Rethinking insurance

How cognitive computing enhances engagement and efficiency

IBM Institute for Business Value

Executive Report
Insurance, Cognitive computing

How IBM can help
Maturing markets, tight capital, increasing risk and technologically sophisticated customers are just some of the pressures the insurance industry faces today. As a result, insurers will have to work faster, more efficiently and, above all, smarter. Those that do will thrive; those that don't will fail. Insurers need to be more nimble, innovative and connected with their customers. The IBM Global Insurance team has reinvented itself to provide solutions to help clients meet the demands of today's insurance business. From enhanced customer service to greater efficiency in the back office and improved risk management, there's a smarter solution for you. For more information about IBM Insurance solutions, visit **ibm.com**/insurance.

Scaling human expertise

More than ever, with premium growth stagnant, declining income and disruption from outside players, insurers are looking for better ways to increase efficiency and get closer to the customer. As the cognitive era dawns, outperforming insurers are rethinking insurance: applying technologies that understand, reason, learn and interact can improve the way insurers do business. Sixty-nine percent of those surveyed in 2016 describe their organizations as prepared to adopt cognitive computing. At the core, data — internal and external, structured and unstructured, real-time and historical — will power and differentiate cognitive systems.

Executive summary

The insurance industry is currently at an inflection point. In today's low-interest rate environment where sustaining profitability on investment income is increasingly difficult, insurers need solid underwriting results. While global insurance premiums have recovered since the financial crisis, premium growth is plateauing and return on equity ratios are stagnant, with expenses rising.

At the same time, customers are ever more critical and empowered. They expect their insurance provider to be just as accessible and engaging as they are becoming used to in other industries — and they are becoming more willing to switch away from providers that are not meeting their needs. Insurers, who have traditionally been comfortable working through intermediaries, are investing in understanding their customer base and establishing a brand presence with them directly through digital channels. Finally, a multitude of what in a recent IBM Institute for Business Value study we called "micro-disruptions" is slowly but steadily preparing the industry for upheaval at the hands of a few successful innovators.[1]

More and more, insurers feel the need to react. But within traditional insurance business models and modes of operation, this balancing act is harder to achieve. Sustainable performance on both sides of the balance sheet requires something radically different to take advantage of the new technologies that fuel the micro-disruptions.

For success in the digital age, insurers must tap the hidden treasure they already own in massive quantities: data. They need the ability to scrutinize both their own and exogenous data sets, many of which have not been digitally accessible. Cognitive systems offer ways to use data and transform traditional insurance functions. For example, by using machine learning and applying analytics to data to understand more about the enterprise, customers and competitors. Our 2015 report, "Understanding customers and risk" explored the potential of cognitive computing to transform insurance, and 95 percent of executives familiar with cognitive capabilities said they intend to invest in them.[2]
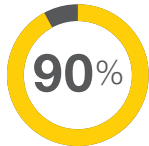
90% **90 percent** of outperforming insurers **expect cognitive to strongly impact** their revenue models
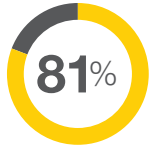
81% **81 percent** of outperforming insurers **are aware of disruption** from other industries
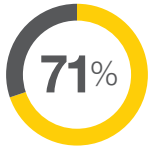
71% **71 percent** of outperforming insurers have **already started using cognitive** technologies

Cognitive systems continually build knowledge and learning, understand natural language, and reason and interact more naturally with human beings than traditional programmable systems. Cognitive capabilities can access and use virtually all types of data whether text-based or sensory. And through such solutions that understand data in context and meaning, institutional human knowledge can expand and scale. In this world of data explosion, empowered customers and evolving ecosystem disruption, insurers need to ask, "What is the cost of not knowing?"

To better understand the potential for the industry to profit from cognitive technologies, we engaged more than 1,500 executives worldwide for the 2016 Cognitive Insurance Survey. Analysis of these findings confirm that lack of internal agility and increasing outside disruption are major industry challenges requiring urgent responses. This research categorizes insurers based on revenue growth and operating efficiency over the past three years to allow a comparison of outperformers with others in the industry. While many organizations still have far to go, outperformers are already taking strides to become fully-fledged cognitive insurers.

