



**New Ways to
Costs Out
the Retail**

Food

**Take
of**

Pipeline

**Making Replenishment
Logistics Happen**

A STUDY CONDUCTED FOR THE *Coca-Cola* RETAILING
BY MERCER MANAGEMENT CONSULTING

RESEARCH COUNCIL

About This Report...

Over the past decade large changes have been taking place in the way retailers in other industries manage their supply chain logistics. In those industries, retailers and distributors have developed techniques for purchasing, using information systems, and structuring and managing physical distribution that are different from those most often used by grocery distributors.* Grocery distributors have seen these new methods gain a foothold in the food industry in both new retail formats and traditional grocery chain operations. Some observers believe that these developments have the potential to create significant savings for food suppliers and distributors.

The new methods in logistics reflect the fact that other retailers have engaged in a higher degree of purchasing to meet immediate consumer demand than is common in the food industry. *These replenishment purchasing practices have given rise to important innovations in logistics.*

* This report follows terminology used by the Food Marketing Institute:
• *Distributors* – all chains, independents, wholesalers, and others that distribute and/or retail grocery products
• *Suppliers* – manufacturers and processors of these grocery products

In contrast, current grocery industry logistics systems are predominantly influenced by supplier promotional programs, which make "forward buying" a profitable investment opportunity for distributors. Some industry players are now experimenting with alternative promotion programs that also complement replenishment purchasing. It is still too early to say whether these programs will take hold, but it is not too early to learn the cost-saving innovations of *replenishment logistics* that have been developed by other retailers.

This report focuses on the immediate significance of the new replenishment logistics practices. It takes a practical approach to recent logistics trends by focusing on currently available opportunities for taking costs out of the food distribution system.

In fact, a few distributors and suppliers have already implemented these practices, and their programs have already shown paybacks in lower costs and improved quality of service. Most food distributors today can begin implementing many of the new practices with selected suppliers and for selected categories and items.

The report recommends that food distributors take a closer look at how other retailers have managed to achieve lower distribution costs, but it does not advocate any specific merchandising strategy such as "everyday low price." In fact, distributors can employ the replenishment logistics practices described in this report while continuing to run aggressive promotional strategies.

The purpose of this study is to give food distributors a handle on forces that are currently changing the way distribution is managed in the industry. By understanding the rationale for the changes, distributors can:

- Be prepared for new sources of competition
- Take advantage of the new tools to suit current needs
- Respond to competitive initiatives
- Control their future by influencing relationships with suppliers

Because the new directions in food logistics have the potential to affect the entire logistics chain, *the messages in this report are relevant to all industry participants who have an interest in "taking the costs out": independent grocers, chain retailers, wholesalers, suppliers,*

and transportation and warehouse providers.

- *Chain retailers and wholesalers* can upgrade methods across the supplier-to-store pipeline.
- *Wholesalers* can develop capabilities to help their customers – the independents – reduce their logistics-related costs.
- *Independents* can improve their understanding of key business tradeoffs and work with suppliers and wholesalers to drive out costs.
- *Suppliers* can work with distributors to increase understanding of costs and benefits and to develop improvements.
- *Transportation and warehouse providers* can enhance service offerings to support the industry.

The report has been written to serve the interests of both senior executives and functional managers.

- *Chapter 1 provides an executive summary of findings and implications of our research*, including an overview of four major new directions in industry logistics and descriptions of 19 specific programs for implementing cost-saving logistics practices.
- Each of the following four chapters presents an in-depth discussion of one program, selected for its key role in replenishment logistics. *The first page of each chapter provides a summary of the chapter.*

This report is based on research conducted by Mercer Management Consulting on behalf of the Coca-Cola Retailing Research Council.

The purpose of the Coca-Cola Retailing Research Council is to identify major research needs in the food distribution business and to conduct studies designed to bring wholesalers and retailers – both large and small – practical guidance on how to address these issues. The Council has operated since 1978, and in that time has produced 12 major reports on a broad range of topics.

Research for this project included interviews with representatives of over 50 major industry participants – independents, chains, wholesalers, and processors – as well as leading firms outside the industry, including other retailers, transportation companies, and hardware and software systems providers. Research and writing for the report were conducted under the direction of Robert J. Quinn of Mercer Management Consulting.

The Council's activities for this report were coordinated by Willard R. Bishop, Jr., President of Willard Bishop Consulting, Ltd.

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A Word About Logistics

What Is Logistics?

Logistics is the management of inventory – whether it is held at some staging position or moving between points – along the entire flow of product, from the supplier's raw material to the final point of retail sale. It involves all the factors and all the conditions affecting decisions about how to control this process, including such functions as material handling, inventory control, procurement, warehouse operations, transportation, and others.

Logistics operations have a direct effect on two key competitive factors:

- *The price of delivered product.* Logistics costs make up the retailer's second-largest controllable cost component, after labor, and represent a major component of the food processor's value-added.
- *The quality of service.* Logistics management decisively influences the availability and condition of goods, as well as the time required to deliver product to the consumer.

Logistics is an old "science" that began with the military requirement of supplying large armies with all they needed to conduct battle out at the front lines, far from their homebase and resources. While the battle for the customer at the front lines of the retail business is not quite "warfare," it is likely to be a test of survival for firms facing a range of pressures in today's competitive environment.

Recent Trends in Logistics Strategies

The logistics strategies of major U.S. corporations have evolved in response to competitive pressures and the changing economic environment.

In the 1970s, Functional Cost Management. Logistics costs were still considered to be a basic and inevitable part of doing business. Strategies were marked by cost control measures that focused on departmental functions without exploring synergies.

In the 1980s, Internal Integration. As savings from the functional focus leveled off, many firms switched their attention to coordinating functions across departmental boundaries. Transportation deregulation, rapid economic expansion, and widespread corporate restructuring offered opportunities to balance trade-offs in functional logistics costs and develop information systems that link operations.

In the 1990s, Pipeline Logistics Management. Integration efforts will lead beyond company boundaries to encompass the entire distribution system. Companies will form close alliances with suppliers, carriers, and other business partners to increase flexibility and to squeeze even more cost and time out of the distribution system.

Now a key component in successful business strategies, logistics will focus on customer satisfaction while becoming more management-, information-, and transportation-intensive.

Using Logistics to Take Costs Out

There are many different opinions on new directions in the retail grocery industry, but a host of studies, reports, articles, speeches, and discussions have generally agreed on a consistent picture of the current industry situation. In an industry with traditionally low margins, now experiencing stagnant or low growth rates (declines in some core categories) and an increasingly fragmented market – which is being served by a wider variety of direct and indirect competitors – the pressure is on to maintain profitability by squeezing more and more waste out of the system at all possible points.

The pressures come from all sides – consumers, suppliers, and new retailers. One of the most important developments in recent years has been the growth of the new players and the addition of grocery items to their product lines. Mass merchandisers, clubs, and supercenters have developed new business systems that target quality of service, fast replenishment cycle times, and pricing strategies that reflect system efficiencies in lower prices.

Shifting from Push to Pull

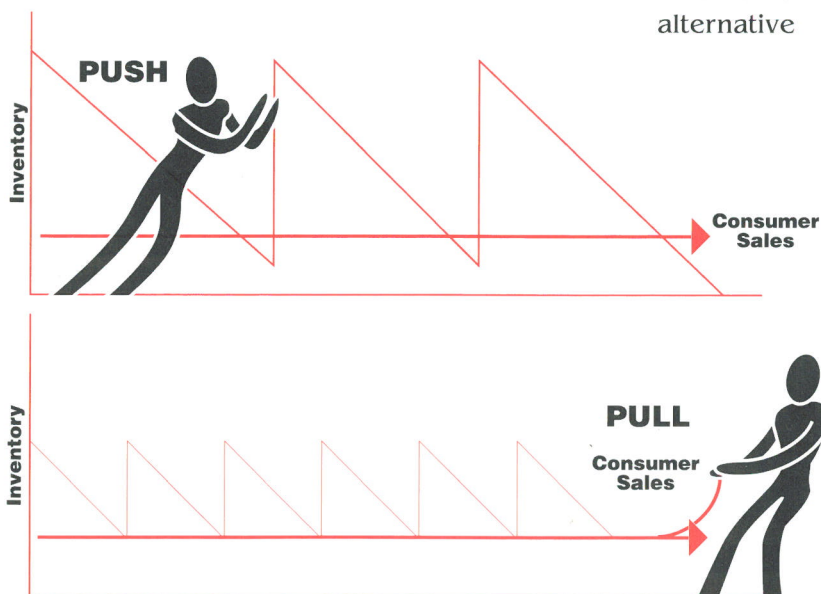
These developments are familiar to most industry participants. The important point is that the new formats are employing alternative

approaches to retail logistics and that these approaches are producing significant benefits. For this reason alone, the new approaches are worth investigating.

The most common factor in the new logistics approaches concerns the management of inventory; and the basic shift is from a supply-side “push” orientation to a demand-side “pull” orientation. In the new systems, demand is the “ultimate” driver of replenishment cycles and the activities that accomplish replenishment. In a very literal sense, logistics systems become customer-driven.

With the emphasis on demand, the new logistics practices also put a premium on taking costs out by reducing the time it takes to complete a cycle of replenishment, from supplier to warehouse and from warehouse to store.

Can the new logistics methods and strategies be applied in the grocery distribution industry? How can these programs be made to work?



Marketplace Realities

In the U.S. food industry, suppliers' promotional pricing practices have created strong incentives for distributors to "forward buy," turning inventories into high-yield – and low-risk – investments. Both suppliers and distributors have substantial distribution capacity in place to support these investments.

At the same time, suppliers and distributors are beginning to experiment with alternative pricing terms and incentives. While suppliers desire to continue to use pricing as a competitive tool and an important means of trade support, many are considering mechanisms that moderate the effect of supply surges on logistics flows.

The Opportunity

There is an increasing understanding that suppliers and distributors alike can benefit from logistics practices that help to reduce inventories. Distributors can eliminate inventories and the costs to handle and carry those inventories, while suppliers can also reduce inventories, costly production surges, and the

administrative burden of invoice deductions required to support large and complex promotion transactions.

Many industry observers have concluded that we are entering a period of hybrid pricing and purchasing practices. Distributors will increasingly use replenishment purchasing – for selected suppliers, categories, and products – to complement today's system, which emphasizes investment buying. These hybrid approaches will be both flexible and targeted – in other words, they will be responsive to market opportunities for both buying and selling while improving efficiency to "take the costs out."

It is tempting to view the new directions in logistics as being within the reach of only major, "leading edge" distributors or as being impractical until other changes are made to today's grocery industry environment. But our research has shown that the success of the new logistics programs is more dependent on management commitment and disciplined implementation.

Grocery Industry Logistics Initiatives

The grocery industry recognizes the importance of replenishment logistics and the linkage between these practices, related approaches to information management, and underlying data structures and technologies.

The Uniform Code Council and Food Marketing Institute (FMI), with the endorsement of the Grocery Manufacturers Association (GMA), are now guiding two studies that address these frontiers.

- *The Efficient Consumer Response Project* is clearing the way for the electronic communications systems that will link retail activities to manufacturers' production and distribution systems. The project will recommend pilot programs to identify the best implementation approaches and strengthen the industry's commitment.
- *The Horizon Scan Project* is identifying the near-term and long-range impact of technology and electronic data interchange on product identification distribution systems in the industry. The project will recommend the leadership roles for inter-industry organizations.

These efforts at coordination and education are making an integrated perspective on the total logistics pipeline more than just a possibility.

