Overview of New Teaching Materials

SCTL 2004
Woodstock, VT

1

Warren Hausman

STMicroelectronics E-Chain Optimization Project
by
Barchi Peleg

Stanford Global Supply Chain Management Forum
SGSCMF-001-2003

2

STMicroelectronics E-Chain Optimization Project[1]

The case describes STM's successful attempt to collaborate closely with a Trading Partner (customer):

1) Sharing forecasts and aligning production plans and capacity
2) Use of RosettaNet
3) Implementing VMI
4) Using "optimization and sophisticated algorithms" (not described in the case) for plant and inventory allocations

1 This case was prepared by Dr. Barchi Peleg of Stanford University, as the basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation. We would like to thank the many people involved from ST for their assistance. Copyright 2003 by the Board of Trustees of the Leland Stanford Junior University. All rights reserved.

3

Woolworths "Chips" Away at Inventory Shrinkage through RFID Initiative

by

M. Eric Johnson
Tuck School of Business
and
Hau Lee
Stanford University

Tuck & Stanford Global Supply Chain Management Forum

4

Woolworths

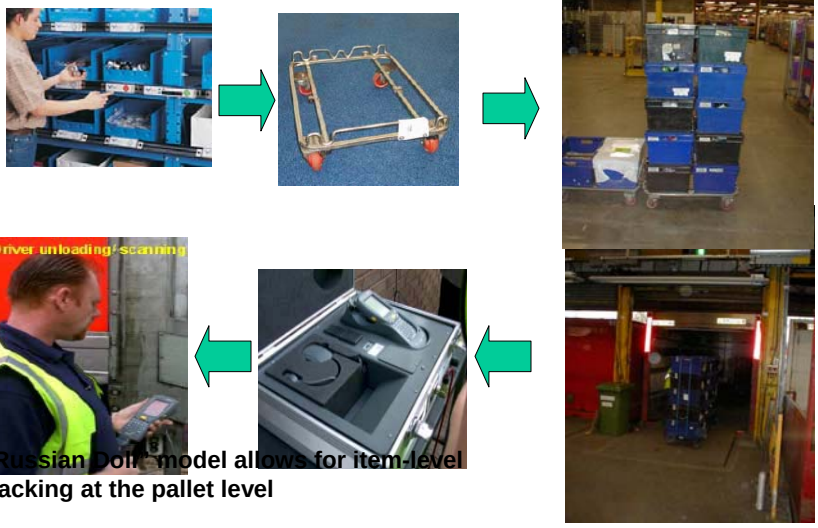
- Demerged from Kingfisher $1^{1/2}$ years ago
- FT250 LSE listed company
- UK retailer focused on Home, Family & Entertainment
- 809 Woolworths, 18 big Ws and 82 MVCs in UK
- Entertainment EUK, VCI, MVC & Streets Online
- 2002/3 group turnover €4.5 billion
- Loss of £75 million each year to theft

5

Woolworths Supply Chain

6

Visibility @ Woolworths



'Russian Doll' model allows for item-level tracking at the pallet level

Visibility @ Woolworths

All 16,000 dollies now have unique ID

Product picked into uniquely ID'd tote boxes

automatically assigned to dolly ID

Readers track movement through DC and confirm loads onto vehicles

GPS tracks vehicle on route

Driver uses handheld RFID unit to confirm delivery

8

Daniel Corsten

Sainsbury's (A) Transforming the Supply Chain
Sainsbury's (B) Supply Chain Performance Measurement
by
Regine Slagmulder, Daniel Corsten

INSEAD/Universitat St. Gallen

9

Sainsbury's (A): Transforming the Supply Chain

R. Slagmulder, INSEAD; D. Corsten, St. Gallen

- In 2000 a benchmarking study revealed a supply chain cost gap of £60 million between Sainsbury's and its best-in-class competitors.
- Sir Peter Davis, CEO, publicly committed to reducing overall cost base (including stores, systems, other assets and administration) by £700 million
- Top management launched the "7-in-3" supply chain management program