Innovative insurtechs:
Disruption changing the insurance game

Close to a decade after the financial crisis, the insurance industry is still not in good shape. Overall growth has been slow. The U.S. market, for example, has seen less than 1 percent nominal premium growth rate since 2008, with the inflation-adjusted premium volume being essentially flat.[3] Even worse, profitability has stayed below pre-crisis results, both on the underwriting and investment sides.[4]

Yet change and innovation are slow in coming to the industry. The general response of insurers has been to focus on cost. In our survey, "improving operational efficiency" was the top strategic objective, cited by 62 percent of respondents overall. Yet this strategy seems to meet with limited success — only 16 percent have seen their operational efficiency significantly improve their competitive position over the past three years.

Outperforming insurers have a different focus — instead of cost, their top three strategic priorities are improving customer engagement and experience, growing investment income, and expanding into new product and service areas. Why the shift?

Far removed from the usual complacency of the industry, outperformers are aware of competitive threats from outside of traditional insurance, namely from other industries, for example online service providers, banks and telecommunications companies, and insurance-specific financial technology firms known as "insurtechs." More than four in five outperformers are wary of disruption coming from those areas (see Figure 1), and more than 90 percent say they have adjusted their strategy accordingly.
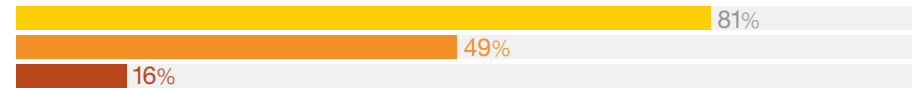
Disruptive insurtechs

U.S.-based insurtech Lemonade is a virtual peer-to-peer insurer. Having digitized the insurance process, brokers and paperwork are replaced with AI robots. The members' premiums are pooled, and payment for insurance claims come from the pool. Unspent premiums are funneled back into the community through philanthropic initiatives.[6]

The Canadian start-up League sells software that helps employers manage employee benefits, with the aim of cutting costs and reducing paperwork. Employees are provided with an allowance on both health spending accounts and personal spending accounts. Traditional health insurers are still needed as payers, but lose the direct customer contact.[7]

Figure 1
Outperforming insurers prepare for disruption from all sides

Outperforming insurers are much more aware of disruption coming from other industries

- Outperformers: 81%
- Avg performers: 49%
- Underperformers: 16%

Outperforming insurers are much more aware of disruption coming from insurtechs

- Outperformers: 82%
- Avg performers: 54%
- Underperformers: 14%

■ Outperformers ■ Avg performers ■ Underperformers

Where is the challenge from insurtechs? Most entrants in this space can be seen as nibbling at the edges of the insurance business model, for example, connecting insurance carriers at the point of sale, creating brokerage platforms via mobile or utilizing blockchain to improve transaction security.[5] But more ambitious insurtechs are setting their sights on real disruption of the core insurance business. They either interject themselves between insurance provider and customer, thus serving as the first point of contact and displacing both insurers and traditional intermediaries, or replace the insurer altogether (see sidebar, "Disruptive insurtechs").

Gaining competitive advantage through cognitive technologies

Clearly, incremental change and the classical insurance approach to innovation — "wait and see" — are no longer enough. The industry needs new ways to achieve a desired level of performance that relies not just on producing expected quarterly results, but tackles the effects of industry disruption.
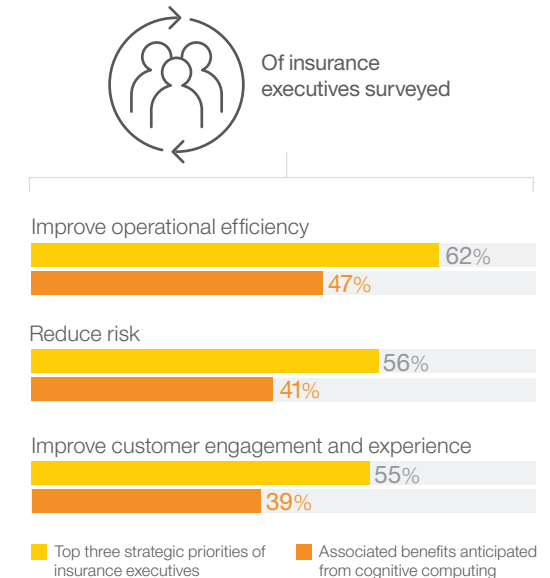
Cognitive computing technologies are still young, but the speed of development is fast and insurers are recognizing the competitive advantage of investing in these areas. Of executives surveyed, 48 percent are familiar with cognitive computing and 47 percent consider their organizations ready to embrace it. Even more (51 percent) consider the industry overall ready for cognitive computing.

