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This is an early draft of:

- "Point-of-Sale Data in Consumer Goods Marketing: Transforming the Art of Marketing into the Science of Marketing", that appeared as ...
- Chapter 2 of the *The Marketing Information Revolution*

Since electronic versions of this 1994 publication are hard to come by, this 1993 draft is provided as a service to researchers.

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## **The Marketing Information Revolution (Chapter 2)**

### **Point-of-Sale Data in Consumer Goods Marketing: Transforming the Art of Marketing into the Science of Marketing**

**by:**

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During the 1980s, there was a dramatic increase in the installation of systems which capture Point-of-Sale (POS) data by retailers. The increase of installations was greatest in the supermarket segment, after the adoption of an industry standard for bar coding (i.e. the Universal Product Code) by the consumer packaged goods manufacturers. The reported benefits from this adoption of standards has led to similar standards by vendors of other lines of consumer goods (e.g. apparel) carried by department stores and mass merchandisers. The initial impetus for retailers to install sophisticated POS systems was to decrease the time required to record the item purchases by customers, and to improve the accuracy of prices charged at checkout. Both manufacturers and retailers believed, however, that even greater benefits might be realized when the POS data were analysed, and applied to improve the effectiveness and efficiency of marketing activities logistics.

Prior to the general availability of POS data, marketing was usually considered to be an art. One reason for this view was that measures of market performance were available only at very aggregate levels, temporally and geographically. This made it difficult to assess the effect of a specific marketing events (e.g. promotions), which might have occurred for a brief period of times (e.g. one week) in limited geographic markets. Consequently, successful marketing was attributed to the

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intuitive understanding of consumer tastes, and the creativity of media advertising. The availability of weekly POS data at the household, store, account and market level, when coupled with measures of causal variables (e.g. store displays), provides the opportunity to obtain precise measures of the effect of different marketing events. However, in order to take advantage of the availability of these data, firms must take a more scientific approach to marketing, and an appropriate commitment of resources.

The decision to commit the resources necessary to effectively use these data, however, has proven to be neither simple nor obvious for most companies. While the cost to retain POS data as an electronic byproduct of transactional systems is low, the resources required to store and analyse these data are significant. In addition, attributing improvements in bottom-line profitability to the direct application of these data has proven difficult.

The purpose of this chapter is to discuss the form and content of POS data available to marketers, current and potential managerial applications of these data, and issues in their effective managerial use. In the first two sections, we discuss the different data sources available, and then the types of decisions to which they may be applied by both retailers and manufacturers. In the third section, we discuss the sequential stages through which firms must progress to improve their expertise in the science of marketing. The following three sections build on the preceding, to review some leading-edge applications of POS data. The chapter concludes with an outlook on the future for POS data.

### **1. Data Sources in Consumer Goods Marketing**

In order to gain a better understanding of the potential value of Point-of-Sale data, it is useful to position these data in the cycles of transactions from production to consumption that typically occur in consumer goods marketing. Figure 1 depicts a two-stage distribution channel as four cycles: a product marketing cycle, a manufacturing/distribution cycle, a retail cycle, and a purchase/consumption cycle.

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Figure 1: Transaction Cycles in Consumer Goods Marketing

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The first two cycles are the primary concern of the manufacturer. The marketing function focuses on the outer "**Product Marketing Cycle**": a product is produced, and a marketing program consisting of advertising and promotion is designed to support it. Consumer advertising builds product awareness, knowledge and preference; promotions are sponsored to induce brand switching or purchase acceleration. For this cycle, data which reports on the success of inducing customers to purchase particular brands is of primary interest. The time spent on these activities is called "**Product to Consumer**".

The manufacturer's Operations function focuses on the "**Manufacturing/Distribution**" cycle (on the inner left). Products flow through manufacturer's warehouses to the retailer's (or wholesaler's) distribution centre. The quantity and price of inventory transferred is captured for accounting purposes, and is frequently made accessible to the sales force to service their customers. These activities of the manufacturer/ retailer dyad are called, colloquially, "**Product to Shelf**".

The retailer is primarily concerned with the the "**Retail Cycle**" (inner center). In this cycle, merchandise processing activities, such as breaking down case lots, marking or ticketing, and/or redistribution to individual stores, are performed. Customer purchases are recorded at the Point-of-Sale, and the record of these transactions are summarized and stored by retailers. In general, retailers are primarily interested in using POS data to design merchandising programs and product assortments which will be successful in attracting consumers to their store(s). These activities may be described as "**Shelf to Consumer**".

The consumer, in the "**Purchase/Consumption Cycle**" (inner right) makes a number of decisions which lead up to the Point-of-Sale. These include the selection of which store to visit on a particular shopping trip, and the brands or products to be purchased. With products that are not immediately consumable,

some after-sales support, in the form of additional services offered by the retailer or manufacturer, may contribute to final satisfaction or dissatisfaction with the product.

Historically, manufacturers have focused on "Product to Customer" and the "Product Marketing Cycle" to develop consumer preferences towards their brands. Retailers have concentrated on moving "Product to Shelf" through the "Retail Cycle", with the goal of maximizing the returns on investment in inventory. The availability of POS data provides direct and timely measures which may be used by brand managers and retail buyers to observe the results of their marketing programs. For marketers, the "Manufacturing/Distribution Cycle" and "Purchase/Consumption Cycle" generally have been only of secondary interest.

As indicated in this discussion, the Point-of-Sale is only one of several data sources available to marketers. Since consumer goods manufacturers generally do not own the retail distribution channel, they do not have direct access to retail POS data. Their records of shipments to a retailer's distribution center are less valuable, since they provide only a rough indication retail store sales. Before the general availability of electronic POS data in the consumer packaged goods segment, market research firms (such as A. C. Nielsen) performed audits of grocery stores, and used warehouse withdrawals to project market shares and volumes for manufacturers. Data from consumer panels was also available, and used to understand purchase behavior at the household level. The procedures to collect these these data were both costly and time-consuming.

The computer revolution has provided an economical method of data collection, where records are generated at each electronic point-of-contact. Not only may an item be tracked at each point in the distribution channel, but the speed and accuracy of data capture has also improved.

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Figure 2: Transactions and Data Sources in Consumer Goods Marketing  
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Figure 2 illustrates the data generated by transactions created through exchanges between the manufacturer, retailer, consumer,

and external market research firms, resulting in data sources which may be tapped by marketers.

In the retail store, **POS Transactions** are commonly recorded at an electronic terminal, in the natural process of selling, tendering and settling the consumer's purchases. At the very least, the sale of a particular item is recorded; other information such as the price paid, the type of tender, the use of a coupon, or the basket of goods purchased in the same transaction, could easily be made available. Most POS systems are now based on programmable PC-based platforms, enabling current item prices to be stored online and looked up when the SKU number or bar code is read from an input device (e.g. numeric key pad or laser scanner). The raw stream of data is continuously processed locally by the POS system to accumulate counts, such as cash balance and item movement totals. Retailers offering credit card programs link to their **Proprietary Credit Card Databases** to exchange dollar amount data, at the department level, for customer billing.

Item movement totals are closed, and summarized after some period of time (e.g. hours or days) into **Item Movement Databases** residing on an In-Store Processor (ISP) and/or the head office mainframe. In contrast to the real-time accumulations maintained at the POS, these systems balance sales and inventories in batches (e.g. at the daily close of business). Data in these systems are valued primarily for audit and control functions, and are archived offline when the accounting period is closed (e.g. at month-end).

Whereas the **Item Movement Database** provides item-level data for accounting purposes, the **Retail Marketing Database** provides item-level data for merchandisers and buyers. Generally, these latter databases retain one or two years of sales histories, consolidated by departments or categories across all stores, aggregated on a weekly or monthly basis. In some cases, the history may be available store-by-store, for comparisons and trending, and may include store causal data (e.g. price and display) which allows the analysis of promotions.

Market Research firms obtain POS data by installing devices, in a sample of stores, which passively "listen on the store loop" between the POS terminals at checkout stations and the POS computer. A micro-computer accumulates the transactions

and forwards them to a central site for consolidation into a **Market Item Tracking Database**. This database is generally organized by product category, and is used to calculate weekly sales, market share, price, display and advertising information on an all category volume basis. Agreements to capture data on consumer packaged goods from supermarkets are most common, either with a payment of fees and/or an agreement to deliver market information to the retailer. Although alternative retail channels (e.g. mass merchandisers or warehouse clubs) have been increasing their share of packaged goods sales, little progress has been made in establishing agreements with them. General merchandise channels (i.e. department or specialty stores) usually do not participate in reporting lower-volume products (e.g. apparel or hard goods) to market research firms.

Consumer Panels augment item movement data with household purchase information, collected by one of two methods. **Scanner Panels** are comprised of households clustered around specific supermarkets that record POS data. Panel members present a scannable card at checkout which link the household to item purchases. **Panel Diaries** rely on panel members to keep their own records. The chore of maintaining handwritten diaries has been relieved by some market research firms providing a scanning "wand" to each respondent. After returning home from a shopping trip, purchases are recorded by scanning the bar codes on each item, and then keying in details on the quantity purchased, price paid, the retail outlet where the purchase was made, and which the member of the household made the purchase.

Each of these two types of panels has both advantages and disadvantages. Scanner panels limit panel members to specific geographic regions, and purchases are recorded only in participating stores. The data may be augmented by having panel members keep purchase receipts from non-participating stores. Electronic capture at the POS, however, allows prices to be recorded accurately, and the small selection of stores can be monitored for display and store advertising information at a relatively low cost. In addition, if the households are located in cities with cable television, exposure to television commercials can be monitored electronically. Consequently, both purchase data and television advertising data can be recorded for each household, creating "single source data".

Panel diaries are not limited to households in specific

geographic regions, and provide a means for recording purchases from all retail outlets. For product categories distributed widely through a variety of retail channels (e.g. nylon stockings), this method provides a better measure of actual household purchases. Disadvantages include data entry by the consumer, rather than a trained cashier, so that price information may not be recorded accurately. In addition, it is difficult to inexpensively monitor display and store advertising, since the households are generally dispersed geographically.

