Vanguard Software
CORPORATION

New Product Demand Forecasting
From Comparables to Supersessions

Marketplace fluctuation raises the specter of product-release failure or underperformance. This makes new product demand forecasting and planning exceedingly difficult, especially for products with short and fast-changing consumer demand cycles.

The good news:
- New products are usually comparable to older products. Applying the right shared attributes between old and new improves new-product forecasts.
- New products are often introduced to replace existing products, in which case statistical tools such as Supersession can help planners model the transfer of demand from one or more products to a new product or set of products.

About Comparable Forecasting
When Samsung released the S6 Edge smartphone in 2015, the company found out quickly that it was unprepared to meet demand. Samsung planners thought that the handset's first-of-a-kind design (the sleek curved screen) would appeal to a niche audience, thus limiting sales. They thought wrong.

The S6 Edge was a hit for the masses, or would have been if given adequate availability. Instead, Samsung had a hot product with a

Executive Summary:
- Forecasting demand for new products is difficult as they lack sales history. There are, however, tried and true statistical methods that get around this obstacle.

Vanguard's Solution:
- Two decades of experience applying Comparable Forecasting, Spread Curves, and Supersessions to hardto-predict product launches.

Impact on Client's Business:
- Match great products with effectively planned launches for maximum market penetration, sales, and profitability.

skimpy logistical roll-out. Supply was overrun by unanticipated demand. This led to production shortages, shipment problems, lost sales, and probably lost market share.

Conversely, Samsung had at the same time overestimated demand for its regular S6 handset, a cheaper and supposedly more mass-appeal model. The unit was overstocked, which led to an ill-timed surplus of unsold handsets. Competitors, such as Apple and a host of lower-cost producers in China and India, were ready and pounced with their own competitive releases.

Samsung's S6 product releases became a textbook example of the difficult but critically important role of new product forecasting. The stakes are especially high in technology, consumer electronics, and fashion, where new products abound, and where sales can spike and fizzle in short demand cycles, sometimes just months or weeks long. This makes product forecasting, launch timing, and capacity planning exceptionally difficult. It raises the importance of dynamic and agile supply chain planning.

Across industries, some 80% of new products fail. Not surprisingly, one of the biggest contributors to this failure rate is unnecessarily inaccurate forecasting. While no system or organization gets forecasts 100% right, the best get them consistently less wrong if you are forecasting to a single number.

New products are inherently difficult to forecast because they have:
- No direct historical data to extrapolate
- Diverse or sometimes unknown buyer sets
- Harder-to-predict adoption rates and lifecycle spans

The Promising and the Proven

In the consumer arena, many supply chain leaders use real-time, or near-real-time, historical data as a demand sensing tool, synthesizing the latest sales and other data to gauge true demand. Vanguard's forecasting and planning platform factors multiple point-of-sale data streams to improve consumer goods forecasts. Other, non-historical data streams used in demand sensing include weather, economic indicators, and social media. You can use this outside data for additional regression analyses to better sense true demand, such as which new smart phone consumers want. In Samsung's case, better stock-out or social data may have helped.

Rather than jump into promising innovations in demand sensing, following are some market-proven fundamentals in the realm of historical, time-series forecasting:
- Comparable Forecasting
- Spread Curves
- Supersessions

About Comparable Forecasting

The problem with trying to forecast demand and adoption rates for new products is that there is no history to work with, at least no direct history. However, there may be similar products with comparable attributes and sufficient historical data to serve as a proxy.

Comparable Forecasting applies the patterns and parameters of similar previous products to the forecasting of new

products. You can use it for both initial and later-stage adoption rates. It works best if your new product or service is substantially similar to an established, or previously launched item, or better yet, a set of items. With the right technology platform, you can select comparable past products by virtually any attribute, such as:

- Product code
- Product family
- Region
- Seasonality
- Adoption profile
- Life cycle span
- A combination of attributes

Some organizations can aggregate entire series of similar previous products with which to model forthcoming launches. Vanguard clients have seen first-hand the improvement that aggregated data sets can contribute to Comparable Forecasting. Independent research bears this out.

