



DATA-DRIVEN FORECASTING
**6 BEST PRACTICES TO
EFFICIENTLY DRIVE
TIMELY AND ACCURATE
DECISION MAKING**



The background features a blurred office scene with people in business attire. The foreground shows a close-up of a laptop keyboard and a document with a bar chart. The document has a header that reads "Detailed information of changing business..." and a table with columns for years from 2010 to 2017. The bar chart shows data for each year, with values increasing from 2010 to 2017. The laptop keyboard is partially visible, showing keys for "Subsidiary 1", "Subsidiary 2", and "Product".



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INTRODUCTION

Modern forecasting has evolved from a consolidation of submitted guesses and commitments to an ongoing calculation based on live data and analytics from multiple sources. This is no accident: We are living in the most data-rich times to date. Strong data governance practices are making that data more reliable and useful than ever before. Sophisticated aggregation tools allow enterprise leaders to dive headfirst into a sea of data points, accumulating previously unthinkable levels of information on their customers and industry and market trends. But just because we have more data than ever before doesn't mean we are necessarily better off when it comes to our decision-making prowess.

The deeper you dive into big data, the murkier it gets - and the more difficult it can be to gain insights. The sheer volume of data many FP&A professionals have at their disposal now is certainly unprecedented, but it is also growing faster than can be effectively managed. High volumes of data are only useful if you can successfully read and comprehend it, gleaning insight from the relevant information. Otherwise, this avalanche amounts to simply noise, bloating forecasts with potentially irrelevant - or even counterproductive - data.

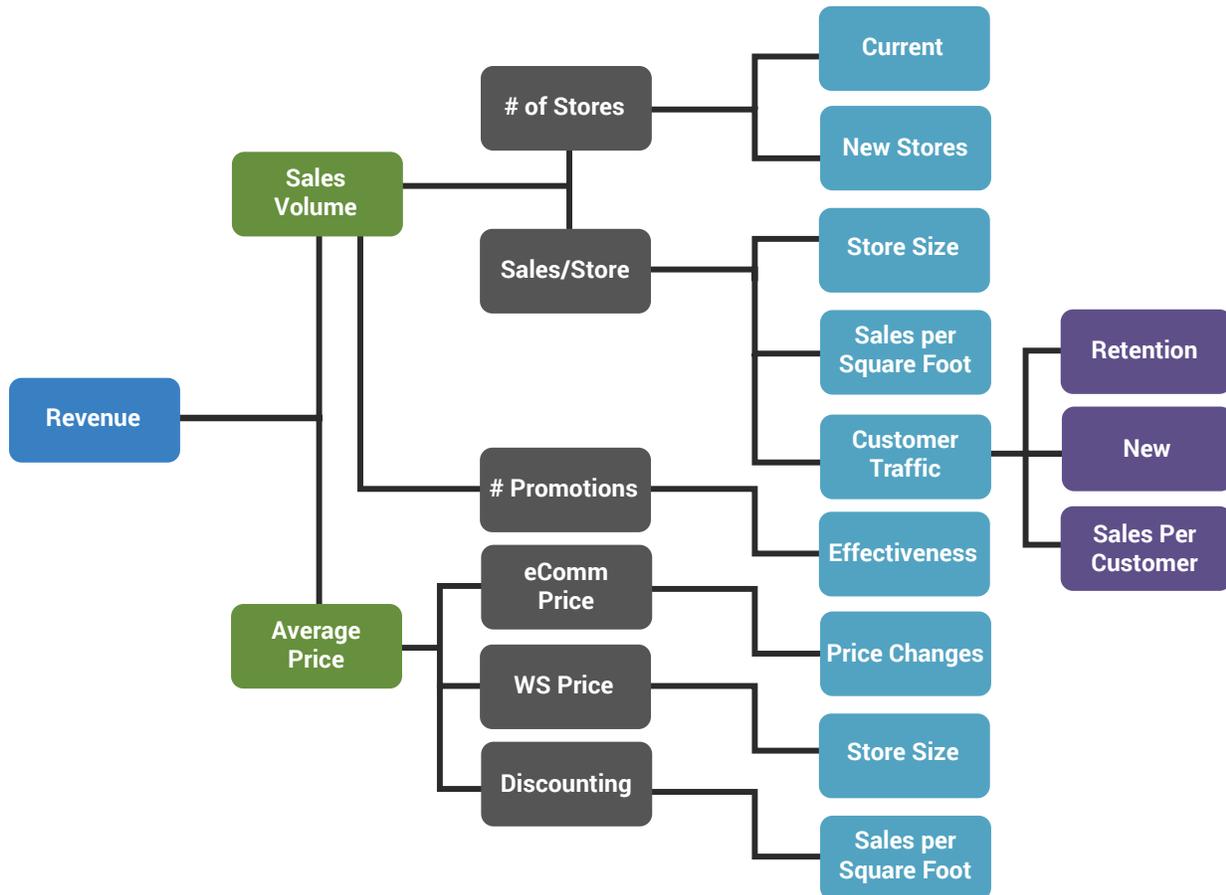
In today's market, FP&A professionals cannot afford to waste time sifting through large data banks seeking a diamond in the rough. Economies are more globally interconnected than ever before: Suppliers, customers, employees, stakeholders and other external influences work together to respond to sudden fluctuations in global markets. The sheer pace of modern business is unparalleled, with instant communication enabling and even driving the expectation of virtually instantaneous decision-making.

