REWIRING DECISION MAKING IN INSURANCE WITH DATA SCIENCE

By Christian Bongiovanni and Murli Buluswar

I F ONE INDUSTRY IN the world has traditionally used data to make decisions more than any other, it is insurance. Today, insurers continue to invest heavily in the infrastructure needed to collect, organize, and analyze data. In most cases, however, their mindsets are either additive (focused on using data science to incrementally augment what they already do) or aspirational (dedicated to building capabilities that may yield results only in the very long term). Consequently, if you talk to C-suite leaders in insurance about how they think data science will transform their organizations in the next three years, you'll find their responses less than compelling—or completely unclear.

Although insurers are setting up many pilots and experiments, they aren't using data science to consistently retool decision making. Indeed, few use data to tackle challenging issues related to the core of their operations—particularly those that demand changes in their organizational culture in the medium term, require a holistic view of processes, and demand greater understanding of real-time data. However, companies can't achieve digital transformation merely by generating insights. The only way to realize the full potential of data science is to use it to systematically shape the *what* and the *how* of decision making, thereby redefining roles and reshaping organizational cultures. To the extent that insurance companies do try to use data systematically, they tend to operate on too limited a scale. They behave like an athlete who imagines that running a mile every day for 26 days is all the preparation needed to win a marathon on the 27th day.

In contrast, insurers that use data science in a systematic way have found that its promise isn't a mirage. They've improved their profit margins by between 200 and 400 basis points, on a run rate basis, in two to three years' time, depending on the diversity and scale of their portfolios. Above all, they've learned that using data science doesn't inhibit their people: data-driven decision making augments human expertise and helps employees make more precise decisions across functions.

Insurance industry leaders have succeeded by developing a portfolio of scalable pilots, and the most effective way to do that is by thinking through the dimensions of certainty, time, and value. Harnessing the power of data science selectively enables a company to improve the quality of decision making in key parts of the value chain, as well as to generate new business models on the fly. In addition to delivering measurable outcomes, it finances the industry disruptions to which insurers aspire.

Choosing Data Science Projects in 3D

Most CEOs in insurance struggle with inconsistent proof points in data science–based projects. They aren't confident that they've devised viable long-term strategies and effective execution plans. They are reluctant to embrace the potential of data science and instead look no higher than to generate modest returns on their investments. That's why data science in the insurance industry has become a mix of an interesting tool, a bet to go with the industry flow, and a hood ornament symbolizing technological smarts.

To overcome their hesitation, insurers should focus on three dimensions when managing their initial investments in data science projects:

- Certainty—the likelihood of success

- Time—the speed of execution

- Value—the benefits relative to costs

Viewing their objectives through such a 3D lens, insurers have started their data journeys along one of three paths. Most have invested in a large number of small projects that have a high likelihood of success and should show results reasonably quickly, but are unlikely to generate much value. Such projects may yield interesting tools, but their impact on the company's top line and bottom line will be marginal.

Other insurance carriers have instead, or simultaneously, invested in developing proofs of concept for business ideas in narrow, marginally strategic lines of business and geographic markets. Those efforts may yield interesting anecdotal evidence about the potential of data-based decision making, but they rarely have a significant impact on the organization or move the needle in critical parts of the business.

Still other insurers have kicked off experiments that amount to moon shots, embodying a research thrust but likely to have limited commercial impact. Such projects are meant to overcome technical challenges in the long run, if ever, and thus contribute to valuable business strategies. Although intriguing, they usually end up as thought leadership seminars and have low relevance to insurers' financial performance.

Because all three kinds of investment break new ground, they are arguably valuable. But most such projects don't occur at the efficiency frontier of certainty, time, and value; and as a result, their connection to gaining scale and boosting profits is tenuous. Insurance companies would do better to start out by addressing the sweet space in the three-dimensional vector— what we call *core projects*. (See the exhibit.)

Core projects are problems that companies will be able to solve (certainty) in a 12- to 24-month period (time) to produce financial results that make a difference to the insurer's bottom line (value). Choosing such projects will build confidence internally and externally; it will move the profit needle; and above all, it will fuel the organization's ambitions by improving the speed, clarity, and granularity of decision making. Crucially, this approach also embodies the customer perspective: customer data serves as the key enabler and driver of the insurer's data science strategy.

Innovation in the Core

Insurers can identify opportunities for innovation in the core by asking themselves four questions:

- Where in our processes do clearly articulated customer pain points exist?