	Sainsbury's	Tesco	ASDA	Safeway
2002 Sales including VAT (£M)	18,200	25,700	9,500	9,400
Number of stores	648	979	245	480
Number of employees	173,800	260,000	109,000	90,000
Average store size (sq. ft.)	32,000	35,000	42,000	31,000
Customers/week in UK only (million)	11	14	8	8

10

Sainsbury's (A): Situation and Challenge

- Key Principles
  - Replace the current depots with automated fulfilment factories and Primary Consolidation Centres;
  - Manage transportation in an integrated fashion from the factory gate through to the store back door;
  - Replace core supply chain systems which are currently old and inflexible;
  - Ensure clear ways to measure performance by reorganising the supply chain structure and processes;
- In July 2003 transformation of the Supply Chain was well under way.
  - £100 million saved in 2002,
  - Overall availability in stores improved by 1%.
- However, the verdict about "the biggest project of its kind in Europe and one of the largest in the world", was still out....

11

Sainsbury's (A): Assignment Questions/Learning Objective

(1) Learn about recent developments in supply chain configuration and information systems in the retail industry;

(2) Assess the opportunities and risks associated with major investments in supply chain restructuring.

Additional Material:

(1) Supply Chain Transformation Video (12 minutes)

(2) Sainsbury's (B) Supply Chain Performance Management

12

Sainsbury's (B): Supply Chain Performance Measurement

R. Slagmulder, INSEAD; D. Corsten, St. Gallen

- Quote: "[Several] years ago when Tesco overtook Sainsbury's, if you had asked me then, I would have said that Sainsbury's came across as the arrogant retailer, the one that really laid down the line hard for the supplier, and Tesco was the company that you could really have a collaborative conversation with. Now my personal observation is … that it has flipped."

- Supplier Information Direct
  - Key Performance Indicators
  - Collaborative Planning System
- The Global Scorecard
  - Masterfoods – The Entry Level Scorecard
  - Mack – The Intermediate Scorecard
- New Developments in Supply Chain Performance Measurement
  - Store scorecard
  - Collaborative Performance Measurement (CPM)

13

Sainsbury's (B): Challenges

Despite the comprehensive set of supply chain performance measurement systems at work at Sainsbury's, the retailer was still faced with a number of challenges. Those challenges had less to do with information systems design than with organisational issues....

Additional material
(1) Corsten, D./Kumar, N. (2003): "Profit in the Pie ", HBR May
(2) The Global Scorecard Video (2004)
(3) www.globalscorecard.net

14

Sainsbury's (B): Assignment Questions/Learning Objectives

(1) Why and how has Sainsbury's moved from adversarial to a collaborative ECR-type relationships?

(2) Why are the suppliers reluctant to use Sainsbury's Information Direct system?

(3) What is the value of information sharing for the suppliers?

(4) What are obstacles towards Scorecarding?

(5) Why do buyers internally resist CPS? What is the influence of the supply chain organization on supplier relationships?

(6) What is the impact of Supply Chain Collaboration on the distribution of costs and benefits?

15

Sainsbury's (A): Transforming the Supply Chain

R. Slagmulder, INSEAD; D. Corsten, St. Gallen, D. Grottoli, INSEAD

This is the first of a two-case series (603-020-1 and 103-057-1). In 2000, under increasing competitive pressure from other major UK retailers, J Sainsbury's Supermarkets embarked on a radical transformation of its supply chain. The case study describes the challenges involved in rejuvenating the firm's supply chain infrastructure, systems, processes, and skill sets as part of an 'all-or-nothing' strategy to regain a leadership position in the marketplace. The teaching objectives are: (1) to learn about recent developments in supply chain configuration and information systems in the retail industry; and (2) to assess the opportunities and risks associated with major investments in supply chain restructuring.