As such, financial planning and forecasting need to happen quicker, and with reference to more sources of data, which in turn supports the need for continuous planning with automated data flows. But even speed won't save a forecast unless it is approximately right, taking into account only the the relevant data and pivoting as needed.

In our experience as advisors and providers of analytical tools to FP&A professionals, we have observed several best practices that can help drive timely decision-making, while maintaining high levels of accuracy. The following is a guide to six of the primary best practices.

ONE: IDENTIFY A STRONG SET OF DRIVERS FOR YOUR BUSINESS OR FUNCTION

Driver Example - Wholesale Sporting Goods



In this example, Revenue is the product of Sales Volume and Average Price. Macro-level adjustments may be made at this level, but it is best to drill down to a lower driver - in this example sales volume is driven by the number of stores, sales per store, and the number of promotions. Each of these drivers is further driven by lower level components. By modelling each of the components and their relationship and sensitivity based on historical trends, a robust and reliable forecast can be constructed based on changes in any of the underlying components. Often the granularity helps

to identify those drivers which are the most impactful historically - assuming that historical trends will continue into the future - so that forecast effort can be more tightly focused.

It's important to note that having a simple list of drivers is not sufficient; we strongly recommend that each organization understand its drivers in 'chain' fashion, as shown above. This allows metrics to be used in multiple chains while understanding how each metric contributes to overall success.

The key first step towards putting together a forecast of any long-term use is selecting the short-list of drivers that are leading indicators within your business or industry. This can often be more difficult than it seems, since causal and correlated drivers can superficially resemble one another, with dramatically different implications for forecast accuracy.

To identify these drivers, FP&A professionals should examine the forces at work within their respective markets or industries, seeking to understand, test,

and develop the causal relationships between the forces. Once a set of factors has been identified, lifecycle testing should help determine what has the greatest impact on the market. Take these strong predictive drivers and make them the focus of forecasts, building “chains of drivers,” while setting aside or giving less weight to the others. Most enterprises benefit from a more limited set of drivers to help minimize data noise, so getting the right ones is important. Then find the right level of detail, or granularity (see sidebar) that balances the goals of forecast accuracy and efficiency.

Granularity is a broad term used to indicate the level of detail used to develop a forecast and can have many dimensions.

For example:

Time: Some forecast elements can be built monthly, others weekly. But staffing forecasts are often built in hourly or 15-minute intervals within each day.

Product or Service: consider if your forecast drivers behave consistently within each product or service category, or if there are unique metric values for specific products or services.

Geography: Can you forecast by region, or do driver values behave differently at each location?

Actions: Will your business react to a very short term or product/geography-specific forecast change?

Powerful software tools allow us to track and auto-forecast at low levels of detail, and then manage by exception. This produces a highly accurate forecast that recognizes specific driver activity without burdening the user with managing too much data. The alternative is a broad guess that misses the mark when mix shifts occur.