Balance Your Portfolio Across Three Dimensions

SPEED

CERTAINTY

VALUE
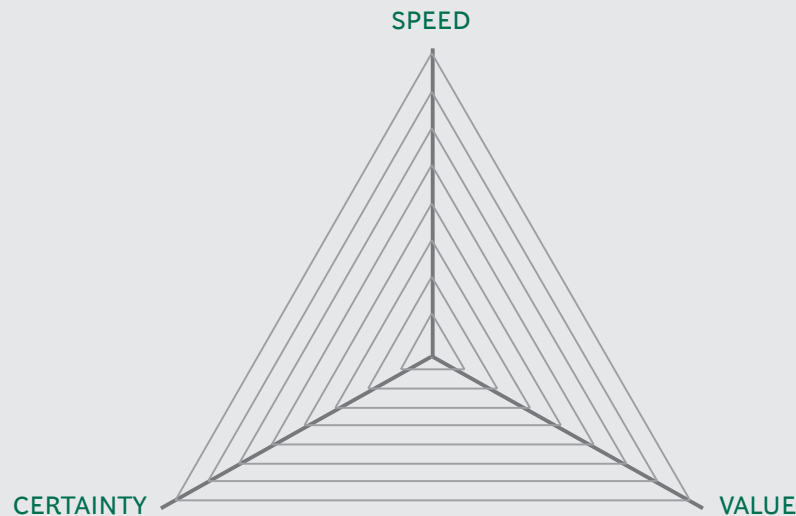
Source: BCG analysis.

- Which of our approaches or processes haven't evolved in, say, the past decade?

- Where might new kinds of data help us tackle traditional challenges?

- How are other industries addressing similar challenges?

In our experience, almost every insurer must address four core projects that lie in the sweet spot identified by our framework.

Predicting Cash Flows in Real Time. Most insurers currently analyze aggregate data in spreadsheets to predict the adequacy of their reserves to cover payments when adverse events occur. Their approach to predicting loss ratios and cash outflows is prone to a great deal of noise, and usually it provides snapshot views in hindsight. Unclear estimates, along with the wide range of possible outcomes, cause wild fluctuations in insurers' cash reserves, affecting their credit ratings and capital costs.

At the same time, every day, insurers gather diverse types of data on customers and claims—such as whether a payment has been made or not, and whether a claim has been closed or not—as well as changes in the customer mix because of attrition

and acquisition. By analyzing that data in real time, insurers can predict future cash flows. Those forecasts will be much more accurate, which has positive implications for sales, marketing, capital allocation, and claims management. Real-time data analysis will also reduce the likelihood of any sudden systemic shocks.

Dealing Efficiently with Commercial Submissions. Underwriters receive many more submissions—requests for insurance quotes—from insurance brokers than they have the capacity to evaluate. For this reason, underwriters don't respond to every broker request. Instead, in choosing which ones to respond to, they rely on some combination of subjective judgment, heuristics, recent loss histories, and broker input on pricing. This process is obviously susceptible to bias.

At the same time, underwriters clearly possess invaluable insights about risk that data-driven models lack. To combine the two, smart companies create an exhaustive set of customer insights by asking brokers to collect as much data as they can on all of the requests for submissions they receive. Using internal data sets, they rank all submissions on multiple parameters, such as the probability of winning the request, the expected

premium, and the estimated loss ratio. They may even calculate the expected lifetime margin measure for every quote request.

Next-generation data engines can predict the distribution of potential losses on the basis of a few factors at an early stage in the underwriting process. (See "Building New Data Engines for Insurers," BCG article, November 2018.) That data anchors the underwriters' thinking and leads to more consistency in pricing decisions. The process also shapes underwriters' performance parameters and staffing, and it helps companies develop a database of market intelligence that they can use to shape future underwriting and risk assessments.

Deepening Customer Understanding. Until now, quantifying the future net present value of a customer relationship by measuring how, when, and why it will change hasn't been a consistent priority for insurers. Building data-based applications that can assess the attrition risk, embedded value, and cross-selling potential of each customer can shape insurers' capital allocations. Insurers can use these tools to identify subsidies in their portfolio, analyze cost allocations in order to estimate tradeoffs between profitability and growth, and shape sales, marketing, and customer experience strategies accordingly.

The data will enable insurers to develop predictions based on every touch point and customer interaction, which in turn will enable them to identify the gaps in their understanding of customers. Harnessing internal data and complementing it with noninsurance data on customers will yield deep insights that companies can use to reshape the value chain. Insurers can link those findings to how they manage their agents and how they identify, attract, engage, and retain customers.

Augmenting Human Judgment with Machine Intelligence. Historically, in commercial insurance, decisions about underwriting and claims have relied on expert judgment. Human beings are good at detecting patterns where no data exists; machines are better at spotting patterns

where data does exist. Complementing human experience with analytical insights brings consistency to critical decisions in both areas. (See "Why Contact Centers Still Need People in the Digital Age," BCG article, October 2017.)

