A Road Less Traveled

The Transformational Path to Becoming an Analytic Insurer

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Executive Summary

Fierce competition among insurance providers, asset managers and banks for the money and attention of customers, agents and financial advisers forces organizations to rethink and retool as they try to capitalize on opportunities in the marketplace. To differentiate themselves and capture a bigger, more profitable piece of the pie, they are turning to analytics. Organizations that capitalize on and invest in analytics, including predictive modeling, targeted marketing and segmentation, will gain competitive advantage. Analytics has long been used to optimize business processes, yet insurance lags other industries in leveraging analytics to complement qualitative decision-making processes. Technological, organizational and cultural challenges serve as barriers to implementation. This paper will help insurers develop and act on analytic strategies to enable business goals.

Introduction

In the global insurance industry across life and property/casualty insurers, industry, regulatory and economic pressures continue to force rapid adaptation to changing market conditions. Technology is advancing at a meteoric pace, the Web continues to evolve distribution channels, economic drivers rapidly change consumer insurance purchasing behavior, demographic shifts create opportunity and challenges, and consumers continue to become more aware of their power to drive purchasing decisions. Through all of this, every insurer is on a quest for profitability, efficiency and growth, and with pressure on operating expenses, doing more with less isn't a luxury – it's an imperative.

How does an insurer prioritize all of these seemingly competing goals and create sustainable competitive advantage?

Other companies and industries are increasingly making core business decisions through the use of analytics, defined by Thomas Davenport in the popular book *Competing on Analytics* as the "extensive use of data, statistical and quantitative analysis, explanatory and predictive models, and fact-based management to drive decisions and actions." The value of analytics is no longer in question. Companies are using analytics to drive new business or retain profitable customers, to optimize business processes, and to supplement any number of qualitative decision-making processes with fact-based information. Any company in any industry has the potential to become an analytic competitor, and with a treasure trove of data, the insurance industry is ripe for an analytic revolution.

The insurance industry varies widely in its implementation of and approach to analytics, but few insurers would classify themselves as true analytic competitors. Many insurers take a siloed or project-based approach to analytics, which is difficult to repeat or scale. Still other insurers struggle to identify initiatives where analytics can make a difference, or their internal ability to execute on analytic insight may be impeded due to resource or technology constraints. Regardless of the size of the organization, the lines of business or distribution model, insurers can begin to navigate down the analytic road less traveled by identifying key areas where they want to differentiate or expand, or want to create or maintain competitive advantage. The insurer must create an information strategy that links information delivery to strategic business initiatives so that analytic insight can be more easily derived. By defining analytic objectives, capturing information requirements and rationalizing those information needs, insurers can begin to effectively build analytic insight.

Qualitative Versus Quantitative Decision Making

Quantitative decision making complements, and does not replace, qualitative decision making. Analytic adoption rates in the insurance industry have lagged other industries due in part to insurers' ability to find the right balance of decision making. Insurers may perceive that one must take precedence over the other, and lack the ability to educate or convince their decision makers on how to use the information to make better decisions. This challenge extends over many areas of insurance business processes, from underwriting to risk management and sales and distribution management.

Depending on the complexity of the product, some insurers may use predictive models to either drive the entire underwriting process or identify predictive variables that enhance the underwriting decision. For example, a specialty insurer may use predictive pricing models as guidance on whether to underwrite a risk, but the underwriter makes the final determination on whether to accept the risk. In personal or small commercial lines, where the products are more commoditized, automated underwriting engines may do more of the work. These systems embed internal underwriting rules with predictive pricing and loss models. Policies can quickly be quoted and issued without the need for manual policy underwriting, and the system even facilitates the broadening of the insurer's underwriting appetite.

Chartis, a leading global property and casualty insurance company, turned to SAS® Analytics to estimate the risk of future losses and help underwriters assess insurance risk. To estimate future loss risk and help underwriters assess and price insurance risk in one of Chartis' specialty insurance lines, the organization analyzed hundreds of potential loss drivers. Assistant Vice President David Lee noted: "With six significant predictors, we deployed the Quantitative Risk Model, a Web-based, on-demand tool that summarizes risk profiles and enables risk-based business decisions. In an 18-month period, we used the solution to target $14 million in new, low-risk business, representing 100 percent growth in that segment. More importantly it enabled us to avoid a potential loss of $75 million from high-risk accounts in the year."

