BIG DATA
THE NEXT BIG THING FOR INSURERS?

By Eric Brat, Stephan Heydorn, Matthew Stover, and Martin Ziegler

THE ABILITY TO PROCESS and analyze large amounts of varied data and data sources together to generate actionable business insights—a capability that has come to be known simply as "big data"—is an emerging megatrend. It has already shown its ability to reshape operating models in a number of industries—including retail banking, telecommunications, and retail consumer goods—and is high on the agendas of most CEOs, CIOs, and business line managers.

But exactly how much relevance do big-data solutions have for insurers in particular? The answer is *plenty.* And it is not surprising that insurers are gradually recognizing the importance of big data to their future strategies and overall competitiveness.

Nonetheless, there are hurdles to overcome. Because their interaction with customers is relatively infrequent, insurers do not have rich transactional data to work from—as banks do, for example, through credit card and account transactions. In addition, the data that insurers do have are typically of low consistency, the result of siloed-information capture and management. Finally, there are customer privacy concerns related to data collection, although these differ from region to region.

For reasons such as these, the insurance industry's use of big-data solutions has lagged behind other sectors—despite the presence of new market entrants whose mission is to help companies gather and analyze huge amounts of data in search of useful, action-ready information. The silver lining is that some early-mover insurers have already proved that big data can go a long way toward creating significant savings, enhancing revenues, and improving competitive advantage in focused business areas.

Overall, there is more than enough evidence to demonstrate that the big-data approach is a potential game changer in the insurance industry. All insurers, regardless of size, specialty, or location, should investigate the possibilities, keeping in

mind that the impact of big data varies for different areas of the insurance value chain. (See the exhibit below.)

The key, of course, is to identify those areas in which the big-data approach brings about real change and creates real value. In our view, the impact of big data for insurers can be both evolutionary and revolutionary.

The Evolutionary Impact of Big Data

The evolutionary impact of big data principally concerns *improvements* to areas of the insurance value chain that—due to better analysis and understanding of customers, risks, and claims—bring about growth in the top and bottom lines.

Indeed, the main advantage of big data compared with traditional business intelligence (BI) is that big data can access high volumes of previously untapped information—especially unstructured internal and external data—and leverage a higher degree of computing power and sophisticated algorithms to find patterns and
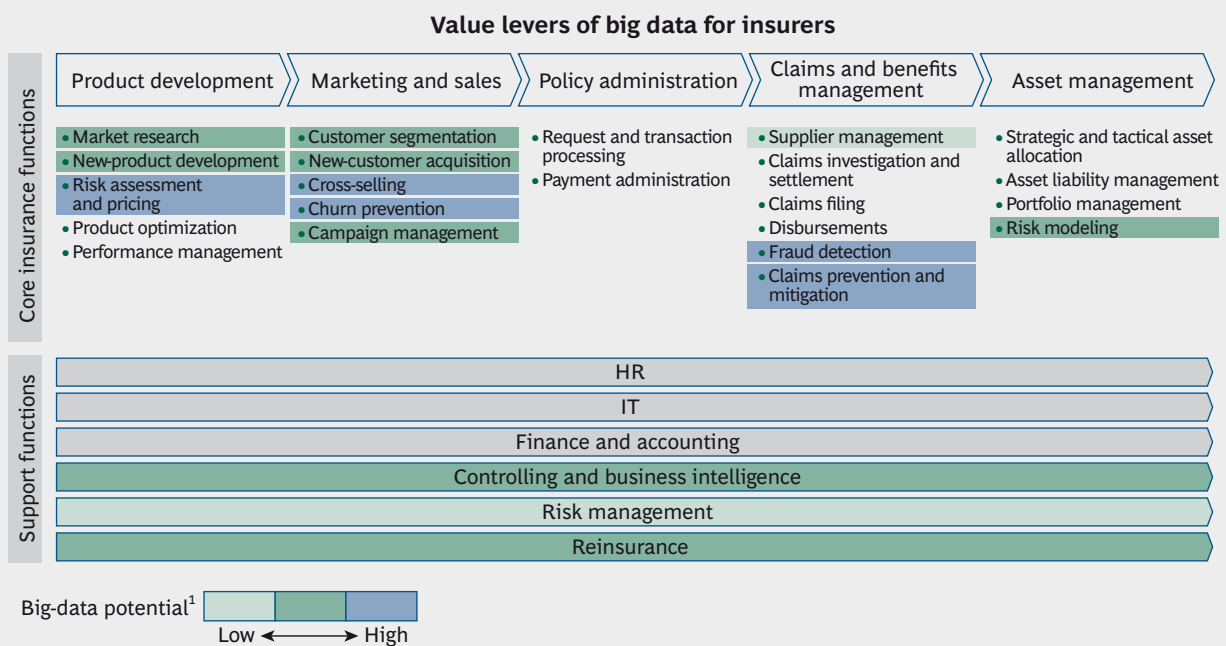
customer information that insurers can act on in a highly targeted, timely way.

