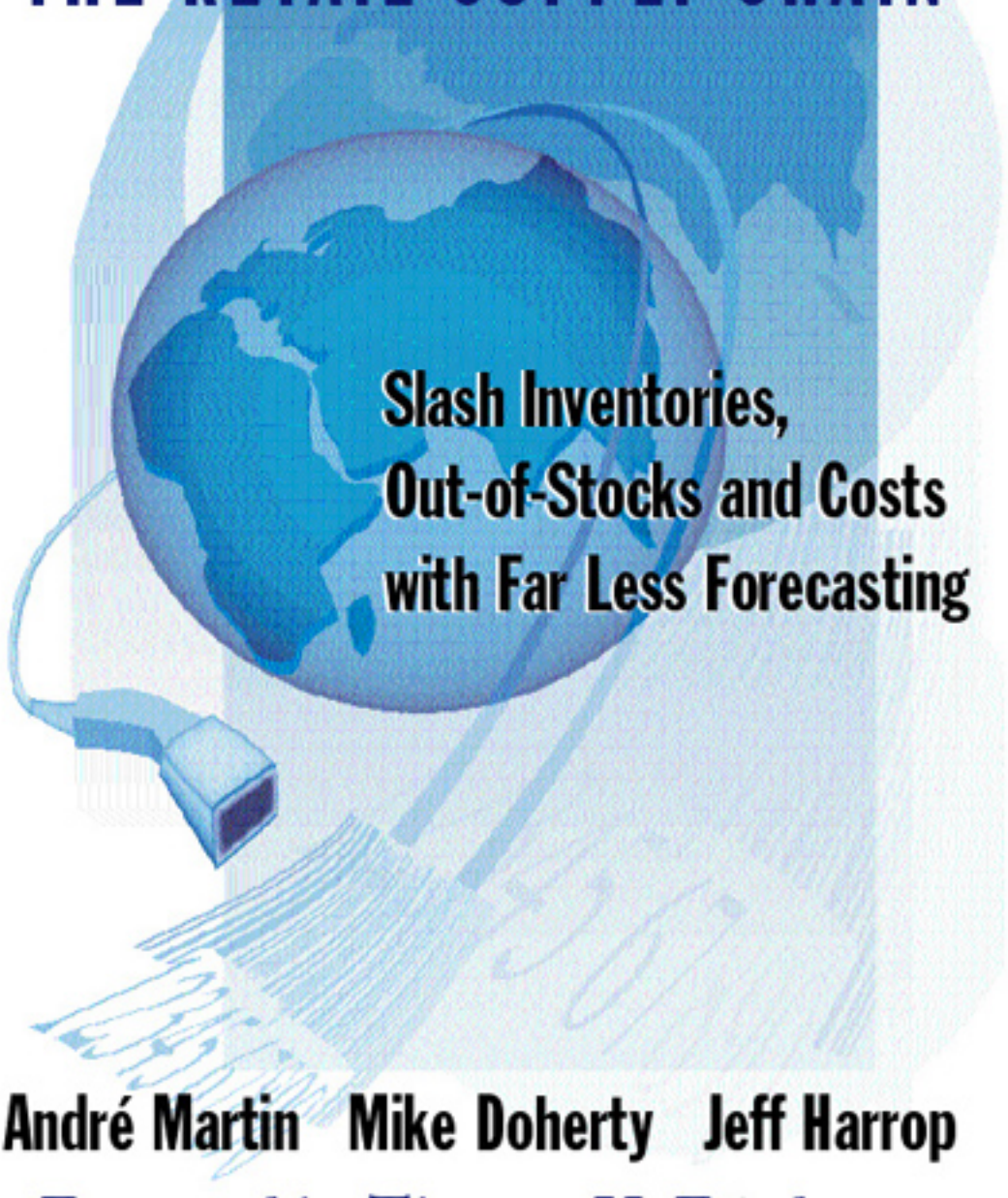
FLOWCASTING

THE RETAIL SUPPLY CHAIN



Slash Inventories,
Out-of-Stocks and Costs
with Far Less Forecasting

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Foreword by Thomas H. Friedman

INTRODUCTION

Winning the Retail Supply Chain Race

Imagine that you're a race car driver, and you're minutes away from the most important event of your Formula 1 racing career. Your world class pit crew has prepped your car from front to end, and everything in between. All systems are go. Your team pushes your car into place at the starting line, and you climb in. The steering wheel is locked into place. The countdown begins, and the first starting light flashes. Then the second, followed by the third, fourth, and finally the fifth. The lights simultaneously flicker off indicating the start of the race. Your engine roars, and then you discover something terrible: the steering wheel isn't connected to anything, and you're out of the race.

This is an apt analogy for what happens in retail supply chains today. The retailer may have great wholesale and manufacturing partners, but if the retail store is disconnected from its trading partners, the retail supply chain will never win the race to cut costs while offering the best customer service. Instead, the retail supply chain will function like the race car with the disconnected steering wheel -- it will have tremendous brute force to push forward, but it will have little ability to steer a course, react to changing "road" conditions, or carry out a well-executed plan.

Because of this disconnect, the retail store is often considered the weakest link in the retail supply chain -- a notion supported by

numerous surveys conducted over the past 10 to 15 years regarding out-of-stocks. Retail store out-of-stocks (usually in the 5 percent to 8 percent range) are indeed much worse than the percentage of out-of-stocks that occur elsewhere across retail supply chains. As you'll learn in this book, the nodes in a retail supply chain are highly interdependent. And when they're managed accordingly, the benefits that accrue to the trading partner are staggering in terms of reducing costs and improving customer service -- two keys in winning today's retail race.

Steering Linkage for the Retail Supply Chain

If you work within a manufacturing organization, you've probably heard of DRP (Distribution Resource Planning) and may deploy it in your company right now. DRP is a means of ensuring that goods produced at the manufacturing end of a supply chain reach the retail end in the most cost-effective way possible. The results from DRP, however, will be only as good as the ability to forecast what retail stores will actually need for routine and promotional sales activity. If you can't accurately forecast consumer demand, you'll need to rely on safety stock as a hedge against uncertainty. Whereas in the "good old days" inventory and capacity were cheap, today, no company can be competitive if a substantial portion of its inventory is held in limbo in case the forecast is incorrect. The only way to truly remove uncertainty about what you'll sell across a given retail supply chain is to forecast at the store level. Moreover, forecasting at the retail store level "drives" the entire retail supply chain; all plans for every trading partner can be derived from that single forecast.

Now wait a minute. According to conventional wisdom, you *can't* forecast at the store level! That's correct, as far as yesterday's conventional wisdom goes and before the advent of a revolutionary new concept called Flowcasting[1]. Today's DRP software packages, which do a superb job of planning for distribution and logistics management, are designed for manufacturing, not store-level, volumes.

[1] Flowcasting is a new concept and is derived from the DRP Process created and implemented by André Martin at Abbott Laboratories in the mid 1970's

Software packages for Flowcasting, in contrast, are specifically designed for forecasting, inventory management and replenishment, and driving the retail supply chain from the point of sale back, eliminating all other levels of uncertainty.

Flowcasting is a multi-echelon retail inventory management business process designed to 1) forecast products at the retail store level and 2) plan inventory, replenishment, people requirements, space, and equipment resources throughout the retail supply chain in a time-phased manner. Flowcasting continually monitors and controls the flow of inventory from beginning (the store) to end (the factory) -- the entire trading network. As inventory at store level increases or deceases above or below a set level, Flowcasting automatically recommends the adjustment of the flow and level of inventory across the Distribution Centers (DCs) and factories that service the store. The result is a balanced trading network, the elimination of shortages, increased sales, reductions in supply chain operating costs, and greatly increased inventory velocity (fewer inventories, greater turns).

The Flowcasting business process works as follows:

1. Flowcasting generates a baseline forecast that extends a year into the future for every item in every store.
2. Flowcasting allocates total planned promotion quantities to participating stores, thereby creating a total forecast of consumer demand.
3. Flowcasting takes the total forecast, deducts on hand inventories, considers on order quantities, applies the retailer's business rules, and creates a 52-week, time-phased model of how much product should flow into both retail stores and Retail Distribution Centers (RDCs), and when the product flow will occur.
4. Flowcasting calculates how much inventory will be necessary across all other nodes in the retail supply chain to support the total store and RDC's level forecasts every day for the next year.

5. Flowcasting enables the communication of replenishment schedules for both retail stores and distribution centers to wholesale and manufacturing trading partners over a 52-week planning horizon.
6. Flowcasting plans all required people, space, equipment, and capital resources necessary to acquire, transport, store, and deliver products from the final point of manufacture to the final point of sale.

The implications for retail supply chains are significant. Flowcasting not only eliminates the need for suppliers to forecast their retail trading partners' needs, but it ensures that the entire retail supply chain will be refreshed and automatically resynchronized on a daily basis, depending on whether sales at store level come in under or over forecast. In doing so, Flowcasting generates a detailed and realistic model of inventory based on the store-level forecasts of consumer demand. This model factors in all retailer specific constraints, schedules and rules, such as store shelf capacity, minimum shelf displays (including safety stock), minimum ship quantities to stores and DCs, transit lead-times between nodes, and shipping schedules.

The Flowcasting business process is made possible by several developments: advances in forecasting techniques that marry intrinsic and extrinsic forecasting at store level; the availability of new DRP-based, time-phased planning logic that can crunch and model retail store volumes on low-cost hardware; and advanced networking technology that enables trading partners to communicate on a level playing field. Of the many benefits that Flowcasting provides retailers, the following are particularly compelling:

1. Retailers and manufacturers can "flowcast," rather than forecast.

Flowcasting is a business process that gives retail supply chain trading partners the ability to model the stocks and flows of inventory, in a time-phased manner, from factories to final points of sale. Consequently, *sales forecasting and a myriad of other forecasting*

activities are completely eliminated at every node of a given supply chain except the only place where it matters: the final point of sale. The end result is the creation of a model of the business inside the computer and a totally synchronized retail supply chain aligned daily to pure end user demand. This process, upon reaching critical mass, enables manufacturers and their trading partners to transition from a make and ship-to-stock environment to a make and ship-to-order environment. Resulting benefits from this process are greatly reduced store out-of-stocks, inventories and cost reductions for all trading partners, ranging from 1 percent to 6 percent of sales depending on the company.

2. Better planning and execution of promotions.
Promotions may be the lifeblood of most retailers today, but they frequently become cost-intensive exercises in futility. Too often, manufacturing operations ramp up production in anticipation of a promotion -- in effect inventorying their capacity -- then deploy the inventory to their distribution networks where it sits until the retailers actually order. Since there's no visibility into the retail side of the supply chain (that is, into what and when trading partners will order), this strategy is akin to rolling the dice at Las Vegas or Monte Carlo. Maybe 50,000 cases of product wind up in the Chicago or Rome distribution center, but only 40,000 are actually needed. London and Milwaukee need another 10,000 cases, so the company ships the 10,000 cases from Chicago or Rome, incurring unnecessary added costs.

