

Strategic supply chain management

CASE STUDY

INSTRUCTIONS FOR CANDIDATES

You will be expected to demonstrate your knowledge and understanding of relevant theoretical principles, concepts and techniques; to apply these appropriately to the particular situation described in the case study; and above all, to make sound decisions. You will not gain marks by writing a general essay on the topic.

Please note that all work should be your own. Copying or plagiarism will not be tolerated and could result in no marks being awarded. If quotes or short extracts are used they should be attributed or the source of the information identified.

You should acquaint yourself thoroughly with the case study.

WHIRLPOOL CASE

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The case was written in August 2015 and may not reflect the current situation. Candidates are advised to base their answers on the situation depicted in the case.

Introduction

Whirlpool Corporation (Whirlpool) manufactures and markets a full range of major home appliances and related products. According to the Marketline Company Profile (2014), Whirlpool's main products include laundry appliances, refrigerators and freezers, cooking appliances, dishwashers, mixers and other portable household equipment. Whirlpool also produces hermetic compressors for refrigeration systems. The company owns a number of brands in the USA and other countries, including Whirlpool, Maytag, KitchenAid, Brastemp, Bauknecht, Jenn-Air, Amana and Consul.

Whirlpool is headquartered in Benton Harbour, Michigan, USA and employs about 69,000 people. The company operates in North America, Latin America, Europe, the Middle East, Africa and Asia. It manufactures products in facilities spread across 11 countries, and markets its products throughout the world. Whirlpool recorded revenues of \$18,769 million in the financial year ended December 2013 (FY2013), an increase of 3.5% over FY2012. The operating profit of the company was \$1,249 million in FY2013, an increase of 43.7% over FY2012. The net profit was \$827 million in FY2013, compared to \$401 million in FY2012.

Whirlpool has a dominant market position and a strong corporate reputation. The company's strong portfolio of brands, some of which have a 100-year heritage, leads to competitive strength and continued customer loyalty. It also has a strong innovation focus and has been continuously investing in various research and development (R&D) initiatives to develop innovations that address specific consumer needs. The company follows a strategy of design excellence and has achieved nearly 100 design awards in the areas of conceptual, product, interaction and graphic design. In FY2013, Whirlpool's R&D spending for the development of new and innovative products and the improvement of existing products was approximately \$582 million.¹ The performance of every business unit is measured against an expectation that 25 percent of sales will come from recent innovations.²

Whirlpool is a global player in the home appliances market. However, it is significantly dependent on mature markets, with 53.7% of its revenues from the North American region and 45.7% from the USA alone. The household appliances market in China is growing rapidly and Whirlpool announced an agreement to buy a majority stake in Chinese appliance maker, Hefei Rongshida Sanyo, in August 2013 in order to increase its footprint in this region.³

In 2014 Whirlpool acquired majority shares in an Indian company and created four joint ventures (JVs) in China. This kind of investment enables Whirlpool to understand local buying behaviours through the experiences of local JV partners more rapidly. Moreover, it does not have to build a brand new supply chain everywhere it goes because it can utilise the existing infrastructure that JV partners already have.⁴

¹ Whirlpool Corporation Company Profile, Marketline, 27 November 2014

² Lessons from Leaders: the Best Innovator Competition; www.scmr.com; 28 June 2015

³ Whirlpool Corporation Company Profile, Marketline, 27 November 2014

⁴ Supply Chain Case Study; www.supplychainopz; June 2014

Resurgence in the USA housing market will also boost demand for home appliances. In March 2015, Whirlpool signed a three-year agreement with Dan Ryan Builders, one of the nation's leading private homebuilders, as their exclusive supplier of home appliances. Under the new agreement, Dan Ryan Builders' customers will be able to choose from a diverse selection of popular Whirlpool brand and premium KitchenAid brand appliances to meet the individual needs of their homes.

"We're excited that two trusted industry leaders, with reputations for quality, have partnered together in order to provide homeowners with the best designs, products and services available in new homes. Customers can now easily choose from an unmatched portfolio of kitchen and laundry appliance brands built for today's consumers," said Bob Bergeth, general manager, builder sales at Whirlpool. *"We are looking forward to the benefits this agreement will provide to Whirlpool Corporation, Dan Ryan Builders and the American homebuyer."*⁵

Among the threats to Whirlpool are volatile raw material costs that could impact on operating profit. The company uses large quantities of primary raw materials such as steel, oil, plastic resins, and base metals such as aluminium, copper, zinc and nickel. Any fluctuations in the prices of these raw materials will affect the margins of the company. On a global and regional basis, the sources and prices of these materials are sensitive to price fluctuations due to supply/demand trends, transportation costs, government regulations and tariffs.⁶

The Supply Chain

Whirlpool's supply chain encompasses more than 40 manufacturing facilities supplied from 7,000 different suppliers in every corner of the world. These facilities import as well as export products to separate regions and deliver to 30,000 retailers worldwide. Besides retailers, the company also delivers products to builders and directly to consumers' houses. Whirlpool has 2.2 to 2.5 million units in inventory at any given time.⁷

As a global manufacturer, Whirlpool has progressively moved toward regionalising its supply chain, manufacturing closer to demand.⁸ Many manufacturers have off-shored production to low-cost countries but, according to www.supplychainbrain.com (2014), this has not been Whirlpool's approach. The company undertakes some sourcing overseas, but it maintains *"a very, very heavy domestic manufacturing footprint"*, says Michelle VanderMeer, senior director of North American logistics. *"We're actually seeing that it's a competitive advantage to manufacture here in the US,"* says VanderMeer. *"We've got a great, talented workforce."*

Downstream between 50 and 60 percent of Whirlpool's sales come through large retailers, with the construction market accounting for a big chunk of the remaining business. *"It's a pretty healthy split,"* says VanderMeer. *"A lot of builders buy through big-box retailers as well."* General economic trends are, of course, crucial to the company's health. An improving economy means growing consumer confidence, and with that comes a boost in discretionary spending, such as home remodelling projects.