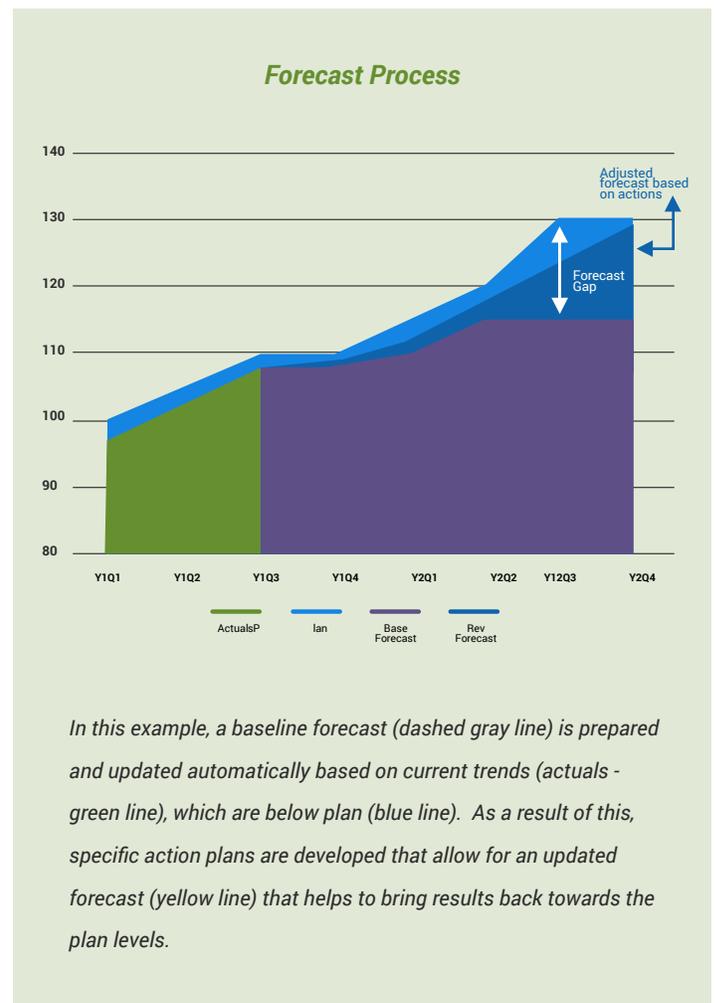
TWO: BUILD A CONTINUOUS FORECAST FOCUSED ON THE RIGHT DRIVERS

Once you have built your customized chain of drivers, your forecast should use driver data to predict outcomes over different time horizons, scenarios, and analytical dimensions. More importantly, your forecast should be ongoing process, constantly changing and being tweaked rather than becoming a periodically performed “project.”

The modern marketplace simply moves too quickly for an annual or semi-annual forecast to have value as a “set it and forget it” projection. Ever-changing business goals, customer interest, and other forces make it much more advantageous to perform regular, small, short-term adjustments rather than set up a long-term projection and slowly watch as it becomes irrelevant. Indeed, part of this advantage is operational: FP&A professionals report higher rates of satisfaction with flexible budgets with short cycle times to update. A shorter cycle time reduces workload, focusing simply on the essential drivers and the way they will shape demand – shortening the gap between forecast and real-time.

This of course requires the establishment of processes that enable on-demand forecast updates. Rolling forecasts, built around the most important drivers of business activities and using data already available through operational reports, allow for the quick and efficient creation of new forecasts as needed, aided by one of the subjects

of our next best practice - automation. Further, if the impact of specific actions is known - as should be the case, such as incremental revenue generated from specific types of promotions - then an updated forecast can instantly be prepared incorporating the impact of taking a given action.



THREE: AUTOMATE AND OVERRIDE, RATHER THAN REQUIRING INDIVIDUAL PROJECTIONS

For forecasters, automation represents a minor revolution in terms of the ability to generate accurate forecasts faster than would be humanly possible. Sophisticated analytic technologies can easily handle vast quantities of data as input, producing comprehensive yet supremely comprehensible, even to laymen, projections - assuming your interface design is built around user experience.