Item movements between the manufacturer and retailer may also be captured, as shown in Figure 2, through one of two forms of transaction communication. With **Direct Store Delivery (DSD)**, hand-held terminals can be used by route salesmen to capture item deliveries and consumer take-away electronically at the store level<sup>2</sup>. This data is transmitted overnight to head office, and provides counts close to actual consumer sales by retail outlet. Additional measures, such as estimated sales of competing products, may be recorded using the same technology, but these efforts would be the result of corporate initiatives, rather than industry standards. Due to the large investment in delivery trucks and route salesmen, DSD is used primarily by manufacturers of perishable products.

Item movement data within more traditional channels of distribution may be captured from **Electronic Data Interchange (EDI)** communications between organizations concerning orders, confirmations and invoices. In the most advanced operations, Advanced Shipping Notices may be used by retail warehouse staffs to schedule manpower and dock assignment for arriving trucks. If integrated into centralized systems accessible to the marketing function, valuable information tracking the expected delivery dates of new merchandise can be provided to the retailer's merchandisers and sales personnel.

<sup>2</sup>Common examples of programmable hand-held terminals used in industry are manufactured by Telxon, MSI and Norand. Route salesman visiting each retail store can acknowledge the deliveries, issue invoices immediately, or even record more detailed information, such as returns of stale products. Terminals are plugged into a "docking station" overnight, so that the batteries may be recharged, the day's deliveries and data may be transmitted to head office, and the next day's orders loaded.



To organizations accustomed to acquiring information about markets primarily from marketing research (e.g. survey research), market information from POS data requires a very different approach. The former generally acquire information on variables thought to mediate buyers' responses to marketing programs, and are generally managed as projects with a fixed cost. In contrast, POS data are an electronic byproduct which may be captured at a low incremental cost, and which arrive in a continuous stream. A large investment in information technology is required to effectively use these data on an ongoing basis. In addition, POS data provide a direct measure of buyers response to marketing programs without providing an understanding of the variables mediating response. Without bounded research objectives set in advance, both computer and human costs can spiral with continued research. POS data will continue to accumulate with each new business day, and it is only with a firm management hand that it can be harnessed into an information base for effective marketing decisions.

The next few sections will review the different types of decisions made by retailers and consumer goods manufacturers, and current and potential uses for the POS data. The volume of data which continuously arrives requires the data management skills of I/S (Information Systems) professionals, but it is the needs of their clients (i.e. marketers) that determine the methods and systems to be designed.

## **2. Marketing Decisions by Manufacturers and Retailers**

In order to understand the potential value of POS data to retailers and consumer goods manufacturers, we first discuss the differences in the decision-making orientation and accessibility to POS data in these two organizations. We then present a typology for marketing decisions which is used to understand the current and potential uses of POS data.

**Orientations towards POS Data:** Since retailers own the POS systems where the transaction data is captured, their opportunities are limited only by the amount of resource which they commit in order to effectively use these data. Consumer goods manufacturers, on the other hand, do not have direct access to these data. Consequently, they have relied primarily on

marketing research firms, such as A. C. Nielsen, for POS data. These latter firms provide clearinghouse functions such as data cleaning, validation, and projection of the their samplly up to an account, market or national level.

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Table 1: Alternative Orientations of Manufacturers and Retailers

| <u>Manufacturers</u>            | <u>Retailers</u>              |
|---------------------------------|-------------------------------|
| Brands                          | Product Categories, Stores    |
| Time-series                     | Cross-sectional               |
| External Market Research        | Responsiveness to Market      |
| Quarterly/Annual Planning Cycle | Weekly/Monthly Planning Cycle |
| Analytical Solutions            | Workable Solutions            |
| Active Marketers                | Passive Marketers             |

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The different orientations of manufacturers and retailers are summarized in Table 1. The first and most obvious difference is the interest of manufacturers towards individual brands, while retailers are more concerned with the profitability of the entire product category, and more generally, the performance of each store.

Secondly, manufacturers tend to have a time series orientation to their data, where performance is compared

relative to that in previous quarters, or years. This may be attributed to the importance of the "production pipeline", where the focus is on obtaining production efficiencies by operating factories at full or near-to-full capacity. Retailers, on the other hand, have tended to have a cross-sectional orientation with weekly or monthly planning cycles. This is due to the cost of holding inventory, and a requirement to respond quickly to fashion trends or the price promotions of competitors.

Thirdly, manufacturers have typically been more interested in marketing research than retailers because they are "further" from consumers in the distribution chain, and must maintain market presence through recognition of their branded products. In order to successfully design and develop communication programs to position a product, they must obtain a good understanding of consumer needs and preferences. In addition, manufacturers typically have operated on an annual planning cycle, which allows for the necessary time to gather and analyze information.

Retailers have focused on developing an ability to react quickly to market changes, and, consequently, have nearly a continuous planning cycle, rather than the meticulous development of a pro-active strategy. In addition, since retailers directly observe consumer reactions to promotions and product offerings on a daily basis, they continually have direct measures of consumer preference. Since it is manufacturers who generally design products, the low perceived value for consumer research by retailers is not surprising.

Fourth, manufacturers generally have been more interested in obtaining precise analytical solutions to their marketing questions. With large costs associated with advertising and promotion, and low rates of new product success, more accurate estimates of consumers' responses improve the probability and size of return on investment. The benchmark by which they determine their performance is in comparison to their peers, in terms of market shares. Retailers, with a much shorter time horizon, have little patience for an elaborate search for an optimal solution, but instead want an immediate "workable" one. A first order approximation using a simple rule-of-thumb is a large improvement over a decision made with little information.

Finally, retailers have historically been passive marketers. It is the manufacturers who have actively developed

products and communicated to the consumer through media advertising. Retailers traditionally select the assortment of goods from manufacturers which they believe will be the most attractive to customers.

The marketing information revolution has the potential to change the orientation of manufacturers and retailers, and the relationship between them. Having access to electronic POS data has the potential to greatly increase the power of the retailer in the channel of distribution. These data provide the opportunity for the retailer to assess the profitability of a promotion not only by brand, but also as an element in the category portfolio. The profitability of individual SKUs (Stock-Keeping Units) may be assessed, and unprofitable items can be delisted. In order to attain this advantage, however, retailers must put into place information systems, and upgrade the skills of retail buyers to do the necessary analysis. The sophistication of retail buyers today may be compared to those of brand managers, 25 years ago. However, if retailers can exploit the rapid changes in technology which are occurring, their transformation to true "marketers" may take less than 25 years.

**A Categorization of Marketing Decisions:** Within both organizations in the consumer marketing chain, we may identify different categories of decisions which will require different views of data. In general, the information requirements for each category of decision require POS data at a different levels of aggregation. The different categories of decisions are summarized in Figure 3 according to their position in the organization.

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Figure 3: Categories of Marketing Decisions, and  
Marketing Data  
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The first category of marketing decisions are **Operational**. These decisions generally focus on the delivery, presentation, and selling of the product to either to the retail trade or to a consumer. For the retailer, most of these decisions involve the

management of store operations. For the manufacturer, operational decisions involve the sales force moving product through the channel.

The second category of marketing decisions are **Tactical**, which involve the development, implementation and evaluation of short-term marketing programs. For the retailer, these decisions are generally made by buyers and merchandisers who are responsible for purchasing and presenting product lines (e.g. women's sportswear). For the manufacturer, brand managers and category managers generally make tactical decisions in the development of promotion and advertising programs.

The third category of marketing decisions are **Strategic**, and focus on setting long-term directions which will position the company for an enduring competitive advantage in the marketplace. For retailers, these decisions involve which segments of customers to serve, what types of products to carry, and what price and merchandise positions will be chosen. For manufacturers, these decisions involve the types of products that should be produced, and pricing, promotion and channels strategy. Recently, many of these decisions have focused on the development and nurturing of relationships with retailers.

While these different categories of decisions generally require the use of POS data at a specific level of aggregation, occasionally data at different level will be required. As an example, executives primarily review category or regional totals, but they may occasionally also require data at a lower level (e.g. category sales of a particular brand). Similarly, a store manager or a field sales representative may depart from his store-specific or account-specific data to compare his performance to other similar stores or accounts elsewhere. This, however, does not mean that everyone in the company needs to have access to all levels of information every day. Since the volume of POS data is so great, information overload may be curtailed by providing each marketer with a core set of data, supplemented by a responsive procedure to access occasional special requirements outside of that set. For decisions in the strategic category, a **Top-Down Perspective** starts executives with broad views of the overall market with an annual planning horizon, with finer levels of detail available when investigation is warranted. Decisions in the operational category generally begin with a **Bottom-Up Perspective**, as

marketers examine events with a set of limited locales or defined customers, and then generalize their findings into knowledge. Marketers with tactical types of decisions may have to be the most nimble in their use of the data, as they will encounter some problems best solved by top-down methods, with others better suited to bottom-up.

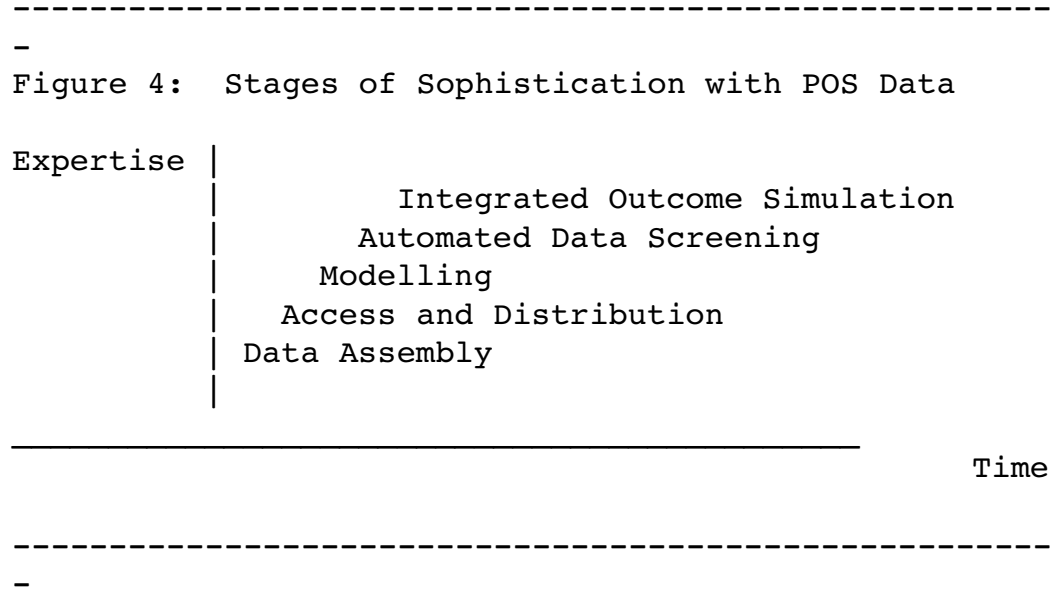
Before we discuss examples of marketing decisions in the above typology, the process of developing the body of expertise to be applied to POS data will be addressed. Few organizations would claim that their facility with POS data is mature, and that the rapid assimilation of new information technology is occurring simultaneously with the introduction of new marketing techniques. Still, in the pursuit of competitive advantage, there are some pioneers who have acted to fulfill the vision of exploiting the promise of POS data. Experience is not built without some effort.