Four Directions for Replenishment Logistics

Recent developments in the food and grocery industries bring into focus a clear picture:

Over the next several years competitive forces will increase the importance of replenishment purchasing and lead grocery distributors to logistics practices aimed at improving responsiveness and eliminating costs from the supply pipeline.


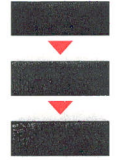
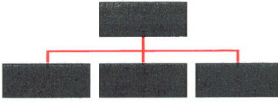

We call these logistics practices *replenishment logistics* – a new way of looking at physical distribution and material handling practices in industries where most products are

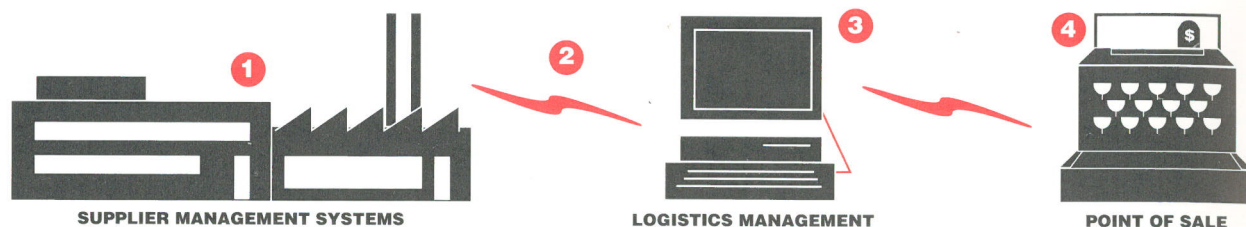
bought to restock depleted inventories. These practices are designed to improve responsiveness, smooth product flow, and shorten cycle times.

Companies practicing replenishment logistics have developed four broad initiatives that improve inventory and communications systems, distribution operations, organization management, and performance measurement (see table).

On the following pages we briefly describe 19 key programs that distributors have practiced to advance the four major directions in replenishment logistics. In the rest of the report, we present a closer look at four of the most important programs and consider the implications of these programs for the way distributors work with suppliers.

Four Directions for Replenishment Logistics

| Direction | Objective | Key Programs |
|---|--|--|
|  Continuous Replenishment Inventory Systems | Bring supply more in line with the rhythm of demand | Automated systems that enable distributors to stock and reorder goods based on actual consumer sales (i.e., point-of-sale transactions) |
|  Flow-Through Distribution Systems | Take every bit of wasted space, handling activities, time, and therefore costs out of the process | New methods that increase the speed of product flow by reducing inventory and relying on timely, coordinated, and dependable transportation and material handling |
|  Pipeline Logistics Organizations | Institutionalize key product flow processes, cultivate "total pipeline view," and coordinate operations | New roles and responsibilities that remove barriers to communication, rationalize accountability, encourage coordination, and provide incentives for aggressive management of the logistics pipeline |
|  Pipeline Performance Measures | Establish objective tools for improving management control of processes and motivating appropriate decision making ("you can't manage what you can't measure") | Precise criteria, accurate decision rules, and consistent procedures that support management objectives and take into account total pipeline performance |



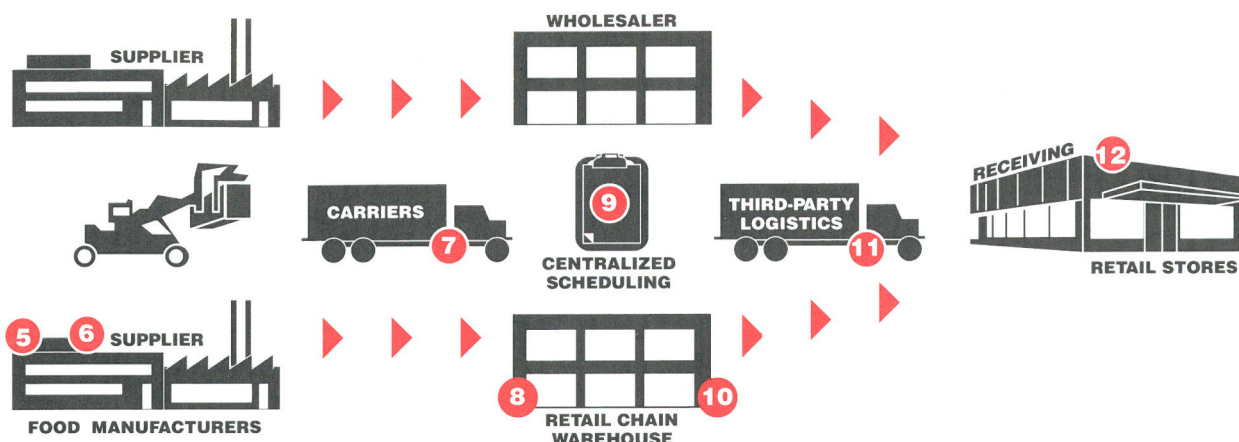
Continuous Replenishment Inventory Systems

Store and warehouse inventory management systems that stock, reorder, and replenish goods from suppliers based on consumer sell through

Continuous replenishment systems enable timely changes in supply and distribution in reaction to fluctuations in demand. Continuous replenishment methods have evolved to the point where they are able to rely on continuously updated point-of-sale (POS) data to drive inventory requirements forecasts, replenishment orders, and product flows from supplier to warehouse to retail store.

Key Requirements

- 1 "Never out" supplier order fulfillment and delivery systems. Supplier systems that receive the retailer's pull-based data, aggregate store and regional demand, generate and ship orders, and interact with manufacturer systems to guide production scheduling.
- 2 Order, product, and shipment communications systems with trading partners. Electronic networking capabilities that link retailer systems with warehouses and suppliers to generate orders, route shipments, arrange transportation, and notify distribution points of product movement.
- 3 Pull inventory management tools and forecasting models. Computer models – driven by store-level perpetual inventory systems – that compare current data with established trends, retailer conditions, and warehouse parameters to determine inventory requirements at all stages in the logistics pipeline.
- 4 Product movement information, captured daily at the SKU level of detail by automated scanning technology. Scanning systems that capture all transactions at the point of sale and warehouse to allow buyers to perform full product management analysis of demand trends.



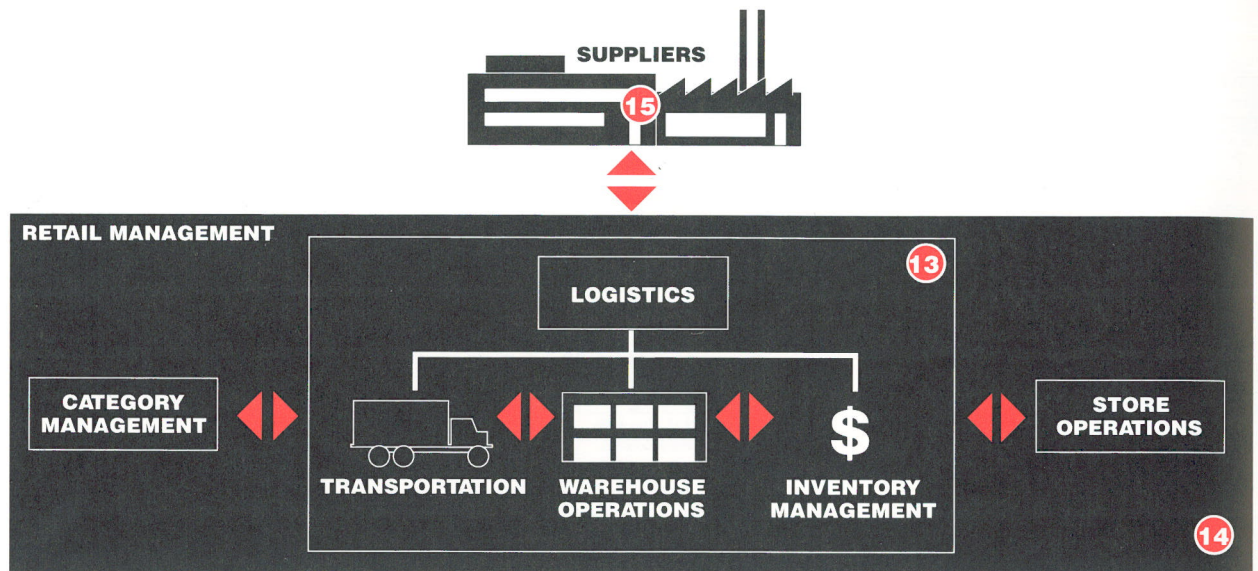
Flow-Through Distribution Systems

Material handling and delivery systems from supplier to retail floor that reduce costs and cycle time in the logistics pipeline

Flow-through systems are physical distribution techniques that improve the efficiency of product movements. Based on detailed analyses of the receiving, storage, handling, delivery, and stocking processes, they may require extensive reengineering of current procedures.

Key Requirements

- 5** *New pallets and pallet management practices.* Studies have shown significant industry costs can be eliminated through adopting new pallet standards that enable faster handling, improve trailer cube utilization, reduce damages, and lower total costs per pallet.
- 6** *Store-ready packaging and shipment conveyance.* To enhance crossdocking, suppliers may also prepare orders for immediate placement on retail shelves by adopting special packaging features or developing customized display-ready modules.
- 7** *Increased control of inbound transportation.* By establishing partnerships with a core group of regional and national carriers, retailers can exercise more control over the timing of shipments, improve consistency of high service standards, and lower costs.
- 8** *Crossdocking.* Crossdocking techniques (e.g., advanced shipping notices, supplier predistribution, JIT receiving) eliminate steps in the warehouse material handling process. When combined with efficient supplier operations, these techniques can reduce total time, space, and labor.
- 9** *Improved delivery, processing, and receiving scheduling.* Replenishment logistics practices result in smaller, more frequent shipments; this puts a premium on coordination of deliveries to avoid congestion, delays, and errors.
- 10** *Warehouse automation and scanning.* To facilitate flow-through procedures, many warehouse procedures can be speeded by improved tracking of shipments and direct transfer of product to conveyers; automated technology may require significant investment.
- 11** *Third-party logistics.* Replenishment logistics can complicate management of the number of operations required. Transportation companies and other third parties can perform integrated, well-coordinated shipping, handling, and storage services.
- 12** *Store receiving capability.* Cycle times may also be reduced by shipping product direct from the supplier to the store receiving dock. This program requires superior transportation services and enhanced systems and procedures at retail stores. Retail store operations should change to reflect the new environment.



Pipeline Logistics Organizations

Organizational structures, incentives, and relationships that integrate and focus management of the total replenishment logistics process

Replenishment logistics programs are designed to integrate the management of inventory throughout the supply chain. As a result, they focus management attention on the key processes that guide the work flow, rather than on separate departmental functions. Management needs to ensure that overall leadership is established, that teamwork is fostered, and that personnel are motivated to achieve the potential of the new systems by taking the responsibility to balance operating tradeoffs across the pipeline.

Key Requirements

13 Consolidation of logistics management responsibilities. Integrated organizations are led by managers with responsibility for functions formerly distributed across several different jobs. Replenishment logistics managers are responsible for inbound transportation and fleets, store delivery, distribution center operations, and targeted in-stock levels.

14 Improved organizational integration between distribution, merchandise and category management, and store operations. New pipeline objectives and individual performance criteria create different expectations among personnel regarding other functions within the company. Without the buffers created by high inventories, companies have a greater need for teamwork to balance cost increases in one area against cost savings in others.

15 Linkages with supplier logistics and manufacturing organizations. Replenishment logistics companies focus on understanding the supplier's total cost of doing business, and they actively help suppliers understand the retailer's costs. Logistics-related managers in distributor organizations and their counterparts in supplier organizations cultivate teamwork to achieve cost reductions.

