
Supply Chain Complexity

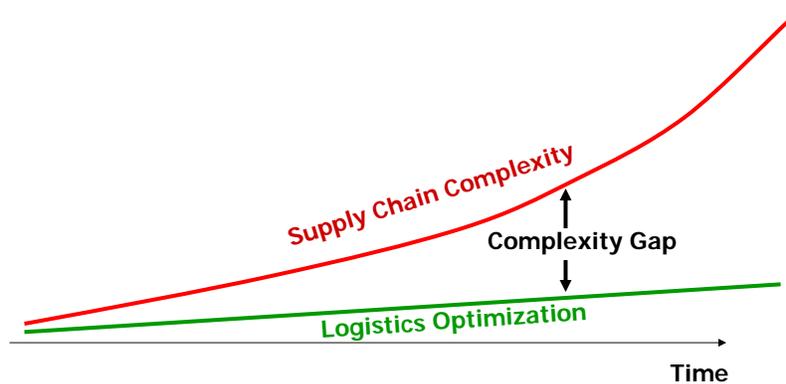
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Supply Chain Complexity



- Huge inefficiencies result from complexity gaps

Supply Chain Complexity "Root Causes"

1. **Uncertainty**
 - Not knowing about future events
 - Not knowing about present status
 - Not knowing process
2. **Variability**
 - Requirement and/or resource changes over time
3. **Synchronization**
 - Matching requirements and/or resources with time
4. **Unity**
 - Dealing with indivisible products and/or resources
5. **Size**
 - Number of actions to perform or consider for performance
6. **Speed**
 - How quickly actions must be performed
7. **Diversity**
 - Differences among products and/or resources



Impact of Mega Trends on Complexity

	Uncertainty	Variability	Synchronization	Unity	Size	Speed	Diversity
Globalization	↑	↑	↑		↑	↑	↑
Just-in-time	↑	↑	↑			↑	
Mass customization	↑			↑	↑		↑
Increased Security	↑	↑				↑	

Supply Chain Complexity Gaps

- **Large complexity gaps are bad**
 - Increased cost and risk
- **Small complexity gaps are not necessarily good**
 - Complexity is often decreased by increasing inefficiency in the supply chain
- **Reducing complexity in one part of the supply chain often increases complexity in another**
 - Example – delivery appointments
- **Reducing complexity gaps often results in new complexity gaps**
 - Example – decision technology
- **Transforming complexity and/or complexity gaps may itself be complex**
 - Understanding complexity is essential

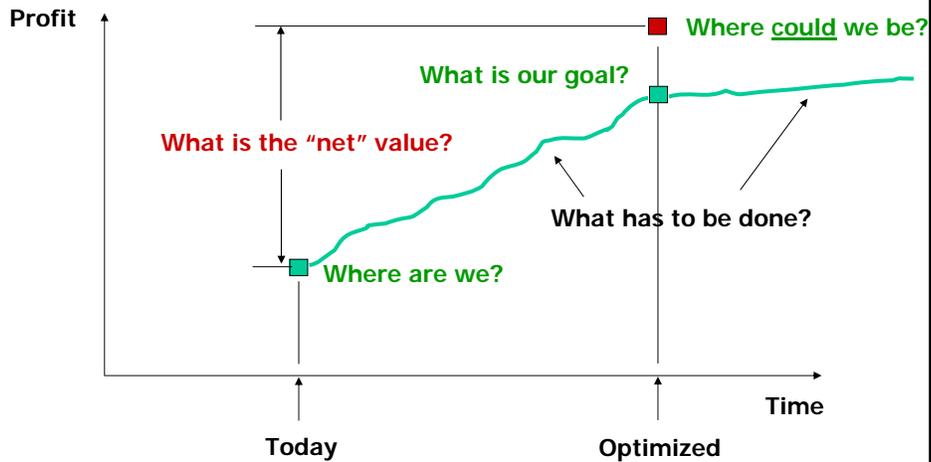


Responding to Supply Chain Complexity

1. **Strategic Visibility**
2. **Innovation**
3. **Integration**
4. **Information & Decision Technology**
5. **Executive ownership**