Whirlpool is highly susceptible to the ups and downs and the housing market, which accounts for a large portion of its sales. By monitoring licenses for new construction, the company can learn months in advance when and where its products will be needed. It can also plan in conjunction with the service partners who provide critical last-mile delivery to construction sites, as well as to retailers' distribution centres.

⁵ Whirlpool Corporation Signs Multi Year Agreement with Dan Ryan Builders; www.prnewswire.com; 26 March, 2015

⁶ Whirlpool Corporation Company Profile, Marketline, 27 November 2014

⁷ Supply Chain Management: Whirlpool; Operations and Supply Chain Hub; IIM Raipur; November 2013

⁸ Supply Chain Excellence: A Manufacturing Firestarter; www.inboundlogitics.com; January 2015

Whirlpool's final-mile service is handled by JB Hunt Transport Inc., which took over the company's local distribution network five years ago. *"They no longer just put our freight through that network,"* says VanderMeer. *"They also haul other shippers' freight. The operation is truly shared."* Like Whirlpool's other key logistics relationships, it goes a long way toward satisfying the complex nature of customer demand.⁹

Whirlpool has three tiers of distribution for its finished appliances. Each of the company's 13 North American factories – most of which produce only one type of appliance – have a factory distribution centre at which larger customers, including major retailers, can pick up a full truckload of one product in its own trucks or have the truckload shipped to them by a third-party logistics provider.

Other customers who want a mix of different appliances in a single truckload receive shipments from one of Whirlpool's nine regional distribution centres throughout North America. Finally, builders and homeowners receive small truckload deliveries from Whirlpool's 90 local distribution centres (LDCs). The LDCs and trucks are all operated by a third-party logistics provider.¹⁰

Supply Chain Issues

While the Whirlpool brand has long been associated with reliable household appliances, its supply and delivery performance in 2000 was far from being reliable. Availability was low even while total inventory levels were too high.

Some of the issues at the time were:

- Oversupply in the distribution channel
- Slow response to non-standard orders (waiting time of 5 to 10 days for retailers)
- Inadequate inventory for some stock-keeping units (SKUs) leading to stock outs
- Excess inventory which was transferred forcefully to distributors (almost 15 temporary buildings for stockpiles)
- Lack of communication between ordering and manufacturing units
- Large number of forecasting errors leading to increased storage cost
- Increasing paperwork causing a rise in operational costs and issues with vendors
- Too many third-party logistics (3PL) providers resulting in transactional and adversarial relationships (Issues included contract variations with no common metrics to measure and check distribution)¹¹

The problems were so bad that the supply chain function was referred to by Whirlpool's salespeople as the 'sales disablers'. Colleagues grimly joked that in surveys on the delivery performance of the four biggest appliance manufacturers in the USA, Whirlpool achieved fifth place.¹²

Supply Chain Redesign

It was clear that nothing short of a supply chain redesign was required. From 2000 Whirlpool developed an integrated supply chain management (ISCM) vision with the aims of improving productivity, lowering finished goods inventories, improving product availability and improving its cash-to-cash cycle.¹³ It implemented a range of initiatives to achieve these aims.

⁹ How Logistics Helps Whirlpool Stay Competitive; www.supplychainbrain.com; 28 April 2014

¹⁰ Whirlpool; www.scw-mag.com; accessed August 2015

¹¹ Supply Chain Management: Whirlpool; Operations and Supply Chain Hub; IIM Raipur; November 2013

¹² Leading a Supply Chain Turnaround; www.hbr.org; October 2004

¹³ Tools and Techniques for Implementing Integrated Supply Chain Management; Institute of Management Accountants, 1999

Reuben Slone was Whirlpool's North American supply chain chief at the time. In an article for the Harvard Business Review in 2004, he recalls how the company transformed its supply chain operations:

We needed to formulate a battle plan that would include new information technology, processes, roles, and talents. But before we could begin to imagine those, we needed to define our strategy. Looking to the future, what would it mean to be world-class in supply chain performance?

The decision we made at this very early point in the process was, I think, a pivotal one. We decided that we could answer that question only by focusing on customer requirements first. Our approach to developing our supply chain strategy would be to start with the last link — the consumer — and proceed backward.

It's an obvious thought, isn't it? Except that it wasn't. The overwhelming tendency in a manufacturing organisation is to think about the supply chain as something that originates with the supply base and moves forward. It's understandable: This is the part of the chain over which the company has control. But the unfortunate effect is that supply chain initiatives typically run out of steam before they get to their end point. Whether or not they make customers' lives easier becomes an afterthought.

Understanding Customers' Needs

If you start with the customer, the customer can't be an afterthought. The way I expressed this to my colleagues was to say, 'Strategic relevance is all from the consumer back'. And conveniently, we had new research to consult on the subject of consumer needs. Whirlpool and Sears had recently engaged Boston Consulting Group to study consumers' desires with regard to appliance delivery. The top-line finding was that people value what I call 'delivery with integrity'. That is, your ability to get it there fast is important, but not as important as your ability to get it there when you said you would. 'Give a date, hit a date' is what they're asking for. This sounded familiar to me, coming from the automotive industry. In my previous position at General Motors, I'd been involved in several studies that emphasised the psychology of delivery date commitments.

Identifying Trade Partners' Priorities

Moving upstream, we needed to understand the desires of our direct customers better. We conducted our own interviews to define requirements by segment. As well as looking at smaller retailers versus larger ones, we focused individually on Sears, Lowes, and Best Buy, our three biggest customers. And within the contract-builder market, we studied many sub-divisions, from contract distributors and apartment developers to single family-home builders. We asked about their overall availability requirements, their preferences in communicating with us, and what they would like to see along the lines of e-business. We asked about inventory management and how they might want Whirlpool to assist in it. In all, we discovered 27 different dimensions along which our performance was being judged, each varying in importance according to the customer.

Benchmarking the Competition

Naturally, our customers' expectations and perceptions were shaped in large part by what others in our industry were doing. So we benchmarked our competitors — primarily GE, which was our biggest rival. We obtained cross-industry information and competitive intelligence from AMR, Gartner, and Forrester Research to make sure we had a broad and objective assessment of supply chain capabilities. Then we mapped out what would be considered world-class (versus sufficient or transitional) performance for each of the 27 capabilities and how much it would cost us to reach that top level. It turned out that to prevail on every front would require a total investment of more than \$85 million, which we knew wasn't feasible. It was time to get serious about priorities.