### **3. Building Expertise with POS Data: The Learning Curve**

The amount of POS data generated at the retail level is immense. A single store may generate around 50 thousand transactions per day. A supermarket may list 25 to 30 thousand items, while a department store may list 1.5 million SKUs. Since a supermarket chain will usually have more stores than a department stores chain, a Retail Marketing Database with weekly item movements by store is typically sized on the order of 12 to 16 gigabytes. Consumer goods manufacturers typically have smaller databases of brands and region summaries, but greater breadth with many more causal variables linked by external market research firms. A consumer goods manufacturer may be provided with data on 5000 items for 50 markets, over a few years. Item-by-item inspection of these marketing sources are well beyond the capabilities of human processing.

These large databases create two issues. Firstly, online access of stored data requires an considerable investment in hardware, software and data processing staff. Secondly, and of direct concern to marketers, is the amount of managerial time and effort required to obtain an understanding of the data. A consumer packaged goods brand manager in the United States now has the opportunity (and burden) to examine 2 million new

numbers each week<sup>3</sup>.



In order to effectively use POS data for decision-making, firms must ascend a learning curve requiring increasing expertise. This learning curve (Figure 4) contains five stages of development.

The first stage, **Data Assembly**, requires the development of systems to acquire reliable POS data and then organized and integrate these data with other relevant data (e.g. causal information) into Marketing Databases. Cashiers ast the POS must be trained and monitored to ensure that the data are captured accurately. As an example, cashier must be trained to scan each individually item from a multi-item purchase with many flavors, instead of simplying hitting a "repeat" key after the first flavor. The detailed data from each checkout must be "cleaned", summarized and transmitted to the central computer. and transmitted from the store to a central computer, and validated to clean up such mistakes. Since the immediacy of the data is important for decision-making, it must be prepared for online access. These tasks are performed internally by

<sup>3</sup>John H. McCann, John P. Gallagher, William G. Lahti and Justin Hill, The Generation and Management of Marketing Insights: Conceptual Foundations and a Computer Approach, (in press, 1992).

retailers, and by market research firms on behalf of manufacturers.

Although accessing online data may be simple for the I/S professional, the second stage empowers the marketers themselves, by putting systems into place which will allow them to independently access the data they require. Data **Access and Distribution** systems permit less sophisticated users to quickly query the database, interactively, from the comfort of their offices. The flexibility to build any subset or summary of data is important in transforming the volumes of data into manageable sets of information for review. It is important that the data be presented in contexts which facilitate decision-making. These may be cross-sectional views (e.g. market shares), or time series views (e.g. changes in sales trends). Simple market status reports can give the marketers an indication of the health of their business.

The stage at which marketing may first be called a science is the third: **Modelling**. This step formalizes the marketer's concepts about relationships between marketing variables and their effects through quantitative analyses. Establishing the correlation between two variables (e.g. volume increasing as price decrease) may be relatively simple, but more complete decompositions of effects (e.g. volume effects attributed to price cuts, in-store displays and flyer advertisements) require the use of multivariate statistical techniques such as multiple regression analysis. The use of these techniques, however, requires an appropriate level of sophistication in the user, since it is relatively easy to misapply the procedures. Quantitative methods may also be applied to customer purchase datasets, to cluster of consumer groups based on their behavior. These different groups may then be targetted for differing offers or promotions.

As noted earlier, considerable managerial time is required to obtain an understanding of POS data. The major emphasis at the stage which follows, **Automated Data Screening**, is the automatic analyses and structuring of these data to facilitate their use by decision-makers. This may occur by automatically summarizing the data or by identifying exceptions. An example of a system designed for the former purpose is "Coverstory"<sup>4</sup>.

<sup>4</sup>John D. Schmidt, Gordon D. Armstrong and John D. C. Little, "Coverstory -- Automated News Finding in Marketing", Interfaces,



This systems is based on the metaphor of a "marketing newspaper" which reports on what has occurred in an market during a particular time period. As an example, sales trends for different brands and sizes are summarized for a market, complete with a list of promotional activities. Like a newspaper, this approach aims to make the information easier to browse, by drawing data from many sources into a single presentation.

An extension of the above approach shifts the information-orientation of the presentation to an action-orientation. Discovery of poor performance in a marketing program should naturally lead to the suggestion of some remedial actions to correct the cause<sup>5</sup>. Continuing the example above, if poor brand sales are attributed primarily due to a share decline at only one chain of stores, special recommendations could be made to those sales representatives.

In the store, systems at this level may be used as automated "detectives" to sift through data at the transaction level to uncover theft. More sophisticated systems in department stores might provide early identification of categories which are selling well for quick reordering, or items selling poorly for additional merchandising effort. Screening out items within a "nominal" range around plan, or within a comparable range to other stores in the chain, would greatly reduce the amount of data requiring inspection by the marketer.

At the fifth, and highest, stage of the learning curve are systems which perform **Integrated Outcome Simulation** tasks. These systems close the loop on the planning process, by extending and combining the multiple automated recommendations from lower-level applications. These are integrated into alternative marketing programs with expectations of particular outcomes, which the marketing decision-maker may review. Lower-level systems focus on solving individual problems, rather than integrating the knowledge within the organization to determine an overall result. What would be the effect of following through with a recommendation, not only for an individual marketer, but for the company as a whole? For manufacturers, these system would use the quantitative models developed at the third level to allow brand managers to estimate the sales, market share, and profit which would be obtained with different

1990, Volume 20, pp. 29-38.

<sup>5</sup>McCann et al., 1992.

marketing plans. Retailers might use this systems to plan out the merchandising strategy for the next season. The emphasis with these systems is not to fix a problem from previously-created strategic plan, but to assist in the creation of new, improved plan.

Where do the greatest roadblocks lie, in climbing the learning curve with POS data? The commitment of resources, combined with effort and time, will produce results, but any path up an incline has its plateaus and bumps.

For manufacturers, the challenge has not been only in managing the large volume of data, but also in integrating a multitude of data sources to produce a complete and consistent view of the marketplace. Market research firms provide market-level data which contain estimates brand share, and then store-level data for the detailed analysis of chain and regional competitiveness. Consumer panel data is available to estimate the effects of advertising and promotion. Direct Store Delivery and/or warehouse withdrawal data can give a measure of the efficiency of the distribution system. Methods of incorporating the intelligence from the field sales force are under study in some companies. Choosing to attack the the learning curve on only one of these data sources may result in findings that are easily undermined from conflicting indicators from another source.

Retailers, with the richness of POS data at their fingertips, have a different path to follow. Most of their software developments have had the efficiency of transactional systems in mind, rather than the effectiveness of their informational systems. Much of this orientation comes from the inertia, in the historical role in which retailers have seen themselves. As merchants, with consumers "pushed" to a distribution channel driven by manufacturers, retailers needed primarily a control emphasis to "keep score" of the inventory and the cash flowing through their many stores. The transformation of retailers to respond to the "pull" of consumer demands requires increased coordination and strategization by the head office. Traditionally, retailers have aimed to keep wages and overheads low, and have not invested in hiring MBAs, or developing analytical marketers. Their greatest challenge in ascending the learning curve will be upgrading the skills and qualifications of analysts and middle managers so that the opportunities in their data may be exploited.

The next three sections will each review examples of the three types of marketing decisions at both manufacturers and at retailers. These will illustrate the level of expertise which has been attained by a number of companies working at the state-of-the-art.

#### **4. Operational Decisions with Marketing Data**

Much of the decision-making at the Operational level in marketing is focused on **efficiency**, primarily through the delivery of the appropriate "Product to Shelf" at the right place. Both manufacturers and retailers can share in the benefits of providing the right product at the right time. To the consumer, selection is better when the product assortment is broad and the inventory level is deep, but this is at odds with the limits of selling space. High product service levels can mean an ongoing burden of carrying costs, and lowered margins to clear excess merchandise. Marketing data can provide, at this level, an ability to adjust macro plans to fit local customer needs. As an example, the head office may provide the field sales force with the national outlook, or a store manager with an expected profile for the customers, but it is the responsibility of the individuals closest to the customer to deliver results. Marketing as an art relies on the experience and intuition of each and every marketer to make the correct decisions; marketing as a science will guide him/her with pointers towards the right direction.

**Manufacturers:** The main goal of the manufacturer's sales force is to ensure that retailers have the appropriate assortment of his/her products on the shelf, and at least a fair allocation of shelf space and promotional support by the retailer. Since most manufacturers deliver their products only to the retailer's distribution center, they can not accurately measure activities occurring within the store. This is a disadvantage in two ways. Firstly, since it is difficult to differentiate between consumer sales and inventory build-up by the retailer (i.e. forward buying), the share and effect of shelf space and promotions is difficult to assess. Secondly, the delay in reporting store-by-store actual consumer purchases creates uncertainties which are reflected in higher-than-necessary levels of inventory in their warehouses.

Manufacturers supporting a Direct Store Delivery (DSD) method of distribution have a path around some of these disadvantages. With a delivery cycle ranging from a few days to a several weeks, DSD data does not have the frequency of the data captured at the POS, but it can provide a workable estimate of consumer sales, store-by-store. An equally-detailed record of sales may not be available, but the manufacturer's sales representative may be able to piece together enough knowledge to get a rough bearing of his/her territory.

Two of the most frequently-cited examples integrating DSD with information technology are Frito-Lay and Hanes DSD. In 1987 and 1988, Frito-Lay issued handheld terminals to all of its route salespeople, giving them the ability to enter the number of snacks replaced in the store, and the number of stale-dated products removed. At the end of the each day, the data from each terminal are transmitted to Frito-Lay headquarters via telephone, where it is aggregated and distributed to headquarters staff and the field sales force as appropriate<sup>6</sup>. With a coverage of over 400,000 stores, updates are received daily on 100 product lines, from the Frito-Lay sales force of 10,000 people<sup>7</sup>.

