Turbo-charged transformation:
How cognitive underwriting is revolutionizing the insurance industry
Contents

2 Summary

2 Introduction

3 How insurance is changing, fast

5 The future will be challenged by change

6 Cognitive underwriting is turbo-charging traditional processes

7 The force behind the future

11 Getting started with cognitive underwriting

Summary

Processes of the past are being jettisoned. Innovative digital platforms are being deployed, changing the way underwriters view policy applications, and policyholders relate to their insurance providers. This paper presents the transformational landscape of the underwriting process, the challenges faced as a result of shifting customer demand, and how advanced analytics and cognitive computing will enable underwriters to expand their role to market management, sales, and product innovation.

Introduction

Changing customer expectations, competition and new technologies have put unprecedented strain on insurance companies and the underwriting departments that support them. Additionally, new regulations and legal compliance have contributed to a far more complex and time-consuming decision process. But there’s good news: cognitive computing, big data and analytics are revolutionizing the underwriting process and changing the way insurance companies do business.

Once fully implemented, this innovative technology, in which systems actually learn and apply their knowledge, will provide underwriters with tools and techniques that provide new information, analyze historical data, and alleviate many manual tasks.

Cognitive underwriting will transform insurance companies by augmenting underwriters’ skills to enhance their performance and improve corporate profitability. Ultimately, this revolutionary new technique will enable these valuable professionals to work more productively, more quickly, and spend more time doing what it is they do—risk assessment, market management, sales, and product innovation.

Before we get into the detailed application and benefits of the cognitive underwriting process, let’s review the current insurance landscape.
**How insurance is changing, fast**

**Information is created while knowledge is lost**
To properly assess risk and make appropriate decisions, the insurance industry has historically depended upon enormous volumes of data. Whether it was tucked into paper files or stored on legacy computer systems, these valuable data points were often difficult—if not impossible—to quickly locate. Searching for that information cost valuable time that underwriters preferred to dedicate to more important activities.

Today, with an explosion of data from a myriad of sources, underwriters are working hard to absorb and synthesize all the information that is available to them. They spend a great deal of time examining research reports, details of historical performance, and the many other factors necessary to making correct, consistent decisions.

And then, after all that information has been accumulated and processed over a lifetime career, that wisdom can be lost when the underwriter retires. With Baby Boomers leaving the workforce at a rate of 10,000 people per day, organizations struggle to extract from them their knowledge and experience, and infuse it into a new generation of workers.

**New technology delivers new data**
In the past, transactional underwriting decisions were reliant upon the intuition of underwriters who read copious amounts of documentation to become experts in their craft. But, often, they did not have access to the most timely updates to critical information. They depended upon historical attribution as they made specific policy decisions.

Today, volumes of information are available and accessible to those who have the technology to gather it. But underwriters are challenged to absorb it all and then apply it to their individual assessments—even when they realize its potential significance and value.

For example, there’s now a wealth of information hidden in unstructured data from alternative sources such as publicly available social media, and devices connected to the Internet of Things (IoT). Tracking systems on automobiles, biometric wearables, security monitors, and even smartphones are also transferring lifestyle factors and other details that any underwriter would want to consider when evaluating policies for potential customers. Do they engage in dangerous activities? Do they practice safe driving? Is their home secure from intruders?

How can all this information be analyzed and presented in a useful format for underwriters? And, most importantly, can you identify which information is actually relevant to the underwriting process?

It’s a formidable challenge, and particularly so if hindered by old technology, outdated processes and dated attitudes that inhibit innovation. Legacy systems can’t perform the functions that are required because they’re unable to connect to this literal goldmine of data. And integration is also impeded by disparate systems and silos that become even worse when acquisitions occur.