Now that we had established the cost of world-beating performance, we asked ourselves: for each capability, what improvement could we accomplish at a low investment level, and at a medium level? We quickly staked out the areas where a relatively small investment would yield supremacy, usually due to an existing strength. A few areas we simply decided to cede. Our plan was to meet or beat the competition in most areas, at minimum cost.

Building for the Future

Strategy, of course, does not simply address the needs of the moment. It anticipates the challenges of the future. A final component of our supply chain strategy was identifying the probable range of future operating scenarios based on industry, economic, and technological trends. The point was to assure ourselves that our proposal was robust enough to withstand these various scenarios. To date, the planning has worked. Having set a course, we've been able to deal with situations we hadn't conceived of and to continue evolving in the same basic direction.

Selling the Revolution

It's always a difficult decision — when to involve your internal customers in the planning of a major capital investment. Their time is scarce, and they typically don't want to be embroiled in the details of what you, after all, are getting paid to do. You must have your act together and have a solid plan to which they can respond. On the other hand, you can't be so far along in the process that you've become inflexible. You need to maintain a careful balance between seeking their guidance and selling your vision.

Like most well-managed companies, Whirlpool will not undertake a capital investment without a compelling business case. As a cost centre in the company, we had to justify our project wholly on expense reductions and working capital improvements. We spent an enormous amount of time talking with the brand general managers and others who would be affected by the changes we were proposing.

What helped here was our competitive analysis, in which we had plotted our capability levels against others. We charted our current position against our number one competitor on each dimension valued by customers, then extrapolated to show how, depending on the level of investment, we could overtake that company or allow the gap to widen. Sure enough, the competitive instincts of our colleagues kicked in. No one wanted to fall behind.

Getting Focused

One of the earliest successes in the turnaround of Whirlpool's supply chain was the rollout of a new sales and operations planning (S&OP) process. Our previous planning environment had been inadequate. What passed for planning tools didn't go far beyond Excel spreadsheets. Now, we had the ability to pull together the long-term and short-term perspectives of marketing, sales, finance, and manufacturing and produce forecasts that all the participants could base their game plans on.

We soon pushed our forecasting capability further by launching a CPFR pilot. The acronym stands for collaborative planning, forecasting, and replenishment, with the collaboration happening across different companies within a supply chain. The idea is straightforward. Traditionally, we forecast how many appliances we will sell through a trade partner (Sears, for example) to a given market. And at the same time, that trade partner develops its own forecast. Each of us has some information that the other lacks. With CPFR, we use a Web-based tool to share our forecasts (without sharing the sensitive data behind them), and we collaborate on the exceptions.

As simple as it sounds, it isn't easy to pull off, but we have. Within 30 days of launch, our forecast accuracy error was cut in half. Where we had close to 100% error (which isn't hard, given the small quantities involved in forecasting individual SKUs for specific warehouse locations), today we're at about 44% or 45%. To put this in perspective, a one-point improvement in forecast accuracy across the board reduces our total finished goods position by several million dollars.

These were just two of many initiatives we launched in rapid succession. A couple of things were absolutely critical to keeping them all on track: a highly disciplined project management office and stringent performance metrics. The key was to think big but focus relentlessly on near-term deadlines. We organised the change effort into 30-day chunks, with three new capabilities, or business releases, rolling out monthly — some on the supply side, some on the demand side. The job of the project management office was to ensure the completion of projects on time, on budget, and on benefit.

Also keeping us honest were new metrics — and the man I brought in to enforce them. My colleague John Kerr, now general manager of quality for the North America division, was then in charge of Whirlpool's Six Sigma program. He's a real black belt when it comes to performance management. It took some persuading, aimed at both John and the North American leadership team, before he was freed up and allowed to dedicate himself to the supply chain turnaround. But we absolutely needed his data-driven perspective. When one of my team would say, "We need to take this action to fix this issue", John would always counter with, "Please show me the data that allowed you to draw that conclusion". Were these demands sometimes a source of irritation? I'd be lying if I said they weren't. But they forced all of us to rebuild the metric 'fact base' and hone our problem-solving skills.

By the third quarter of 2001, we had already done a lot to stabilise product availability and reduce overall supply chain costs. And, after a challenging fourth quarter, we took a huge step forward by implementing a suite of software products from i2, which specialises in supply chain integration tools. That was in January 2002. Six months later, Whirlpool had historic low inventories and a sustained high service level. Before the year was out, we were delivering very near our target of 93% availability across all brands and products. (Momentum has since carried us well into the mid-nineties.). We delivered slightly more than promised by reducing finished goods working capital by 10% and improving total cost productivity by 5.1%.

Our customers were voicing their approval. By May 2002, a blind Internet survey given to our trade partners showed us to be 'most improved', 'easiest to do business with', and 'most progressive'. I remember that after these results came out, our VP [vice president] of sales said, "You're good now — but more important, you're consistently good." It was a turning point in the trade's perception of Whirlpool.

Sustaining Momentum

Three years into the project now, we continue to assign ourselves and deliver three new capabilities per month. This doesn't get simpler over time, either. As I write this, for example, we're focused on something we call 'Plan to Sell/Build to Order'. Here, the notion is that certain high-volume SKUs should never be out of stock. These are the heart-of-the-line dishwashers, refrigerators, washing machines, and other products that appeal to a broad range of consumers. They are the equivalent of a supermarket's milk and eggs; running out of them has a disproportionately negative impact on customers' perceptions.

We're now formulating a supply chain strategy that allows us to identify these SKUs across all of our trade partners in all of our channels and to ensure that the replenishment system for our regional warehouses keeps them in stock. That constitutes the 'plan to sell' part of the program. At the same time, for our smallest-volume SKUs, we are taking out the entire inventory and operating on a pure pull basis, with a new, more flexible build-to-order process. The inventory savings on the small-volume SKUs helps offset the costs of stocking up on the high-volume SKUs.

