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Demand Forecasting Done Right

FORRESTER®



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Manufacturers are embarking on POS and RFID projects to factor in consumer demand. But first they must unify internal demand forecasts, hone POS accuracy, and tighten distribution links.

2 MARKET OVERVIEW

- Shorter product life cycles and fresher consumption data are forcing firms to revisit current demand management practices.
- But firms struggle with store-level consumption signal accuracy and widespread use.

3 ANALYSIS

- Firms must first clean up messy internal demand practices.
- Firms should expect consumption-driven production to be only a pilot.

8 WHAT IT MEANS

- CPFR becomes irrelevant.

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MARKET OVERVIEW

DEMAND-MANAGEMENT TUNING EXERCISE MEETS LIMITED SUCCESS

Forrester recently surveyed 18 experts in distribution, retail, and manufacturing to understand their practices for managing demand information. Facing increasing uncertainty and inventory write-offs, our respondents told us they're focused on improving demand forecasting and distribution strategies. Why now? Firms are driven as a result of:

- **Readily available point-of-consumption signals.** Manufacturers are increasingly apprised of retail-store-level consumption -- through retail link, Wal-Mart now makes store-level data available to suppliers every 15 minutes. By regularly receiving this store-level demand, firms like Black & Decker can position inventory regionally to meet real demand. The University of Tennessee estimates that manufacturers can eliminate 40% of the inventory they currently hold.¹
- **Shorter product life cycles.** Procter & Gamble now offers 46 different types of Tide, while the average CPG firm now introduces 70 to 80 new products every year. With short product life cycles no longer limited to the high-tech industry, traditional make-to-stock firms like Kimberly-Clark must adjust production and inventory levels on the fly for all existing and new products -- or face excess inventory and lost sales. But to do so, these firms must shorten typical quarterly planned forecasting cycles to weeks to reduce error and improve asset use.
- **More flexible manufacturing.** Firms like Delphi and POSCO have redesigned their manufacturing facilities to handle shorter production runs and quicker changeover -- enabling them to respond faster to demand changes (see the May 2002 Forrester Report "The X Internet Makes Manufacturing Flexible").² As a result, firms like TRW Automotive want to trim forecasting horizons and manufacturing planning cycles -- rather than producing well in advance of consumption.

But Existing Demand Practices Fail To Deliver . . .

Firms' efforts to improve demand management by replacing historical-data-based forecasts with actual consumption signals are stymied by their existing processes since:

- **Building forecast consensus is time-consuming.** To agree on a forecast, firms must reach a consensus across sales, marketing, production, and finance -- a task that's not easy when each group has its own objectives and demand streams, making unification a battle each time. One CPG firm told us it takes them five days of long meetings to agree on a forecast across the organization. The problem? They begin this cycle again each week.

- **VMI doesn't get to the point of consumption.** While VMI signals are completely accurate, they don't get firms much closer to the point of consumption than ASNs do. Instead, most VMI initiatives plan off consumption that occurs at the regional distribution center -- not the local stores. This often results in huge discrepancies between actual consumption timing and replenishment orders.

. . . And Technologies For Capturing Consumption Are Immature

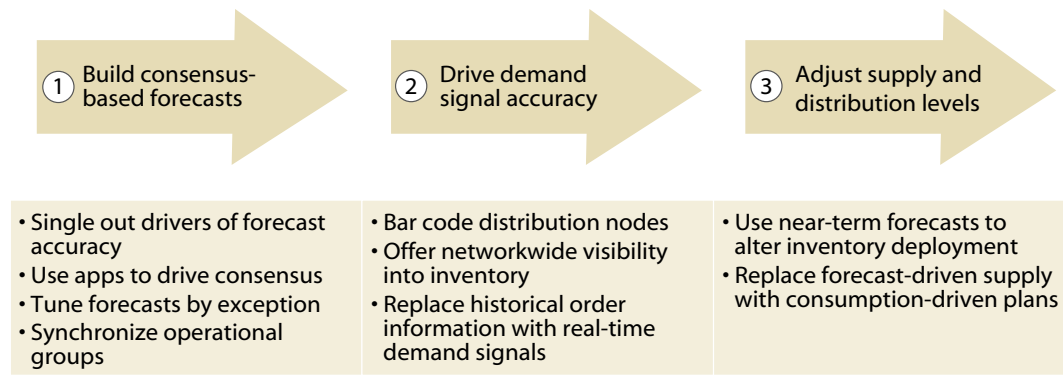
While manufacturers are eagerly piloting new technologies to build a true picture of consumption, these technologies are still immature and ineffective. In particular:

