High-Velocity Supply Chains for Perishables: A Fresher Proposition

To accelerate in-store delivery and ensure the freshest goods for consumers, today’s retailers must redesign their value chains, and create new ecosystems informed by sophisticated logistics and superior inventory management.

**Executive Summary**

The perishables sector of the retail industry is a case of extremes: above-index gross margins and waste; large variations in volume-to-sales ratios (depending on seasonal and climatic patterns) and a showcase for brand equity and risk. In Australia, the grocery and fresh produce retail industry registered a total turnover of $131 billion in 2009, with forecasted revenue of $194 billion by 2020 (compound growth of 3.7% p.a.). Approximately 40% of that revenue is derived from perishables - presenting an opportunity for retailers to achieve material, commercial and financial gains.

At the same time, today's consumers are better informed, and swayed by marketing campaigns that focus on their health and well-being, and their desire for fresher, more nutritious options. A recent report in *The Wall Street Journal* highlights the changing preferences of American consumers, who now favor fresh-from-the-source products over pre-prepared frozen meals. (Sales of the latter fell by 3% - to $8.92 billion in the period between 2009 and 2013, according to Euromonitor International).

Freshness is clearly on the agenda of leading retailers; for example, in 2013, Wal-Mart initiated a program to ensure the freshness and quality of its fruits and vegetables, backed by a 100% money-back guarantee.

Yet providing the freshest products to customers remains a challenge for retailers, since doing so is not tied to a single business function; merchandising, store operations and the supply chain all play a collaborative role in managing and maintaining freshness and reducing shrinkage in the perishables cycle. While different approaches can help retailers achieve this goal, developing a high-velocity supply chain is one of the most straightforward strategies for ensuring freshness and realizing top- and bottom-line improvements.

This white paper provides insights on the strategies, tools and technologies required to frame and create a high-velocity, highly efficient perishables supply chain.
The Need for a High-Velocity Supply Chain

According to Harvard Medical School's Center for Health and the Global Environment, in the U.S., produce purchased at the grocery store normally travels more than 1,500 miles from farm to table. A typical Australian food basket travels an estimated 70,000km – equivalent to travelling around the circumference of the earth twice or around Australia’s coastline three times.\(^4\)

While these are impressive logistics, a road literally less travelled could lead to fresher goods and better nutrition for the customer.

In-store product freshness positively influences customer demand. As stated in a report by consulting firm Oliver Wyman, “Customers who are satisfied with freshness will spend over a third more in the produce department of their primary store compared to those who are not satisfied. At the same time, they will spend 8% more of their total grocery spend with retailers whose produce they are pleased with than the shoppers who are not happy with that store’s produce.” The report also stated that “freshness and shrink, managed together, can add as much as $60M a year to a $10BN chain’s earnings while growing sales and improving its market positioning.”\(^5\)

Nonetheless, estimates tell us that produce spends up to 50% of its life between suppliers and retailers at different touch points in the supply chain. And a longer supply chain translates into more touch points. Each compromises product freshness and quality due to factors related to loading/unloading, wait and execution time on the dock, malfunctioning cooling systems, or incorrect configurations that can result in shrinkage or waste.

A high-velocity supply chain can reduce waste (shrink) across the chain by delivering product to store with an extended shelf life (i.e., by consuming less of the finite shelf life between manufacture or harvest and sale).

Extending shelf life provides more opportunities for a product to be picked from the shelf, and reduces the likelihood of it being thrown away due to expiration. A 2010 study by the Asian Food Information Centre (AFIC) reveals that 67% of consumers in India actively consider expiration dates before buying perishable goods.\(^7\)

While perishables make up about 38% of total store sales, they contribute up to 65% of total store shrink.\(^8\) Increasing the velocity of a retail supply chain increases revenue and gross profit proportionately (see Figure 1). The speed of the supply chain can be directly linked to the days it takes to deliver a product ready for sale in store. The faster this is executed, the wider the window of opportunity to sell, and the less chance of shrinkage/waste.

\[
\text{Days to Deliver} \propto \frac{1}{(\text{Opportunity to Sell})} \\
\text{Opportunity to Sell} \propto \frac{\text{Sales}}{\text{Waste/Shrinkage}}
\]

Profit Potential from Increasing Supply Chain Velocity

The transition from Supply Chain 1 to Supply Chain 2 shows how a high-velocity supply chain can improve gross profit. Figure 1
The industry average for retail shrinkage in the U.S. is around 2.7% of retail sales, with 65% of that attributed to perishables. Clearly, an opportunity exists to reduce shrinkage, increase overall revenue and provide a fresher proposition to the customer by accelerating supply chain velocity. The question is how? In the following pages, we will answer that question, and detail measures that can be taken to create a high-velocity supply chain.