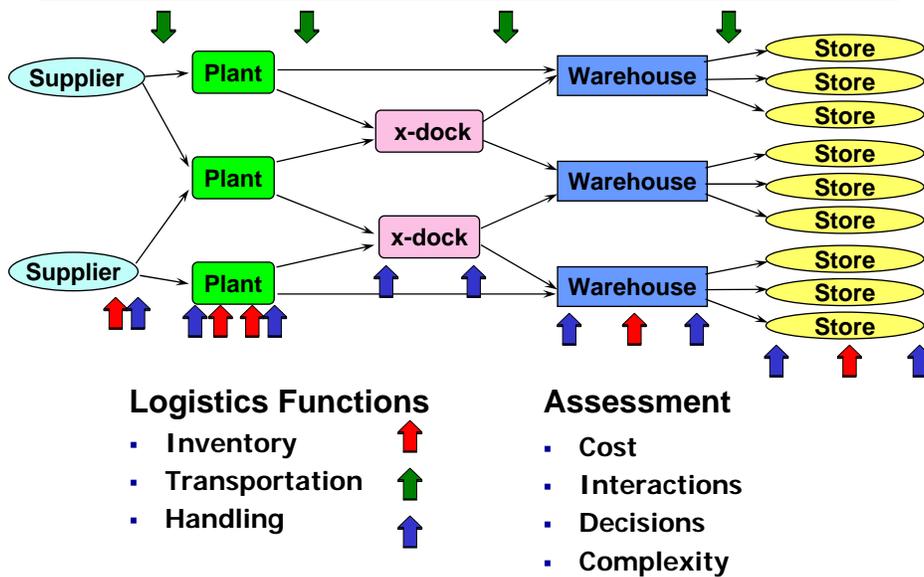


Supply Chain Strategic Visibility



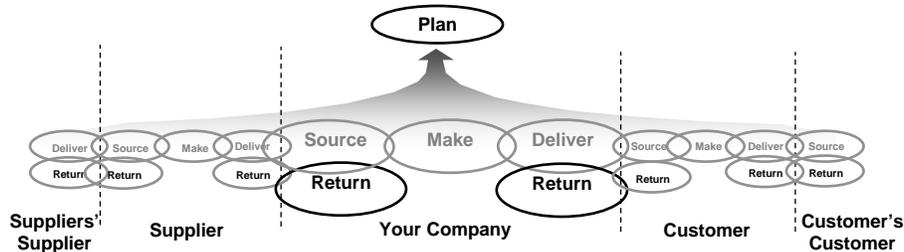
For each logistics process (e.g. delivery to dealers)

Mapping the Supply Chain



Supply Chain Operations Reference (SCOR) model

- ✓ Decompose the supply chain into elemental logistics processes
- ✓ Quantify performance metrics and capture as-is state of each process
- ✗ Establish targets for each process based on best-in-class results
- ✗ Characterize the management practices and software solutions that result in best-in-class
 - **Interactions between processes are ignored!**



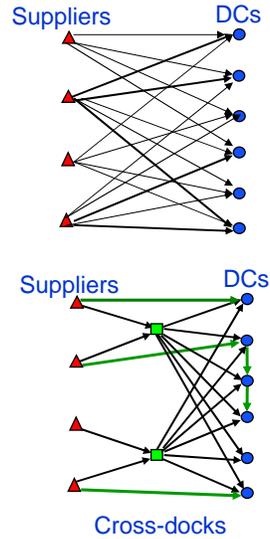
Innovation

- Wal-Mart → **Cross docking**
 - Southwest Airlines → **Only 737s**
 - Dell → **Build to order**
 - FedEx → **Hub and spoke**
- Each innovation fundamentally transformed complexity!



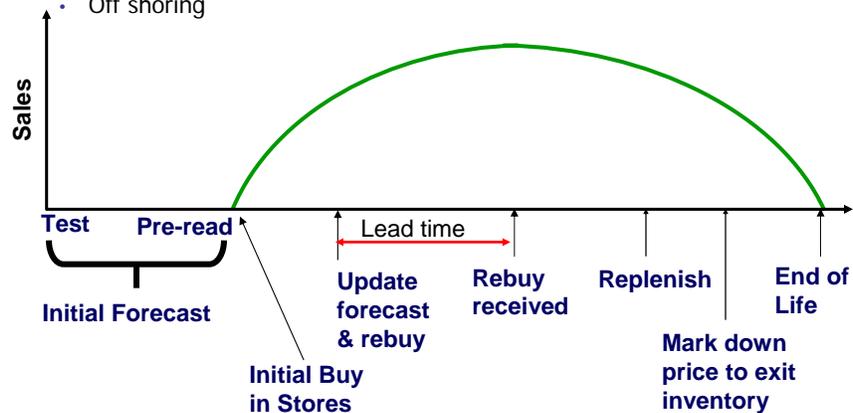
Walmart's Cross-dock Network

- **Example**
 - Large retailer
 - Shipments from multiple suppliers to DCs
 - Less than truck load shipments
- **Possible networks**
 - All direct ships
 - Utilize cross docks
- **Hybrid**
 - Some via cross docks
 - Some direct
 - Some via multi stop
- **Both increase and decrease complexity to reduce cost**



Integration

- **Retail life cycle**
 - Lead time
 - Order quantity
 - Off shoring



Ref: Marshall Fisher

Sporting Goods – Reorder Quantity

- **Example**
 - Receipt and put away at store
 - Typically a fixed order quantity
 - Quantity may not fit shelf space
 - Often not a well defined process with little training
 - May cause lost sales of other products
 - Integrate
 - Order quantity
 - Order time
 - Ship frequency
 - Delivery time
 - Receipt process



