



Global Business Services

# Using ABC to Manage SKU Proliferation: A Case Study

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## Presentation Overview

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- Major North American contract and brand name manufacturer in the grocery products sector
- Multiple plants in Canada & the United States
  - This case study focuses on one facility located in the mid-west US
- History of very rapid growth in products & customers, with little management attention to SKU proliferation: most analyses focused solely on incremental sales
- Highly seasonal demand patterns
  - Peak demand in the summer
  - Frequent requirement to outsource some production in pre-summer buildup and during summer
- Current problem driven by plant being at capacity but with largest customer planning significant volume growth

## Project Goals

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- Review company definition of A-B-C-D class SKUs
  - Based solely on annual sales volumes within package size
- Compare the cost of A-B-C-D class SKUs
- Determine the capacity generated by discontinuing D-class SKUs
- Determine the impact on profitability of discontinuing D-class SKUs
  - Profitability impact is defined as net change in cash flow

## Summary of Results

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- Direct net cash benefit from eliminating all 85 D-SKUs produced in the plant is about \$290,000
- Project created additional 5-7% incremental capacity beyond volume exchange of deleted D-SKUs for large customer volumes
- Most D-SKUs are cash profitable, i.e. net selling price less direct production and distribution costs is positive
- However, D-SKUs are generally unprofitable after reflecting allocations of fixed costs and previously spent funds, and efficiency opportunities
- D-SKUs are significantly less efficient to manufacture than A-SKUs, resulting in relatively much higher yield losses and opportunity costs (lost production capacity)
- Production efficiencies of B & C SKUs are similar, suggesting that - from an operations perspective - these categories should be combined
- Many D-SKUs are categorized as such due to production decisions, i.e. product volume is at a B or C level, but the product may be produced in multiple plants (e.g. company's midwest plant and two contract packers) each at a D volume level

## Summary of Results, continued

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- Even though D-SKUs are cash profitable, profitability can be substantially improved if many of these SKUs are eliminated
- “Soft” cost savings opportunities are tangible, substantial (in aggregate), and realizable
- Realizing the savings requires that many D-SKUs be eliminated, and that associated costs are eliminated through several actions:
  - activity elimination
  - targeted head count reduction
  - customer and supplier negotiation
- Additional migration benefit (assuming average of \$0.50/case cash margin) can be estimated at US \$22,000 per year per 10% of volume retained
- Soft cost benefit (full goods carrying costs) can be estimated at US \$32,000 per year, or \$0.07/case (net of carrying costs associated with new SKUs)

# Root Causes of Potential Benefits

***MATRIX of COST SAVINGS DUE to RATIONALIZATION of D SKUs***

	<u>Cash "Go Away" Costs</u>	<u>Indirect Operating Costs</u>	<u>Warehouse, Distribution &amp; Obsolescence Costs</u>	<u>Materials Management Costs</u>	<u>Procurement Costs</u>	<u>Product &amp; Package Development Costs</u>	<u>Selling Costs</u>	<u>Finance &amp; Administration Costs</u>
<b>Individual SKU</b>	Raw and packaging materials	Eliminate flavour change-over time	Savings will be limited to freight costs only	None	Savings are too small to be noticeable	Savings upon periodic re-design are too small to be noticeable	None	None
<b>Multiple SKUs</b>			Savings will be largely related to freight costs only	Minimal savings due to managing fewer unique materials	Potentially noticeable, but small, procurement efficiencies	Minimal savings upon periodic re-design	None	Minimal savings due to selling fewer SKUs
<b>Package Size Within a Brand</b>		Elimination of line change-over time (where applicable)  Minor additional savings due to simplified production scheduling	Additional savings in warehousing may be achieved	Minimal savings due to managing fewer unique materials	Moderate procurement efficiencies	Moderate savings upon periodic re-design	Minimal, since account still requires service	Low-moderate savings due to simpler (and fewer) invoices
<b>Brand or Account</b>			Moderate to significant savings	Moderate to significant savings	Moderate to significant procurement efficiencies	Significant savings as no re-design work is required	Significant, as CSR and account management time and expenses are eliminated	Significant, as invoicing & collection time and expenses are eliminated

**NOTES and ASSUMPTIONS :**

1. Elimination of a SKU (or multiple SKUs) does not include potential production line savings, as it appropriate to assume that production of other SKUs will increase.
2. Some savings or opportunities, such as elimination of a flavour-change, can be realized without necessarily eliminating the SKU. For example, flavour changes can be eliminated or reduced through the use of common concentrates and product formulas.
3. Product & package development costs savings apply only to future costs that can be avoided IF a SKU or brand is re-designed.