Pipeline Performance Measures

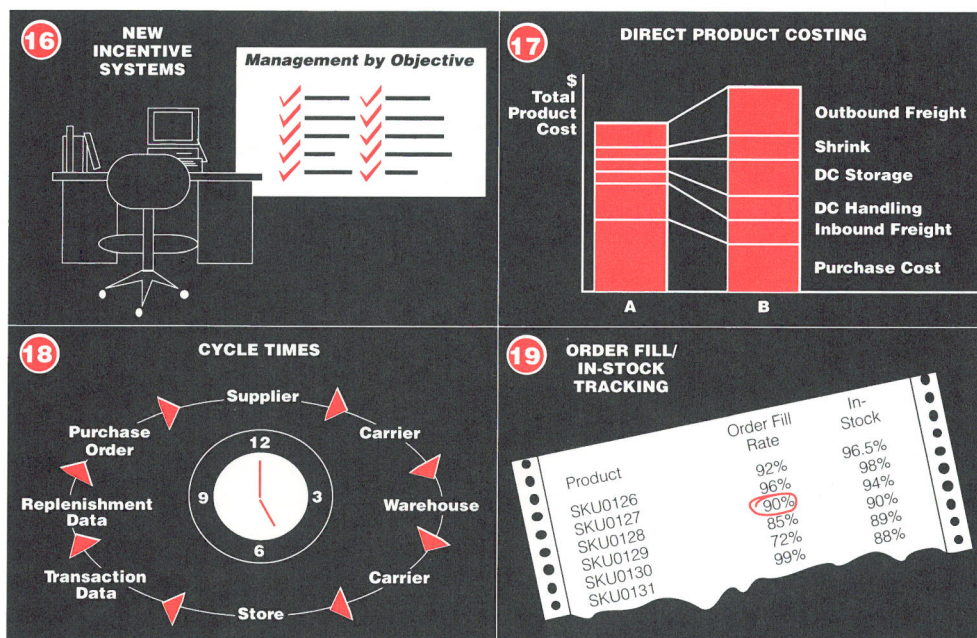
Performance measures that emphasize costs and service performance across the entire pipeline, from the supplier to the retail store floor

Replenishment logistics involves intensive management of ongoing processes; a crucial part of management's success depends on its ability to measure performance on the basis of criteria that fit the goals of greater efficiency and higher service quality. Managements have developed new ways of understanding and monitoring the costs and benefits of operations across the supply chain – from supplier to warehouse to store.

Key Requirements

- 16** *New incentive systems to reflect integrated responsibilities.* When management adopts a total pipeline perspective, certain tradeoff decisions within the pipeline may affect job definitions. Incentive systems and current expectations for rewards should reflect the

- 18** *Cycle time measurement.* Replenishment logistics practices take costs out of the pipeline by taking time out of the replenishment cycle. Thus, to manage this process, companies measure supplier order cycles, handling cycles, and store delivery-to-floor cycles to determine where efficiencies can be achieved.



dual efficiency objectives of lower costs and higher product availability across the entire supply chain.

- 17** *Direct product costing.* Cooperative trading relationships depend on costing methods that accurately aggregate total pipeline costs for products, including purchasing transaction costs, inbound transportation, inventory carrying costs, handling and storage costs, store delivery costs, and in-store stocking costs.

- 19** *Order fill/in-stock tracking.* As inventories are reduced, the traditional "buffer" against uncertainty is reduced. To protect against out-of-stocks, companies improve their capabilities for monitoring and maintaining inventory levels at all times. Key measurements will be supplier order fulfillment rates, warehouse fill rates, and store in-stock levels.

Overview of Benefits

The replenishment logistics programs have yielded significant benefits in other retail industries and new formats in the food industry. There is growing evidence that similar benefits are within the reach of food distributors and suppliers.

Implementation of the full range of programs just described may require a considerable investment on the part of food distributors, for example – computer software, staff and training, and warehouse automation and scanning. The experience of other companies, however, has shown that initial efforts and pilot programs can require relatively modest resources. Costs may vary considerably among distributors, depending on their “starting position.” In addition, the range of benefits experienced obviously depends on many internal and external circumstances.

Nevertheless, the benefits experienced by retailers and suppliers in other industries give a good indication of the magnitude of improvements in efficiency and service quality that implementation of replenishment logistics makes possible.

1 Faster Cycle Times and Reduced Inventory

Process enhancements within the warehouse (e.g., crossdocking, automation, scanning) and adoption of replenishment purchasing techniques have significantly reduced cycle times, inventory, and costs while improving cash flows. Continuous replenishment partnerships and greater adoption of EDI capabilities have increased inventory turns significantly.

- One retailer involved in continuous replenishment can move 77 percent of its product through the warehouse in 24 hours or less.
- One consumer goods manufacturer serving the food industry has seen its partners’ turns increase by 30 to 100 percent.

2 Reduced Administrative Expense

By employing computerized systems to record, aggregate, analyze, and communicate product movement data, distributors and suppliers can eliminate excess paperwork and reduce invoice deductions.

- Comprehensive EDI communication systems have been found to decrease general clerical costs by over 60 percent.
- These EDI systems have also been known to decrease purchase order (PO) maintenance costs by 80 percent.

Benefits of Reduced Warehouse Cycle Times (days)

| Current Average | Days Saved | Cycle Time* | Savings (% of total sales) |
|-----------------|------------|-------------|----------------------------|
| 19 | 4 | 15 | .14%–.28% |
| 19 | 9 | 10 | .31%–.62% |
| 19 | 14 | 5 | .49%–.98% |
| 19 | 17 | 2 | .59%–1.18% |

*Time lapsed from receipt of product at DC to time of shipment to store

3 Reduced Distribution Operation Costs

Improved communications and coordination allow industry participants to eliminate unnecessary steps in the supply chain, producing savings through decreased labor expenses, increased productivity, and reduced losses from handling and damage.

- Crossdocking can reduce warehouse labor by 50 to 66 percent.
- Crossdocking reduces product damage and returns.
- Utilizing centralized safety stocks to support flow-through warehousing can offer the retailers low-cost and next-day replenishment, while expanding geographical coverage for smaller suppliers.

4 Increased Sales and Reduced Unsalables

When product replenishment is triggered by up-to-the-minute sales data, and flow-through systems cut distribution cycle times, new product arrives "just in time" to satisfy customer demand, product is fresher when available to the consumer, and product expirations are reduced.

- A consumer goods manufacturer serving the food retailing industry has seen sales increase as store in-stock levels increased from mid-80 percent to high 90 percent through continuous replenishment techniques.
- A distributor using flow-through logistics systems took three to seven days off distribution cycles – and added three to seven days to available shelf life.

In sum, replenishment logistics programs have been shown to produce benefits across the distributor's organization and throughout the logistics pipeline.

- Internally, they have improved the distributor's and supplier's cash flow and return on investment by reducing operating costs, lowering capital assets, and increasing revenues.
- Externally, they have enhanced quality, raised the level of customer satisfaction, and sharpened overall competitiveness.

Notes

Assumptions and sources

Gross margin = 24.4%
(1991 FMI Operations Review)

Percentage of goods flowing through warehouse = 70%

Annual warehouse turns = 16
(FMI Speaks)

Inventory carrying costs = 20–40% of total product

What's included in inventory carrying costs?

- Costs of physical space
- Taxes and insurance
- Shrink (loss of product through breakage, theft, obsolescence, spoilage, etc.)
- Opportunity cost of alternative investment

Looking Ahead

In the next four chapters, we focus on programs related to the first two major logistics trends:

► *Continuous Replenishment Inventory Systems*

- Chapter 2: Inventory management tools and forecasting models
- Chapter 3: Order, product, and shipment communications systems

► *Flow-Through Material Handling and Delivery Systems*

- Chapter 4: Improved delivery, processing, and receiving scheduling
- Chapter 5: Crossdocking

The report concentrates on these specific programs because they represent both opportunities that distributors can begin to act on in the short term and because they are critical building blocks for the other replenishment logistics programs.

Chapter 6, "Working with Suppliers," considers the implications of these programs for trading partners and the role they must play in achieving the joint savings offered by replenishment logistics.

How to Read This Report

Each chapter begins with a one-sentence definition of the recommended practices and a one-page Overview that describes its "Function and Purpose," "Key Concepts," and "Opportunities and Advantages."

For readers desiring a more in-depth understanding of each program, the chapter then covers the subject under four headings:

- *How It Works* describes specific implications for logistics operations.
- *Making It Happen* identifies prominent implementation requirements.
- *Issues to Consider* offers insights on potential barriers, challenges, or other considerations for management.
- *Other Benefits* (where appropriate) links these programs to additional opportunities for improved performance.

Overview

Reduce total pipeline inventory (at stores, warehouses, and in-transit) and increase store in-stock rates by using inventory management tools and demand-based forecasting models to pull supply through distribution channels

Function and Purpose

Many grocery distributors have found that the inventory systems they use to match supply with consumer demand have not met their expectations:

- Systems are not able to gather or aggregate complete and accurate data.
- Decision rules are often imprecise because system models do not capture actual variabilities across items.

With the arrival of scanning, more powerful personal computers, and other technologies, leading distributors have redesigned their inventory management systems to use better data to drive more accurate algorithms. The new systems enable merchandisers to micro-manage their inventory down to the SKU

level, allowing them to employ new category management techniques to meet both merchandising and logistics objectives. Distributors are also integrating the new systems with suppliers' production planning and distribution systems.

Key Concepts

To achieve the full advantages of inventory management tools and forecasting models, distributors should:

- Use scanner-based information to maintain perpetual inventories, including models of store and warehouse stocking and reorder levels
- Develop short-term (1- to 2-day), continuously updated forecasts of inventory requirements based on actual demand
- Segment inventory at the warehouse level based on SKU
- Generate warehouse orders automatically based on daily requirements, reorder levels, and on-hand inventory
- Forward POS information, along with warehouse orders, to suppliers to aid in forecasting for warehouse replenishment

Opportunities and Advantages

Demand forecasting and inventory planning systems that determine requirements for every UPC item at every warehouse or store offer distributors the ability to:

- Carry lower inventories
- Respond immediately to sales trends
- Automate a large portion of ordering while addressing inventory decisions on a "management by exception" basis
- Help suppliers to anticipate replenishment requirements, leading to more reliable and efficient distribution and production
- Allocate more time for buyers to focus on high value-added functions of category management and make more reliable tradeoff decisions across products and categories

How It Works

Generally speaking, the basic objective of an advanced inventory management system – keeping sufficient product in stock to meet demand – is not significantly different from those of traditional methods. But the largely automated systems accomplish the task while saving labor and improving accuracy and functionality. By doing so, they also tend to rationalize replenishment throughout the logistics pipeline. The functionality of the new inventory management and forecasting systems can best be seen in three areas of importance:

- Stocking levels
- POS transaction data
- Inventory segmentation

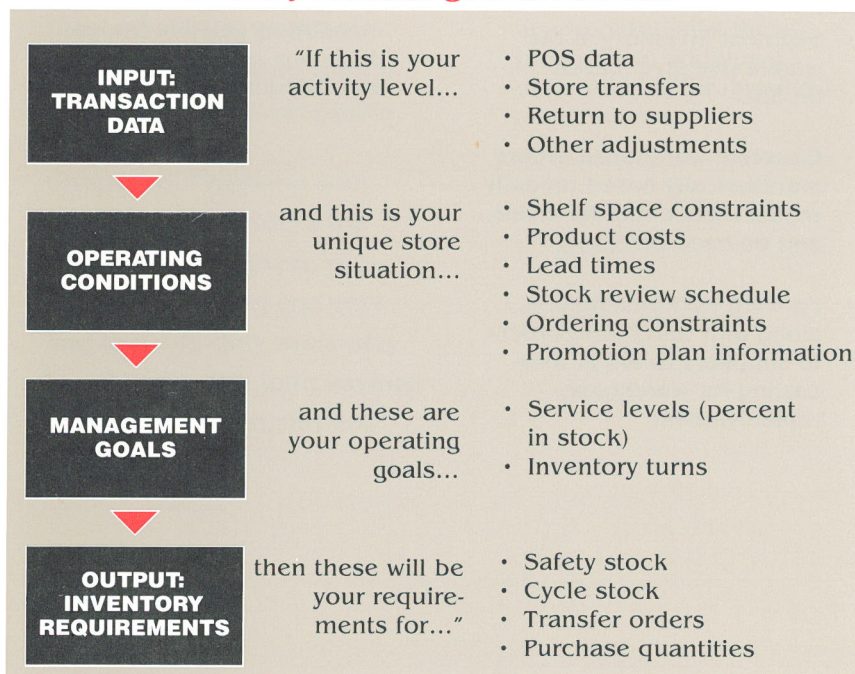
Stocking Levels

Older methods were limited by what someone could “keep in mind,” and so were based on visual inspection of shelves, rules of thumb for reorder points, and generalized inventory categories. Better quantification of decision-making procedures (e.g., using planograms to make cost/benefit tradeoffs for shelf space, three-week moving averages as forecasting tools, or warehouse lead times to set reorder points) has improved inventory management. Compared with currently available systems, however, these tools still have to generalize to a degree that prevents them from achieving further potential savings.

