



**AASA Special Report:
Harnessing Big Data to Predict
Demand Across the Supply Chain**

**Special Report
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Harnessing Big Data to Predict
Demand Across the Supply Chain

Abstract

The Aftermarket is spending a lot of money to provide its 5 o'clock promise. This service level requirement leads to just-in-case inventory methods—which leads to a high product return rate. It's not all bad, but significant opportunity remains for cost savings and margin gain.

Epicor tackled the challenge of supply chain visibility in its last AASA Technology Council report, dated October 2012. Here, the focus is on harnessing Big Data to forecast demand across the entire supply chain. With collaboration throughout the industry, the ability to predict future demand throughout the product life cycle will be a game changer.

The industry is capable of forecasting demand at the store level. Some participate in data warehouses in order to predict demand at the subchannel level. The next big step for the Aftermarket is to see forecasted demand for the entire supply chain.

Having this information will help suppliers pull slow-moving or inactive parts and place their products on shelves where they're most needed, employing stock balancing on a macro level. This will lead to leaner practices for the supply chain as a whole where manufacturers produce a more accurate volume of parts, distributors and suppliers stock the right amounts in their DCs and stores, and the entire supply chain works collaboratively to make this a reality.

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High Returns and Market Saturation Challenge the Aftermarket

It is well known that high warranty returns are problematic for manufacturers. Not only do returns reduce annual sales—AASA's annual Pulse survey indicated they reduce sales by an average of 2.6%—but there's a hidden cost as well. Consider the cost of shipping unused parts, wasted labor, credits due, and the environmental impact of disposal; not to mention the impact to one's reputation as a quality, leading-edge supplier.

Quality issues are a small percentage of returns

Only a small portion of these returns represents quality related issues. According to the 2014 AASA Annual Supplier Benchmarking Survey, "It is estimated that the Automotive Aftermarket has roughly \$3.9 billion dollars of parts warranty returns each year. More interesting is that only 2.5% or less of those returns are related to actual quality issues. If the industry could reduce warranty returns by half, it could save approximately \$2 billion which would go straight to the bottom line of suppliers and channel partners. If they could reduce returns to just being quality issues, the industry would have \$3.9 billion in additional profit."

But what are the reasons for returns if not quality issues? These reasons include the fact that the part doesn't look like what came off the car or a miscataloging issue. Most importantly, **many parts are returned because they were never installed.**

This white paper will focus on reducing unsold returns by reducing market saturation.

The Aftermarket is NOT for the faint of heart

The state of the industry today leaves a lot to be desired. It's too easy to overbuild and saturate the market as multiple brands compete for a piece of the pie. It's anybody's guess which parts will fail on which model over time. In fact, according to a 2012 Gartner survey 51% of companies said that forecast accuracy and demand variability were top obstacles to achieving their goals (Big Data in the Aftermarket, Brian Albright). And forecast algorithms based on historical sales don't factor in the life cycle of an aftermarket part. What was selling one year might not be the next. The Aftermarket is not for the faint of heart.

5 o'clock promise leads to just-in-case inventory

Those in the Aftermarket already know this. They have proven that they can thrive in an industry delivering on a 5 o'clock promise—a fast turnaround promise which has led to the just-in-case inventory philosophy and the high return rate.

Just as technology has risen to meet the needs of suppliers to deliver on that 5 o'clock promise through the years, it will do so again. A technology quantum leap occurring now will ultimately allow suppliers to come together and begin a new way of doing business. Those willing to take that leap will find themselves managing less waste and increasing margins.



Technology changes the publishing industry: How can the Aftermarket ride the wave of change for the better?

But first let's take a look at how technology has affected the publishing industry, and how those ready to make the leap have been reaping the rewards. The digital age revolutionized how we get our information and completely reshaped the publishing industry as a result. The ability to publish and distribute information directly to the masses without a publisher has changed the demand and shape of the publishing industry. Online unedited ebooks can be accessed. Content can be published instantly with blogs, vlogs, and even through Facebook® and Twitter® posts. The good news for publishers is that books published through traditional means are perceived as offering higher quality.

One of the problems the industry faced prior to the Internet was high returns on books not sold and the cost of disposal and waste associated with those returns. As industry demand has changed, those willing to leap have published smaller batches of traditional bound books in lieu of those available online and distributed via e-readers. Others offer books on a print-on-demand basis. Publishers are producing less, reducing costs (and the waste associated with overproduction), and earning sales in a mix of channels.