Crafting a High-Velocity Supply Chain for Perishables

Bringing efficiency to the perishables supply chain is not just about the transportation lead time for logistics. That responsibility lies with all functions within the organisation that are engaged in the end-to-end supply chain. Any sustainable velocity strategy will require all processes involved in product flow and management to work together seamlessly.

Before investigating or executing an optimal organisational structure, it is important to start with a process analysis to diagnose the root cause of impediments to supply-chain velocity. This exercise, which includes the steps above, will quickly reveal areas for improvement, and help define future initiatives and subsequent implementation plans.

1. Identify Priority Action Items

Optimising every stock keeping unit (SKU) in a supply chain is unfeasible. A more pragmatic approach is a Pareto-style analysis to define the top 20% “highest value” and “most at risk” product lines, based on lead-time analysis. Improving velocity through the supply chain for these items will have an incremental impact on profitability and decrease waste.

At-risk items are identified based on their ESL (effective shelf life, i.e., the remaining life of an item) after removing lead-time components and minimum freshness days* from the total shelf life. ESL represents the window of opportunity to sell a perishable item at maximum margin.

Effective Shelf Life (ESL) = Total Shelf Life - Supplier to Customer Lead Time - Minimum Freshness Days

* Minimum freshness days is the number of days a product must maintain freshness in order for a customer to accept it, e.g., a customer will buy milk if it has a minimum of two days of freshness remaining or is set to expire after two days.

2. Perform a High-Level Supply Chain Analysis

Following item prioritisation, the next step is to review the end-to-end supply chain and isolate the time spent at each node, or transportation leg, in the chain. This reveals the value chain’s role within each site, the high-level integration of cognizant 20-20 insights
The Pressure to Maximize Margins

Out of the 20 days of total shelf time, only six are available to sell the product at full margin in-store. Figure 3

touch points, and the lead time at each stage of the supply chain (see Figure 4).

3. Perform a Detailed Process Analysis
Following the high-level supply chain analysis, the next step is to deep-dive into lower-level processes and activities, then categorize each process stage as either a value-adding or non-value-adding activity. The detailed analysis on the list of process steps will identify (for removal) the latter, and reveal opportunities to reduce the lead-time of value-adding tasks. Figure 5 on the following page is an example of a detailed process analysis worksheet.

At this stage, data must be captured from various areas and systems at each point related to freshness and waste. This includes systems for warehouse, transportation, point-of-sale, procurement, etc. The intent is to build a quantitative supply chain matrix that will help identify non-value-adding processes in the supply network.

Capturing and obtaining access to the right information is an important investment for retailers, and key to realizing the maximum benefits from this analysis. Most retailers retain generic information about transport lead time, wait time, etc., or store it in various systems.

4. Identify Future Initiatives and Actions
Restructuring the supply chain by eliminating non-value-adding process steps (as identified in Step 3) and selectively implementing industry best practices can lead to a highly efficient, high-velocity supply chain. At the same time, every retailer has different challenges, and must work innovatively to achieve their objectives. Based

Stepping Through the Supply Chain

Figure 4
on the outcomes of the detailed process analysis, these companies can identify areas for improvement and formulate key future initiatives.

Examples of initiatives undertaken by retailers include:

- Collaboration with supply partners for speed and freshness.
- Automation to reduce warehouse processing time.
- Implementation of sophisticated replenishment technology with special considerations for freshness.

As with any investment decision, prioritising future initiatives based on their potential impact and benefits is highly recommended.

Implementation Considerations and Industry Best Practices

Moving to a high-velocity supply chain requires organisational alignment and commitment, the adoption of industry best practices, and seamless implementation of leading technologies (see Figure 6, next page).

Nonetheless, with 65% of all stores’ shrink occurring in perishables departments, we see only best-in-class (top 25%) companies placing more emphasis on implementing industry-proven best practices. These organisations are demonstrating an average of 22% less shrink in perishables departments than the remaining 75%.