The new systems make it possible to “do the math” with much greater precision and accuracy, covering greater ranges of data. Some grocery distributors are currently using these systems to predict the next week’s sales at the beginning of the current week. Forecasts can be based on historical data and on comparison of recent forecasting trends against actual sales.

In addition, a number of systems are being designed as expert systems, which allow users to predict future sales using “what if” scenarios that incorporate such future parameters as promotions, related item activity, and likely competitor actions (see illustration for a “generic” model structure). On older systems, models were often run only once or twice a year, and parameters were changed only at those times. With newer models and systems, parameters can be changed and re-run daily, if necessary. Or weekly forecasts can be disaggregated into daily replenishment orders.

Inventory Forecasting Model Structure



POS Transaction Data

The use of POS information is critical for replenishment logistics. Although most retail food stores currently use scanners to speed up the check-out process, relatively few of them use this scanning information to drive replenishment ordering.

Many retail stores determine the next day's order by laboriously counting shelf stock. Clerks walk the floor each day to check each SKU and, if shelf stock is low, enter (or scan) the SKU and quantity into a hand-held computer. The data are then forwarded to the warehouse for replenishment.

Best-in-class distributors have replaced this manual method with automatic inventory management systems. Instead of continually recounting shelf stock, retail scanning systems simply and automatically count how much goes into stock (warehouse shipments or store receipts) and how much goes out (POS scans). With simple arithmetic – i.e., using POS information to deduct scanned items from the on-hand inventory file – retail management is able to replace clerical labor with a perpetual inventory system.

Reliance on this input/output calculation actually simplifies inventory management; and it tends to rationalize other procedures as well. For example, a perpetual inventory system will force distributors to address the issue of misplaced stock.

Inventory Segmentation

State-of-the-art inventory systems also allow distributors to make finer cuts when segmenting their inventory, allowing them to manage products on the basis of very specific demand patterns. Because of the limitations of older computer systems, similar types of products have been managed identically, even though they have very different demand patterns.

Segments can be based on the product's velocity or its variability. For example, a brand of cat food that comes in six flavors might be managed to achieve a single in-stock and service level, even though two of the flavors account for 80 percent of the sales. With systems capable of managing down to the SKU level, items can be segmented in

several classes based on sales. High-velocity items can be managed under high service levels, and low-velocity items under low service levels.

In the cat food example, the two high-velocity SKUs could be managed at a 99 percent service level, with the others at 96 percent. Overall service levels will stay constant or increase, while the required inventory decreases.

Another method of segmentation is by variability. By segmenting the more predictable from the more variable items, inventory managers can determine which SKUs can be automatically replenished and which should continue to be scrutinized by merchandisers. Soup, cereal, spices, and baby food have been mentioned as primary candidates for automatic replenishment, while items such as ethnic foods and snack foods often require more attention.

Making It Happen

To ensure that advanced inventory management systems and forecasting models make a strong contribution to corporate performance, management will have to set proper goals, educate staff, and take gradual steps for building replenishment practices into the organization at all levels. Some of the primary considerations are the following:

Management should base inventory goals and merchandising decisions on service levels for individual SKUs.

- Many merchandisers now work with conflicting, less-than-optimal goals, such as gross profit, store turns, or warehouse turns.
- Because service levels are directly correlated with product movement, they can rationalize subordinate goals and lower inventory levels.

Companies should develop or hire inventory management specialists to analyze and coordinate the logistics implications of merchandising decisions.

- Inventory management decisions are often made by personnel with merchandising expertise only, and buyers often mistrust the new systems because they do not understand how they work.
- Buyers should be trained to understand the systems so that replenishment priorities are recognized and accepted.

Grocery distributors can move toward full implementation of automatic replenishment in incremental steps. It is not an "all or nothing" decision.

- Systems should be tested and proven on carefully chosen items, probably the more predictable products.
- Where continuous replenishment relationships are possible, distributors should work with a small number of suppliers who are currently involved with similar logistics innovations.

Take steps toward building a perpetual inventory system by improving the accuracy and integrity of POS data.

- Aim to ensure that all merchandise is marked with scannable codes.
- Scan merchandise when it is shipped to stores (this can be done at the warehouse or the store).
- Upgrade cycle counting practices to maintain the integrity of the system.

The Role of Buyers

When distributors implement inventory management systems to drive replenishment logistics practices, the role of traditional buyers is likely to change. In some cases, traditional buyers have initially felt threatened because some of their functions were performed automatically by the system. But, in fact, with much of the routine work being automated, buyers will be freer to spend their time on functions that add value, such as:

- *Management by Exception:* spending time with the limited number of products and events that do not fit the normal rules
- *Key Trends Analysis:* immediately spotting variations in demand in order to take advantage of opportunities for promotions or pricing moves
- *Category Management:* looking for patterns and options within whole classes in order to balance tradeoffs among product alternatives
- *Supplier Relations:* keeping in touch with counterparts at other points in the supply chain – and so, keeping up to date with special programs and their narrow windows of opportunity

Retail Store vs. Warehouse Transaction Data

A key hurdle to implementing the new systems is the difficulty of obtaining accurate point-of-sale data. The costs of implementing retail store perpetual inventory systems can also be significant.

Many distributors have found that implementing scanner-based perpetual inventory systems at the warehouse level can be justified by quicker pay-backs, and distributors have developed hybrid inventory systems that use warehouse transactions to drive their replenishment planning systems. These hybrid systems support improved automated rebuying and lay the groundwork for subsequent development of total (store and warehouse) inventory management systems.

Perpetual inventory systems work best when based on POS data, but POS data are not always reliable. Because of the uncertainty of POS data, store-level forecasting can yield large errors. Many of the problems with data integrity stem from either coding or scanning procedures.

- The manual coding process in the industry often introduces errors.
- In addition, automated scanning is often inaccurate or incomplete because check-out clerks bypass the system by using the quantity keys or manual entry as shortcuts.
- Further errors are commonly introduced if the retailer's system is not UPC-driven, requiring that codes be manually cross-referenced to fit the wholesaler's or manufacturer's systems.
- Even when used, UPC codes may cover multiple packaging for a product (e.g., one code for both a can and a six-pack of soda).

Consequently, store training programs are essential to successful implementation of planning systems. In addition, successful distributors have developed comprehensive and universally employed procedures for aggregating the data to eliminate or reduce the effects of store-level inaccuracies. Finally, the industry is currently at work on several initiatives, under the leadership of the Uniform Code Council, to improve UPC coding accuracy (see Chapter 3).

Shared Information

The final issue concerns information that distributors share with suppliers. Leading-edge firms are providing suppliers with store sales and on-hand inventory information for the following reasons:

- POS information will ensure that the supplier is responding to actual sales, not projected sales (i.e., warehouse pulls).
- By having access to store on-hand inventories, suppliers can better forecast upcoming orders, even on days when no order is placed. When using only warehouse pulls, the supplier has no idea of store activity until store-level stock dips below the reorder point.
- Communications requirements are simplified because the same information goes to both the warehouse and the supplier.

Distributors' concerns about sharing proprietary information with suppliers are discussed further in Chapter 3.

Overview

Improve pipeline logistics cycle times by enhancing and fully exploiting order, product, and shipping communications systems with trading partners

Function and Purpose

One of the most effective ways of reducing cycle times is increasing pipeline coordination through order, product, and shipment systems that link suppliers, distributors, warehouses, and carriers. These systems most commonly take some form of electronic data interchange (EDI) – networking systems that link different locations – known in the grocery industry as UCS.

Use of basic EDI functions to exchange purchase orders and invoices with suppliers tends to be as extensive in the food industry as it is in other retail industries. But the industry's use of EDI's more advanced functions – e.g., POS transmittals and advanced shipping notices – is more limited than it is among other retailers (see chart on next page). The more advanced functions of EDI, however, will offer the greatest payoffs, and to achieve them, food distributors and suppliers should expand their use of EDI.

Key Concepts

Retailers who want to implement EDI capabilities should consider the following initiatives:

- Establish EDI links to transmit and receive EDI data directly
- Expand EDI to support replenishment logistics via such uses as advanced shipment notification, POS data, and carrier tracing functions
- Utilize third-party “value added networks” (VANs) unless volume warrants direct links
- Enhance internal systems to improve UPC code conversion
- Support industry initiatives to improve UPC database integrity

Many retailers have been slow to implement EDI because of current perceptions regarding three key issues. They believe that EDI offers limited paybacks; that there are no standardized data formats; and that EDI requires the sharing of proprietary or confidential data. None of these perceptions, however, survives a closer look at the realities and none presents a significant obstacle to implementation of communications systems.

Opportunities and Advantages

The two primary advantages of improved use of EDI are reduced administrative costs and improved management control. Administrative savings have not been achieved by many users because key features have not been implemented. For example, some suppliers admit to receiving purchase orders (POs) via EDI, printing out hard copies of the orders, and then entering the data into their system. The extra step increases lead times and errors.

The second major benefit – improved management control – will come from timely information on the status of product movement throughout the pipeline. With improved information flow, suppliers will be able to anticipate orders, distribution centers (DCs) will anticipate receipts, and stores will plan for deliveries.

How It Works

The volume of data communicated between distributors and suppliers to support continuous replenishment can be tremendous. To maximize the efficiency and speed of EDI systems, distributor and manufacturer systems should be set up to transmit and receive EDI data directly, from computer to computer and from program to program, without manual intervention.

Although communications systems will produce savings in administrative productivity, their greatest importance for replenishment logistics will come in the value of shared information that runs parallel to and guides logistics operations. Among the value-added transactions EDI makes possible are the following:

► *Inventory withdrawals.* Continuous replenishment systems will require EDI

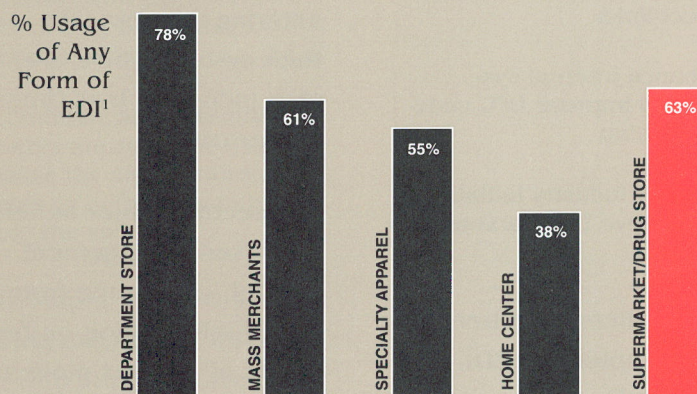
transmittal of either POS or warehouse withdrawal or POS information. Without this infrastructure support, potential benefits will be missed.