However, outperforming insurers are significantly more ready than our full sample of executives: 86 percent of outperformers are aware of cognitive computing and 69 percent of them describe their organizations as prepared to adopt cognitive computing.

The expected benefits of cognitive technologies align well with insurers' strategy goals; the highest ranked strategic priorities in our survey are also the benefits of cognitive computing that insurance executives cite most (see Figure 2).

Figure 2

Cognitive technology outcomes align well with insurers' strategic goals

Of insurance executives surveyed

Improve operational efficiency
62%
47%

Reduce risk
56%
41%

Improve customer engagement and experience
55%
39%

■ Top three strategic priorities of insurance executives
■ Associated benefits anticipated from cognitive computing

How cognitive can change insurance

Cognitive computing solutions offer valuable capabilities by analyzing high volumes of data and processing information more like a human than a computer — by understanding natural language, generating hypotheses based on evidence, and learning as it goes.

Cognitive solutions have four key characteristics:

Understand. They understand imagery, language and other unstructured data like humans do. They can read submissions, dig into contract or claims histories, and understand key concepts. They can listen in to a call center dialogue or read though mails and emails while understanding the intent, as well as the tone. They can ingest regulatory requirements and identify the related obligations and controls. They can scan the news and identify relevant content or dig into social media content.

Reason. Cognitive systems can reason, grasp underlying concepts, form hypotheses, and infer and extract ideas. They unlock meaning because they can reason through it, giving us new contexts to weigh and consider. They can identify similar risks and claims, support assessing and classifying risks, check for compliance and spot new sales opportunities.

Learn. Over time, cognitive systems learn from their experiences. With each data point, interaction and outcome, they develop and sharpen expertise and never stop learning. The knowledge base is updated automatically as new information is received. Cognitive systems identify best practices, digest new regulatory requirements and help to improve guidelines.
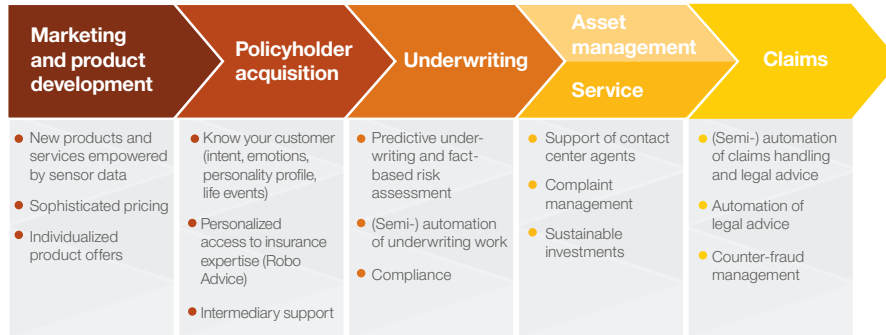
Interact. With capabilities to see, talk and hear, cognitive systems interact with humans in a natural way. Clients, agents, brokers, contact center agents, underwriters, claims handlers and many others experience the dissolving barriers between humans and machine. A new kind of partnership is possible that provides relevant knowledge and enhances human cognitive performance.

Cognitive systems support insurance companies in providing insurance expertise at scale, enhance the client experience and free-up time to better engage with clients. As insurance is a highly skilled and knowledge-based endeavor, cognitive technologies can be used across the industry value chain, from advanced risk-based pricing models in marketing and product development, all the way to sophisticated means of reducing and managing fraud in claims (see Figure 3).