Hanes DSD has implemented a similar technology in a slightly different manner. The L'Eggs brand of hosiery is distributed by 1,000 sales merchandisers, making over 35,000 calls per week, servicing the average store every three weeks. To deliver the correct mix of products, Hanes initially discovered that its personnel would have to make two trips into the store. The first trip would determine the quantity of product required, and the second was to fill the shelf from the "rolling warehouses". The delivery process has now been improved by forecasting an assortment of product from histories retained on the head-office mainframe, pre-packing the order at the warehouse, and then recording the unfilled slots on the hand-held terminal to adjust the next pre-packed order.

For both Frito-Lay and Hanes, the direct beneficiaries of the DSD data are the corporate salesmen, who negotiate the base quantities and prices, as well as promotional events, with the

<sup>6</sup>Jeremy Main, "Computers of the World, Unite!", Fortune, September 24, 1990, pp. 115-122.

<sup>7</sup>Wall Street Journal, January 30, 1990.

buyers at retailer's head office. Supplied with the correct reports in advance, they are able to relieve the retailer from the tasks of managing the product mix within their small part of the store. This service has now become a standard, against which other vendors must compete.

In order for a sales representative to be most effective, he/she should have (1) access to information not available to a single retailer (e.g. performance comparisons versus the market), and (2) better and/or timelier presentations of in-depth analyses of sales and profits, by promotion and by shelf space position. Unfortunately, most commercially available "sales force automation" packages merely install personal productivity applications (e.g. paperless expense statements or electronic mail) onto a laptop computer. Some internally-developed systems aim to provide the sales force with inventory availability, and/or sales by account. Converse, for example, rolled out a proprietary system in 1988, whereby 90 sales representatives can dial in to a mainframe and download a real-time inventory status, before making a sales call<sup>8</sup>. While this application does not report consumer purchases, it does improve service to the retailer by ensuring the availability of delivery for each model and size of shoe ordered.

The ultimate vision for the sales force may be a system which creates a tailored, professional sales presentation for each call upon a retailer. One prototype, called the "I Want Knowledge Base"<sup>9</sup>, was developed by the Duke University Marketing Workbench Project. Beyond just data or information, this system creates sales visuals, complete with a script to justify increased promotional support from a retailer. This approach combines a number of "off-the-shelf" software products to demonstrate a "proof-of-concept" for a sales force support system. Similar concepts have been incorporated into a commercially-developed system, called "Sales Partner", by Information Resources, Inc.

**Retailers:** For the store manager in most retail

<sup>8</sup>Alan J. Ryan, "Report from the Field: Toss out the Scissors", Computerworld, May 21, 1990, p. 100.

<sup>9</sup>John M. McCann, John P. Gallagher, William G. Lahti and Justin Hill, The Generation and Management of Marketing Insights: Conceptual Foundations and a Computer Approach, (in press, 1992).

organizations, most of the major decisions concerning product assortment, promotion, and space allocation are largely made at the head office. Some retailers track in-store inventory at the SKU level with POS data, and automatically order from the warehouse when the inventor on-hand falls below a predetermined level. These systems seem to perform well under normal conditions, but generally require human intervention whan an item is promoted. POS data can also be used to assist the store personnel in managing the sales process, and help to provide service to the customer. As stores have become larger, the ability to execute at a consistent level of quality has become more important.

Most retail operations centralize inventory responsibilities to personnel at the head office and distribute the information to stores. In contrast, Lechmere, an electronic appliance retailer, has decentralized its inventory control to store managers, and the head office is updated overnight. The major objective behind their "automated selling and reservation system" was to improve customer service through more informed sales associates. If an item is available, a customer can confirm pick-up or schedule a truck delivery directly with the salesperson. If inventory is not immediately available, the system provides an estimated date of delivery, and a rain check is offered. When the store receives its shipments, reserved items are segregated from the new inventory for 14 days, and a letter inviting the customer to return is automatically generated. The frequency of salesmen querying an out-of-stock item, but not issuing a rain check, is recorded as a rough measure of lost sales. Existing communications lines are used to exchange data between the store and head office, during nightly off-peak periods<sup>10</sup>.

Another view of improving customer service uses POS data and information technology to ensure that "best practices" are maintained across each and every store. The Retail Operations Intelligence (ROI) software, designed by Mrs. Field's Cookies, automates most of the administrative functions of a store manager. Hour-by-hour dollar sales from to the in-store system are uploaded to a historical database at the head office. Weekly, a daily sales forecast is downloaded, which can be modified by the manager for local events. An hour-by-hour sales

<sup>10</sup>Thomas Jeffrey, Lechmere, speaking at the IBM Retail Executive Conference, 1989

plan is generated for each day, based on a "day model" curve. An expert system-based Labour Scheduler ensures a correct mix of skills available to support the hourly sales targets, and a Production Planner revises the mix of products expected to be in demand when the bake is complete.

District managers use a system similarly networked to the head office, and are able to review Flash Reports on each store in the chain, on the next day. Using a Profit and Loss User's Module, specific objectives can be set with each store manager, and tracked for appropriate rewards or controls. At the head office, an Operations Expert System reviews the performance of individual stores, and suggests remedial actions to be taken. Through the use of this software, Mrs. Fields Cookies claims to have 600% advantage in staff productivity over its competitors: 6000 employees in 650 company-owned stores around the world are supported by only 90 people in its headquarters staff<sup>11</sup>. The ROI software has been customized by Burger King to support over 250 restaurants across the United States in 1991<sup>12</sup>, and is being installed in a number of other quick service operations.

Summary: These companies have each been pioneers in the development of advanced systems which support marketing decisions at the operational level. They enable Stage 2 (Access and Distribution) activities, through the capture of sales data, centralization to the head office, and redistribution of the information back to the field. Rudimentary Stage 3 (Modelling) analyses allows the pre-packing of women's stockings assortments, and the scheduling of flavours of cookies can be seen as practical extensions of the type of data which naturally occurs for any manufacturer or retailer.

One important characteristic of an operational system, however, is that the many decentralized users who rely on it daily are generally removed from the developers at head office. The best route salespersons and counter clerks are valued for their customer orientation, and need to understand their systems only to the extent that they service the customers. The supporting systems are based on the replication of scarce managerial and administrative skills, remotely replicated through the use of information technology. Microcomputers have

<sup>11</sup>"CEOs' Use of Emerging Technologies", Competiting the Global Marketplace (video), IBM.

<sup>12</sup>"A Whopper of a POS", Information Week, March 18, 1991.

enabled this replication feasible, not in the sense of "personal computing", but instead as a network from the head office to the field, where data and knowledge are rapidly made available where it can be best leveraged.

Further advancements to higher stages of the the learning curve requires continued investment in understanding the market. New technologies such as notebook computers and pen-based systems<sup>13</sup> present opportunities for information to be obtained from, and provided to, the mobile worker who does not work at as desk. It will be the visionary marketers at head office, however, who will assemble the market data and develop appropriate methodologies into the systems which will ensure the best corporate performance.

### **5. Tactical Decisions with Marketing Data**

Decision-making at the tactical level is focused on the **effectiveness** of marketing and merchandising programs, centrally developed, analysed and evaluated at the head office. For manufacturers, the "Product to Customer" focus by brand emphasizes media advertising and trade and consumer promotions. The "Product to Shelf" focus of retailers, is on category buying and merchandising, through product assortment, distribution to stores, and promotion.

Small enterprises are able to conduct marketing as an art. Personal contact with customers permits a case-by-case understanding of marketing situations. For large enterprises with a national presence, however, the desire for "market coverage" requires a perspective above the transaction-by-transaction level. Segmenting the consumer base into clusters permits the development of more effective programs, while retaining the economies of scale of reaching multiple targets. The challenge in the science of marketing is the quantitative definitions of the market, and measurements of their performance.

**Manufacturers:** The earliest and most intensive analysts of marketing data have historically been in the brand management function of the consumer packaged goods manufacturers. In the

<sup>13</sup>Robert M. Carr, "The Point of the Pen", Byte, February 1991, pp. 241-221.



1980s, the growth in supermarkets equipped with POS scanners enabled an increased richness of detail. Bimonthly projections of brand shares by region were replaced by weekly estimates by market (i.e. major metropolitan areas) or even by account. Datasets are now available either from a product/store perspective (e.g. item movements, supplemented by unit pricing and promotional variables); from a consumer perspective (through "scanner panel" diaries), or in some markets, as a combination, "single-source data"<sup>14</sup>. This "data explosion" has resulted in some issues in the management and delivery of data from market research firms.

The weekly frequency of refreshes has created technical difficulties in **data delivery**. Market research firms have traditionally duplicated copies of their databases to be sent to consumer goods manufacturers, but a weekly turnaround results in their comparison to "tape factories". As an alternative, the Databank approach has allowed A. C. Nielsen to centrally maintain its database, while giving the marketing analyst at the manufacturer an easy method of remote online access. In contrast to simple communications packages which slowly download a full "cube" of data onto the microcomputer, the Databank uses Metaphor Data Interpretation System to quickly access "slices" of data. Analyst are able to create customer groupings (e.g. "our coffee brands") as ad hoc subsets, and analyse them with PC-based tools. This approach cleanly separates the data management function at the market research firm from the data analysis function at the client. Over 100 Gigabytes of data are currently available in 500 databases<sup>15</sup>.

Most consumer packaged goods manufacturers today are trying to manage the data and make it available to managers. This is the second stage of the learning curve. Some of the more advanced consumer packaged goods companies are modelling the effects of promotion or the third stage of the learning curve. Data suppliers, on the other hand, are at the third stage of the learning curve, developing procedures for measuring market response to causal variables. Both IRI and A.C. Nielsen provide estimates of changes in sales due to price changes, in-store

<sup>14</sup>David J. Curry, "Single-Source Systems: Retail Management Present and Future", Journal of Retailing, Spring 1989, pp. 1-20.

<sup>15</sup>Personal communication with Laura Reeves, Metaphor Computer Systems.

displays and advertised specials. Both also have procedures for measuring the profitability of promotions, based on estimates of "baseline sales", (i.e. sales that would have occurred in the absence of any promotional activity).