We're also working on the capability to set service levels by SKU. That is, instead of having one availability target for all our products, we are recognising that some products are of greater strategic importance than others. Some of them, for instance, are more profitable. Some hold a unique place in our brand strategy. Again, it's easy to grasp the value of being able to vary service levels accordingly. But in a sprawling business like ours, shipping thousands of different SKUs daily, it's a very difficult thing to accomplish.

We continue to develop new Web-based tools. Recently, we've been focused on system-to-system transactions, in which our system talks directly to a customer's system for purposes of transmitting orders, exchanging sales data, and even submitting and paying invoices. We've rolled out this capability with a number of trade partners over the past 18 months. At the same time, we keep enhancing our Partner Store, which allows customers to check availability and place orders via the Internet. The site allows them to find near equivalents of models, for those times when a SKU is out of stock or retired. They can even find deals on obsolete inventory.

By the time this article appears in print, we'll also have implemented event-management technology, which will allow us to be more on top of the movement of goods through the supply chain. An event manager provides an alert whenever an action in the process has taken place — for example, when a washer [washing machine] is loaded into a container in Schorndorf, when that container full of washers is loaded onto a ship in Rotterdam, when the ship departs, when the ship arrives, when the container is unloaded from the ship in Norfolk, when the container leaves the port via truck, and, finally, when the washer is unloaded at the Findlay, Ohio, warehouse.

The result is that people's attention is directed to what needs to be done. We'll also be further along in our application of lean techniques (usually associated with manufacturing operations) to our total supply chain. This involves using pull concepts and kanban-like triggers to speed up processes, reduce inventory, and enhance customer service.

On the Horizon

Whirlpool has much to show for its supply chain efforts. By the end of 2003, our product availability had reached over 93%, up from 88.3% in 2001. (Today it's more than 95%.) That allowed us to attain an order fill rate for key trade partners of over 96%. The number of days' worth of finished goods we were holding in inventory had dropped from 32.8 to just 26. We drove freight and warehousing total cost productivity from 4% to 7.2%. From 2002 to 2003, we lowered working capital by almost \$100 million and supply chain costs by almost \$20 million. Does all this add up to value in excess of the expense our leadership team approved? Absolutely. In fact, total payback on that original investment occurred within the first two years.

Still, our work is far from finished. Just months after we kicked off our turnaround, we were fortunate in that the new executive vice-president brought in to run Whirlpool's North America region had deep supply chain knowledge. Dave Swift, who came to us from Kodak, believes strongly in the strategic importance of the supply chain both for building brands and for creating sustainable competitive advantage. Immediately after joining us, he elevated our sales and operations planning process by personally chairing monthly executive S&OP meetings. These meetings have become the model for the company and the basis for much of our just-started global supply chain efforts.

In the future, we'll face greater demands for end-to-end accountability. We're already responsible for the resale of any returns. Soon we'll be accountable for the disassembly of products in Europe. And we'll be taking an even closer look at the design of the products themselves. If we can re-design a product — make it in a smaller plant, make it with smaller parts, ship it in smaller pieces — we can dramatically affect supply chain economics. It's great to improve forecasts, optimise transportation, and speed up our processes with existing SKUs. But what if we could push the end stages of production closer to the consumer and get higher leverage from those SKUs? That's the kind of thing that can change the rules of the game.

It's a wonderful thing about our business: We have fierce competition all over the world, and on top of that we have very smart trade partners who deal with numerous other suppliers. We may be a white-goods, big-box supplier, but because our customers also buy electronics and apparel and so on, we're constantly being challenged by the benchmarks of other, more nimble industries. Technologies continue to evolve, channel power continues to shift, and the bar is constantly being raised. But I'm confident that the talent in Whirlpool's supply chain organisation will be equal to it all.¹⁴

¹⁴ Leading a Supply Chain Turnaround; www.hbr.org; October 2004

Redesign Outcomes

The supply chain transformation at Whirlpool was very successful, leading to the following benefits being achieved:

- Product availability was increased to 90/95 per cent
- Inventories were reduced by 15 to 20 per cent
- Lead times became as low as five days.
- Forecasting errors were reduced by 50%
- Warehouse and transportation cost-saving rose by up to 5%
- Improved quality of goods delivery and integrity
- Improved relations with suppliers
- Increase in customer service levels¹⁵

In order to maintain quality in its supply chain processes, Whirlpool used the Malcolm Balridge Award Quality Criteria. The efficiency of the entire process was measured in terms of the quality, cost and cycle time. Whirlpool constantly tried to update and adapt to the latest best practices, ideas and innovations.

The restructured operations yielded considerable benefits, including a \$4.8 million reduction in standing inventory in Australia alone over just seven months. Whirlpool also reduced its annual inventory by about \$250 million a year and was able to deliver products in 48 to 72 hours. Whirlpool also saved about \$100 million a year because of improved efficiency in the new distribution system. Ordering and delivery functions of Whirlpool used to be located in separate divisions, complicating coordination and resulting in costly mistakes when Whirlpool made too much of a certain product.¹⁶

The core of the redesign programme was replacing 41 outdated sites with 10 huge regional distribution centres that used high-tech warehouse management systems and upgraded vehicles that could handle a variety of products. Trucks deliver appliances from the company's factories to a distribution centre, the merchandise is sorted according to how quickly it is likely to leave. Slower-moving goods, such as certain high-end refrigerators or stoves, are deposited in the centre of the building, while fast-moving dryers and washing machines are closer to the loading docks.