On the retail side, the situation is likely worse, because buyers, category managers, and planners are thinking about how many items they can sell in their 3,000 locations rather than about how many items they can sell *in a given promotion*. The result is that some stores wind up with excess inventory and the associated carrying and return costs, while others incur lost sales due to insufficient inventory.

In a Flowcasting environment, all of these problems vanish. Guessing and blind spots give way to a synchronization of the flow of inventory across the entire retail supply chain. This, in turn, makes

it possible to plan and execute promotions that are profitable for all trading partners involved in the exercise.

3. A common language for all trading partners in the supply chain. Traditionally, entities involved in creating, distributing, and selling goods have been nations unto themselves, each speaking a different mother tongue. MRPII and DRP each eliminated a few floors of this "Tower of Babel," and ERP further promoted consistency throughout the manufacturing side of supply chains. But several key disconnects among trading partners still exist on the retail side. Disconnects occur between store inventory replenishment systems, RDC replenishment systems, merchandising systems, and trading partners replenishment systems.

Flowcasting resolves these major disconnects and introduces a means of consistent communication for all trading partners, one that enables them to easily share required people, space, equipment, and capital resources necessary to acquire, transport, store, and deliver products. Flowcasting makes anticipated people, space, and equipment constraints highly visible to all supply chain partners so they can deploy effective resolutions *before* the constraints become a problem. For example, take the after-the-fact-capacity considerations that often compromise the appointment systems of large retail chains. All too often, the retailer end of the supply chain orders a product and the manufacturer is ready to ship it immediately to an RDC. Unfortunately, the RDCs' receiving docks are all booked, and there won't be a delivery window for three days. The result is that stores may have stock outs which, in turn results in lost sales and reduced customer service levels. The manufacturers also pay a price, since they'll have to carry the inventory and replan logistics so that the order can eventually reach the RDC in a cost-effective way. With Flowcasting, receiving capacity considerations are taken into account before orders are released to suppliers resulting in the elimination of delivery delays.

Flowcasting creates a tight and natural linkage between consumer demand at the retail store shelf and output from manufacturing partners in the retail supply chain. Because Flowcasting models

the flow of product in a time-phased manner, product will be pulled across the supply chain to distribution centers and retail stores only when it's needed. And because all trading partners are communicating in the same language, the flow will take place in an optimal way from a logistics standpoint.

4. Linking the supply chain to true consumer demand.
With Flowcasting, all trading partners win as forecasting moves from the individual nodes to the place where it counts: the point of pure consumer demand (the retail store). This is critical, because the biggest cost of doing business in a retail supply chain environment is the management of uncertainty on a daily basis. Flowcasting enables retailers to adopt a truly consumer-centric approach and focus on pure consumer demand. In this regard, Flowcasting might be called "Reality Planning and Modeling," since it synchronizes retail, wholesale and manufacturing plans to the reality of consumer purchases.

5. Instant business simulations, better reaction time.
Flowcasting enables retail supply chain trading partners to model the way they want to do business. The focus is on how product should flow from factories to store shelves. In seconds, trading partners can perform "what if" calculations that, at one time, would have required hours on costly hardware systems. By using Flowcasting, retailers can simulate their entire business and Flowcast their total supply chain on inexpensive computers and workstations. This enables them to react quickly to anticipated changes in demand and replenishment flows of products, and take appropriate actions.

So, rather than being caught by surprise with excess or insufficient inventories, retailers can respond to change in a way that enables them to minimize problems and seize new opportunities. The key is that trading partners are dealing with instant information, rather than information that is days old and out of synch with activity at the retail shelf level. Flowcasting enables buyers at all levels of the supply chain to truly make informed decisions, because the future has already been modeled and future flows of inventories fore-

casted on the basis of real-time consumer demand. What better way could there be to run a business?

6. Cutting costs at the core.
We recently analyzed 20 of the largest consumer goods (CG) manufacturers and 5 of the largest retailers in the world, comparing the cost of producing product to the cost that a consumer actually pays in a store. Our analysis showed that for those 20, depending on the product, consumers pay on average anywhere from 2 to 4 times the manufacturing cost. (Refer to Appendix G for complete details about the aforementioned calculations.)

While every retailer and manufacturer has its margin goals and pricing strategies, 45 percent (on average) of the cost a consumer pays represents the costs of manufacturing the product. Another 37 percent represents the way these companies market, sell, and distribute products. Flowcasting enables manufacturers and their retail trading partners to dramatically reduce their manufacturing, selling, distribution, and administrative costs. How much? We believe that the above mentioned 45 percent of the costs of manufacturers can be reduced as follows: materials 1 percent to 3 percent, labor 3 percent to 10 percent, and overhead 5 percent to 15 percent. We also believe that the cost of marketing, selling, distributing, and administration can be reduced in the range of 5 percent to 10 percent.

The bottom line is this: Trading Partners can reduce their cost of doing business in the range of 1 percent to 6 percent of their total sales volume. We calculated ranges because implementing the Flowcasting business process is a journey and is usually done one supplier or one retailer at a time, depending on who initiates the process. Therefore, the speed with which the process is implemented and the volume of business done by the participating trading partners will dictate the size of benefits achieved. Second, some companies are more efficient than others and, therefore, you have to allow for that.

According to the Economist, the Global Consumers Goods marketplace is a $10.36 trillion Industry. Reducing the costs of manufacturing, marketing, selling, and distributing products to consumers

by 6 cents on the dollar (which represents the high end of the range) would generate savings of over $600 billion (USD) to be shared by trading partners and the consumer.

As you'll see throughout this book, Flowcasting opens remarkable opportunities for cutting costs while boosting profitability and customer service.

But…Does It Work

At this point you might be thinking, "Yes….but can you really eliminate forecasting everywhere but at the retail store level?" The answer is a resounding "yes." To test the Flowcasting concept, we conducted several simulations and pilots. Our latest simulation involved generating 378 different sales forecasts at the store/SKU level at a Fortune 100 Consumer Goods Manufacturer. To provide a context for the results of the simulation, we chose a study conducted by Georgia Tech's Marketing Analysis Laboratory. The study provides data, summarized in Figure 1, about the state-of-the-art in forecasting accuracy.

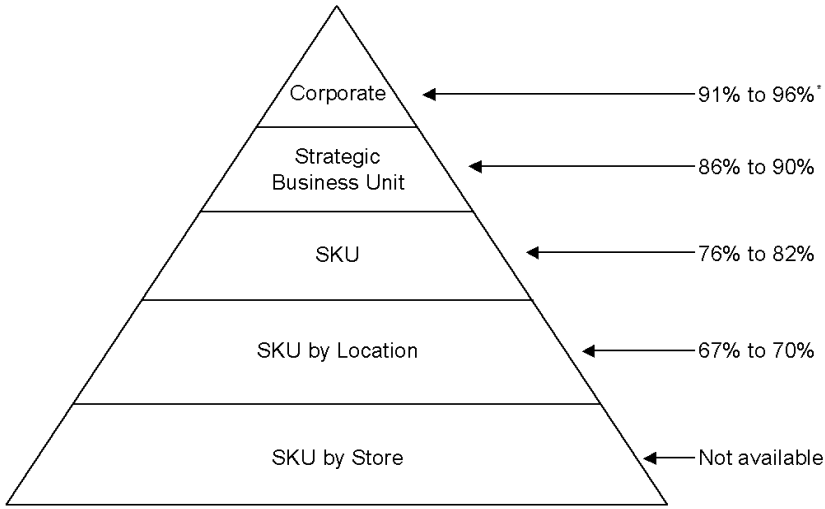


Figure 1: Benchmarking Sales Forecasting Performance by Kenneth B Khan, *Journal of Business Forecasting*, Winter 1998-'99.

As shown in Figure 1, our ability to forecast tends to improve at higher levels of aggregation. This makes good sense; it is far easier to

forecast total corporate sales for the year than it is to forecast sales at the strategic business unit or specific product (SKU) level. Yet forecasting at the business unit, SKU, and SKU by location (retail, wholesale and manufacturing DCs) must be done. And the lower the level, the less accurate the forecast. Now what if, as a manufacturer, you had to forecast at the store/SKU level as well? Would your forecasting accuracy improve? Actually, it would most likely continue to deteriorate below the level reported in the study (67 percent to 70 percent), even though no statistics on forecast accuracy are available at the store/SKU level.

Can we improve on the current state-of-the-art? Let's return to our simulation for an answer. The objective for the manufacturer in our simulation was to use Flowcasting to forecast what one of its retail trading partners, also a Fortune 100 company (which we'll refer to as "Retailer X"), would sell during a given month for a sample of six products. The products included two high-volume SKUs, two medium-volume SKUs, and two low-volume SKUs sold across a group of 63 stores. The simulation would then subsequently forecast what Retailer X would purchase from the manufacturer for that month.

The simulation was performed on November 12, 2005. First, a sales forecast for December 2005 and the following eleven months was created for every product (SKU) in every store for a total of 378 separate forecasts. Then, the Flowcasting system netted store inventories (inventory on store shelves and back room) the morning of November 12, considered store/SKU safety stock requirements, and used each store's ordering rules (minimum ship quantities, lead times, and shipping schedules) to create a model of what each store would most likely order by day and week for the next twelve months.

The results were accumulated for the six products across all 63 stores and aggregated to show what Retailer X would specifically buy from the manufacturer during December. The information was kept for seven weeks. Then, in early January 2006, when the December 2005 orders from Retailer X had been received and shipped, a comparison was made between orders received in December and the forecast made seven weeks earlier for December.

Forecast Accuracy Summary – Retailer X

Product	December Actual Orders	December Orders Forecast	Forecast Accuracy
1	123,687	105,462	83%
2	13,500	11,940	87%
3	38,720	34,880	89%
4	67,200	75,600	89%
5	28,692	27,612	96%
6	79,464	77,352	97%

Figure 2: Simulation Results for Retailer X.

The level of forecast accuracy ranged from 83 percent to 97 percent for the 6 products as shown in Figure 2. In addition, Flowcasting gave hard evidence that Retailer X had ordered more inventory than it needed in anticipation of heavy sales during the holiday season. Had this not been the case forecasting accuracy at the store/SKU level would have been higher.

Hard evidence now exists to prove that sales forecasting accuracy at the store level can consistently be in the 80 percentage plus range. With the Flowcasting approach to retail supply chain management, forecasting uncertainty only exists at the store, so that the balance of the retail supply chain becomes a mere calculation. Therefore, with a Flowcasting business process in place, sales forecasting at all other levels in retail, wholesale, and manufacturing companies can be completely eliminated. The implications for retail supply chains are staggering, which brings us to the final point in

this introduction: it's time to start thinking of Flowcasting as the gold standard for retail supply chain management.