Although applications of external market data are well-reported in the trade press, applications of internal data sources are not so well-known. In some cases, the richness of DSD data can surpass that of POS data obtained through third parties. As an example in Canada, Coca-Cola Ltd. has created a unique arrangement with its major bottler (TCC Beverages Ltd.), to share online access to its delivery data. In contrast to vertically-integrated manufacturers with Direct Store Delivery, (such as the much-cited Frito-Lay), Coca-Cola's marketing function is independent from the manufacturing and distribution functions of the regional franchised bottling operations. In the industry, these partners both share an enviable level of detail in the data: weekly inventory changes by outlet (e.g. a soft drink dispenser located at a service station), are available at the touch of a button.

In comparison to most consumer packaged goods manufacturers (including its sister organization in the United States), Coca-Cola has, in Canada, has been committing greater resource towards studying internal data sources, relative to external sources. The combination of DSD data with external market data illustrates strengths and weaknesses in each. Since a sizable proportion of soft drinks are purchased through channels of distribution other than supermarkets, DSD data from the bottler can provide a complete picture of total consumption of Coca-Cola brands. These outlets (e.g. fountains at restaurants mixing bulk-packed syrup, or self-service dispensers of single bottles or cans) are not audited by market research companies. On the other hand, DSD data can not give a good estimate of sales by competing brands, nor are causal variables (e.g. media advertising, or in-store promotions) linked by outlet. Although POS data distributed by the market research firms generally do not provide estimates of sales in retail outlets other than supermarkets, they do provide an estimate of sales for competitive brands.

Harnessing the increased richness of data with information technology tools, a number of manufacturers their use for **micro-marketing**: the tailoring of products, advertising, and

promotional variables to specific ethnic and/or cultural targets. Geodemographic research has enabled "zip code segmentation"<sup>16</sup> to determine the characteristics of the population within the trading area of a retail store. It is POS data, however, which gives marketers the ability to track immediate changes in product performance, and then attribute some causal variables to their success or failure. As the prospect for category growth diminishes, manufacturers are bringing different expectations and measurements to the capture of brand share. Rather than mounting a huge national marketing campaign to the masses in anticipation of big win, micro-marketers put their efforts behind a multitude of local programs which will each deliver a small gain<sup>17</sup>.

A leading example of this approach is the "Micro-Merchandising" project, led by the sales function at Kraft USA<sup>18</sup>. Multiple data sources are used to compare consumer purchasing patterns in store locales against their estimated potential profiles. Actual product movement histories across categories and stores create an "Historical Purchase Behavior" of products selected from the store's existing set of offerings. The "Shopper Group Purchase Potential" identifies potential product purchases consistent across five shopper profiles. These groups are defined by their demographics, lifestyle, stage of life, and responsiveness to types of promotions (ads, displays, coupons and price reductions)<sup>19</sup>. Kraft piloted the micro-merchandising approach in July 1990 with retailers from five pilot cities. In one case, coolers displaying cream cheeses tailored to local

<sup>16</sup>Geodemographic data, and access software may be synthesized from government census data, combined with market surveys. Examples of firms who would provide this service include CACI, Claritas, Donnelley, Equifax, and Compusearch.

<sup>17</sup>Zachary Schiller, "Stalking the New Consumer", Business Week, August 28, 1989, pp. 54-62.

<sup>18</sup>Major sessions on the micro-merchandising approach were featured at the Food Marketing Institute meetings in Chicago, in May 1989 and May 1990. The final report was prepared by Willard Bishop Consulting, Ltd for the Food Marketing Institute, "Micro-Merchandising: Targeted Consumer and Category Merchandising", Food Marketing Institute, 1991.

<sup>19</sup>As examples, Full-Margin shoppers showed relatively little response to price cuts or coupons, whereas Mini-Baskets were retirees who would shop frequently and would be more responsive to promotions.

tastes were installed in 30 stores with shoppers identified as responsive to displays. This resulted in a 47% increase over the previous year's sales<sup>20</sup>. In another application, overlaying the micro-information onto space management data was found to improve the sales of a west coast retailer by \$3 million<sup>21</sup>.

**Retailers:** The tactical decisions of retailers center on selecting the correct assortment of products, designing merchandising and promotion programs, and distributing the appropriate quantity to each store. These decisions can be made across stores, or on a store-by-store basis. Retail buyers commonly take one of two approaches to selecting merchandise, according to the characteristics of products being purchased: replenishment, or merchandise planning.

**Replenishment** is a common methodology applied to "staple" items, where item-by-item forecasts may be mathematically extrapolated from their sales history. Although the final responsibility for approval usually still rests with the buyer at head office, the mundane computational tedium to prepare many grocery and mass merchandise orders can be delegated to software programs<sup>22</sup>. In the high-turnover, highly-promoted environment of grocery products, this methodology is known as Computed-Aided Ordering (CAO). In 1990, only 14% of supermarket chains and wholesalers were using CAO, and 29% were planning to do so. The 57% that were not planning any form of CAO had issues primarily in the reliability of their scanned data<sup>23</sup>.

When a strong discipline is maintained, replenishment has clearly been demonstrated as an effective strategy, particularly for wholesalers. As an example, Hannaford Bros. tout a 96% average service level on a 26-time turn. Since maintaining high service levels is expensive, category service levels vary from 99.9% to 88%, depending on the extent to which the consumer will

<sup>20</sup>Wall Street Journal citation.

<sup>21</sup>Presentation by Daryl Kales [check with Dave, can't read my own handwriting], Director of Category Experts, Kraft U.S.A., at the Food Marketing Institute meeting, May 1991.

<sup>22</sup>IBM's Inforem software, used for "Inventory Replenishment", is an example of a mathematically-based approach.

<sup>23</sup>Deloitte & Touche, Supermarket/Wholesaler Advanced Merchandising Technology Survey 1990, in Warren Thayer, "Computer-Aided Ordering is Ready . . . Should you Care?", Progressive Grocer, March 1991, pp. 81-86.

substitute alternative items, if their preferred purchase is out-of-stock. As an example, a mother may substitute one flavor of baby food for another which is out-of-stock, but if the preferred brand of diaper or baby formula is not available, the sale will be lost to the store. Highest service levels are required for cigarettes, baby formula and diapers; at the low end are candy, gum, baby food and household cleaners<sup>24</sup>.

In a replenishment environment, the buyer generally plays an important role in negotiating prices and quantities with vendors. This is especially true with trade promotions. The buyer must decide which promotions to accept, how much should be ordered on promotion, and how to merchandise the promotion. Access to electronic POS data and the ability to evaluate the effects of previous promotions are very useful to the buyer in making these decisions.

**Merchandise planning** plays its greatest role in categories whose items change frequently and/or in environments where demand is difficult to forecast. It includes many of the activities of **category management**, involves the monitoring, forecasting and distribution of product across the chain, and the negotiation of contracts with vendors. Beyond the "hard numbers" which might be available for analysis, buyers may also need to rely on their personal judgement to reach their decisions. In a competitive, promotional environment, (e.g. consumer packaged goods driven by event marketing) qualitative factors (e.g. the weather, or some world news event) may cloud the data available. Alternatively, for fashion items (e.g. women's apparel), merchandise mix may be subject to the buyer's judgement and intuition. It is difficult to make accurate estimates of demand when styles may change as frequently as four seasons per year, and orders must be placed six to nine months prior to delivery. Unfortunately, for buyers, "retail is detail", and some person must take responsibility for each item on each shelf in each store.

The number of SKUs maintained online in a retail database can be staggering. Table 2 gives some orders of magnitude for the number of distinct items which are on record at any given time.

<sup>24</sup>Hannaford Bros. is a grocery wholesaler based in the Northeastern United States. "The Return of Stockouts", Progressive Grocer?

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Table 2: Average Number of SKUs, by Retail Segment

|                   |            |       |
|-------------------|------------|-------|
| Department Stores | 1.5 M      | SKUs. |
| Mass Merchandiser | 300K       | SKUs. |
| Supermarket       | 25K to 30K | SKUs. |
| Specialty         | 3K to 15K  | SKUs. |

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Supermarkets would appear to have fewer items to manage, but their higher proportion of perishables means that orders must be placed more frequently. Department stores are burdened not only by having to provide a large number of vendors and styles, but also a wide assortment of colors and sizes. It is not uncommon for a fashion buyer in a major chain to have responsibility for 20,000 SKUs, with a requirement to place orders each season (two or four times per year), for each item. Poor decisions result in either lost sales opportunities, or markdowns to clear out unpopular items.

A successful tactical marketing support structure requires not only a good source of data and appropriate tools, but also a vision for buyers to break from the methods developed in a data-poor era. This encouragement has clearly been demonstrated by Canadian Tire Corporation in the "Buyer's Workbench" project. The initial pilot of this concept originated in the Automotive Group, where shipments of parts (e.g. brake linings) to associate dealers were monitored through a "fineline review". Although a single analyst had performed a detailed analysis of all fineline classes in the previous year, the task took many months to complete, due to the difficulty of managing the large scope of data in a PC-based spreadsheet environment. In a new approach, workstation tools with direct access to corporate relational databases were provided to the buyers, enabling them to each manipulate and analyse their own data<sup>25</sup>. Within a few weeks, buyers were able to monitor inventory turnover at the item level, and chose some slow-moving lines to be delisted.

In an associated task, the merchandise manager devised a "poor-man's EDI" process: rather than receiving price

<sup>25</sup>IBM Data Interpretation System was chosen as the platform for Buyer's Workbench, and databases were accessed from the DB2 and OS/2 Database Manager environments.

quotations from numerous OEM manufacturers on paper, Canadian Tire requested that they be delivered in a specified spreadsheet format. By joining this data with forecasts of regular and promotional sales, more effective negotiations can be performed with the vendors. Canadian Tire wins, by lowering its purchasing costs through more balanced inventory levels, and vendor also win, by more effectively gauging the schedule of demand over the season<sup>26</sup>. The Buyer's Workbench is now being rolled out to other merchandise groups within Canadian Tire, as part of the MIPS project. The vision of this project will be to integrate the POS data from associate dealers with other advanced technologies, (such as image, and advertising production), in order to transform the business processes associated with retailing<sup>27</sup>.