Insurers with a direct selling relationship with their policyholders and prospects have been able to use analytics to influence the customer relationship. However, insurers that sell through independent or other third-party distribution channels can leverage analytics to optimize their sales strategy. With too many sales representatives competing for too few opportunities across the industry, it is essential that insurers give their intermediary (or wholesaling) sales forces the right sales opportunities and make sure that the wholesalers are both efficient and productive. An emerging differentiator for sales organizations is the ability to effectively use analytics in the field to increase productivity and service capabilities as well as identify profitable sales opportunities.

Implementing analytics requires significant changes to business processes. Not only is the mechanism for distributing information different, but also the process by which users interact with the information. In a highly relationship-driven business, the wholesalers and advisers may not understand the business need or want to work with new tools or technologies. Any analytic endeavor requires buy-in and support across the network to ensure appropriate use. Success depends on full-scale adoption by users, and gaining buy-in of the salesperson as a decision maker requires senior-level champions and accountability.

One insurer implementing a financial adviser retention model in the field put the entire sales organization through a training and education process. The education included an overview of predictive modeling, identified the data used in the modeling process, and explained the outcome of the model: the probability or score advisers received based on their propensity to stop selling. The explanation and education at this level were extremely important because some top-selling advisers received high-risk scores, leading wholesalers to doubt the model's validity. With the process well-understood, the organization quickly accepted the campaign and achieved a significant lift in sales as a result. The art of selling became coupled with the science of analytics.

Start with Strategic Business Goals

Analytics is not an end unto itself; the heart of an analytic strategy underlies the insurer's overall strategic business goals and core operating principles. All analytic initiatives should align to these goals and be prioritized accordingly. Some examples from insurers around the world include the following:

- Improve customer loyalty, reinvent protection and retirement solutions for the consumer, and grow our businesses.
- Underwriting comes first, maintain a disciplined balance sheet, invest for total return, think like owners.
- Become the partner of choice for all stakeholders, drive profitable growth, strengthen our competitiveness, increase market and customer focus, maintain capital management discipline.
- Comprehensive delivery capability, scale and strong market share, consistent market presence, target opportunities that require a high level of experience and understanding of risk.

These high-level strategic goals are broken down into business unit objectives. The example in Figure 1, from a large US multiline insurance company, begins with a specific business unit's mission statement, value creators for the enterprise and operational goals that define how they will be accomplished.

Figure 1: Sample insurance business unit strategic goals.

Data, information and the derived business insight are essential components enabling these strategies through either the execution or monitoring of the goal. Yet how many insurers have a dedicated analytic or information strategy that aligns with their strategic business goals? The challenge is most insurers have similar business objectives. But defining opportunities for quantitative decision making allows an insurer to differentiate its strategy from its competitors'. In addition, this process creates activities that the insurer can measure progress against. As the insurer begins to ask the analytic questions, the analysts will uncover additional insight through the process that drives additional questions or even changes strategy. The key is selecting projects that will drive or enable business change.

Figure 2 breaks down two of our operational goals by hypothetical analytic objectives.

Operational Goal	Analytic Questions	Internal Objectives	Information Needs	Resource Needs
Enable customers to do business the way they choose.	Create customer/agent profiles: Who are they? Where are they located? How do they want to do business with us? How do they currently transact business with us? How profitable are those channels? How do we use this information to attract new customers/agents?	Profile and segment customers and agents to accurately ensure the correct interaction channels are available. Create a consistent information delivery mechanism for internal decision makers (sales management) to support their performance management responsibilities and sales targets.	Book of business profile, contact/call center data, policyholder transactional data, marketing campaign and third-party data sources at the appropriate level for analysis: transactional, policyholder/customer, household, agent/ financial adviser, agency/ firm, distribution channel.	Integrated view of internal and external data for use in modeling. Data platform, statistical modeling tools, marketing automation/optimization tools, information delivery tools. Data preparation specialists, statistical modelers, IT for implementation of results.
Create profitable products and services that are easy to understand.	Are there demographic or economic trends affecting our product development life cycle? Can we predict market conditions driving consumer/agent needs? Can we bundle products and services?	Advanced capabilities that facilitate the monitoring of portfolio and product optimization and quickly identify and anticipate trends that affect internal product decisions.	Trustworthy internal and external historical data: exposure, premium, and loss at the product, coverage, geographic levels. Expense and commission data. Economic and demographic data.	Integrated view of internal and external data for use in modeling. Data platform, statistical modeling tools, information delivery tools for monitoring product sales, sales mix, expenses, losses and profitability. Data preparation specialists, actuaries, statistical modelers, IT for implementation of results.