At this stage of development, big-data applications are especially promising for improving fraud detection and claims mitigation and prevention. Some early adopters claim that the savings potential for big data can reach up to 2 percent of premiums in these areas, thereby directly translating into bottom-line improvements.

Fraud Detection. Take the example of a car accident that results in whiplash injuries to several people. In the old world, investigation was largely manual, with some automated claims analysis. But with big-data techniques, a claim stemming from such an accident would trigger three independent, automated analyses aimed at detecting anomalies.

First, there would be an investigation of potentially fraudulent-claims patterns. Are the amount of damage, the stated time and location of the incident, and the medical diagnoses in line with the accident as reported? Second, personal history would be explored. Does the claimant have a

The Impact of Big Data Varies Across the Insurance Value Chain

Value levers of big data for insurers

Core insurance functions	Product development	Marketing and sales	Policy administration	Claims and benefits management	Asset management
	• Market research	• Customer segmentation	• Request and transaction processing	• Supplier management	• Strategic and tactical asset allocation
	• New-product development	• New-customer acquisition	• Payment administration	• Claims investigation and settlement	• Asset liability management
	• Risk assessment and pricing	• Cross-selling		• Claims filing	• Portfolio management
	• Product optimization	• Churn prevention		• Disbursements	• Risk modeling
	• Performance management	• Campaign management		• Fraud detection	
				• Claims prevention and mitigation	

Support functions:
- HR
- IT
- Finance and accounting
- Controlling and business intelligence
- Risk management
- Reinsurance

Big-data potential[1] Low ←——→ High

Source: BCG analysis.
[1]Big-data potential was estimated on the basis of the combination of impact and feasibility.

precarious financial situation, a criminal record, or online behavior that is in any way suspicious? Third, the possibility of a fraudulent network would be examined. Does the claimant have connections to other suspicious claims or to people involved in suspect activities?

The goal of the insurer is to make the fullest use of both internal and external data—related to historical claims and fraud patterns, accidents, social networks, and medical and criminal records (where available and accessible)—in order to identify dubious claims. One North American insurer uses big data to evaluate all auto claims, subjecting highly suspicious files to closer scrutiny by a special investigations unit. This insurer has been able to achieve an estimated 2 to 3 percent reduction in auto claims payouts by improving fraudulent-claims detection by around 30 percent. Broadly speaking, big-data solutions lead to lower auto-claims expenses, higher customer satisfaction (through faster payouts and fewer unjustified examinations of legitimate claims), and lower claims-handling expenses (by reducing manual work).

Claims Mitigation and Prevention. Consider, for example, a worker's compensation claim involving a severe foot injury for which no surgery has been scheduled in the three months following the incident. First, using a vast number of data points from historical claims, medical bills and insurance, treatment records, employer information on the claimant, and even social-media activities, insurers can detect incident patterns that reveal typical follow-up costs for similar claims. Second, detailed analysis of the claimant—including medical history, demographic profile, and lifestyle—can estimate the probability of his or her development of long-term health problems potentially linked to the accident. On the basis of this analysis, a disease manager can be assigned to the claim and proper treatment prescribed.

The goal of the insurer is quick and accurate detection of outliers—claims with the potential for huge future payouts—and

either prevention or mitigation of overall claims. One insurer has established a next-generation predictive model for identifying outlier claims, initially using nearly 150 million data points. The benefits of the initiative have been much earlier and more precise detection of outlier claims through pattern recognition and optimized claims handling, leading to a reduction in claims costs of 2 to 3 percent.

The Revolutionary Impact of Big Data

The revolutionary impact of big data on insurers involves the *fundamental redesign* of selected steps in the insurance value chain. Indeed, in the past, the prediction of probabilities based on averages and the mutualization of risk—carried out by actuarial specialists—was the cornerstone of a successful insurance business. But big data can facilitate predictions that are based on individual characteristics, complementing mutualization with "segments of one" and leading to the emergence of fully new insurance business models. Big data can enable insurers to identify shifting customer demand, change products and services within days, learn continually from vast amounts of internal and external customer information, and even create products that adapt to individuals' risk exposure in real time. Such capabilities represent a fundamental change in traditional risk assessment.

Big-data applications that already involve a revolutionary element include cross-selling, risk assessment, and pricing. And these may be just the beginning.

Cross-selling. Big-data analytics help make it possible to offer one-time insurance (OTI) over mobile phones for activities such as skiing, cycling, and golfing. The phone customer receives a prompt after arriving at the location of the activity and is offered the opportunity to buy insurance coverage with just a few clicks.

One company that is active in both the telecommunications and the insurance sectors identifies ski resort customers who

have agreed to receive OTI text messages. Shortly after a customer arrives at the target location, the company sends him or her a message offering coverage for ski damage and theft, accidents, and search and rescue. The contract details are largely predefined to make ordering as easy as possible, and the premium for the insurance becomes part the customer's mobile-phone bill. Overall, using location data, mobile-app data, and customer-relationship-management data, this company has leveraged a new sales channel to deliver customized property and casualty coverage to skiers.

