PRODUCTIVITY AND SCANNING: A WINNING TEAM

by

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INTRODUCTION

Clearly, the scanning revolution is with us. Today, there are approximately 7,000 supermarkets in the U.S. equipped with UPC scanning systems. Although these stores represent only 1/4 of all supermarkets in existence, they capture nearly 40% of all supermarket sales.

In a real sense, however, the scanning revolution is just beginning to get underway. The wealth of data and management information made possible through scanning remains largely untapped. In fact, it appears that less than 10% of all scanning supermarket companies are making comprehensive use of the data for decision-making purposes. Ultimately, the impact of scanning will go far beyond changing the way products are checked out at the front-end. In the future, scanning data will help improve decisions in many areas of supermarket operations and merchandising.

PURPOSE

In the previous persentation on scanning's "hard" benefits by Professors Fletcher and Edwards, we saw that the scanning technology can significantly improve operating productivity through increased checkout speed, improved price accuracy, and the elimination of item price-marking. These "hard" benefits alone can justify the substantial investment in scanning equipment. However, even greater potential benefits lie on the "soft" side of scanning; that is, the use of the data generated by these systems.

The purpose of my presentation this morning is to outline several ways in which scanning information can be used to enhance merchandising decision-making. Specifically, we will be focusing on the following two areas, which represent the major responsibilities of the supermarket merchandiser:

1. Retail Shelf Management
2. Sales Promotion Management

In both areas, we will be exploring--through several "real life" examples--how scanning data is being used to improve overall performance.

RETAIL SHELF MANAGEMENT

In a real sense, the supermarket retailer's greatest asset is his shelf space, simply because that space produces his sales and profits. A primary responsibility of the supermarket merchandiser is to insure that available shelf space is utilized productively.

Historically, our approach to shelf space management was to insure that the shelves looked orderly and remained full. Unfortunately, this often led to imbalances between customer demand and what was stocked on the shelves. In addition, most chains and wholesalers developed standard shelf planograms for implementation throughout their different supermarkets. By definition, a "standard" approach cannot adequately satisfy the varied needs of different stores.

Today, there are several computerized shelf management systems that are designed to provide a better balance between the space allocated to grocery products and the consumer demand (sales patterns) for those products. Ideally, this process results in fewer out-of-stocks, less "dead" inventory, and a higher level of inventory turnover. Some of the more popular shelf management systems include:

-- COSMOS (Computer Optimization and Simulation Modelling for Operating Supermarkets)

-- HOPE (Higher Operating Profits through Efficiency)

-- SLIM (Store Labor and Inventory Management)

-- ACCUSPACE

Basically, all such systems prescribe a space allocation/product assortment plan--customized by store--based on historical item movement. The historical data were typically based on warehouse withdrawals (i.e., actual unit purchases by consumers).

Let's take a look at the experience of a Texas supermarket chain that introduced a scanner-based space allocation program. Based on the program recommendations, the chain completely reset the dry grocery and health and beauty aids departments in two of its stores. The following tables illustrate the percentage improvement achieved over the previous approach.

As Table 1 illustrates, the chain was able to continue increasing its sales volume while maintaining a proportionately lower level of inventory dollars. (NOTE: These figures reflect year-to-year comparisons based on unadjusted dollars.) The improvement is particularly noticeable in terms of inventory turns which increased markedly.

TABLE 1. BENEFITS OF SPACE ALLOCATION IN THE DRY GROCERY DEPARTMENT (% CHANGE VS. PREVIOUS PERFORMANCE)

	Store A	Store B
Sales Dollars	+11.4%	+39.8%
Inventory Dollars	(- 3.8%)	+15.9%
Inventory Dollars	+19.4%	+35.9%

In the health and beauty aids department, the new space allocation system resulted in even more dramatic improvements. In this instance, the chain experiences tremendous improvement with substantially less inventory investment, Table 2.