16

Sainsbury's (B): Supply Chain Performance Measurement

R. Slagmulder, INSEAD; D. Corsten, St. Gallen, D. Grottoli, INSEAD

This is the second of a two-case series (603-020-1 and 103-057-1). The (B) case focuses on the performance measurement tools that Sainsbury's has implemented to improve the efficiency and effectiveness of its supplier relations. It describes the internal information system that provides up-to-date performance data on suppliers as well as an Internet- enabled system aimed at sharing daily supply chain information with suppliers. The case also demonstrates how a performance assessment tool called the Global Scorecard helps Sainsbury's and its suppliers identify opportunities for jointly improving their interface. The teaching objectives are: (1) to illustrate state-of-the-art information systems aimed at measuring and managing supplier performance in a retail context; and (2) to discuss how retailers and suppliers can work together to improve the efficiency of their interface and strengthen their relationship.

17

Erica Plambeck

Hayward Lumber Company
by

Magali Delmas, Erica Plambeck, Monifa Porter

Stanford GSB OIT 38

18

Luk Van Wassenhove

- The Scotts Company (co-written with R. Slagmulder), INSEAD case
  Case (A) – Transforming the European Supply Chain, 10/2002-5062
  Case (B) – Developing a Supply Chain Balanced Scorecard, 06/2002-5062
- Hewlett Packard – The Velocity Factory, INSEAD case 11/2003-5146
- Hewlett Packard – The Solution Factory, INSEAD case 11/2003-5147
- Performance Measurement in the Supply Chain (co-written with R. Slagmulder) 05/2004-5192
- Disaster Logistics cases

and

Supplier Rationalization at Barclays (A), (B) and (C)
by
Beril L. Toktay, Mumin Kurulus
ECCH (INSEAD)

19

Supply Chain Management Cases

- "the scotts company: transforming the european supply chain": usa company buying 5 national companies in europe within two years and trying to build a european supply chain organization…
- "performance measurement in the supply chain": HP developing and implementing their inventory-driven cost metric to prioritise supply chain improvement projects…

20

Extended Manufacturing Cases

- “HP velocity factory” and “HP solution factory”: HP server plant in germany fighting for survival by extending its activities downstream into supporting the sales and marketing of services.

21

Disaster Logistics Cases

Series of 4 cases on the United Nations Joint Logistic Center concept:

a) genesis of concept,

b) the first six months in Afghanistan,

c) the second year in Afghanistan,

d) institutionalisation of the concept in the UN.

22

Disaster Logistics Cases

2 cases on interface between ethics and humanitarian logistics:

1) coordinating disaster logistics after El Salvador's earthquakes using SUMA's humanitarian supply management system,
2) genetically modified food donations and the cost of neutrality: logistics response to the 2002 food crisis in Southern Africa.

23

Disaster Logistics Cases

2 cases on partnerships between logistics companies and humanitarian organizations:

1) Moving the World: the TPG-WFP partnership – looking for a partner and
2) learning how to dance

24

Disaster Logistics Cases

- There are now about a dozen recent cases available with teaching notes and other supporting materials.
- The materials are sufficient to be used as the basis of a course on the subject.
- A book will be published on the basis of the cases and supporting materials.

25

Books and Special Issues on Closed Loop Supply Chains

- Business aspects of closed loop supply chains (CBI, 2003)
- Reverse logistics: quantitative models for closed loop supply chains (Springer 2004)
- Case book (forthcoming 2004)
- California management review: winter 2004
- Interfaces: nov-dec 2003

26

Supply chain rationalization at Barclays (A,B,C)

- Barclays embarked on a change process from having 40 suppliers for its marketing print materials to a single partner.
- Case A deals with the question of central versus decentralized sourcing and single or multiple suppliers by analysing the current print supply chain status and its needs.

27

Supply chain rationalization at Barclays (A,B,C)

- Case B discusses the single-source solution: what should the contract specify, how would you structure the implementation, what challenges do you anticipate, what does a supply chain partnership really mean?
- Case C deals with making the partnership work: defining a single end-to-end process including Barclays, the single-source print partner and Royal Mail, and, implementing a collaborative improvement process.