**For some policies, specialized expertise is required**
In the past, when unsure of risk or when an expert opinion was deemed beneficial, underwriters have been able to seek the advice of experts in specific fields. These experts could identify which information was relevant, and provide sound opinions on how the underwriter should proceed. Today, there aren’t always enough experts available, or the topic of concern is so new that a body of intelligence and intellect has yet to emerge. For example, where does one find an expert on the risks associated with privately owned drones?

Until analyses over time are able to provide reliable feedback regarding newly measurable risks, there is only conjecture as to which have an impact on the policies being requested.
Customers demand personal attention
In the era of mass communications, automation and online connectivity, customers have become accustomed to personalized service without the necessity of face-to-face interaction. Whether engaging with organizations through smart phones, mobile devices, kiosks, laptops, home computers or in person, today’s customers want to be recognized, respected and provided with instantaneous answers. They want to be listened to, understood, and helped to understand what might be complicated concepts. They want attention and consideration. And mostly, they want it now—24 x 7 wherever they may be and however they’re in touch.

But while the consumer is demanding immediacy, underwriters are struggling to gather and analyze all the details necessary to make a reliable decision. Time is wasted chasing down information, or simply doing the usual footwork on policies for certain classes of business.

As one would expect, this insistence upon immediacy and individualization, and reliance upon so many different communication vehicles, has a significant impact on insurance companies that are under pressure to combine professionalism with personal relationships, consistency with choice, and affordability with profitability. Innovative organizations have responded with a wider variety of seamless contact points through which customers can select their choice of deductibles, pay-as-you-go coverage and other personalized policy decisions.

Whether they’re providing life, health or property casualty lines, insurance companies are making fundamental changes in their processes to interact with customers on the customers’ own terms—whether they want to chat online at 3:00 PM or submit a claim through a phone app a thousand miles from home.

Competition creates differentiation
With so many insurance companies vying for business, and each one trying to out-perform the other in meeting customer demands, industry competition has become fierce. Now, not only are the older, established companies involved in the fray, they’re having to contend with newer, non-traditional entrants and InsureTechs. Unencumbered by legacy processes, these younger organizations are more nimble and better able to launch new business models with products and services more attuned to the modern consumer.

Three Drivers for Change in Quantifying Risk

Accuracy
Risk class theory versus risk class reality

Sustainability
Dependence on individual underwriters is increasingly unsustainable and complex

Compatibility
Knowledge capital developed in clients’ industries can be used by insurance companies who are expected to speak the same language

Figure 1: The underwriting process is undergoing transformation as a result of shifting market dynamics.
The issues cause a bottleneck
Unfortunately, even as they struggle to keep pace with demand, many underwriting departments have become bottlenecks within the organization. When this occurs, customers may be lost, agents may go elsewhere and profitability is endangered.

There has never been a better time to re-examine the role of underwriter. The objective is to determine what can be done to improve the decision-making process, and augment the individual underwriter with a wealth of knowledge that can transform their role to a business partner—one who can help manage the risk, underwrite it, and serve as an innovator who understands the customer's business needs.

The future will be challenged by change
Predictions are that the insurance industry can anticipate significant change over the next two years. Some foresee that by 2018, up to one third of premium sales will take place via internet-enabled or mobile devices and social networks.¹

To become or remain a leader in the new insurance marketplace, it’s imperative that insurers differentiate themselves by applying stronger analytical capabilities that support the role of the underwriter. Most insurance carriers have made significant progress in their use of analytics, and are already collecting myriads of data that are necessary to achieving this new way of operating. As a matter of fact, an IBM study revealed that the average industry IT department is wrestling with data storage compound growth rates of 60 percent per year.²

When fully implemented, analytical capabilities enable the underwriter to incorporate new insights into the underwriting process while minimizing risk, increasing the number of quotes generated and policies issued, and maximizing profit. They elevate the underwriter from the more mundane tasks of the job so more time can be spent in customer-facing activities that build long term relationships.