Category management has become a key area of interest for many retailers, but drilling down from high-level strategies to line-by-line detailed items has been difficult. In one successful example, KMart has created a Classification and Assignment System (CLAS), which allows merchants to allocate their promotional and seasonal items to stores with greater accuracy and ease. Assignments are based on the actual sales for the same or similar products, with consideration for the price and time period. As an example, total sales for a \$119 microwave oven might be judged as equal to the combined sales of three small models at their regular prices, plus two medium-sized models at a promotional price. As a result of using the system, a \$50 million assignment was cut to less than one-third, reducing the excess inventory after the promotion<sup>28</sup>.

Integration of many existing data sources, which support buying, logistics and store operations, has been difficult for many retailers. In a two-year development project, Sears created the Merchandise Assortment Planning System (MAPS). Multiple databases were joined to create an assortment planning environment for the home office, with what-ifs capabilities,

<sup>26</sup>Private communications with Richard Goulet and Kelvin Cantafio, Canadian Tire Corporation.

<sup>27</sup>Presentation by John Young and Kelvin Cantafio, Canadian Tire Corporation, at the IBM Retail Executive Conference, March 30, 1992 in Palm Springs.

<sup>28</sup>CLAS was the runner-up to the RITA (Retail Innovation Technology Award) in 1990. See "KMart Tackles Distribution with CLAS"

financial analysis routines and space management functions incorporated into a complete package<sup>29</sup>.

Summary: For tactical types of decisions, it is clear that consumer goods manufacturers have taken the lead in developing systems which can easily access marketing data for analysis. Their indirect relationship with consumers has had both advantages and disadvantages. The arms-length association with market research firms has not permitted in-depth access to certain proprietary data, but as intermediaries, much of the technological shock of the "scanner data explosion" has been absorbed in the "value-added" services of data cleaning, consolidation and analysis. Since the consumer marketplace can be observed from multiple views, much of the work of brand managers and analysts requires the reconciliation of numerous data sources, to give an indication of real trends.

In the consumer packaged goods industry, most firms are at stage two on the learning curve (Access and Distribution), and are moving into stage three (Modelling). Data suppliers, on the other hand, have developed stage three procedures (e.g. decomposing the promotional effects of price cuts, in-store displays and advertised specials), and are moving into stage four (Automated Data Screening) systems, such as Coverstory.

Retailers have much further to climb on the learning curve. It is only recently that the most aggressive competitors have transformed their roles as merchants into the functions of marketers. Replenishment methodologies are not uncommon, as these are available as complete software packages ready for installation, yet some companies have barely advanced from the 1970s standard of paper-based reports. Most retailers have information systems which can report on business results, but the understanding of causal events which explain those results has yet to be developed. To advance through Stage 3 of the learning curve (Modelling), investment in the quantitative and analytical skills of buyers and the marketing support staff will be necessary.

The shift from the art of marketing to the science of marketing will require retailers to strike a balance between the

<sup>29</sup>Stephanie Spring, presentation at the IBM Retail Executive Conference, April 1991. Chain Store Age Executive, October 1990.



two approaches. There are aspects of buying and merchandising (e.g. a fashion sense), that can not captured in through experimental methods. In addition, since retailers are both buyers and sellers in the marketplace, their negotiation skills can have a major impact on their bottom line. On the other hand, the ability to understand quantitative relationships in the marketplace adds a degree of precision to the retailer's knowledge.

## 6. Strategic Decisions with Marketing Data

From an orientation of data and information technologies, a strategic perspective of the company would usually usher in a discussion of Executive Information Systems. This would commonly lead to a discourse on the "Critical Success Factors" through which the senior management is able to gauge the health of the company. While this methodology is important, our marketing emphasis will focus us on considering how POS data has changed the set of strategies which may be feasible for the immediate future. While it is true that marketing data for an executive is likely to be presented at a high level of aggregation, it is also possible that he/she will take special interest in a particular project, and will request detailed reports on a periodic basis. This section will therefore review strategic opportunities that can exploit the richness of POS data which is available.

Returning to a variant of the first figure presented in the chapter, the emphasis in the cycles of marketing for the 1990s is shifting. In the past, manufacturers were interested primarily in satisfying the needs of the consumer, and had considered the retailer only to be a necessary link in the chain.

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Figure 5: Strategic Opportunities for the 1990s  
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Figure 5 illustrates that, as the power of the retailers have risen, and manufacturers are improving their efficiency with "Just-in-Time" techniques, the **Manufacturing/Distribution Cycle**

has become more important. Simultaneously, the retailer's previous focus on getting the product to the shelf is under attack, as competitors move to preempt sales through a closer relationships with the consumer. By working on the **Purchase/Consumption Cycle**, retailers are trying to establish "store loyalty", much as manufacturers had created "brand loyalty".

In both these customer-driven approaches to doing business, the basic premise has been to create a sustainable competitive advantage, by changing the relationships from buyer and seller to one of long-term partners. Since there are so many participants within the market (as well as individuals within the corporations), marketing information is being used to create an image of "smallness" and personalization. With the changes in business process required, information technology plays a supporting role in the implementation.

**Strategic Alliances with Distribution Efficiencies:**

Historically, consumer goods manufacturers have invested in marketing research which would be shared with retailers, suggesting a portfolio of products and promotions which would drive consumer demand. Retail acceptance of these programs resulted in a few large manufacturers setting the direction for the food industry. Now, retailers armed with POS information are able to observe consumers patterns more directly, and have become more skeptical of the interests of manufacturer. These dynamics have strengthened divisions in the two-stage marketing effort. The retailer creates his marketing program independently of the manufacturer, and each party attempts to gain at the expense of the other during negotiations.

As an alternative to the adversarial postures in negotiations between buyer and seller, some manufacturers are proposing strategic alliances with retailers that will have benefits for both.

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Figure 6: Strategic Alliances and Distribution  
Efficiencies  
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Figure 6 illustrates a cooperative approach to the use of POS data. Rather than the retailer periodically placing an order when the inventory is stocked out, an agreement could be established that has the manufacturer automatically sending product to retailer, based on POS data which has been shared.

In apparel, this process is called Quick Response. Domestic soft good vendors adopted this approach in the early 1980s, to counteract the threat of imported goods. Since merchandise could easily be produced at a lower cost in the Far East, U.S. manufacturers sought an area of distinctive competence. Adopting "Just-in-Time" production techniques would reduce their costs, but they would still be uncompetitive with imports. In order to add value to their product, the domestic manufacturers guaranteed "Just-in-Time" marketing and distribution services to the retailers, taking advantage of their proximity to the market. Retailers, rather than committing in advance to large shipments of merchandise imported from the Far East, could choose to maintain a lower level of inventory, replenished frequently with popular styles from nearby manufacturers.

One example of a partnership is Levi Strauss, the manufacturer of denim and casual wear, with a retailer named "Designs Exclusively Levi Strauss & Co." Designs establishes a model stock level for each item in its stores, by style and color. Each week, a sales file data file is sent across an EDI network, and replenishment inventory is automatically sent the store. This process has cut the lead time to delivery from 10 days down to 7 days, by removing the human element in the loop. The buying staff does revise the model stock level at the changes in season or based on recent sales trends, but a merchandising and buying staff of less than 10 people handle \$120 million in sales<sup>30</sup>. Similar agreements are in place between a number of retailers, and manufacturers such as Haggard, Vanity Fair, Estee Lauder, West Point Pepperell, Playtex and U.S. Hosiery<sup>31</sup>.

In consumer packaged goods, similar partnerships began to emerge only at the close of the 1980s. Suppliers to supermarkets were concerned by the eroding value of their brands

<sup>30</sup>Special Report, QR, Chain Store Age Executive, March 1991.

<sup>31</sup>EDI: Closing the Loop, New Role for the Buyer.

to retailers. High slotting allowances were being paid to introduce new brands on the shelf; forward buying ensured that retailers were stocking up with product at low margins; the diversion of goods meant that prices encouraging local promotion were spread nationally; and, the administration required to support promotions was increasing. Managers at Procter & Gamble estimated that 25% of salesperson time and 30% of brand management time were being spent in designing, implementing and overseeing promotions. In the food industry, manufacturer and distributor costs from trade promotion amount to an estimated 2.5% of retail sales<sup>32</sup>.

Procter & Gamble pioneered a partnership in this industry segment with Wal-Mart in 1988. In a demonstration of commitment, 12 managers were moved from Cincinnati to Bentonville, Arkansas, to support the Wal-Mart account. Diapers, a category turning 52 times per year, was chosen as the first experiment where POS data from Wal-Mart's satellite network was transmitted to P&G headquarters for analysis. After three months, diapers turns had improved to 104 times, and service levels had risen from 91% to 99.6%<sup>33</sup>. Based on this success, P&G have assigned more than 120 teams to various customers in the U.S., some sharing their POS data in a similar fashion<sup>34</sup>.

Industry relations may also be improving on other fronts. The process of redemption of coupons by scanning has been both a major nuisance and a major expense for both manufacturers and retailers. A committee at the Food Marketing Institute set standards for coupons coded with a UPC which improved compliance from 60% in 1988 to over 90% in 1991. By the end of 1991, P&G promised to produce only scannable coupons that would require no checker intervention, eliminating promotions such as multi-brand coupons. In addition, electronic redemptions would be cleared within 5 days, meaning that the retailer would receive its funds electronically, 30 days earlier than the old process. Although the paper and electronic counts would be reconciled at a later

<sup>32</sup>Robert D. Buzzel, John A. Quelch and Walter J. Salmon, "The Costly Bargain of Trade Promotion", Harvard Business Review, March-April 1990, pp. 141-149.

<sup>33</sup>Lou Pritchett presentation at the Retail Executive Forum, IBM Canada Ltd., Markham, September, 1990.

<sup>34</sup>Barnaby J. Feder, "Moving the Pampers Faster Cuts Everyone's Costs", New York Times, Sunday, July 14, 1991, pp. B1, B5, B6.

time, this new process demonstrated the commitment to trust and partnership between the manufacturer and retailer.

**Relationship Marketing:** In the battle to retain a loyal consumer base, both manufacturers and retailers have been implementing Relationship Marketing programs, in the form of Frequent Shopper, or Customer Loyalty campaigns. These programs have been especially prevalent as the size of retail stores have grown, and fewer personal services are provided to consumers. Relationship marketing activities mark a changed attitude in the industry, harkening to a simpler time, when customers were individually known by the local merchant. As an extension of micro-marketing, information technology is being used as a method of tailoring marketing programs to each consumer's specific tastes.

Relationship marketing programs can be executed at two levels. The first is an operational/transactional level in stores, either by sales staff, or at the POS. The second is a tactical level, through the use of customer purchase histories to design marketing programs targeted at specific households.

