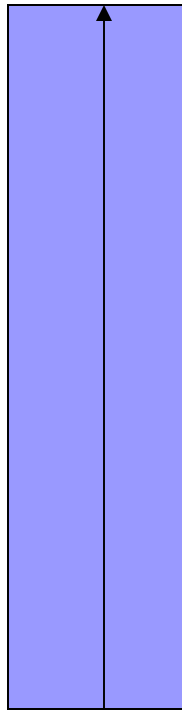




Where is Your Decoupling Point?

Bruce Hildenbrand CPIM
Mid-Hudson APICS, January 2008

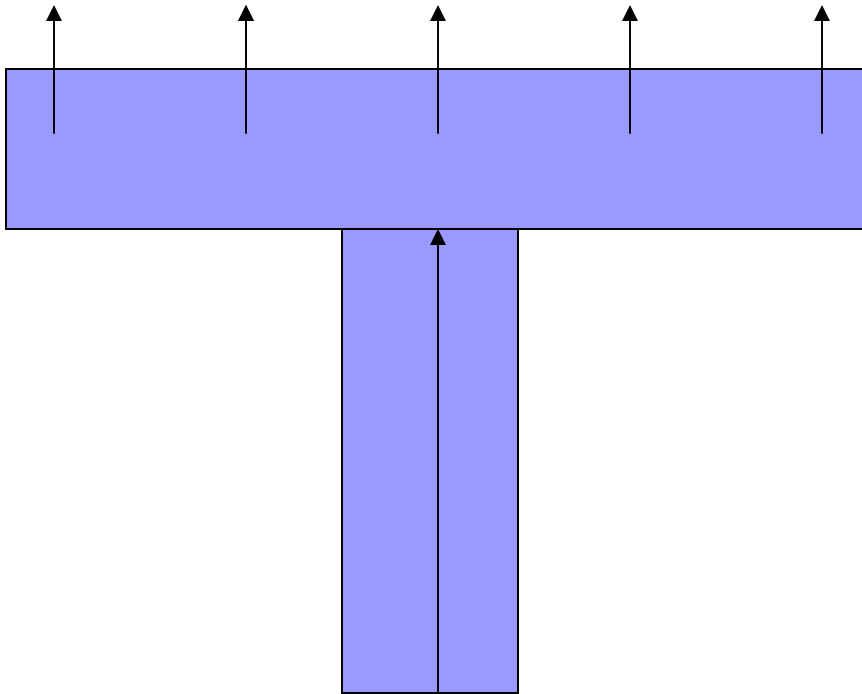
“i”



Basic linear production

Examples?

“T”