Figure 2: Example analytic objectives by operational goals.

Once the analytic capabilities have been identified, the next step is to perform a current state assessment of each enabling capability across four fronts and assess the needs and gaps:

- **Data**: What data is currently available? What is the quality/latency/availability of the data? Do we understand the data well enough to use it (including validity, integrity, timeliness, relevance, accuracy, consistency, completeness)?
- **Technology**: What technology architecture is in place? What types of databases, ETL processes, reporting and analytic tools are needed and available? Do we need different or common tools across the organization?
- **People**: What types of resources are needed to implement and run these initiatives? What are the right skill sets? Where do I find them?
- **Practices**: What best practices or processes will facilitate the implementation of our analytic strategy?

As the insurer goes through the exercise of identifying analytic needs, common "enabling" needs will emerge. These needs are used as an input into the organization's information strategy road map.

Figure 3 illustrates the components of an integrated and aligned strategy.

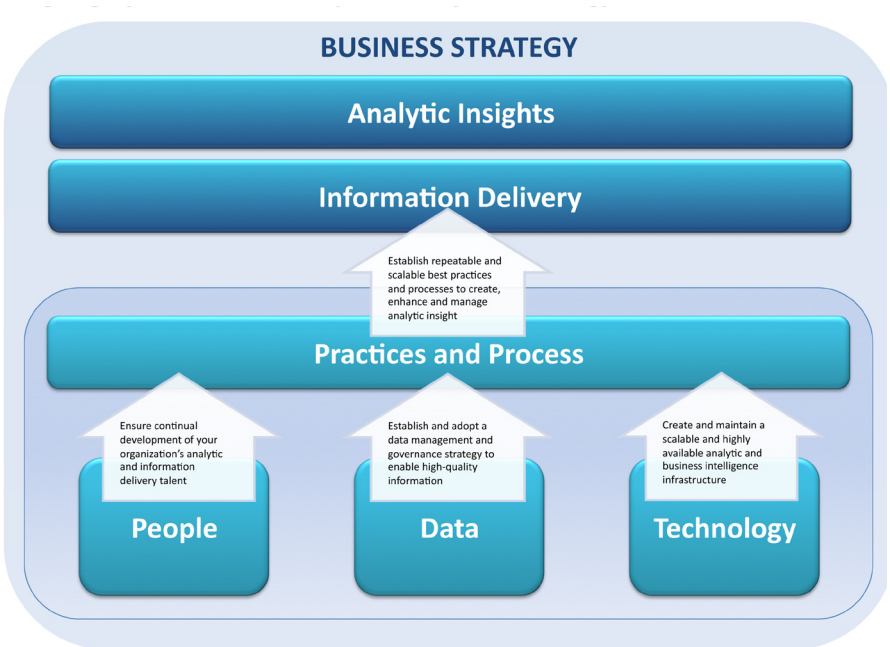

Figure 3: Aligning information and analytic delivery with strategy.

Assess Your Analytic and Information Delivery Architecture

A scalable, flexible and highly usable analytic and information delivery architecture is a critical success factor for any analytic competitor. The insurer should address several broad areas of technology infrastructure across database platforms; data management, information delivery and analytic applications; and operational systems.

> *AEGON UK, a life insurance, pension and investment company with 2 million customers, embarked on an initiative to modernize its SAS analytic and information delivery infrastructure to deliver even greater power to users. Historical initiatives had included SAS/IntrNet® software to "handle high volumes of standard enquiries" and PC-based SAS to take usage out to desktops. "We wanted a sea change in how the system was used, in SAS capabilities and in how hundreds of users worked, in different areas and at different levels," says Charlie Ewing, Business Solutions Manager. "We took ownership of SAS and laid out a vision and road map to move a new and more powerful platform to better achieve our strategic goals while taking all our users with us." The new architecture delivered efficiency gains and significant cost savings. Massively improved capabilities improved some job run times by a factor of 50 or 60: "Because we re-engineered, we had better data control and a stronger computational engine," says Ewing. Tools that had "fallen into disrepair and disuse because it was running on a system that was no longer efficient" went back to being "an absolute core capability."*

The purpose of this section is to provide a high-level overview of technology groups to consider and is not meant to exhaustively list solutions.