The Flowcasting Imperative

If you look back at the introduction of new planning and execution business processes such as MRPII, DRP, and ERP, you'll see a similar pattern. Early adopters understand the vision and potential, leap in, and serve as guinea pigs while bugs and glitches are hammered out. And while they might be on the "bleeding edge," they're also the first to reap the benefits. Others soon follow, recognizing that the business processes will be essential to running a profitable business. Lastly, a group of companies adopt the business processes and supporting technologies because they've found themselves at a competitive disadvantage.

Where are we with Flowcasting today? A number of companies -- some at the Fortune 100 level -- are already implementing the Flowcasting business process and harnessing the immense power of planning based on a single forecast of consumer demand to gain a cost and competitive advantage. It's not a matter of if your competitors will adopt Flowcasting, it's a matter of when they'll begin using Flowcasting to improve planning, reduce costs, boost customer service, and reap all of the benefits of selling through finely-honed and well-synchronized supply chains.

And while Flowcasting represents a new paradigm for managing the supply chain, it's also an adaptation of existing systems that enables companies to easily transition to a new and highly efficient way of doing business. Unlike so many systems that require massive investments of time and money and the scrapping of existing systems, Flowcasting allows for the gradual adoption of new planning and modeling capabilities. Perhaps most appealing, Flowcasting simplifies the management of the entire retail supply chain.

Thirsting to know more? This book is designed to help you understand why it's critical to be on the earlier side of the adaptation curve and how you can use Flowcasting to gain a competitive advantage. It's divided into three sections that provide you with the essen-

tial information you need to know to adapt Flowcasting effectively in your organization.

Section 1 covers the current difficulties and challenges of forecasting and planning the retail supply chain, focusing on the difference between independent and dependent demand. It also reveals a little-recognized fact: most of the forecasting in the retail supply chain is unnecessary! Section 2 explains how to use Flowcasting to forecast demand at the store and integrate replenishment schedules among stores, DCs, and manufacturing plants. The third and final section discusses how problems that were previously tackled with disjointed forecasting can be solved more effectively using Flowcasting. It shows how Flowcasting, which creates a valid simulation of every future product movement, makes it easy to plan promotions, products' phase-ins and phase-outs, seasonal set-ups and take-downs, labor scheduling, capacity planning, load building, transportation, and financials.

Given the enormous benefits of Flowcasting, we hope you'll join in the new race for greater retail supply chain efficiencies, lower costs, higher customer services, and greater profitability. Don't wait -- some of your contenders are already rounding the first lap!

André Martin
Mike Doherty
Jeff Harrop
May 2006

Section 1:
Flowcasting Basics

CHAPTER 1

The 21st Century Retail Supply Chain

Doing Business with a Single Forecast

Back in 1958, Jay Forrester, then a professor at MIT, wrote a groundbreaking article stating that a volume increase of 10 percent at the retail store level actually cascades and translates into a 40 percent increase at the manufacturing level. His findings, which originally appeared in the *Harvard Business Review*, were later documented and published in a book entitled *Industrial Dynamics*. Forrester's work focused on the behavior of the flows of money, orders, materials, personnel, and capital equipment across what we refer to today as "retail supply chains." He found that these five flows were integrated by an information network. This information network gave retail supply chains their own dynamic characteristics.

Interestingly, Forrester calculated that the four-fold increase at the manufacturing level would take six months to manifest itself. This makes sense, given the fact that in those days, most business was done by snail mail.

Fast forward to the 21st century. Remarkably, the multiplier between retailer and manufacturer is still the same: four-fold. The only difference is that the ripple effect takes days or weeks, not months, to materialize thanks to the use of communication technologies that form the life blood of today's networked supply chains. The elapsed time may have shrunk, but the volume amplifier effect remains because we still manage the nodes in a supply chain inde-

pendently, almost as if they're discrete islands or fiefs, blind to each other's needs. Because of this disconnect, pure consumer demand takes a back seat to business incentives, such as promotions, which create forward buys and diversions. Optimal shipping formats can also play a role in the multiplying demand. For example, the retailer may only require three cases of an item. But the manufacturer offers incentives to ship in pallet or truckload quantities. The retailer then winds up with more inventories than needed. Hence 10 percent at the retail store level becomes 40 percent at the manufacturing end of the supply chain.

This amplification of demand, coupled with the various disconnects across the supply chain, inevitably leads to uncertainty about the items, quantities, and delivery dates that various trading partners will need over the course of days, weeks, months, and beyond. That uncertainty, in turn, results in excess inventories and added costs. The good news, as you'll learn in this chapter, is that there are now solutions for gaining better visibility into the retail supply chain, so you can eliminate surprises without using inventory as a hedge. The first part of this chapter explores the problems with forecasting in retail supply chains today, while the second shows how forecasting at the retail store level is a far more accurate way to predict demand from the factory to the store shelf. If you believe that retail store level forecasting is impossible or just a dream for tomorrow, read on.

PART 1: FORECASTING IN A VACUUM

Every Node for Itself

The largest cost of doing business across a retail supply chain is dealing with the uncertainty of demand. This is directly related to not having visibility into what customers will actually buy, what quantities they'll purchase, and when they'll make their purchases. This lack of visibility and associated uncertainty results in major operating disruptions and significantly increased costs of doing business.

The lack of visibility is manifest in the fact that, in most supply chains, each node does its own forecasting. A retail store may have some sort of forecasting and replenishment system, but that system

usually functions in a vacuum. The same holds true for the RDC, which looks at the needs of the stores it supports as an aggregate sum that's computed on the basis of history such as warehouse withdrawals. It is only a coincidence if the aggregate forecasts at the RDC level relate at all to what is actually happening on the retail shelves.

At the next downstream level in the supply chain, from the manufacturing DCs to the factory floor, you'll typically see tighter planning and data integration due to the use of MRPII and ERP. But even the most exquisite choreography among the manufacturing nodes won't improve supply chain management unless all the various nodes are connected with actual demand at the retail store level.

Nonetheless, few retailers today actually forecast at store level; instead, forecasting typically starts at the RDC, and is ultimately done throughout the supply chain. The farther from the consumer that the forecasting takes place, the less accurate the forecasts are likely to be. And depending on what's being forecasted, inaccuracies can have a significant impact on a business. Inaccurate sales forecasts across a given retail supply chain translate into increased operating costs and lower customer service levels for all trading partners. In addition, inaccurate sales forecasts lead directly to:

- Lost sales
- Dissatisfied customers
- Too much inventory
- Increased selling costs
- Increased distribution costs
- Increased manufacturing costs
- Increased purchasing costs
- Obsolescence

To appreciate the roots of forecasting inaccuracies, consider a typical retail supply chain (see Figure 1.1), which consists of two separate legal entities, a retailer and a manufacturer.

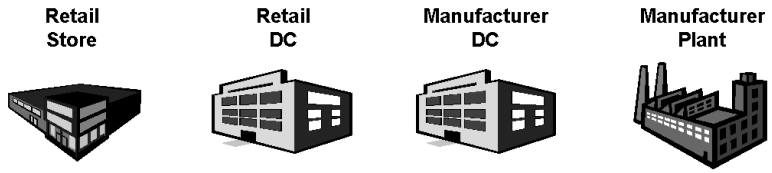


Figure 1.1: A typical retail supply chain.

The retailer owns the first two nodes, which consist of the retail store and the RDC and the manufacturer owns the last two nodes, the manufacturing DC (MDC) and the plant. In an effort to generate the best forecast, both the retailer and manufacturer must forecast at multiple levels. Let's start with the forecasting on the retailer's side.

The Retail Nodes

Retailers typically begin forecasting at the total business level, based on a plan with a timeline that usually stretches out one year and beyond. This business plan normally includes a forecast of total sales expected for the business period, as well as assumptions about new store openings and closings, store renovations, new product introductions and deletions, and anticipated promotions. In addition, business volume forecasters will compare their forecasts to those of prior years, compare their data with key competitors' data by buying syndicated data, examine market share, and consider other critical economic and competitive factors as well. Figure 1.2 lists the various functional areas that create forecasts and the type of forecasting activities they typically perform in a typical retail operation; in aggregate, the number of different forecasts that are created is staggering!

Regardless of how many forecasts are created in a given retail company, they're done for high-level planning purposes. And the lit-

Who is Forecasting

What They're Forecasting

Top Management	Sales and Marketing	Stores	Distribution	Finance
Revenues	Marketing plans	Sales	Transportation	Revenues
Profits	Sales plans	Manpower	Warehousing	Profits
Capital expenditures	Promotions	Inventories	Receiving	Cash flow
Earnings per share	New products	Space plans	Shipping	
New stores		Receiving	Customer service	
Store closings		Shipping	Manpower	
		New products	Inventories	
			New equipment	

Figure 1.2: Retailer's functional forecasting activities.

mus test of a "good" plan is financial. Will the plan generate enough cash from operations to meet our targets? Will we have to borrow to support store expansions, and store renovations and closings?

In other words, the planning, by definition forecasting, is related more to the blessings or condemnation of Wall Street than to the planned flow of product from manufacturer to retailer to consumer. And therein lies the problem; these higher-level forecasts are not linked to the day-to-day business activities and lower level forecasts that drive replenishment into the stores, which in turn drives replenishments (purchases from suppliers) into the distribution centers. As a result, it would be a remarkable coincidence if the sum of the store and DC forecasts were to add up to the corporate sales forecast!

The Manufacturing Nodes

Like retailers', manufacturers' business plans must also include a forecast of total sales expected for the business period, which means forecasting at multiple levels. Typical forecasts must take into account the proposed marketing and sales targets, promotional plans, new lines of products, and product deletions. Given expected sales volumes, manufacturing must make adjustments to production capacities (adding or eliminating production shifts), and the addition, expansion, or closing of distribution centers. Figure 1.3 below depicts the major forecasting activities that functional areas of a manufacturing organization undertake as they plot the future.

Higher level plans in many manufacturing companies are disconnected from day-to-day business activities and the lower level forecasts that ultimately determine factory output and replenishment into manufacturing distribution centers (MDCs). What are the chances that the sum of the sales forecasts that drive both distribution replenishment and production will add up to the corporate sales forecast? Slim to none!

The Wrong Stuff

The problem with so many independent forecasts across the supply chain is two fold. First, the very fact that they're independent and dri-

Top Management	Sales and Marketing	Distribution	Production	Finance
Revenues	Marketing plans	Transportation	Production rates	Revenues
Profits	Sales plans	Warehousing	New equipment	Profits
Capital expenditures	Promotions	Receiving	Additional capacity	Cash flow
Earnings per share	New products	Shipping	Manpower	
		Customer service	Inventories	
		Manpower	Warehousing	
		Inventories	Receiving	
			Shipping	

Figure 1.3: Manufacturer's functional forecasting activities.

ven by internal metrics means that they do not mirror changes in actual demand at store level.