Figure 3

There are use cases for cognitive technologies in all parts of the insurance value chain

Insurance value chain

Marketing and product development	Policyholder acquisition	Underwriting	Asset management / Service	Claims
• New products and services empowered by sensor data • Sophisticated pricing • Individualized product offers	• Know your customer (intent, emotions, personality profile, life events) • Personalized access to insurance expertise (Robo Advice) • Intermediary support	• Predictive under-writing and fact-based risk assessment • (Semi-) automation of underwriting work • Compliance	• Support of contact center agents • Complaint management • Sustainable investments	• (Semi-) automation of claims handling and legal advice • Automation of legal advice • Counter-fraud management

Ultimately, cognitive computing enables insurers to exploit the benefits of available data by supporting three separate dimensions (see Figure 4):

• Providing deeper and more personalized customer insights, allowing improved customer engagement

• Generating better actionable insights to support more informed decisions across the whole organization

• Accelerating operational and organizational efficiencies and speeding enterprise transformation

Figure 4
Cognitive computing transforms the entire insurance organization across three key dimensions

Dimensions of cognitive insurance

Improved customer engagement
• Understand customer wants and needs
• Empower advisors by augmenting insurance expertise
• Interact in natural language and on customer's terms

Actionable insights
• Facilitate new products and services
• Enable sophisticated pattern recognition
• Leverage untapped data sources

Enterprise transformation
• Extract best practices and improve guidelines
• Automate knowledge-based insurance processes
• Manage regulatory environment
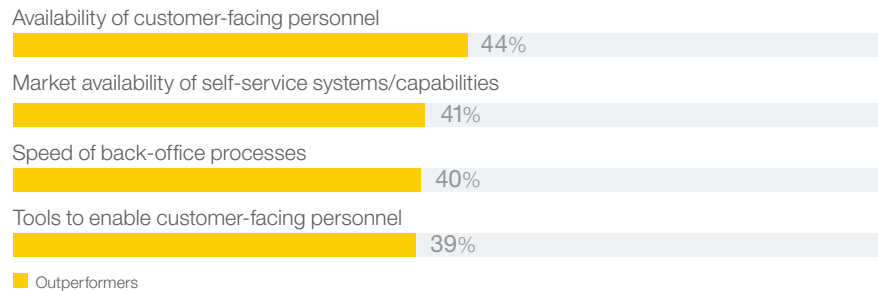
Improved customer engagement

As noted in a recent IBM Institute for Business Value study, superior customer engagement, both emotionally and rationally — "capturing hearts and minds to capture market share" — is the key to acquiring and retaining customers.[8] In that survey, respondents touted non-traditional providers, such as Google and Amazon that are disruptors from other industries, as easier to reach, faster and more competent in meeting personal needs and customizing services. Personalized interaction was also shown to have a significant effect on customer loyalty.[9]

What are the barriers to better customer engagement and experience for incumbent insurers? The top barriers outperformers cited for their organizations in the current survey are the availability of both customer-facing personnel with the tools to enable them, and self-service capabilities (see Figure 5).

Figure 5
The availability of tools and personnel are the biggest barriers to better customer experience

Top barriers to better customer experience

Availability of customer-facing personnel
44%

Market availability of self-service systems/capabilities
41%

Speed of back-office processes
40%

Tools to enable customer-facing personnel
39%

■ Outperformers

U.S. P&C insurer: Improving online sales and customer satisfaction

A large U.S. insurer with focus on P&C serves more than 14 million customers in all 50 states. While it serves its customers through various channels including intermediaries, the main focus of improvement is the ability of customers to buy insurance via its online channel.

For this purpose, the insurer built a cognitive virtual agent with the ability to conduct a conversation in natural language to help consumers select coverages that match their needs and budgets. The agent can answer a wide variety of consumer questions while completing a quote, and differentiate the user experience based on key context variables. Benefits of the systems include improved quote completion by customers, increased online conversion rates and an overall improved customer experience.

Self-service engagement allows delivery of one-on-one experiences at scale, as when a cognitive virtual agent has highly personalized conversations in interactions with insurance customers (see sidebar, "U.S. P&C insurer"). Such a direct-to-consumer cognitive virtual agent can serve, guide and advise customers via web and mobile. It uses cognitive technologies to enable the most appropriate responses, and creates a learning feedback loop to improve interactions in the future.