- **Legacy point-of-sale (POS) systems generate inaccurate data.** POS data is historically 6% wrong. Why? Scan-based errors and theft contribute to an inaccurate picture of merchandise availability, sales, and promotion trends.³ For example, when a consumer buys eight different types of Campbell's soup in a single purchase, often the cashier rings up all eight cans as the same item -- even if the consumer purchased chicken noodle *and* tomato rice (see the November 2001 Forrester Report "Picking A POS System").⁴
- **RFID is an experiment at best.** While RFID promises to help CPG and retail clients, it's not yet ready for item-level tracking (see the August 2002 Forrester Report "RFID: The Smart Product (R)evolution").⁵ Why? Low-cost tags are just now in their first production run, and industrialized scanners and antennas are still in test mode. With these issues to work out, most firms are experimenting with limited pilots and locations -- making incorporation of this consumption data into a meaningful forecast impossible today.

ANALYSIS

FIRMS NEED A PRAGMATIC APPROACH FOR FORECASTING DEMAND

Access to accurate real-time consumption data in theory would let manufacturers eliminate inventory stockpiles, tuning production to fluctuating consumer demand. But this pipe dream is far from a reality. Until store-level consumption signals like RFID initiatives and POS upgrades improve beyond pilots, firms must take a pragmatic approach to demand forecasting by executing three steps (see Figure 1):

Figure 1 Firms Must Take Three Sequential Steps To Integrate Demand

Source: Forrester Research, Inc.

1. **Build consensus-based forecasts.** Firms must streamline and expedite consensus-building process for forecasts to accommodate consumption patterns.
2. **Drive demand signal accuracy.** After speeding internal forecasting processes, firms should focus on improving signal accuracy for baseline demand.
3. **Adjust supply and distribution levels.** Once forecasts are generated from consumption, firms must optimize production and inventory to meet with them.

Step 1: Build Consensus-Based Forecasts

While RFID and POS can provide real consumption trends, lengthy forecast processes will nullify their usefulness. To build internal consensus quickly on forecast adjustments, firms must:

- **Single out drivers of forecast accuracy.** While many firms will list dozens of drivers that change demand patterns, a detailed analysis will often remove those having a minor impact. To do this effectively, firms like NCR use PwC to help identify and remove demand drivers -- like promotions or competitor relocations that artificially raise or lower consumption -- to reflect an accurate picture of real demand.⁶
- **Use apps to drive consensus.** Firms must be able to gain consensus on forecasts in hours -- not days or weeks. Using apps from Manugistics, Bausch & Lomb today creates forecast consensus in hours by combining baseline data sources into one model -- tunable by promotions, VMI feeds, and production constraints. And CPG firms like Sanford Group -- with thousands of product intros each year -- can use Logility's app to unify demand signals for production and marketing to negotiate and finalize forecast decisions online.

- **Tune forecasts by exception.** Firms need collaborative tools that track *relevant* changes in demand patterns, signals, and drivers. So rather than routinely replanning each week, firms like Whirlpool can use Oracle's multidimensional app to gain visibility and reforecast on an exception basis -- like when the difference between the forecast and actual demand exceeds a certain percent. And firms like Unilever can tap SAP tools that mine actual sales data to warn marketing of significant forecast variations for an individual brand.
- **Synchronize operational groups.** New consensus processes won't work if departments are out of sync. One CPG firm implemented consensus forecasting, but finance overrode it to meet its own goals, reducing accuracy by 30%. To keep business units from focusing on their individual metrics, firms like Minor Health Products use i2's Demand Planner to benchmark key metrics against "best-practice" workflows. This ensures that their consensus forecast becomes operational reality for operations, finance, and sales.