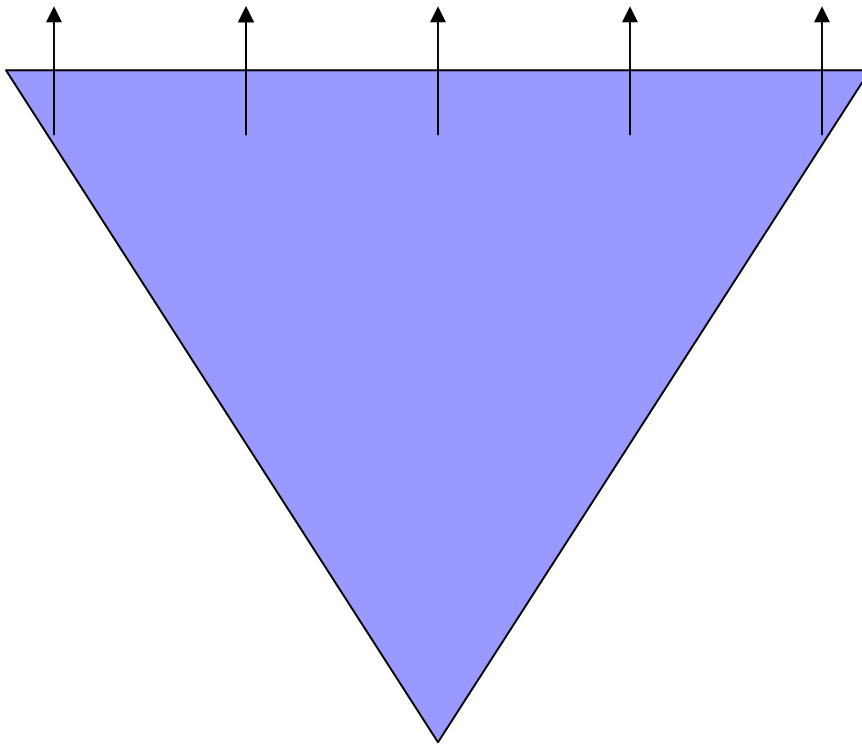


Many simple product or packaging variations or distribution points

Low variety of products

Examples?

“V”

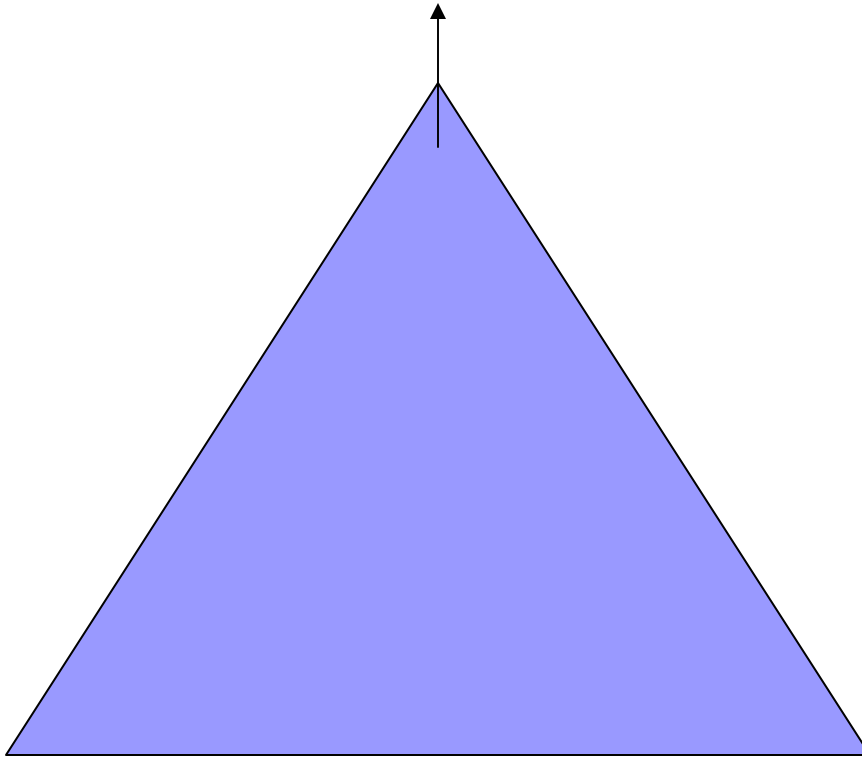


Many end products

Few raw materials

Examples?

“A”

