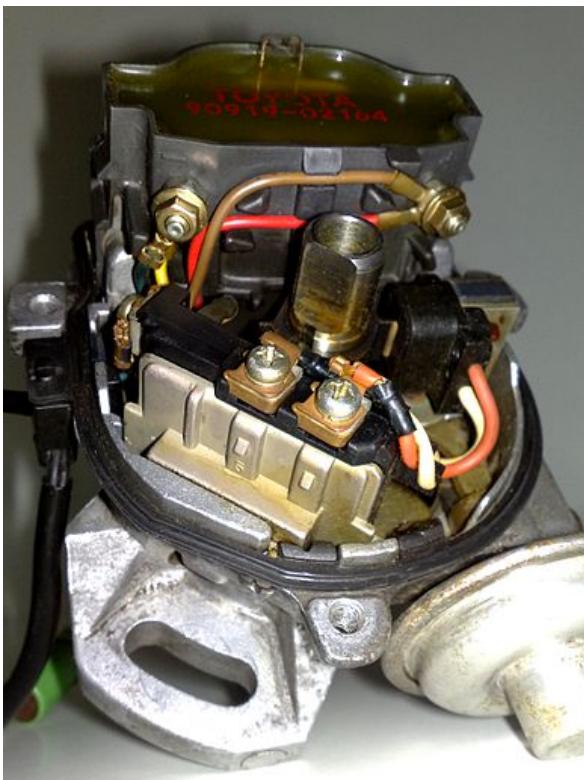


Introduction to Logistics & Supply Chain Management





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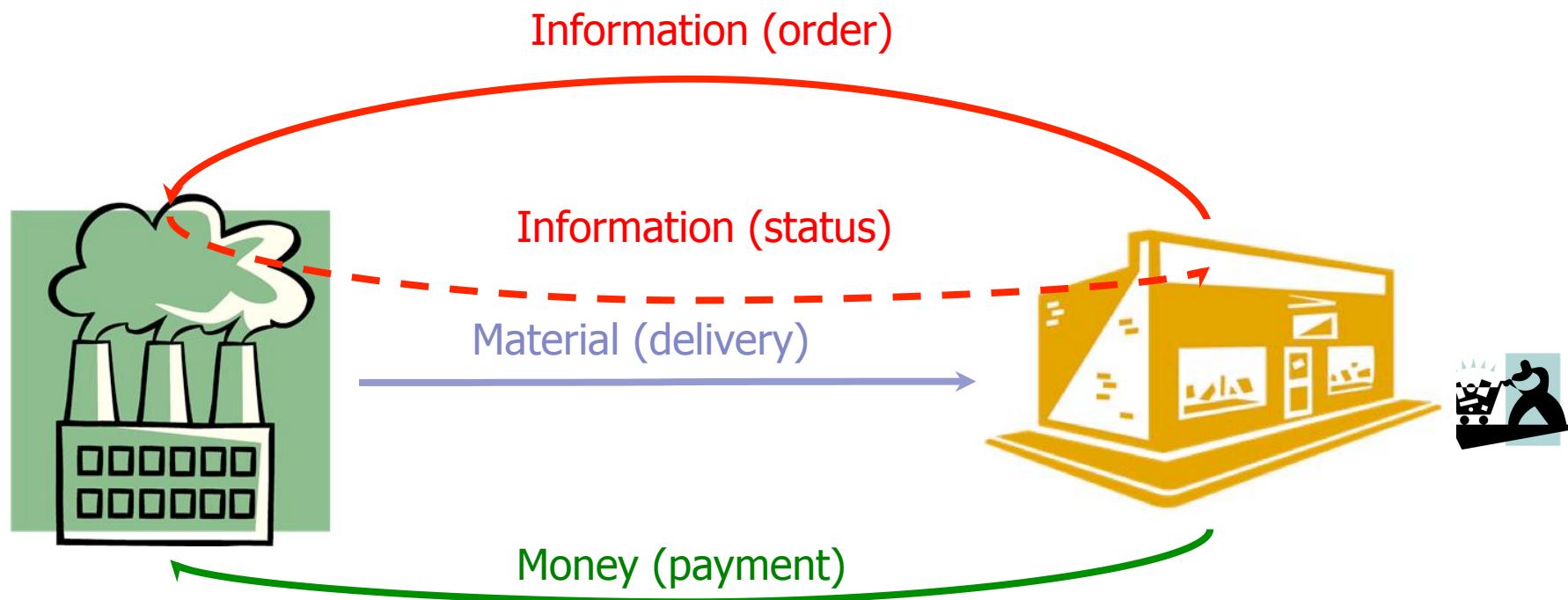
Five Questions

1. What is a supply chain?
2. What are *logistics* and *supply chain management*?
3. How should you view SCM?
4. What are the challenges
5. Why should you care?