Step 2: Drive Demand Signal Accuracy

Firms can't migrate from a forecast-based to consumption-driven supply network until they can rely on accurate demand signals. Since POS data is often inaccurate, firms must first gain demand visibility at upstream distribution nodes in the supply chain. How?

- **Bar code distribution nodes.** CPG firms like P&G want to use real-time demand data to shrink production-to-consumption cycles to less than a week. But before RFID-tagging every physical asset in their supply networks, firms should tackle the basics of bar coding at DCs and regional centers -- using receiving and delivery data at regional DCs and cross-docks until accuracy improves. Firms that have invested in warehouse management apps from vendors like EXE can use wireless bar coding technologies -- and later transition to RFID without a system overhaul.
- **Offer networkwide visibility into inventory.** Once firms begin collecting actual demand data, they need to expose it to brand, production, and inventory managers to adjust forecasts and drive replenishment. Using an adaptive logistics management (ALM) app from WorldChain or Savi Technology, firms can use both static and in-transit inventory data to feed daily forecasts (see the July 2002 Forrester Report "Grading Apps For Inventory And Order Visibility").⁷ One MRO supplier was able to feed inventory receipts into forecasts and adjust replenishment needs daily -- shortening its forecasting horizon from eight to two weeks.
- **Replace historical order information with real-time demand signals.** Fashion retailers like Gap struggle to get the right inventory on store shelves because current and past sales data sit in different systems -- making it impossible to form a true

picture of changing demand. But European clothing retailer Zara -- which introduces more than 10,000 new SKUs each year -- uses a wireless system to place orders from the store floors directly to the plant floor.⁸

Step 3: Adjust Supply And Distribution Levels

Once baseline forecasts embrace real-time demand, firms must use those consumption-driven forecasts to shape inventory and production decisions. Firms should:

- **Use near-term forecasts to alter inventory deployment.** Firms can't drive production directly from consumption data -- long production lead times depend on forecasts. Instead, firms should emulate Kimberly-Clark, which is using DC-based consumption-driven forecasts to alter inventory placement -- moving a shipment of shampoo from one regional DC to another to take advantage of a successful weekend promotion. While underlying data feeds will have some errors, inventory movement will lower overall supply chain costs.
- **Replace forecast-driven supply with consumption-driven plans.** Starting in 2003 as manufacturing becomes more flexible, firms can pilot consumption-driven production instead of building inventories. First, with VMI orders of short-cycle re-occurring goods, manufacturers like HP can link specific orders to production changeover and ship product from the production line to retailer stores directly (see the February 22, 2002 Forrester Brief "Executive Overview: Adaptive Supply Networks").⁹

WHERE TO LOOK FOR HELP

Restructuring entire supply and demand processes and experimenting with new technology will push firms to seek help from (see Figure 2):

- **Sales and operations planning (S&OP) consultants.** Firms need key partners, like IBM Global Services, Accenture, and Kurt Salmon Associates, that can develop an overall strategy for their entire supply-demand process change. These firms not only have experience with industry-specific implementations of consensus forecasting, supply planning, and forecast normalization, but they also have benchmarks and well-defined KPIs that let firms quantify their success.
- **Demand management vendors.** In addition to process change, many firms will need new collaborative forecasting engines that let them bring in forecast data from different sources -- like stores, accounts, or DCs -- and view by formats like store-level, brand, or monthly account status. Likely candidates? i2 Technologies, Logility, Mercia Software, Manugistics, and Prescient Systems.

