The strategy-analytics revolution

It’s time to bring advanced analytics into the strategy room—here’s why.

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Over the past decade, advances in digital analytics have transformed the way businesses operate. From marketing and pricing to customer service and manufacturing, advanced analytics is now central to many corporate functions. The same, however, cannot be said for strategy—at least not yet.

While strategy development will always require creative and thoughtful executives to set aspirations and make bold choices, analytics tools can give you an edge. Advanced analytics can be used to accomplish the following:

— **Reduce bias in decisions** by calibrating the likelihood of your strategy succeeding before you allocate resources.

— **Unearth new growth opportunities** by complementing traditional brainstorming methods to reveal hidden pockets of growth.

— **Identify early-stage trends** by painting a real-time picture of how your business context is unfolding so that you can trigger big moves before your competitors do.

— **Anticipate complex market dynamics** by generating proprietary insights about the combined impact of myriad forces.

Each of these applications can sharpen business leaders’ views of the competitive arena and how they can position themselves to win. But that requires putting advanced analytics front and center in the strategy process.

**Reduce bias in decisions**

When Daniel Kahneman and Amos Tversky observed that even experienced planners tend to underestimate the cost and time required to complete projects, they termed the phenomenon “planning fallacy.” They argued that this tendency results from people making forecasts based on the specifics of the case at hand combined with their personal experience and intuition (commonly referred to as “the inside view”), without taking into account the distribution of outcomes of similar cases (“the outside view”). As a result, many forecasts are overly optimistic. The two collaborators went on to propose a corrective procedure called “reference class forecasting” that involves complementing the inside view with data on real-world outcomes, or “base rates,” from a reference class of similar cases.

In the past 20 years, the use of this technique has gathered impressive momentum, with hundreds of articles highlighting the methodology’s application in both academic and practical settings. To date, such calibrations have been limited largely to the field of project management, but forecasts made during strategic planning confront similar challenges. Strategic plans, too, involve estimating the future costs and benefits of investments, making an outside view just as valuable in informing those decisions.

In our recent book *Strategy Beyond the Hockey Stick* (Wiley, February 2018), we introduced the idea of using data analytics to bring an outside view to strategy. By embracing the outside view, you can estimate your strategy’s odds of success before you allocate resources to that strategy. For example, if your target is to grow economic profit by $100 million per year in the next decade, would it not be helpful to know that only 35 percent of large companies managed to achieve that over a decade? And if we told you that companies which implemented programmatic-M&A strategies and reached the top quintile in productivity improvements were 1.5 times more likely to achieve that profit target, would you not consider prioritizing those two areas in your strategic efforts (Exhibit 1)?

We have often applied this methodology to calibrate strategies and performance aspirations against data from thousands of publicly listed companies. The

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2 The terms “inside view” and “outside view” were proposed by Daniel Kahneman and Dan Lovallo in “Timid choices and bold forecasts: A cognitive perspective on risk taking,” *Management Science*, January 1993, Volume 39, Number 1, pp. 17–31.

3 Many small deals that accrue to a meaningful amount of market capitalization over multiple years instead of episodic, “big-bang” transactions. For more, see Jeff Rudnicki, Kate Siegel, and Andy West, “How lots of small M&A deals add up to big value,” McKinsey Quarterly, July 12, 2019, McKinsey.com.
approach can be used to motivate bold strategic moves while, in some cases, demonstrating that an ambition is unlikely to be achieved without exceedingly strong execution. For example, when shown this approach, an energy company realized that their planned strategy had achieved the financial performance they were targeting in only 10 percent of historical cases. The strategy was simply too timid. This led the company to reassess the plan and include bigger, bolder strategic moves that would improve their odds of achieving desired gains. At the other extreme, a materials-industry company set a strategy that only 5 percent of companies in a database had managed to execute successfully. Highlighting the stretch of this ambition helped demonstrate the importance of establishing a rigorous execution- and performance-management infrastructure for the plan’s delivery, helping to lower the risk in $8 billion worth of investment.

Unearth new growth opportunities
Advanced analytics can also enhance strategic planning by unearthing growth opportunities that would otherwise be hard to spot, be they attractive industry segments and acquisition targets, ideas for new products or services, or even new applications for existing offerings. The most effective of these algorithms use sophisticated network analysis and natural-language processing to parse and find connections among hundreds of disparate text data sources such as company descriptions, patent filings, M&A data, and academic papers.

