



Massachusetts Institute of Technology

# Supply Chain Management: Driving Strategic Advantage

MIT Exec Ed  
June 10, 2016






MIT Center for Transportation & Logistics

## SC Management: Driving Strategic Advantage

- Tuesday: E62 & Samberg
  - Introduction & Ice Breaker
  - Halloran Metals Case: Jim Rice
  - Beer Game: Dr. Chris Caplice
  - Beer Game Debrief: Jim Rice
  - **Adjourn 5:00 pm**
  - Reception at Champions (Marriott) – **hard stop at 7 pm.**
  
- Wednesday: E62-276
  - Intro to SC Financial Accounting and Analysis: Jim Rice
  - Activity Based Cost Accounting; Dakota Office Products Case: Jim Rice
  - Working Capital & Cash-to-Cash Conversion Cycle: Dr. Jarrod Goentzel
  - Working Capital Simulation: Jarrod Goentzel
  - Evaluating Supply Chain Initiatives: Jarrod Goentzel
  - Last Mile Logistics: Dr. Matthias Winkenbach
  - **Adjourn 5:15 pm**
  - OPTIONAL RESEARCH BRIEFS
  - Sustainable Sourcing – Dr. Alexis Bateman
  - S&OP Overview – Kai Trepte
  - **Adjourn 6:15 pm**



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## SC Management: Driving Strategic Advantage

- Thursday  
E62-276
  - SCM Introduction & info on recruiting – Sue Wang
  - Supply Chain Risk Management: Resilience – Jim Rice
  - Supply Chain Resilience SCREAM Exercise – Dr. Josué Velázquez
  - Class Photo
  - SCREAM Debrief – Josué Velázquez
  - Zara Fast Fashion Case: Jim Rice
  - Global Supply Chain Business Case Simulation: Jarrod Goentzel
  - **Adjourn 5:15 pm**
  - OPTIONAL RESEARCH BRIEFS
  - Omni-channel & Supply Chain – Dr. Eva Ponce
  - Sustainable Supply Chains - Josué Velázquez
  - **Adjourn 6:15 pm**
  
- Friday  
SAMBERG
  - Global SC Simulation Debrief: Jarrod Goentzel
  - The Power of Resilience: Prof. Yossi Sheffi
  - SC2020: Rethinking Your SC Strategy: Dr. Roberto Perez-Franco
  - **Adjourn 2:15 pm**



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## Halloran Metals Case

- Does Halloran have a strategy?
- Is it a good strategy?
- Allied & Halloran
  - Distinct strategies, competing in different ways – both can be successful
- Alignment is critical
  - The supply chain must serve the business strategy



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## Halloran Metals Case

- Does Halloran have a strategy?
- Is it a good strategy?
- Allied & Halloran
  - Distinct strategies, competing in different ways – both can be successful
- Strategy
  - Deciding what you WON'T do!
- Alignment is critical
  - The supply chain must serve the business strategy

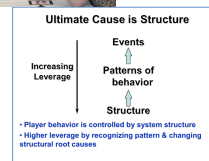
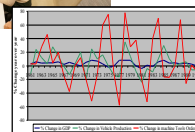


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## The Beer Game

- Playing the Game
  - Mayhem, limited data, uncertainty but...
  - Similar to the real world
  - The winner(s) – Lita Beer OR Eva Beer?
- Debrief
  - Tendency to respond to events
    - Events → manifestations of patterns
  - The possibilities: 10X improvement!
  - Key patterns found in SCs
    - Oscillation, Amplification, Phase Lag – the BULLWHIP EFFECT
  - Events → Patterns → Structure
    - Leverage at structure level



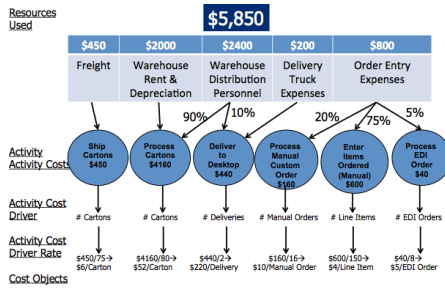
# SC Financial Analysis

- Income Statement cf. Balance Sheet
- Activity-Base Cost (ABC)