By taking statistical projections and focusing on relevant drivers, automation can help FP&A professionals generate an initial forecast, effectively eliminating the need for human actors poring over spreadsheets and dramatically reducing human error. However, this doesn't mean it's best to hand forecasting over to an algorithm. Automation should have a built-in manual review and override function, allowing users to adjust and re-calibrate manually as needed with the acquisition of information not available within the algorithm, such as a customer advising you that a new product will be launched in 3 months.

This combination of approaches also places ultimate responsibility for the forecast into the hands of the business users who are most familiar with the data, such as sales representatives for sales data or treasury analysts for foreign exchange needs.

Statistical Forecasting - Best Practices

The level of complexity that is available in today's tools creates both opportunity and challenge. For most non-statisticians, the array of statistical formulae are overwhelming. Many of our models incorporate tools that can automatically choose (or recommend) the best method for any given situation, based on a "best fit" approach.

Frequently, users need to exclude data outliers from the historical dataset when building a projection. Again, tools can identify those data points that lie outside of normal probabilities, with the user making the final determination to include or exclude.

Applying smoothing can be of significant assistance in removing the historical bumps and burps from data when projecting into the future. Of course there are multiple methods for smoothing, including the ability to vary the time sensitivity of the calculation.

Finally, visualization is critical when creating statistical-based forecasts. Seeing trends is often more effective than relying on raw datasets. Trendline comparisons tell the lay-forecaster much more than comparing the slope function on any given line.

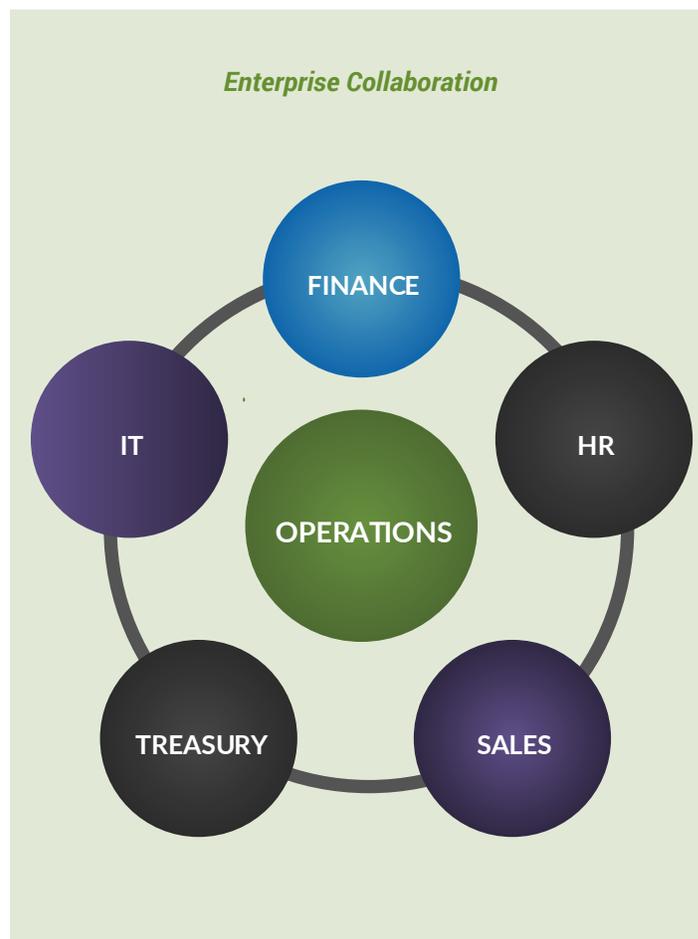
FOUR: MAKE FORECASTING A CROSS-ENTERPRISE COLLABORATION

No single aspect of an enterprise has all the answers - the enterprise must be viewed holistically. As such, forecasting needs to be a collaborative effort across sales, operations, finance, and other functions.

This requires using collaborative tools accessible to all users. By sharing assumptions and specialized knowledge, the focus of the enterprise's planning process shifts to creating stronger, more accurate forecasts. Through live dashboards, driver data is transparent thus ensuring that all functions see changes and can adjust their own functional plans accordingly; further, workflow capabilities embedded in leading tools enable users to set reminders and send requests within the planning tool rather than email or messaging tools.