Data Marts/Data Warehouse

The data warehouse supports the analytic strategy by providing a repository that provides trustworthy data to users through business intelligence and analytic tools. For a majority of insurers, access to a holistic data warehouse covering all subject areas is not a practical goal. The complexity of designing, staging, cleansing and transforming data into an easily consumable form has become an often overwhelming task. The landscape is littered with war stories of insurers spending millions of dollars and many years in a data warehousing project offering little or no business value.

Realistically, the insurer will be managing multiple data sources across multiple data stores for analytic projects. Often, analytic processes that uncover meaningful variables can drive business requirements for data warehouses. At a minimum, the data warehousing environment should be scalable and flexible as business needs grow and change. Assessment and documentation of the current data environment will assist in the determination of the type of platform, the type of access needed and recommendations for how the data should be structured for use. For insurers with limited database infrastructure, smaller focused data mart initiatives can serve as the foundation for future larger scale initiatives.

Data Management

Data management has challenged insurers for decades. Operational insurance systems are as complex and unique as many of the products the systems support. A large insurer may have multiple hundreds of systems supporting a single business division. Typically, data exists in disparate data marts and "spread marts," mainframes and relational databases scattered throughout the company. Many insurers may not have the appetite for large-scale data management projects or have the organizational maturity needed to pursue these initiatives.

Data management practices that address data quality, governance and metadata can be implemented on a project-by-project basis. When embarking on data management initiatives, it is important to select the practices that will bring the most value to the business and address specific challenges (e.g., common definitions or calculations, consistent access and security policies, etc.). Practices to consider for analytic projects include:

- Identification and management of data access and security policies.
- Documentation of data environments and known data quality/consistency/integrity issues.
- Guidance on appropriate data sources for use in analytic projects.
- Common business definitions and calculations for key metrics and data elements.
- Analytic database "sandbox" policy and data set retention guidelines.

Analytic initiatives depend on high-quality data: Analysis based on faulty data or interpretation of the data provides no business value. The meaning of data quality is based on the ability of the business to provide context and metadata for data quality. Ultimately, the insurer must identify the data quality issues that impede the implementation of the analytic initiative and define measures for quantifying data quality. Data quality must become a pervasive business process.

Information and Analytic Delivery

Information delivery capabilities (loosely defined as a collection of reporting mechanisms – ad hoc or production reporting, dashboards, OLAP and scorecards) are often underrated and poorly executed in many organizations. Executed well, these tools serve to provide a common understanding of information. Enterprise or divisional reporting capabilities allow the insurer to centralize the information needed to monitor business activities or initiatives with agreed-upon data elements, metrics and calculations. In the absence of this formal reporting mechanism, each user or functional area may be determining key business attributes at an individual, and highly inconsistent, level.

Beyond reporting, an overlooked aspect of implementing analytics is the ability to deploy models into operational systems. Legacy systems will continue to present a challenge for insurers. In the past five years, the industry has invested hundreds of millions of dollars in modernizing its operational systems, including customer service platforms and policy and claim administration systems. As these systems are upgraded, insurers should ensure that the technologies are extensible to predictive model implementations.

Analytics

The insurer needs analytic technologies to develop, maintain and monitor predictive models and leverage other data mining techniques related to anomaly detection and text mining. Ideally, the analytic tools support all aspects of exploratory, explanatory and production-quality models across a wide variety of statistical methodologies and techniques. While analysis can be performed at a desktop level, an emerging best practice is to centralize the analytic infrastructure within a server environment so that analysts can easily share and protect insight and information. A scalable platform is also especially important as the volume of data and number of analytic users increases.

Depending on the type of business problem that the insurer is looking to solve, a number of technologies may be appropriate, including applications for text mining (natural language and traditional), in-database data mining, and newer applications for social network analysis.

Increasingly, packaged analytic applications are available to solve specific insurance business problems, specifically for risk, fraud and pricing. These applications are generally packaged with starter models that can be used to accelerate analytic capabilities in these areas and evolved over time as business conditions change.