Balance Sheet: Intel 2014

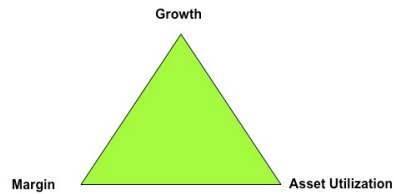
Assets	2014	2013
Cash	1,200	1,200
Accounts receivable	1,200	1,200
Inventory	1,200	1,200
Prepaid expenses	1,200	1,200
Other current assets	1,200	1,200
Total current assets	5,200	5,200
Property, plant and equipment, net	1,200	1,200
Goodwill and intangible assets, net	1,200	1,200
Other non-current assets	1,200	1,200
Total assets	8,800	8,800
Liabilities, deferred credits, and shareholders' equity		
Accounts payable	1,200	1,200
Accrued expenses	1,200	1,200
Deferred revenue	1,200	1,200
Other current liabilities	1,200	1,200
Total current liabilities	4,800	4,800
Long-term debt	1,200	1,200
Other non-current liabilities	1,200	1,200
Total liabilities	7,200	7,200
Shareholders' equity	1,600	1,600
Common stock	1,200	1,200
Retained earnings	400	400
Total shareholders' equity	1,600	1,600
Total liabilities, deferred credits, and shareholders' equity	8,800	8,800

## Dakota Cost Drivers



# SC Working Capital Simulation

- Sun Nutraceuticals:
- Distributor with high turnover, thin margins, breaking even, high receivables, flat growth....
- Considering investment options
- WACC vs Cost to borrow
- Cash constrained
- Balancing Margin – Revenue Growth – Asset Utilization



## Zara: Fast Fashion

- Zara business system
- Challenged the traditional, dominant SC design to disrupt the industry
  - From far-market, high labor content, low capital outsourced → near-market, low-labor, high capital vertically integrated SCs
- Integrated system, postponement, JIT, automation/selective labor use, daily demand sensing, short production runs, low risk testing new designs → Fast Fashion!
- Can a regional SC serve a global marketplace?

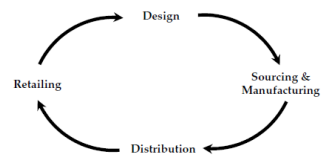
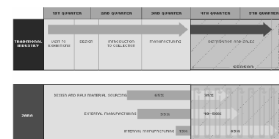


Exhibit 13 Product Precommitments: Zara vs. Traditional Industry



## Global Supply Chain Simulation

- Design, marketing, procurement, balance supply & demand, profitability, board interests
- Key takeaways: Accurate forecasts
  - Gather more data, esp individual forecasts
  - Capture std deviation of individual forecasts
  - Small amt of actual demand → improve forecasts
- Key Takeaway: Responsive supply
  - Consider products to produce with speculative/reactive capacity
  - Shorten lead times, boost reactive capacity
- Key Takeaway: Optimize inventory\*
  - Use standard deviation to ID how much to over/underproduce
  - Consider Critical Ratio (based on the cost of being under/over) for intuition



Member	Objective
Betty	<b>Forecasting:</b> choice of options (consensus vs. mean)
Doug	<b>Forecasting:</b> choice of options (role of risk)
Yvonne	<b>Stocking Levels:</b> Weighing the costs of over/understocking
Meryl	<b>Production flexibility:</b> accurate response/sourcing strategy (focus on flexibility)
Paul	<b>Production flexibility:</b> accurate response/sourcing strategy (focus on demand uncertainty)

Winners!

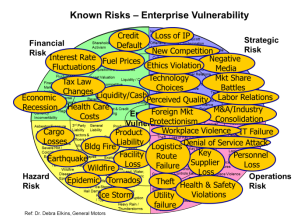
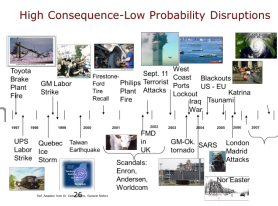


\* These relate to newsvendor problem. Contact Jarrod for more detail and application...