---

Industry Predictions for 2018

USD $6.6 billion³
expected to be spent to enhance the total customer experience

Omni-engagement levels will become a barometer of customer profitability

33% of insurers will have more than half of new application infrastructure projects in the cloud⁴

USD $3.7 billion
expected to be spent on cognitive software⁵

Insurance data will grow 94%²

84% of data will be unstructured⁶

---

Figure 2: Demand for a more positive and proactive customer relationship is driving changes in process and technology.
Now underwriters will turn their attention toward data aggregation and the application of information. They will create new predictive modeling and prescriptive analytics that improve decisions. They will emphasize insight and action as they present relevant, timely data in an easy-to-use and customizable format that enables the non-technical user—the underwriter—to make better decisions, faster. Leveraging the value of properly applied data, the underwriter will now be confident that decisions are based on indisputable facts rather than simply on intuition, and the organization will be satisfied that consistent decision-making is ameliorating leakage.

The most startling transformation will come in the form of cognitive underwriting. The technology that enables underwriters to utilize cognitive is not intended to replace their position, but to enable engagement that augments their skills to assess and price risk. Those organizations that put forth the effort to supplement the intuition of their underwriters with the power of cognitive underwriting will achieve a differentiating advantage that places them ahead of their competitors. They’ll become better customer advocates, more responsive and better equipped to introduce market-moving innovations.

The technology is here. It’s being implemented now. And those who don’t integrate it into their organization and adapt their corporate culture to this new way of conducting business are going to miss out on the future.

Cognitive underwriting is turbo-charging traditional processes

*Cognitive* relates to thinking, understanding, learning and remembering. Cognitive systems are computerized processes that ingest and analyze large volumes of structured and unstructured data that is obtained from internal and external sources. They’re able to interact with humans to augment their knowledge and skills, even using natural language. They can analyze information, and learn from experience to create rules that can be applied to tools such as predictive models.

In the insurance industry, the cognitive underwriting system continuously applies information from underwriting guidelines, and analyzes the performance of similar risks to provide information relevant to decision-makers. Output can be customized to ensure it is being delivered to the underwriter in the most friendly and actionable format, enabling faster and more consistent policy decisions.

A feature of increasing importance is the scaling of expertise in evaluation and risk assessment—like that gleaned from senior underwriters—so that every underwriter in the organization can apply an equivalent depth of knowledge when making decisions. This provides greater throughput, consistency, and precision to the underwriting process, while protecting the organization from brain drain as a generation of professionals enters into retirement.

Thus, with the implementation of cognitive underwriting, organizations are assured of greater customer intimacy, efficiency, minimized risk, and improved profit potential.
Cognitive underwriting systems never stop learning

Traditional underwriting places extraordinary pressure on individuals, each with their own experiences and attitudes that affect decisions. While cognitive computing doesn’t replace the critically important human factor, it enhances the decision process and provides a platform that is constantly learning. Cognitive underwriting systems continuously improve, enabling much finer levels of rating and coverage based on detailed nuances in submission information and information collected from other valuable sources, such as research reports, expert opinions and data retrieved from the Internet of Things.

The benefits achieved through cognitive underwriting include:

- Improved underwriter productivity
  - Improved appetite clarity rightsizes the funnel resulting in increased underwriter productivity
- Additional insights
  - Appetite match provides additional insight for underwriting and pricing. Analytics on submissions informs appetite optimization and product development
- Improved channel relationships
  - Improved risk appetite clarity increases agent productivity in the submission process
- Increased underwriter retention
  - A more functional and user-friendly tool set helps new underwriters more quickly gain expertise and become more productive and satisfied with their work
- Faster scale-up of new hires
  - Expert-trained systems able to mentor underwriters at all levels, scaling expertise
- Use of single tool
  - Provide a one stop shop for all relevant information required in the underwriting life cycle process
- Reduced underwriting leakage
  - Faster and consistent underwriting process and decision making
- Improved conversion and retention
  - Provides underwriters with speed, accuracy, appetite and insight to better meet pricing and coverage considerations

The force behind the future

With the current market imperative to improve speed and agility, and pressure to achieve profitable premium volume and growth, cognitive underwriting provides the efficiency organizations require to keep up with—if not surpass—their competition.