Figure 2 Vendors Can Help Firms Overhaul Demand Forecasting

Category	Capabilities	Example vendors												
Sales/operations	<ul style="list-style-type: none"> • Industry-specific process/methodology • Benchmark of KPIs • Alignment of practice with consumption-based technology 	Accenture Inforte IBM Global Services Kurt Salmon Associates												
Demand management vendors	<ul style="list-style-type: none"> • Multidimensional planning • Forecast personalization • Support for new-product life cycles 	<table border="0"> <tr> <td>i2 Technologies</td> <td>PipeChain</td> </tr> <tr> <td>Logility</td> <td>Prescient Systems</td> </tr> <tr> <td>Manugistics</td> <td>Retek</td> </tr> <tr> <td>Mercia Software</td> <td>SupplyChainge</td> </tr> <tr> <td>NONSTOP Solutions</td> <td>Syncra Systems</td> </tr> <tr> <td>Oracle</td> <td>WorldChain</td> </tr> </table>	i2 Technologies	PipeChain	Logility	Prescient Systems	Manugistics	Retek	Mercia Software	SupplyChainge	NONSTOP Solutions	Syncra Systems	Oracle	WorldChain
i2 Technologies	PipeChain													
Logility	Prescient Systems													
Manugistics	Retek													
Mercia Software	SupplyChainge													
NONSTOP Solutions	Syncra Systems													
Oracle	WorldChain													
RFID	<ul style="list-style-type: none"> • RFID and POS support • Analysis and data 	Adexa Savi Technology SAP (Inventory Early Warning Agent) Teradata												

Source: Forrester Research, Inc.

- **RFID and POS data mining technologists.** As firms begin to experiment with real-time consumption data, they'll need analytic apps from vendors like Teradata or SAS Institute or agent-based solutions like SAP's Inventory Early Warning Agent. These tools can quickly convert petabytes of real-time RFID and POS data into aggregate-level demand signals that offer users insights into actual customer behavior and inventory positions (see the May 6, 2002 Forrester Brief "RFID Redefines The Retail Supply Chain").¹⁰

WHAT IT MEANS



Inventory planning apps become more dynamic.

Renewed interest in forecasting and shortening the cycle will have a huge impact on inventory applications. In the past, firms have bought DRP systems from vendors like Manugistics that support static replenishment -- so min/max boundaries are set once, and when inventory falls below the minimum level, it is replenished. In the future, as forecasts are updated by exception, inventory planning apps from vendors like NONSTOP Solutions and Retek will dynamically set replenishment levels to reflect changes in consumption trends. The overall impact? Inventory turns improve by 30%.



Consumption-based demand management stifles CPFR.

As firms continue to improve internal forecasting consensus processes and internal business group collaboration, they will de-emphasize CPFR initiatives -- which are still mostly pilot projects today. As manufacturers improve internal cycles, replace distribution with store-level demand data, and drive production directly from consumption, the need to share and agree upon forecasts with customers will be unnecessary. As a result, retail customers will shelve CPFR projects and instead invest the money in RFID and flexible manufacturing apps.

RELATED MATERIAL

Companies Interviewed For This Report

Cott Corp.
www.cott.com

i2 Technologies
www.i2.com

IBM Global Services
www.ibm.com/services

Inforte
www.inforte.com

K2B
www.k2b.net

Kimberly-Clark
www.kimberly-clark.com

Logility
www.logility.com

Manugistics
www.manu.com

Mercia Software
www.mercia.com

Miller Brewing Company
www.millerbrewing.com

NONSTOP Solutions
www.nonstop.com

Oracle
www.oracle.com

Prescient Systems
www.prescient.com

Retek
www.retek.com

SAP
www.sap.com

Savi Technology
www.savi.com

Syncra Systems
www.syncra.com

Unilever
www.unilever.com

Related Research

August 2002 Forrester Report “RFID: The Smart Product (R)evolution”

July 2002 Forrester Report “Grading Apps For Inventory And Order Visibility”

May 6, 2002 Forrester Brief “RFID Redefines The Retail Supply Chain”

May 2002 Forrester Report “The X Internet Makes Manufacturing Flexible”

February 22, 2002 Forrester Brief “Executive Overview: Adaptive Supply Networks”

November 2001 Forrester Report “Picking A POS System”

GRAPEVINE

Making sure Sally gets that Mustang.