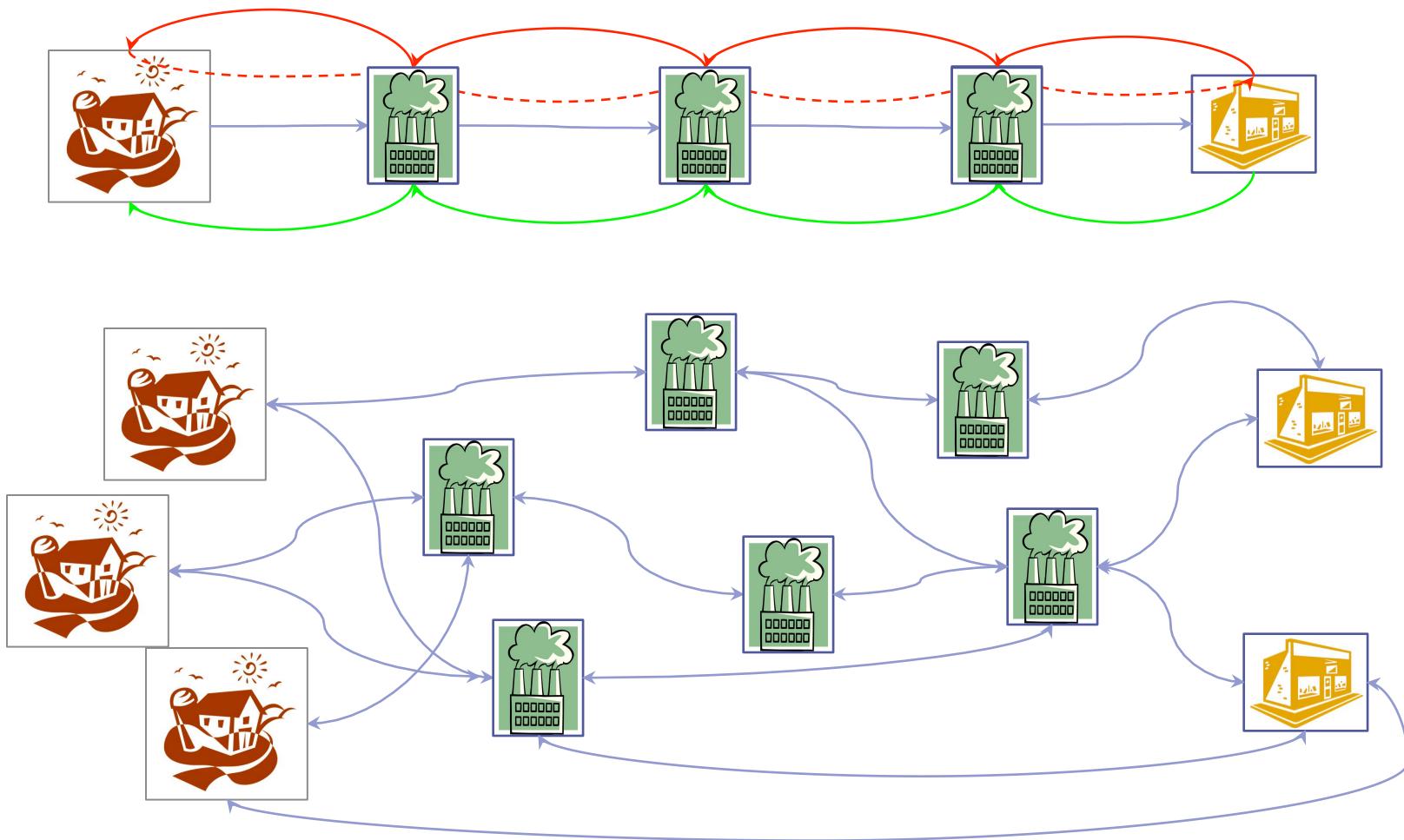
What is a Supply Chain?

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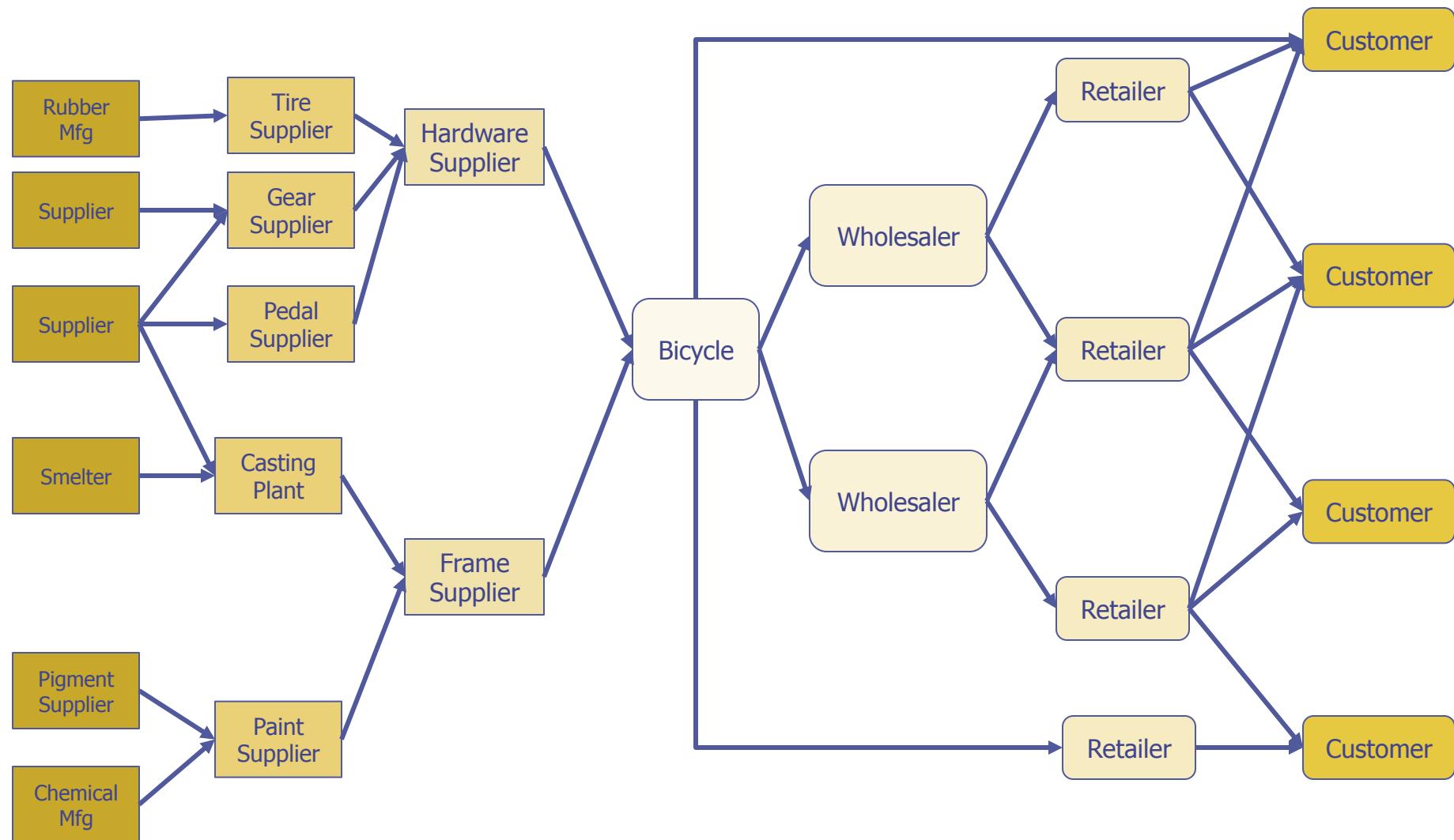
Two or more parties linked by a flow of resources – typically material, information, and money – that ultimately fulfill a customer request.



