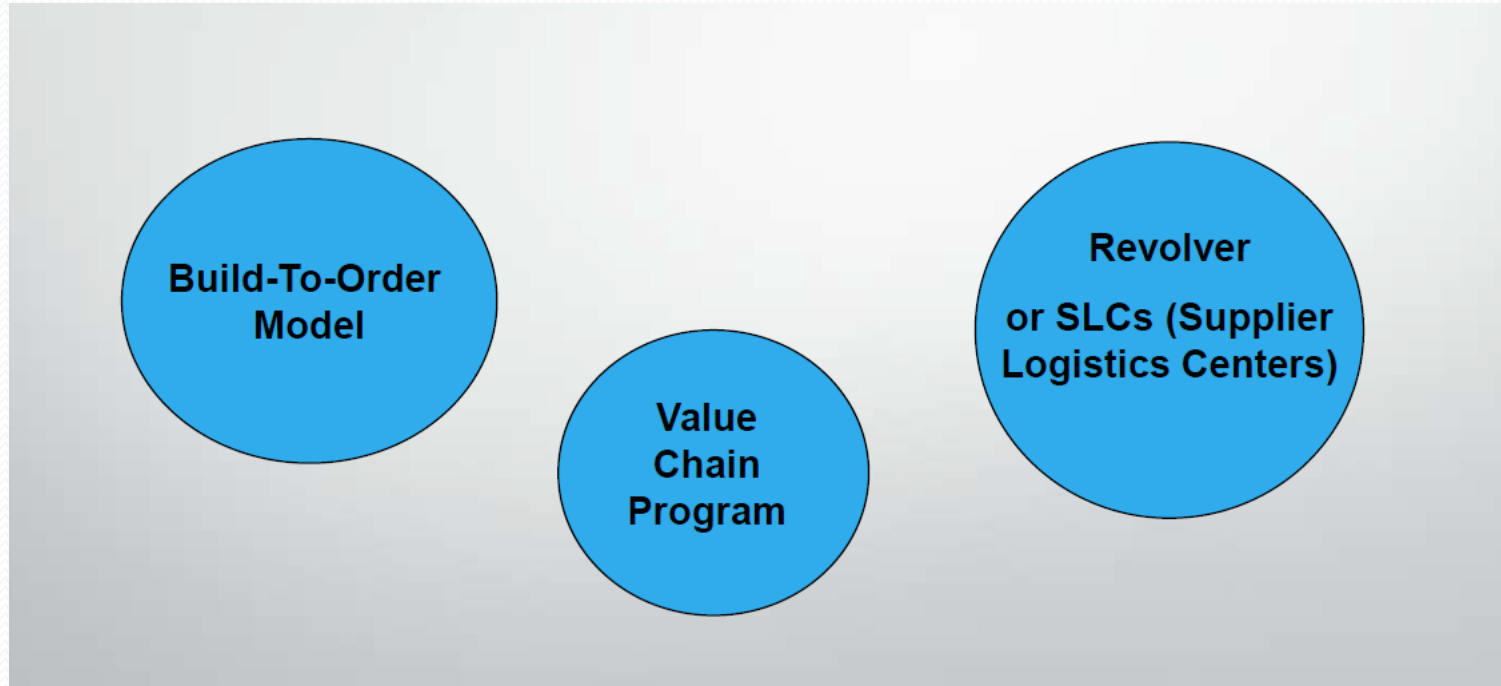
# Dell's supply chain

Dell's success is a combination of:

- Direct Sales.
- Inventory Management
- Supplier Integration



# Dell's supply chain



# Dell's supply chain

- In contrast to others who produce-to stock, Dell first receives the order and the money and only then starts to build, using that money to purchase from supplier
- Therefore there is customization of products for each and every customer.
- While other companies had to guess, Dell knew exactly what its customers wanted before manufacturing the product
- Others had to maintain inventory as middlemen existed, so as to support reseller and retail channels.

# Dell's supply chain

To compensate for long lead times & buffer against demand variability, Dell requires its suppliers to keep inventory on hand in the revolvers.