Technology

ERP

- Transactions
- Value – automation
- CEO sale
- Complex IT & process installation
- Limited maintenance
- IT support
- Clerical users
- Few parameter changes

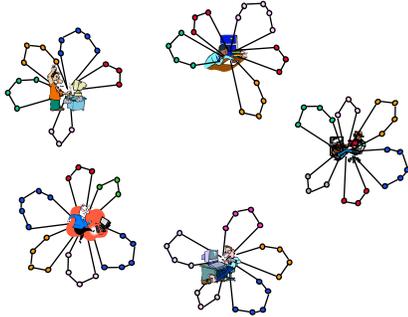
SCP

- Decisions
- Value – optimization
- VP sale
- Complex IT, process & logistics installation
- High maintenance
- IT & Logistics support
- Technical users
- Many parameter changes



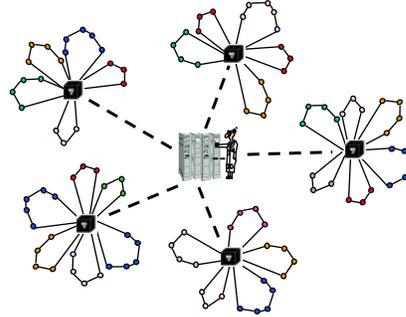
Planning Technology

Decentralized



- People power
- Enhance with computing power

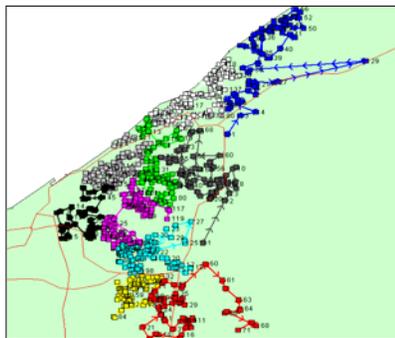
Centralized



- Computing power
- Enhance with people power

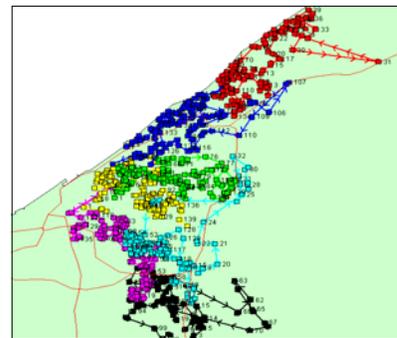
Optimization not obvious!

Example - Dedicated Delivery Fleet



Current Solution

10 Routes
2006 Miles



Optimized Solution

7 Routes
1345 Miles

- The only way to determine the value of optimization is by optimizing!

Current State of Planning/Optimization Technology

- **Opportunity**
 - Large disparity between current practice and optimum
 - Excellent data and communication capability
 - New generation of computing technology
 - Decision technology can significantly mitigate complexity
 - Knowledge to create a “next generation” of decision technology
- **Challenges**
 - More complex supply chains require more complex decision technology
 - Spotty success with sophisticated decision technology
 - Decision technology requires some “rocket scientists”
 - Supply chain planning software vendors are struggling
 - The “next generation” of decision technology requires significant departures from the past



Computer/Communications Technology

- **Computing evolution**
 - Mainframes (1960s)
 - PCs (1980s)
 - Client/server (1990s)
 - Internet centric (2000s)
- **Internet**
 - Ubiquitous access
 - Computer location irrelevant
- **Wireless**
 - Voice, data, GPS, RFID
- **How has computing/communication impacted complexity?**
 - Better data, automated transactions, improved status
 - Dynamic data, few standards



Executive Ownership

- Supply chain complexity and logistics optimization can have a huge impact on the “bottom line”
- CEOs are rewarded for “bottom line” impact
- CEOs typically do not understand supply chain complexity or logistics
- Companies are not systematic and persistent about identifying opportunities
- Supply chain transformation champions are typically in operations
- Supply chain transformation has risks
- Operations are not adequately rewarded for assuming risk
- Must develop executive (CEO) ownership



Responding to Supply Chain Complexity

1. **Strategic Visibility**
 - What is your supply chain map?
 - How do you determine cost, risk and performance metrics for each of your logistics processes?
 - What are the root causes of complexity for each of your logistics process?
 - Which logistics process provide the biggest opportunities for improvement based cost, risk and complexity?
2. **Innovation**
 - Where are the opportunities for fundamental changes in supply chain design and logistics processes?
3. **Integration**
 - Where can better integration between your logistics processes improve performance?
4. **Technology**
 - Where are the opportunities for improved technology for transaction automation and logistics planning
5. **Executive Ownership**
 - What is required to obtain executive ownership?





Questions



Comments