Second, the independent forecasts are expressed in mutually exclusive units of measure. People in sales will be forecasting in terms of the number of units that will be sold and the currency those units represent. People in distribution will be forecasting in terms of how many trucks will be coming and how many people will be needed to unload them, how much warehousing space will be needed, what kind of resources will be necessary for order picking, and so forth. And in manufacturing, people will be forecasting in terms of how many batches, pieces, or units the plants must produce, how many shifts will be needed, and so on.

The fact is, on both the retail and manufacturing side, there's a whole underworld of forecasts below the radar screen -- and none of them are connected.

PART 2: A BETTER WAY OF DOING BUSINESS

Doing—and Forecasting—Business Your Way

Given the patently clear shortcomings of the current "forecast everywhere but where it counts" approach, it's tempting to ask, "Why don't

we just forecast the way we conduct business?" The question is so obvious that we rarely, if ever, bother to ask it. In part, doing business as usual is easier than questioning whether our planning tools map to our actual business. As we saw earlier, with marketing, sales and management people, sales forecasting is usually done at the corporate, regional, category, or product group level. On the operating side of the business (distribution, manufacturing, and purchasing), sales forecasting is typically done at the product and raw material level. Although these methods of forecasting have value, they bear no resemblance to the way we do business. Consumers do not buy products at the corporate, regional, category or product group level; consumers buy specific products in specific stores on specific days. Distribution people do not ship and receive products at the corporate, regional, category or product group level -- companies build distribution centers and ship products to support retail stores with the products they need. And factories produce and ship products to distribution centers. Until retailers, wholesalers and manufacturers step back and take a reality check on their planning practices, forecasting will continue to be out of synch with the actual flow of product throughout their supply chains.

Another reason that we forecast at the wrong place is our assumption that since we're dealing with supply chains, the answer to our problems lies in technological fixes and practices. So we keep developing new systems and practices that try to improve supply chain management. During the last several years, a number of initiatives such as Quick Response, Vendor Managed Inventory and Efficient Customer Response have improved overall supply chain performance. As good as some of these technologies and practices may be, none focus on the core issue: *you only need one unique sales forecast to drive a retail supply chain*. The retail store is both the beginning and the end of retail supply chains. It's the beginning of the information flow and the end of product delivery. So why not start there? As you'll see below, if you forecast at the retail store, the need to forecast anywhere else in the supply chain completely vanishes. The magic behind this lies in a concept called "dependent demand," which we'll turn to next.

Dependent Demand

Years ago in the auto industry, people realized that once you forecasted how many of a particular car model you would assemble and then sell, you could easily calculate the demand for tires, steering wheels, hubcaps and a variety of other parts. These item level forecasts were based on "dependent demand" -- that is, they depended entirely on another item's forecast (the assembly schedule).

Dependent demand is important in retail planning as well. Consider the supply chain shown in Figure 1.4. It consists of a distribution channel (or network) with four levels: a factory, a manufacturer's distribution center (MDC1), two retail distribution centers (RDCs 1 and 2) and four retail stores. At every node of this distribution channel, a customer/supplier relationship has been created. For example, the factory has one customer, MDC1. MDC1 plays a dual role -- it is the customer of the factory and the supplier to RDC1 and RDC2. RDCs 1 and 2 also play dual roles; each is a customer of MDC1, and each is a supplier to a specific number of stores (two each in this example).

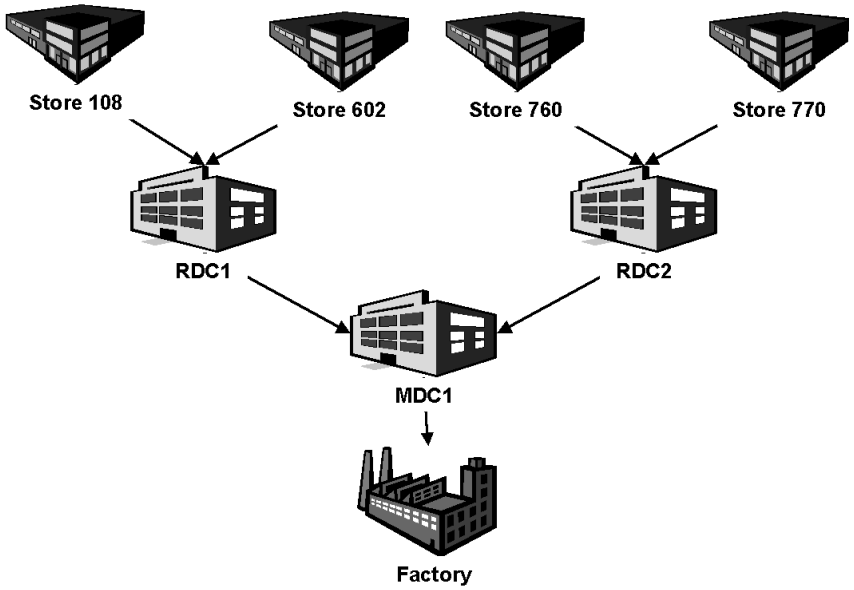


Figure 1.4: Dependent demand in a retail environment.

Suppose that when store 108 needs products, it orders from RDC1. When RDC1 needs products, it will order from MDC1. The product demand that RDC1 experiences will always be generated by stores 108 and 602. In other words, the demand on RDC1 is dependent on the needs of stores 108 and 602.

Another way to look at this distribution channel is to think of the way products will normally flow from factories to store shelves. Once you have forecasted what consumers will buy at the store level, you can calculate the demand flow through every node and trading partner within this distribution network. And this makes perfect sense. After all, we build distribution centers to serve the demands of other DCs and stores. So why not have forecasting and planning processes and systems follow in the same path that supports the way we actually do business?

One Retail Supply Chain, One Forecast

All retailers and their supply chain trading partners who sell and distribute products must answer the following "universal logistics questions":

1. "What am I going to sell?"
2. "Where will I sell it?"
3. "What do I have?"
4. "What do I have on order?"
5. "What do I have to get?"

As shown in Figure 1.5, the first question need only be answered at the final point of sale, the retail store. The calculated demand at each level, from retail stores through the supplier's factories, *is the one set of numbers that can be converted into meaningful units within each functional area of the supply chain*. (This is quite a contrast to the traditional approach in which each functional area has its own currency and is left to its own devices to develop a forecast that enables it to hit its bogey. The forecasts are done on the basis of history, application of "creative" formulas, and rules of thumb developed over the years through hard work and experience.)

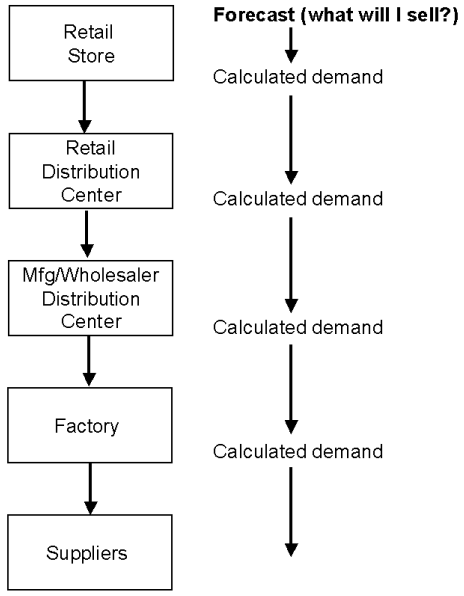


Figure 1.5: One sales forecast only at store level.

The answer to each of the subsequent questions lies in calculating and communicating demand to the next level of the supply chain where inventory is maintained. What sells at the retail shelf drives how much the retail store needs. What the retail store needs drives what the retail DC needs to provide, and so on until the entire retail supply chain is calculated and synchronized.

An important benefit of this approach is that the universal questions are answered not just for today, but for a planning horizon of 52 weeks into the future, in daily time increments. Imagine not only knowing your current inventory balance, but your projected inventory balance weeks and months into the future. Or what your expected purchases will be weekly for the next 52 weeks!

As desirable as this may sound, it's also tempting to ask, "Wouldn't it be more accurate to forecast at the retail distribution center level instead of the store level? Isn't this the law of large numbers?" The "law of large numbers" may be intuitive, but several pilots and simulations have shown that forecasting at the store-level only and Flowcasting back yields a more accurate RDC demand plan than

forecasting at the RDC level explicitly, even though you're dealing with smaller numbers. This is because the law of large numbers still applies -- the only difference is that you're taking a sum of the store forecasts rather than a forecast of the sum.

Moreover, forecasting at the distribution center level actually introduces a significant source of error: store-level inventories. If the stores have too much inventory, any RDC level statistical forecast based either on aggregate sales history or warehouse withdrawals will yield forecasts that are larger than what is actually needed. The result is even more excess inventory. If the stores don't have enough inventory any RDC level statistical forecast based on the aggregate sales history or warehouse withdrawals will generate a forecast that is too low, resulting in out-of-stocks.

A multitude of factors make forecasting at the RDC level different from the sum of the POS forecasts at the RDC level supporting these stores. These include store on hand balance, shelf resets, delivery schedules, minimum shipping quantities, supplier ordering rule changes, product phase in/phase out, and so on. Figure 1.6, which is based on actual numbers from a simulation, shows the sum of the POS forecast for a product at a number of stores supported by a retail DC, as well as the projected demand (dependent demand calculation) on the distribution center from the same stores. It clearly shows the effect of one of these factors: inventory imbalances at store level.

The solid line is the sum of the POS forecasts for the more than 100 stores supported by this distribution center. The dotted line is the actual demand, or *dependent demand*, that the distribution center will experience once store level inventories are taken into account. Notice that in the first week, the dotted line demand is significant as the stores that are below the minimum display quantities are brought up to the minimum.

The differences between the dotted and solid lines indicate the degree of error that can exist between the POS forecasts and an accurate orders forecast (what a retailer will buy from suppliers). The typical orders forecast resembles the solid line, while the orders forecasts we are proposing would resemble the dotted line.

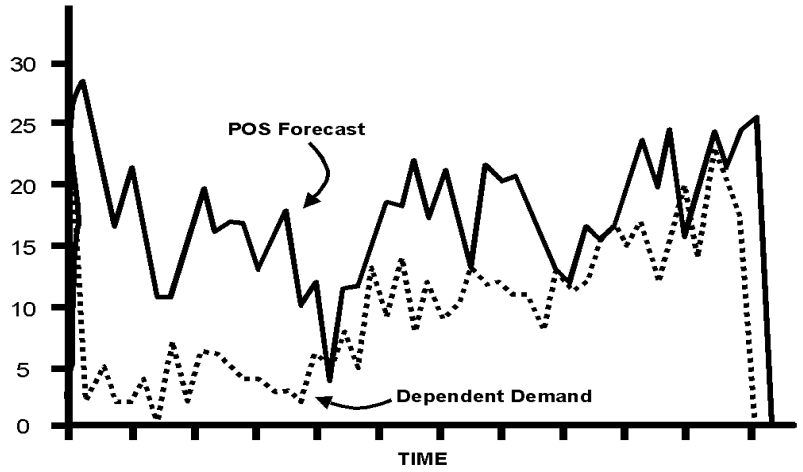


Figure 1.6: POS Forecast based on retail DC that supports more than 100 stores.