Organisational Design

An effective organisational design must be guided by a formal process for integrating people, information and technologies across the enterprise – all focused on meeting key business objectives. Thus, a design that supports a high-velocity supply chain must take into account the following:

- **Key Performance Indicators (KPIs):** Each entity in a perishables supply chain must have its KPIs engineered to assure freshness and efficiency. For example, a procurement manager should define targets to reduce overall lead-time and shrink/wastage in the supply chain. Fostering the achievement of these targets will help align people and processes with the common goals of delivering freshness and maximizing perishable supply velocity.

- **Centralized functions:** Organisations are working to centralize functions across the supply chain in order to maximize efficiencies and tighten delivery times. Centralization helps to more effectively manage regulatory obligations, assure compliance (in this case, for perishables), and standardize processes and practices.

Transitioning from scattered procurement processes with different objectives to centralized procurement can help accelerate product flow and reduce waste. However, completely centralizing operations may not be possible or applicable in all situations; many progressive organisations have adopted a hybrid approach that combines a centralized strategy to gain consensus with decentralized execution to improve service.

- **Centralized supply chain leadership:** An emerging global trend is to unify procurement, logistics, contract management, forecasting/demand planning and similar management functions under a single supply chain leader. This helps facilitate effective decision making with a view spanning the entire supply chain.

- **Supply chain council for food chain:** The purpose of a governing council is to provide direction and help align the supply chain strategy with all other functions and departments in the organisation. The council can...
help measure and monitor the impact of new initiatives for perishables. Its membership should include the leader of the supply chain organisation, as well as corporate executives, business unit managers and other influential stakeholders within the company. Its existence will indicate that supply chain management has the endorsement and commitment of senior leadership.

**Business Process Changes**

To meet customers’ needs for freshness, retailers must revisit their ability to plan and execute process and supply chain strategies. As illustrated in Figure 7 (see next page), the following represent industry best practices for maximising velocity and responsiveness across the perishables supply chain.

- **Process collaboration**: Leading perishables retailers already enjoy a high level of collaboration with their supply chain partners. They not only collaborate on data, but also on processes and business objectives. Since a perishables supply chain depends on speed, the crucial collaboration focal points are vertical integration, innovations in network sharing, and sharing demand forecasts.

- **Vertical integration – “paddock to plate” value chain**: The emerging trend in perishables is to maintain effective control of supply, quality and speed. Many retailers are investing in fruit, vegetable and livestock farming, either through collaboration or ownership, to secure supply and ensure freshness. The goal is to exert more control over the end-to-end supply chain through vertical integration, and minimize the total supply lead time from farms to customers.

For example, Aussie Farmers Direct has designed its supply chain as close as possible to the big markets to ensure that perishable items get to customers within 48 hours of being harvested. Vertical integration may not be the best solution for all supply chains; however, grocery retailers must re-evaluate their supply network and examine the benefits of vertical integration while analysing the market competition and the dominance of buyers and sellers.

Over the 2011/12 financial year, affirming the vertical integration model, Morrison’s opened 37 new stores, acquired two manufacturing sites, and established a major new distribution centre. Efficient processes, a vertically integrated business model and a cost-conscious culture enabled Morrison’s to drive out unnecessary waste and allowed the company to offer its customers great food at “affordable” prices.

- **Network collaboration**: Perishables retailers need to look at increasing collaboration in extended supply chain networks to help bridge the gap between vendors and customers. An emerging trend is for supply chain partners to share distribution networks and infrastructure. Although not popular for distributing highly perishable items, this model is being used by Kraft, Nestle, Heinz, Unilever and several other retailers in Europe to transport shelf-stable foods.

The ECR Sustainable Distribution Group initiative (UK) aims to decrease the food and grocery industry’s transport miles by sharing vehicles and improving the efficiency of warehousing networks. To date, this initiative is said to have saved 24 million road miles on UK roads and 60 million liters of diesel fuel per year.

- **Single view of forecast**: Sharing the demand forecast and POS data with suppliers
(within organisational norms) diminishes the bullwhip effect across the supply chain by reducing inventory costs at supplier hubs and helping to control production costs. As a result, the retailer receives fresher product on time, and with a lower probability of stock-out.

For Smithfield Foods Inc., a pork processor and hog producer, the biggest challenge is to determine how many hogs to produce. If the company can forecast customer demand (i.e., how many leg hams are required, say in December), it can determine when and how many hogs to have ready — allowing time for the sow to be bred and give birth, and for the pigs to grow.