As this new technology continues to be adopted, cognitive underwriting will hasten processes, eliminate inconsistencies, eliminate the potential for underwriter bias, reduce leakage, and improve profitability so organizations can be more confident in taking on additional appropriate risks.

Ultimately, the learning and decisions made possible by cognitive underwriting will become essential to the survival of insurance organizations, and may ultimately re-shape the landscape of the entire insurance industry.

For example, cognitive underwriting enables or enhances straight-through processing capabilities for less complex risks. It modifies the role of the underwriter from that of individual risk underwriting to exception and book management underwriting. The underwriter is tasked with determining
the impact of cognitive sourced data points on eligibility, price and coverage without placing added burden on the distribution channel to gather this information.

In most cases, the information required for risks meeting the straight-through processing criteria will be available through digital sources (a practice followed in today’s personal lines marketplace) and consistently streamlined through analytics and machine learning. Exception risks requiring additional information can be supported through digital virtual advisors via chat-bots.

As technology enables change in traditional exposure bases (that is, usage-based), the practice of underwriting in relation to these new measures will change as well. As the risk is monitored over the course of the policy period and the new exposure bases are converted to premium, these measures can also alert the insured and insurer to risk attributes not originally contemplated (for example, radius of operations, number of customers serviced, foot traffic, temperature) and respond appropriately via operational or risk management responses. The underwriter will now have more tools to establish and monitor risk and, by working with the claims and actuarial departments, determine how these new measures are evaluated in the pricing and underwriting process.

**Knowledge will be retained**

To ensure the timely capture of knowledge and consistency of decisions, industry innovators will rely upon cognitive underwriting to scale expertise and protect them from the potential hazards of losing key, experienced professionals.

Intellectual capital that the underwriter had acquired through years of experience will be mined and leveraged. Then it will be applied to predictive models and cognitive computing to benefit future professionals. That means that instead of laboring many long years to become fully knowledgeable in their craft, entry-level underwriters will be supported with streamlined decision-making tools that provide them with the benefit of expertise gleaned over decades of experience.

**New data will become new insights**

Drawing upon analytics made possible by mobile devices and other non-traditional data sources, the new technology will provide underwriters with an improved understanding of their accounts.

Forward-thinking insurance companies, who are already directing their IT departments to turn their attention to unstructured data, will implement systems that enable them to gather relevant information that is revealed through data analysis, and then confirm that data through triangulation. Combining both sources of data will enable the underwriters they support to make informed decisions based on complete, reliable information. Armed with this new insight that was never possible before, they’ll be equipped and eager to make smarter choices that benefit both the policyholder and the insurer.

**Expertise abounds**

Because cognitive underwriting systems are capable of quickly ingesting huge volumes of outside research reports and other data critical to make informed decisions, the need for outside expertise will be greatly reduced, if not entirely eliminated. Best of all, virtually every underwriter in the organization will have instantaneous access to a specially curated wealth of knowledge so every application can be judged using the same expert criteria.
Personal intimacy will become a differentiator
Astute organizations are responding to the competitive marketplace in a variety of ways, with cognitive computing providing invaluable assistance monitoring the life cycles of individuals and foreseeing future insurance needs. Early engagement provides the opportunity for brand loyalty (or, at minimum, inertia) that will keep that customer entrenched throughout their changing life situation and evolving needs for coverage. These customers will be extremely profitable as they mature and acquire new policies. Unless they’re given a compelling reason to switch, they may be clients for life—and removed from the competitive market entirely.

Cognition creates differentiation
Cognitive underwriting provides fast insight and clarity into complicated issues, freeing the underwriter to concentrate on areas that require more human intervention such as customer contact. Just as a skilled underwriter is a powerful advantage for any insurance company, cognitive underwriting will become a primary differentiator. By supplementing the skills of personnel to transform them into highly productive professionals, cognitive underwriting will become a disruptive force in the industry, and a competitive differentiator that propels innovative organizations to leadership positions.