TABLE 2. BENEFITS OF SPACE ALLOCATION IN THE HEALTH AND BEAUTY AIDS DEPARTMENT

	Store A	Store B
Sales Dollars	+12.1%	+35.0%
Inventory Dollars	(-27.5%)	(-30.6%)
Inventory Dollars	+35.0%	+110.0%

The chain learned several lessons from this experience:

1. Many faster-moving items had previously been under-allocated (which contributed to out-of-stocks, lost sales, and comsumer disaffection).

2. Conversely, many slower-moving items had been over-allocated (resulting in unnecessarily high inventory levels).

3. Unit sales should be the primary determinant of shelf space (i.e., number of facings).

4. Gross profit dollar contribution may be used to determine shelf positioning (i.e., shelf location).

5. Shelf allocation did not result in reduced variety.

6. Overall, most product categories required less shelf space to support their sales volumes (which produced "new" space for alternative merchandising uses).

Let's turn to another example of using scanning data to improve shelf management decisions. As I'm sure many of you have heard, a project called ScanLab has been underway for the past 2-1/2 years. This unique project is a joint effort between General Foods, Dick's Supermarkets (Wisconsin) and Willard Bishop Consulting Economists. The purpose of ScanLab is to develop meaningful approaches for exploiting scanning data for merchandising decisions.

ScanLab employed an experimental "test/control" design to evaluate several concepts of scanning data utilization. Matched groups of supermarkets were divided into two panels. Stores in the "test" panel were exposed to ScanLab reporting concepts and analyses, while the "control" stores continued to operate as usual. Before ScanLab was introduced, three months of data were collected in both panels to provide a "base period." Sales and profit performance of each store panel was monitored over time and compared to the base period.

Three product categories were initially selected for testing: detergents, dog food, and shampoos/conditioners. The test stores received the ScanLab reports and decision support analyses on these categories which included, among other data, unit item movement, sales dollars and gross profit contribution. Based on this information, merchandisers were able to make more informed decisions regarding space allocations, shelf positioning, new item introductions and item deletions.

Table 3 presents the improvement in merchandising performance that can be attributed to the ScanLab-based decisions.

TABLE 3. SCANLAB RESULTS (3 TEST CATEGORIES COMBINED)

	Percentage Change In:		
	ScanLab Stores	Control Stores	ScanLab Contribution
$ Sales	+ 14%	+ 11%	+ 3%
Gross Profit ($)	+ 19%	+ 11%	+ 8%
Gross Profit/ Cu. Ft.	+ 17%	+ 5%	+ 12%

Clearly, the ScanLab stores experienced significantly greater increases in dollar sales and gross profit contribution. The ScanLab experience leaves little doubt about the large potential benefits that can be achieved through the proper use of scanning data.

The ScanLab project has also shown that there are several important considerations necessary for the effective use of scanning data, including:

-- Insuring data integrity (e.g., checker disciplines, scan file maintenance)

-- Tracking "causal data" that can influence item performance (e.g., out-of-stocks, promotional activity)

-- Controlling reporting/information volume (to avoid "data overload")

-- Developing more sophisticated approaches to evaluated products (i.e., Return On Inventory Investment [ROII] and Direct Product Profit [DPP]).

The last point is a particularly interesting one. Scanning and related computer technologies make more feasible the development of improved product performance measures such as ROII and DPP. Indeed, merchandising decisions are greatly affected by the type of measures or "rules" used.

Traditionally, merchandising decisions have been heavily influenced by relatively straightforward performance measures such as gross profit percent, unit sales, or gross profit dollars. To an increasing degree, more sophisticated measures are gaining acceptance in the industry. As mentioned, one of these is ROII, which can be defined as follows:

$$\text{ROII} = \frac{\text{GROSS PROFIT DOLLARS + PROMOTIONAL ALLOWANCES}}{\text{COST OF ALLOCATED SHELF INVENTORY (AT CAPACITY)}}$$

Decisions based on ROII improve inventory productivity and, at the same time, shelf space allocation.