When implementing cognitive technologies in a customer engagement setting, it is critically important to utilize design thinking and good user experience design. The technology needs to feel as natural as possible to the user to gain rapid acceptance as an enhancement or replacement for human interaction.

Actionable insights

Given that the insurance business revolves around the understanding and pricing of risk, analytics — in the form of actuarial science — has always played an important role. Cognitive computing allows insurers to take this one step further. Cognitive takes diverse structured and unstructured data sets and reveals patterns, relationships and insights that are hidden from conventional means of analysis.

The discovery and decision-improving capabilities of cognitive can support insurers in several areas of the value chain. They can help to introduce new products and expand offerings by analyzing customers' behavioral traits. Data input for this can be from various sources, including sensor data such as in "smart home" or assisted living scenarios.

For underwriting, cognitive allows more and more complex parameters for pricing and decision making by "connecting the dots" and interpreting diverse information in the right context. This can improve the underwriting process and overall profitability.

Other insurance scenarios include improvement of fraud handling by discovering patterns of fraud and reducing false positives, as well as general management and handling of unstructured documents, such as contracts (see sidebar, "Swiss Re").

Swiss Re: Contracts Intelligence

Zurich-based insurer Swiss Reinsurance Company is the world's second largest reinsurer with in offices in more than 25 countries and a global business footprint. In contract management, the business analysts at Swiss Re spent a large part of their time searching for information scattered across contract documents and applications. Much of it is not captured in any business processes and can only be found in contract wordings, making the process time-consuming, imprecise and incomplete.

To improve the situation, Swiss Re implemented a Contracts Intelligence platform using cognitive technologies. The platform combines data from structured and unstructured documents to answer specific contract related questions for the contract managers. As a result, managers can derive new insights through linkage of contract wording and business data. They can find contracts containing certain clauses easier and faster, and results are more precise and complete.

RIMAC: Cognitive automation in claims handling

RIMAC Seguros is the largest Peruvian provider of insurance products and services, with more than 4,000 employees and 120 years of experience in the market. RIMAC is using cognitive technologies in several areas of the business to improve decisioning and streamline operations. For claims handling, the cognitive system crawls through multiple sources of documents, identifying relevant conditions or excerpts of information, and collating it into a single unified view for the claims processor to handle, eliminating manual search and analysis steps.

In early tests, this cut claim processing time by more than 90 percent. By collecting and structuring previously unstructured information, the system is also expected to lead to further automation down the road, with spillover to other processes that rely on the contractual data, such as cross-selling additional coverages. As a next step, the system will advise the company's insurance agents on the "next best action"; in addition to cost reduction and improved response times, this is expected to increase conversion rates.

Accelerated enterprise transformation

In line with the goals of improving organizational efficiency and customer experience, many insurers have begun considering the transformational improvements that a cognitive approach can bring. In claims handling, the potential efficiency gains from automation using cognitive solutions are particularly high. Insurers expect to reduce claims processing time by an order of magnitude, saving cost and freeing up claims processors for more complex claims (see case study, "RIMAC").

Long term, the cognitive insurer can make improvements that offer greater visibility into specific business challenges and support proactive decisions across the whole organization. For example, cognitive capabilities can monitor risk and compliance across business processes. Imagine a system that understands your global client base on an individual level, with comprehensive knowledge of both existing and proposed insurance regulations across continents, countries, states and provinces.

Understanding the potential

The insurance industry is awakening to the potential of cognitive technologies. Thirty-eight percent of our survey respondents said they have adopted cognitive computing, almost three times the adoption rate of their peers in the banking industry.[10] Outperforming insurers are even further ahead — an impressive 71 percent of this group has already started working with cognitive technologies.

What are the barriers? While the average insurer still sees cost as the main issue (48 percent), that is less of a concern for outperformers. Instead, they are not sure whether customers are ready for this type of technology (42 percent) and they have general concerns around security and the use of personal data (39 percent).

Generally, the life insurance industry seems to be more ready for cognitive than property and casualty (P&C) insurers, both on an industry and an individual company basis (see Figure 6). Why? Generally, life products tend to be of higher complexity, both in underwriting and in administration. Life insurers also tend to be larger overall — in our sample, 37 percent of life insurance respondents had gross premium written (GPW) of more than USD 1 billion, compared to only 17 percent of P&C insurers.