Figure 1.7 shows the effect of yet another factor that diminishes the value of RDC level forecasts: shelf resets at store-level.

The area of the graph on the left, beginning just before 9/28, represents the additional demand on the RDC as the number of facings for this product is increased at the stores. These changes are scheduled to occur on different dates at the different stores.

The area in the middle of the graph, beginning at 11/23, represents the depressed demand on the RDC that results from returning the number of facings to the original level at the end of the selling season. Again, these changes are scheduled to occur on different dates at the different stores.

Notice that there is a significant difference between the two curves, showing that the product forecasted has excess inventory at the stores that will take some time to sell off. This situation is represented by the lower dependent demand curve which, over the course of a year, finally catches up to the POS forecast curve. The point is that any calculation that does not take inventory at the stores into account on a store-by-store basis will provide the supplier with an incorrect picture of the future.

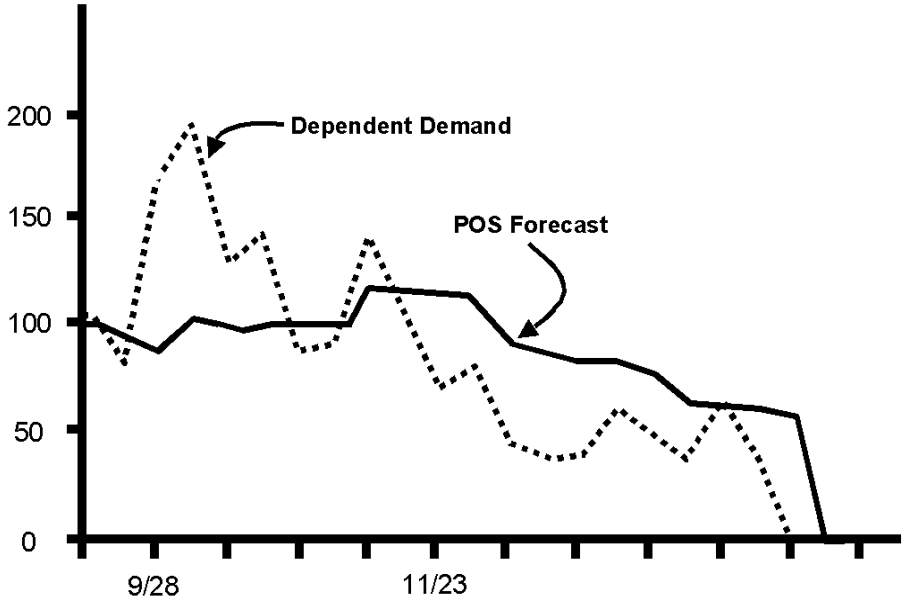


Figure 1.7: Shelf resets at the store level.

Summary

In this first chapter, we've looked at the traditional retail supply chain model in which hundreds of forecasts are generated by various functional trading partner groups. We've also commented on the problems associated with that model. Here are the key points to remember:

1. Traditional forecasting in retail, wholesale, and manufacturing companies is done to satisfy high-level business plans, which are based on aggregate numbers across a company's operations, rather than calculated on the basis of actual consumer demand.
2. Forecasting is done everywhere but where it counts: at the retail store level. The result is a collection of disconnected forecasts.
3. When forecasting is done in the traditional disconnected fashion, stock outs and excess inventories are inevitable and promotions become logistical and financial nightmares. As a

result, all trading partners experience higher operating costs.

4. Contrary to conventional wisdom, forecasting can, and should only, be done at the retail store level. Everything else throughout the supply chain can be calculated on the basis of the retail store-level forecast.
5. By forecasting at the retail store level, the need for hundreds of forecasts generated elsewhere in the supply chain vanishes. That provides visibility into the entire retail supply chain, which means that retailers, wholesaler and manufacturers can model the way they actually do business! The net result is that uncertainty is totally removed from the retail supply chain except the only place where it truly exists: the retail store.
6. By forecasting at the retail store level, all trading partners are poised to improve the way they do business.

The next chapter introduces a new concept, "Flowcasting," which provides unprecedented insight into consumer demand and every activity in a retail supply chain, from the moment product leaves the factory to the time it is purchased at the retail store.

C H A P T E R 2

From Forecasting to Flowcasting

The New Art and Science of Managing a Retail Supply Chain

A Brief History of Supply Chain Technology

Since the advent of the industrial revolution, manufacturers built distribution facilities to match their unique needs. As they grew, manufacturing businesses found that it made sense to build distribution centers in geographic areas with heavy customer concentrations. Doing so enabled them to achieve economies of scale; they could manufacture products in a specific city, then ship full or nearly full truckloads to a given distribution center in another city, thereby reducing transportation, handling and warehousing costs. This approach not only saved money through newfound efficiencies, but it enabled manufacturers to improve customer service.

Wholesalers and retailers followed a similar course. Retailers, for example, found that it made sense to build distribution centers in geographic areas with a heavy concentration of retail stores. The motivation was the same as with manufacturers: achieving economies of scale in transportation, handling and warehousing costs, and improving service to retail stores and consumers. As markets further expanded, wholesalers and retailers began to look for additional opportunities to reduce their distribution costs. This led to the beginning of warehouse automation projects, many of which are still going on today.

During the 1950s and 1960s, companies also began to make investments in inventory management and replenishment systems designed to support the burgeoning distribution networks. The first inventory management systems were manual and included the visual two-bin system, followed shortly after by the visual reorder-up-to system. In the early 1950s, we saw the emergence of the manual Min-Max Kardex system, which was subsequently replaced by the manual, and then computerized, ReOrder Point system. For manufacturing, wholesale, and retail companies, the primary concern in inventory management was determining how much to order and when. Today, the emphasis is more on the "when" part of the equation. The attention has shifted to getting the right material at the right place and at the right time.

The mid-1970s saw the emergence of a new approach to inventory management and replenishment on the distribution side of a manufacturing business: Distribution Resource Planning (DRP), which revolves around the concept of dependent demand. DRP arose from the recognition that 1) within a manufacturing company, the capabilities of production facilities were out of synch with the needs of distribution facilities, and that 2) inventory management and replenishment practices had to accommodate inventory and production *dependencies* throughout the company's internal supply chain. Today, DRP is universally accepted in modern manufacturing and distribution operations in consumer goods manufacturing companies.

But what about managing inventory on the retail side of the supply chain? Back in the 1980s, it was recognized that DRP and dependent demand had applications in retail and that a complete retail supply chain was indeed interdependent. But the sheer volume of product/location combinations within large retail operations made the DRP approach to inventory management and replenishment impractical at the retail store level. (By contrast, the DRP system in a large consumer goods manufacturer may have to plan for, and manage, 250,000 product/location combinations. A large retailer may have upwards of *400 million* product/location combinations that need to be planned and managed.) As we stated earlier in the book,

advances in technology and forecasting have made Flowcasting a reality.

In this chapter, we'll explore the benefits of forecasting at the store level through Flowcasting, and show how these accrue to retailers, wholesalers, and manufacturers alike.

The Power of One (Forecast)

Imagine how different the management of your company would be if you could operate and manage your total business on the basis of the single forecast described in Chapter 2. That one forecast would provide an unprecedented opportunity to reduce costs. Remember, the greatest cost of doing business today is managing uncertainty, and sales forecasting uncertainty *only exists at the final point of sale*. By forecasting only at the retail store (the underlying premise of Flowcasting), the entire retail supply chain benefits in two major ways: first, from simplicity (demand throughout the supply chain can be calculated from the store-level forecast), and second, from the ability to model several weeks into the future the flow of product from the store shelf to the factory.

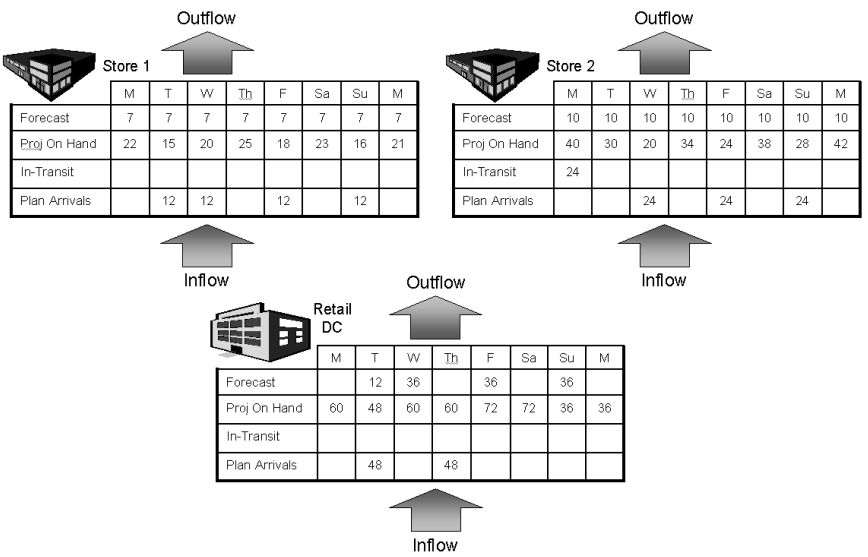
This modeling capability is extremely powerful and places users in a proactive mode by establishing a "rack and pinion" customer/supplier relationship that starts at the retail store and connects every trading partner in the supply chain. By time-phasing recommendations for product over a period of several days, weeks, and months into the future, retailers can simulate the future in the way they actually do business. Such modeling greatly improves decision making and customer service while significantly reducing costs. In addition, it gives retail supply chain partners greater control of their business activities. The key is to think in terms of "*Flowcasting*" -- the ability to calculate, in a time-phased manner, the flow of products in and out of each node in a given supply chain from the factory to the store shelf.

The Flowcasting Concept

Flowcasting starts at the head of the retail supply chain (the store) by forecasting what consumers will buy each day over the forecast

period -- typically one full year to capture the entire business cycle. It calculates dependent demand to predict how much inventory RDCs must ship to the stores, and when specified quantities of product must arrive in order to meet consumer demand from several days to weeks into the future. Flowcasting repeats this process for every supply chain node that a product will flow through on its way from the factory floor to the retail store shelf. Figure 2.1 shows the power of this approach within the first two nodes of a retail supply chain. The detailed logic and mechanics of flowcasting will be discussed in later chapters, beginning with Chapter 3.

