A DIGITALLY-CONNECTED, CONSUMER-DRIVEN *Supply Chain*

Lessons learned at Princess Auto Limited when it implemented "flowcasting."

BY MIKE DOHERTY AND SYLVAIN LANDRY

"The best laid schemes o' mice an' men
Gang aft a-gley."

— *From "To a Mouse" by Robert Burns*

It may seem anachronistic to begin an article about today's digitally-connected, omni-channel supply chain with a quote from an 18th century Scottish poet. However, many retail supply chains have operated from the principal: "The best-laid plans … may still go wrong."

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In the retail world, inaccurate forecasts and plans too often lead to over-stocks of all the wrong items, out-of-stocks of the right items, lost sales opportunities and reduced profit margins.

Getting inventory right in the distribution center and on the store shelf is an imperative in today's hyper-connected and always-on world, where consumers rule. They now have at their fingertips access to real-time information that helps them make informed decisions about product purchases, shopping preferences and recommendations. Coupled with a social mindset, it's no wonder that the digitally-connected, agile and omni-channel supply chain is top of mind for most retail supply chain professionals.

What do these trends mean? That the status quo will inhibit a retailer's ability to meet the ever-evolving and demanding needs of the consumer. In addition, retailers that don't change and deliver to the always-on consumer will be faced with lost sales, poor supply chain performance and the resulting erosion of margin and profits.

To combat these pressures and respond to the increasingly demanding requests from consumers, retailers have been working to improve supply chain agility and responsiveness. Additionally, to address retail out-of-stocks—that have remained stubbornly at 8% to 15% for decades based on various studies by the Coca Cola Retailing Research Council and the Grocery Manufacturers Association—retailers and manufacturers are collaborating in order to better plan and execute; ultimately attempting to drive all planning and execution as close to the consumer as possible.

This paper outlines a process known as "flowcasting" that was utilized by the Canadian hard goods retailer Princess Auto Ltd, or PAL, to significantly reduce out-of-stocks while improving inventory performance and bottom-line profits. Flowcasting is an approach to forecasting that makes consumer demand at the retail store the focal point for the time-phased planning of inventory and replenishment throughout the retail supply chain. As a result, the entire supply chain is driven from the consumer back—that real-time, hyper-connected, always-on consumer driving retail sales today—allowing real-time visibility and daily re-calibration of the extended supply chain. While many projects of this nature do not achieve the desired benefits, Princess Auto achieved industry-leading benefits by using an approach that focused on people and process—an approach that can help teach any company embarking on a transformation project. In addition, we will:

- outline the capabilities and benefits of daily re-calibrating and translating the latest insights about consumer demand into actionable information for all stakeholders throughout the extended supply chain—from consumer to factory;
- describe the approach that was used to change the entire mental model of the Princess Auto extended supply chain—from merchants, store operations, planners and suppliers—enabled by new technology that seamlessly connects the supply chain from consumer to factory; and
- differentiate flowcasting from S&OP (see sidebar).

Flowcasting vs. S&OP

Flowcasting is a retail planning process that is analogous to (and a direct descendant of) the manufacturing resource panning (MRP) and distribution resource planning (DRP) processes used to plan and manage manufacturing and distribution resources and inventories. The flowcasting process produces time-phased forecasts of consumer sales by item/store/selling location and calculates all resulting time-phased product flow plans from selling locations to all supply locations over a long-term planning horizon—seamlessly connecting and driving the retail supply chain based on the consumer.

S&OP is a process that utilizes the flowcasting projections—aggregated and converted to the language of the retail business (e.g., sales, purchases, inventories)—to assess business plans and strategies. The flowcasting process allows a retailer to connect the strategic, aspirational plans of the business with the day-to-day operational realities—thereby providing management with unprecedented control of the business.

In the same way that S& OP became ubiquitous in manufacturing and distribution only after MRP and DRP were widely adopted, the benefits of retail S&OP can only be unlocked with the elemental long-term projections provided by flowcasting.

A new take on planning

Although technology as a whole is changing at a rapid pace, most retail planning processes and solutions use the same basic thinking and approach. Most often, they rely on a re-order point, or min/max method, augmenting this basic thinking with home-grown analytics, often developed and managed with elaborate and labor-intensive spreadsheets.