Table 4 illustrates how different performance measures--including ROII--can result in very different conclusions.

TABLE 4. PRODUCT PERFORMANCE SUMMARY -- BREAKFAST CEREALS

Manufacturer	Gross Profit %	Average Unit Movement/Item	Gross Profit $	Weekly ROII
Kellogg's	9.5	31	180	11.7
General Mills	7.0	33	91	11.6
Quaker Oats	14.8	31	131	20.8
Post	10.7	24	89	12.9
Nabisco	13.0	29	50	22.1
Ralston	12.0	21	39	17.4

Kellogg's generates the greatest gross profit dollar contribution. However, on a ROII basis, Nabisco is highest; signifying that Nabisco products are more productive in terms of generating a return on the inventory and shelf space that has been allocated to them.

Sales Promotion Management

Another critical responsibility of the supermarket merchandiser is for advertising and promotion. Every week, a great deal of time, effort, and money goes into choosing ad items, creating the copy, building store displays, etc. Scanning data provides valuable input for determining the effectiveness of sales promotion activities.

The following tables provide a quick look at how one chain is beginning to evaluate feature items in its ads. Over the past several months, this medium-sized, midwestern chain has begun a program of simultaneously advertising competing national brand and private label products in the same product categories. The idea is to present consumers with a dual choice of reduced price brand and store label products from which they can make their own "best value" determination. Competing items within each category received equal treatment in the ads and in terms of store display.

The first of our five examples deals with a fresh milk promotion that was run this past summer, Table 5. The data show the percentage change (%Δ) in performance between the promotion period and the norm (average performance). In this case, although both prices were reduced by proportionately the same amounts, the private label milk responded more favorably in terms of unit movement

TABLE 5. 2% GALLON MILK PROMOTION

		Private Label	Regional Brand
Retail Price:	Pre-sale	$1.79	$1.84
	Sale	1.53	1.59
	%Δ	(-15%)	(-14%)
Gross Profit: (%)	Pre-sale	25.04%	25.57%
	Sale	11.44	13.84%
	%Δ	(-54%)	(-46%)
Unit Movement:	%Δ	+75%	+23%
Sales ($):	%Δ	+49%	+ 6%
Gross Profit: ($)	%Δ	(-32%)	(-42%)

and sales dollars. Both milk promotions, however, resulted in a gross profit dollar contribution that was significantly less than the normal performance for these items.

Table 6 presents the results of a private label/brand margarine promotion. Here again, the lower-priced private label alternative responded much more strongly, although it did receive a substantially larger price discount than the brand. In terms of gross profit dollars, both items contributed nearly as much as they did at their regular prices.

TABLE 6. 16 OUNCE CORN OIL MARGARINE PROMOTION

		Private Label	Regional Brand
Retail Price:	Pre-sale	$ .69	$ .95
	Sale	.49	.89
	%Δ	(-29%)	(- 6%)
Gross Profit: (%)	Pre-sale	47.25%	25.10%
	Sale	25.72	20.07
	%Δ	(-46%)	(-20%)
Unit Movement:	%Δ	+134%	+29%
Sales ($):	%Δ	+66%	+21%
Gross Profit: ($)	%Δ	(- 9%)	(- 3%)

In Table 7, we have an example concerning English Muffins. Both the private label adn the brand experienced huge increases in unit movement and sales dollars. However, the store

TABLE 7. ENGLISH MUFFIN PROMOTION

		Private Label 6 Count	Regional Brand 12 Count
Retail Price:	Pre-sale	$ .63	$2.23
	Sale	.40	1.79
	%Δ	(-37%)	(-20%)
Gross Profit: (%)	Pre-sale	49.47%	23.32%
	Sale	20.96	4.54
	%Δ	(-58%)	(-81%)
Unit Movement:	%Δ	+640%	+444%
Sales ($):	%Δ	+366%	+337%
Gross Profit: ($)	%Δ	+ 98%	(-15%)

brand nearly doubled its normal gross profit dollar contribution (+98%), while the brand's contribution declines (-15%). The unit sales increase of the private label more than compensated for the mark down in price (and gross profit percent).