Figure 6

Overall, life insurers seem to be more ready for cognitive than P&C insurers

The life insurance *industry* is significantly ahead of P&C in its readiness to embrace cognitive

57%

37%
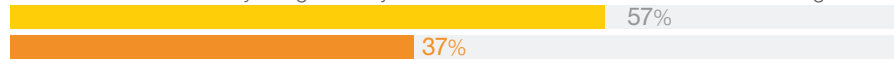
Also, life insurance *organizations* lead their P&C counterparts in readiness to embrace cognitive
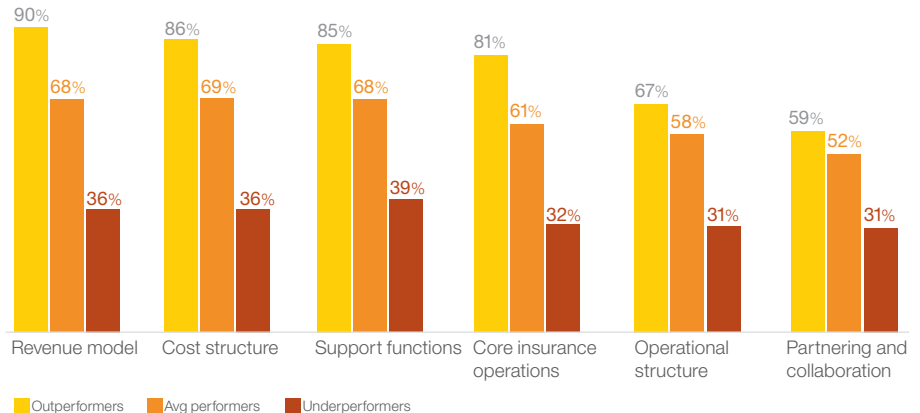
44%

34%

■ Life   ■ P&C

Outperforming insurers expect cognitive computing to be highly relevant to their organizations, both from a strategic viewpoint and how it affects the organization. Our respondents see an immense potential effect on revenue model and cost structure, making it a real game-changer (see Figure 7).

Figure 7

Outperforming insurers believe cognitive will have huge impact on their organizations

	Revenue model	Cost structure	Support functions	Core insurance operations	Operational structure	Partnering and collaboration
Outperformers	90%	86%	85%	81%	67%	59%
Avg performers	68%	69%	68%	61%	58%	52%
Underperformers	36%	36%	39%	32%	31%	31%

■ Outperformers   ■ Avg performers   ■ Underperformers

Ultimately, successful use of cognitive computing depends on the data. Cognitive can access and use virtually all types of data — structured and unstructured, text-based or sensory. Outperforming insurers — and those that have successfully started implementing cognitive technologies — recognize the importance of data accessibility, both their own and external. Eighty-five percent of outperformers (compared to 34 percent of underperformers) realize that cognitive will require rethinking or redesigning their data governance. Data will power and differentiate cognitive systems.

Recommendations: Becoming a cognitive insurer

Plan

Start with the tangible. Use ideation workshops to identify a prioritized use case for cognitive computing. Begin with a simple prototype that demonstrates the future business case and helps explain the technology. Define the roadmap and obtain senior management commitment. Appoint "cognitive champions" throughout the organization, whether in underwriting, back-office operations, the compliance function or elsewhere.

Formulate your cognitive intentions using design thinking. Explore relevant cognitive computing solutions and use data to create superb customer experiences — both for external customers and internal users of the cognitive systems. Strive to offer the ideal experience for obtaining a quote, adapting the coverage portfolio to changing life circumstances or creating the ideal claims handling experience when an incident happens. Take advantage of the knowledge of agents and brokers about the client experience and involve them early in the cognitive design process.

Create Minimal Viable Product (MVP) and conduct pilots, refining continually. Promote agile and crowd-sourced ideation and creation methods such as hackathons. Encourage all-level involvement. Refine these with user inputs to improve stakeholder buy-in over time. Think big, start small and scale quickly.