- **Lean logistics with innovative distribution strategy:** Perishable products require unique distribution strategies. The journey to a lean supply chain begins with innovative distribution channels and progresses through continuous process improvements, automation, and the adoption of best-in-class technologies.

  Sourcing a product is only half the job; the item must also be available at the store, and time to store is directly tied to network complexity. There is a growing need to strategically leverage the DSD (direct store delivery) channel directly from farms/production to store/customer to distribute more product. In 2008, the Grocery Manufacturers Association (GMA) reported that DSD represents 24% of unit sales and 52% of total profit in the grocery channel. Further, the report noted that of the top-ten food categories by dollar volume, seven were fulfilled through DSD processes.

  The DSD model launched by Nestlé in 2009 ensured the availability of Nestlé products wherever and whenever consumers wanted them, thereby allowing the company to continue broadening its distribution base into non-traditional alternative locations. In 2012, following the model’s success, Nestlé also invested in modern DSD/route accounting solutions.

  A centralized distribution network is another way to tread the line between optimising truck loads and meeting the need to ship quickly and directly. In this model, small branch warehouses are positioned close to the point of consumption; stores do not rely on traditional warehouses to receive products that take longer to process and ship.

  Warehouse processes, if not optimised separately for perishables, may slow time to store. Through agreements with suppliers, retailers can leverage advance shipping notes (ASNs), enabling warehouses to pre-allocate the shipment to be received for cross-docking, or make necessary arrangements for flow-through/pick-to-zero.

  Aligning replenishment frequency with the

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**Process Changes – Key Drivers**

![Diagram of Process Changes – Key Drivers](image)

- **Collaboration**
- **Demand Forecasting**
- **Dynamic Allocation**
- **Vendor Contracts**
- **Supply Chain Visibility**
- **High Velocity Supply Chain Key Drivers**
- **Lean Logistics**

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Vendor ordering calendar and receipt times at stores/warehouses is essential to achieving a smooth product flow throughout the supply chain.

- **Dynamic allocation:** The freshness of products at a warehouse is a primary success criteria for fulfilling a stock-allocation strategy. The key is to have clear visibility of the expiry date or “best before” date of the available and in-transit stock. The warehouse should also be able to perform dynamic allocation to avoid waste.

The rapid growth of multi-option retail has made order fulfilment more complex. Therefore, the supply chain must be able to prioritize and optimize the management of e-commerce and retail store orders.

- **Supply chain visibility:** An estimated 30 percent of all global perishables shipments never reach consumers because of a variety of supply chain issues. Monitoring stock levels over the course of the day through the supply network, ideally in real time, can further improve inventory management. Traceability is an important aspect in identifying areas for improvement. It can help determine the actual lead time, processing time and wait time at each step in the supply chain before the product reaches the customer.

  Papa John’s implemented Manhattan Associates’ fleet software system and a visibility package, UK-based Isotrak, to boost its freight-tracking capabilities. A 2013 case study by Manhattan Associates highlights that the implementation of new technology provided unprecedented visibility, reduced expenses and improved efficiency and productivity at every point in the supply chain.

- **Procurement considerations:** The effective shelf life of a product should be a key consideration during contract formulation and sign-off. A retailer must define a realistic lead time that meets freshness criteria and ensures compliance. Penalties and rewards are agreed upon during negotiations and when defining terms of purchase with suppliers.

**Technology Enablers**

Implementing industry best practices, organisational design and appropriate technologies are critical to achieving a high-velocity supply chain. Some of the key technologies and considerations are:

- **Automated replenishment and inventory planning to optimise freshness:** While automated replenishment and inventory planning are standard practices among leading retailers, measures for gauging the freshness of perishable goods (e.g., shelf life, wastage parameters) in planning systems are rare. Leading software providers are enhancing their solutions by incorporating perishables replenishment modules in their offerings. Inventory planning and replenishment information from automated planning systems can reduce shrinkage to a great extent and help pick up speed in the supply chain.

  JDA offers “Date Sensitive Inventory” (DSI), a module within the JDA Fulfillment application that can accelerate delivery to customers. DSI enables a time-phased replenishment plan for store and warehouse deliveries by optimising order size and order frequency based on freshness criteria and waste constraints.