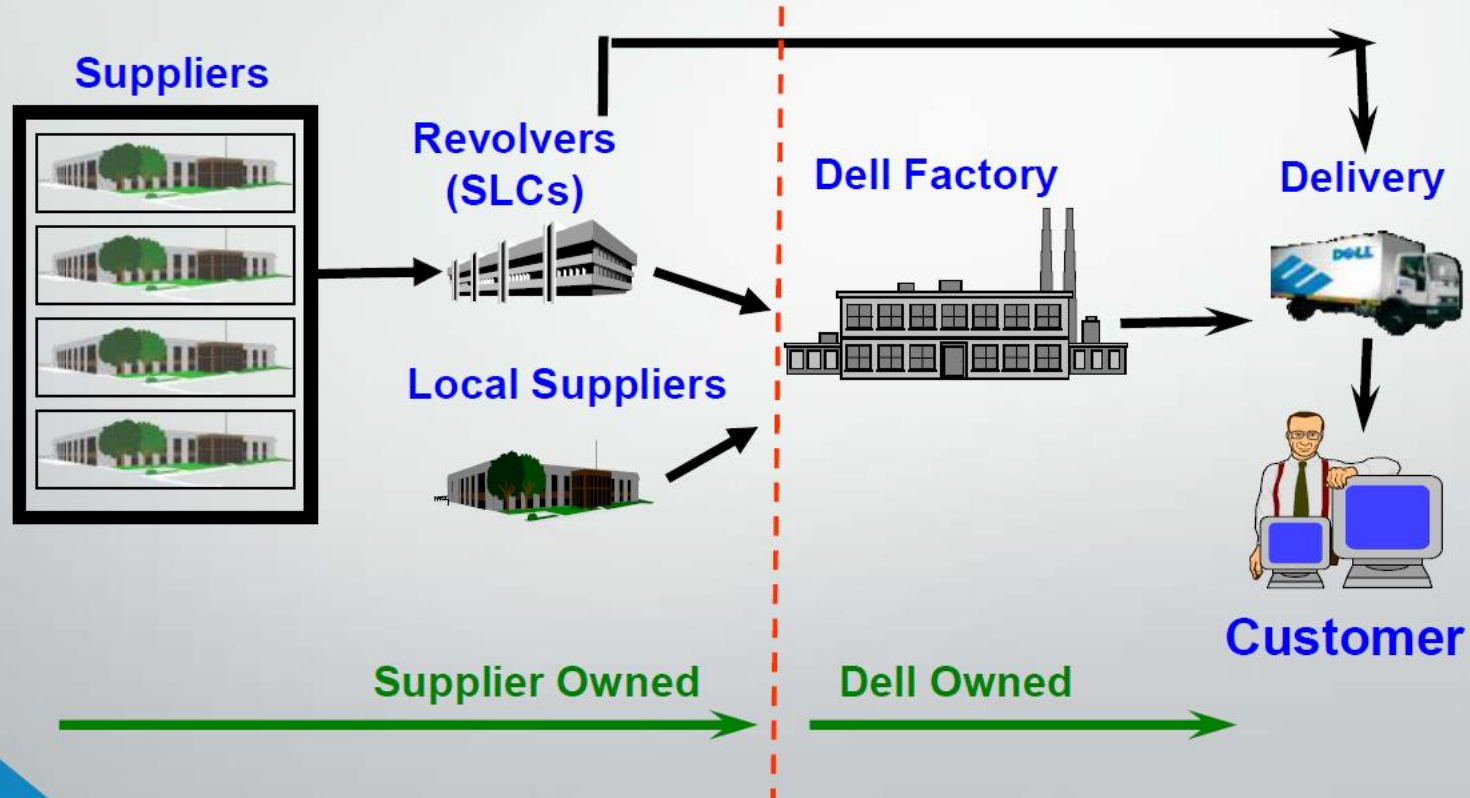
- **Revolvers or supplier logistics centers (SLCs)** are small warehouses located within a few miles of Dell's assembly plants.
- Each of the revolvers is shared by several suppliers who pay rents for using their revolver.
- Dell does not own the inventory in its revolvers; this inventory is owned by suppliers & charged to Dell indirectly through component pricing.

# Dell's supply chain

- Dell has a special vendor-managed-inventory (VMI) arrangement with its suppliers
- Suppliers decide how much inventory to order & when to order while Dell sets target inventory levels & records suppliers' deviations from the targets.
- Dell withdraws inventory from the revolvers as needed -- on average every two hours.
- It uses a quarterly supplier scorecard to evaluate how well each supplier does in maintaining this target inventory in the revolver.

# Dell's supply chain

3 days of inventory - Inventory turns of 122 per year



# Dell's supply chain: efficiency vs. responsiveness

The Dell supply chain would be considered very responsive.

**COMPETITIVE STRATEGY:** For Dell, the competitive strategy targets customers who value having the latest PC models customized to their needs. Furthermore, these customers want the PCs delivered within a few days.

**DEMAND UNCERTAINTY:** Given the vast variety of PCs, the high level of innovation and rapid delivery, demand from Dell customers can be characterized as having high uncertainty.

# Dell's supply chain: efficiency vs. responsiveness

- An efficient supply chain uses slow, inexpensive modes of transportation and economies of scale in production.
- If Dell chose this it would have difficulties in supporting the customer's desire for rapid delivery and a wide variety of customizable products
- Building a responsive supply chain, however, will allow Dell to meet its customers' needs. Therefore, a responsive supply chain strategy is best suited to meet the needs of Dell's targeted customers.

# Dell's supply chain: efficiency vs. responsiveness

- Dell gives a choice to customers to make customized models for their requirement, and delivers them at their door steps.
- This increases the implied demand uncertainty for Dell which needs a responsive supply chain.
- To provide these services to the customer additional costs are involved for carrying huge inventory for all the parts which cannot be charged to the customers, because Dell has to be competitive in the market to survive.

# Dell's supply chain: strategic fit

- As a solution to the increased cost Dell closely collaborates with suppliers, which allows Dell to operate with only a few hours of inventory for some parts and a few days of inventory for other common components.
- This way the supplier will have less demand uncertainty which can be handled through an efficient supply chain.
- Thus Dell absorbs most of the uncertainty and provides responsiveness in its supply chain and its supplier being efficient absorbs very low uncertainty.
- To achieve strategic fit Dell brings consistency between implied demand uncertainty and supply chain responsiveness.

# Dell's supply chain: strategic fit

Dell's competitive strategy is to provide a large variety of customizable products at a reasonable price.

- A supply chain strategy that emphasizes flexibility and responsiveness has a better strategic fit with Dell's competitive strategy of providing a large variety of customizable products.
- This notion of fit also extends to Dell's other functional strategies. For instance, its new product development strategy should emphasize designing products that are easily customizable, which may include designing common platforms across several products and the use of common components.
- This feature allows Dell to assemble customized PCs quickly in response to a customer demand.
- Dell clearly has achieved strong strategic fit between its different functional strategies and its competitive strategy.