New thinking has emerged that facilitates a planning approach that allows multi-echelon retail supply chains to be seamlessly integrated and re-planned daily based on actual consumer sales, connecting any number of distribution points and supply locations. In the process, this approach decimates out-of-stocks while providing a robust, agile, consumer-centric planning model. It's called flowcasting.

Flowcasting is a business planning process that generates long-term (typically 52 weeks or more) forward-looking, daily consumer demand forecasts. They do so by product, by how much a retailer will sell, by where and by when. The resulting upstream replenishment, purchasing and distribution/manufacturing plans integrate any number of supply chain echelons.

The flowcasting process is based on a fundamental tenet in supply chain planning: Never forecast what you can calculate. Every product movement in the extended retail supply chain is driven by a single forecast—consumer demand at a selling location such as a store, the web or any other point of consumption (see Figure 1).

Flowcasting makes a completely integrated retail supply chain possible while providing substantial bottom-line benefits for retailers and their trading partners. Changes in consumer sales and the resulting forecasts at the store or another selling location are easily and instantly translated and then made visible to retail, distribution and manufacturing facilities. In this way, everyone in the supply chain has complete visibility of future product requirements and flows.

Most supply chain executives and practitioners will agree that the retail supply chain should be demand driven—that is, it should be driven by a forecast of consumer demand based on point of sale (POS) data. Flowcasting makes this possible as a result of four fundamental pillars:

1. a digitally-connected model of the business;
2. a valid simulation of reality;
3. manageability and scalability; and
4. daily re-forecasting and planning.

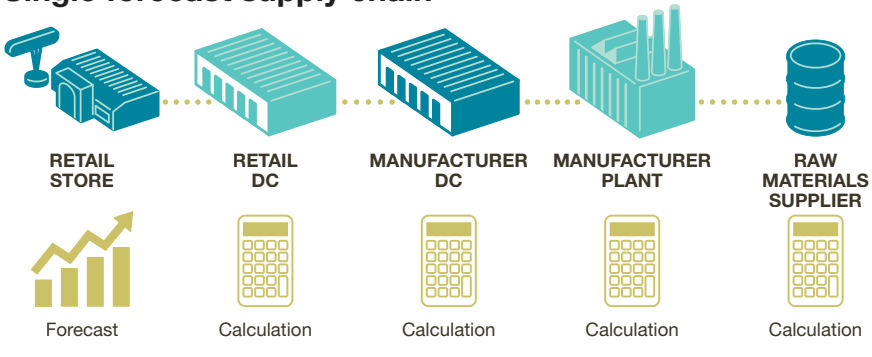
Digitally-connected model of the business

Flowcasting was designed with the vision of generating a set of consumer-driven, integrated plans that are valid across the entire value chain—including plans that span multiple organizations. It generates a single, bottoms up model of the retail business that projects forecasted sales, shipments, receipts and inventories at all stores, DCs and supply facilities by and for all products.

The retailer and its trading partners now have, for the first time, a complete up-to-date digital model of their business—that is, a digital twin of the physical supply chain—containing all projected product flows from factory to consumer for an extended planning horizon of 52 or more weeks. The result is that retailers, distributors, wholesalers and manufacturers gain unprecedented control over their businesses. High-level sales plans and targets are connected to and influenced by the day-to-day operating plans

FIGURE 1

Single forecast supply chain



Source: Authors

based on what is and what is not selling. This gives top management the ability to identify issues and opportunities in order to meet their financial plans and targets.

Simulating reality

A key concept and principle of flowcasting is that it provides the retailer and all associated partners—both internal (merchandise and operations teams) and external—with a valid simulation of the future. These projections begin at the most elemental level—by selling location and by item—and are used to calculate all future planned sales, inventory and product flows from supply to consumer for a planning horizon of 52 weeks.

In order to enable a valid simulation of reality, the process and supporting solution need to properly plan for a wide variety of planning scenarios that retailers typically have to manage, including three common ones:

- slow selling items;
- assortment changes; and
- seasonal items.

Slow selling items. In retail, a significant percentage of items sell less than one unit every two weeks in a store, or web store/point of consumption. The process needs to develop store level forecasts and replenishment plans for these slow selling items that are reasonable and provide all partners a projection of what's expected to occur—across time and location—ensuring that the resulting calculated demands for all partners is a good representation of what's likely to happen.