Risk Assessment and Pricing. Using big-data analysis, we can take our skiing example a step further. Not only can the company deliver an insurance offer to the skier in real time, it can also use location and movement information—and even weather data—to calculate a highly accurate risk profile for each skier. For example, if the skier ventures off the established trails or if storms have made slope conditions particularly slick or raised the likelihood of an avalanche, the skier would be notified by smartphone of the increased risk. If, despite the warning, the skier were to continue on, the insurance company could adjust the premium or withdraw coverage. The key is that insurers can deliver highly individualized, segment-of-one offers.

In another example—one related to the concept of telematics—companies offer auto insurance whose premiums are determined on a pay-per-mile basis. A device installed in the car accesses the car computer, collecting data on the distance driven and tracking the car's movements through a GPS application. The device then processes the data over a cellular connection, and a clear portrait of individualized driving distance and behavior emerges, making it possible to offer segment-of-one insurance coverage.

Telematics, a growing phenomenon worldwide, has the potential to significantly alter the dynamics of auto insurance, helping insurers de-average pricing mod-els, capture a greater share of low-risk drivers, cut claims management costs, and enhance customer relationships.

Clearly, a number of big-data applications are already on the table. But optimal results will not appear overnight. Insurers must succeed at *implementing* big-data solutions into their companies.

The Four Keys to Successful Implementation

It might be more difficult to meet the requirements for successful implementation of big-data applications than to achieve those of other complex IT solutions, because both the applications and their use are still evolving. Our view—which is based on observations of early-mover big-data users—is that insurers should pay close attention to four key success factors.

Create the right entrepreneurial environment. Insurers need to create an innovative, risk-friendly big-data ambiance that is separate from the traditional business organization and its governance. This will help foster a much-needed greenfield approach for developing, testing, and implementing solutions.

Redesign processes and the organization. The big-data approach is not just an IT topic. Nor is it just an add-on tool to traditional BI. Successful use of big data requires insurers to take action so that not only IT processes but also BI processes and the overall BI organization are redesigned and adapted. Insurers should create a dedicated team for data analytics and data management—a team that need not be large initially—to drive big-data efforts and coordinate vendor relationships.

Expand the knowledge base. Since the big-data approach is not traditional BI, many insurers do not yet have the critical analytical skills that are required for its implementation. Rather than attempt an internal, low-key solution, insurers should partner with external entities to expand their knowledge base and develop the

resources and expertise they need—sooner rather than later.

Leverage internal data to the fullest.
Insurers should not consider big data as being applicable only to external data sets. To be sure, they need to fully leverage insights from internally available unstructured data instead of focusing too much on external sources. The greatest value is typically in the internal data they already have. The challenge is to mine it thoroughly and make it useful. In most cases, individual strategies must be developed to achieve this. Obviously, forging partnerships to enrich their data can be viable for some insurers.

Devising a Plan of Action

Simply put, the big-data approach is a tough nut to crack. Its potential to be a game changer in the insurance industry is unmistakable, but how fast that change may (or may not) happen is still open to debate.

For example, the potential may be greater in some markets than others, owing to such factors as regulatory hurdles and openness to technology-driven change in the insurance industry. It's also true that the potential impact is highest in health insurance—because of the sheer quantity of data to be analyzed—followed by property and casualty insurance, then life insurance. So far, big-data applications are most advanced in the U.S., particularly in property and casualty lines.

Another reality is that only large insurers have the pure size required to succeed with proprietary big-data solutions. For small and midsize players, third-party data consolidators have entered the market and can offer scoring capabilities built on sources such as cross-company claims databases, criminal records, credit scores, and fraud patterns. Cooperation among small and midsize insurance companies is an option, and insurance associations will

most probably play a key role in providing insights.

Ultimately, each insurer has to determine for itself, on the basis of its own resources and aspirations, the extent to which it wants to pursue big-data solutions. Successful applications certainly exist, and pragmatic approaches can bring significant bottom-line results. But the road can be long and difficult, and measurable benefits can easily take more than two years to appear. Selecting the right data to include, establishing data consolidation solutions for various data sources, and testing and refining algorithms all pose significant challenges.

At the same time, insurers must ask themselves whether they can afford *not* to test the big-data waters. Indeed, the true prediction of risks and accurate pricing though big data can lead to adverse selection problems for insurers that are *not* participating. And we are witnessing the entry of new competitors—such as a company that uses vast amounts of weather data to offer insurance to farmers—whose value propositions are based on access to data and advanced analytical skills rather than on expertise in insurance.

Above all, insurers need to be prepared for the changes that big data will bring to their industry. They should experiment, explore, test, analyze, innovate, and adapt. They should upgrade their capabilities in this highly dynamic environment. Those players that lay the groundwork for implementing big data will be best positioned to make bold moves as big-data solutions evolve. Those that do not prepare and that take a wait-and-see attitude may never be able to catch up.

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