How Insurers Can Tame Data to Drive Innovation

To thrive among entrenched rivals and compete more effectively with digital natives, insurers will need to get their data right. That will mean moving to more responsive, AI-enabled architectures that accelerate data management and deliver insights that drive business performance.
Executive Summary

Data has always been an important asset in the insurance industry, which is largely built on algorithms and models. But today, that is truer than ever before. Data can be analyzed to provide insurers with deeper business insights and the ability to target the right customers through the right channels. And it has opened the door to a growing group of digital natives and insurtech companies.

Today, the advent of artificial intelligence (AI) is increasing the importance of data across the industry. AI is widely recognized for its potential to bring greater efficiency and innovation to the entire insurance lifecycle, from customer acquisition to claims processing. But effective AI depends on large amounts of sound, timely data. AI is key to competitiveness, and data is key to AI.

However, most mainstream insurers struggle to use data effectively. Our recent research found that about three-quarters of insurers have low levels of digital maturity, and are pursuing only limited digital initiatives or taking a wait-and-see approach to the digital technologies needed to leverage data. Legacy systems, siloed data, and growing volumes and varieties of data make it difficult to manage data effectively and use it to generate improved business results.

To address the problem, insurers need to fundamentally rethink the technology foundations that underpin their data-management efforts. While the appropriate mix of processes and technologies will vary from insurer to insurer, three core concepts can guide this transformation:

- **Design a responsive data architecture.** Simplify, augment and transform the data landscape to leverage different types of data and quickly deliver it to AI, analytics and business processes.
- **Leverage intelligent data management.** Streamline and automate data management processes to enable the organization to rapidly create and deliver actionable information and insights to provide better customer experiences, raise renewal rates and enable cross-selling of insurance products.
- **Enable delivery at scale.** Take advantage of advanced delivery methods, such as Agile, DevOps, DataOps and asset-based development models, to optimize and simplify data management processes and dramatically shorten time-to-market for new capabilities.
AI is not only the driver for the increased importance of data management; it is also a key part of the solution. AI can support all three of these core concepts. It can help insurers understand the data requirements of customers, operations and products, and accelerate and automate a range of tasks. It can also help insurers contend with large amounts of data by quickly assessing the value and relevance of various data sets to allow the data organization to focus on the most valuable data sources.

To make the most of their data foundations, insurers can benefit by following seven data-architecture design principles:

- **Plan for scale and elasticity.** The data architecture should enable on-demand computations and use cloud technology to enable the organization to scale up and down as computing requirements change.

- **Build in the ability to ingest all types of data.** The architecture should address different varieties of data and largely handle data in real time.

- **Be metadata-driven from the start.** Metadata extraction should be more than a compliance-driven afterthought. It should be considered early on rather than later.

- **Provide open access across all layers.** Platforms have three layers of data: raw, curated and consumption — and it is vital that they are all open for access.

- **Enable autonomous data integration.** Machine learning (ML) can automatically detect changes in incoming data and adjust integration patterns, helping companies integrate new data sources quickly.

- **Get feature engineering right.** Feature engineering transforms data into consumable forms and shapes used by ML, making care and precision in the process critical.

- **Support a unified security model for data.** A unified security approach lets companies consider security from the point that data is produced to all points of consumption and cycles of enrichment — which is key in today’s complex, hybrid environments.

As they rethink their approach to data, insurers can follow our seven data-architecture design principles. At the same time, they will need to adjust the data organization’s culture, and take a fresh look at metrics, talent and leadership — all while viewing the creation of a new data foundation as a strategic initiative.
New opportunities, new challenges

Technology is changing the face of competition in the insurance industry. Executives don’t have to look far to see digital at work. Today’s emerging insurtech companies are using technology and data to automate processes and operate more efficiently, and to provide fast, innovative service to customers. Some of these digital natives are focused on customer-facing processes — witness Friendsurance, for example, which uses a peer-to-peer insurance model to connect groups of customers and facilitate annual cash-back payments when those groups remain claims-free. Others are providing back-end solutions to other companies. For example, TrueMotion offers a platform that collects smartphone data to assess driver behavior and risk levels; this is embedded in insurers’ products, including Progressive’s Snapshot mobile app.

Industry executives recognize this shift. In our recent research that explored how insurers are applying digital technology, more than 85% of survey respondents said that they are investing in their digital agendas.