► *SCM.* Shipment container markings allow for increased receiving efficiency at the warehouse and store location.

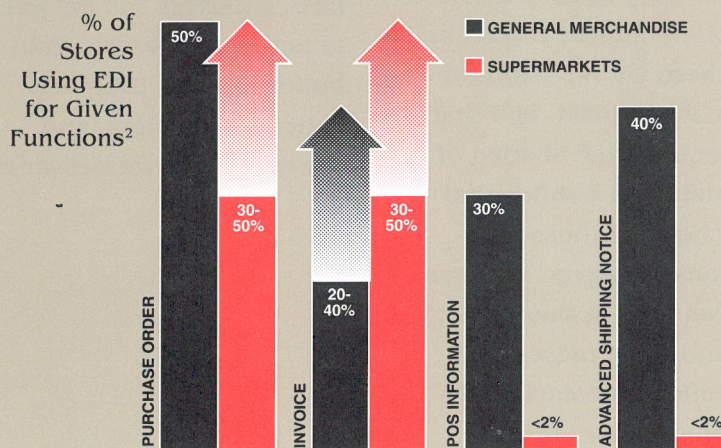
► *ASN.* Advanced shipping notification between vendor and retailer is crucial to reaping the benefits of a crossdocking operation. It also allows for work load planning, increasing utilization of warehouse labor.

► *EFT.* Electronic funds transfer can greatly reduce the cost of processing invoices. However, the reduction of the retail float caused by this improvement in payment cycle time has created an unforeseen barrier to EFT. To eliminate this roadblock, many suppliers have changed payment terms to allow retailers to maintain the float in exchange for the internal efficiency gains the supplier was achieving via EDI.

Supermarkets are among the leaders in the use of EDI...



...but they apply it to a relatively small number of functions



¹ Source: Garr Consulting Group, Inc., 1992 Chain Store Age Executive Survey.

² Source: EDI application vendor estimates. Arrows indicate range.

Implementation of a communications network that links programs and trading partners involves more than just installing hardware and software. These systems have the great benefit of rationalizing work procedures, but this also means that there will be significant impacts on roles and responsibilities within the organization. Establishing new procedures and managing their effects will require careful planning and leadership from the top of the organization. Food distributors should consider the following steps:

▶ *Develop a comprehensive work plan*

- Establish a core management team
- Identify responsibilities and tasks
- Estimate the cost and benefits of the plan

▶ *Educate management teams regarding trading partners and competitors*

- Benchmark operations against current best practices in the industry
- Learn what similar companies are doing to avoid "reinventing the wheel"
- Understand what potential trading partners are doing to ensure compatibility

▶ *Examine outside software packages and VANs before committing to in-house development*

▶ *Begin with a small pilot program*

- Choose one transaction set at first, probably purchase order and purchase order acknowledgment
- Choose one or two vendors, probably suppliers of basic, predictable goods with consistent replenishment requirements

▶ *Avoid making the pilot strictly an MIS project*

- Include merchandising, logistics, and store operations personnel
- Set team goals; give each department an opportunity to leverage the benefits of EDI

▶ *Measure results: clerical cost, errors, cycle time, order fill rates, in-stock percentages, turnover/sales of product*

Utilize VANs Unless Volume Warrants Direct Links

VANs are "value added networks" – communications systems and services provided by third parties. While EDI links between distributors and suppliers can be proprietary direct connections, the vast majority of connections (85 to 90 percent of general merchandise transactions) go through VANs such as Ordernet or GEIS. For distributors just entering the EDI world, these third-party networks make implementation much smoother.

For those heavily involved in EDI, however, direct connections with high-volume partners tend to be more cost-effective than third-party VANs. For example, some distributors involved in EDI report using direct links with those trading partners that account for the top 10 percent of their total data volume.

Why use VANs?

- Networks are already in place, so systems can be brought up faster and less expensively than by installing proprietary direct lines.
- The VAN is responsible for all technical issues.
- Users can communicate at different speeds, formats, and times of day.
- Supplier and distributor systems are never on-line, reducing security risks.
- VANs can offer such value-added services as activity logs, audit trails, industrywide E-mail, logistics databases ("ship-to's"), and edit checking.

Support Industry Initiatives for Improving UPC Database Integrity

As data are utilized across company boundaries, the accuracy of UPC codes becomes critical. Because UPC updating in the grocery industry today is often a manual operation, the process is not timely, and distributor and manufacturer systems often do not agree. Since an unreliable system can be worse than no system at all, the industry must take an active role in improving the integrity of its UPC codes. (This requirement will be assessed in greater detail in other industry studies currently under way – see Chapter 1.)

Consider Enhancing Internal Systems to Utilize UPC Codes

Because retailer systems are often not set up to utilize the UPC codes directly, cross-reference tables have been established, thereby introducing another source of error for retailers. To eliminate these costs, some distributors have reengineered their PO systems to utilize UPC, not internal SKU numbers. They found that it not only saves several days' lead time but also increases accuracy by eliminating the need for cross-referencing. Others have developed improved techniques for more frequent conversion updates.

EDI Implementation Checklist

- | | | |
|---|---|--|
| 1. Obtain commitment from key management | 11. Review data contained in the documents to be exchanged | 19. Implement the translation software |
| 2. Educate managers | 12. Determine what optional product information will be employed | 20. Implement the network connection |
| 3. Establish a plan | 13. Determine what partnership identification scheme will be used | 21. Conduct system test with translation and network |
| 4. Establish project team and define each person's responsibility | 14. Develop an overall design | 22. Conduct system test with trading partner |
| 5. Designate EDI business contacts | 15. Code and test the interface to in-house system(s) | 23. Decide on production cutover date |
| 6. Designate EDI technical contacts | 16. Decide on translation software configuration | 24. Implement full EDI operation |
| 7. Review internal systems and business procedures | 17. Decide on a network provider | 25. Reevaluate checklist for future implementations |
| 8. Secure the appropriate reference materials | 18. Finalize any optional services that you may wish to use from network provider | 26. Review legal requirements |
| 9. Conduct a trading partner survey | | |
| 10. Conduct a communications equipment survey | | |

Source: P. R. Johnson & Associates.

Issues to Consider

Sharing Proprietary or Confidential Data

The success of replenishment logistics operations depends to a large degree on the sharing of demand data. Distributors, however, are sometimes reluctant to share these data for either or both of the following reasons:

- They are concerned that sharing data on inventory movements will compromise their ability to control market share data provided to market research companies.
- They are concerned that the data they provide through communications networks will be misused or fall into the hands of competitors.

These are reasonable concerns; but in the first case, it is important not to confuse market share information with the data required for full implementation of replenishment logistics. The two sets of data are based on the same sales activity, but there is no need to provide suppliers with competitive information (e.g., market share).

Reluctance based on concerns about confidentiality is also a serious issue. The experience of companies that have implemented communications systems has shown that, with careful planning and procedures, these obstacles can be overcome without much difficulty.

- Distributors should ensure that VANs and direct links have adequate security precautions (for example, limited access by personnel, passwords, encrypting programs).
- Data-sharing agreements should explicitly prohibit suppliers from reselling or re-using shared data.

Success will ultimately depend on the ability of distributors and suppliers to commit to fully confidential business agreements that can only be confirmed by experience.

Standardized Data Formats

Standardized formats – defining what information items are included and how they are coded – allow for the seamless translation of logistics information from one database and company to another. The most common reason given by distributors and suppliers for their cautious move into EDI

is the perceived lack of standard formats for exchanging data. However, the two major standards now available are converging, and conversions are easily managed, so there are no significant obstacles to exchanging data in the industry today.

There are currently two major formats:

- VICS, a subset of ANSI X.12, the general merchandise standard
- UCS, the grocery standard developed before ANSI X.12 by the Uniform Code Council

While UCS developed the first PO and invoice formats, VICS pushed further in developing formats for additional transactions. The UCS formats are now being converted to the ANSI X.12 standards. The most common UCS transactions supporting replenishment logistics have been converted. As UCS becomes completely compatible with ANSI X.12, food distributors should move to take advantage of the new transactions.

Cost Limitations

Many manufacturers resist converting to EDI because of reluctance to invest in hardware and software. Expenditures are required to implement EDI, but they have come down over the past several years. One large consumer products manufacturer required only three additional people and \$16,000 to supplement its MIS department to support an EDI environment. While this example is exceptional, distributors and suppliers should recognize that a wide variety of affordable software is available to support EDI.

Overview

Improve the coordination and scheduling of product movements through distribution centers to stores to shorten replenishment cycles and reduce handling costs

Function and Purpose

Replenishment logistics programs force companies to focus on the efficiency of product flows from supplier to retail store. A key factor in the ability to manage these flows is the distributor's skill at scheduling delivery, processing, and receiving at warehouses and stores.

- At the warehouse, accurate, reliable scheduling can help smooth the peaks and valleys in work requirements, greatly reducing operating costs.
- At the store, better informed scheduling enables retailers to match delivery with store requirements, making sure that needed product arrives in time to maintain in-stock levels during peak demand periods.

More often than not, in the past deliveries have been made on a first-come, first-served basis.

Furthermore, it has often been the case that within one retail chain, buyers, distribution center managers, backhaul managers, and store managers each

have had different reasons for wanting a particular shipment delivered and received on different days.

Today, with the availability of advanced communications and accurate replenishment information, scheduling can be more dynamic and respond to immediate merchandising needs.

Because of their emphasis on coordination and communication within the pipeline, replenishment logistics programs will increase management's opportunities for optimizing and balancing these needs.

Key Concepts

To overcome the inefficiencies of traditional scheduling practices, retailers should:

- Develop a centralized scheduling function within the company
- Consider automation of appointment scheduling
- Explore options for expanding the delivery week to six or seven days
- Explore options for alternative delivery hours to serve peak periods of demand
- Develop incentives to encourage new behavior patterns that match scheduling objectives

Opportunities and Advantages

Improved scheduling for delivery, processing, and receiving offers food distributors the following advantages:

- Facilitates flow-through warehousing by eliminating the current "first come, first served" method of warehouse scheduling
- Significantly reduces the labor costs associated with the alternating peaks and valleys of warehouse and store receiving
- Provides buyers with complete preshipment information, eliminating days from the time required to respond to incomplete shipments
- Improves store in-stock levels by scheduling store receipts to allow time for both receiving and complete shelving of merchandise before customers arrive

How It Works

Inbound Transportation

The traditional method of scheduling in-bound freight has a number of drawbacks (see illustration):

- Shipments are received on a first-come, first-served basis, not according to inventory requirements and store priorities.
- Receiving schedules may not be based upon warehouse capacities or reflect needs to schedule labor, plan for crossdocking, preprint labels, etc.
- Buyers are able to respond to incomplete orders only after product has been received.

To overcome these drawbacks, distributors should consider utilizing a central scheduling department to handle inbound loads for their warehouses (see illustration on next page).