A recent study led by researchers from Northwestern and Penn State universities found that Dell's comparable product data, when properly assembled, could raise forecast accuracy on new products by as much as 9%. That's huge, especially given that new products account for more than a quarter of sales (on average) for retailers and consumer product makers. The potential returns are also huge: reduced inventory, stock-outs, and emergency shipments, plus higher sales and customer satisfaction.

In Dell's case, researchers found that by clustering previous products with similar product life cycle (PLC) curves, they could model each new product according to the PLC cluster it most resembled. This improved new product forecast accuracy, as each cluster encompassed an aggregated series of product histories (a lot of data). They combined this with additional information for each new product, such as launch timing, sunset plans, and more to fine-tune individual demand forecasts.

Comparable Forecasting is one of several methods for new product forecasting. It's most effective when combined with other statistical techniques. Vanguard Predictive Planning integrates multiple techniques in addition to Comparable Forecasting to maximize forecast accuracy including:

- Spread Curves for new product adoption
- Supersession for cannibalization effects

Prior to choosing the right mix of forecasting tools, it's important to first conduct a review of the product portfolio, past, present, and future. Look for lessons in the sales data. Identify the products, product sets, and seasonal or geographic releases that are analogous to imminent or future new products.

Also, review the forecasting and planning process. It should combine at least some level of statistical modeling and simulation, workforce collaboration, and automation. Either way, it may be worth looking into a best-of-breed solution that combines all three in a single, cloud platform. Let's look at Spread Curves and Supersession.

About Spread Curves
In Vanguard Predictive Planning, a user with domain expertise can select the likely demand factors that will affect

---

Vanguard Software
CORPORATION

1255 Crescent Green
Cary, NC 27518
vanguardsw.com

Phone: 919-859-4101
Fax: 919-851-9457
Email: info@vanguardsw.com

the adoption of a new product and apply them to the forecast. These effects can include seasonality, decay, launch time, life cycle, region, and more. Typically, Vanguard works with clients' domain experts to discover, test, and isolate the effects of these key demand factors.

About Supersession

When Apple executed a staggered release of two new handsets in 2017, the company was surprised to see that the first release (iPhone 8) had unexpectedly weak sales. It was launched in the fall, several weeks before the then highly anticipated iPhone X.

Initial iPhone 8 sales were weak. In some markets, they paled in comparision to those of the iPhone 7 (during that phone's comparable launch period a year earlier). The unexpected weakness caused uncertainty for Apple and its investors, and once again brought into focus the difficult but critically important role of new product forecasting.

A Supersession is an adjustment tool for a Time Series forecast that models the transfer of demand from one or more products to a new product or set of products. Supersession factors in the cannibalization effects of the new product introductions (NPIs), such as on existing products, or in cases where there is a staggered release of two or more products (iPhone 8 and iPhone X).

Using the iPhone example:
- Did marketplace anticipation of the iPhone X cannibalize iPhone 8 sales?
- Were potential iPhone 8 buyers holding out for the iPhone X?
- Did Apple overstock the iPhone 8, or was adoption just latent, not doomed?
- Did Apple have sufficient iPhone X production and inventory in place to meet demand?
- How did both products' adoption cycles shake out?
- How would they go on to cannibalize share from iPhone 7?

These questions illustrate the difficult challenges of NPIs and of product transition planning. Following are the advanced statistical techniques for managing around these challenges, and the ability of advanced analytic software to automate the forecast process and improve accuracy.

Supersession is useful in modeling:
- Product transitions: One product replaces another product.
- Phase-outs: One product slowly phases out and is no longer sold.
- Cannibalization: A new product competes with an existing product and cannibalizes some of the existing product's demand.