Bottlenecks are broken
Faced with a seemingly endless proliferation of data, the innovative organization will depend upon cognitive underwriting to quickly collect, digest and synthesize information to reduce congestion that could strangle the underwriting department. Accelerated throughput and quotes will improve competitiveness and could become another valuable differentiating factor. A sample application of this involves book transfers. What has historically been a tedious process for insurers, involving the analysis of hundreds if not thousands of policies, can be quickly and efficient conducted. Source data can be supplemented by digital data to determine the percentage of risks meeting guidelines, as well as the premium level variance to the incumbent carrier.

Usage-based insurance will enable timely response to risk
Changes created by usage-based insurance on the underwriting process and premiums are expected. As the risk is monitored and usage exposure measures are converted to premium (for example, miles driven, customers served, revenue generated), these measures can also alert the insured and insurer of activity not covered or anticipated in the original underwriting, such as radius limitations, services provided, miles driven, or temperature. Each party can then react appropriately via operational or risk management responses. The underwriter now has more tools to establish and monitor risk exposures and, by working with the claims and actuary departments, determine if and how they are to be converted to rates or restrictions (for example, endorsements).

Shift from prediction to prevention
By leveraging cognitive tools, insurers are expected to increase work with insureds and risk managers in new ways to reduce or manage losses that are either identified or anticipated through the underwriting process. For example, in identifying root causes of slips and falls at a retail location, floor treatment procedures, cleaning protocols and even weather responses may be suggested or mandated for rating, or even risk acceptance. Such greater participation will be made available through direct interaction with the insured, supporting agent and broker services as well as automated (bot driven) tools and information services.
Turbo-charged transformation: How cognitive underwriting is revolutionizing the insurance industry.

- Heavy burden aggregating and reviewing documentation for each submission
- Time consuming manual reviews of documents, periodically requiring the assistance of limited number of experts
- Limited ability to identify and consider the historical performance of similar types of risk
- Limited feedback mechanisms to learn from experience with similar risks taken in the past
- Availability of underwriting specialists for class of business/industry, if required

- Ability to learn from experts on how to evaluate and assess risks
- Able to process vast amount of structured and unstructured data
- Continuously apply information from underwriting guidelines and identify and provide performance of similar risks, enabling faster and consistent decisions and accurate pricing
- Feedback mechanisms facilitate continuous improvement over time, enabling much finer levels of rating and coverage based on detailed nuances in submission information
- Able to mentor underwriters at all experience levels, scaling expertise
- Greater consistency

Figure 3: The traditional underwriter performs many manual duties while the cognitive underwriter concentrates on consistency of process and decisions, with results fed into a continuous improvement cycle.
Turbo-charged transformation: How cognitive underwriting is revolutionizing the insurance industry.

Business and Underwriting Events
- Life events (such as family dynamics, employment changes, and retirement)
- Industry changes (for example, regulatory and environmental issues, industry disruption)
- Business events (such as mergers and acquisitions, new customers, new geographies, new technologies, and business processes)
- Economic changes (inflation, market fluctuations, recession/expansion, and other influences)
- Policy changes (such as changes in underwriting, and new exposures via advancements in technology)

Getting started with cognitive underwriting
Many insurance companies have yet to take their first step into this new way of conducting business. They realize that it’s imperative to their future success, but envision a lengthy, costly and cumbersome process to incorporate the approach into their existing business processes.

The fact is that the initial steps toward cognitive underwriting can begin quickly as a set of rapid proof of concepts that lead to a larger vision and roadmap. As with any emerging technology, proof of concept is essential, but urgency to address market conditions necessitates fast learning and agility to make rapid adjustments as new knowledge is acquired.