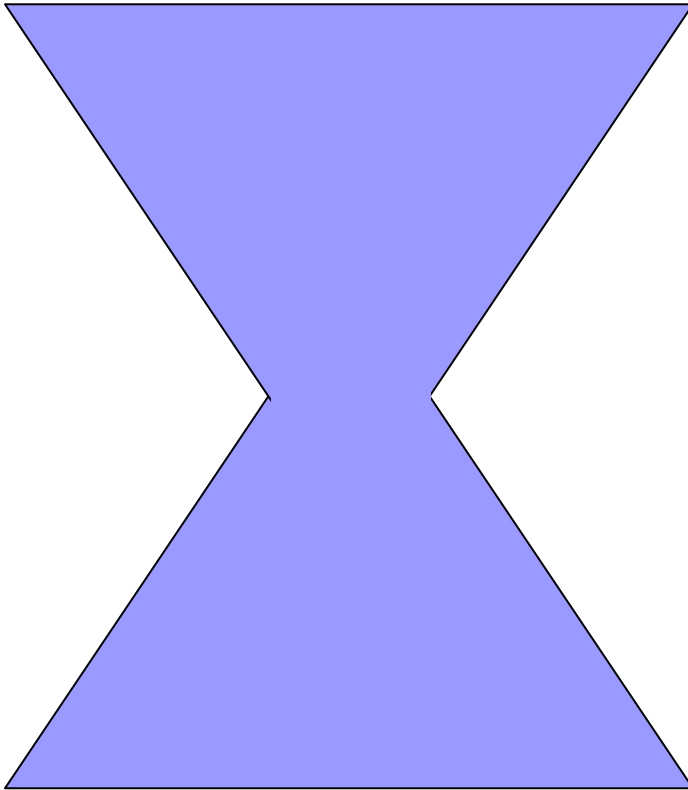


Few end products

Many raw materials
and sub-assemblies

Examples?

“X”



Many end products

Many raw materials
and sub-assemblies

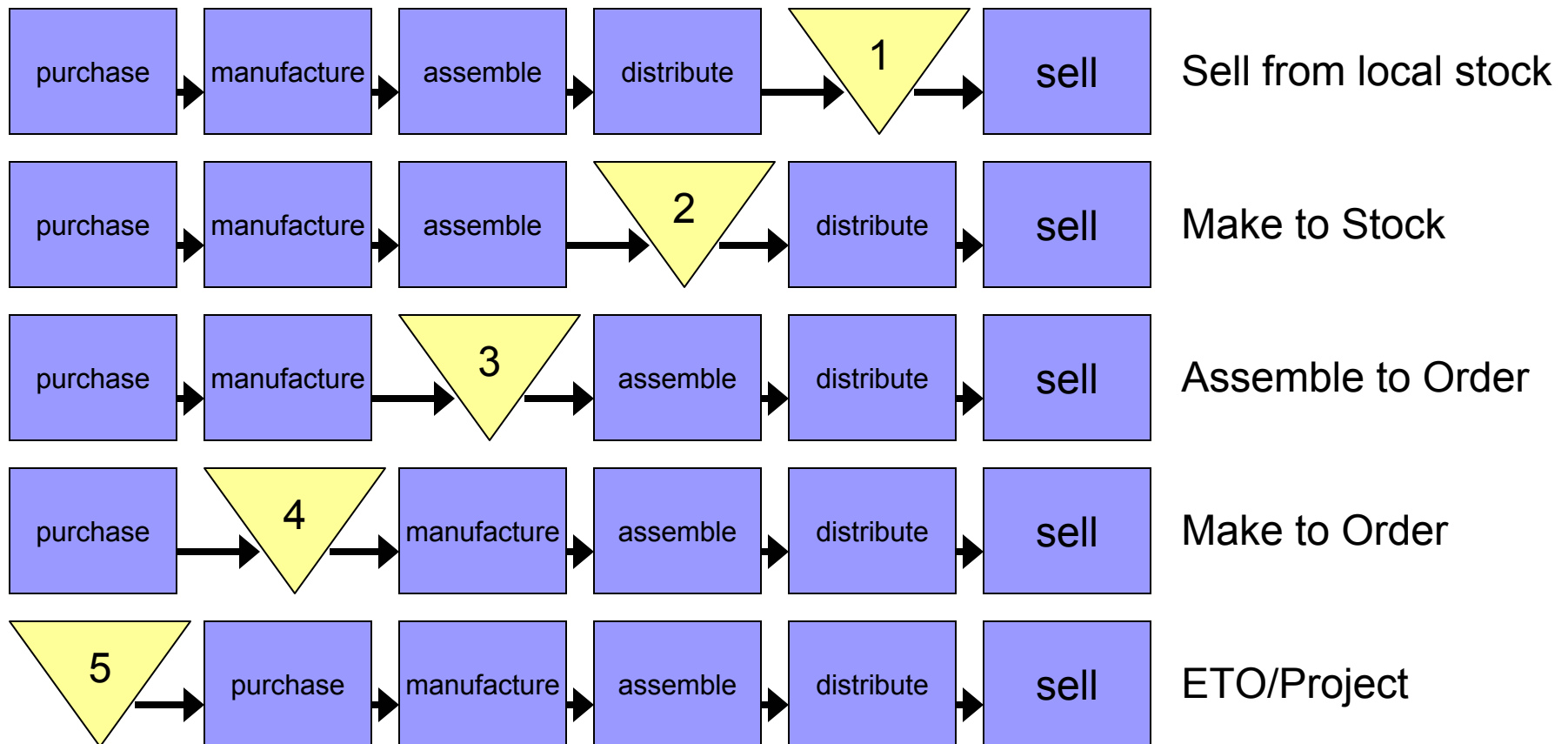
Examples?