> *Max New York Life, a joint venture between Max India Limited and New York Life International, adopted SAS technology to transform its efforts to strengthen customer retention and cross-selling to a tightly segmented customer base. "Sales cycles to existing customers are faster, and the average premium amount is often 30 to 40 percent higher. Plus, we've found that the retention probability for a customer goes up 300 percent to 400 percent once they make a second purchase with us. We were eager to get momentum in these areas, since it would be a more profitable way to grow our business," says Nagaiyan Karthikeyan, PhD, Head of Business Intelligence and Analytics. As part of the initiative, the insurer consolidated its customer data into a centralized repository and addressed data quality issues inherent in its address and contact data. The analytic team built a series of predictive customer segmentation models that "let us tailor specific cross-sell offers and script different contact scenarios based on their value, their propensity to buy, their propensity to pay, and their propensity to lapse. With these tightly defined customer segments, clean data, campaign management and rapid modeling, we're executing 60 separate campaigns a month."*

Align Your Resources

Analytic insurers embed analytic skills across all decision makers in the organization. The culture of analytics must be pervasive through multiple levels and across different resource types, representing local ownership of analytics. Employees must be held accountable for and compensated on their ability to make excellent fact-based decisions. Staff members are divided into those who create the analytics and those who use the analytics:

Analytic Creators

Analytic creators must be trained across a number of areas: statistical methodologies, technical tools, data, internal business knowledge, and external industry or domain knowledge. The scope includes:

- Statistical modelers.
- Programmers who support research data preparation activities.
- Business and technical administrators who support analytic environments.
- Business users of the analytic tools.

Users of Analytic Insight

The users who are accountable for the outcome of the business decision (either quantitative or qualitative) must also be trained in how to appropriately use the information to influence the decision-making process.

Developing a formal curriculum encompassing self-service, internal and external learning opportunities allows the insurer to identify and evaluate competencies, recognize areas of improvement and teach techniques that can be immediately applied in the workplace. Training also provides organizational resources that will help users throughout the development process. The activities do not have to be formal; insurers can tap into their internal experts for lunch-and-learn type activities for sharing information. The acquisition and retention of analytic skills and knowledge is embedded in the culture of an analytic insurer.

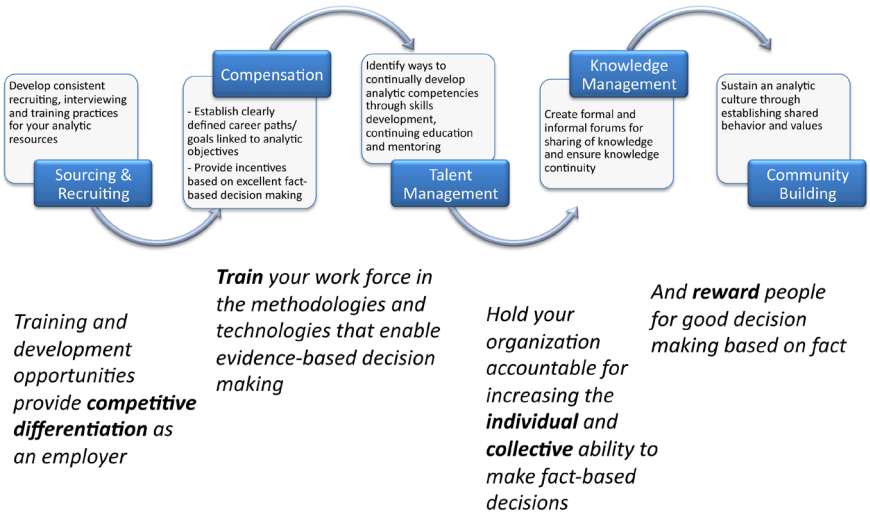

Figure 4: Embedding analytic skills and knowledge within the ethos.

Organize Around Analytics

An insurer can improve its ability to act by formalizing the organizational structure around business intelligence and analytics through a competency center or center of excellence. There is a distinction between the two groups: A competency center is generally responsible for the analytic and technical execution of the analytic strategy, while a center of excellence may coordinate or influence the activities of organizations with multiple competency centers or disparate analytic resources. Much documentation exists on the types of activities typically performed by a competency center. Each insurer should carefully evaluate the capabilities and design its team around its organizational needs and goals. The example below illustrates an organizational model utilized at a major US insurance company for predictive analytic support. The actuarial and strategic development teams perform modeling activities on behalf of the insurer, the BIA team supports the presentation layer and analytic infrastructure, and the IT teams support the back-end database management and processes.