  The JDA perishables system helped Butterball manage perishables-related issues, reduce risk and improve customer satisfaction. With the implementation of JDA’s date-sensitive inventory management module, planners could modify Butterball’s plans to minimize any excess inventory and ensure customer satisfaction.

  The key advantages of the JDA perishables system (i.e., date sensitive inventory) include:

  - Implementation speed and scalability (ease of configuration and deployment).
  - Enhanced visibility into the replenishment plan (advance planning/speed).
  - More visibility into inventory at the distribution center and in the store with the expiration date (less shrink).
  - Optimised orders (quantity/frequency) with perishables consideration (less shrink).
  - Perishables-specific exception for taking proactive actions (management by exception).
  - Future visibility of quantity being expired (visibility to trigger proactive actions for markdown or promotion).
SAP (via the SAP for Retail suite) offers procurement capabilities for managing perishables. Buyers can create scenarios for a push/pull strategy, distribution to stores and vendor evaluation. The critical needs of buyers are addressed through SAP’s Perishables Procurement Work Centre. This module provides buyers with the tools and consolidated information they need to manage purchasing, distribution decisions for perishables across business divisions.

The starter pack service for grocery retailing and meat processing includes unique solutions from SAP for Retail and SAP Enterprise Solution Services. It offers a complete solution based on SAP best practices for retail packages, supports pre-configured, industry-specific business processes, and offers a number of enhancements.

The Oracle Retail Advanced Inventory Planning system calculates the product/store level inventory need for perishable products—balancing waste and availability based on an item’s shelf life and acceptable loss due to waste.

- Forecasting tools with perishables characteristics: Retailers must use best-in-class technologies to generate accurate forecasts, which in turn drive a more efficient and effective supply chain.

Forecasting tools for perishables must offer random weight consideration; incorporate robust algorithms to account for seasonality; distinguish demand anomalies due to marketing/promotions, and employ lost sales calculation logic along with basic functions. Multiple software companies provide demand-forecasting tools; all should be evaluated and selected based on the specific needs of the organisation.

- Technology to integrate weather impacts: Exceptional weather events can have a major business impact; however, daily weather may have an even greater effect. Weather conditions are a primary reason why consumers decide to buy or not to buy a product or service. The Planalytics solution gathers weather-driven demand signals and assists in sales-history cleansing to formulate baseline forecasts.

“Our weather-driven demand number is tied directly to what percentage of our sales were up or down. You would be amazed at the correlation between how our volume performs and how the weather performs.” (Testimonial by Subway at Planalytics.)

- Management by exception: A supply chain team should be alerted by system-generated exceptions that allow the team to focus on priority issues. The intent is to avoid any delay in taking action.

- Efficiency through innovative solutions: Quickly delivering a product to the customer is a key success factor in the perishables supply chain; however, this capability often comes with a high cost. Consequently, there is a pressing need to generate innovative solutions that alternately add value and/or remove non-value-adding activities.

- Traceability and tracking technologies: Retailers are continuously evolving and embracing more sophisticated technologies to track stock through the supply chain network. Adopting leading-edge technologies such as RFID or real-time visibility tools is required to minimize product shrinkage in perishables. Using global standards such as GS1 DataBar across the supply chain will help track information such as lot number, serial number and expiry dates. Standardization through the global trade item number (GTIN) provides accurate traceability of products in end-to-end supply networks.

Looking Forward

The perishables supply chain is unique in terms of operations and product characteristics. Retailers looking to develop a world-class perishables supply network must first understand the concept of an effective shelf life (the available days that a product can be sold without becoming unfit for consumption) in order to identify the top 20% of items that contribute to 80% of waste.

It is important to adopt a structured approach for analyzing and uncovering the root cause of waste and identifying future initiatives. Vertical integration, network collaboration

An estimated 30 percent of all global perishables shipments never reach consumers because of a variety of supply chain issues.
and collaborative planning create a foundation for an efficient and sustainable supply chain. Enforcing perishables KPIs within the organisation and compelling all stakeholders to ensure the delivery of fresh products will serve as a catalyst for achieving the objective of a fresh supply chain.

Adopting perishables-specific technologies can help lead the way to a high-velocity supply chain that accelerates and coordinates information, aligns business processes, reduces waste and assures the delivery and availability of fresh products. In this way, retailers can boost sales, reduce shrinkage and establish a “fresh” connect with consumers.

Footnotes
12. Ibid.
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