What is a supply chain?



What is a Supply Chain?



What is a Supply Chain?

- The primary purpose of a SC is to satisfy customer needs.
 - Only one source of revenue – the customer
 - Payments between parties are just fund exchanges
 - Division of intra-SC payments are a function of power, market conditions, etc.
- Supply Chains try to maximize the total value generated
 - = [What customer pays] – [Total effort expended to fulfill]

Logistics versus Supply Chain Mgmt

What is Supply Chain Management?

Logistics involves . . . “managing the flow of items, information, cash and ideas through the coordination of supply chain processes and through the strategic addition of place, period and pattern values.”

MIT Center for Transportation & Logistics

“Supply Chain Management deals with the management of materials, information, and financial flows in a network consisting of suppliers, manufacturers, distributors, and customers.”

Stanford Supply Chain Forum

“Call it distribution or logistics or supply chain management. By whatever name it is the sinuous, gritty, and cumbersome process by which companies move material, parts, and products to customers.”

Fortune (1994)

Logistics vs. SCM

According to the Council of Supply Chain Management Professionals . . .

- **Logistics management** is that part of supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirements.
- **Supply chain management** encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies.

Source: Used by permission, Council of Supply Chain Management Professionals, <http://cscmp.org/>.

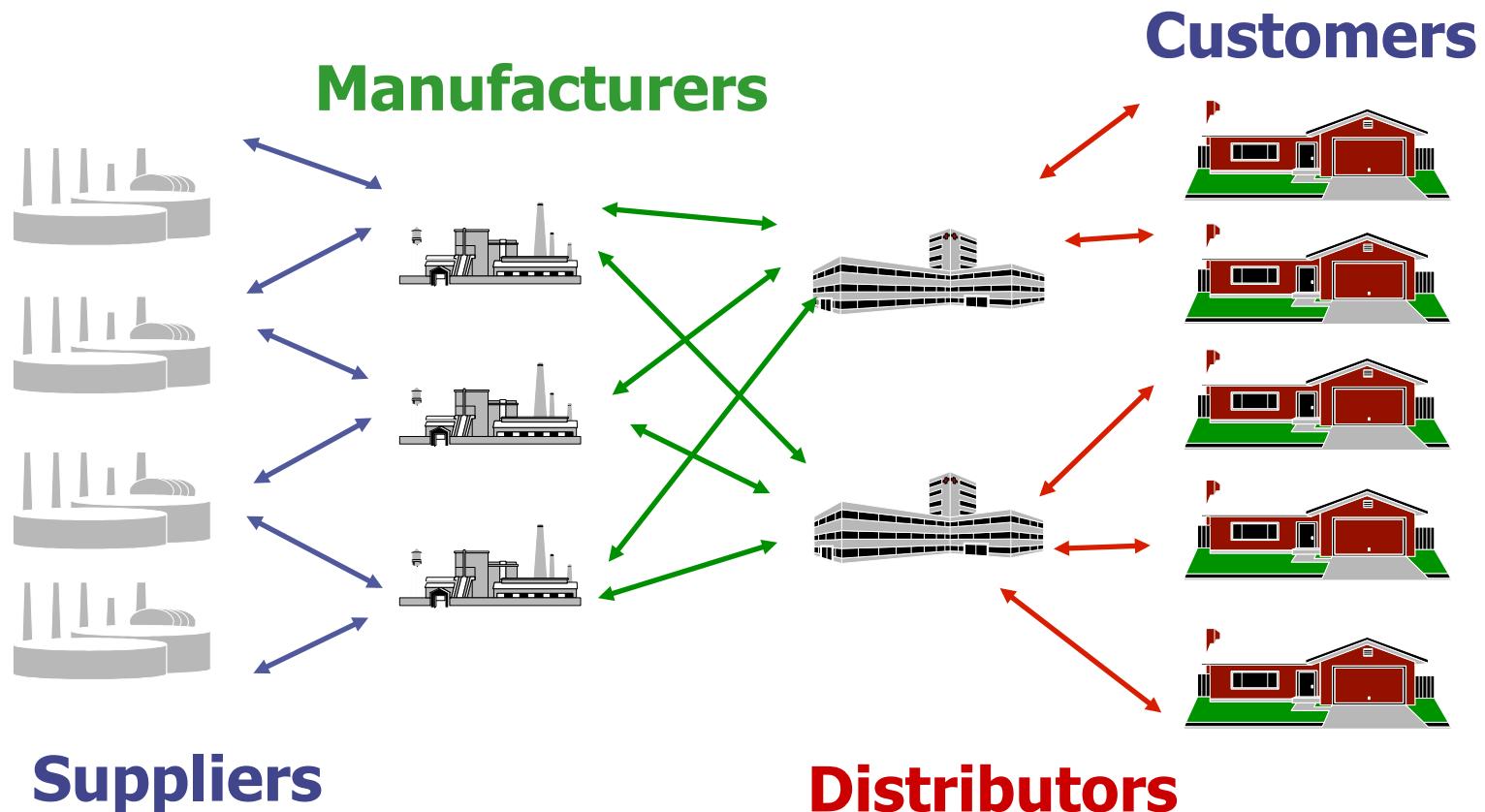
Supply Chain Management Perspectives

Supply Chain Perspectives



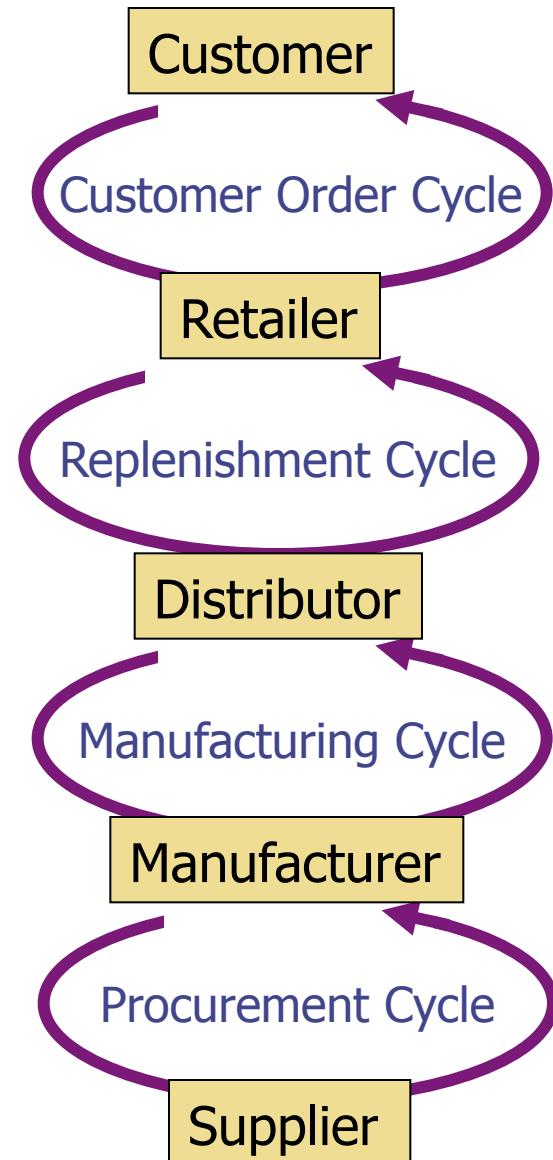
Image Source: Arntzen, B. MIT Center for Transportation & Logistics, Hi-Viz Research Project (2013)

Supply Chain Perspectives



Process View of Supply Chains

- Four Primary Cycles
 - Customer Order Cycle
 - Replenishment cycle
 - Manufacturing Cycle
 - Procurement Cycle
- Cycles Occur Between Stages
 - Interactions differ at each stage
- Not every SC will have all 4 Cycles



Adapted from Chopra & Meindl "Supply Chain Management"

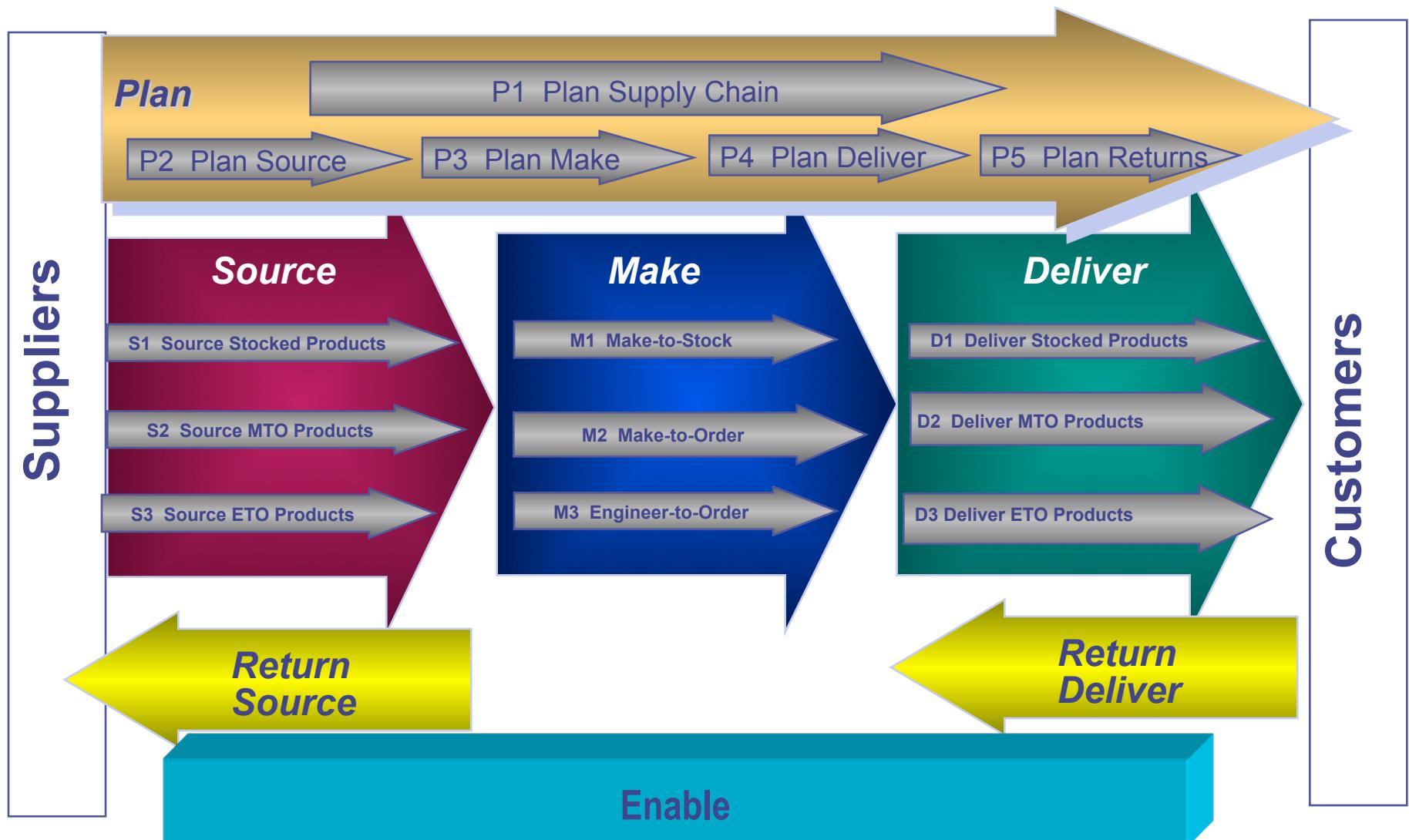
Macro Process (Software) Perspective



Different macro processes should be aligned

- Fall under different groups (Marketing-CRM, Manufacturing-ISM, Purchasing-SRM)
- Forecasts, schedules, design, etc. should be coordinated