Supersession is extremely useful for consumer technology products because they are frequently updated with newer, faster, sleeker versions. Supersession is also useful for certain seasonal products that have multiple iterations. Supersession is another way to use the demand history of old or base products to forecast a new product.
Using smartphones as an example, following are four types of Supersession:
- One to one: You are phasing out handsets with headphone jacks and transitioning to Bluetooth audio transfer.
- One to many: You are phasing out red handsets and transitioning to black and stainless steel handsets.
- Many to one: You are phasing out red and black handsets and transitioning to stainless steel.

- Many to many: You are phasing out red and black handsets and transitioning to blue and gold.

Note that as demand for the base product diminishes:
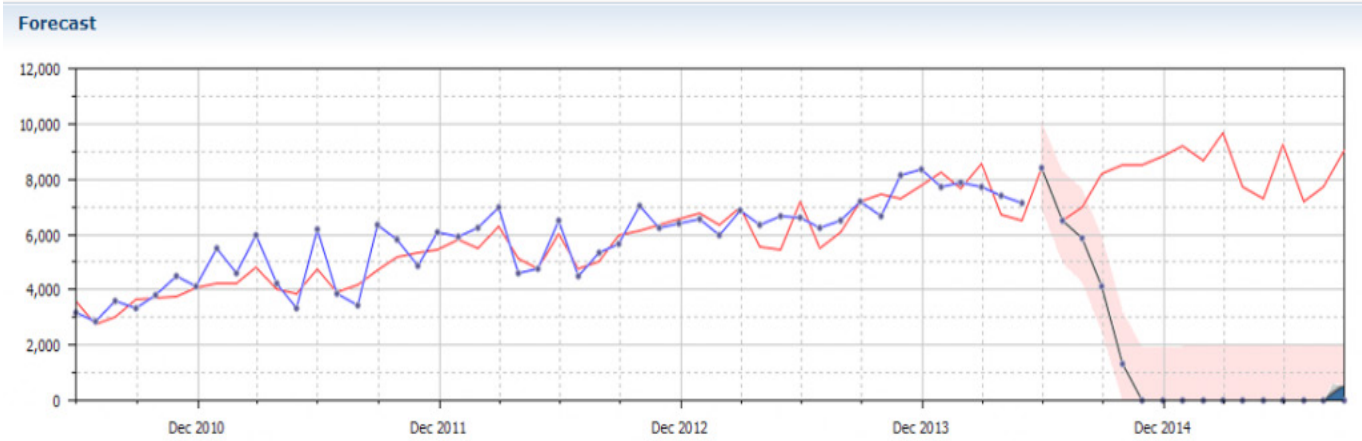
Demand for the replacement or competitor product rises

Supersession with forecast automation

With automated forecasting and planning software, the Supersession feature automatically maps old-item sales data to new items. This lets organizations easily model and map the gradual (or swift) replacement of existing or base products with new products. This is key to product demand planning, transition planning and strategy, and NPI execution.

There are two major ways to model a Supersession, depending on the circumstances:
- Use the historical sales data of base products to forecast new products, and the transfer of demand (or sales) from old to new. This is done when the new product has little or no history to factor into the forecast, at least not until it matures sufficiently.
- Combine the sales histories of base products with sales data from the new (or newer) products being forecast, as that new product data streams in.

The Supersession feature in Vanguard's forecasting and planning platform delivers best-of-breed capabilities for predicting demand transitions from one product to another, one to many, many to one, or many to many. This combined with Vanguard's unmatched arsenal of analytics, automation, and collaboration features gives you an all-in-one enterprise Sales and Operations Planning (S&OP) solution in a single, cloud platform.

Vanguard has over 20-years' experience building the most precise forecasting and supply chain optimization solutions available. Learn more at vanguardsw.com

Vanguard Software
CORPORATION

1255 Crescent Green
Cary, NC 27518
vanguardsw.com

Phone: 919-859-4101
Fax: 919-851-9457
Email: info@vanguardsw.com