The New Era of Customer Service Management

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The Value of Customer Service

Flextronics

Solectron

Celestica
Performance Measures

• Transportation cost per cwt
• Inventory Turn Rate
• Cases ordered versus cases shipped
• Orders shipped complete
• Warehousing cost
• Total Logistics Cost
• Distribution cost as a percentage of sales
• Sales accounting ??
Customer Satisfaction Measures
Change from 1995 - 2000

- Nestle: -4.5%
- Unilever: +1.2%
- Procter and Gamble: -1.2%
- The Dial Corporation: -1.2%
- The Clorox Company: -3.4%
- Dole Food Company: -8.9%
The Customer Service Audit

• Provides external information
• The questioners are often long and customers do not take the time to fill out the forms…Difficulties with low response rate
• Sometimes audits do not show much differentiation between vendors
• Scale rating system may not be valid
• Unique service is often identified (Welch’s frozen distribution system)
Customer Service is multi-dimensional.

This makes measurement difficult.

The Xerox Example,

The Cisco Systems Example,

Be Careful!!!!!!!!!!

The Anchor and Adjust Heuristic
Recent Research in B2C Customer Service Orientation

• The Characteristics of eCommerce in Japan
• 1/3 of those who have used the Internet to order a product claim they will no longer use it to place additional orders
• 50% state they will not use the Internet
Grocery Home Delivery Shoplink

- The best business model among online grocery retailers
- Out of business
- Customer service policy the most reasonable in the business
- Ignored customer density
- No model for service, cost and density
- Ihann Chen’s work at MIT
The Economics of Information

• Do we know anything about this area?

“Brains have become far more important than bricks and mortar in the post-industrial economy.”

*The New Math*, Barron’s

• The price of information:
  – What the market can bear
  – The cost of creating information
  – Search Cost

• **Paul Romer and New Growth Theory**
The Value of Information (Continued)

- The Network Effect
  - Value proportional to the square of the nodes
- Sabre…. $40 mm to start…
  …Sold for $3.3 Billion
- Dell’s web-based distribution system, which accounts for over 40% of sales, does not appear on the balance sheet
- Productivity:
  - Equipment
  - Training
  - Systems
  - Methodology
General Customer Service Benchmarks
Fast Moving Consumer Goods Industry

Cases ordered versus cases shipped = 99%

Line items shipped complete = 95%

On time arrival = 90%

Inventory turn rate = 15 – 20

CRP Inventory Turn Rate = up to 50

Forecast error = MAD = 15 – 30% Product Group
30 – 50% Plant/SKU

Order cycle time = 3 – 5 days

Logistics cost as a percentage of Sales = 4 – 7%
New Methods of Customer Service

• Customer Relationship Management
  – Aspect Communications
  – Echomail, General Interactive, Inc.

• Continuous Replenishment Systems

• Collaborative Forecasting, Planning and Replenishment (CFPR)
  – Knowledge creation through “team work”
Product Line Complexity in Relation to Customer Service

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The Average Consumer:

- Spends 21 minutes to do shopping…
- Buys an average of 18 items per shopping trip…
- Is confronted with between 30,000 to 40,000 choices…
- *Search cost increases*
Proctor and Gamble

- Over 60 SKU’s for Crest
- 1/3 reduction of SKU’s (in 1996)
- The result:
  - A 2% reduction in sales
  - A savings of about $40 million
- No evidence of formal analysis
- “Ready, Fire, Aim” type of decision
The Turning Point at Toyota Motor Company

- Impressive productivity gains through the 1980’s through manufacturing flexibility (JIT, Total Quality Management and reduced set-up time)
- In the late 1980’s Toyota attempted mass customization with no cost increase
- By 1993, Toyota was forced to reduce their product line by 20%…costs had exploded…
- Only 20% of the product varieties accounted for 80% of the sales.

“Variety in and of itself is not customization – and it can be dangerously expensive.”

The Plastech Example (1995)

- Obtained a 20% increase in sales revenue through a strategy to increase product variety
- Batch sizes decreased by 50%
- PROFITS SHRANK BY 83%

- Others report no additional cost from line extensions.

*However, the data is from the PIMS data base.*
“There is increasing evidence that achieving competitive advantage through increased variety is heavily dependent on ensuring the proper alignment between the marketing and manufacturing strategies pursued by a company.”

