



Predictive Forecasting™

**Incorporating Science into Forecasting for Greater
Accuracy & Speed**

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Executive Summary

In all market conditions and especially down markets the need to look forward with more certainty and granularity will separate those companies that just survive from those that leap beyond their competitors. Down or uncertain markets are environments to fundamentally change the competitive landscape and those that embrace this opportunity emerge as market leaders. *Predictive Forecasting* is a strategic advance that enables business to engage science into forecasting for greater accuracy, speed. This paradigm shift is a path away from the sole reliance on human guesses about the future that has been debilitating for businesses.

Predictive Forecasting blends the strengths of software, scientific formula and human knowledge for better forecasting that leads to the optimum deployment of capital and human resources and the mitigation of risks. It frees humans to look at a calculated forecast (based on past performance data) then apply their knowledge to verify the reasonableness of the forecast and inclusion of future events to refine the forecast as necessary. In this manner, forecasts are at least 50% more accurate and completed in 90% less time as compared to the typical approach using guesses and spreadsheets that are compiled into a “forecast.”

A Cartesis/CFO Research Study indicates the top two user requirements for forecasting as **Accuracy** and **Speed**. However, typical “forecasting” consists of groups of people who guess about the future. People are asked “What do you think” the forecast will be over the next week, month, quarter or year. While founded in business experience, this method is subject to personal and political pressures. As such, forecasts are often force-fit into desired outcomes and if the outcome does not match the forecast, the forecast is changed or the organization scrambles to develop “explanations.” From this framework, companies make capital commitment decisions.

The shift to Predictive Forecasting has two requisites: first, decision making will use sophisticated mathematical techniques to look ahead and model outcomes; second, they will include the probability to get predictions that span a range of values vs. a single forecasted number. Newer software solutions have packaged mathematics and statistical analysis to support the human reasoning that goes into forecasting. These software systems go further: they **predict the probability** that the actual result will fall within a certain proximity to the forecast. Similar to the weather report (“there is a 60% chance of rain tomorrow”) that attaches a probability to a forecasted event, businesses will be able to leverage Predictive Forecasting technology to deliver the following forecast: “There is an 85% likelihood to close between 500 and 550 loans next month.” This kind of prediction, showing the probability of an outcome, is crucial to effective decision making for the optimization of the business.

Current State of Forecasting

A COO of a major publishing company was asked how sales were forecasted. He responded that the sales staff submitted their “forecast” each month for the balance of the year. The comment was made that the forecast was a culmination of guesses rather than a scientific calculation. After a stunned pause the COO became cognizant that forecasting was essentially a guess. There is too much political pressure on people for them to be objective and while humans are intrinsically intuitive they generally are not inherently statistical. As such, forecast by guessing is too often skewed by the “sand-bagger”, “eternal optimist” or the guy who just wants to make the boss “happy.”

According to the Adaptive Planning/BPM Partners Benchmark Survey (November 2006) the state of forecasting and budgeting in the U.S. includes:

- 78% and 68% of SMB (<\$500 million) and Large (>\$500 million) companies, respectively, use spreadsheets as their primary tool for forecasting and budgeting
- 52% of midsized and 68% of large companies, respectively, take three months or more for the annual budget cycle

- **53% of companies are 10% or more out of budget (i.e. actual results vs. budget)**

The survey shows that spreadsheet based forecasting is slow, labor intensive and largely inaccurate. The survey also identifies that the top 10% of budgeting performers use applications rather than spreadsheets, are more collaborative, forecast more frequently and are more accurate. However, even in this top 10%, collaboration is a key requirement for forecast accuracy and while results are improved forecasting remains a long and labor intensive effort requiring many people to give their best “guess” about the future.

In summary, the current state of forecasting is largely inaccurate, difficult, intrusive on the normal business day and lengthy. As such, business needs a new breed of forecasting technology and methodology that would be:

- **Accurate, fast and requiring less effort**
- **Simple to use (no need to be mathematician)**
- **Providing more frequent forecasting**
- **Granular with Top to Bottom forecasting**
- **Independent from IT (no programming)**
- **Independent from the need for spreadsheets**
- **Less intrusive on business**

If business could be confident in their forecast decisions would shift from its current reactive use of forecasts to proactive. Managers would make decisions for the future to change the future. This would be a profound weapon in business management and give companies that adopt Predictive Forecasting a major competitive advantage.

Predictive Forecasting

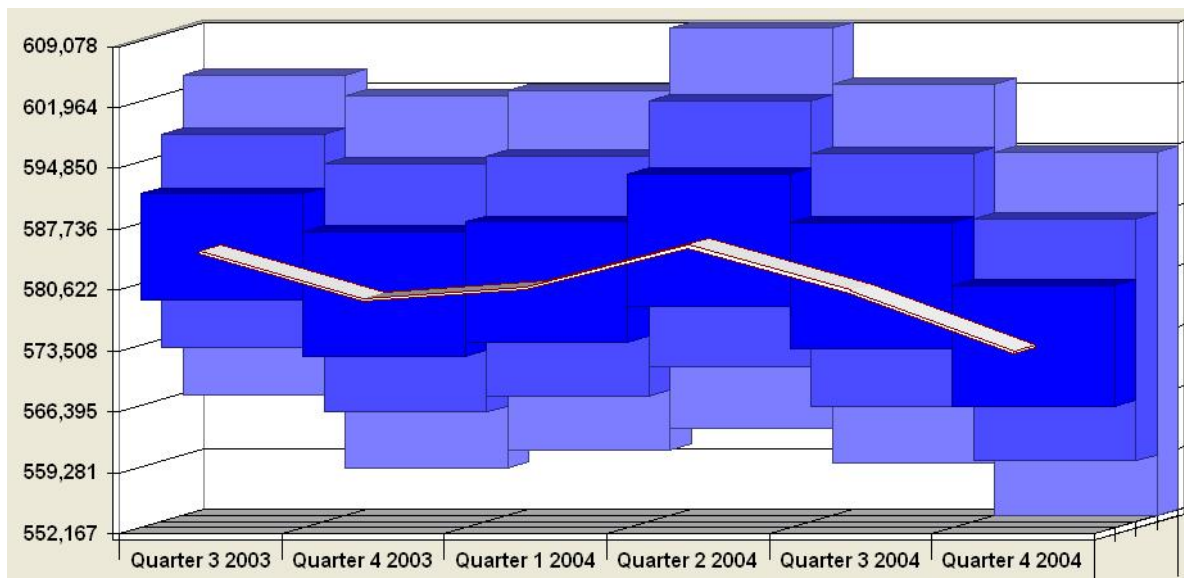
The first step to improve forecasting is to recognize what a forecast should be; i.e. by definition a forecast is to **“calculate in advance through the analysis of data.”** The key word being “calculate” which requires the use of mathematics and more specifically that class of mathematics developed for forecasting. Predictive Forecasting goes a step further to assess the probability of achieving the forecast or, viewed another way, the uncertainty that surrounds the forecast.