Supply-Chain Operations Reference (SCOR) Model



Source: Supply Chain Council

Lesson: Introduction to Supply Chains

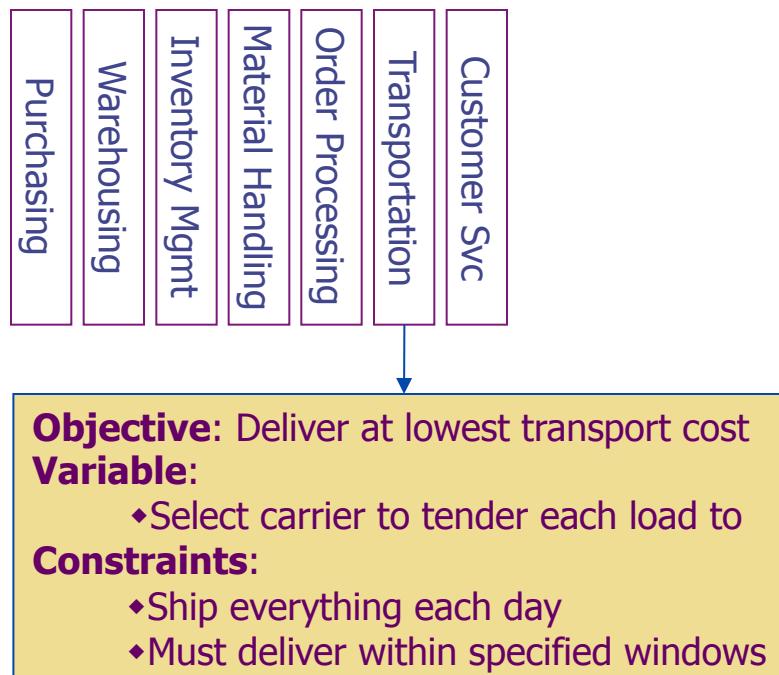
Traditional Functional Perspective

- Purchasing / Procurement
 - What to buy from who
 - Corporate vs Group
- Inventory Control
 - How much to stock where
 - Trigger points
 - Replenishment plan
- Warehousing
 - Storage, Mixing, Break bulk
 - Pick Pack and Ship
 - What to stock where in WH
- Materials Handling
 - How to move product
 - Packaging, containerization
 - Storage layout
- Order Processing
 - Receiving, Entry & Status
 - Order Management
- Transportation
 - Inbound versus Outbound
 - Domestic versus International
 - Modal control (Rail, TL, LTL, Parcel, Air, etc.)
- Customer Service
 - Geographic
 - Product Line Specific
- Planning Group
 - Facility Location
 - Network Design
 - Demand Planning