The benefits of demand management don't stop with supply chain and logistics. Forrester recently spoke with Trilogy, a vendor of customer-facing apps that handle sales, marketing, and service. Trilogy customer Ford Motor Company has a nifty search feature on its site that lets potential buyers find the vehicle model and color they want at a convenient dealership; if you want a green Explorer, you'll find the closest one available. Demand for green Explorers goes back to Ford folks in both manufacturing *and* marketing -- enabling correct inventory stocks but also showcasing searched terms for future marketing strategies. If candy-apple-red Mustangs are a hot search ticket, Ford's marketing gurus have their next campaign theme ready to go.

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Forecast errors are okay . . . really.

According to a conversation with Inforte, one of the reasons that CRM hasn't yielded benefit is that it doesn't solve the problems of the future. The goal is not to achieve zero error but to achieve a consistent error every time so you can predict it. If you are always 30% wrong with the forecast, then you can be 100% right because you can adjust. Sounds like fuzzy math, but it makes sense to us.

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It's a good thing sales and marketing aren't in charge of chemicals.

Manugistics told us about a personal-care products company that tried using different kinds of histories to come up with a unified forecast. By using one history stream, each group created a forecast and looked at which one was the closest. The core operations group tended to be the most accurate; marketing and sales the least . . . and when they were wrong, they were highly inaccurate. At least they were forecasting sales volumes and not volumes of peroxide to add to lens solution.

ENDNOTES

- 1 Kahn, Kenneth B. and John T. Mentzer, "EDI and EDI Alliances: Implications for the Sales Forecasting Function," *Journal of Marketing Theory and Practice*, (No. 2, 1996), pp. 72-78.
- 2 Delphi's Oak-Creek (WI) plant has curbed its order-to-delivery cycle from 21 days to four days, whereas POSCO can today promise a two-week delivery window -- a record within the steel industry. Both companies heavily leverage X Internet technologies like RFID and sensor-enabled shop-floor equipment to make their manufacturing flexible.
- 3 One CPG firm was experiencing a 50% theft rate of its top seller in a retail chain, meaning on-hand retailer inventory doesn't match projected inventory half of the time.
- 4 POS terminals have been optimized for a single purpose -- processing a transaction -- but retail today requires more than current POS systems deliver. They're isolated, expensive to maintain, and can't be upgraded to meet the increasingly sophisticated needs of retailers.
- 5 RFID is today what the bar code was in the early 70s -- a promising technology with narrow exposure. At present, RFID is limited to a handful of pilots and an even smaller number of full-blown deployments -- amounting to around 1 million tagged objects in the CPG industry. But just as it took only three key events to drive the worldwide adoption of the bar code, it will take only a few drivers -- occurring in 2003 and 2004 -- to ignite RFID expansion.
- 6 PwC Consulting was acquired October 2, 2002 by IBM for approximately \$3.5 billion in cash and stock, creating IBM Business Consulting Services, which is a part of IBM Global Services.
- 7 ALM apps help firms: 1) sense and interpret, by providing visibility into shared processes; 2) decide and act, by aggregating, syndicating, and transacting data across multiple firms; and 3) learn and transform, by recommending corrective action and redirecting resources.
- 8 Helft, Miguel, "Fashion Fast Forward," *Business 2.0*, May 2002. The firm has tripled profits over the past three years by producing to order.
- 9 Growing uncertainty and variability in supply and demand will drive firms to migrate their static supply chains to adaptive supply networks, which are event-driven, real-world aware, and self-regulating.
- 10 Because of cross-border tracking issues, Europe has been more aggressive in piloting RFID, but it looks attractive to retailers in the US because of its declining costs and increasing competitive pressure.

Forrester's WholeView™ Research provides clients with unified guidance on customer trends, business strategy, and technology investments through Technographics®, TechStrategy™, and TechRankings™. WholeView Research drills down into the most important details of an issue while maintaining a holistic perspective of the impact of technology change on business.

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