The facilities are laid out in quadrants, with most of the products arranged in identical order four times in the same building. This ensures that drivers can access everything they need without going from one end of the building to another. Whirlpool's new distribution centre in Lockbourne, USA is a 1.56 million-square-foot building with 172 trucking docks and stretches more than half a mile from end to end.¹⁷

Whirlpool integrated its supply chain functions and eliminated redundancies. *"Prior to having an integrated supply chain, we had separate leaders over our 13 manufacturing plants and other supply chain functions in North America,"* recalls Jim Keppler, vice president of the integrated supply chain and quality. *"So we had one leader who had manufacturing and quality responsibility and another leader who had the traditional supply chain functions of inbound and outbound logistics, order intake and order fulfilment, and a central planning function,"* Keppler explains. *"Those were two separate leaders reporting to the president of North America."*

"We decided to combine responsibilities and create this integrated supply chain for a lot of different reasons," states Keppler. *"There is so much overlap between what we do on a day-to-day basis, and a lot of interaction that goes on between these different functions, and it made perfect sense for us to have them under one leader. One of the intended outcomes is to help break down some of the traditional silos that were there and work more cross-functionally. As we've done that, I'm not sure you would say that we've eliminated headcount. We've actually redeployed headcount as we've made improvements into other more productive areas."*¹⁸

¹⁵ Supply Chain Management: Whirlpool; Operations and Supply Chain Hub; IIM Raipur; November 2013

¹⁶ Supply Chain Management: Whirlpool; Operations and Supply Chain Hub; IIM Raipur; November 2013

¹⁷ Whirlpool Cleans Up its Delivery Act; www.wsj.com; 24 September 2009

¹⁸ Whirlpool; www.scw-mag.com; accessed August 2015

Supply Chain Logistics and Transportation

In 2006, according to www.inboundlogistics.com (2015), Whirlpool brought Penske Logistics on board as lead logistics provider (LLP) for its North American supply chain, augmenting the 3PL's existing transportation responsibilities. Whirlpool wanted a more strategic partnership predicated on network visibility. *"The relationship with Penske started heavily on the inbound side; with Penske managing the transportation of components from our supply base to our manufacturers,"* explains Jim Thompson, senior manager of transportation for Whirlpool. *"It then expanded into outbound distribution to support finished goods through our network."*

By the late 2000s, as Whirlpool was expanding into Canada and Mexico, Penske's role grew as well. It became accountable for inbound materials into all eight US manufacturing facilities and five locations in Mexico, as well as outbound distribution for both US and Canadian markets. Like other US companies, Whirlpool is challenged by domestic transportation dynamics. Dealing with driver and capacity constraints, and ancillary costs, presents a huge obstacle. *"Working with Penske has allowed us to diversify transport modes from boxcar to intermodal to over-the-road, and even small parcel where it makes sense,"* Thompson says.

An Outside-in Approach

Penske Logistics' role as LLP was a cornerstone of Whirlpool's North American supply chain transformation. The two companies worked together on building a Transportation Centre of Excellence, creating an integrated and outsourced transportation management programme to help Whirlpool reduce costs and improve service. The manufacturer maintains control over capital assets — facilities, technology, and carrier contracts — while the 3PL oversees day-to-day transportation management and distribution centre operations.

Penske brought an 'outside-in' approach to eliminate costs and standardise processes. *"If we were a manufacturer, we'd make data,"* says Bob Daymon, vice president of transportation management for Penske Logistics. *"Our role as LLP is to figure out how to use that data to drive the network forward, tailored to Whirlpool's processes and desired outcomes."* The manufacturer similarly benefits from Penske's perspective. As an LLP, it works with myriad companies in automotive and other industries, which provides different insights and best practices that can be adopted and applied accordingly.

Control Tower Power

The key to effective logistics is data and companies paying closer attention to granular-level details. Penske acts as a control tower for Whirlpool's North America operations. From the outset, both companies outlined key milestones they wanted to hit as the partnership progressed. *"When we began this relationship, our guiding principle was to use data to make decisions,"* Daymon explains. *"By focusing on data accuracy, timeliness, and completeness, we're not driving the supply chain by looking through the rear view mirror."*

Traditionally, shippers and service providers sift through freight bill data, and start building models to better understand performance, find tactical problems, and prescribe business process fixes. Penske took a more proactive approach by using data to predict what will happen, and thus being able to plan carrier capacity in advance. It is not unlike the way manufacturers engineer just-in-time production systems — getting better forecasts, synchronising upstream processes to pull in accordance with demand, and levelling variability. It is just happening on a bigger scale at a macro level. Whirlpool is allowing its manufacturing strengths to bleed into other aspects of its supply chain, with Penske's assistance. *"Whirlpool has its own system that is well-defined and built around competencies, as well as the appropriate structures and milestones,"* says Thompson.

Whirlpool also recognised that Penske needed end-to-end access to planning functions in order to become a true extension of the enterprise, and fully optimise transportation operations. That requires a certain level of trust between the two companies.¹⁹ Penske and Whirlpool decided what information could be shared and what was to be confidential. Working together, a code of conduct and process of signing off between the two entities were established.²⁰

While Thompson acknowledges the centre of excellence has been transformative, he's also quick to point out that this change has been evolutionary, not revolutionary. *"We didn't just bring Penske in and flip the switch on the network,"* he says. It has been a multi-year journey. Penske's scope and touch has slowly expanded as the project hit new milestones and contracts were renewed. The 3PL has become as much an input to setting strategy as it is executor.

Objectives and expectations have similarly evolved as the two companies refine metrics and data to get a better read on future trends. This pays dividends in some interesting ways. *"When we started out, we decided to just get the data and metrics right, see how it performs, then figure out how to optimise transportation,"* says Thompson. *"Today, we're taking a more holistic approach by looking at how we can get ahead of the curve, especially as the economy improves."*

"We're in a better position to forecast out and provide some reliability to our carrier base," he adds. *"Carriers want shippers they can depend on. When we award a bid, we consistently tender that business. We provide heavy drop-and-hook, driver-friendly scenarios."* As capacity tightens, and carriers start picking where they want to put their assets, they'll want to do business with companies such as Whirlpool and Penske because they have a good handle on demand. In a hardening market, that type of value is hard to come by and increasingly important.