The ability to Flowcast the inflow and outflow of products across each node in a given retail supply chain enables the translation of information into the various languages of the key functional areas within a retail company. For example, as shown in Figure 2.2, planned receipts (into a store or RDC) can be converted to receiving hours in order to plan receiving capacity. The capacity plan for receiving can also be expressed in terms of the number of trucks that need to be received in a given retail store or RDC, thereby transforming the typical appointment system into a forward looking system in which valid delivery dates can be stated on planned purchases before purchase orders (or supplier schedules, covered in Chapter



Store 1	M	T	W	Th	F	Sa	Su	M
Forecast	7	7	7	7	7	7	7	7
Proj On Hand	22	15	20	25	18	23	16	21
In-Transit								
Plan Arrivals		12	12		12		12	

Store 2	M	T	W	Th	F	Sa	Su	M
Forecast	10	10	10	10	10	10	10	10
Proj On Hand	40	30	20	34	24	38	28	42
In-Transit	24							
Plan Arrivals			24		24		24	

Retail DC	M	T	W	Th	F	Sa	Su	M
Forecast		12	36		36		36	
Proj On Hand	60	48	60	60	72	72	36	36
In-Transit								
Plan Arrivals		48		48				

Figure 2.1: Flow of products in and out of retail stores and DCs.

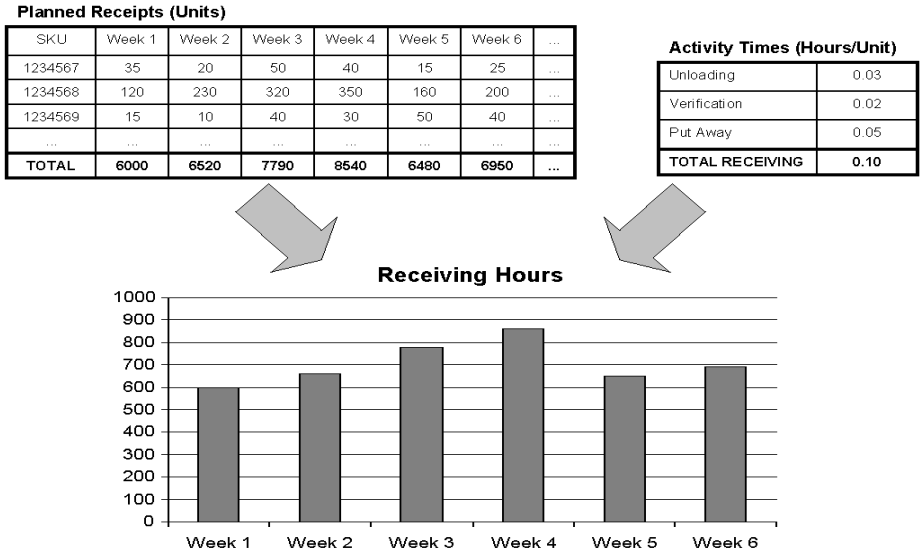


Figure 2.2: Conversion of planned receipts into receiving hours.

5) are sent to suppliers. By using this approach, suppliers would no longer have to call in for appointments before making a delivery -- Flowcasting creates a receiving capacity plan for the planned inbound flow of traffic and can be used to match daily receiving capacity before sending out purchase orders.

Planned shipments to stores and RDCs can also be converted to shipping hours to plan shipping capacity as shown in Figure 2.3. This

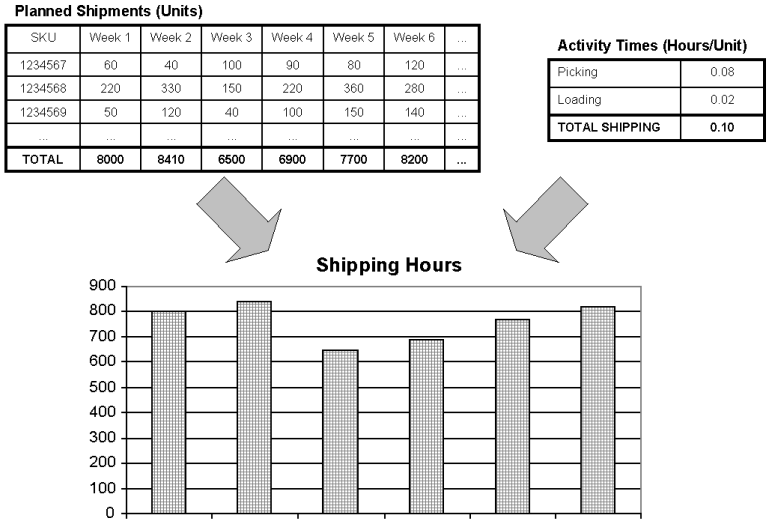


Figure 2.3: Conversion of planned shipments into shipping hours.

Figure 2.4: Total capacity plan for an RDC.

makes it possible, for example, to generate a capacity plan of total manpower for a given retail DC (see Figure 2.4).

Output from Flowcasting can also be used to make financial projections of planned product receipts from suppliers in dollars or euros (or any other currency) by week, by month, or one year into the future. These projections become excellent input for cash flow planning purposes. Companies can even take the projected product receipts from suppliers and offset them by their payment terms to predict the amount of accounts payable that product purchases will represent. Projected inventory levels can be converted to projected inventory *investment* in the currency of choice, as shown in Figure 2.5. The projected inventories can also be converted into cases and pallets in order to calculate how much warehousing space will be needed. Since information is generated by a single consumer sales forecast and is time-phased a year out, it drives every key function in a retail company. In other words, the consumer sales forecast becomes a "universal" set of numbers that can easily be trained to speak the various functional languages of the company.

In Chapter 11, we delve into significant detail on the benefits of using Flowcasting as a financial planning tool.

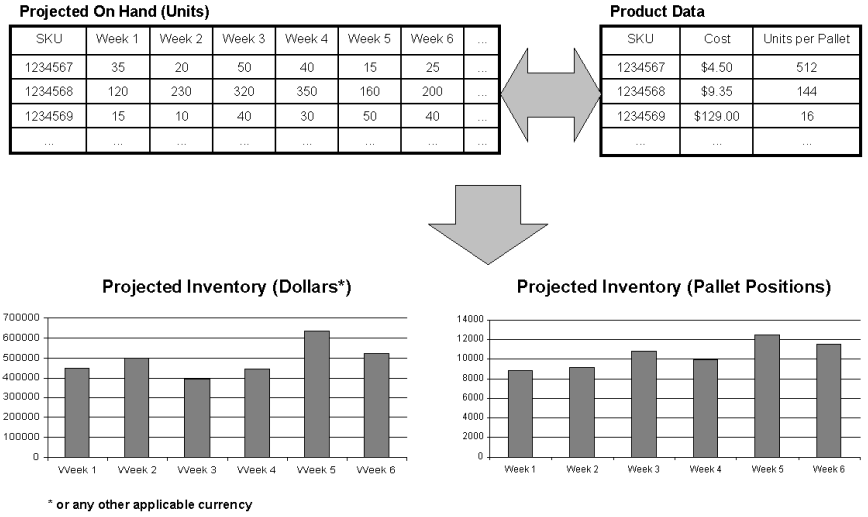


Figure 2.5: Projected inventory levels converted to inventory investment and space requirement.

Flowcasting for Lower Costs

By Flowcasting demand in a retail supply chain, companies can create numerous opportunities for reducing the cost of selling and distributing products. To appreciate the magnitude of these opportunities, consider the manner in which most companies order and deliver products today, as depicted in Figures 2.6 and 2.7.

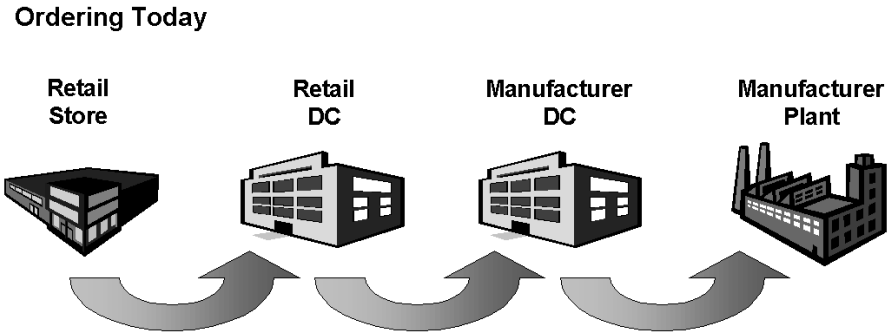


Figure 2.6: Ordering product in typical retail supply chains.

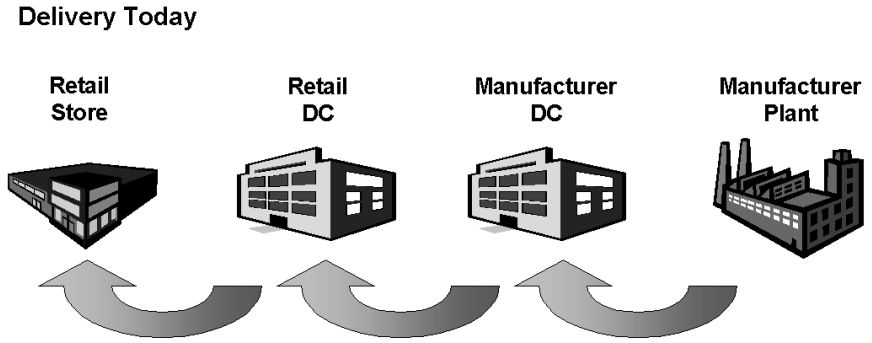


Figure 2.7: Delivering product in typical retail supply chains.

Normally, retail stores order from retail DCs, which in turn order from manufacturing DCs (MDCs) that place orders on the factories. Typical delivery cycles follow the same pattern, but in reverse: factory to MDC, MDC to RDC, and RDC to the store. (Note that we say "typical," because there are some variations. A retailer might, for example, cross-dock through a MDC or through an RDC. Or a retailer might bypass either the MDC or RDC.)

To Flowcast this supply chain, we would start with daily requirements at the head of the supply chain -- the store. Once those requirements are known, the entire retail supply chain can be synchronized to meet those needs. As a result, ordering and delivery requirements to retail stores will be completely visible to supply chain participants that manufacture and distribute those products. Trading partners will know the specific retail store needs today, tomorrow, next week and well into the future. The same visibility will apply to all other nodes in the supply chain. As a result, when conditions change (selling over or under forecasts), product flow requirements can be recalculated daily and communicated to supply chain participants.

Imagine how much supply chain partners could reduce selling costs if they had daily visibility into their customers' inventory levels, what and how much product their customers sell every day, and when their customers will order again. Now imagine this information being refreshed daily and shared among supply chain trading partners. The efficiencies and savings would be enormous!