What can the Aftermarket learn from this model? How can we leverage available technology to reduce the return rate and associated waste while improving margins; and at the same time stay ahead of the curve of rising innovation?

Take the macro view of demand forecasting

The solution is to forecast demand across the entire supply chain. Demand is fluid, like an ever-changing sea. Those businesses that learn to "surf" that sea become champions. If manufacturers have a better idea of what demand is like for the industry, they can take measures when they see demand starting to fall, centralize their products, and shift them to where they are most needed.

What is Big Data?

Big Data is “an all-encompassing term for any collection of data sets so large and complex that it becomes difficult to process using on-hand data management tools or traditional data processing applications.”

Top 20 Vehicles - Oxygen Sensors, Year over Year Trend

2013 vs. 2012

YEAR	MODEL	RANK		DEMAND	
		RANK	RISE/FALL	RISE/FALL %	
2002	ACCORD	1	27	53%	New
1999	CIVIC	2	(1)	-30%	
2001	SENTRA	3	39	62%	New
1999	CAMRY	4	115	143%	New
2000	CIVIC	5	(4)	-35%	
2004	GRAND CHEROKEE	6	8	12%	New
2001	QUEST MINIVAN	7	146	158%	New
1998	CIVIC	8	(5)	-33%	
2005	CIVIC	9	378	343%	New
	ELANTRA	10	7	14%	
2001	DAKOTA	11	41	53%	New
	SILVERADO 1500 PU	12	8	16%	
2005	CARAVAN MINI VAN	13	18	23%	New
2001	CIVIC	14	24	31%	New
1997	F150 PICKUP	15	37	47%	New
1996	TACOMA PICKUP	16	371	291%	New
1991	ACCORD	17	63	57%	New
2002	FRONTIER PICKUP	18	46	47%	New
1997	ACCORD	19	6	5%	New
2003	PASSAT	20	820	723%	New

Demand is fluid, an ever-changing sea.

In the graphic above, it's clear that when looking at the demand for the top 20 vehicles from one year to the next, you'll find that more than 75% are new to this list on a year over year basis. That's a lot of change. And, unless you have a way to track those changes, the parts you build one year might not be the parts in highest demand the next.

Demand Forecasting Today in the Supply Chain

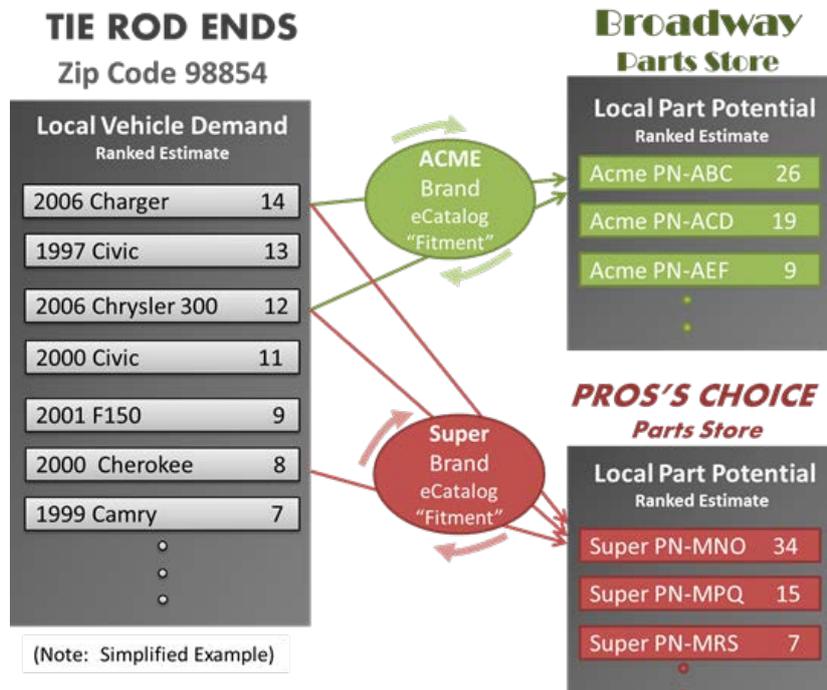
According to statistics issued by the Auto Care Association in 2012, the US Aftermarket is a \$307.7 billion industry. That same year, there were 254 million vehicles registered in the U.S. alone (Statista.com). Each car has approximately 30,000 parts (figure from Toyota). An average automotive store stocks around 30,000 parts while an auto parts warehouse stocks 120,000 parts. The Automotive Aftermarket is a Big Data industry. If the industry learns to harness and utilize that data, the results will be astounding.