For example, a company that specializes in producing brominated compounds (largely used in commodity-chemicals segments such as detergents) scanned all publicly available information on such compounds, including more than 120 million patents and 100 million academic publications, to identify hundreds of potential new applications for its products. The organization prioritized 30 higher-margin applications, such as in niche medical devices, which ended up collectively contributing $50 million of revenue to its growth plan. Similarly, when another company specializing in performance materials wanted to analyze growth opportunities within the gasket and insulation space, it used a text-clustering algorithm and network analysis to pinpoint 45 potential growth areas within five clusters, each with a shortlist of acquisition prospects (Exhibit 2).
Exhibit 2

A performance-materials company analyzed growth opportunities within the gasket and insulation space.

A text-clustering algorithm and network analysis pinpointed 5 clusters of opportunity ...

... and 45 potential growth areas, each with a shortlist of acquisition prospects
Identify early-stage trends
State-of-the-art artificial intelligence engines can analyze, in real time, publicly available information spanning billions of web pages, patent filings, news sources, clinical-trials reports, earnings-call transcripts, and more. By finding patterns in these disparate data sources, they can help executives identify emerging trends by, for example, measuring the change in the frequency of a term appearing in the data.

Take the example of a manufacturing company trying to decide which electric-vehicle battery technology to invest in. This is not a trivial decision—the capital expenditure alone would run into billions of dollars and likely lock the manufacturer into a specific technology for many years. Executives in this company would benefit from knowing how associated trends are evolving and when a specific technology is likely to have a clear advantage. They could gain these insights through near real-time tracking of patent and academic-publication momentum, announcements, and investments across different technologies. They could also track relevant regulatory changes such as zero-emission-vehicle mandates that stimulate demand for electric vehicles or local ownership rules in countries where lithium supply is concentrated (Exhibit 3).

Some of these real-time tools can also perform "sentiment analysis," which uses trained algorithms to classify news and social-media content based on the event or topic, the companies involved, and the positive or negative sentiment associated with each company. Quantitative investors seeking short-term market inefficiencies use this type of data to inform their trades. Companies developing strategies can similarly tap such analyses for timely perspectives on customer sentiment or reputational risk.

Exhibit 3
Companies can gain insight by tracking emerging trends.

Illustrative tracking dashboard
In a world of increasing uncertainty, companies need to be dynamic in how they set and manage their strategic plans. That requires combining no-regret moves that work in any condition and can be executed immediately with a few bigger, bolder bets that would be executed once the executive team is comfortable a conducive scenario is unfolding. By using advanced analytics to track emerging trends, you can trigger these contingent moves before your competitors do.

**Anticipate complex market dynamics**

By approximating real-world behavior, mathematical modeling and simulation can be used to highlight important trade-offs and assumptions associated with various strategic choices, forecast market demand under different scenarios, and help managers understand and predict competitive responses or customer behaviors. The modeling methods currently available include system dynamics, agent-based simulations, Monte Carlo analyses, and a range of machine-learning approaches. Models are especially helpful in assessing complex market and competitive situations where managerial intuition is insufficient to fully account for the implications of many interdependent parties’ actions.

Consider the experience of an electric-power-grid operator that used a detailed power-flow model to create a capital-spending strategy based on different scenarios for the future energy mix (wind, solar, nuclear). The model considered more than 10,000 variables, including all grid assets, current and future generation capacities and their profiles, expected load distributions and their profiles, and import and export capacities. The probabilistic-optimization engine then ran 40 million iterations that enabled the utility to determine how to deploy billions of dollars of capital in a way that would minimize downtime and cost while ensuring reliable capacity in the grid. The resulting savings reached an estimated $500 million.

Models can be particularly useful in analyzing systems with many independent entities, where behavior cannot be anticipated at the aggregate level because it evolves in unpredictable ways from the interactions and choices of the numerous agents, such as customers or competitors. In such situations, strategists can turn to so-called agent-based modeling and simulation. These tools assign each agent a set of decision-making rules and then simulate their choices based on the information available to each agent. Behavior “emerges” from the system in ways that often could not have been predicted using more traditional top-down models.

While commonly used to model dynamic social behavior, epidemics and natural systems, agent-based modeling is not yet widely applied in strategy. However, companies operating in markets with many customers, competitors, or suppliers, such as e-commerce and digital ecosystems, can find such models valuable. For example, a consumer-goods company used this approach to develop an integrated market model that captured the behaviors of its customers, suppliers, and competitors. It then used the model to understand the impact that new product launches and competitor-pricing strategies would have on demand for its products.

Relative to most corporate functions, strategy has not yet captured the benefits of advanced analytics, missing out on potentially critical insights. By tapping these technologies to complement the creativity of your team, you can materially improve your strategic outcomes.