28

Marshall Fisher

Paper and More

Noel Watson

HBS Case 9-604-093

29

Paper and More
Noel Watson

Description:

- Provides context and exercises for introducing retail inventory management, including cost optimization, service-level criteria, and forecasting in single and multi-product settings.
- The owner of a (fictional) single-location, paper and paper products store considers the implications of expansion on inventory management. Considerations include lost sales, retail metrics for multi-product settings, and shelf space constraints.
- An Excel spreadsheet allows students to explore these issues.

Structure

- Designed for two classroom sessions
- Seven analysis questions. Students prepare questions for in-class discussion. Analysis done using accompanying Excel Spreadsheet.
- Prerequisites: Familiarity with newsvendor problem, normal distribution and regression.

30

Paper and More Teaching Objectives

Class 1

- Inventory order-up-to level determination using
  - Historical data (simulation, Prob. Dist. Fitting)
  - Criteria
    - Type 1 and 2 service levels
    - profit maximization

Class 2

- Forecasting
  - Trend line estimation
- Lost Sales Estimation
  - Type 1 to Type 2 translation
- Multi-product management
  - Drawbacks with Aggregate Type 1 service level metric
  - Shelf-Space Constraints

31

Jan Hammond

Amazon's European Distribution Strategy
Zara: IT for Fast Fashion
Operational Execution at Arrow Electronics
ITC eChoupal Initiative

32

Amazon's European Distribution Strategy
by
Jan Hammond & Claire Chiron

HBS Case N9-605-002 (pending release)

33

Zara: IT for Fast Fashion
Andrew McAfee, Anders Sioman,Vincent Dessain

HBS Case 9-604-081

34

Zara: Case Overview

- Zara is largest chain of Spanish apparel retailer Inditex
  - > 500 stores worldwide at time of case
- Zara introduces more SKUs and has shorter leadtimes than any competitor
  - 'Fast fashion' at low price points
- Case decision: upgrade POS terminals in stores?
  - Port to new operating system (from DOS)??
  - Add functionality to allow inventory lookup (currently not possible within or across stores)?
  - Add functionality to network store cash registers (currently, store employees move floppy disks around, place orders on PDAs).

35

Zara: Teaching Objectives

- Give a 'best practices' example of how IT supports a business model
- Show that Zara handles SKU-level proliferation (and potential for complexity) via distributed decision rights and standardized business processes.
- Demonstrate the power of Zara's 'minimalist' approach to adopting IT
  - Driven entirely by business needs (as opposed to appearance of new technologies)
  - Strives always for simplest, 'leanest' solution
  - Of course Zara *could* do a lot more with IT, but why *should* they?
    - Business is extremely profitable and scalable.

36

Zara: IT for Fast Fashion
Teaching and Discussion Points

- Case underscores the need for “alignment” or “fit” between supply chain and business strategy. In other words, how does Zara’s supply chain support the company’s business model.
- Class discussion establishes the idea that Zara’s success probably derives from how various parts of its supply chain and business model fit together. Some counter-intuitive ideas emerge during the discussion: for example, Zara has made a virtue of stockouts in its retail stores because consumers expect the store to stock out and hence, come often to the store and buy something they like right away.
- Analyses
  - Quantitative analysis shows that new IT would not be prohibitively expensive
  - Qualitative analysis (i.e. understanding of business model) shows that new IT would not provide valuable capabilities
    - Zara’s current IT has demonstrated its ability to support and grow with the business

37

Operational Execution at Arrow Electronics
by
Ananth Raman, Zeynep Ton
HBS Case 9-603-127

38

Operational Execution at Arrow Electronics
Ananth Raman, Zeynep Ton

Context:

- Describes the DC operations (from order taking to order fulfillment) and the importance of attending to process details at Arrow Electronics, a large distributor of electronic components and computer products.
- Describes the actions the company takes to achieve and maintain accurate inventory records
- Describes the importance of inventory record accuracy to the company's strategy.

Decision:

- What should the VP of Operations at Arrow do about poor inventory data at Eagle, a company that Arrow acquired with CEO's promise to Eagle CEO that Eagle would be allowed to operate independently?