Table 8 deals with canned bean sprouts. In this instance, the feature price treatment was very different between the private label and brand alternatives. The private label was offered at 3/$1 which reduced the gross profit margin percent markedly. On the other hand, the brand was featured at a small 4¢ discount. Interestingly, while private label unit sales increased nearly sevenfold, gross profit dollar contribution declined by

TABLE 8. BEAN SPROUTS PROMOTION

		Private Label 16 oz.	Regional Brand 28 oz.
Retail Price:	Pre-sale	$ .55	$ .89
	Sale	.34 (3/$1)	.85
	%Δ	(-38%)	(- 5%)
Gross Profit: (%)	Pre-sale	43.01	28.45
	Sale	5.97	25.13
	%Δ	(-86%)	(-12%)
Unit Movement:	%Δ	+680%	+66%
Sales ($):	%Δ	+372%	+59%
Gross Profit: ($)	%Δ	(-34%)	+41%

a third. Brand unit sales increased to a lesser degree. However, the brand promotion generated increased gross profit dollars.

Finally, Table 9 presents a private label/brand promotion of one gallon bottled orange drinks. In this instance, the brand promotion generated a phenomenal response across the board, while the private label alternative expreienced a relatively minor increase in unit movement. A contributing factor to the brand's performance appears to be the psychological impact on the consumer of reducing the price from three digits ($1.39) to two digits ($.99).

The chain is currently expanding this analysis to include:

-- The effect of promotions on overall category performance

-- The effect of promotions on future sales (i.e., cannibalization)

On the whole, this chain is very happy with its initial efforts in scanning data analysis. Based on its efforts to date, the chain has developed several preliminary observations concerning its promotional efforts:

1. There appears to be a general correlation between the unit movement increase resulting from a promotion and the amount of the retail price markdown.

2. At a given price markdown level, brand products typically generate a significantly higher increase in unit movement (i.e., are more price elastic).

3. Most promotions appear to result in decreased gross profit dollar contribution (vs. the average, non-promotion contribution).

4. Promotions appear to be generally more effective (as measured by gross profit dollar contribution) in those instances where the item has a "healthy" normal gross profit (e.g., 30-50%) and the markdown results in a "reasonable" promotion gross profit (20-25%).

The first two findings, concerning price elasticity, are of particular

TABLE 9. ONE GALLON ORANGE DRINK PROMOTION

		PRIVATE LABEL	Regional Brand
Retail Price:	Pre-sale	$ .98	$1.39
	Sale	.79	.99
	%Δ	(-19%)	(-29%)
Gross Profit: (%)	Pre-sale	35.71%	47.90%
	Sale	20.25	26.62
	%Δ	(-43%)	(-44%)
Unit Movement:	%Δ	+19%	+414%
Sales ($):	%Δ	(- 4%)	+265%
Gross Profit: ($)	%Δ	(-46%)	+103%

interest. The chain would eventually like to develop a "promotion sensitivity model" that would help forecast unit sales increases at various markdown levels.

Based on the limited data available to date, the chain has developed an approximation of what such a model might look like, Figure 1.

Clearly, such a model must eventually be developed on a category-by-category basis. It should also incorporate other causal data--apart from price--that may influence sales (e.g. type of ad, use of signs, displays, competitive activity, etc.)

If such models can be feasibly developed, there are several potential benefits available to the merchandising decision-maker, including:

-- Being able to accurately forecast the quantity promotional product that should be on hand (in the warehouse and at store level) to satisfy consumer demand at a given price point.