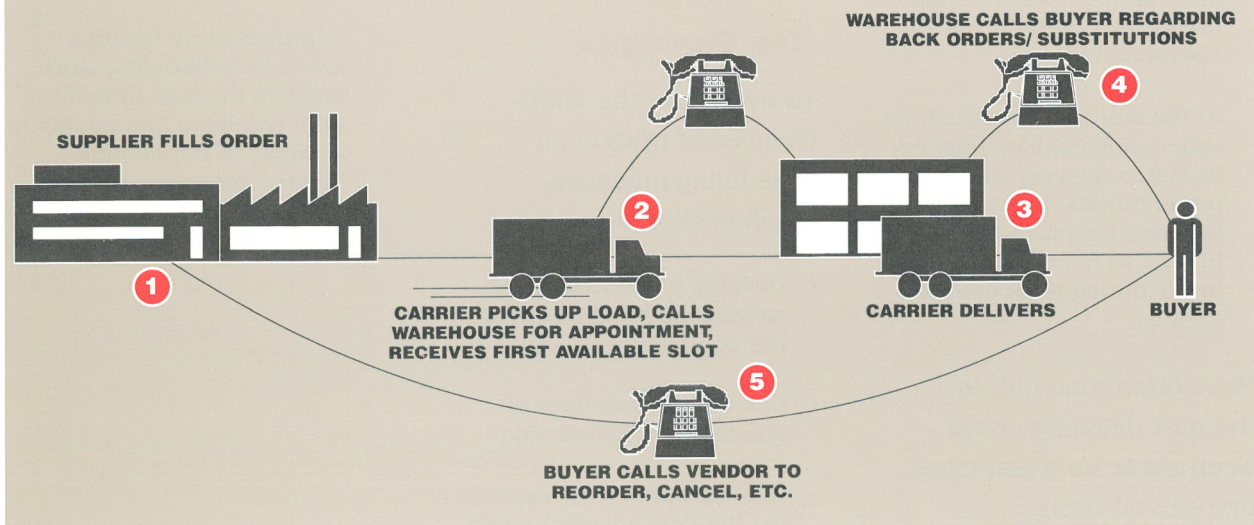
Centralized scheduling avoids the inefficiencies of having individual buyers set delivery dates without knowing warehouse capacities or being aware of the actions of other buyers. Instead, the scheduler acts as a clearinghouse to collect all the shipment information and then coordinate deliveries to serve company objectives. The centralized scheduling function:

- Maintains contact with buyers to ensure that receipts will be based on store requirements and to notify buyers at the time of appointment of any incomplete orders
- Maintains contact with warehouses to ensure that receipts are based on the availability of capacity and labor and to inform them of all incoming goods
- Allows for greater ability to track vendor/carrier compliance by company, instead of just by warehouse

Store Delivery

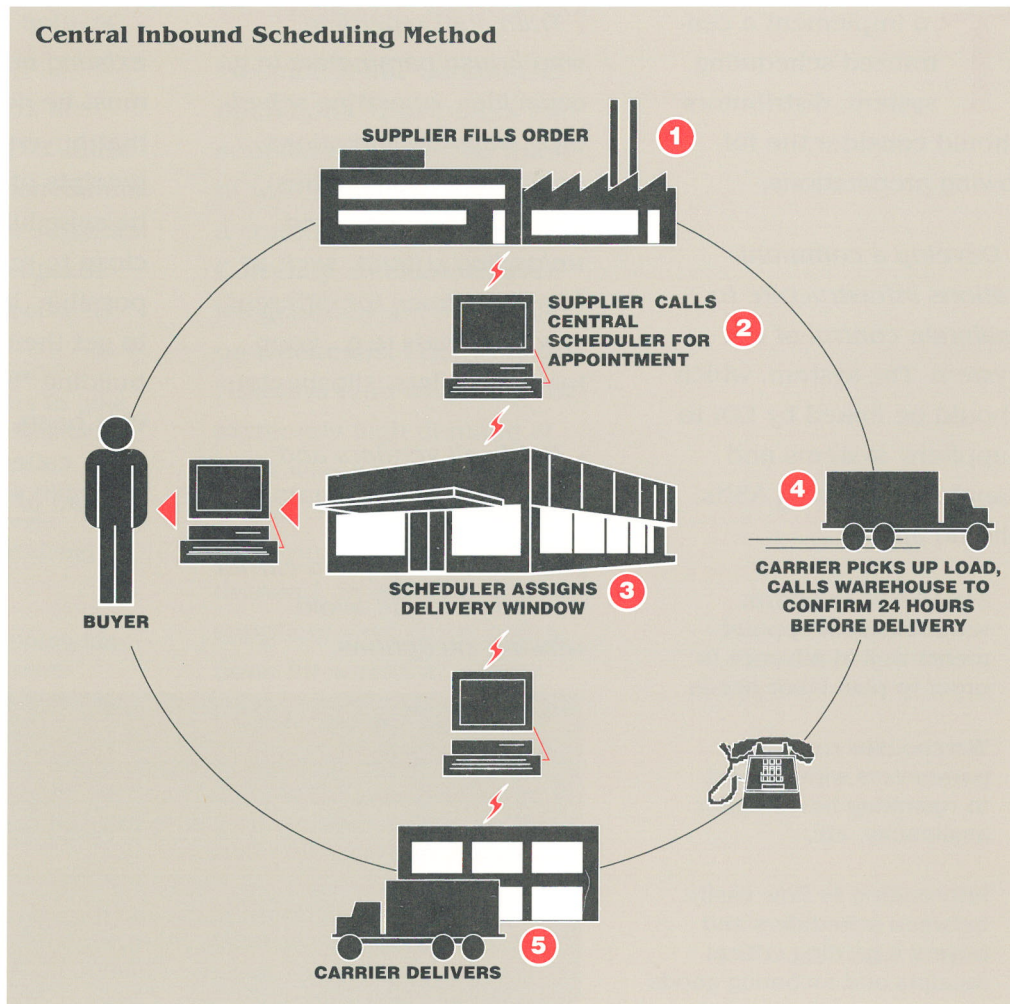
The primary goal of scheduling outbound shipments should be to ensure that the goods arrive at the store early enough to be received

Traditional Inbound Scheduling Method



and stocked before the hours of heavy consumer demand. One method currently being followed is to change warehouse operating hours to fit store receiving requirements.

Under traditional warehouse working schedules, with receiving during the day and shipping at night, product usually arrives at the stores between 5:00 and 8:00 a.m., often too late to be easily stocked on the shelves. With receiving in the early morning and shipping in the late afternoon and early evening, the warehouses are now capable of delivering product to the stores between 1:00 and 4:00 a.m., leaving plenty of time to restock shelves. As weekends become increasingly important to total sales, distributors are expanding their schedules to include deliveries to stores six or seven days a week.



Other companies have developed several store delivery options, from which each store may choose according to its individual needs. While it can be costly to allow stores this flexibility, one mass merchant has determined that this cost is outweighed by the ability to match receiving with demand more accurately. This retailer's store delivery options include:

- Daily delivery
- Twice-weekly delivery, whereby a trailer is dropped for two days at the back door
- Night delivery (50 percent of the retailer's stores elect this option)
- Accelerated delivery – late-in-day or next-day delivery for stores located close to DCs

Making It Happen

To implement a centralized scheduling system, distributors should consider the following preparations:

- ▶ *Develop a communications infrastructure to maintain control of the system.* The system, which should be linked by EDI to suppliers' systems and capable of utilizing ASNs, should allow:
 - Schedulers to inform warehouses of appointments well in advance in order to plan labor needs
 - Warehouses to change parameters with respect to operating hours, labor availability, etc.
 - Information to flow easily between schedulers and buyers regarding critical receipts and incoming goods
- ▶ *Consider utilizing an "expert system" to aid in assigning appointments.* With such systems, the scheduler just enters the PO or ASN number, and the system suggests the time, door, and delivery window.

▶ *Train staff regarding warehouse parameters (e.g., capacities, operating schedules, physical limitations, equipment availabilities), product attributes, and unloading criteria, such as handling times for different types of loads (e.g., floor-loaded, pallets, slipsheets).*

▶ *Notify all vendors and carriers of new programs.*

▶ *Monitor vendor and carrier compliance and avoid making exceptions.*

▶ *Develop incentives to alter existing behavior.* Incentives must be devised to ensure that buyers are allowing receipts of their orders to be scheduled to arrive as close to replenishment as possible, instead of rushing to get their goods inside the building "before someone else beats me to it" (this has been called "just in case" instead of "just in time").

"Effort and Commitment"

One distributor interviewed for this report, who has already altered his warehouse hours, says that supporting store requirements depends on just "effort and commitment." He cited two major hurdles:

- Convincing warehouse managers to work the late-night/early-morning shift. (While the transition was difficult, all of this distributor's managers eventually decided to accept the new schedule.)
- Negotiating with carriers to make off-hour deliveries. (For this distributor, the problem was minor because a few high-quality carriers offered to meet the service requirements.)

Buyer Responsibilities

Some retailers are attempting to utilize buyers as schedulers. Recent experience suggests, however, that this option has significant drawbacks:

- It requires frequently overworked buyers to take on added responsibilities.
- Buyers need to be trained regarding warehouse capacities and receiving abilities.
- With each buyer doing his own scheduling, warehouses and suppliers may become very confused about whom to contact.

Continuous Deliveries

To smooth out warehouse operations, distributors and suppliers will need to think of warehouse deliveries as a continuous operation. Currently, because deliveries generally are not made on weekends, Fridays and Mondays tend to be days of extremely high demand at retail warehouses, as retailers stockup for and replenish from weekend consumer demand. In addition, some suppliers shut down operations for weeks at a time, forcing distributors to build large stocks to carry through the period.

Some major suppliers have already responded positively to requests for weekend deliveries and others are investigating the possibilities. In the future, distributors may be called on to deliver to each store several times per day – as is common in the United Kingdom – to support flow-through operations at stores.

Other Benefits

Inbound Transportation

Significant benefits can be captured by installing an inbound scheduling system that prioritizes delivery, receiving, and processing on the basis of retail store inventory requirements. Among them are:

▶ Reduced labor and other costs of case handling

- Scheduling receipts to better match labor availability with warehouse capacity will reduce idle work hours, early releases, layoffs, and overtime.
- As shown in Chapter 5 of this report ("Crossdocking"), predistributed products can save approximately 50 to 66 percent of handling charges over regularly handled products.
- This can only be accomplished if inbound receipts are scheduled to match essential outbound requirements, while nonessential shipments are held until needed.

▶ Reduced cycle time for some products

- If buyers are supplied with preshipment notifications, they can make decisions to backorder, replace, substitute, or otherwise resolve incomplete or erroneous orders at the time of shipment, instead of at the time of receipt.
- This can save four to eight days of reaction time for the buyer.

▶ Improved warehouse in-stock positions

- It is not uncommon for warehouses to receive goods that they currently have in stock, while out-of-stock replenishments are left waiting five days for an appointment.
- Prioritizing receipts to match store needs can greatly increase in-stock positions.

Store Delivery

The primary benefit of improved store delivery scheduling will be higher in-stock percentages. Many retailers believe that their in-stock levels are high enough to make this a minor issue, but their confidence may be misleading for two reasons:

▶ Inaccurate in-stock measurements

- Some retailers include backroom and unstacked product in their in-stock counts; others measure their inventory at off-peak times when customer activity is lowest. Improved outbound delivery scheduling will help ensure that the product is on the shelf during peak periods of demand.

▶ Product category differences

- While overall in-stock levels may be good, in-stock levels for perishables and frozen foods have been known to be significantly lower. Sales for these other items can be significantly improved when improved scheduling focuses on raising their in-stock levels.