39

Operational Execution at Arrow Electronics

Learning objectives:

- Understand the importance of inventory data accuracy for the strategy of a distributor
- Through a detailed analysis of process flow at a DC, understand how easily inventory data could become inaccurate
- Develop an understanding of the role of process design, human resource management, and top management attention in achieving operational execution

40

FYI…

ITC eChoupal Initiative
David Upton
HBS Case 9-604-106

41

Matching Supply with Demand: An Introduction to Operations Management

Solving the Sport Obermeyer Case

Gérard P. Cachon and Christian Terwiesch
The Wharton School
University of Pennsylvania

Supply Chain Roundtable – July 2004

42

The reactive capacity opportunity

- Two ordering opportunities, the first well before the season starts, the second after the Las Vegas show.
- There is very little uncertainty in demand after the Las Vegas show.
- Demand uncertainty (coefficient of variation) varies across products.
- Price varies across products.
- Reactive capacity is limited, so the first order must include at least 15,000 units

Item	p	μ	σ
Gail	110	1,017	388
Isis	99	1,042	646
Entice	80	1,358	496
Assault	90	2,525	680
Teri	123	1,100	762
Electra	173	2,150	807
Stephanie	133	1,113	1048
Seduced	73	4,017	1113
Anita	93	3,296	2094
Daphne	148	2,383	1394

Gross margin = 24%
Loss on units salvaged = 8%

43

Utilizing limited reactive capacity

- Evaluate each product's Newsvendor order quantity and expected profit.
- Evaluate each product's maximum profit.
- Evaluate each product's mismatch cost to quantity ratio

Item	p	μ	σ	C_o	C_u	(a) Q	(b) Exp profit	(c) Max profit	(d = c-b) Mismatch cost	(e = d/a) Mismatch cost / quantity ratio
Gail	110	1,017	388	8.8	26.4	1279	22509	26,849	4,340	3.39
Isis	99	1,042	646	7.9	23.8	1478	18255	24,758	6,503	4.40
Entice	80	1,358	496	6.4	19.2	1693	22039	26,074	4,035	2.38
Assault	90	2,525	680	7.2	21.6	2984	48317	54,540	6,223	2.09
Teri	123	1,100	762	9.8	29.5	1614	22941	32,472	9,531	5.91
Electra	173	2,150	807	13.8	41.5	2694	75071	89,268	14,197	5.27
Stephanie	133	1,113	1048	10.6	31.9	1820	21353	35,527	14,174	7.79
Seduced	73	4,017	1113	5.8	17.5	4768	62116	70,378	8,262	1.73
Anita	93	3,296	2094	7.4	22.3	4708	53764	73,567	19,803	4.21
Daphne	148	2,383	1394	11.8	35.5	3323	63665	84,644	20,980	6.31

44

Make smart bets

- Produce safe items first (those with low mismatch cost to quantity ratios) and leave reactive capacity for the riskier products.

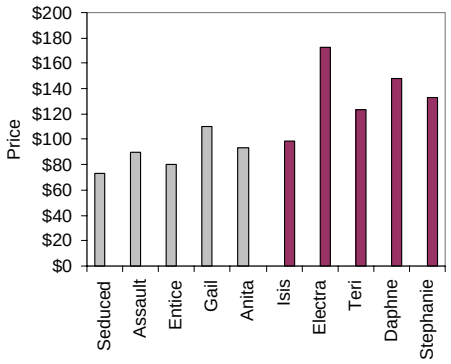
	(a)	(b)	(c)	(d = c-b)	(e = d/a)	Reactive capacity		
Item	Q	Exp profit	Max profit	Mismatch cost	Mismatch cost / quantity ratio	1st order	Profit	Expected 2nd order
Seduced	4,768	62,116	70,378	8,262	1.73	4,768	62,116	0
Assault	2,984	48,317	54,540	6,223	2.09	2,984	48,317	0
Entice	1,693	22,039	26,074	4,035	2.38	1,693	22,039	0
Gail	1,279	22,509	26,849	4,340	3.39	1,279	22,509	0
Anita	4,708	53,764	73,567	19,803	4.21	4,708	53,764	0
Isis	1,478	18,255	24,758	6,503	4.40	0	24,758	1,042
Electra	2,694	75,071	89,268	14,197	5.27	0	89,268	2,150
Teri	1,614	22,941	32,472	9,531	5.91	0	32,472	1,100
Daphne	3,323	63,665	84,644	20,980	6.31	0	84,644	2,383
Stephanie	1,820	21,353	35,527	14,174	7.79	0	35,527	1,113
Total	26,360					15,431		7,788