Forecasting Local Vehicle Replacement Demand by Store Trading Area

Right now, most in the supply chain can track and forecast demand per store for the practical goal of customizing assortments to local demand. This is great news. Being able to forecast on a trading area and store-by-store basis is an important first step. Some distributors that have been recognized with Industry Best Practices awards for excelling in inventory efficiency use advanced Demand per Store Trading Area capabilities. They exhibit precise inventory accuracy and can predict demand per store on a level previously unseen. The Aftermarket is on its way.

Example of local vehicle replacement demand by store trading area:

Goal	Stores differ in terms of "Vehicle Clientele." The goal is to customize local assortments to support high-sales service levels.
Challenge	The demand data set by store and part number is not enough to truly understand the local potential in stocking any one part versus another part. Companies cannot properly customize store assortments to maximize inventory performance to local Vehicle Clientele service needs. (see earlier Special Report on Channel Visibility for more information).
Solution	The first step is to profile the Vehicle Clientele and their service needs in the local trading area. This can be done by calculating the Local Vehicle Replacement Demand per zip code, irrespective of brand. Then, stock the shelves with the brand and parts that best reflect the demand per zip code. The brands will vary per competing stores, and in some cases any store may carry multiple brand choices.

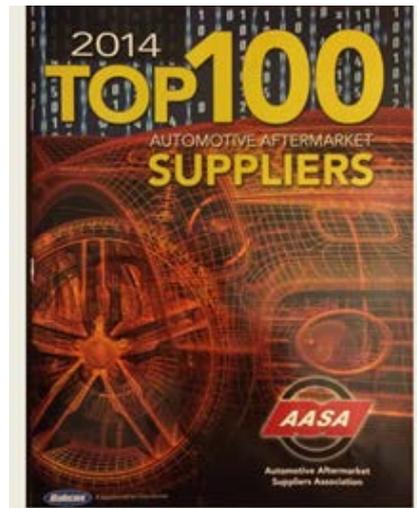


Over the last seven years, Distributors that utilize tools which apply the technique above have dominated the annual Aftermarket Global Symposium Award for "Inventory Efficiency."

The question now is how do manufacturers and distributors take it from forecasting demand on a micro level (store) and step back to the macro level (supply chain)?

Forecasting demand by subchannel or program group

All of the pieces are in place for even greater change as the industry begins to capture demand data per subchannel or program group. Each business that comprises an Aftermarket Program participates to capture data that benefits the whole group. Their participation helps them understand the demand for the entire subchannel. This collaboration leads to greater insight for their business and for the group as a whole.



What if each manufacturer had access to 80% or more of their true customer "end of channel" demand by part?

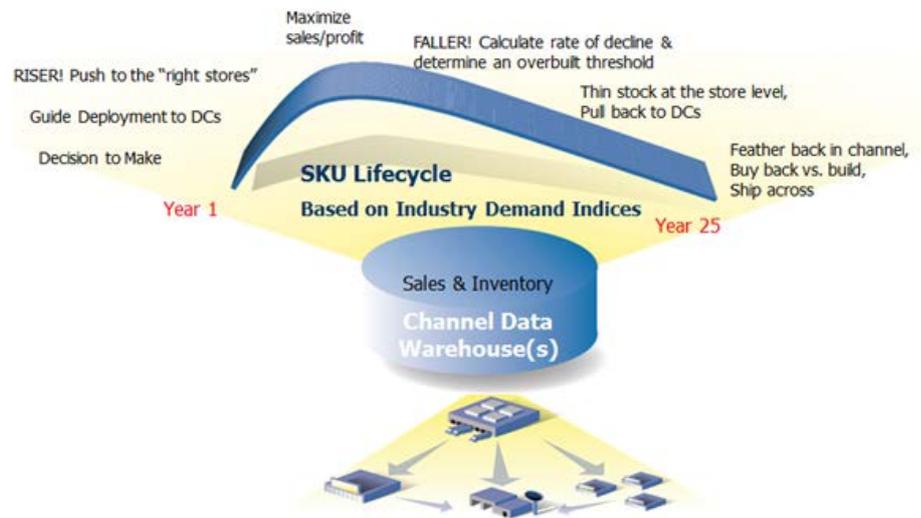
The truth is, many manufacturers do have access. 37 of the top 100 Manufacturers have access to Program Group Data Warehouses. Most have access to multiple Data Warehouses.