Assortment changes. Retailers are constantly changing and improving their assortments or offerings to their customers. The flowcasting process must properly depict when sales are expected to happen for new products and/or stores but also, importantly, provide sensible projections when products are planned to exit the assortment. That includes ensuring that available supply is not only properly reflected in not only the quantity and timing of the individual store forecasts, but also the resulting calculated dependent demand on the distribution centers and supplying locations.

Seasonal items. Many retailers sell seasonal and/or highly seasonal items. Providing a valid simulation of the future requires that store-specific seasonal selling patterns are created for these items. In addition, resulting end-of-season forecasts and inventory positions need to be planned to respect inventory carry-over targets and, critically, planned in advance of the actual selling season.

These three common scenarios are examples of the challenges faced by retailers that need to be properly planned. Given that all upstream projections of demand, supply, inventories and product flows are a function of the store-level forecasts and resulting replenishment plans, flowcasting requires that the process produces reasonable estimates of sales, planned shipments and projected inventory for all planning scenarios—thereby providing all partners in the extended supply chain a valid simulation of reality.

Manageability and scalability

The ability for people and systems to manage the vast array of information and data is another key pillar of flowcasting. New processes provide planners the ability to quickly and effectively update key planning information, such as forecasts and replenishment parameters, so that everyone can see the most up to date plans. The result is that flowcasting can scale to provide projections of sales, demand, inventory, capacities and financials for any sized retailer, for an extended planning horizon of 52 weeks or more. Planning for an extended horizon is crucial for retailers and manufacturers to perform integrated business planning, capacity and financial planning.

Daily re-forecasting and planning

Profitably staying in-stock is also critical to a retailer's success—even more so today. Fundamental to the architecture of the flowcasting process is that every product that had any change in status, including a sale, receipt or inventory movement, is automatically re-forecasted and re-planned for the entire, integrated supply chain. As a result, the process ensures that inventory is constantly re-aligned to where it's required based on what is and isn't happening at the retail/consumer level, one of the reasons we refer to it as a true consumer-centric, connected supply chain. One result of this simple, yet profound, capability is that out-of-stocks are virtually eliminated even during promotional periods and new product introductions, two critical customer journeys that are typically fraught with disappointment.

Princess Auto

Princess Auto Limited (PAL) is a Canadian hard goods retailer with stores located from coast to coast, selling a wide variety of products that are targeted to help "figure-it-outers" do, fix and make things. PAL's legendary customer service is based on a set of principles entitled "royal service" in which, among other axioms, "no sale is final."

The company was established in 1933 as Princess Auto Wrecking. Harvey Tallman purchased the business in 1942 and began by selling auto parts to customers who visited his shop located at Princess Street in Winnipeg, Manitoba. By the 1950s, Princess Auto Wrecking was buying parts from Canada and the United States, and Harvey had begun to travel worldwide in search of new products needed by farmers and handymen across Canada.

The company currently operates 47 stores across Canada and includes an online portal where customers can order digitally and have the products delivered to their preferred address. The stores are supplied by a national distribution network of three strategically-located distribution centers, acquiring and distributing products procured from around the world.

Flowcasting can scale to provide projections of sales, demand, inventory, capacities and financials for any sized retailer, for an extended planning horizon of 52 weeks or more.

In 2015, PAL became an early retail adopter of the flowcasting process, enabling it to manage the entire supply chain from a forecast of consumer demand, by item, by store and web store. They use the consumer demand forecast to calculate a series of integrated, time-phased plans over a 52 week planning horizon from the store to the supplier factory.

The projections of corporate product purchases are shared with their merchandise vendors in the form of a supplier schedule. That way, vendors have visibility to see future requirements and plan accordingly. Approximately 400 merchandise vendors are using these projections to plan raw materials and production and are adhering to the concept of "silence is approval." If they see something that looks odd in their schedule, they contact their respective analyst; otherwise, they are expected to supply according to the plan.

Product transfers from stores to distribution centers and purchase orders from vendors to distribution centers are automatically created at the agreed upon lead time between any two locations. Because all partners in the supply chain have visibility, they are working to a single lead time between two nodes in the supply chain; even promotional requirements are automatically converted to an order at the same lead time as regular demand. In fact, their thinking has evolved to the point where they understand that, in retail, there really is no difference between a regular order and a promotional order.