Definitions

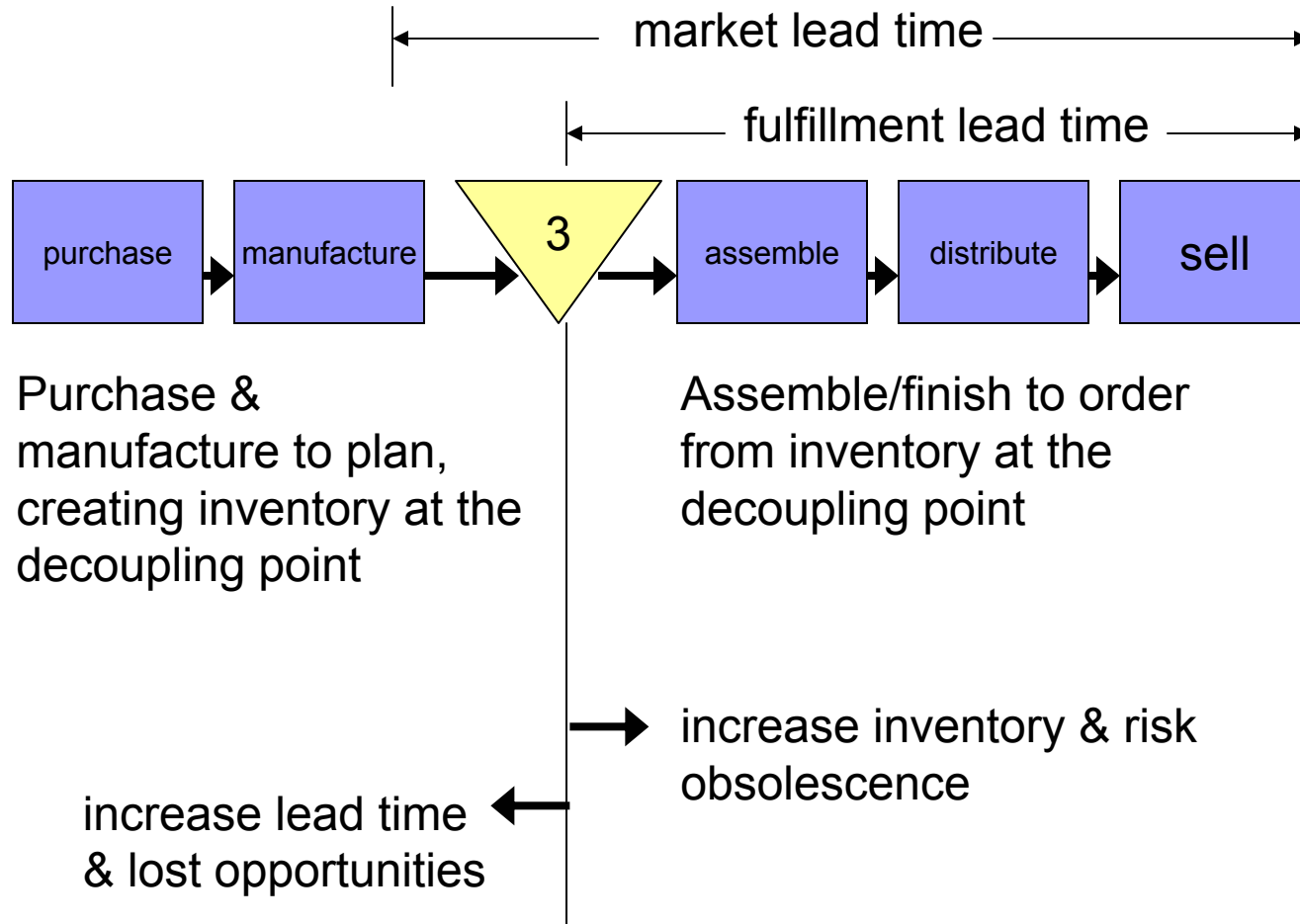
from APICS Dictionary, 11th Edition

- “**decoupling points** : The locations in the product structure or distribution network where inventory is placed to create *independence between processes* or entities. Selection of decoupling points is a strategic decision that determines customer lead times and inventory investment. See: control points.”
- “**control points** : In the theory of constraints, strategic locations in the logical product structure ... Detailed scheduling instructions are planned, implemented, and monitored at these locations...”