Systems Perspective of Supply Chains

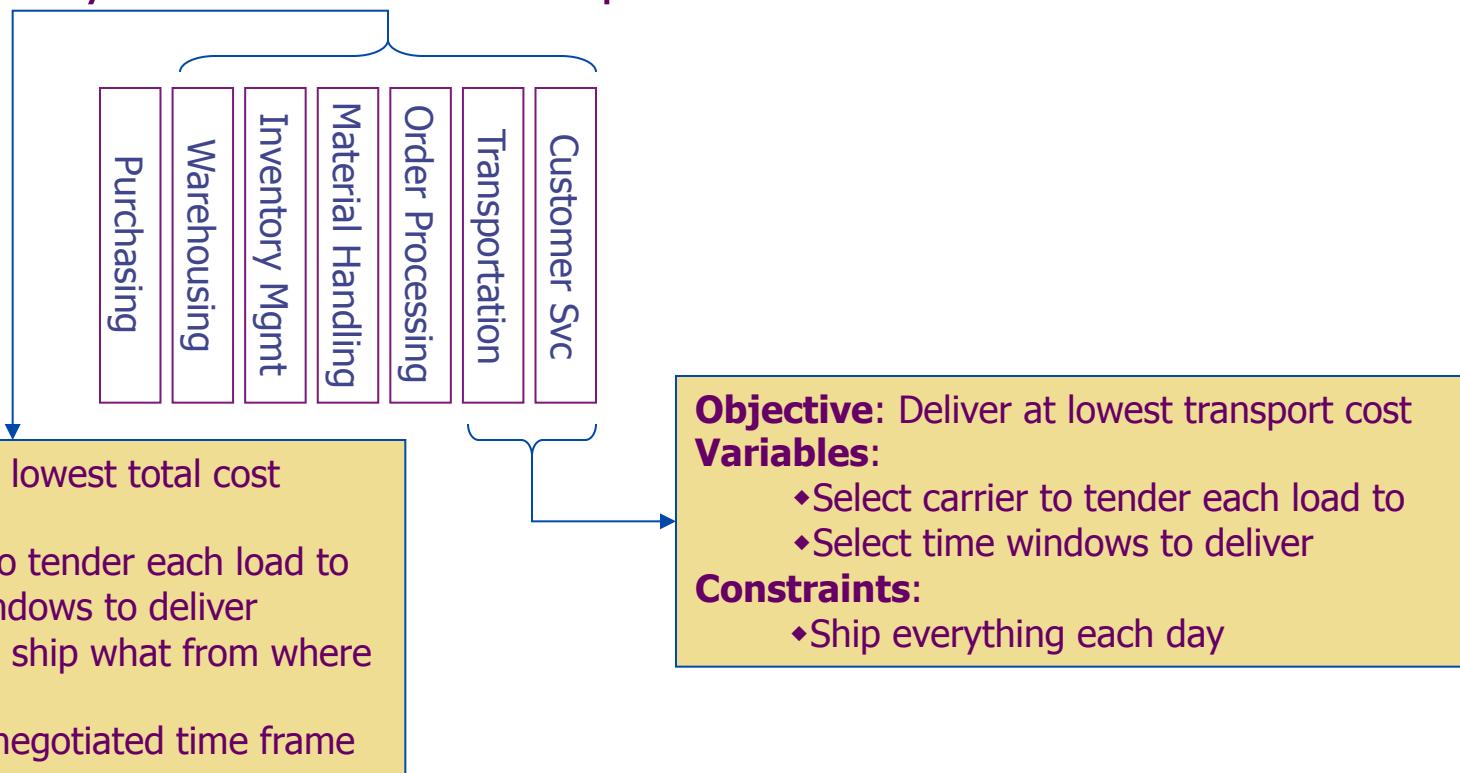
Supply Chain as a System

- Take an Engineering Systems Perspective
 - What is a variable and what is a constraint?
 - Continuous expansion of decision variables
 - Increases potential for improvement but increases both complexity and coordination requirements



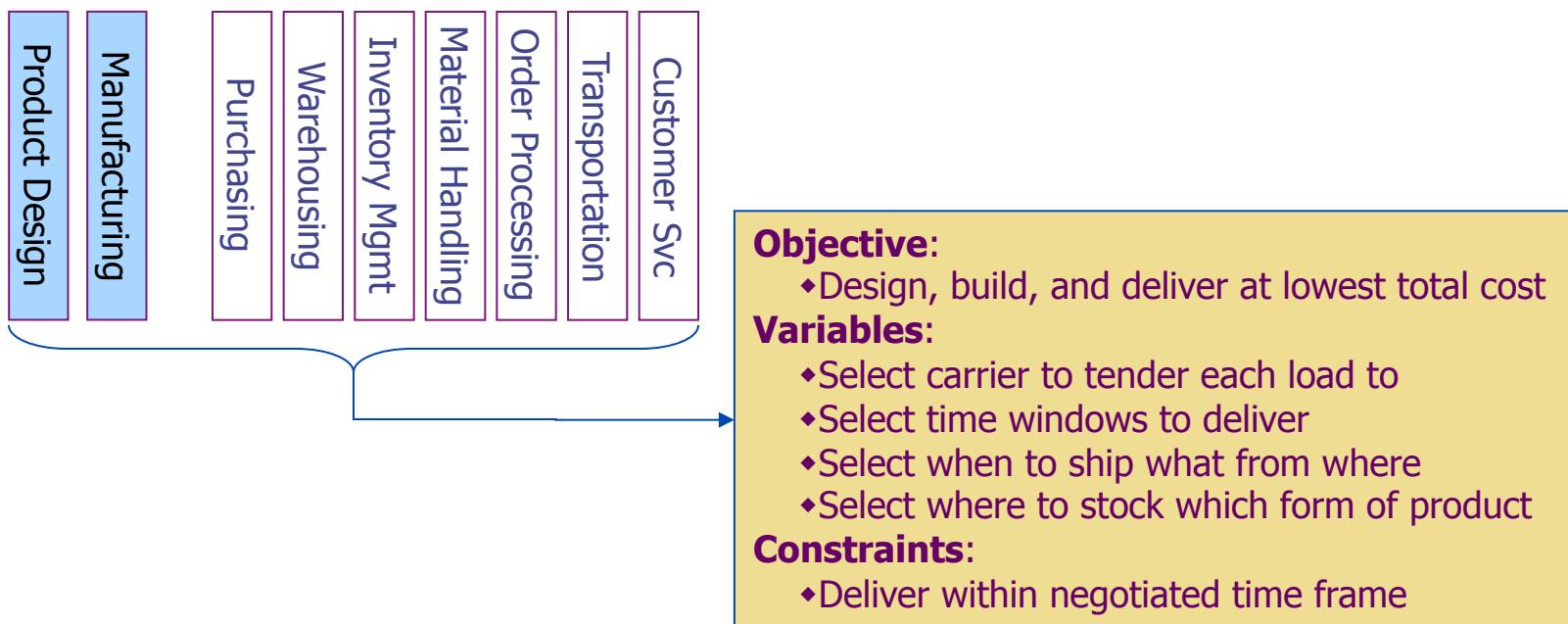
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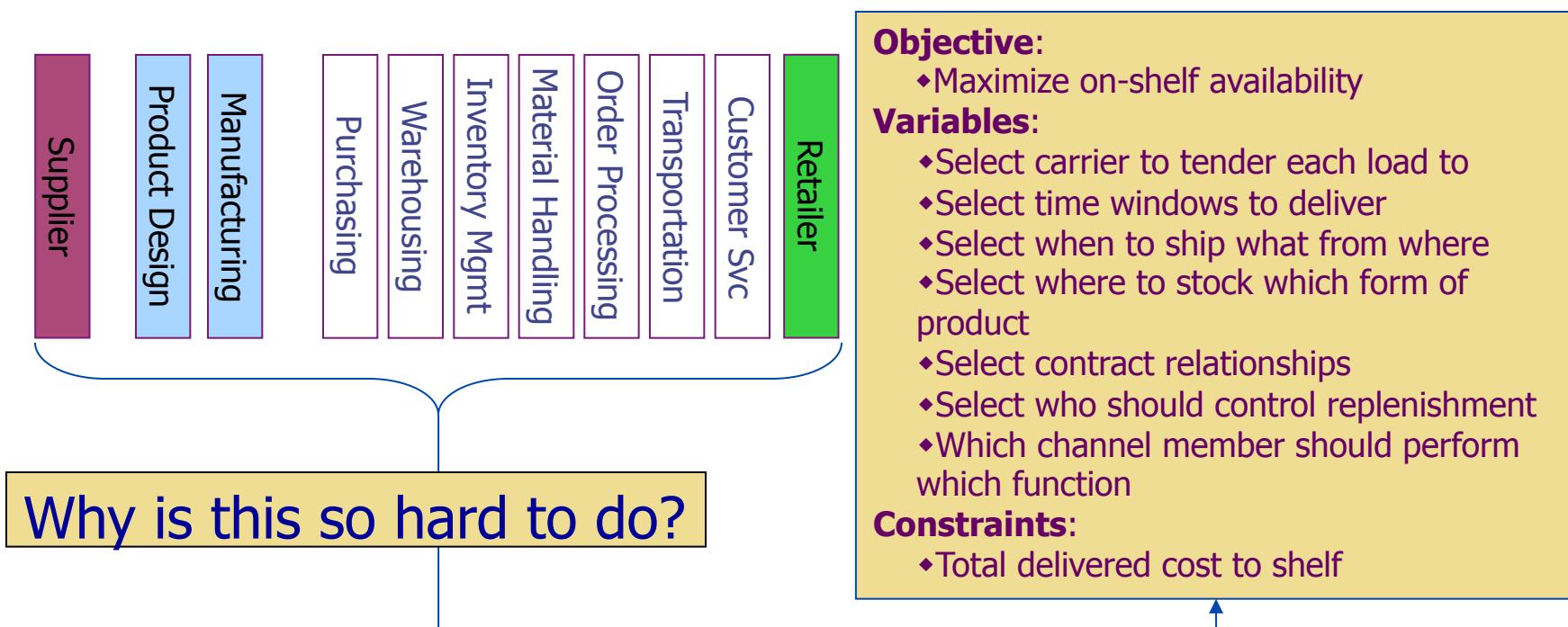
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What are the major challenges? (Why is it so hard?)