The unit projections at all levels are automatically translated to different languages of the business:

- in dollars for finance to aid in budgeting and gaining control of the business; and
- in cube and weight for distribution, transportation and retail operations to provide volume projections and automatically convert the projections to capacity requirements.

Since implementing flowcasting, PAL has achieved significant results, especially at the store shelf, where daily in-stocks increased from about 92% to a consistent 98%, regardless of the planning scenario.

In addition to the increase in in-stock and resulting sales increase, PAL has achieved improved inventory productivity throughout the extended organization. However, the biggest benefit is that PAL is now managing its business to a single set of numbers, where all departments, including suppliers, are driven by a common forecast of consumer demand and each department's plans are the translated version of this forecast into actionable information with which to improve service, cost and productivity.

Overall the flowcasting implementation was completed in about two years, including all SKUs, planners and suppliers. Given the significant in-stock increase and resulting improvement in sales and associated profits, the financial payback period was only a few months.

The anywhere shelf

By providing a digital connection from the consumer to the supply chain, the flowcasting process has allowed PAL to implement a new strategic direction for omnichannel fulfillment. Rather than supply online demand

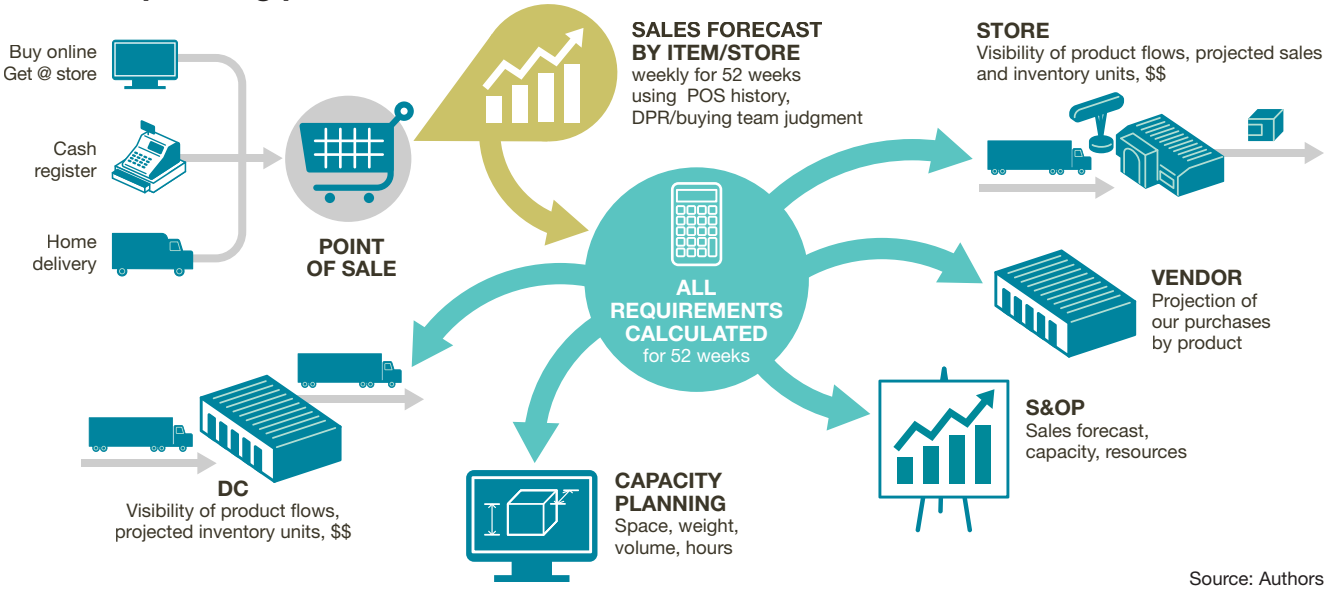
from a central warehouse, PAL is leveraging its new capabilities of consumer demand planning at the store level to deliver online demand from a number of strategically located stores across Canada.

This new omni-channel planning and fulfillment model, arguably a "next practice" in any-channel delivery, combines the best in terms of integrated planning and store level fulfillment to move as close as possible to the consumer, thereby significantly reducing customer order cycle times and last mile fulfillment costs. The new planning process is depicted in Figure 2.