- “**order penetration point** : The key variable in a logistics configuration; the point (in time) at which a product becomes earmarked for a particular customer. *Downstream from this point, the system is driven by customer orders; upstream processes are driven by forecasts and plans.* Syn: principle of postponement.”
- “**postponement** : A *product design* strategy that shifts product differentiation closer to the consumer by postponing identity changes, such as assembly or packaging, to the last possible supply chain location.”

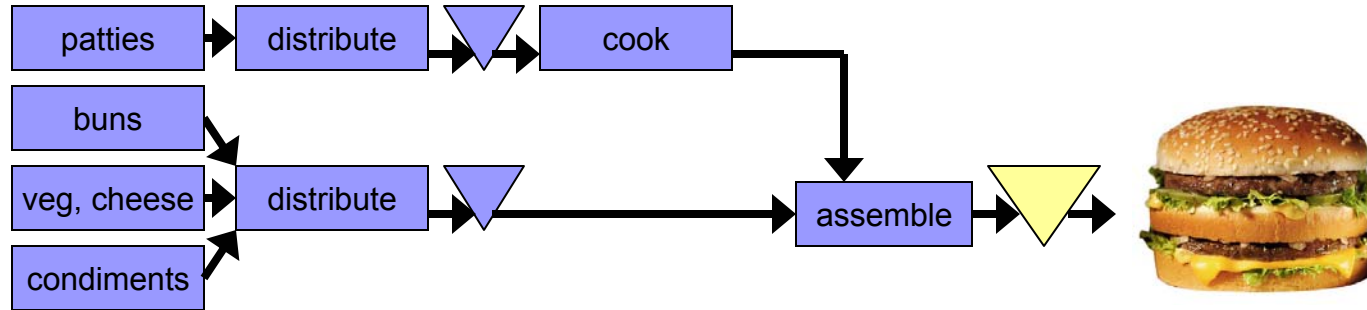
Generic Customer Order Decoupling Points