## Root Causes of Potential Benefits, *continued*

### **POTENTIAL COST SAVINGS DUE to RATIONALIZATION of D SKUs - ESTIMATES ONLY**

	<u>Cash "Go Away" Costs</u>	<u>Indirect Operating Costs</u>	<u>Warehouse, Distribution &amp; Obsolescence Costs</u>	<u>Materials Management Costs</u>	<u>Procurement Costs</u>	<u>Product &amp; Package Development Costs</u>	<u>Selling Costs</u>	<u>Finance &amp; Administration Costs</u>
<b>Individual SKU</b>	\$ Nil	\$0.65 / case	\$0.20 / case	\$ Nil	\$ Nil	\$ Nil	\$ Nil	\$ Nil
<b>Multiple SKUs</b>	\$ Nil	\$0.65 / case	\$0.20 / case	< \$0.02 / case	< \$0.02 / case	\$ Nil	\$ Nil	\$ Nil
<b>Package Size Within a Brand</b>	\$ Nil	\$0.65 - \$2.63 per case	\$0.25 per case	< \$0.02 / case	\$0.02 / case single serving sizes		\$ Nil	\$ Nil
<b>Brand or Account</b>	\$ Nil	\$0.65 - \$2.63 per case	\$0.30 per case	\$0.02 / case	\$0.02 / case single serving sizes		\$100,000 per year	\$125,000 per year

1. Individual SKU Cash Go-Away and Indirect Operating cost savings assume that A-category SKUs are produced instead of D-category SKUs.
2. Current change-over loss averages 230 cases per 10 minute flavour change (520 such changes per year). If we assume 1/10 as many line changes per year (say 50) at 3 hours per change, total cases lost would be about 180,000 (50 changes times 200 cases lost per 10 minutes \* 18 ten minute periods per change). Now assume that 1/3 of such package changes are eliminated, thus realizing additional capacity of 60,000 cases at average of \$2.63 per case. This per case amount is calculated as the net selling price \* volume of all D-SKUs, less associated ingredient and packaging costs.
3. Selling costs savings associated with brand or account elimination assume the elimination of 1 full-time, account-dedicated sales representative.
4. Finance & Admin. costs savings assume the elimination of 1 or more accounting/clerical staff, telephone calls, postage, write-off of disputed balances, etc.

## Root Causes of Potential Benefits, *continued*

### Relative Costs of A-B-C-D SKUs

	<u>INDIVIDUAL SERVINGS SIZES</u>		<u>MULTIPLE SERVINGS SIZES</u>	
	Format 1	Format 2	Small Size	Large Size
<b>Increased Floor Cost of B/C-SKUs Relative to A-SKUs</b>				
Operating Costs	\$0.05 - \$0.09	\$0.03 - \$0.06	\$0.21 - \$0.45	\$0.14 - \$0.23
Yield Losses	\$0.00 - \$0.01	\$0.00 - \$0.01	\$0.00 - \$0.02	\$0.00 - \$0.01
Increased Fixed Development Amortization Charge for B/C-SKUs Relative to A-SKUs				
	\$0.10 - \$0.20	\$0.05 - \$0.15	\$0.10 - \$0.20	\$0.10 - \$0.20
<b>Increased Floor Cost of D-SKUs Relative to A-SKUs</b>				
Operating Costs	\$0.07 - \$0.14	\$0.05 - \$0.10	\$0.51 - \$0.83	\$0.22 - \$0.36
Yield Losses	\$0.01 - \$0.02	\$0.01 - \$0.02	\$0.02 - \$0.04	\$0.01 - \$0.02
Increased Fixed Development Amortization Charge for D-SKUs Relative to A-SKUs				
	\$0.90 - \$1.00	\$1.75 - \$2.00	\$0.50 - \$0.60	\$0.80 - \$1.20

## ABC Analysis, summary

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	<u>Production Benefits</u>	<u>Migration Benefits</u>	<u>Soft Costs</u>	<u>Excluded Costs</u>
Direct Labor		✓		
Ingredients & Packaging	✓			
Plant Overheads		✓		
Product & Package Development				✓
Purchasing				✓
Warehouse, Distribution, Pallets	✓			

## ABC Analysis

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- Traditional activity analysis was performed in several areas:
  - Production
  - Production support or Indirect operations
  - Warehousing & distribution
  - Materials management & procurement
  
- Higher level, or more strategic, ABC analysis was done in SG&A and product/package development areas
  
- Specific product/package costs were drawn from bills of material & related sources

## ABC Analysis, continued

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- Package sizes were defined by the company, typically starting with single-serve and multiple serving formats and then breaking these down further (see subsequent slides for an example)
  - Single serving format encompassed up to 4 different package configurations
  - Multiple serving format encompassed up to 6 different package configurations
  
- Migration Benefits :
  - the operating margin (net selling price less floor cost) of the SKU to which the volume migrates, as the production benefit component already incorporates the loss of revenue from the D-SKU
  - for example, Brand X Flavour 5 deleted multi serve format to the same brand & flavour, in the retained multi serve format
  
- Soft Costs :
  - finished goods inventory carrying cost (floor cost \* average days in inventory \* 10% cost of capital)