Since modern POS systems are programmable, the first level is relatively easy to implement as consumers are readily recognized by their frequent shopper identification number. Marketing programs can be designed which give immediate discounts to consumers at the point-of-purchases, or dollar purchases are recorded as points, accumulated for a later reward. This basic implementation may result in increased sales due to increased store loyalty by members of the program. These benefits, however, may accrue only to the first few retailers who implement such a program. Laggards who institute similar programs later may find that they have little or no effect on sales, and therefore, only increase costs.

The second level of these programs, the tactical level, represents a greater challenge. The basic data reported at the POS (e.g. store visited, and dollars spent) may be augmented to detail the market basket of purchases. Since a shopping cart might hold dozens of items selected from a variety of product categories, the magnitude of data to be transmitted to the mainframe host may be increased by orders of magnitude. This data would be used to create targeted programs to the consumer. A shopper presenting his card might receive electronic coupons

on two items, while another with an identical basket might be eligible for ten coupons. In partnership with a manufacturer, this methodology could clearly improve the efficiency of consumer promotions.

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Figure 7: Data Sources for Relationship Marketing  
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The new data sources associated with relationship marketing are depicted in Figure 7. In contrast to samples of the shoppers drawn in a traditional consumer panel diary, market baskets collected at the POS have the potential to provide practically a complete history of a retailer's client base. A successfully-executed marketing program may expect 70% of shoppers in a store as participants<sup>35</sup>. The disadvantage of these data are they provide information only about a household's purchases at a single retailer. The omission of certain products from the shopping list may be interpreted either as purchases at another retailer, or no consumption of the product at all. This data, by itself, may be used for offers which promote repeat buying. Otherwise, it must be combined with additional data sources to create more traditional segments for targeting.

The relationship marketing program with the greatest noteriety, recently, was initiated neither by a retailer nor a manufacturer, but a third party: Citicorp POS Information Systems. The original concept, in 1985, was an electronic clearinghouse for the paper coupons used by shoppers. Instead of clipping coupons, shoppers would have their products eligible for coupons automatically tabulated by Coupon Bank. Not only would the retailer benefit from the faster electronic clearing of their coupons, but the manufacturers could receive more accurate reports on redemption rates, more rapidly.

The success of electronic couponing led to the idea of identifying shoppers, by offering them merchandise, rebates or electronic payment with the presentation of a scannable card. The goal was to maintain a database of 40 million active grocery shoppers, permitting manufacturers the ability to target coupons

<sup>35</sup>Paul Walters, "Winning in the Zellers Zone" presentation at the Retail Council of Canada Meetings, October, 1991.

at customers purchasing a competitive product, rather than wasting money on loyal customers receiving coupons through mass distribution. In 1988, the Reward America program supplemented electronic couponing with a frequent shopper cash rebate program, supplemented by fees from manufacturers.

The retailers, however, perceived fewer benefits from the program. They did not want to share the shoppers names with the manufacturers, and were charged for the use of data generated by their own stores. In addition, since Reward America was designed primarily for manufacturers to promote switching of brands, resulting incremental sales for the retailer were generally low. Most consumers lost interest as they received their monthly statements notifying them of the additional number of points required to reach a prize. Shoppers refused to provide much demographic data about themselves, and with many households dropping out of the program, there was little continuity in the purchasing patterns<sup>36</sup>.

Although the programs initiated by third-parties and manufacturers have been flagging, retailers still appear to have a strong interest in relationship marketing programs. In 1991, 12% of the 17,000 chain stores and 3% of 14,000 independent grocers offer some sort of electronic marketing programs. The implementation of rewards, however, is changed: the "instant gratification" of electronic coupons appears to be winning over points clubs<sup>37</sup>. In upstate New York, the Wegmans' Shopper Club offers electronic coupons on up to 60 designated items, per week. Data is collected on the demographics and buying patterns of its customers, and shared with the manufacturers who underwrite the costs of the program<sup>38</sup>.

In the mass merchandising segment in Canada, Zellers has been a leader with its frequent shopper points club. Announced in 1986, Club Z was seen as an alternative to a private-label credit card for building customer loyalty, since many consumers have switched to bank cards. Developed as an internal, proprietary system, implementation issues were focused in two

<sup>36</sup>Fred R. Bleakley, "Citicorp's Folly? How a Terrific Idea for Grocery Marketing Missed the Targets", Wall Street Journal, April 3, 1991, p. 1.

<sup>37</sup>Progressive Grocer

<sup>38</sup>N. R. Kleinfield, "Targeting the Grocery Shopper", New York Times, May 26, 1991

domains. Business issues encompassed the selection and distribution of gifts, the media plan, training of store personnel, and accounting for the financial liability of the program. Technology issues involved online systems allowing instant notification of accumulated point statuses, the recording and reporting of points to head office, and processing of customer gift requests, and the tracking of activity of gifts<sup>39</sup>.

Consumer response to Club Z has been strong, with over 50% of Canadian household registered as members. A competitive advantage was maintained for a few years, as responses by major competitors were slow. The next major program, Sears Club, was announced by Sears Canada in 1990, four years later.

As pioneers with relationship marketing programs, neither Wegmans nor Zellers have taken full advantage of their consumer market basket data. They have achieved competitive advantage solely through the early operational implementation of the programs. Much as many retailers have had faith in an implicit value of POS item movement data, there is a similar belief in frequent shopper data. There may be some challenges with leaving the tactical aspects of marketing as a secondary phase. As an example, Zeller's did not obtain demographic information beyond name and address when customers were enrolled. With only the history of purchases as data, repeat purchases are easily targeted, while potential purchases are largely unknown.

The method for maximizing the benefits of relationship marketing programs may be the result of partnerships. Even if the programs are owned and executed by retailers, funding and expertise in their design may have to come from manufacturers. Retailers primarily concerned with the pressures of day-to-day management of their stores have not invested in corporate staffs of MBAs to do their analytical work and planning. Consumer goods manufacturers have demonstrated leadership in innovative marketing research, and have honed their skills in the process of designing micro-marketing strategies. The challenge, in a market of many manufacturers and many retailers, will be in the design of marketing programs where both parties will be able to share in the benefits.

<sup>39</sup>Kenneth R. ewightman, "The Marriage of Retail Marketing and Information Systems Technology: The Zellers Club Z Experience", MIS Quarterly, December 1990, pp. 358-366.



Summary: Electronic POS data has had a major impact in transforming the relationships in consumer goods marketing from those of self-interested buyers and sellers at each transaction, to longer-term "win-win" associations, where both parties benefit. For consumer goods manufacturers, this marks a changed relationship with the retail trade; for retailers, it is a new view of the consumer.

The development of Strategic Alliances between manufacturers and retailers has sought to replace the typical adversarial relationship with one of cooperation. The general belief is that the joint profits that accrue from a long-term cooperative relationship will greatly exceed those which would result from each party attempting to gain at the expense of the other. These benefits would come from reduced inventories, fewer stock-outs, and more effective store merchandising. The base sales data is captured at POS, and, with appropriate agreements in place, could be shared between retailers and manufacturers. Making sense of the great volume of data, to create decision rules which will increase efficiency requires, however, Modelling skills obtained at Stage 3 of the learning curve.

The premise behind a Relationship Marketing program is the 80/20 rule: 20% of a company's customers will provide 80% of its profits. The greatest challenge, however, is to identify the top 20%. Since most retailers do not detail every purchase with a customer identification at the POS, and anonymous forms of tender (e.g. cash) are accepted, retailers have found it difficult to pre-select its most loyal customers. The solution for most frequent shopper programs has, therefore, been to admit all applicants to the club, and then to discriminate the most attractive from the pool. This approach fills Stage 1 (Data Capture) of the learning curve, and, with some data management, provides the marketer with Stage 2 (Access and Distribution) foundations. In order to effectively plan promotions and perform target marketing, however, Stage 3 (Modelling) activities should be used to set expected levels of response.

While a number of strategic alliances between consumer goods manufacturers, and a number of frequent shopper programs have been instituted, it is safe to say that the full benefits through exploitation of the data have yet to be realized. Most strategic alliances are still trying to achieve a full

cooperative relationship: measurement of the total benefit requires some effort, and fairness of the sharing agreements are likely to be subject to renegotiation. Balancing the conflicting objectives of the manufacturer's brand managers with the retailer's category managers requires some degree of trust. Frequent shopper programs compound issues about the proprietariness of the retailer's POS data, with greater detail about its most loyal customers. Retailers are caught between the choices of investing in the infrastructure to analyse its customer purchases database to provide the appropriate targets to consumer goods manufacturers, or releasing relevant subsets to the manufacturers who advise on appropriate promotional plans.

## **7. What Does the Future Hold?**

In this chapter, we have discussed current and potential uses of POS data for different types of decisions by retailers and consumer goods manufacturers. In this discussion, we have presented a "learning curve" for using POS data, and discussed the extent to which marketers have ascended it for different types of decisions. Currently, most retailers and packaged goods manufacturers have reached Stage 2 of the learning curve, by developing systems which permits access and distribution of the data to its marketing managers. Market research firms have been active in Stage 3 (Modelling) projects for some time, and have starting developing Stage 4 (Automated Data Screening) systems to meet the demands of consumer packaged goods manufacturers.

In this section, we will first discuss the factors which impede the speed and the extent to which retailers and consumer goods manufacturers move up the "learning curve" in using POS data. Next, we discuss how these impediments can be overcome. Finally, we discuss how these changes will affect the marketing of consumer goods.

### **Current Impediments to the Exploitation of POS Data**

There are four factors which have presented challenges to marketers embarking on a strategy to develop the use of POS data to obtain a competitive advantage. The first is the difficulty

in **assessing**, a priori, **the potential benefits** and/or reduced costs from using the data. Generally, a large investment in hardware, software and manpower is required to gather, store and develop the systems to access and analyse these data. While everyone generally agrees that these data will improve the quality of decision-making, most upper managers are reluctant to commit resources without a precise estimate of the incremental profits.

The second factor is the considerable uncertainty as to the **design of the systems**, the type and form of the data that should be provided to each marketing function, and the best method of analysis for each particular application. In the absence of this wealth of data, the flow of the business still required marketers to reach decisions. Introduction of new information sources brings to light the lack of understanding in the relationship between critical marketing variables. The "paradigm shift" from an information-poor environment to an unclear definition of information richness means some amount of adaptive design during the development of the necessary systems. The inability to ensure that the "first system" will be the "final system" can increase development costs.