Tradeoffs



A familiar example – MTS vs ATO



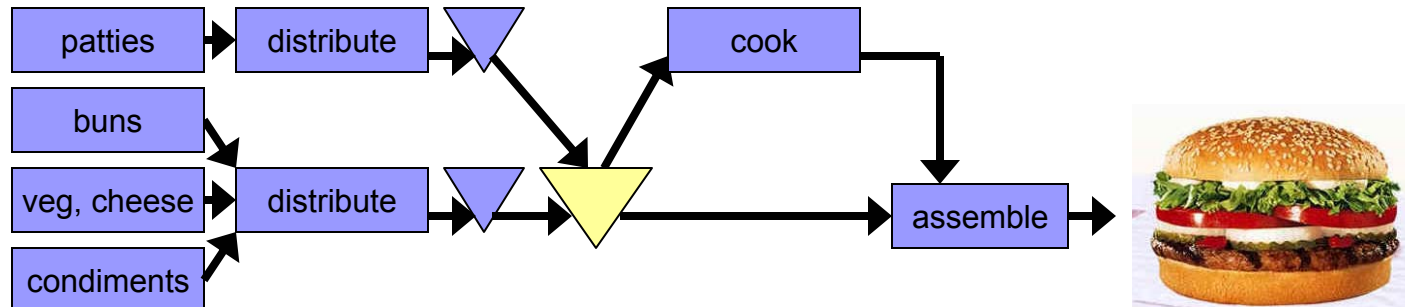
Per sandwich costs:

patties \$.40, other ingredients \$.15, cook \$.10, assemble \$.10

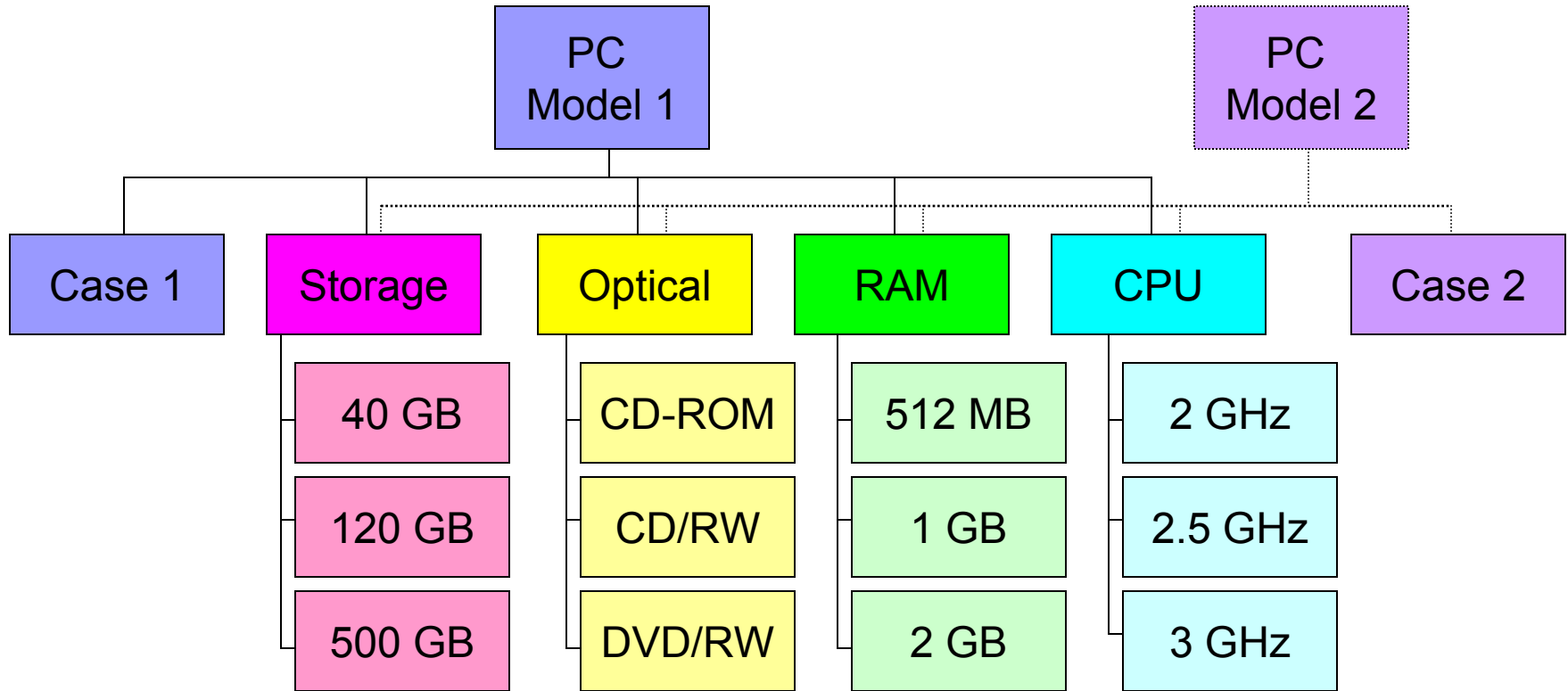
Finished goods inventories? WIP? Local stock?