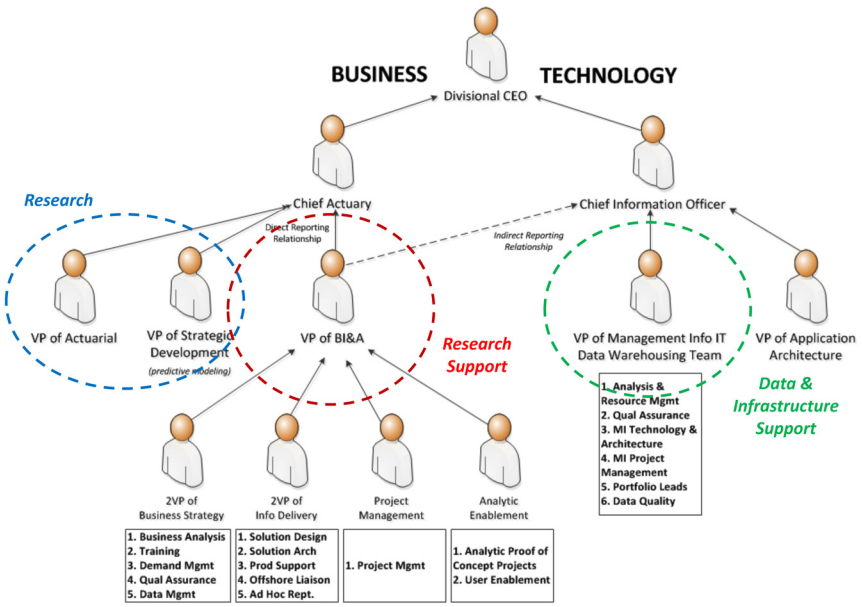

Figure 5: Example insurance business intelligence and analytics competency center organizational structure.

At AEGON UK, the Business Intelligence Competency Center (BICC) within the Finance Business Solutions group is a center of excellence for finance and risk analytics. The BICC uses its SAS Analytics architecture to support other teams, including customer insight and a customer transformation program. The BICC originally supported 300 SAS PC users and 400 mainframe users, but Ewing says, "There are now over 1,000 active users because of the real benefits people see, the real efficiency gains and new levels of analytics impossible before … More and more people are requesting access."

Analytic Capabilities: Buy vs. Build

Insurers can look to three different models for closing the gaps in their analytic capabilities. Many insurers use a combination of these three strategies for implementing analytics, and may leverage different resources depending on the capability (e.g., data warehousing performed in-house with offshoring, analytics outsourced). Each organization will need to determine its own most effective implementation model. Insurers that are new to analytics may outsource initially and then bring the capability in-house as they increase their analytic maturity. Analytically sophisticated insurers may choose to offshore more routine analytic tasks and dedicate their internal experts to high-value projects.

Outsourcing analytic work to another firm, typically a consulting company or an outsourcing partner, can quickly help the insurer carry out analytic projects. In addition to having statistical expertise, the consultants often bring specific insurance or other domain expertise (customer/marketing analytics, pricing analytics, etc.). If analytics is a strategic capability for the organization, it will most likely develop the analytic skills and capabilities in-house. For those insurers just beginning their evolution as an analytically driven company, there are many types of business problems that insurers can begin to solve with out-of-the-box predictive modeling techniques that don't require an enormous initial investment in resources or technologies.

Summary

Insurers looking to travel the analytic road less traveled can take a modular approach to implementation, enabling them to execute projects more quickly and deliver business value faster. Organizations new to analytics should start with small proof of concept and pilot projects and build on success to gain support throughout the organization, leading to increased funding and buy-in for more ambitious projects. Legacy systems and poor data quality are no longer an excuse; beginning with small pilot projects and targeted data solutions will empower an organization to make more significant financial investments in the supporting analytic capabilities down the road.

Insurers should perform an assessment of their business goals to determine which strategies can be enhanced by fact-based decision making. Insurers must identify what will give them serious competitive advantage with analytics. Once the analytic goals are aligned to business strategies, insurers should take stock of their internal ability to execute. Consideration must be given to data, technology, people and practices. Scalable database platforms, data management and quality, information delivery and analytic tools, and operational systems are important technology aspects, but rigorous analytic process management and a focus on developing analytic resources are essential to success.

Insurers can choose from a variety of internal, external and hybrid implementation models. The insurer should choose the model that works best within its organizational structure; there is no "one size fits all" when it comes to analytic execution. Insurers capitalizing on their emerging and maturing analytic competencies have the capability to gain a quantitative and quantifiable edge over their competitors.

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