

LEAN THINKING IN WHOLESALE DISTRIBUTION...



Do You Really Need to “Take the Lumps”? Some Solutions for Forecasting Intermittent Demand

Introduction:

Over the years, I’ve identified at least 9 different “product demand patterns” that need to be (1) identified, (2) understood and (3) addressed.

Note that “identified” is the key first step. Many wholesale distributors don’t choose to or don’t possess a demand analysis capability that reliably identifies a specific product’s demand pattern type.

In fact, in a typical wholesale-distribution environment, a product demand pattern that is particularly perplexing - probably occurs more than you think - and therefore poses real forecasting challenges - is *intermittent demand*. I simply call it “*lumpy demand*”. Many ERP systems don’t provide a forecasting solution, at all, for lumpy demand patterns. Does yours?

What’s Lumpy?

I define “lumpy” as being characterized by several monthly periods of zero (0) sales, let’s say over the past 12-months (see example #1, below)

Example #1:

Jan.	Feb.	Mar..	Apr.	May.	Jun
.0	50	25	0	0	0
Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
45	0	0	25	0	0

Unlike other products that sell “some” most every month, lumpy demand products have one additional challenge – forecasting “*when*” the next demand will occur. So, it’s really a two-pronged challenge – “how much might I sell - and when”?

Now, in practical terms, let’s face it - forecasting is a bit of crystal ball gazing despite the variety of forecast modeling techniques out-there. Some of these modeling techniques are over 50 years old. Depending on the capability of an organization’s product demand analysis and forecasting

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system, and the extent of complete understanding of the methods and best practices to be used, history has shown both good-to-excellent overall results – and some not so good.

What's Wrong Here?

Well, take a look at example #1, again:

Demand over last 12-months = 145

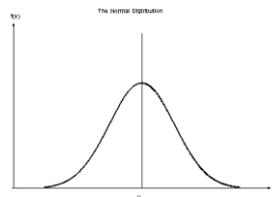
Last 3-month average = 8

Last 6-month average = 12

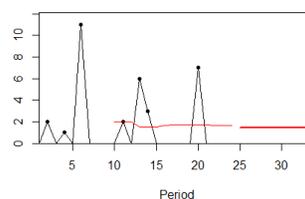
Last 12-month average = 12

I doubt that any of these possible answers, using moving averages (a common approach) or even weighted moving averages (called “smoothing”), would be acceptable to you as a demand forecast to drive your inventory replenishment system!

Moving averages ignore the special impact of zero values in demand history, as well as its potential negative impact on the computation of safety stock logic. In other words: using moving averages that are based on a “normal distribution of demand” – like this....



...is simply not effective in attempting to forecast this:



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Since moving averages tend to lag, they may give you an idea of average historical demand, not a reasonable prediction of what you will sell in the next month or beyond – or “when”. Using a moving average is sort of like driving - by looking in your rear view mirror.

So if moving averages won't work well, what can we do?

Some Solutions:

I recently spoke with Rick Morris, President of Thrive Technologies, a provider of cloud based demand forecasting and inventory replenishment software. Rick was right upfront in acknowledging the challenges posed by lumpy demand.

First he equated products exhibiting a lumpy demand pattern, to what is often called “spare parts” – like in the automotive parts world. Think windshield wipers! I bet you haven't often thought about your products that way or even thought they did exhibit spare parts demand characteristics.

Next, he suggested asking this question; Is this is really a product that can reasonably be forecast, or is the demand statistically impossible to predict accurately, based on prior history, because its primary demand was “project related demand” – not repeatable? If so, this is where Sales, Inventory and Operations Planning (SI&OP) can be very helpful. Getting feedback from your sales team regarding their customer's anticipated inventory requirements can be used to create forecasts for your replenishment system. We'll cover the latter in more detail in another article.

But, if you think that this might be a product that can be forecast, and it is part of a product grouping (for example - windshield wipers), then it may be possible to group all those SKU's demand history together, create a forecast at the group level, and then allocate (pro-ratio) the group forecast back down to the individual SKU's to derive a reasonable forecast to work with. Companies like automotive parts distributors who have 70-80% intermittent - lumpy demand with their parts, have used this technique very effectively.

Rick also mentioned that there are also new forecast methodologies (formulas) like the Croston method, which is designed to forecast lumpy demand occurrences. He suggests you experiment with Croston, using a forecast modeling software like Thrive, to see if these forecasts might be more effective for you. In fact, Rick is offering “a free proof of concept” simulation for a sampling of your specific SKU's.

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Further, Rick mentioned that these types of forecasts need to be evaluated, that is, it's also important to get an error measurement or a measurement of the demand volatility. Ultimately, this can then be used to calculate optimal safety stock. The forecast accuracy for these types of items will probably be low, but if it is an important item that you have to stock, you can still refine the math on the replenishment side of the calculation to stock a quantity that satisfies the bulk of the demand but doesn't force you to stock too much. This is where, in my conversation with Rick, I interjected a method I've often suggested.

Average the demands, over the past 12 months, in which some demand values greater than zero (0) has occurred.

Example #2:

Jan. .0	Feb. 50	Mar.. 25	Apr. 0	May. 0	Jun 0
Jul. 45	Aug. 0	Sept. 0	Oct. 25	Nov. 0	Dec. 0

New Demand Forecast = 36 (145 / 4)

Compare this to: Last 3-month average = 8
 Last 6-month average = 12
 Last 12-month average = 12

Perfect? No. Is it more "reasonable"? In this case yes. Many times, it is.

Summary:

In the real world, forecasting is not exact, we all know that. So...

(1) Identify and understand the demand patterns you experience. It's an important first step before attempting to provide a solution. Your forecasting software should provide this demand analysis capability – not just produce a demand forecast number in a "black box" manner.

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(2) Understand forecast error measurement to seek out the best possible solution that provides the lowest forecast error.

Yes, there are some valid solutions out there – surely a lot better than looking in your rear view mirror, isn't it? Why “take the lumps?”

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About Thrive Technologies

Thrive Technologies is the leading provider of cloud based demand forecasting, cloud based inventory replenishment and inventory performance software to SKU intensive businesses. Thrive's award winning systems increase inventory profitability for wholesale distributors and retailers through industry leading forecast accuracy combined with a unique inventory 'nervous system' that dynamically adjusts SKU level inventory based on recent activity, orders and strategic goals. Based on their supply chain goals, Thrive clients monitor their continual and self evident improvement in inventory performance. Supported by Thrive's long term partnership approach and deep domain expertise, Thrive's clients achieve a 90 day return on investment and lasting improvements to profitability and competitive advantage. For more information, please visit Thrive on the Web at www.thrivetech.com, or call us at 770-222-8599.