Predictive Forecasting has a mathematical rigor that uses advanced formula to calculate a forecast from the historical data then applies statistical formula to determine the probability around the forecast. Bringing this approach to business will create more accurate and faster forecasts because:

- Forecasts will be calculated by sophisticated mathematical formula along with a probability of achieving the forecast
- Forecast calculations by software can be completed far faster than a human trying to divine a guess by looking at the historical data
- Forecasts can be done to a greater level of detail and throughout the business
- Collaboration process time will collapse as humans collaborate to review exceptions to a forecast rather than the more difficult task of creating a forecast
- The political pressures often involved with forecasting are eliminated by dispassionate quantitative analytics

A forecast is a calculated future point value at a future point in time. However, the future has uncertainties and the probability of hitting a point value is relatively small. Therefore, once a forecast is created Predictive Forecasting employs statistical probability formula to determine a level of confidence and the most probable range of values.

An example of a **Predictive Forecast** is presented on the graph below. The white line is a calculated forecast (from a non-linear seasonal formula). The forecast (based on a time series of historical data) represents a 50% probability that the future actual value will fall at or below the forecast value. The blue bars around the forecast line are the statistical standard deviations representing the probable range of the future outcomes (calculated using a Monte Carlo Simulation). The darkest blue bar represents one standard deviation or about a 68% probability that the future outcome will fall into that range. The next lighter blue bars extending past the darkest blue bar are two standard deviations with each segment representing about a 15% probability. The lightest blue bars segments are three standard deviations with a 1% probability the future outcome will fall into this range.



This Predictive Forecast is an extremely powerful management tool. For example, suppose the chart above is a Predictive Forecast of sales for John, who is the consummate “sand bagger.” When asked for his forecast for the second quarter John submits \$560,000. Without a Predictive Forecast it is tough to argue. However, with a Predictive Forecast, a scientific calculation is made (the white line) based upon John’s past performance then the probability (or uncertainty) about the forecast calculated (the blue bars). The value of \$560,000 is in the 3rd standard deviation segment, meaning there is a 1% chance for this value to occur. The conversation can now shift with John based upon this scientific method with the focus on a more likely 1st standard deviation in the range of \$575,000 to \$590,000. Management now becomes better informed to make future decisions.

Company	Forecast Subject	Forecast Interval	Forecast Horizon	Company Forecast	ISIS Forecast	Actual Result
\$550 M Hardware Dist	Sales in Units	Monthly	8 Months	11.8 M	9.82 M	9.89 M
\$500 M Clothing Mfg	Line Sales in \$	Seasonal	1 Year	31.5 M	26.8 M	26.5 M
\$2 B IC Mfg	Brand Sales in Units	Quarterly	1 Year	NA	5.66 M	5.8 M
\$250 M Insurer	Policies in Units	Monthly	6 Months	150,000	121,500	121,000
\$1.5 B Gaming	Revenue Growth %	Quarterly	3 Quarters	2% Growth	4% Decline	5% Decline

Predictive Forecasting in numerous benchmarks proves 50%-98% more accurate, 90% faster and takes 70% less effort than using spreadsheets or business intelligence tools. The table above presents some examples of Predictive Forecast benchmark accuracy up to one year in advance.

Predictive Forecasting is critically important in capital deployment. For example, one manufacturing company had its sales group forecast an 11% growth for the second half of the year. The Predictive Forecast calculated a 4% growth. After much discussion management committed to 7% growth and began building products. The actual year end result was 4.2% growth and the company realized millions of dollars in savings by avoiding the excess inventory and labor that would have resulted from the high growth commitment.

Conclusion

Predictive Forecasting is a new paradigm that shifts forecasting and budgeting from humans guessing the future to employing science to forecast future values from historical data then using statistical probability formula to calculate a confidence interval about the forecast. From here, humans can use their experience about the business to refine the forecast as needed. Predictive Forecasting enables proactive management that optimizes the deployment of capital and human resources and the mitigation of risks.



About ISIS Solutions, Inc.

ISIS Solutions, Inc. is a recognized leader in *Predictive Analytics* and the *ISIS Discovery & Predictive Analytic*[™] software enables users to harness the power of prediction through a simple English language interface, without programming, spreadsheets or IT support to engage sophisticated mathematical models that uncover the meaning in the data and foresee the future. ISIS delivers all *12 Essential Analytics*[™] that include the leading indicators of future trends, forecasting, probability of achieving the forecast and efficiency metrics used to improve the deployment of human and capital resources. For more information please visit the web site at www.isis-solution.com.

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