Risk?

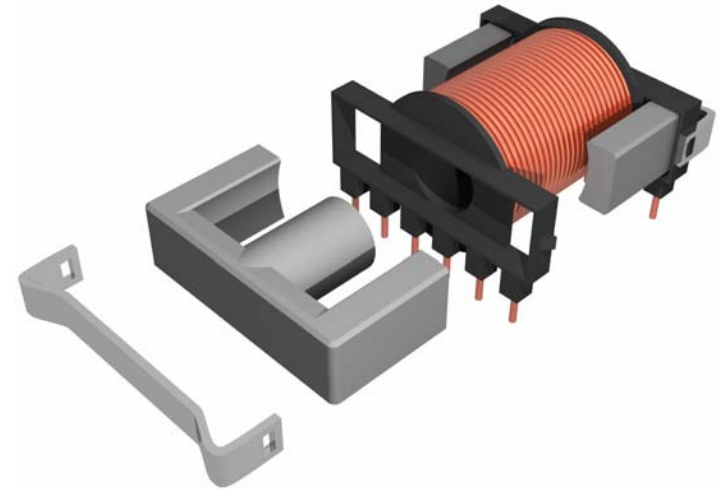
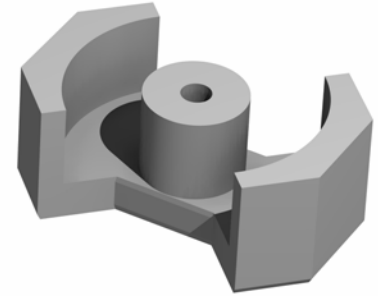
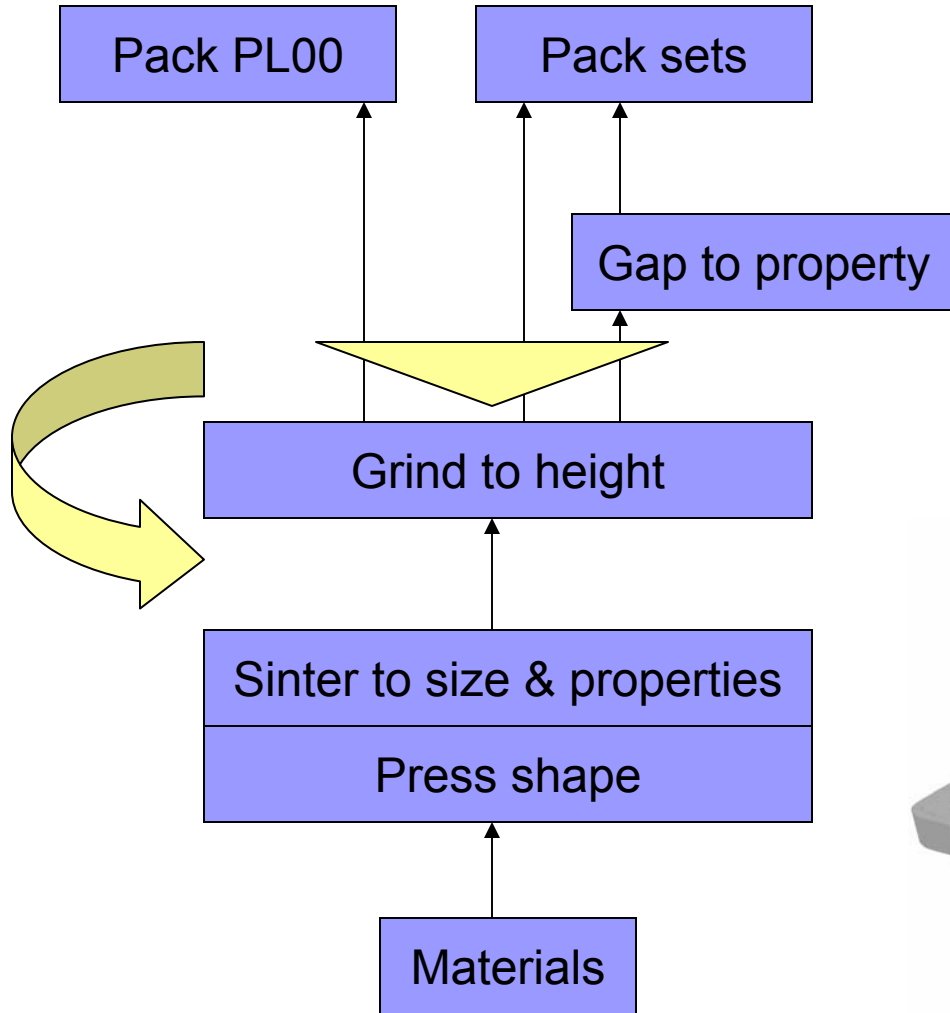
Lead time?