Lean and Agile

Whirlpool has a culture of continuous improvement. Lean Six Sigma runs through its production and distribution nodes. But over the past several years, the company has made a greater effort to extend this ethos throughout the entire organisation. *"We have dedicated resources assigned to each functional area that are responsible for embedding Lean culture beyond the four walls of manufacturing or even warehousing,"* says Thompson. *"We are investing around the concepts of Lean and Six Sigma to drive standardisation and improvement in the overall process."*

"Lean Six Sigma is a key piece. Our daily focus is weeding out cost and inefficiencies," adds Daymon. *"Transformations — some small, some big — happen every day."*

Whirlpool's centre of excellence is also built around agility. Whether it is absorbing an acquisition, weathering a housing market crash, or providing greater latitude to expand as the economy rebounds, the company has a sustainable structure in place that can flex and adapt to change. *"Consider the market dynamics we had to deal with in 2008,"* says Thompson. *"We had to adjust down and make sure we had flexibility within our network. Accurate data allowed us to make precise decisions."*²¹

Managing the Logistics Operation

Penske appointed several general managers to oversee key functions, such as:

- Distribution network services — including support of strategic sourcing and contract administration, provider payment management, business process improvements, policies and procedures and customer service of all distribution centres and cross-docks.

¹⁹ Supply Chain Excellence: A Manufacturing Firestarter; www.inboundlogistics.com; January 2015

²⁰ Whirlpool Corporation Case Study; www.penskelogistics.com; accessed August 2015

²¹ Supply Chain Excellence: A Manufacturing Firestarter; www.inboundlogistics.com; January 2015

- Transportation network services — focused on shipment load planning and optimisation, mode selection, shipment tendering and monitoring, carrier performance, carrier freight payment, proof of delivery compliance, claims management and managing carrier rates and budget compliance.
- Financial consolidation — responsible for auditing and reviewing the key performance indicators (KPIs) of all 3PLs. This function focuses on RFP financial analysis, the annual business plan, carrier and provider financial audit, financial reports and statement consolidation.
- Technology and engineering — a key function as Penske LLP is the link that allows Whirlpool visibility to all of its suppliers. This function includes network design and transportation modelling, warehouse engineering/design, LLP freight and provider management, LLP portals to 3PLs, web visibility/shipment monitoring, exception/alert monitoring, freight bill audit and payment, business intelligence and EDI interface and support.

As Whirlpool's LLP, Penske assumed responsibility for execution and management of all 3PLs. It became an extension of Whirlpool — involved in every business, staff and budget meeting. From a financial perspective, Penske LLP provided Whirlpool with an enhanced ability to view supplier's key performance indicators integrated with financials. This scorecard provided a clear picture of performance.

Penske LLP developed a monthly reporting process for Whirlpool to review at a high level the LLP, RDC and LDC scorecards, as well as the scorecard for every provider location. Penske LLP began conducting monthly reviews with all providers and Whirlpool using the scorecard as the basis to identify best practices and areas for improvement. RDC scorecard metrics include inventory cycle count accuracy, damage as a percent of throughput, inbound on-time loading and on-time departure. LDC scorecard metrics include total units per stop, miles per stop and on-time delivery percent.

Technology is also an important driver in the success of this relationship. Penske built a new routing tool specifically designed for Whirlpool. Whirlpool benefited with overall cost optimisation and mode selection. Orders from all 3PLs are sent to the central system, which stores all the shipping data for each region every day and determines the best-cost solution — whether it is a truck carrier, dedicated fleet, etc. This optimisation allows Whirlpool to remain confident that every day they are getting the best-cost solution.²²

Greening the Supply Chain

According to an article in Supply Chain Quarterly in 2008, Whirlpool's history of environmental activism dates back to the 1970s, when it was one of the first businesses to set up an office of sustainability (the office focused on product development). Whirlpool was also an early champion of Energy Star, a US government-backed program launched in 1992 to encourage the design and manufacture of energy-efficient products.

During the supply chain redesign programme, Whirlpool took the opportunity to raise its eco-profile even more. Given the company's support for energy conservation in product development, says Brian Hancock, vice president of Whirlpool's North American regional supply chain, it was natural for Whirlpool to take the same approach to redesigning its supply chain. *"Environmentalism has been built into our company fabric,"* he says, *"and the supply chain is an extension of one of the best corporate cultures where sustainability is concerned."*

The redesign team produced a supply chain strategy that would not only meet the company's cost and service objectives, but would also be environmentally sustainable, with energy-efficient warehouses and cleaner equipment. Although the plan required an investment in new buildings and equipment, it produced considerable savings over time. *"In the long term, it's the low-cost solution,"* says Hancock. *"And that's what makes it good for business and the environment. That's what sustainability is all about."*

²² Whirlpool Corporation Case Study; www.penskelogistics.com; accessed August 2015

Greener, cleaner buildings

A part of Whirlpool's supply chain redesign programme was to rationalise its plant and distribution network. It was decided to consolidate buildings and replace older distribution centres with new, energy-efficient facilities. The new distribution centres conserve electricity by using energy-efficient lights, skylights (in some locations), and motion sensors to turn lights on and off automatically. By adopting more energy-efficient practices, Whirlpool also reduced emissions of the greenhouse gases that many scientists believe contribute to global warming. *"That all adds up to a lower carbon footprint,"* says Hancock.

By the end of 2008, Whirlpool added 10 new energy-efficient regional distribution centres in North America to replace older facilities. It also cut the total number of buildings by half. Once the rationalisation programme was completed, there were 17 percent fewer factory distribution centres, 33 percent fewer regional DCs, and 32 percent fewer local DCs.

A breath of fresh air

Whirlpool looked at more than just its buildings in its drive to go green. It also swapped its internal combustion-powered industrial forklift trucks for cleaner electric models. The company estimates that replacing the internal-combustion models has kept 12,643 tons of carbon dioxide and 208 tons of nitrogen oxides from entering the atmosphere.

Although the new trucks have done much to curb pollution, Whirlpool's decision to use electric models was actually motivated by a desire to reduce noise and product damage as well. The forklifts that Whirlpool uses are equipped with big clamps to pick up items like refrigerators and stack them as many as five high. When an operator of an internal combustion-powered lift truck would deploy the clamp while pressing down on the gas pedal, the clamp would sometimes damage the side of a refrigerator. *"There was an increase in clamp pressure as the gas pedal was pushed,"* Hancock explains. *"That's not the case with electric trucks. We get a more level and even clamp, which we feel helps reduce damage."*

The push for full loads

Just as Whirlpool has been analysing its distribution network for ways to save energy, it has also been examining its transportation operations for opportunities to reduce its carbon footprint. As oil prices rose rapidly, the company devised several innovative strategies for cutting transportation costs and, at the same time, reducing greenhouse gas emissions. For example, Whirlpool has made a concerted effort to ship products in full truckloads rather than in multiple less-than-truckload shipments. Using full truckloads, wherever feasible, creates efficiencies that reduce fossil-fuel consumption, noise, and traffic congestion.