-- Deciding on an "optimal" price point that would maximize the promotional item's gross profit dollar contribution (or other decision rule objective)

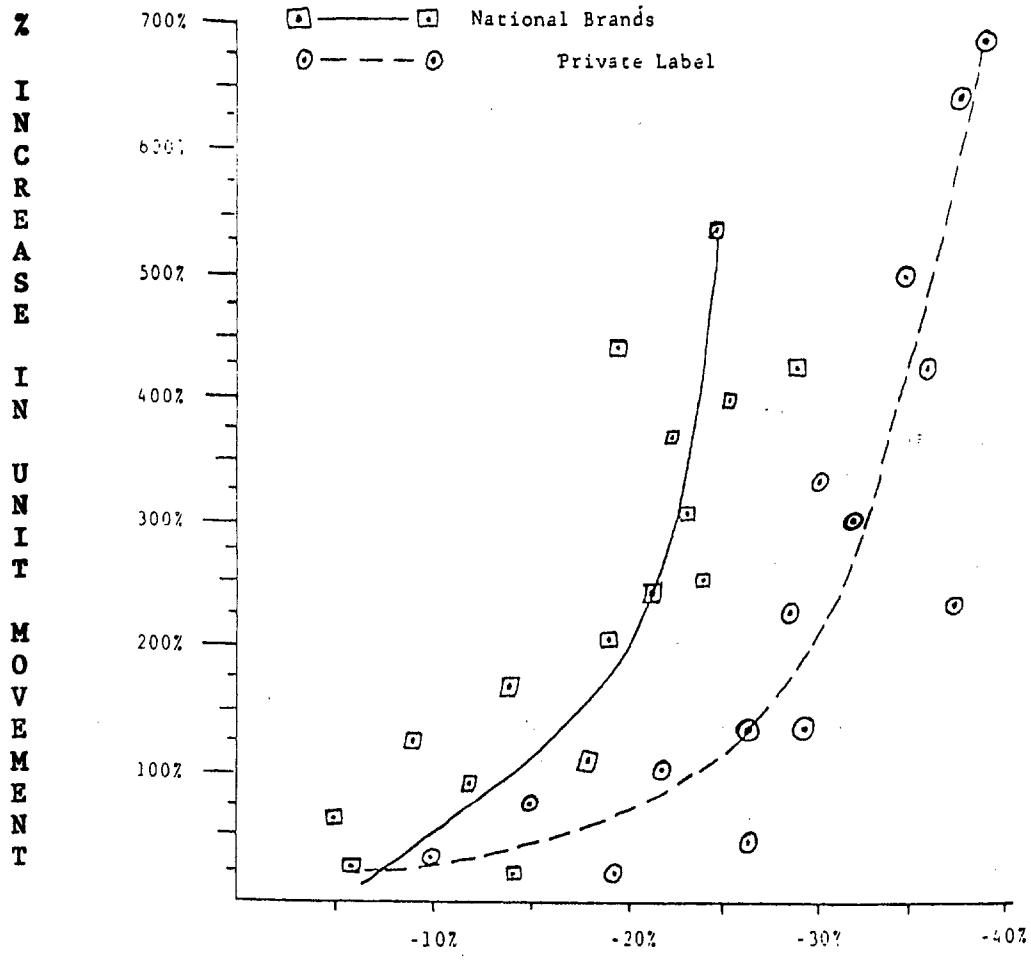
This is just one example of how scanning data might be applied. In truth, properly formatted scanning information can be used as input for virtually any decision affecting promotional merchandising.

Summary

Through these case examples, it is clear that there are major opportunities to improve merchandising decisions via the support of scanning data. The technology provides information that is more immediate, more accurate, and more comprehensive than any previously available. The potential benefits of these soft applications are incalculable. The actual benefits achieved will depend on how aggressively supermarket companies pursue the opportunities.

Although supermarket merchandising will remain largely an art form, the science of scanning can substantially elevate the skills of the decision-maker.

FIGURE 1. PROMOTION SENSITIVITY: MOVEMENT RESPONSE VS. PRICE DECREASE



PERCENTAGE DECREASE IN RETAIL PRICE