Overview

Reduce pipeline cycle time, inventories, total system handling costs, and product damage by implementing crossdocking practices at distribution centers

Function and Purpose

In the simplest terms, crossdocking covers any method for processing shipments that avoids putting the product into storage before sending it on to retail stores. Instead, the distributor simply moves it from the receiving dock to the shipping dock or holds it in a temporary staging area. Crossdocking methods range from the "high tech" (using barcoded scanner information and automated conveyers) to the "low tech" (using innovative product placement techniques). High-tech support for crossdocking requires significant investment, but low-tech versions can also be effective. In either case, the best applications of crossdocking work by eliminating redundant activities rather than by transferring costs between distributors and suppliers.

Key Concepts

Crossdocking capabilities require a considerable amount of knowledge and planning. Distribution center personnel need to know when the product will arrive, where it will be going, and when it will be shipped to its destination.

- Allocate product to specific stores before it arrives at distribution centers or shortly after
- Prepare and code packaging and container markings
- Automate material handling

Opportunities and Advantages

Implementation of cross-docking practices at distribution centers can reduce inventory carrying costs and decrease warehouse labor costs. Suppliers and distributors can work together to eliminate redundant handling or order preparation activities. Additional savings can be achieved through:

- Reduced product handling and storage time (for put-away and replenishment moves), which means reduced labor costs, damage, shrink, out-of-code, and returns
- Reduced storage and processing space requirements

How It Works

There are several versions of crossdocking; the differences depend primarily on when a determination of store destinations can be made.

- If store-specific allocations can be made before the supplier ships the product, then the product can be marked to flow through the warehouse without waiting to be redirected.
- If the allocation can be made when the product arrives at the warehouse, labels can be applied that allow automated handling systems to distribute the product to outbound loads.
- If neither advanced distribution information nor automated handling is available, crossdocking can be accomplished by using staging areas near shipping docks.

This range of possibilities can be illustrated in detail by complex, intermediate, and simple examples, as described in the following sections.

Complex Crossdocking

Complex crossdocking is possible if product can be "predistributed" (see insert below) before the supplier ships it and the supplier is capable of building store-specific, multi-SKU pallets. Generally speaking, these conditions are met in the grocery business only for promotions, when precise timing is most important. And because it does not require automatic material handling systems at the DC,

this method of crossdocking is the most common. A complete version of complex crossdocking would take the following steps:

- The purchase order is forwarded to the supplier, along with individual instructions for distributing product for each store.
- The supplier consolidates all products (involving multiple SKUs) for a given store into the same case or pallet.
- The supplier labels cases with a barcode representing the store number and the pallet with a master barcode representing all product on that given pallet.
- The supplier ships product to arrive at the retailer's DC on the same day that the indicated store is to be replenished.
- At the DC, the retailer scans inbound cases, verifies shipments against a receiving invoice, and then transfers cartons immediately to the shipping dock.
- All cases for a given store are loaded on the outbound trailer or consolidated on the dock and then loaded when sufficient volume has built up.
- Cases are shipped to the store and spot-checked by store personnel, who compare the license plates to the actual contents of the cases or pallets.

What's Involved in Crossdocking?

- *Predistribution:* Can the retailer determine product allocation for specific stores either before the supplier ships or before the shipment arrives at the retail warehouse?
- *Supplier preparation:* Is the supplier willing or able to perform services to support flow-through operations (e.g., multi-SKU palletizing, or packaging and container marking)?
- *Automated material handling:* What type of conveyor and sortation system is available at the DC?

| Factor | Complex | Intermediate | Simple |
|---|--------------|--------------|--------|
| Store Distribution with Purchase Order | yes | no | no |
| Supplier Packing & Labeling Assistance | yes | no | no |
| Store Distribution with Warehouse Receiving | — | yes | no |
| Automated Material Handling | not required | yes | no |

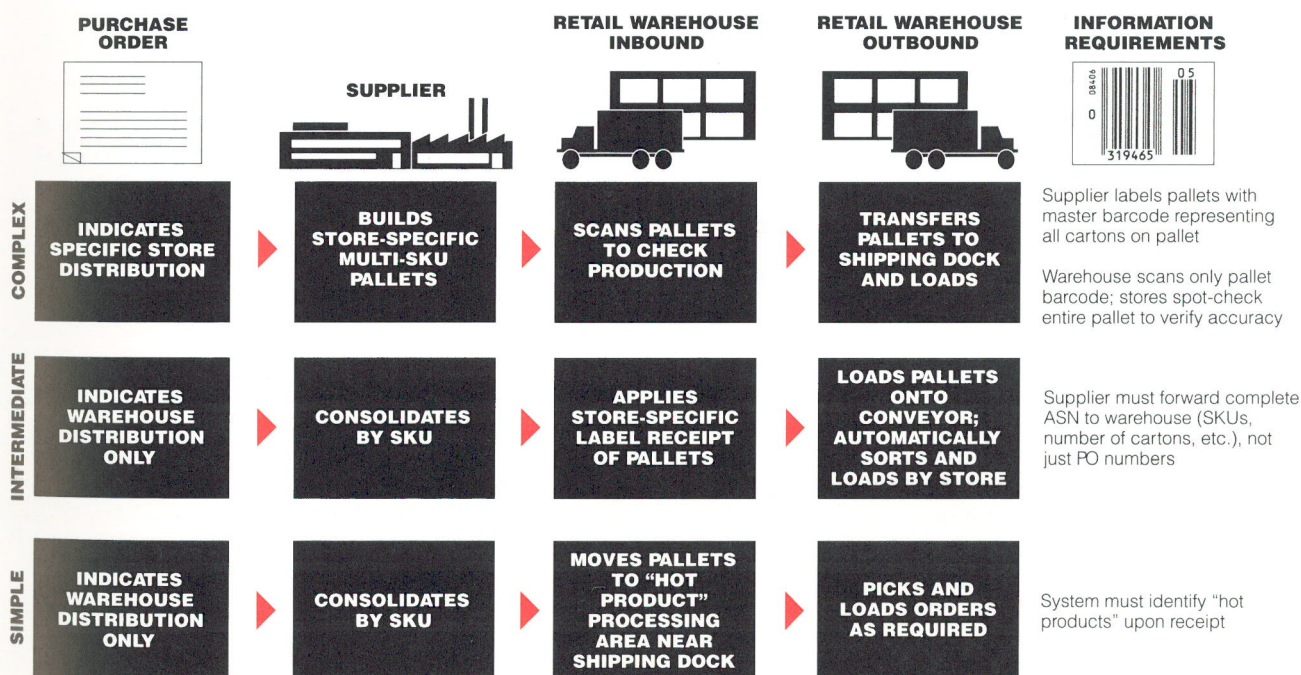
Intermediate Crossdocking

If the retail warehouse is equipped with an automatic material handling system, the supplier will not need to segregate by store because the sortation system can accomplish that task. In addition, since labels can be applied on receipt at the warehouse, predistribution does not have to be performed until the shipment arrives at the warehouse. In these cases, the following steps apply.

- The supplier receives purchase orders that indicate only DC requirements.
- The supplier consolidates all products by SKU only.
- The supplier notifies the retailer, before the shipment arrives, of the exact contents of the shipment (SKUs, number of cases, etc. – not just PO numbers).
- If product is allocated at the time of the order, the supplier applies labels to the cases; if it is allocated at the time of receipt, the distributor does it.
- Cases are loaded on conveyors, sorted by store, and transferred to the outbound truck.

Simple Crossdocking

The simplest method of crossdocking requires no predistribution, no assistance from the vendor, and only the knowledge that the product will be shipped within a day or two. In this process, goods are received and transferred immediately to a “hot order processing” area on or near the shipping dock. By picking the high-volume items on the shipping dock, product storage, replenishment moves, and the order picker’s travel time can all be greatly reduced.



Making It Happen

Converting a traditional warehouse operation to a crossdock distribution operation requires significant internal changes. For optimal implementation, distributors should consider the following:

- Establish communication links, preferably EDI, to facilitate predistribution and ASN information.
- Decide upon barcoding and Standard Case Marking formats.
- Standardize store delivery schedules so that inbound shipments can be scheduled to match outbound shipments. Core carriers must be chosen and rewarded on the basis of their ability to meet the strict standards required by crossdocking. They must also be involved in all team meetings involving scheduling decisions.
- Update the warehouse system to accept advanced shipping notices, which allow for automatic check-in of inbound receipts without manual tracking of cases. This will also require receipt scanning, which many warehouses have yet to implement. This capability can have a significant effect on inventory turns. Research indicates that the average number of turns for chains that do not scan products at warehouses is 2.68, while the average for those that do is 3.50.
- If multiple stops per trailer will be required, set up a store laydown area so that store orders can be held until they can be loaded in proper order to suit the delivery route.

Distributor/Supplier Tradeoffs

To ensure that crossdocking operations produce the greatest possible benefits, distributors should work closely with their suppliers and cooperate in making certain crucial decisions.

For example:

► Case-labeling responsibilities

- If the distributor possesses an automatic sortation system, the supplier probably should do the labeling, so inbound loads can simply be placed on conveyors.
- If sortation is manual, distributors should produce labels and apply them as product is sorted (in store order).

► Packaging formats

- What is the biggest/heaviest carton size acceptable? This will depend upon material handling equipment, stacking methods, etc.

- Where should the labels be placed on the box? This will depend on whether the retailer is using fixed-head scanners (overhead vs. side) or portable handgun scanners.

► SKU aggregation (i.e., which items should be packaged together)

- To minimize store replenishment labor, try to package together SKUs that will be physically close in the store.
- If the supplier's distribution capabilities are inefficient compared to the distributor's, predistribution may be not be attractive (i.e., it may be too costly).

Sharing Costs and Benefits

The most efficient forms of crossdocking generally require order selection by the supplier, which may add to the supplier's labor costs. For the operation to win the supplier's complete support, it is essential to ensure that crossdocking does not merely transfer these costs to the supplier. Consequently, crossdocking will be feasible only in situations where the overall pipeline benefits outweigh the added supplier costs.

It is essential to monitor and measure total pipeline benefits, preferably through a version of Direct Product Costing, and to allocate benefits fairly.

Multi-Supplier Consolidation Warehouses

Another variation of crossdocking has been achieved through the multi-supplier approach. In this system, distributors operating several warehouses can be served by a centralized safety-stock DC run by a third-party specialist. In this system:

- The distributor contracts a third party to operate a consolidation warehouse.
- The third party works with a number of small suppliers currently utilizing public or other third-party warehouses to transfer storage of their products to its warehouse.
- The retailer reduces inventory of these items within its own warehouses to two to three days' worth of product.
- The retailer replenishes stores with warehouse stock and replenishes warehouse stock daily (or every other day) with full trailerloads made up of any combination of small supplier goods from the third-party warehouse.

The centralized safety stock version of crossdocking is

one of the most promising options. It requires no additional material handling or added labor for the supplier, while providing significant benefits to both distributor and supplier. It is also possible for several distributors to use third-party warehouses, in combination with existing distribution programs, for slow-mover crossdocking.

Other Benefits

Labor Savings

In addition to the savings in inventory and inventory carrying costs that will result from reducing cycle times, crossdocking will also result in lower labor costs at DCs because of reduced handling.

The amount of labor savings from crossdocking will depend on four factors:

- Are inbound loads sorted by product or by store?
- Can inbound loads be moved directly to shipping?
- Does the warehouse ship in waves, or is there a shipping door for each store?
- Are there conveyors or automatic sortation systems in the warehouse?

If the putaway and picking functions can be eliminated, there is a potential savings of between 50 and 66 percent for variable labor. Even if opportunities for inbound/outbound coordination are limited and DCs still must use store-specific storage locations, significant labor benefits can still be achieved.