Moving products in full truckloads may be cost effective and eco-friendly, but it is not always easy to achieve. That is especially true now that more retailers are turning over the responsibility for customer deliveries to Whirlpool. Because of the bulky nature of large appliances, Whirlpool often finds that shipments 'cube out' (fill up the trailer) before they 'weigh out' (reach the maximum weight capacity allowed for road travel). Even so, the company aimed to move more than 63 percent of its consumer products via full truckloads.

At the same time, Whirlpool began to increase its use of rail transportation, which is both cheaper and more fuel-efficient than road transport. For example, the company is now using rail to transport refrigerators from Mexican plants to US regional distribution centres. As it does with trucking, Whirlpool seeks to fill up the intermodal containers and railcars it uses for shipping.

Fuel-saving incentives

In many cases rail is not an option, leaving Whirlpool with no choice but to use trucks. In its dealings with US carriers, the company has initiated several programmes to encourage greater fuel economy. To begin with, it developed a fuel surcharge policy that provides incentives to carriers to boost fuel efficiency — and conversely, penalises them for poor fuel utilisation. Whirlpool determines the mileage for each trip and then pays its carriers a fuel surcharge based on a set rate of six miles per gallon, regardless of the truck's actual mileage per gallon. On a 330-mile trip, for example, Whirlpool will pay surcharges on 55 gallons of fuel — the amount a truck that gets six miles per gallon needs for the journey. If the truck gets just 5.5 miles per gallon and the carrier ends up using 60 gallons of fuel for the trip, the carrier can only collect fuel surcharges on 55 gallons.

“Current engine technology says a truck should get six miles a gallon,” says Hancock. “This makes the carrier responsible for having trucks with the right engines. This fuel surcharge method provides an incentive for carriers to maximise fuel efficiency and minimise empty miles.” Whirlpool has had this fuel surcharge arrangement in place with its 50 primary truck carriers as well as its 250 secondary carriers. *“In the beginning, there was some pushback from the carriers,” says Hancock, “but we haven’t had any pushback in the last couple of years.”* Although the six mile per gallon standard applies to fuel surcharges only in the United States, Whirlpool has a similar programme in Europe.

To further encourage fuel economy among its carriers, Whirlpool has also been promoting the practice known as ‘drop-and-hook’. In a drop-and-hook operation, the carrier drops off a fully loaded trailer in the warehouse yard and then hauls away an empty one. The primary advantage of this arrangement is that it eliminates the need for the truck to sit in the yard with its engine idling while it waits for the trailer to be unloaded. In some cases, Whirlpool even provides trailers to carriers to facilitate the practice. The company uses drop-and-hook in its US, Canadian, and Mexican operations, and to a limited extent, in its European operations.

Whirlpool also helps its carriers ‘triangulate’ shipments in order to make the best use of their assets. In triangulation, carriers deliver an outbound load to a Whirlpool customer, and then arrange loads that will bring them back to the starting point with no empty moves. For example, a trucking company might move a shipment from a Whirlpool facility in Ohio to Memphis, Tennessee; pick up a load from another shipper and haul it to Atlanta; and then take a load in Atlanta from a third company and bring it to Ohio in time to pick up another of Whirlpool’s outbound loads.

Along with its other transportation programmes, Whirlpool has enlisted in the SmartWay Transport Partnership, an initiative by the US Environmental Protection Agency (EPA) and the freight industry to increase energy efficiency while reducing greenhouse gases and air pollution. In signing up for the programme, the company committed to using more energy- efficient practices in its warehouses and to shipping at least 50 percent of its product volume with carriers that participate in the program. *“The carrier actually signs up with the EPA, and we agree to use those approved carriers,” says Hancock. “The program is trying to get the carriers and the industry to work on sustainability.”*

A long but worthwhile journey

Whirlpool’s supply chain is considerably greener than it was before the redesign programme was initiated. As a result, the company is able to realise big savings in energy and transportation costs, as well as increased consumer goodwill. Yet Whirlpool has found that it is not always easy being green. In fact, Hancock advises others considering a similar programme to steel themselves for a long journey. Just putting the infrastructure in place is not enough, he says. You also have to ensure your suppliers are meeting your demands for eco-friendly goods and services. *“Once you start changing the infrastructure of your supply chain, you need to be persistent in monitoring what types of trucks you use, what types of carriers you use, and the type of lighting you use in the warehouse,” he says. “It’s a long-term commitment.”*²³

²³ The Greening of Whirlpool’s Supply Chain; www.supplychainquarterly.com; Quarter 2, 2008

In pursuing sustainability in the supply chain, the trick is to *“look at compliance and risk not as a negative, but as something that could bolster the brand and make its value chain more resilient,”* says Ron Voglewede, North American sustainability lead at Whirlpool. *“The first step is to develop a strategy. This involves figuring out what’s important to a company and to its customers. The second step is to identify the main processes and map the data throughout the value chain, which helps companies understand where they need to take action.”*

“Communicating with suppliers can be tricky, particularly when companies are working with smaller suppliers who may not have the resources to fill out the supplier questionnaires on their own,” he says. *“Ensuring questionnaires are available in the supplier’s local language is another important detail,”* Voglewede added. *“In the very diverse global environment, it’s very critical you’re understood in the right manner.”*²⁴

Supply Chain Ethics

Whirlpool operates a Supplier Code of Conduct, which formalises the key ethical principles under which suppliers are required to operate. The code was established in 2006 and states:

In selecting suppliers, Whirlpool seeks to do business with reputable business partners who are committed to ethical standards and business practices compatible with those of Whirlpool. This Code applies to all suppliers of Whirlpool including all of the Whirlpool suppliers’ facilities. Whirlpool strongly encourages suppliers to exceed the requirements of this Code and promote best practices and continuous improvement throughout their operations.