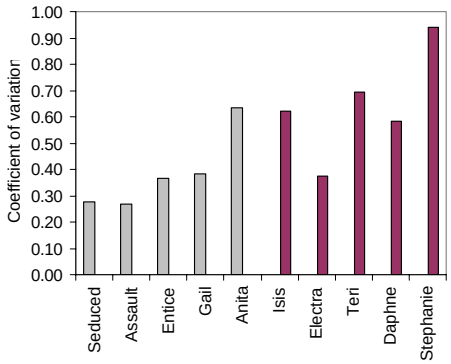
Newsvendor profit	410,028
Reactive capacity profit	475,412
Maximum profit	518,076
Reduction in mismatch cost	61%

45

What makes a product “safe”

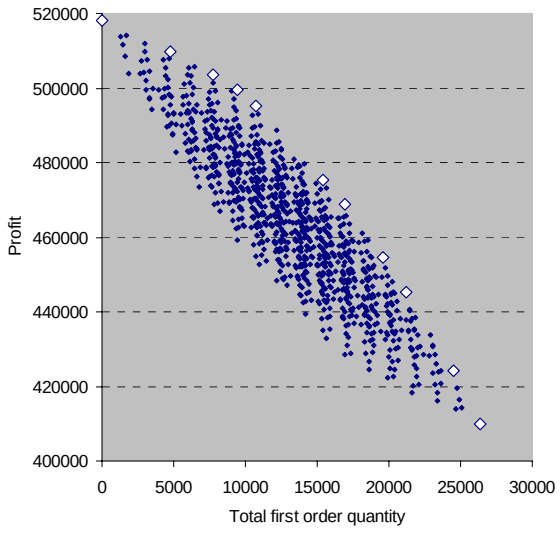
- The low mismatch cost to quantity ratio products tend to have a low price and a low coefficient of variation. (Grey = 1st order items, dark = 2nd order items)





The mismatch-quantity ratio is very effective

- Each observations is one of the 1024 possible 1st order quantity portfolios.
- The mismatch-quantity ratio finds the best 1st order portfolio no matter the required total first order quantity.



Karen Donahue

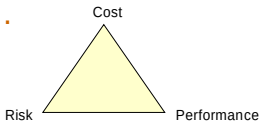
Conveying International Supply Chain Concepts

48

Conveying International SC Concepts

Concept 1: A balanced supply portfolio…

…includes the appropriate mix of



These factors are heightened when producing globally due to variability of "hidden" cost factors:

- cross-border freight and handling fees
- complex inventory stocking and handling requirements
- documentation and regulatory compliance requirements

Case Idea:

An Excel-based exercise that has students work through different sourcing scenarios (perhaps playing the role of Li & Fung, or a manufacturer like IBM). The model could include costs, restrictions, and time delays incurred in transporting product across borders.

49

Conveying International SC Concepts

Concept 2: Trade policy is an important input into how supply chains are managed. Supply chain professionals need to understand the impact of these policies and how to keep current on changes that effect their industry over time.

Case Idea:

Apparel and Agriculture are two obvious industry choices for a such case. For example, within the Agricultural industry, the following questions could be explored concerning the local production debate:

What are the major supply chain challenges in supporting more local, or organic, food production?

Are the benefits of local production unique to food, or are there other product categories where similar arguments toward local production might apply?

50