**Harvard
Business
Review**

Forecasting

Develop a "Probabilistic" Approach to Managing Uncertainty

by Mike Walsh

February 20, 2020

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Summary.   When faced with uncertainty, how should leaders react? Should they make a big bet, hedge their position, or just wait and see? We naturally tend to see situations in one of two ways: either events are certain and can therefore be managed by planning, processes, and reliable budgets; or they are uncertain, and we cannot manage them well at all. Fortunately, there is another approach.
Imagine a billiard table. You put on a blindfold and your assistant randomly rolls a ball across the table. They take note of where it stops rolling. Your job is to figure out where the ball is. All you can really do at this point is make a random guess.

Now imagine that you ask your assistant to drop some more balls on the table and tell you whether they stop to the left or right of the first ball. If all the balls stop to the right, what can you say about the position of the first ball? If more balls are thrown, how does this improve your knowledge of the position of the first ball? In fact, throw after throw, you should be able to narrow down the area in which the first ball probably lies. This is an example of probabilistic thinking. Developing a probabilistic mindset allows you to be better prepared for the uncertainties and complexities of the Algorithmic Age. Even when events are determined by an infinitely complex set of factors, probabilistic thinking can help us identify the most likely outcomes and the best decisions to make. **close**

Our new world of sensors, smartphones, and connected devices means more data than ever — but does it also mean that it's getting easier to make well-informed decisions? Quite the contrary, in fact. What's more important than how much data you have is how it frames the way you think. Too often, leaders under pressure to appear decisive attempt to deal with complex issues with simple rules or analogies, selectively using data to justify poor judgment calls. But what if rather than trying to be right, you could be less wrong over time?

When faced with uncertainty, how should leaders react? Should they make a big bet, hedge their position, or just wait and see? Investors and traders might be adept at managing risk and unforeseen events, but in other industries, leaders can be blindsided by the unknown. We naturally tend to see situations in one of two ways: either events are certain and can therefore be managed by planning, processes, and reliable budgets; or they are uncertain, and we cannot manage them well at all. Fortunately, there is another approach.

Consider Thomas Bayes, an English statistician and clergyman, who proposed a theorem in 1763 that would forever change the way we think about making decisions in ambiguous conditions. Bayes was interested in how our beliefs about the world should evolve as we accumulate new but unproven evidence. Specifically, he wondered how he could predict the probability of a future event if he only knew how many times it had occurred, or not, in the past. To answer that,

he constructed a thought experiment.

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You can find evidence of Bayesian thinking throughout modern history, from nineteenth-century French and Russian artillery officers adjusting their cannons to account for uncertainties about the enemies' location, air density, wind direction, and more, to Alan Turing cracking the German Enigma codes during the World War II. Bayes has even influenced the design of AI and machine learning techniques, notably with naive Bayes classifiers, which are a family of algorithms used to predict the category a data object belongs in. They're used in a wide range of applications from social media sentiment analysis to spam filtering or movie recommendation systems.

For modern leaders, Bayesian thinking has also become increasingly influential. For example, at Amazon, one of the 14 Leadership principles is "Have Backbone; Disagree and Commit" — which, as explained by Jeff Bezos —is a strategy to encourage leaders to avoid wasting time trying to secure universal agreement. Better to commit to a controversial decision, and then gather data and adjust if

necessary. At X, Alphabet's moonshot factory, they consciously celebrate failed projects as a data point that helps them narrow the range of options, and in doing so, accelerate innovation. Similarly, at Spotify, they have developed a framework for exploring the relationship between data and uncertainty that they call DIBB (Data, Insights, Beliefs and Bets). They use it to explicitly identify success metrics for new ideas and opportunities, and create a common language around judging performance.

Data can be imperfect, incomplete, or uncertain. There is often more than one explanation for why things happened the way they did; and by examining those alternative explanations using probability, you can gain a better understanding of causality and what is really going on.

However, thinking probabilistically takes some getting used to, as the human mind is naturally deterministic. We generally believe that something is true or false. Either you like someone or you don't. There is rarely, for example, a situation when you can say that there is a 46% probability that someone is your friend (unless you are a teenager with lots of frenemies). Our instinct for determinism may well have been an evolutionary innovation. To survive, we had to make snap judgments about the world and our response to it. When a tiger is approaching you, there is really not a lot of time to consider whether he's approaching as a friend or a foe.

However, the deterministic approach that kept our ancestors alive while hunting in the savannah won't help you make good decisions in complex, unpredictable environments when your natural mental shortcuts and heuristics start to fail you. One of the best ways to embrace uncertainty and be more probabilistic in your approach is to learn to think like a professional gambler. Take, for example, Rasmus Ankersen.

Ankersen, a Dane living in London, originally came to the UK to look for an English publisher for his book on human performance, the writing of which had taken him from Kenya to Korea in search of why

great athletes, whether they are runners or golfers, tend to come from the same small regions. One of the reasons he decided to stay in London was a chance meeting with a professional gambler named Matthew Benham who founded two gaming companies, Matchbook, a sports betting exchange community, and Smartodds, which provides statistical research and sports modeling services.

When Ankersen and Benham met, they started talking about how soccer was a sport that was yet to be disrupted by data and probabilistic thinking. Benham was impressed enough to invite Ankersen to help run Brentford Football Club, which he had recently acquired. Soon after, Benham also bought FC Midtjylland, the soccer club in Ankersen's hometown.

Ankersen's insight was this: *Soccer is one of the world's most unfair sports*. Although there is a saying that "the league table never lies," in Ankersen's opinion that is exactly what it does. Because soccer is a low-scoring sport, the win/loss outcome of a game is not an accurate representation of the actual performance of a team, and therefore the intrinsic value of its players. From a professional gambler's perspective, the key to placing a good bet is to continually update your position with relevant insights that impact the probability of an event occurring. Rather than trying to be right, gamblers strive to be less wrong with time.

Benham and Ankersen started to use the scientific application of statistics — the "moneyball" technique pioneered in baseball — when assessing the performance of a team. Their key performance metric became "expected goals" for and against a team, based on the quality and quantity of chances created during a match. The point of this exercise was to develop an alternative league table, which might serve as a more reliable predictor of results and a better basis on which to value and acquire players.

Benham and Ankersen's approach has lessons for all kinds of leaders as they seek to incorporate more data into their decision-making. A probabilistic HR manager, for example, might examine the data about

where a company's best people come from and how they perform throughout their career to identify new sources of talent that may have been overlooked. A probabilistic sales professional might be conscious that it's not enough to simply close lots of deals; it's critical to also think about where leads come from. Rather than relying on inflexible credit policies, a probabilistic risk manager might start to look deeper into their data to see if there are low-risk segments in their customer base that they may have missed.

Developing a probabilistic mindset allows you to be better prepared for the uncertainties and complexities of the Algorithmic Age. Even when events are determined by an infinitely complex set of factors, probabilistic thinking can help us identify the most likely outcomes and the best decisions to make.

Mike Walsh is the author of *The Algorithmic Leader: How to Be Smart When Machines Are Smarter Than You*. Walsh is the CEO of Tomorrow, a global consultancy on designing companies for the 21st century.