Consider how the following trading partners would benefit if Flowcasting and the resulting Flowcasting process were implemented in their retail supply chains:

Retailers

- Retail distribution centers would become, over time, cross-docking and repackaging facilities. Products would arrive from supply sources and would then be repackaged when necessary in units of weekly store sales. Initially, most products would be cross-docked and inventory turn rates in RDCs would rise to 50 or more annually. Repackaging operation costs would be shared among supply chain trading partners. Over time, fewer retail DCs would be required.

- Retail stores would receive deliveries so that trucks would be unloaded in shelf placement sequence. Since repackaging would be done in RDCs (or in 3PL provider facilities), retail stores would be able to free up significant shelf space that management could use to fulfill other consumer needs. Backroom inventories would become a thing of the past. Retail store sales would increase 2 to 8 percent, while store inventory turns, over time, would rise to 50 or more annually depending on products' selling velocities.

- Retailers would no longer need separate forecasting and replenishment systems for their stores and RDCs. One common system would manage inventory in both stores and RDCs and interface with suppliers on a daily basis.

- The internal theft portion of product shrink would be reduced by at least 50 percent due to the hourly, and up to the minute, visibility of what is on the shelf, what is sold, and what is coming into the store.

- One common system would span cross-organizational boundaries. Store operations, merchandising, buying, category management,

distribution, finance, and management would all be working from one set of numbers.

Wholesalers

- Flowcasting would enable wholesalers to become value-added partners for their manufacturing suppliers and retailing customers. Their businesses would transform as they become professional cross-dockers and repackagers for those retailers or manufacturers that cannot or do not want to take on those activities themselves.

- Wholesalers would only need to hold a few days of inventory, compared to the volumes they carry today.

- Wholesalers would require far less warehousing space. Many of their current activities in purchasing, distributing, marketing, and selling would be significantly reduced and, in some cases, eliminated.

Manufacturers

- A manufacturer's way of doing business would change completely. The timeframe for the change would depend on the size of their retail and wholesale customers, and how rapidly those customers adopt Flowcasting. For example, if the major global retailer of a CG manufacturer we've researched adopts Flowcasting, that manufacturer would no longer have to forecast 30 percent or more of its business. Over time, as more retailers adopt Flowcasting, the manufacturer would gradually convert from a manufacture-to-stock (MTS) strategy to a manufacture-to-order (MTO) strategy for most of their business, and reap all the economic and productivity benefits that derive from the MTO approach. Gone would be the uncertainty of demand, associated safety stocks, and warehousing and operating costs as well as last minute and very costly production schedule changes.

Finally, supply chain-wide inventory investment would drop significantly for those retail supply chain partners that adopt the Flowcasting way of doing business. We predict that once critical mass is achieved, finished goods inventories in the global consumer goods industry would drop by two-thirds. These inventories, which now range from 80 to 120 days on hand in the consumer goods industry, would drop to 30 to 45 days on hand, which would represent a substantial opportunity to reduce costs, product obsolescence, and returns.

Improving the Execution of Sales Promotions

As vital as promotions are to a retail business, they often result in lost sales and excess inventory. The root cause is almost always improper deployment. It's one thing to forecast how much you will sell in total for a given promotion -- retailers working with the supplier offering the promotion usually do a good job of this task. But problems begin when the retailer has to spread the promotion quantities over participating stores. Retailers usually ship the complete promotion quantity to a store just ahead of the promotion. Since most promotions last a week, there is little time to make adjustments. By the time the promotion is over, retailers inevitably end up with out-of-stocks in some stores and overstocks in others.

Promotions are also critical for manufacturers in the consumer goods sector. As much as 40 to 70 percent of a CG company's annual sales volume is derived from products that are promoted to retailers and wholesalers. In certain product categories, many wholesalers *only* buy from promotion to promotion. Unfortunately, manufacturers typically have significant problems with planning and executing the promotions. The major challenges center on production constraints. On average, most manufacturers promote their products three to four times per year for a period of three to four weeks per promotion. That translates into an enormous amount of inventory created in advance of promotions. By way of example, the U.S. grocery industry (as of 2005) manufactures and distributes roughly 50 percent of their annual volume to retail DCs over a 12-week promotional period as promotional inventory.

Regardless of the industry, promotions are scheduled well ahead of time. Since manufacturing people need advance information about the scheduling of promotions, they are normally able to plan production and accommodate capacity constraints accordingly. For example, let's assume that the maximum amount of product a manufacturer can produce is 1,000 units per day. Let's also assume that the manufacturer knows a promotion for the product will start in three months and that the promotion forecast predicts demand of 10,000 to 12,000 units per day (or 10 to 12 times the plant's daily production capacity). This means that the manufacturer has no choice but to start producing product and holding it as inventory several weeks before the promotion begins. In fact, many consumer goods manufacturers typically start making product *10 to 12 weeks* ahead of a promotion. In other words, they produce very large amounts of inventories ahead of the stores' needs and deploy it to their own DCs in anticipation of receiving retail/wholesale orders for a particular promotion.

Manufacturers must resort to this strategy because they have little flexibility to add or reduce production capacity without creating a major financial impact. That means for 40 to 70 percent of their annual production volume on promoted products, manufacturers have already produced *100 percent* of what will be sold during a promotion! That inventory is normally deployed into the manufacturer's own DCs six to eight weeks before that product will be sold in retail stores. So for promoted products, the problem is not with production -- *the real issue is one of executing proper product deployment from MDCs to wholesale or retail DCs and stores*. If there are constraints during promotional periods, they will be found outside the four walls of the factory, anywhere within the retail supply chain.

Impact of Flowcasting on Demand and Business Planning

The introduction of Flowcasting will bring with it the need for new approaches to planning. Like manufacturing systems thirty years ago, the planning systems in retail organizations as mentioned earlier are isolated today from one another. As a result, the top-level cat-

Figure 2.8: Disconnected retail systems.

egory plans are not directly connected to the systems that purchase and replenish products (see Figure 2.8).

Top-level plans are developed, but a reorder point system orders products when the inventory at a particular location drops to the trigger point. If the sum of these purchases adds up to the dollar amount on the category plans, it's just coincidental.

A Flowcasting system creates a direct connection between top-level plans and the execution systems that buy products. The same direct connection is also in place with respect to the systems that are used to make decisions about hiring full- or part-time associates, negotiate freight rates and/or increase the fleet size, and project profit and inventory levels into the future.

In a Flowcasting environment, the business planning process is similar to that used in manufacturing operations. Flowcasting, however, adds components to both demand management and resource planning that make it possible to link business plans with a single time-phased forecast that starts at the retail store end.

The left column of Figure 2.9a shows the overall business planning process. First the business plan, which is developed in the currency of choice, would be agreed upon. Next, product plans at a high level in the merchandise hierarchy or at the category level would be developed to support the business plan. These high-level plans would be translated into the demand side of the business; that is, what the consumers are expected to buy. At the "atomic" level (the store/SKU level), the plans are aggregated to confirm, or change and realign, higher level plans.

The right column of Figure 2.9a shows the four basic components of demand management that Flowcasting integrates. (These components, which will be described in detail in Chapters 3 through 5, enable effective demand management in a retail setting.)

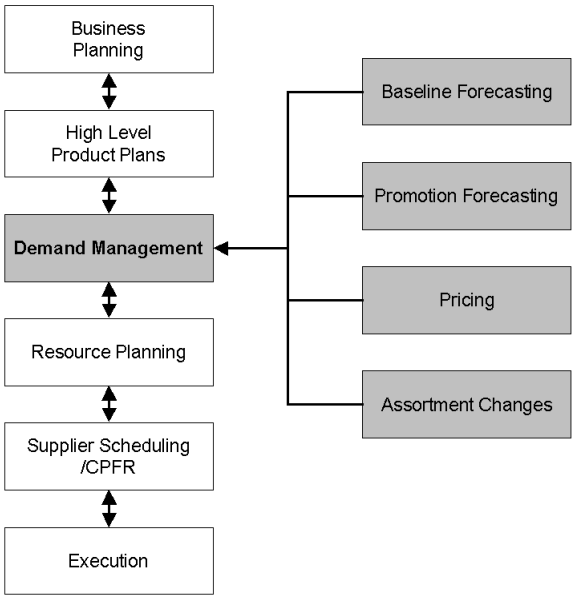


Figure 2.9a: Demand Management components of a Flowcasting system.

Figure 2.9b shows the resource planning components that Flowcasting injects into the planning process. These five components (see Chapters 6 through 10 for details) enable retail companies to effectively manage all their key resources -- inventory, people, space, and equipment.

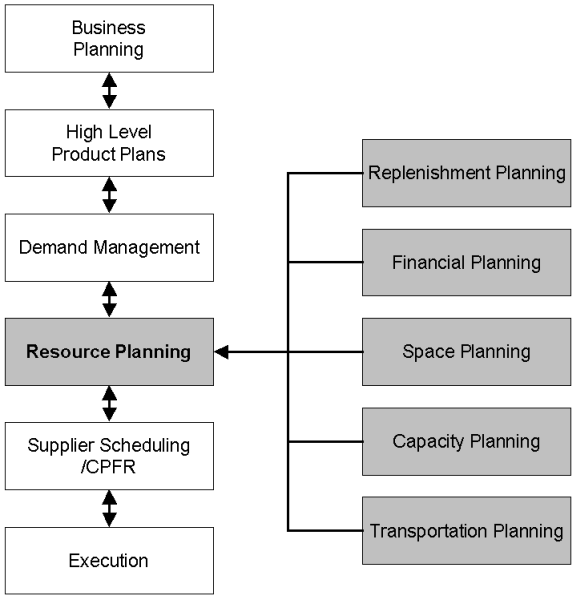


Figure 2.9b: Resource Planning components of a Flowcasting system.

The Demand Management and Resource Planning components of Flowcasting create a direct connection between the top-level plans of the business and the operating plans that actually order merchandise, schedule people's time, arrange for transportation, etc. For example, if a buyer decides to make a large purchase of an item, that quantity will immediately show up in the merchandise plans, along with:

- the amount of storage space needed (in the space plans)
- the weight and cube needed (in the transportation plans)
- the hours required to unload the shipment (in the capacity plans)
- the cost of this large purchase
- the inventory increase
- the change in gross margin (in the financial plans)

In short, everyone will be in the game using the same playbook. Best of all, there's still time to change the plans if business conditions change. From a planning perspective, this is vastly better than looking in a rear-view mirror and piecing together "what we should have done."

Flowcasting Will Spawn New Modes of Distribution

As a result of Flowcasting, distribution, and logistics professionals will finally be able to apply their expertise in their field and generate significant savings for their companies; distribution people have long known how to save money, but they've lacked the timely information necessary to do so. Flowcasting gives distribution professionals the visibility they need to take advantage of opportunities for bypassing nodes in retail supply chains when applicable. This will result in increased inventory velocity and reduced operating costs for trading partners.