The range of digital initiatives in the industry is impressive — but it is also deceptive. While some insurers are moving ahead rapidly, many others are struggling to gain traction with digital transformation. Our study found that virtually all insurers are exploring digital technology, but they vary widely in terms of digital maturity. (See the “Measuring Digital Maturity” Quick Take.) We found that about half are taking a limited approach, using digital at the business-unit or departmental level or, in some cases, are just beginning to move toward an enterprise-wide approach. Another one-quarter are “dabblers,” organizations that are essentially pursuing a wait-and-see strategy.

Insurers struggle to scale their digital initiatives for a variety of reasons, but a key is their data capabilities — which too often are unable to keep up with growing data demands.
Measuring Digital Maturity

When developing new data strategies, insurers should make their plans within the context of their larger digital journey. With that in mind, we developed a Digital Maturity Diagnostic (DMD) framework that enables insurers to understand where they are in their digital journeys. (To learn more, read our blog, “Shining a Light on Insurers’ Digital Capabilities.”)

The DMD can show an insurer where it stands today with digital maturity in relation to its peers across the industry and in industry subsegments; identify gaps and opportunities for improvement in their capabilities; and chart a course forward. It can also track progress as digital initiatives are proceeding.

The critical role of data in generating value

Large volumes of meaningful data are the raw material of the digital revolution. Sound data management has become a key factor in the insurance industry — especially in the use of analytics to develop insights into market trends and customer preferences.

Insurers’ growing interest in AI is making sound data even more critical. AI has the potential to transform everything from product development to underwriting and claims processing — and it is opening the door to innovations such as instantly customizable life insurance and on-demand property coverage. Evan Greenberg, CEO of Chubb, recently said that data, AI and analytics technology are making it possible to transform core processes in the industry. “Imagine our ability to service (small businesses) in claims and in underwriting,” he said. Currently, his company might ask 30 questions to underwrite a small business, he explained, but “over the next 18 months, that’ll come down to about seven questions, because we can scrape the answers from data that is publicly available.” In the future, with AI and technology, he added, that might come down to two questions — name and address. This means that designing responsible, ethical AI applications will become ever more important, as covered below.
In today’s AI-enabled age, the role and management of data shifts dramatically. Certainly, the insurance industry has a long history of managing large amounts of data. Traditionally, that has meant keeping records, administering contracts and analyzing what has happened in the business. Data has been used to track performance. But now, it is used to drive performance. That means data needs to be treated as a perishable asset that is gathered, understood and made available to business processes dynamically and quickly — even in real time. Data’s traditional flow has been fairly straightforward and linear, moving from source to data warehouse to reporting system. Now, data needs to move freely to a variety of people and systems across the company.

The systems that most insurers have used to manage data are not up to that task. Data is typically siloed and stored across different systems in different formats — a problem that has been aggravated by mergers and acquisitions that leave insurers with disparate collections of legacy technologies. These problems are further complicated by ongoing growth in the volumes and types of structured and unstructured data that insurers have at hand. Today, they can draw on data flowing from online interactions, smartphones, wearable fitness trackers, connected homes, video images, inspection drones, telematics devices in vehicles, mapping and environmental satellites, and anthropological and psychological profiles of customers, to name a few sources. Not surprisingly, in our survey of insurance executives in the U.S. and Europe, the most commonly cited obstacle to the successful implementation of AI-driven capabilities in the business functions was a lack of accurate and timely data. Insurers need to rethink the way they manage data, and create new data foundations.
A strategic approach to the new data foundation

Building a new data foundation should be approached as a strategic initiative sponsored by executives and business teams, rather than technology and data architecture teams. It should look beyond point solutions, fragmented programs and the idea that the company needs to create another large, monolithic platform.

Instead, companies should adopt a structured approach to transforming the ways they source, interpret and consume data to consolidate disparate data sources and support data modernization (see Figure 1). This more flexible and loosely coupled architecture uses “fit for purpose” storage, compute and distribute strategies, while leveraging the power of ML to accelerate the process of drawing actionable insights from data. (See Quick Take, page 10.)

Data modernization addresses the tsunami of opportunities

Figure 1
Three core concepts can offer a valuable framework for insurers as they shape new approaches to their data:

I **Employ a responsive data architecture.** Data architectures are often rigid and hardwired, and built around large, relatively inflexible data warehouses. This makes it difficult to bring in new and varied types of data and use it to develop insights — a critical ability in digitally enabled operations. Next-generation data architectures can simplify, augment and transform the data landscape to enable insurers to draw in different types of data and quickly deliver it to AI and analytics applications and business processes. For example, our Customer 360° platform can sift unstructured data from local governments to help business teams understand household composition and risk characteristics to find coverage upselling opportunities. This can be done without having to involve the IT team to integrate such data sets, which might take weeks or months. That means that insurers can more easily experiment with the data to uncover new insights.