Designing data-based tools to reduce noise and mitigate inconsistency has profound implications. Such tools sharpen focus and anchor decisions in reality. They also reduce volatility when insurers build separate models for projecting estimates and for gauging the volatility of individual estimates. Marrying them will enable human judgment to augment machine learning. The same idea can be useful in claims processing, too, especially in industries where insurers rely to a significant degree on human judgment. This approach isn't AI; it's IA—Intelligence Augmented by data.

The Art of Managing Data Science Projects

To successfully execute data science projects designed to alter their decision-making processes, insurers must focus on five issues:

- **Ensure that top management sponsors all data science projects and gives them constant attention.** At least once a month, insurers' executive committees should discuss the progress made, with each initiative staying on its agenda for 24 to 36 months. Throughout the process, C-suite leaders should develop and refine a point of view about how data-driven insights will deliver innovation. Their understanding is essential. Without it, organizations won't be able to rewire decision making across marketing, sales, pricing, underwriting, customer experience management, and claims management.

- **Involve all stakeholders at every stage.** Top management must formally acknowledge businesses as product owners when those businesses set up pilots. At the same time, the IT function must be free to build the technology stacks, and the data owners should monitor governance issues. Effective

outcomes are easiest to achieve when the data science team partners with business owners and IT talent to create a cross-functional team that aims to generate the maximum monetary impact over time.

- **Establish a centralized data science function to create critical mass.** The organization structure can turn into a hub-and-spoke arrangement or become more decentralized over time. In addition, companies must recognize that talent requires augmentation with data engineering and application development capabilities.

- **Develop an obsession with scaling or industrializing experiments.** After setting up a few value-creating experiments, insurers must solidify their learning quickly—understanding the business issues, building models, and assessing their feasibility. Then they must incubate more pilots, refine the models, and figure out how to scale them. The last step involves working with the digital function to identify needed technologies, adapt customer journeys, and drive necessary organizational change.

- **Reshape organizational processes and roles.** It may seem cool to generate data science–based insights, but if the insights are to have an impact, companies must study processes from end to end. They must figure out how to change processes rather than altering or removing individual links from the chain. The latter endeavor will introduce greater complexity into processes rather than simplifying them.

Consider, for example, an insurer in North America that wished to improve its decision-making capabilities by using data science. The company didn't want to limit itself to consolidating its data science–related capabilities in functions that already dealt with data, but sought instead to build something unique that would extend the boundaries of how it did business. That was its main motive for change.

The company began by establishing challenging criteria for the pilots and test projects that it planned to invest in. To ensure that its choice of pilots matched its vision for change, the planning team stipulated that every pilot must meet at least two of the following four criteria:

- It must offer a better definition of a business problem.

- It must make better use of data, in the form of either a larger volume of data or new sources of data.

- It must lead to the creation of new data-based tools.

- It must foster the development of data-based technologies.

Accordingly, the data science team didn't help the company's businesses and geographic units answer questions or provide analytical support. Instead, together, they focused on solving three types of problems:

- Problems not adequately answered with current data, tools, or techniques

- Issues not previously tackled with data science

- Applications for the future

Those were the company's priorities for change.

To execute the strategy, the company first recruited a central pool of data scientists. Insurance companies are not magnets for digital talent, but the company managed to attract top-notch talent by arguing that it offered opportunities to tackle "wicked" problems and to extend the boundaries of how the company worked. The central team focused on dealing with the most important or most difficult challenges, and the local teams in each business directed their efforts toward resolving the more routine daily challenges such as updating churn models and running machine-learning models that the central function developed.

The insurer also took care to develop some executives who could serve as conduits between the digital function and the businesses. These were not analytics practitioners, but analytically savvy agents of change who worked with the businesses to identify their key problems and connected them with people in the central function who could help them overcome those challenges. That arrangement allowed the central data sciences function to develop working relationships with the businesses; after all, it had to work closely with them to develop solutions, and it depended on the businesses to deliver its solutions.

Over time, the insurer added a small corps of software engineers who could deliver data science as a service—as opposed to engineers who could only write code—and could structure requests and needs appro-priately. In the first year of full operations, the company generated a return of approximately 5 times its investment; a 15-times return on investment seemed likely in three years' time.

DATA SCIENCE IS not hype. It has real potential. Data science can help deliver steady profits, and it can also serve as a powerful tool in decision making. Leaders do, however, need to reimagine its potential for core activities and to invest boldly in developing digital capabilities. Indeed, it is better to err on the side of overinvestment than underinvestment in this regard. Above all, insurance CEOs must commit themselves and their organizations to digital transformation, realizing that data is reshaping the industry's value chains in ways that represent a step change from the past.

About the Authors

Christian Bongiovanni is a partner and managing director in the Munich office of The Boston Consulting Group. You may contact him by email at bongiovanni.christian@bcg.com.

Murli Buluswar is a senior executive advisor in the firm's New York office. You may contact him by email at buluswar.murli@advisor.bcg.com.

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10/18 Rev. 1/19