## ABC Analysis, continued

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- First assumption is that each D-class SKU is eliminated and resulting production capacity is fully absorbed by incremental large customer of the closest equivalent flavour and pack size
- Change-over cost is defined as the lost revenue due to lost production capacity, and need not include labor and overhead costs (see Note 4)
- All change-overs related to D-SKUs are assumed to be flavor changes and do not include package or line changes
- Production Benefits and Costs include :
  - capacity currently used to produce each D-SKU plus the capacity made available from the elimination of the associated flavour changes is used to meet additional demand from the largest customer
  - elimination of yield loss from each D-SKU flavor change, limited to the cost of ingredients, and hence excluding any cost for water or sewage treatment

## SKU Elimination Opportunity Example

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- Brand X
  - Flavour 1 :
    - Offered in 4 multi serve formats, 2 A, 1 BC, and 1 D
    - Also offered in 3 single serve formats, 2 A and 1
    - Recommendation: delete the D multi-serve format
  - Flavours 2 and 3:
    - Offered in 2 multi serve formats, both BC
    - Also offered in 2 single serve formats, 1 A and 1 BC
    - Recommendation: no change
  - Flavour 4:
    - Offered in 4 multi serve formats, 1 A, 1 BC, and 2D
    - Also offered in 2 single serve formats, both A
    - Recommendation: delete both D multi serve formats
  - This same approach continued for 7 more flavours in this brand alone

## Manufacturing Facility SKU Profiles

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- The following pages highlight several points:
  - A items account for 80% of production volume, but consume only 58% of runs
  - D items account for less than 4% of production volume, yet consume almost 12% of runs
  - The efficiency loss on A items is only about 5%, for B and C items in the range of 13-15%, while for D items it is more than 20%

## Manufacturing Facility SKU Profiles, continued

SKU Classification by Production Volume	Production (raw cases)	Number of Runs	Avg. Run Length (raw cases)	Avg. Days in Inventory	# of SKUs	% of SKUs	% of Production Volume	% of Total Runs or Changeovers	Total Cases Lost During Changeovers	Efficiency Loss (Cases Lost / Cases Produced)
A - items	13,572,900	3,138	<b>4,325</b>	<b>10.75</b>	93	24.4%	80.9%	58.4%	744,865	5.5%
B - items	1,470,372	864	1,702	21.63	49	12.9%	8.8%	16.1%	198,621	13.5%
C - items	1,148,997	755	1,522	46.97	96	25.2%	6.9%	14.0%	173,114	15.1%
D - items	575,796	617	<b>933</b>	<b>102.00</b>	143	37.5%	3.4%	11.5%	<b>118,327</b>	<b>20.6%</b>
<b>Total</b>	<b>16,768,065</b>	<b>5,374</b>	<b>3,120</b>	<b>26.02</b>	<b>381</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>1,234,926</b>	<b>7.4%</b>

## Manufacturing Facility SKU Profiles, continued

	Single Serving Size - Format 1			Single Serving Size - Format 2		
	A	B / C	D	A	B / C	D
<b>Definition (Sales in cases)</b>	> XXX	YYY - XXX	< YYY	> XXX	YYY - XXX	< YYY
<b>Number of SKUs</b>	17	26	8	21	31	8
<b>Average Case Sales</b>	191,522	14,764	2,469	124,632	19,594	1,244
<b>Average Run Length</b>	5,491	2,317	1,813	3,710	2,306	1,818
<b>Yield Loss (see Note 1 below)</b>	0.23%	0.54%	0.74%	0.36%	0.58%	0.73%
<b>Efficiency Loss (Cases Lost / Cases Produced)</b>	5.42%	12.85%	16.42%	8.02%	12.91%	16.37%
<b><u>Opportunity Costs - Relative to A-SKUs</u></b>						
Efficiency Loss Cost, Estimate		\$0.05 - \$0.09	\$0.07 - \$0.14	\$0.03 - \$0.06	\$0.05 - \$0.10	
Yield Loss Cost, Estimate		\$0.00 - \$0.01	\$0.01 - \$0.02	\$0.00 - \$0.01	\$0.01 - \$0.02	
Amortization of Fixed Development Costs, Estimate		\$0.10 - \$0.20	\$0.90 - \$1.00	\$0.05 - \$0.15	\$1.75 - \$2.00	

Notes : (1) Yield loss is defined as the number of cases of finished product that would have been produced with the ingredients lost during a flavour change-over, expressed as a percentage of total cases produced. For example, 7798 cases worth of ingredients was lost during change-overs within the multi-serving small size for A-items; this represents a loss of **0.23%** of cases produced. For B/C items, the equivalent ratio was 3312 cases, but **0.79%**.

(2) Opportunity cost by account is calculated from the Net Selling Price less Floor Cost of the SKUs in a given category (e.g. Brand-Package-Size A items, where all items in a given brand-package group have the same price and cost) times the efficiency or yield loss for that package and SKU category.



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Thank you

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