Contribution Margin Calculation

Net Price – Variable Cost

Scarce Resource Unit Time
Impact of Increased Variety

• Inadequate Inventory Turns
  – Product freshness
  – Working capital

• Cost of Capital
  – Disproportionate amount of line capacity

• Variable Cost Impact
  – Product recoveries
  – Line inefficiency
  – Change-over cost

• Warehousing costs
• Management time and attention
A List of Today’s Topics

• Introduction to the study of complexity
• Sources of manufacturing complexity
• Dealing with complexity
• Modeling the cost of complexity
• Data Envelopment Analysis
• Conclusion
Complexity Defined

• Consisting of interconnected or interwoven parts
• Involved or intricate in structure
Complex Systems

- Non-linear nature, a small change in a single variable causes a large change in the overall system
- The anchor and adjust heuristic and human decision making
- A strong link to biology
- Santa Fe Institute
Examples

- Airplane crash research
- System dynamics – the beer game
- Sudden positive news for a consumer product
  - Health announcement for grape juice
- Factories and supply chains are the ultimate non-linear systems
The Change in Thinking

• Newtonian Universe
• Cause and effect
• Randomness and chance
• Interaction and the dynamics of the overall system
• Static optimization versus complex adaptive systems
  – the problem in planning today, mismatch between systems and environment
Sources of Manufacturing Complexity

- Multi-level systems
- Product/Process/Supply Chain Design
- Multi-plant operations
- Flexibility can produce complexity
  - Central batching area feeding several lines
- Accumulation of errors and discontinuity in the supply chain
- Heuristic decision making (Sterman)
- Interaction of many variables
A Dimension of Business Complexity

- Customer
- CRP
- Customer Service
- Plant
- Broker
- Regional Sales Manager
Dealing With Business Complexity

- Proctor and Gamble (Interfaces Article)
  - Standardizing product families and packages
  - Reduce trade promotions
  - Fewer coupons
  - Eliminate marginal brands
  - Reduce product lines
  - Re-apply strategies that work
  - Trim new product launches
Dealing with Business Complexity

• John Deere
  – A million permutations of planters
  – Genetic algorithms
  – More business systems based on recursion

• Focused Manufacturing

• Modeling the cost of complexity

• Application of Data Envelopment Analysis (DEA)
A Look at the Cost Characteristics of a Complex System

- A packaging line for canned juice items
- 34 containers, single container size
- No sequence-dependent change-over
- High speed, high capacity utilization
- Buffer stock required
- Decision – At what capacity utilization to add capacity?  Learning curve effects…
- At what capacity utilization do costs explode?
The Modeling Tool

- Spreadsheet based, finite capacity planning system
- Programmed in Visual Basic
- Based on a modified Dixon Silver heuristic
- Assume same set-up cost for all products
- Holding and set-up costs are known
- Title of paper...
Model Parameters

- Set-up time varies from 1.0 hers to 1.0 hrs
- Volumes held constant
- Capacity utilization hovers around 90%
- Dynamic buffers established based on future sales forecast
- Model seeks lowest cost based on heuristic
Model Results

• Increase in set-up time means increasing costs
• Greater setup time results in few set-ups, longer production runs
• Hard to contain “added capacity” above 93% utilization
Understanding the Cost of Complexity

- Changing set-up times
- Additional products
- Additional product families
- Dynamic demand
A New look at Complex Sets of Data

• Data Envelopment Analysis – look at outliers in data set
• Different from central tendency analysis
• Measure relative efficiency
• Charnes, Cooper and Rhodes, 1978
Definition of Inefficiency

When should a unit be considered inefficient?

….when another unit produces more with less…

When another unit has produced at least as much output and consumed at most as much input.
Benchmarking with DEA

- Customers/Category Management
- Products
- Effectiveness of models
Identifying Decision-making Units

• DMU: Any system with measurable inputs and outputs
  » Schools
  » Branch banks
  » Hospitals
  » Computer systems
  » City governments
  » Investment funds

• We need a set of comparable units
Data Envelopment Analysis

• Each decision-making-unit is viewed as transformers on inputs into outputs
• DEA compares all units on all dimensions (inputs and outputs)
• DEA determines the efficient frontier of best practice
Conclusion

• Complexity analysis must take a role in your organization

• Rational models are the only way to understand complexity
World–Wide Customer Service (Will) Differ By:

- Operating unit
- Customer
- Market Channel
- B2B versus B2C
- Local trade-offs
- Brand
The Balanced Scorecard Framework

• Customer Perspective
  – Customer view of:
    » Product services
    » Timeliness
    » Flexibility
    » Customer value

• Internal Business Perspectives
  – Waste reduction
  – Time compression
  – Flexible response
  – Unit cost reduction
The Balanced Scorecard Framework

• Financial perspective
  – Profit margins
  – Cash flow
  – Revenue growth
  – Return on assets

• Innovation and learning perspective
  – Product/process innovation
  – Partnership management
  – Information flows
  – Threats and substitutes