Why is it so difficult? 1/2

- Metrics – How do you measure a system?
 - Trade-off of Breadth vs. Validity of metrics
 - Outcome Based Logistics - Perfect order, Perfect Shelf
- Politics and Power of Players - Who wins?
 - Mom & Pop Shop versus Mega-Stores
 - Mega Retailers vs. Mega CPG Manufacturers
- Visibility – Who can see what and how quickly?
 - Data are stored separately
 - All parties do not have equal access to data
 - Massive data ≠ Shared & accessible information

Why is it so difficult? 2/2

- Uncertainty - Who knows what is going to happen?
 - Variable demand of product (shorter lifecycles)
 - Variable manufacturing yield
 - Unreliable sourcing of raw materials
 - Inconsistent transit lead times
- Increased complexity – Why is it getting harder?
 - Exploding number of Stock Keeping Units (SKUs)
 - Higher and diverging customer demands
 - New & merging channels (Omni-Channel)
- Global operations – Why don't we ever close?
 - Most firms source & sell across globe
 - Multiple regions, time zones, languages, & cultures

Why do we care?

Why do we care?

- Supply Chains . . .
 - Span the globe and cannot be managed as an isolated function,
 - Have become critical to any organization's operations, and
 - Connect functions, divisions, and business units within a firm as well as across firms.

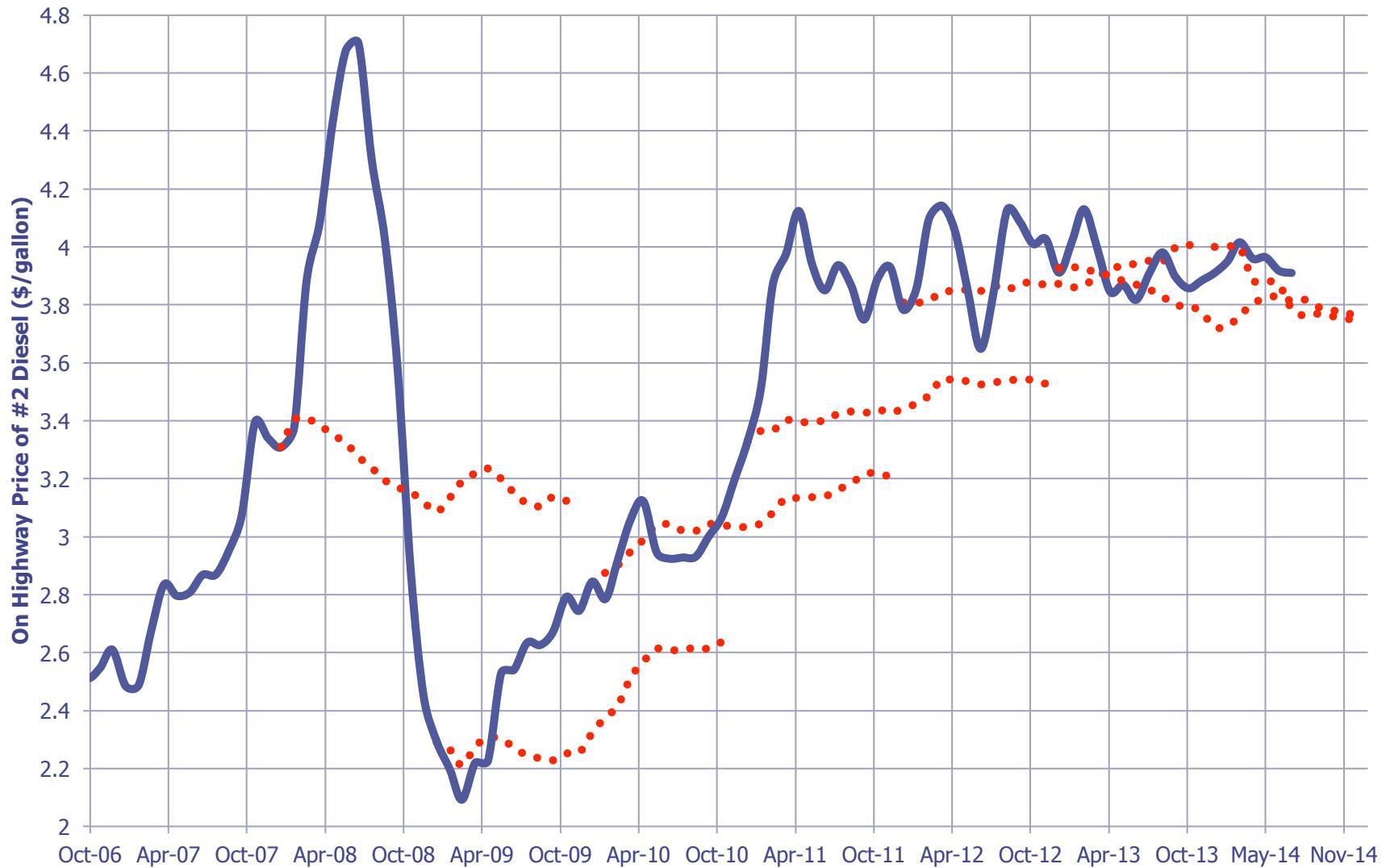
Evolved into being both a Bridge and a Shock Absorber