Ultimately, the end result is a process and forecast that dramatically reduces the likelihood of events or trends catching parts of the organization by surprise.

This of course requires not just focusing on tools, but also changing a stratified culture: straightforward cross-channel communication is key to ensuring the most resilient, agile enterprise.



FIVE: TRACK AND IMPROVE FORECAST ACCURACY

You can't improve what you don't measure. With traditional forecasts, declaring a "win" isn't as simple as observing whether or not reality matched projections. "Accuracy" can be a slippery concept, defined according to an enterprise's overall objectives and capacity to adapt and improve forecasting tools on-demand.

Being "inaccurate" can have grave consequences, both in regards to over- and under-estimating demand. Overestimating demand leads to excess inventory or under-utilized resources (e.g., an overstaffed call center), excessive cost, and disposal of excess at lower prices. On the other end of the spectrum, under-estimating demand leads to employee overtime, rushing product completion or delivery by cutting corners that create safety or quality issues, ignored compliance processes, additional operational risk, lower customer satisfaction or simply lost sales.

By this measure, no enterprise is safe when its forecast is inaccurate. Yet the difficult thing is that your forecast may have from the outset been, for all intents and purposes, accurate - until it wasn't. In this respect, even the most airtight forecast can be felled by a tiny error, a small difference in trajectory that leads the entire projection off track.

To fight this, one must consider the appropriate level of granularity while building decision-making models (see sidebar above). To avoid undue data noise - by way of unnecessary precision - build models with the amount of granularity needed to keep it "mostly" on track (with the aforementioned ability to override and redirect as needed). Hinging the accuracy of a forecast on a single data point can lead to the forecast being almost completely wrong, rather than giving a broader guidance that is mostly accurate.

While tracking, testing and improving your forecast, be wary of assigning undue weight to past trends. In spite of our best efforts, sometimes forecasts built on historical data fall short. Whether this is due to data noise, an error in calculations, or the simple fact that history does not always repeat itself, can only be determined by questioning the assumptions made underlie each forecast and business situation.

SIX: INTEGRATE FORECASTING INTO MANAGEMENT

Measuring Forecast Accuracy

Forecast Accuracy is most often measured using a metric known as Mean Average Percent Error (MAPE) - defined as the absolute error as a percentage of the actual result. We like to consider this from three angles:

1. How accurate is the forecast at various intervals (ie. the accuracy 1 month / 3 months / 6 months out, etc.)? This is important because different levels of accuracy are needed for different elements. Staff forecasting needs to be done often daily, while the amount of space required might only need to be updated annually. Forecasting production should take into account the required lead time for each respective product. It is inherently useless to generate an accurate forecast one month out if decision-making must happen three months ahead.
2. Has our accuracy been improving over time? For example, our 3 month forecast accuracy improved from 75% to 80% over the last year.
3. Which forecasts are improving/worsening? Are there particular teams that are better than others? Specific customers? Learning and sharing forecasting best practices drives improvement. This often leads to the question of whether forecast accuracy should be incentivized. Unless you pick stocks or forecast the weather, we don't believe that creates good behavior, and may, in fact, trigger behaviour that forces actuals to meet forecasts. But measuring, tracking and sharing forecast accuracy will have the effect of focusing the organization on the importance of good forecasting techniques.

Finally, the key to effective decision-making is to make forecasts a part of everyday operational management. Forecasts should be reviewed and revised regularly, as well as formulated to look at both internal and external forces that shape the enterprise. When used as the basis for decision-making, the importance of good forecasting is reinforced. When practiced regularly, like any good exercise, the quality of forecasting and decision-making is bound to improve.

Most importantly, orient your management processes so that forecasting is seen as more critical than reporting on historical variances from plan; after all, the purpose of forecasting is to highlight gaps or opportunities against which action must be taken. Only with this change will management discussion and action planning - focused on closing gaps to targets - be most effective.

Conclusion / Summary

By incorporating these best practices, an enterprise can ensure that it focuses resources and strategies on the most operationally vital aspects of their business. The ability to act proactively and quickly in an ever-changing world is key to essential to operational agility and success.