Establish cooperative working relationships between suppliers and distributors to ensure full implementation of pipeline cost reduction programs; develop supplier capabilities for meeting the objectives of replenishment logistics programs

This chapter focuses on the processes and functions performed by suppliers to ensure smooth, reliable, and accurate replenishment for distributors and ultimately for the consumer. It argues that grocery distributors will need to work with their suppliers to realize the full benefits of replenishment logistics programs.

In addition, suppliers will be able to reap many of the same benefits the distributors will enjoy by streamlining the linkages back to their own suppliers.

Making It Happen

Implementation of replenishment logistics programs may require significant adjustments on the part of suppliers as well as distributors. These adjustments will not happen overnight, and some may require substantial investments. Consequently, distributors should remember that suppliers may be as hesitant and cautious as they are. Some of the most important issues the partners will need to address are discussed in this section.

Management, Leadership, and Organization

Logistics functions in many companies are still performed in sharply distinguished departments, without much integration of operations (see "Recent Trends in Logistics Strategies," page 4). Replenishment logistics, however, will require greater communication between functions, and is likely to lead to new organization structures based on flow-through processes rather than discrete stages. The new organizations will consolidate responsibilities for transportation, DC management, customer service, inventory management, and management of distributor replenishment logistics programs.

To ensure that everyone in the supply chain is going by the same "playbook," internal teamwork will have to be matched by "team-like" relationships between functional counterparts across the pipeline. Suppliers and distributors must establish cross-functional leadership in forecasting, inventory planning, replenishment, predistribution, and freight control. Sales managers must be key players in the process, but not necessarily the leaders of the effort.

With the greater cooperation and interdependence of functions, there is a need for strong centralized oversight of the entire process. Top-level managers are the only ones empowered to evaluate and make cost/benefit tradeoffs.

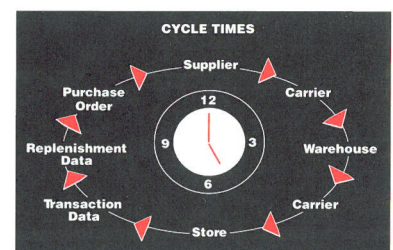
Operations

In a replenishment logistics environment, the strategic orientation shifts from supplier push to retailer pull. However, suppliers will be more intensively involved in physical distribution operations, taking on more tasks and responsibilities.

Furthermore, the coordination required for smooth flow-through distribution has to begin where the movement originates.

Distributors will be spending more time managing demand than managing supply. They will be analyzing sales data and trends in consumption; forecasting demand; managing product categories; and dealing with exceptions, promotions, and merchandising and marketing initiatives. They will rely on suppliers to manage supply on the basis of the data they provide.

Replenishment logistics may also require significant reengineering of the supplier's internal operations. To reduce cycle time, suppliers may now be required to produce smaller lots, perform quick production changeovers, ship product more often, improve material handling layouts and processing, and automate systems.



New tasks may be required to support flow through to distributor. For example, when one major apparel manufacturer implemented replenishment logistics methods with its retailers, its number of cases handled per month increased by 40 percent. As a result, the supplier redesigned its warehouse to accommodate additional conveyors, automatic scales, and barcode scanning, while keeping headcount increases to a minimum.

Goals and Expectations

Successful implementation of replenishment logistics practices and "never out" supply systems will depend to a large degree on management's ability to set rigorous but realistic goals. Experienced suppliers advise that new programs should start with a limited scope and set of objectives in an area where risks are low and probabilities of success are high. The learning experience can then be extended to other areas. Furthermore, objectives should be set cooperatively between suppliers, distributors, and carriers.

**ORDER FILL/
IN-STOCK
TRACKING**

| Product | Order Fill Rate | In-Stock |
|---------|-----------------|----------|
| SKU0126 | 92% | 96.5% |
| SKU0127 | 96% | 98% |
| SKU0128 | 90% | 94% |
| SKU0129 | 85% | 90% |
| SKU0130 | 72% | 89% |
| SKU0131 | 99% | 88% |

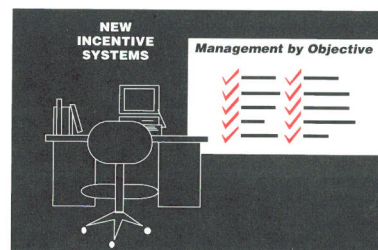
Other goals, such as overall reduction of cycle times, will depend on suppliers establishing sets of specific objectives that should be developed in cooperation with retailers and transportation carriers; for example, two-week supply, 95 percent fill rate, 24-hour response time to order, or 40 percent lead time reduction. Finally, management should set "stretch goals." For example, to follow the lead of successful JIT manufacturers, they should aim to achieve goals of 100 percent complete-order shipments and 100 percent on-time delivery or pickup.

Incentives and Performance Measures

Changes in the company's goals and objectives should be accompanied by changes in incentives and performance measurements. Incentives should encourage behavior that supports replenishment logistics by emphasizing sales to consumers and total costs required to achieve these sales. For example, current

pickup allowances or backhaul programs may not accurately reflect true transportation costs. Instead, negotiations should aim to transfer control to the side that can truly transport the product from the supplier to the retailer more cost effectively.

Suppliers and retailers who have recently implemented continuous replenishment programs report that performance measures keyed to old practices hold up progress by failing to motivate implementation. For example, a supplier and distributor involved in one program experienced initial distrust until they undertook a joint process-mapping exercise and each realized that the partner's unhelpful behavior was a result of financial incentives that encouraged the old, not the new, behaviors. The incentives were changed.



Issues to Consider

Relying on Advanced Shipment Notification

If the distribution network is to implement replenishment logistics procedures, suppliers will have to respond to orders with complete shipments or immediate feedback on order status; perform predistribution tasks usually done at DCs and warehouses (picking, packing, labeling, etc.); and provide advanced shipment notifications to the retailer as soon as shipments are dispatched.

ASNs are essential for preparing warehouses and stores for receipts and for allowing merchants to react to backorders. With ASNs, receiving can be scheduled accurately; space and equipment can be allocated as needed; labels, if required, can be preprinted. Merchants can react to backorders before receipt, which may amount to a time advantage of up to two weeks.

Optimizing Use of Transaction Data

In Chapter 1, we referred to the Efficient Consumer Response and Horizon Scan projects, which are moving the industry toward improved sharing of consumer sales (POS) data with suppliers and contributing to the development of replenishment logistics practices.

To maximize benefits in the short term (until POS data are available and accurate), distributors and suppliers must work together to decide what use of POS/warehouse data best suits their specific relationship. Two contrasting examples:

► *One major supplier "makes to stock" on the basis of aggregated regional monthly warehouse inventory and uses the information to establish general forecasts for planning production only. This method works for:*

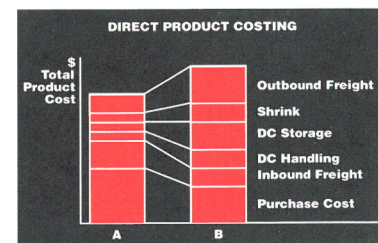
- *Suppliers who are set up to maintain inventories rather than meet demand*
- *Promoted items, because promotions can create large and sudden runs on supply*

But there is no direct coordination of supply and demand. Shipments are not made until a PO is received.

► *Another food manufacturer aggregates daily warehouse depletion data and replenishes as necessary to maintain the retailer's standards of a four-week supply and a 95 percent fill rate.*

- *The supplier uses retail sales information to determine shipment quantities.*

- *The method removes one link in the information pipeline, thereby removing potential for errors and improving cycle time.*



Sharing vs. Transferring Costs

When the supplier simply replenishes inventory on the basis of POs, the distributor retains both the control and the cost of "rebuying." When the supplier replenishes on the basis of direct sales information, the distributor transfers some of the control and the cost of rebuying to the supplier because the supplier is taking on more responsibilities for managing inventory, while the distributor manages demand. For this reason, it is crucial to the partnership that the distributor and supplier negotiate a fair distribution of the costs and benefits of these arrangements, understanding that the overall improved efficiencies will ultimately benefit both.

This report has provided an executive-level overview of major new developments in logistics practices in the retail food industry. We have called these developments "replenishment logistics" and have identified four major new directions that cover changes to processes, systems, organizations, and management controls (see table).

Our research indicates that:

- Grocery distributors are currently implementing

replenishment logistics programs and successfully achieving benefits from them.

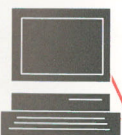

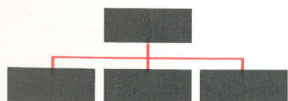

- These programs will continue to spread as distributors seek efficiencies to take the costs out of the system.
- Suppliers play a critical role in successful replenishment logistics programs.
- Many distributors are implementing replenishment logistics methods while retaining the best features of their current logistics systems.
- Replenishment logistics is not an "all or nothing" proposition: distributors

can implement programs that fit their operations on a "pay-as-you-go" basis.

Which programs should a distributor pursue? The answer will depend on four key factors:

- What degree of change is required by the specific program?
- What are the potential benefits each program can create (e.g., cost reduction, cash flow improvement, sales increase)?
- How and to what degree are certain programs interdependent?

Four Directions for Replenishment Logistics

| Direction | Objective | Key Programs |
|--|--|--|
|  Continuous Replenishment Inventory Systems | Bring supply more in line with the rhythm of demand | Automated systems that enable distributors to stock and reorder goods based on actual consumer sales (i.e., point-of-sale transactions) |
|  Flow-Through Distribution Systems | Take every bit of wasted space, handling activities, time, and therefore costs out of the process | New methods that increase the speed of product flow by reducing inventory and relying on timely, coordinated, and dependable transportation and material handling |
|  Pipeline Logistics Organizations | Institutionalize key product flow processes, cultivate "total pipeline view," and coordinate operations | New roles and responsibilities that remove barriers to communication, rationalize accountability, encourage coordination, and provide incentives for aggressive management of the logistics pipeline |
|  Pipeline Performance Measures | Establish objective tools for improving management control of processes and motivating appropriate decision making ("you can't manage what you can't measure") | Precise criteria, accurate decision rules, and consistent procedures that support management objectives and take into account total pipeline performance |

Worksheet for Evaluating 19 Replenishment Logistics Programs

| Programs | Change Gap | Benefits | Dependencies | Investment Requirements | Overall Priority |
|--|--------------------------|--------------------------|--------------------------|--------------------------------|--------------------------|
| <i>Continuous Replenishment Inventory Systems</i> | | | | | |
| 1. Never-out supplier order and delivery systems | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Order, product, and shipment communications systems | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Inventory management tools and forecasting models | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Daily SKU-based retail scanner transaction data | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <i>Flow-Through Distribution Systems</i> | | | | | |
| 5. New pallets and pallet management practices | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Store-ready packaging and conveyance | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Increased control of inbound transportation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Crossdocking | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Improved scheduling | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Warehouse automation and scanning | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Third-party logistics | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Store receiving capabilities | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <i>Pipeline Logistics Organizations</i> | | | | | |
| 13. Consolidation of logistics management | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Organizational integration across functions | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Linkage with supplier logistics and manufacturing | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <i>Pipeline Performance Measures</i> | | | | | |
| 16. New incentive systems | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. Direct product costing | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Cycle time measurement | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 19. Order fill/in-stock tracking | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- What investment, management commitment, or other implementation resources will be required?

Considered together, the answers to these questions will help establish the priorities that senior

executives and their logistics managers should assign to the elements of their logistics strategy. From there, management can set targets, responsibilities, and specific action goals.

The table on this page presents an initial worksheet for evaluating the key implementation factors affecting each of the 19 replenishment logistics programs described in this report.

Additional copies of this report may be obtained from:

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