II **Leverage intelligent data management.** Traditional data management processes are not designed to handle dynamic data and changing business demands. The management of metadata, data quality, security and regulatory compliance are labor-intensive processes that often can’t keep up with changing data sources and applications. Insurers can address that shortcoming by streamlining and automating many of those processes — especially time-consuming manual tasks, such as reconciling entries in multiple data sources. This can enable an organization to more rapidly tap its data stores to create and deliver actionable information and insights. It can also help companies respond to change. For example, special investigation units can be alerted in real time when there are anomalous patterns of interactions in an open claim, or when more data is added or changed by claimants, providers, employees or adjusters.

III **Enable delivery at scale.** The processes used to develop and modify data management systems have not leveraged the advances that have revolutionized application development — which limits the ability to change and improve. Insurers can take advantage of advanced delivery methods, such as Agile, DevOps and DataOps, to optimize and simplify processes. Asset-based development models can enable standardization and the efficient reuse of solution components. And continuous integration/continuous delivery techniques can help ensure that new capabilities are easily and quickly included in systems. These types of approaches can dramatically reduce time-to-market for new capabilities — and, in effect, enable the data organization to release them almost continuously. For example, Uber can support millions of weekly analytical queries. Without being able to deliver insights at scale, it will be difficult for insurers to use data to flexibly launch new capabilities and products.

It’s important to recognize that AI is not only a key reason that many insurers need to enhance their data foundation, it can also play a vital role in making that possible. For example, in designing and creating a responsive architecture, bots and natural language processing can be used to sort through data to understand customers, operations and products to help determine what insights and data the architecture needs to deliver. Or, AI can automatically scale environments to optimize performance and cost, configure backups, and monitor and manage workloads and resources.
In designing and creating a responsive architecture, bots and natural language processing can be used to sort through data to understand customers, operations and products to help determine what insights and data the architecture needs to deliver. Or, AI can automatically scale environments to optimize performance and cost, configure backups, and monitor and manage workloads and resources.

AI can also be used to automate processes such as managing metadata and data quality throughout the data management lifecycle, helping to make operations “self-driving and self-healing.” In ongoing operations, it can be used to automate the integration of data with applications and databases, generate data models and deliver data to downstream applications, external systems and end-user reports.

In an era when insurers are inundated by data, AI can also help them focus on the right data – that is, on the data that has the highest business value. For example, we developed an AI-based framework called DataIQ that performs an up-front assessment of various data sets to determine which attributes are relevant and will provide the intelligence needed to support a given purpose — say, improving the insurer’s claims-loss ratio. This allows engineers to home in on delivering what the business requires.

Meanwhile, when new types of data emerge, ML can be used to quickly experiment with different uses of that data to determine if it has potential value. This helps the data management organization to perform a kind of early triage on potential data sources, before applying the rigorous controls and quality-assurance processes required when data is included in the mainstream data flow.

As they apply this framework, insurers will need to make sure that AI is “responsible” — that it does not make inappropriate or biased decisions that could limit its value and create significant damage to a company’s reputation and shareholder value. Insurers will need to establish policies and procedures to ensure that their AI applications act ethically, and create AI ethics officers to oversee the design and ongoing operation of AI technology. (See “Making AI Responsible — And Effective” for more insights.)

Overall, this framework can be used to create a flexible but industrialized approach to managing data — taking it in, processing and analyzing it, and rapidly delivering actionable information and insights to the business. Data can be delivered as a “product” tailored to processes and users across the company to drive innovation and efficiency.
A leading global P&C insurer wanted to use insights to grow its small commercial lines business by targeting and reaching more small business owners. However, the company had grown through a series of mergers, leaving it with siloed data. For this client, integrating data to support customer-focused insights was a challenge.

We helped the carrier build a responsive data architecture using both the cloud and the company’s existing on-premises systems. The architecture brought together data from the company’s contract engines and customer-service and billing systems, as well as from external third-party data providers, to gather insights on millions of small businesses in the U.S. With the new responsive data architecture in place, the client has access to the integrated data of small businesses, which has helped speed its quote and bind processes.

For example, with its previous approach, the insurer asked business owners to fill out lengthy questionnaires covering basic information such as number of employees, when the business was started, etc. Now, the system draws on external sources to access hundreds of data points for millions of small businesses in the U.S., which are instantly available when an owner applies for a policy. Owners have to answer only a handful of questions, with the system automatically providing the rest of the information.