The third is the lack of people adept in **skills in information technology and marketing** to develop the necessary systems. An ideal candidate to build a new marketing information system would possess design experience crossing diverse areas such as database management, econometrics, operations research and artificial intelligence. With such a breadth of expertise unobtainable in a single individual, firms must hire a staff which would encompass those disciplines, and harness their efforts to coordinate software development. Unfortunately, professionals with depth in these technical skills usually lack the experience in business areas. In addition, although many marketers have become proficient in answering their daily business questions through the use of electronic spreadsheets, they generally lack the technical expertise to generalize their methods for the multitude of exceptions which will arise in the volume of POS data to be processed. Miscommunications often result in the development of the "easiest" systems, rather than the most profitable.

Finally, many managers have been struggling to keep up with the **rapid change in work processes** associated with today's real-

time access to data. Less than a decade ago, monthly or bi-monthly reports were the standard on which most marketers based their decisions. Marketing, as a discipline, has been redefined from the intuitive understanding of the "pulse of the market" to week-by-week measurement of the success of each marketing program. Every dollar expended by marketing is now scrutinized to quantitatively analyse the effectiveness of its strategies. During this period of change, since the computer software and data sources have been evolving over time, marketers have been forced to continuously learn new systems with "improved" features year after year.

### **Overcoming the Impediments**

Each of the challenges discussed in the previous section can be overcome, if marketers are prepared to make the promise of POS data a reality. Some changes will occur naturally over time, such as improvements in information technology. The more difficult changes will require some commitment and vision by the senior management of the enterprise.

**Changes in Technology:** Over the next ten years, it is estimated that computer performance/cost will improve by two orders of magnitude<sup>40</sup>. In the area of managing POS data, this will have an impact in two ways. Firstly, as the storage of large (and larger) volumes of data increasingly becomes more economical, it is inevitable that databases will grow in size and in number. Secondly, as real-time processing becomes more rapid, complex analyses and presentations which will enhance the interpretability of the data are enabled. It is this latter trend which will make the greater difference to marketers.

Greater processing speed permits more sophisticated software to be developed, which allows a business professional to work with the computer through a more intuitive interface. Information supporting the decision environment may be more richly represented, and relationships within the data may be reduced into simpler visual presentations. The complexity of large computer systems has resulted in a trend away centralized, all-encompassing systems (i.e. "the" marketing system), towards the development of more modular, inter-related applications

<sup>40</sup>Robert I. Benjamin and John Blunt, "Critical IT Issues: The Next Ten Years", Sloan Management Review, Summer 1992, pp. 7-19.

(i.e. a "suite" of marketing applications). In this way, a specific domain of decisions can be supported with a smaller subset of data. As an example, many of the key decisions required for media planning<sup>41</sup> are quite independent of those required for promotional planning. This approach requires management not of a single system, but instead the coordination of a number of inter-related applications which may access different views of the main database. A major challenge for developers will be the creation of the end user interface which will provide some consistency to users who must use and learn multiple applications.

While the prices of computer hardware will continue to plummet, the underlying complexity of computer software will increase, with greater function and sophistication. Software development, however, is a labor-intensive activity, and business knowledge which gives it value is a scarce resource. Marketers have the option of choosing to make or to buy their own software. In-house development has proven to deliver competitive advantage (e.g. American Airlines' SABRE system), but requires a commitment of resources to be at the leading-edge of technology. The componentization of software makes the purchase of off-the-shelf software a possibility, but the cost of development must be borne by the number of clients over whom the the software is distributed. Applications which are of interest to only a few clients are necessarily more expensive per unit, as there is a small number of customers over which the software development costs can be distributed<sup>42</sup>.

An alternative approach to exploiting information technology has been to substitute raw computing power for expertise which must be built into the software. "Smart" systems based on technologies such as neural networks have proven to be effective on problems which may be defined as "pattern-matching" applications. The software is "trained" to recognize a pattern, and then allowed to search the database to find similar patterns. Although this is a "black box" approach, where the relationship between input variables and output variables are not explicitly identified, this approach appears

<sup>41</sup>Mitchell (1987, 1988) describes such a system for media planning.

<sup>42</sup>David Liddle (Metaphor Computer Systems, 1990) coined the description of a "software development sandbar" to depict the economics of developing niche application software.

to be promising on large databases.

As computers become increasingly ubiquitous, software will continue to be enhanced to become customized to the business problems of each individual at hand. Computer systems have reached a stage where less effort is placed on building a system than ensuring that it will be used.

**Corporate Strategies to Exploit Information Technology:** In order for POS to achieve their full potential in marketing, a change in the attitudes within all levels of the corporation must occur.

Firstly, corporations must take a **more analytical posture** towards marketing questions. In the past, there has been a reluctance towards the hard quantification of the benefits of marketing activities. This has lead higher management in some companies to think of the marketing function as an expenditure where the financial returns are unclear.

Electronic POS data can play a role in changing these attitudes, if marketing managers change the way in which they think about marketing problems. A more analytical orientation attempts to more precisely calculate the expected marginal return for each specific marketing expenditure.

To statistically derive the impact of specific marketing activities, a basic requirement is a considerable amount of variance within the causal variables (e.g. price) and little collinearity between the causal variables (e.g. display and advertising). Where these conditions have not been met, carefully-controlled market experiments, or a program of systematically varying the critical variables, should be conducted<sup>43</sup>.

Increased quantification in the marketing function may be inevitable, since one general trend from management has been the increased accountability of bottom-line results, from a strategy perspective, down to a customer-by-customer review. POS data provides an impartial "scorecard" which can draw attention to triumphs and failures.

A second change, to improve the development of more

<sup>43</sup>Little ...

effective systems for using POS data, is a **closer coordination between marketing and management information systems functions** which has been lacking in many corporations. This coordination can be accomplished by forming teams with skills in marketing, database analysis and statistics. If these cross-functional teams are empowered to deliver results without the escalation to higher authorities for arbitration, resources within the company may be rechannelled for greater effectiveness. Approaches such as the Strategic Alignment Model align business and information technology strategies, with an integrated strategic management process<sup>44</sup>. This model has successfully been applied by Sears Canada, Inc. in its understanding of the information requirements in its catalogue business<sup>45</sup>.

A strategy to exploit POS data for competitive advantage is a large undertaking, and requires a first step. Projects need to be prioritized to identify the "low hanging fruit" to be picked. Bounds for each should be clearly defined so that progress and early results can be publicized. To accelerate through an initial peak of workload, outside resources such as consultants may provide additional leverage to the internal team. Climbing the first few steps of the learning curve will point the way to more advanced projects.

Finally, corporations must do more than simply apply technology to their current business practices. This has proven not to improve productivity. Instead, changes must be made across the organization. The organizational structure of most corporations was designed in the "Age of Paper", prior to the advent of electronic communications and documentation<sup>46</sup>. The original decomposition of corporate activities into departments has resulted in some operating at cross-purposes to others, at the detriment of managerial decision-making.

Consumer packaged goods manufacturers, who have demonstrated a long tradition of conducting market research activities, may find the transition to scientific approaches to marketing with POS data somewhat easier. The major adjustment,

<sup>44</sup>John C. Henderson and N. Venkatraman, "Understanding Strategic Alignment", *Business Quarterly*, Winter 1991, pp. 72-78.

<sup>45</sup>G. Joseph Reddington, "Using Technology in the Catalogue Business", *Business Quarterly*, Spring 1991, pp. 87-92.

<sup>46</sup>Michael Hammer, "Reengineer Work: Don't Automate, Obliterate", *Harvard Business Review*, July-August 1990, pp. 104-112.

on their part, will be the shift from project-by-project research to the continuous flow of POS data. Retailers, with more immediate access to the data, may benefit by taking a more proactive approach to understanding the relationships between marketing variables, rather than only reviewing results after the fact.

**The Role for Academics:** There are a number of role which academics may play to hasten the further exploitation of POS data by retailers and consumer goods manufacturers.

Firstly, academics have, and will continue, to **develop methodologies for analysing POS data**. A number of articles (e.g. Blattberg and Wisniewski (1989) and Guadagni and Little (1983)) have been influential in the basic concepts of POS data, and have formed the foundation for some commercially-available software products. Currently, a number of research issues under examination by academics may have an effect on the systems in the near future. One example investigates methods of estimating cross-price elasticities, used to determine the effects of a price promotion on brand sales and profitability in a product category. Such fundamental questions should be resolved prior to the development of commercial software products.

The second role in which academics may serve is in the **training of current and future managers** in the analysis and use of POS data. Executive programs can be developed for senior managers on strategies to exploit the data; for managers to understand how POS data can be incorporated into their decision-making; and for practising analysts to enhance their skills in advanced methodologies. These same interests may be reflected in MBA programs which will train the managers of tomorrow.

Finally, industry and academic partnerships can be developed which focus on the exploration of more effective uses of POS data. In some cases, academics may work on solutions to pilot projects, and obtain estimates of the benefits of costs associated with roll-out.

### **The Impact on the Discipline of Marketing**

The overall impact of POS data on the discipline of marketing is heavily dependent on the extent to which retailers will develop the systems necessary to truly exploit the data.



These investments are, in turn, largely based on the size of the economic benefits which they expect will result.

For retailers, the impediments towards investing in the exploitation of POS data are greater than for consumer good manufacturers. As discussed earlier, retailers are not usually favourably predisposed towards analytical solutions, the use of marketing research, and long planning horizons. Consequently, the economic benefits resulting from use of the data must be substantial. At one extreme, these benefits may be so great relative to their costs

### **Conclusions**

Is the art of marketing in decline? In the art of music, keyboard synthesizers and digital sequencers can be used as surrogates of brass or string sections, but this does not necessarily diminish the creative element of the composition. Modern technology can give the composer a direct degree of control that is unmatched by an ensemble of journeymen musicians, plus an ability to create sounds that do not exist in nature. Leading-edge musicians do not merely operate the technology; their artistry is enriched, and flourishes. A similar opportunity is now faced by marketers. The science of marketing is a discipline which has only begun to develop, and it can change the business world as we have known it. As anyone who has ever attempted to learn a new musical instrument will affirm, expertise does not come without years of practice. In marketing, the most successful will be those who are able to uncover the art **in** the science.