Promote ongoing executive alignment and commitment. Communicate and show business value to executive sponsors and stakeholders at all levels. Enlist cognitive champions to drive communication and coordinate cognitive adoption enterprise-wide. Align the planned cognitive implementation and outcomes with the overall technology roadmap.

Prepare

Invest in new kinds of human talent, not just insurance experts. Understand your own talent gap for cognitive deployment. Experts on data, cognitive and other machine learning skills will be invaluable to insurers.

Engage employees early. Continuously work with the affected workforce such as underwriters and claims handlers to help them understand the technology and the impact on their roles. Ideally, involve them in the pilot process or demonstrations.

Adjust processes and policies. Assess the likely impact of cognitive insights from once-dormant ("dark") data on both business processes and the broader organization. Make necessary changes to support cognitive implementations. Using cognitive computing to conduct actuarial research can shave days from the amount of time needed. Build a quality corpus of data as groundwork.

Establish a cognitive-ready infrastructure. An important factor for successful implementation of cognitive technologies is the accessibility of data. Develop infrastructure to support cognitive data sets, volumes and workloads in a secure manner. Consider using cloud as a technology platform. Address related skills and technology needs, whether by growing internal skills or finding external partners.

Progress continually

Communicate the cognitive vision at all levels. Use change management principles to explain, measure and control the ongoing impact of enterprise and ecosystem transformation on employees, managers, intermediaries and other partners.

Apply cognitive technologies. Execute a staged roll-out (using "agile sprints," for example). Establish a framework of metrics and key performance indicators.

Articulate, measure and achieve outcomes. Set up a periodic review process. Assess progress toward your desired outcomes. Measure and communicate value realized at different phases.

Enhance, expand and share collective knowledge. Periodically update functionality and training with new content based on learnings. Look for reusable knowledge and create ways to share it for enterprise-wide, perhaps even ecosystem-wide, scalability.

Are you ready for the cognitive transformation?

Related IBV reports

Bieck, Christian, Lynn Kesterson-Townes, Anthony Marshall and Indranil Nath. "Innovating insurance – Lessons from the world's leading innovators." IBM Institute for Business Value. March 2016. www.ibm.com/business/value/innovatinginsurance

Bieck, Christian and Lee-Han Tjioe. "Capturing hearts, minds and market share: How connected insurers are improving customer retention." IBM Institute for Business Value. June 2015. www.ibm.com/business/value/insuranceretention

Bedell, Craig, Christian Bieck, John Frazis and Anthony Marshall. "Understanding customers and risk: Your cognitive future in the insurance industry." IBM Institute for Business Value. October 2015. www.ibm.com/business/value/cognitiveindustry

Christian Bieck, Dr. Maya Bundt, Patricia Hamilton, Dr. Kurt Karl, Michael Schmitt and Pawel Stefanski. "Cyber and beyond: Insurance and risk in a digitally interconnected world." IBM Institute for Business Value. June 2016. www.ibm.com/business/value/cyberandbeyond

- What opportunities exist to create more engaging and personalized experiences for your consumers and the wider insurance ecosystem? How can you design more positive, non-incident-related interactions with current and potential insurance customers?

- What risk and insurance-related data are you not leveraging that, if converted to knowledge, could allow you to better meet key objectives and business requirements?

- What is the cost to your organization of making non-evidence-based decisions or not having the full array of possible options to consider when actions are being taken? For example, what if you could continuously learn from best practices in underwriting, improving risk assessement and freeing up additional time for your customer-facing personnel to engage with clients?

- What benefits could you gain by being able to detect hidden patterns locked away in your data, such as knowing customer behavioral patterns when designing new products or your channel strategy? How would this accelerate innovation and consumer services?

- What are your organization's skill gaps in cognitive computing? How can you best address those gaps rapidly?

Our methodology

In second quarter 2016, IBM surveyed 1,502 insurance C-suite executives in a range of roles around the world. Respondents' answers to two questions determined whether they fell into the outperformer or underperformer category, or somewhere in between. Outperformers (12 percent of the total) are those organizations with strong growth in both gross premium written (GPW) and operating efficiency over the last three years. Underperformers (33 percent of the full sample) had both GPW and operating efficiency that decreased, or was relatively unchanged during that same timeframe.

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Notes and sources

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