Whirlpool expects its Suppliers to act responsibly in all respects and to ensure that no abusive, exploitative or illegal conditions exist in their supply chains. Whirlpool requires that Suppliers comply with all applicable laws and regulations, as well as the principles set out in the Code. One tenet of this Supplier Code of Conduct is that Whirlpool Suppliers must not use any type of involuntary or forced labour; this prohibits, among other things, slave labour or business practices which in any way rely on, or encourage, human trafficking. Where there is no local legal requirement, or if a local legal requirement is not as strict as the requirement included in this Code, Whirlpool Suppliers are required to follow the requirement in this Code.

Whirlpool has established e-learning courses for our sourcing professionals to educate them on the requirements of our Supplier Code of Conduct. Our Code of Conduct and our training programs undergo review and are refreshed and updated from time to time to reflect changes in circumstances. In addition to requesting our suppliers to certify their compliance with our Code of Conduct, we have engaged a third party agency who has conducted, and will continue to conduct, independent audits of a sampling of our suppliers’ practices. Material failures to comply with our Supplier Code of Conduct may result in the termination of our relationship with a Supplier, as may be permitted by applicable law.

*Whirlpool’s Suppliers are vital business partners, and together, these principles provide us with an opportunity to better the lives of the people we touch.*²⁵

In May 2014 Ethical Consumer viewed Whirlpool’s website and reviewed the company’s code of conduct for suppliers. The review found that the clauses on discrimination, child labour, forced labour and discrimination were adequate. However, the clause relating to working hours was considered to be inadequate because it included the phrase ‘except in extraordinary business circumstances’. There was no clause on living wage. A search of Whirlpool’s website and sustainability report found no further information relating to stakeholder engagement, auditing and reporting, and difficult issues. Whirlpool therefore received Ethical Consumer’s worst rating for ethical supply chain management.²⁶

²⁴ How Whirlpool and ThyssenKrupp Unlock Supply Chain Opportunities; www.greenbiz.com; 26 April 2013

²⁵ www.whirlpoolcorp.com; accessed August 2015

²⁶ www.ethicalconsumer.org; 02 May 2014

Supply Chain Expansion and Improvement

Since Whirlpool's transformational redesign programme, the company has continued to expand and improve its supply chain operations.

Whirlpool's manufacturing operations were consolidated in 2014 by moving its commercial washing-machine production from Mexico to the USA. The company says that the relocation will make its operations more efficient, since 90% of the commercial machines are sold in the USA. Manufacturing them in the USA allows the company to access its logistics networks more effectively and avoid transporting goods across the border. Whirlpool is among a number of US companies who have been shifting their overseas manufacturing operations back to America in recent years.²⁷

In 2015 Whirlpool invested \$21 million to increase the size of its distribution network to better serve its customers. A new RDC was built near Chicago, USA. The new facility is a full-mix, rail-served warehouse, storing products from all Whirlpool-built major appliance categories and brands. The new centre improves service to customers through greater flexibility and more efficient operations, which results in better delivery times. The Chicago RDC serves Whirlpool local distribution centres in the Upper Midwest region.

"The expansion of our network is part of our ongoing commitment to provide the best service to continually meet our customers' needs," said Jim Keppler, the company's vice president, Integrated Supply Chain and Quality. *"Chicago is the perfect location for a new facility. We have a large base of retail and builder customers in the metro area, and it provides easy access to multiple modes of transportation."* Kenco, a third-party logistics provider, manages the warehouse and employs 60 to 70 people when fully operational.²⁸

Whirlpool has utilised technology solutions to improve its processes. Until as recently as 2012, the company used manual processes to read paper tags and manage inventory as washing machine lids flowed from initial stamping into finished, painted products for final assembly. The process was cost-intensive and error-prone, with multiple manual reads of the tag as each lid moved from stamping to final assembly. Despite having more than 2.4 million square feet of factory space, there was no room available for excess inventory when tags fell off or were misplaced or misread. Plant managers continually changed production schedules based on lost parts, leading to higher inventory and less space.

Instead of using bar codes or a similar solution, Whirlpool opted to deploy radio frequency identification (RFID) tags and networked readers across the plant to give managers and operators real-time access to information on the flow of materials. Based on a system by developer Omni-ID, lift drivers and paint-line employees are now able to make decisions and immediately know if they have loaded the correct parts on the assembly line. The result is that inventory is down, quality is up, and Whirlpool is now using RFID to schedule inbound logistics to the paint line and introduce a true 'pull' production system.²⁹

Downstream in the supply chain, a strong web-based presence has been developed. *"To win online you need to understand how to market, cross-sell and up-sell to consumers who do their research on the web,"* says Kevin Summers, global CIO at Whirlpool. A strong web presence can sway consumers' purchasing decision, even if they ultimately go to the local electrical retailer in the high street to make their purchase.

Whirlpool also recognises that people simply do not update their washing machines as frequently as they did. The five-year lifespan is now more like 10. The company therefore needs to support appliances with a far longer lifetime. Whirlpool is working on appliances that can intelligently manage their own power consumption. *"Appliances use 30% of home energy consumption. If you put a chip in the appliance, it can monitor energy usage and detect parts failures,"* Summers explains. *"When you put a chip in an appliance it becomes just like a PC or a mainframe, and can be managed centrally."*³⁰

²⁷ Gathering Strength for US Manufacturing: Whirlpool Moves Production of Washers to Ohio from Mexico; www.forbes.com; 20 December 2013

²⁸ Whirlpool Corporation Expands Distribution Network: Adds New Centre in Illinois; www.prnewswire.com; 13 August 2015

²⁹ Forging Links into Loops: the Internet of Things Potential to Recast Supply Chain Management; Deloitte Review Issue 17; www.dupress.com; 27 July 2015

³⁰ Forrester IT Forum: Whirlpool Focuses on Strategic Suppliers to Allow IT to Innovate; www.computerweekly.com; 10 June 2011

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