The supply chain process is agile and flexible, consumer-driven, regardless of the consumer fulfillment model, and re-calibrates the entire supply chain daily, based on what is and isn't selling, in addition to newly minted strategies and tactics agreed upon. It enables PAL to profitably plan for and deliver to the "anywhere shelf"—the reality that consumers can browse and purchase merchandise from essentially anywhere, for delivery to anywhere.

FIGURE 2

The new planning process



Source: Authors

Implementation approach

During implementation, PAL created a team that combined the capabilities of business and IT with four employees from the business and two from the technology team. The team spent considerable time educating employees on the thinking behind flowcasting: how things work together and the principles of the process. They designed a series of process maps of the future state, including workflows that outlined how employees would execute the process for various planning scenarios.

Roughly 60% to 70% of the time was spent educating people and performing hands-on process prototypes, while 30% to 40% of the effort was devoted to more traditional training on the new system. The implementation team delivered process- and principles-based education to over 100 PAL Home Office employees and roughly 400 merchandise vendors.

The education started with the PAL CEO and cascaded to all employees and team members. Starting the education program at the CEO level was important. The goal of the education program was to not only disseminate knowledge but also, importantly, to build commitment and ownership because everyone realized that a change of this magnitude needed to be sponsored and driven by the executive team with an executive level of commitment.

One of the biggest challenges during the implementation was changing the mindset of the teams from focusing on the traditional retail view of ordering by category teams to thinking about consumer sales. Once a consumer sales forecast is developed and agreed on, what product needs to flow and ultimately be ordered can be calculated from this? Over time, the category teams evolved their processes and placed their trust in the planning process. Since then, the role of the category teams has shifted to determining which product assortment to offer for sale, along with strategies and tactics to drive sales, such as promotions and marketing, leaving the forecasting, planning and ordering to the supply chain teams.

Prototypes

Integrating the retail supply chain using flowcasting is first and foremost about people, process and changing behaviors, or as members of the PAL executive team like to say: "the mental model." While you can't implement flowcasting without a system, paradoxically, the more time and effort you spend educating, listening to, training and coaching people, the better the results.

The approach that was used to guide the implementation has its origins from the "proven path" approach that has been successfully applied thousands of times by the Oliver Wight Group. It's an approach that requires considerable time and effort on education, process prototypes, pilots and coaching.

Seth Godin, one of the world's leading marketing experts outlined the process of change best when he proclaimed: "People don't believe what you tell them. They sometimes believe what their friends tell them. They often believe what you show them. But they always believe what they tell themselves." Process prototypes are used to help people "tell themselves" that the change makes sense and will help their customers and improve their jobs.

To instill the change at Princess Auto, the team relied heavily on what they would describe as a "process prototype." A process prototype is much like a product prototype—essentially a "day in the life" of the new processes, executed with real data by the future planners and users so that they understand, see and feel the new process. It provides users a safe environment to experience the new process after they have been educated and, critically, provides the implementation team with feedback and input on the process and solution. They can share what they like and what they don't like, along with ideas for improvement. At PAL, it also provided the implementation team the opportunity to see how people ingrained the education they had been previously provided; what worked well, any struggles they encountered and where the implementation team would need to provide refresher education, training and coaching.

The implementation team used a series of process prototypes to iterate and improve the process, and gain buy-in from the planners and users, including store personnel, operations, merchants and suppliers. As users became more comfortable, they would go back to their daily jobs and help communicate to their peers about how the new process would likely work. By doing so, they were slowly "telling themselves" and their peers that flowcasting would work.

Using a process-prototype approach takes longer to get a new solution up and running, but, importantly, it makes the implementation smoother. That helps to ensure that the principles of the new process are ingrained and that business results can be sustained. In hindsight, the PAL project team concluded that the process prototypes helped people feel safe during the transition, and ultimately make the shift in thinking. It's a great learning for any transformation project and is consistent with modern design and agile thinking.

Digitally-connected

Princess Auto Ltd has digitally connected its supply chain from consumer to factory using the flowcasting process and solution. Along the way, it has changed the way the entire company plans and works. Now, the entire retail supply chain is re-synchronized on a daily basis as sales happen and the retailer can plan and deliver to any desired omni-channel fulfillment model. These leading planning capabilities are serving them well as they continue to deliver industry leading in-stocks, inventory performance and the never-ending work of improving their customers' journeys. In this instance, the best laid plans may still go awry—but more often than not, they go right.