By Wsvan; cropped by Beyond My Ken (talk) 01:29, 14 October 2013 (UTC) (Own work) [GFDL (<http://www.gnu.org/copyleft/fdl.html>) or CC-BY-SA-3.0 (http://commons.wikimedia.org/wiki/File:Leonard_P._Zakim_Bunker_Hill_Bridge_-_Boston,_MA.jpg)

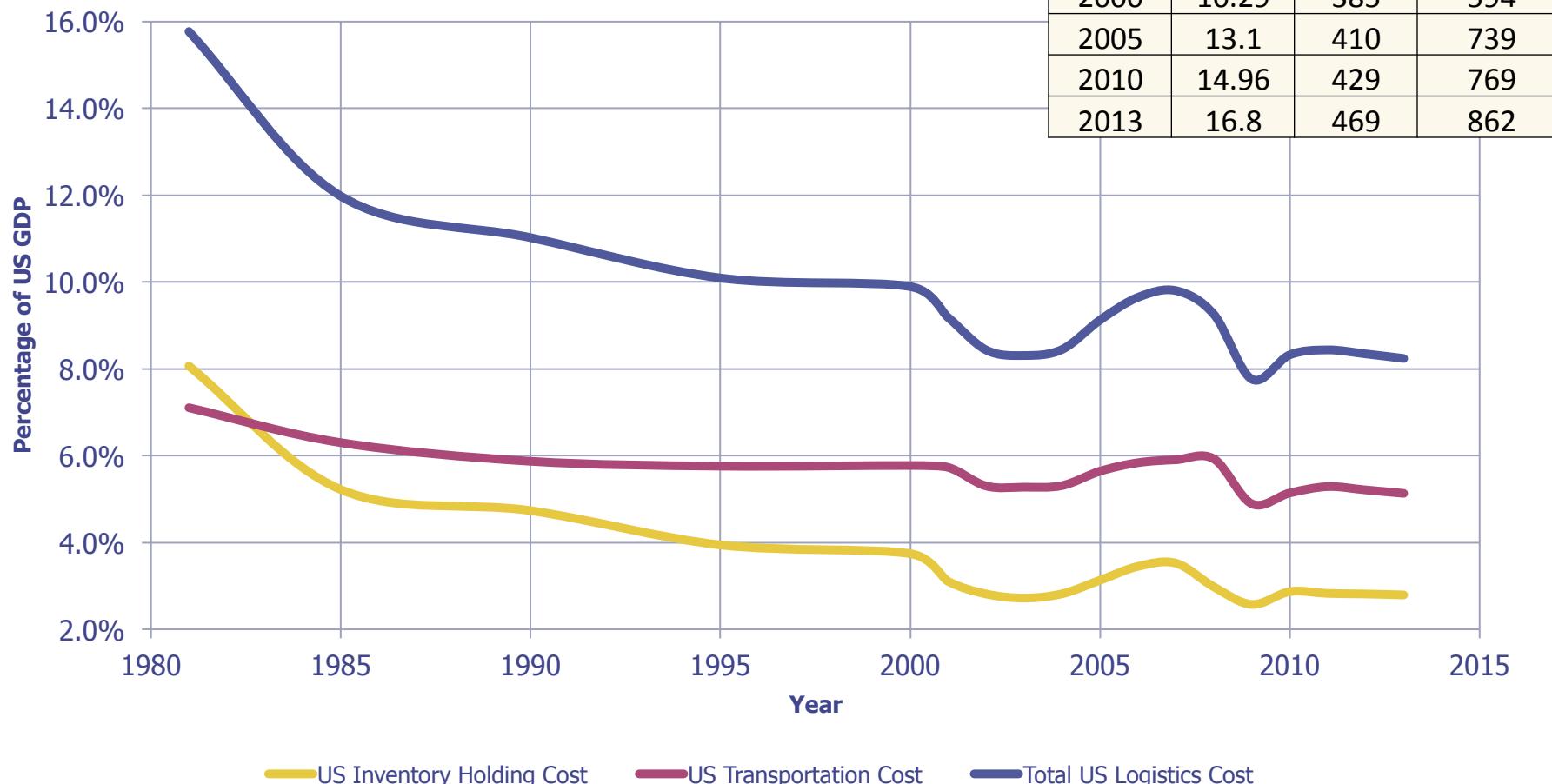
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Example: Variability of #2 Diesel Pricing



Data Source: U.S. Energy Information Administration, http://www.eia.gov/petroleum/qasdiesel/diesel_proc-methods.cfm

Logistics Costs per GDP



Data Sources: Council of Supply Chain Management (2014) [25th Annual State of Logistics Report](#)

Still, why do we care?

Functional

Logistics

Supply Chain



Key Skills	Technically Narrow	Coordination
Influence	Local & Controllable	Across entire Supply Chain
Leadership	Hierarchical, Direct, 'Hard'	Influential, Indirect, 'Soft'
Risk Management	Robust or Reactionary	Planned Response & Flexibility
Measurement	Single Focus	Multi-faceted
Technology Approach	Isolated Optimization	Visibility & Coordination
Technology Platform	Self-Hosted, On-site	Cloud or SaaS
Scope / Reach	Regional / National	Global / Multi-National

Supply Chain Management is a growing and evolving discipline.

Questions, Comments, Suggestions? Use the Discussion!



caplice@mit.edu



MIT Center for
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