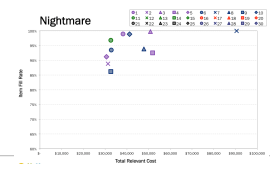
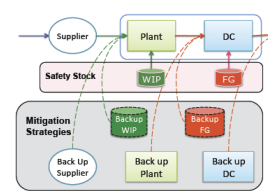
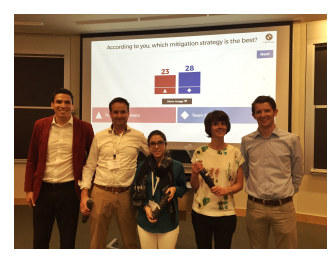
## SCRM & Resilience

- Low probability/high impact disruption
- SCRM Framework
  - Vulnerability Assessment
  - Monitoring & Measurement
  - Crisis Mgt and Emergency Response
  - Mitigation and Implementation
- Failure mode focus
- Flexibility & Redundancy
  - Many paths to flexible SC



## SCREAM

- Not all Sunny days ....choosing one policy for multiple scenarios
- Multiple ways to protect – at different costs
  - Different policies do well under different scenarios
  - Understanding the right scenario portfolio is key
- Downstream matters more than Upstream
  - Protecting the DC is more important than protecting the plant or the supplier
- Combination of Robustness & Flexibility
  - Typically most reasonable approach is mixed
  - Robustness to cover the Response Time for Back Ups
  - Flexibility (backups) relied on for longer term

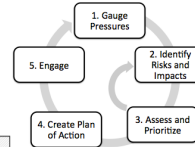


## Research Briefs: Sustainable Sourcing; S&OP; Omni-channel Supply Chain; Sustainable Logistics

- Sustainable Sourcing



Five steps to develop a sound Sustainable Sourcing Strategy

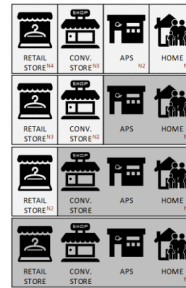


- S&OP

Where does modeling add value?

Model	Cost	Inventory	Service	Quality	Carbon	Water	Waste	Energy	Compliance	Other
Cost	Y									
Inventory		Y								
Service			Y							
Quality				Y						
Carbon					Y					
Water						Y				
Waste							Y			
Energy								Y		
Compliance									Y	
Other										Y

- Omni-channel Supply Chain



- Sustainable Logistics



## The Power of Resilience

- Two ways to look at disruptions: sources and outcomes
- Detectability
- Alert applications
- Two cases: P&G and GM
- Resilience through redundancy and flexibility
- Flexibility DNA



## SC2020: Rethinking Your SC Strategy

- Lamynix and Zara cases
- We're biased toward gradual improvement, hard to imagine huge change
  - Revisit your assumptions about the future
  - Develop success strategies for each future
  - Use scenario planning and risk management to prepare your supply chain for the future
- Four scenario possibilities
  - Millions of Markets, Naftastique!, One World Order, Global Marketplace
- Align SC strategy to support corporate strategy



INNOVATION  
STRATEGIES

Is Your Supply Chain Strategy  
Holding Back Innovation?



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## SCM: Driving Strategic Advantage

Today you leave MIT with:

- a tool set of frameworks and methods for thinking differently about designing and running your supply chain/supply network,
- many illustrations of these methods with examples of the great potential
- a new network of colleagues

How will you  
apply these  
learnings?





## Thank you....

- ...For investing your time,
- ...For engaging so deeply,
- ...and for helping us with two final requests



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## Two parting requests....

- Give us your feedback
  - This helps us improve our program
  - 3-4 minute survey at
  - <https://www.surveymonkey.com/r/GFHPJHV>
- Tell others and....
- Send a colleague to our next course
  - If you've had a good experience, tell a colleague and send him/her to a future CTL exec ed program



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