Cognitive and Analytics Journey
Milestones

**Phase I**

**Proof of Concept**
- Company Analyzer — verification of risk information
  - Capture of tribal knowledge — company UW iCap
  - Unstructured data to verify classification
  - Digital Virtual Advisor designed to capture risk specific information
  - Basic Risk Score

**Business Values**
- Additional insights gained earlier in the process
- Improved channel relationship

**Phase II**

**Underwriting Decision Support**
- Capture of IoT data
- Digital UW Advisor to query on risk specific Issues
- Incorporate external data focused on risk class characteristics
- Verification of correctly coded information (for example, SIC, Class Codes)

**Business Value**
- Enhanced UW productivity
- Improved conversion/retention
- Reduce UW leakage

**Phase III**

**Discovery**
- Aggregation of data and discover new connections / insights within the data
- Development of new predictive and pricing models
- Track behavior against guidelines
- Track price optimization
- Measure impact of new IoT-driven revenue services
- Risk coverage and reinsurance optimization

**Business Value**
- Identification of new risk associations
- Elimination of subjective underwriter biases
- Write business previously rejected

*Figure 4: A deliberate, phased approach ensures objectives are met before moving to the next segment of the journey.*
Forward-thinking insurance executives seeking competitive advantage are encouraged to conduct research into how the technology works, and then select a single pain point that can be alleviated through cognitive underwriting. They should then implement the platform to assess its impact on their customers, their culture, their processes, and bottom line before fully expanding it to their entire underwriting process.

Because cognitive underwriting requires learning time on the part of the platform, this phase of implementation should be taken into consideration when planning implementation. Once the platform is up to speed and operating as designed, the benefits will become known and further progress can be made toward achieving the full value of the cognitive and analytics journey.

Cognitive underwriting will one day be the industry norm. But before that happens, those who are innovative enough to embrace it early, and learn how to apply the technique, will have a definitive advantage over their competitors. Companies that enable their underwriters to offload a portion of their work to cognitive computing so they can manage the more personal needs of the business will ultimately lead the market.

The technology is here, the need for more precise and consistent underwriting is clear, and the market is ready to be transformed.

If you would like to learn more about IBM solutions for the insurance industry, please visit ibm.biz/cognitive-insurance. If you would like to speak with one of the authors of this paper, feel free to contact them directly via email.

**Authors**

Carl Sherzer is a Senior Managing Consultant in the IBM Global Business Services Insurance Digital Solutions Practice, focusing on insurance processes and systems. He has more than 36 years of insurance and consulting experience, with an emphasis on operational improvement, new product and program launches, strategic planning, research and development, and analytics. He can be reached at carl.sherzer@us.ibm.com.

Shabbir Bahrainwala is a Partner in IBM’s Global Business Service focused on Core Insurance transformation. He has more than 25 years of management consulting experience in the Insurance industry. Shabbir is a thought leader and trusted advisor to insurance carriers driving operating model transformation leveraging innovations in IoT, Cognitive and Predictive Analytics across the insurance value chain. He can be reached at bahRAINW@us.ibm.com.

IBM, the IBM logo, and ibm.com are trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at “Copyright and trademark information” at www.ibm.com/legal/copytrade.shtml.

This document is current as of the initial date of publication and may be changed by IBM at any time. Not all offerings are available in every country in which IBM operates.

THE INFORMATION IN THIS DOCUMENT IS PROVIDED “AS IS” WITHOUT ANY WARRANTY, EXPRESS OR IMPLIED, INCLUDING WITHOUT ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND ANY WARRANTY OR CONDITION OF NONINFRINGEMENT. IBM products are warranted according to the terms and conditions of the agreements under which they are provided.

1 Sandip Patel, Insurance POV, IBM Cognitive Academy, 2016.
2 IBM Financial Services, Integrating the Value of Data POV, 2013.
3 Sandip Patel, Insurance POV, IBM Cognitive Academy, 2016.