With better access to more sources of integrated data, the client can quickly price policies, offer discounts to good prospects and even send pre-approved offers when appropriate. It can also use data to identify customers that warrant retention efforts and identify the agents who are most effective at selling insurance to specific types of business, such as restaurants or home maintenance companies. The insights from data also position the insurer to act as an advisor to help small business owners run their firms safely and efficiently.
Principles for moving forward

Each company will have its own needs and goals when rethinking its approach to data. But we have found that seven key principles can guide the development to a new, more adaptive data foundation that is ready for AI. As they work on data architectures, insurers should consider these principles:

- **Plan for scale and elasticity.** The data architecture should enable the on-demand performance of computations, allow the business to use data without needing to check with IT, and use cloud technology to enable the organization to scale up when additional computing horsepower is needed — and scale down when it isn’t.

- **Build in the ability to ingest all types of data.** The architecture should address different shapes and granularities of data such as transactions, logs, geospatial information, sensors and social — and handle data in real time as much as possible.

- **Be metadata-driven from the start.** Most enterprises view metadata extraction as an afterthought, typically driven by compliance. However, metadata is much easier to manage early in the process rather than later, and it has value far beyond compliance. For example, by cataloging the company’s metadata, companies can create a library of data sets that everyone in the organization can access, thereby enabling wider use of insight-generation and AI throughout the enterprise.

- **Provide open access across all layers.** Platforms have three layers of data: raw, curated and consumption. Traditional architectures typically grant access only to the consumption layer. However, data scientists often like to examine raw data for overlooked elements that may generate more information — so it’s important that all the layers are exposed and open for access.

- **Enable autonomous data integration.** Companies will need to integrate new data sources quickly in order to keep relevant data flowing to analytics and AI applications. However, mapping data to target usage environments is still a largely manual process. That can be addressed by using ML to automatically detect changes in incoming data and adjust integration patterns.

- **Get feature engineering right.** Feature engineering transforms data into consumable forms and shapes that ML models can use. Features describe data points and serve as inputs into the learning system, so they need to be as precise as possible. Careful feature engineering is key to making ML accessible broadly within the business.

- **Support a unified security model for data.** Companies often rely on complex, hybrid environments that blend cloud-based and on-premises services, with data scattered in various locations and used by a variety of individuals and systems. A unified security approach lets companies consider security from the point that data is produced to all points of consumption and cycles of enrichment.
Looking ahead: Transforming the data organization

Insurers need to rethink the technology they use to manage data. But they also need to bring new approaches to the data organization itself — approaches that will help them make the most of their technology foundation.

For example, most insurers need to change the culture of the data organization — to give it a mindset that is focused on driving innovation and enabling the business, rather than executing technical tasks. This can start by changing the way the organization is measured. Today, data organizations are typically assessed on how efficiently they complete specific tasks. Do batch processes run as planned? Are sales reports complete and delivered on time each morning? Instead, they should be measured on the value that they deliver to the business, such as how well they support the creation of new services and new customer experiences.

A shift in talent strategies can also support that new mindset. Most employees in data organizations have come out of the traditional data management world — one designed for tracking performance, rather than driving performance. Insurers can provide training and development to their current data professionals. But they may also need to complement traditional staff with new types of employees — people who have experience in using technology to support business innovation, or even those who come from the business itself. That practice should extend to the leadership level as well.

Insurers should consider having data organization leaders who have business rather than IT backgrounds. Without leadership that is focused on innovation and transformation, the data organization is likely to simply continue with business as usual.

Above all, architectures should be purpose-built to support business strategy. In designing and operating new data foundations, engineers should keep a sharp focus on the big picture — understanding the data needs of customers, operations and products, and using those insights to deliver business outcomes. With that approach, data organizations will be able to meet the needs of the business. Just as important, they will also be positioned to help work closely with the business to proactively explore new ways of using data. Today, data is a key enabler of the business — and with the right data foundation, the data organization can play a pivotal role in delivering a competitive advantage.
Data organizations are typically assessed on how efficiently they complete specific tasks. Do batch processes run as planned? Are sales reports complete and delivered on time each morning? Instead, they should be measured on the value that they deliver to the business, such as how well they support the creation of new services and new customer experiences.

Endnotes


9. DevOps and DataOps methodologies automate and accelerate processes associated with software development and data analytics, respectively.


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