Perhaps the real question is this: will each manufacturer maximize the data already at their fingertips? And what's the missing link?

Forecasting demand by industry

The next step for the Aftermarket is to collaborate in order to forecast demand by industry. Why collaborate? Here's what Brian Albright, writer for Aftermarket Business World, wrote in his article on Big Data: "Aftermarket companies are often starved for data on specific SKUs because no single location generates a high level of sales for a given part. That requires data pooling among supply chain partners."

With data pooling, suppliers can adjust pricing across thousands of parts to maximize sales. That leads to the Aftermarket's greatest potential: to collaborate in order to capture data and start to understand the shape of demand across the life cycle of each part type and vehicle platform. As a picture takes shape whether the market for a certain part or vehicle platform is over-deployed, suppliers can move forward towards cost-savings strategies, such as reducing production, centralizing inactive parts, and focusing energy on products that are showing greater activity.



Year-to-Year Vehicle Part Demand Life Cycle

The Solution is Collaboration and Stock Transfer Balancing

What can be done about market saturation of certain parts and the resulting high return rate? The solution is two-fold: 1) collaboration in order to capture big data across the entire industry; and 2) initiation of stock transfer balancing across the supply chain.

Many understand the idea of stock transfer balancing within store locations. Instead of purchasing more supply, a business owner simply transfers stock from one store to another, reducing overspending and overstock.

Now take the macro view and look at how to transfer and balance stock across the supply chain.

It Starts with participation in data warehouses

Data warehouses are collecting and capturing data to help make this solution become a reality, but without buy-in from the entire industry, there will be inadequate data to create a demand forecast with sufficient accuracy.

This data warehouse technology makes it very possible to understand the current state of demand for any given part type and vehicle platform. In fact, Epicor is no stranger to data warehouse technology, as it operates many data warehouses in order to provide very detailed part demand data to more than 40 manufacturers.

What's coming next are much more complex algorithms – technologies that can calculate and forecast demand across the entire supply chain using the Big Data captured in data warehouses. It's going from simple analytics to predictive analytics, from the micro view to the macro view.

How does the industry go to predictive analytics:

1. Sales data needs to be captured in order to understand what is happening now in the supply chain.
2. Data must be collected over time in order to understand the behavior of each part type, allowing for a clear picture to emerge for the life cycle of a part.
3. Software must be developed by a reliable technology partner to use the Big Data to forecast demand across the industry.

Collaboration is key

Those who are willing to participate gain a distinct advantage. Those who know their channels and are first to forecast for them can improve GMROI, grow their bottom line and improve their balance sheet while delivering unparalleled efficiency and customer service. AASA President Bill Long wrote in "The Long View-Who Will Take the First Step": "Throughout its history the automotive aftermarket has looked to the supplier community to provide strong leadership and serve as a beacon for the industry in times of change. Let us all send a clear and powerful message by taking the first steps toward real collaboration leading to real change and long-term industry health for all stake-holders."

Epicor wholeheartedly agrees.

Conclusion

Collaboration is the way to surf the sea of demand in the Aftermarket industry. With such a complex inventory, gaining a picture of which parts have growing demand and which have diminishing demand is key.

Epicor has been a leading participant in the data arena. The company has managed millions of data sets through the Epicor® electronic catalog for more than 30 years. The Epicor electronic catalog data set comprises 480 million catalog applications and nearly 10 million part numbers, with over 1,600 aftermarket manufacturers and 7,800 product lines. Over 6 million part numbers have images displayed in the Epicor Cover-to-Cover™ application.

Epicor offers a Cloud Data Warehouse solution that is already gaining a foothold in the industry. The Data Warehouse captures data for more than 5 billion inventory items (over 200 million per day) and 2.5 billion-plus transactions. From the data captured to date, it is obvious that only 1 or 2% of all inventory is selling on any given day. This means there's a considerable opportunity to cut costs and waste through inventory management and manufacturing.

Epicor has a good picture of demand right now. With a larger set of data points, the next step is predictive analytics. When this technology is ready, manufacturers and distributors can work from models where they offer their products on the shelves where they're most needed.

Contact Us

For more information on how you can get on board with the ability to understand and forecast demand across the supply chain, please contact us at 888.463.4700 or by email at automotive.aftermarket@epicor.com.

About Epicor

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