As more companies adopt Flowcasting as a way of replenishing inventory across retail supply chains, new modes of distribution will emerge. Manufacturers, for example, will be able to collaborate and combine their efforts to reduce the cost of distribution and increase product velocity (see Figure 2.10).

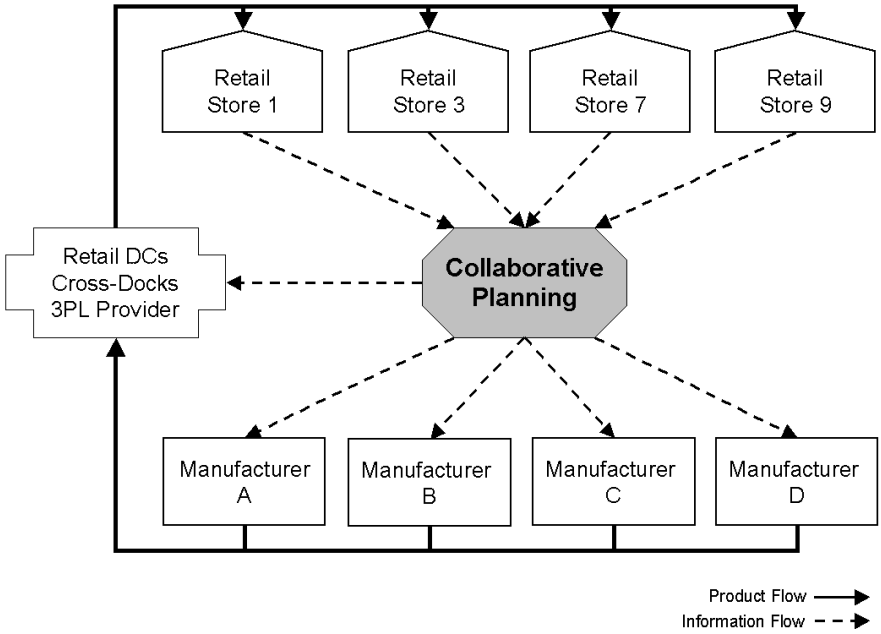


Figure 2.10: Collaborative distribution model.

Such collaborations will make it possible for manufacturers to partner with other manufacturers and deliver to a common customer at a specific store. Transportation volumes for a group of manufacturers could also be combined by store, affording additional economies. For example, imagine a group of ten stores which has a combined volume for one week that adds up to ten trucks. Say there are ten manufacturers involved in the collaboration and each has the equivalent of one full (or nearly full) truck to ship weekly to this group of stores. The Flowcasting system communicates the store orders to all parties involved. Trucks are bulk loaded at the factories and shipped to an RDC or to a third party logistic provider (3PL) location. The trucks are then unloaded and the products are cross-docked to store specific trucks. The stores receive their deliveries on the day requested, and each truck will have a mix of product from each of the ten participating manufacturers.

In large manufacturing companies where products are manufactured in multiple factories, collaboration will be done internally to deliver to a common customer at a specific store. This will entail using a corporate portal, as shown in Figure 2.11.

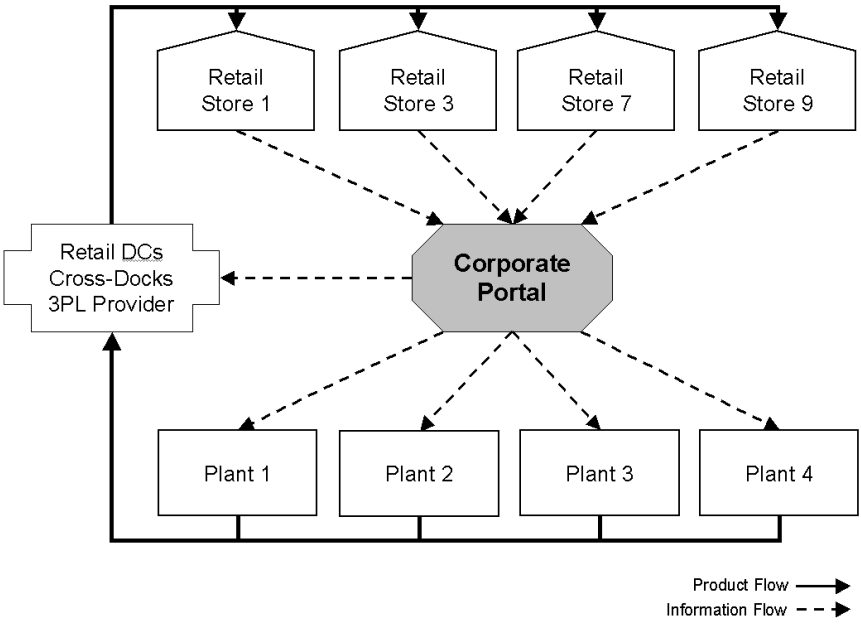


Figure 2.11: Corporate portal model for large manufacturers.

Making It Happen: The Flowcasting Team of the Future

For Flowcasting to succeed, retailers, wholesalers, and manufacturers will need to create Flowcasting teams. The teams' mandate will be to put new business processes in place. These new business processes will support dynamic models of complete product flow from the time products leave factories to the time it ends up on the store shelves. In other words, a whole new world of communications and collaboration will evolve. Retailers will create data repositories, as Wal-Mart and K-Mart did when they created Retail Link and Workbench. These retailer data repositories will contain:

- daily POS, daily store, and DC on hand balances and in transits
- daily store and DC cycle count adjustments
- replenishment lead-times
- minimum store shelf and DC safety stock quantities
- minimum store and DC ordering quantities
- shipping schedules

- new store openings
- new product introductions
- product deletions

Retailer data will flow daily from their repository into the Flowcasting systems, which will contain distribution patterns (factory to MDC to RDC to store, for example) for every product found on retail store shelves. Flowcasting will use the distribution patterns to model the total product flow from factories to store shelves, thus serving as a bridge between the retailer and the wholesaler or manufacturer's ERP system. Figure 2.12 offers a preview of the information flow.

The Composition and Role of Flowcasting Teams

We anticipate that Flowcasting teams will consist of a retailer team and a supplier team. The retailer team will include representatives

The New Flowcasting World of Communications

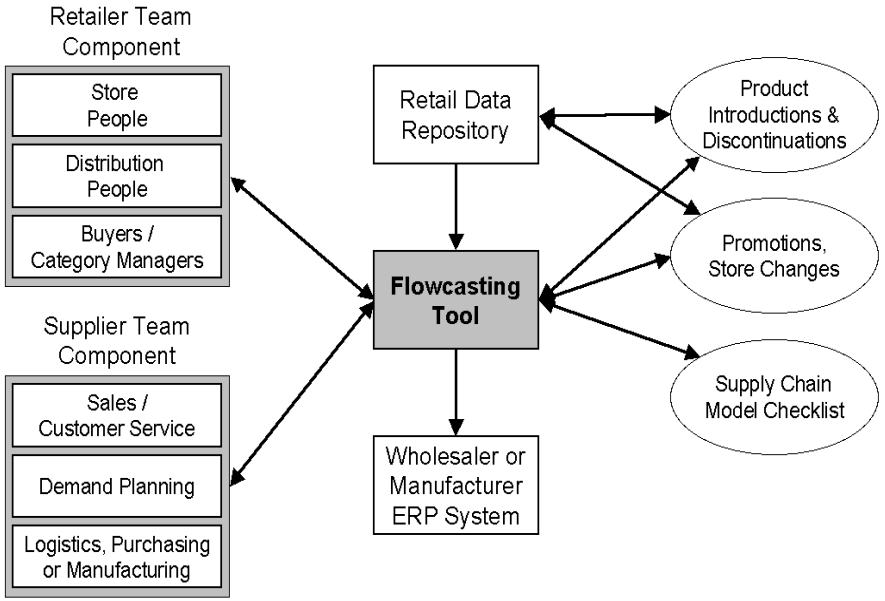


Figure 2.12: Communication patterns in a Flowcasting environment.

from the stores, distribution, category management and purchasing. If the supplier is a wholesaler, the team will include representatives from sales, customer service, demand planning, logistics, and purchasing. And if the supplier is a manufacturer, the team will be made up of representatives from sales, customer service, demand planning, logistics, and manufacturing.

The Flowcasting teams will have two roles. The first will be making sure that foundational data is accurate, complete, and up-to-date. By foundational data, we mean the data repository mentioned previously. It consists of daily POS, inventory balances, lead-times, shelf configurations, safety stocks, MOQs, and shipping schedules.

Specific team members will continually monitor and update the pool of foundational data as business conditions change. The updating will be critical; if the goal is to create accurate models of the way a company wishes to do business, the foundational data must mirror the current environment as well as the rules and schedules used to manage the business on a day-to-day basis.

The second role of the flowcasting team will be to jointly develop and agree upon (the retailer with the wholesaler or manufacturer) store-level sales forecasts that also include promotion planning, product introductions, and product discontinuations.

Finally, Flowcasting teams will act as a buffer for the new business paradigm. You can't overhaul the data structure of a retail supply chain overnight anymore than you can turn an aircraft carrier on a dime. There will be pockets of resistance as well as the normal fears of change that accompany the introduction of new ways of doing business, no matter how much better the outcome may be. Part of the methodology entails preparing people for change. And change there will be! The enormous visibility provided by Flowcasting will be the precursor to the demise of forward buys and product diversions. In addition, over time we will see the reduction of back rooms in retail stores, and a reduction in the number of warehouses and distribution centers across retail supply chains.

Summary

In this chapter, we demonstrated the power of Flowcasting, a time-phased system for planning the flow of product throughout the entire retail supply chain. Key points include the following:

1. True uncertainty only exists at the final point of sale: the retail store. Uncertainty can be eliminated by Flowcasting all product movement throughout the supply chain, beginning at the retail store.
2. Flowcasting provides unparalleled supply chain modeling capabilities, made possible by dependent demand. Flowcasting introduces new opportunities to plan capacities for people, space, and equipment from the same numbers used to purchase and replenish products into retail DCs. The flowcasting projections from Flowcasting can be converted into desired currencies as well as into units of capacity for people, space, and equipment, thereby providing a much-needed bridge between manufacturing and retail trading partners.
3. Flowcasting introduces new approaches to demand management and resource planning in a retail company. It enables a retailer to operate the business from a single set of numbers.
4. In the future, Flowcasting teams will introduce new business practices and processes that will ultimately transform how retailers, wholesalers, and manufacturers interact to achieve improved customer service and greater profitability.

This concludes Section 1 of this book. In the second section, we'll focus on the details of Flowcasting and explain how Flowcasting is used in actual retail settings. You'll quickly see that Flowcasting is far more than a theoretical construct. It's here. And companies are using it to gain a competitive advantage, today.