Example 2



Example 3



Example 4

Camco – Montreal (owned by GE Canada)

Washers, Dryers, and Dishwashers

450 models, \$500 million sales

1980's :	1990's:
120 day planning horizon, 60 days frozen	Make-to-Order project
Growing inventories	Kanban project
75% fill rate	95% customer satisfaction
Labor-intensive forecast process	30 families, less detailed forecast
120 day production cycle	3 day order turnaround
12 week supply of elec wires (external supply)	3 day supply of elec wires (external supply)

2004: still Canada's #1 appliance maker, and #1 supplier of GE dryers; inventory turns were about 12 (vs sales), and the company credits their Six Sigma program for reduced quality costs and enabling other changes

References:

James F. Cox, CFPIM; *Effective Placement of Manufacturing Inventories*; 1989 APICS International Conference Proceedings

Jeff Agar, John Schroeter; *Tackling Tough Supply Chains*; 2003 APICS International Conference Proceedings: Case study of Steelcase, mentions postponement strategy for textiles used on furniture

Sudipta Bhattacharya; *Inventory Velocity: Impact, Metrics, and Best Practices*; 2003 APICS International Conference Proceedings

Raymond M Reed; *Master Scheduling and the Bill of Material: United They Stand, Divided They Fall*; 1990 APICS International Conference Proceedings: Includes example of a hydraulic valve maker gaining MTO advantage through process analysis

Claude Duguay and Michel Lavoie; *Make to Order at Camco*; 1992 APICS International Conference Proceedings

Camco Annual Report 2004;

http://www.moffatappliances.ca/corporate/financial/Camco_AR04_Eng.pdf



What Does Your Supply Chain Look Like?

What Should Your Supply Chain Look Like?

- Customer interface – lead time vs frequency of demand
- Efficiency – demand volatility vs margin
- New products – market life vs design time
- Economies of scale – market size per plant vs transport % of price
- Power position – importance of supplier to customer vs customer to supplier
- Decoupling point – market lead time vs production lead time