



MACHINE LEARNING + STATISTICAL FORECASTING = FASTER RESPONSE



CAROL MCINTOSH

JULY 2, 2018

ADVANCED ANALYTICS

S&OP/IBP

Machine learning doesn't render statistical forecasts obsolete, but makes them more valuable.

18

In forecasting there is an old saying that forecasts are never accurate, and that what's important isn't an exact number, but a range. Advancing digitalization is making this approach more and more effective, as we use forecasts to identify trends, and use **machine learning** and artificial intelligence (AI) to react quickly to short term volatility.

A forecast range has always been valuable as it allows us to know with a reasonable degree of certainty how much we need to produce, and within a tolerable margin of error. But it's not without its limitations – it is after all limited in the sense that you are likely to over or under produce to some extent.

*Far from **machine learning** and AI making statistical modelling obsolete, they are making it more valuable*

But now, by focusing on the direction of trends and range of error, we can overlay digitization and analytics to quickly adjust to reality where needed. Collaboration and increased transparency has allowed organizations to act faster, reducing cycle time and moving decision making into periods where the forecast is more accurate. Far from **machine learning** and AI making statistical modelling obsolete, they are making it more valuable. We can now use time series forecasts as our base and use new data analytics to identify short term spikes in demand, and react accordingly.

Time Series Forecasting Isn't Going Anywhere

The forecast is an integral part of planning. It is the compass that guides the supply, production and financial plans in the right direction. It is a critical input to the Sales and Operations plan. Forecasting is used for many purposes in supply chain: manufacturing capacity, number and type of

machines, employees and skills, long lead-time components, inbound and outbound transport capacity, warehousing space, and material handling equipment as examples.

Even highly flexible businesses that claim to not have a forecast, and only produce to demand, must make some estimates for the future in order to produce economically, hire the right number of employees, and establish sufficient sources of supply.

What Has Changed?

What has changed you ask? Think about the pace of change in business today. Uber, Netflix, Airbnb, Amazon, to name a few, have disruptive business models. Successful companies encourage managed risk, embrace change and focus on speed of decision making. They are passionately aware of their customers' needs. They respond rapidly to new opportunities, constantly evolving and redefining their markets. Their entire operation is geared to respond quickly to deliver new services and products at disruptive prices. AmazonFresh is a great example of this.

The value of forecasting has been elevated with digitization

Companies that believe that facts are the best guide to decisions have made data and analytics an integral part of their business, supporting their competitive strategy. For example, Netflix is using analytics to predict customer viewing preferences. UPS uses prescriptive analytics to tell drivers which route they should follow to make deliveries in the least amount of time with the least fuel.

Digitalization Improves Your Ability To Forecast... And Delight Your Customers

Large data sets are improving the ability to analyze trends and buying behaviours. Companies are using data analytics to help them sense and respond. With data such as [point of sale data](#), channel data, weather patterns, and buying behaviour, early warning signals provide insight into what is really happening versus the plan or forecast. This allows companies to respond faster to deviations.

There is also an increased use and accuracy in predictive and prescriptive analytics to generate forecasts and identify out of tolerance forecast exceptions. And with [machine learning](#) and artificial intelligence the machine will create the statistical models.

Increased collaboration has increased transparency, reducing time to respond to demand changes – you can thank millennials for that

The emphasis on collaboration in organizations, influenced by millennials, has increased transparency throughout functions in the organization. This has resulted in companies reducing their time to respond to demand changes. It is well understood that the accuracy of the forecast diminishes over time; therefore, a faster response can be based on a more accurate forecast.

How Do You Get There? Top Ten Tips

1. Encourage innovation and disruptive thinking. Allow employees to test and learn in innovation labs.
2. Foster education on digitization; big data and analytics and how it can positively impact your forecasting.
3. Focus on group decision making when creating a consensus forecast. This requires cooperation versus competitiveness.
4. Monitor the value add of the collaborative process versus just the statistical and [naïve forecasts](#).
5. Use range forecasting to allow for upper and lower alternative forecasts to also be reviewed and analyzed with multiple forecast scenarios.
6. Perform risk analysis to proactively understand and mitigate the risk on supply planning, production, revenue, and margin of the forecast scenarios.
7. Implement process improvements to reduce reaction time, cycle time and inventory. Taking time out of your process allows you to act on a better forecast and respond more effectively to changes.
8. Improve your response time and the accuracy of your response to the customer for demand changes by working in collaborative teams versus siloed decision making.
9. Direct your employees to be objective driven versus functionally driven.
10. Last but not least, become intimate with your customer. Understand their buying behaviour. Apply segmentation strategies to improve your service and delight your customer, every time.

[Ed: to set up machine learning in your organization, check out [this guide to getting started with machine learning](#)]

PREVIOUS ARTICLE

WHY ALL CEOS MUST EMBRACE S&OP

NEXT ARTICLE

MISSING PERSONS: HAVE YOU SEEN THE SALES DEPARTMENT?

CAROL MCINTOSH

Carol is a business consultant with experience in supply chain transformation, demand and supply planning, and S&OP. She has worked predominantly in the pharmaceutical, consumer goods and high tech industries, including projects at Procter & Gamble, Merck, Schneider Electric and Amgen. She has managed cross-functional teams to deliver demand driven supply chains, eliminate functional silos and implement exception based management. Having spent 14 years at Nortel Networks, Carol moved to Zinata Inc. where she is a business consultant. She holds a degree in Business Administration from Wilfrid Laurier University.