Inspiring deeper brand enthusiasm

Your cognitive future in the consumer products industry

IBM Institute for Business Value

Executive Report

Consumer Products and Watson

IBM Consumer Products

Develop a consumer-centric business model to build enduring brands. For more than a century, IBM has been providing businesses with the expertise needed to help consumer goods companies win in the marketplace. Our researchers and consultants create innovative solutions that help clients become more consumer-centric to deliver compelling brand experiences, collaborate more effectively with channel partners and align demand and supply. For more information about IBM consumer products solutions, see **ibm.com**/consumerproducts.

IBM Watson

Watson is a cognitive system that enables a new partnership between people and computers that enhances and scales human expertise. For more information about IBM Watson, visit **ibm.com**/Watson.

A consumer products renaissance

Welcome to the age of cognitive computing, where intelligent machines simulate human brain capabilities to help solve society's most vexing problems. Early adopters in consumer products (CP) and other industries are already realizing significant value from this innovative technology, and its potential to transform the industry is enormous. Cognitive systems are already helping CP companies improve engagement with customers and improve innovation. And our research indicates that industry leaders are poised to embrace this groundbreaking technology and invest aggressively in cognitive capabilities to improve outcomes for CP companies across key areas.

Executive summary

Technology is advancing more rapidly today than at any other time in human history. Amid the ever-growing market of new technologies, one capability – cognitive computing – is expected to be revolutionary for multiple industries and, indeed, society in general.

For the CP industry in particular, the timing for a game changer couldn't be better. Multiple disruptive forces are creating significant challenges for CP companies as they strive to win in a rapidly changing marketplace. These include: digitally empowered consumers, changing demographics, volatile commodity prices, disruptive competition and changing regulations.

To thrive amid the chaos of change, industry leaders must be smarter in how they approach data. While the digital age has provided CP companies with a massive amount of data brimming with insights, most organizations still struggle to unlock its full value.

Advances in cognitive computing can help bridge the gap between data quantity and data insights. By building knowledge, understanding natural language and offering confidence-weighted responses, cognitive-based systems can quickly find the proverbial needle in a haystack, identifying new patterns and delivering compelling and differentiating new insights.

Our research reveals that cognitive solutions are already helping organizations across industries realize tremendous value. A follow up to the "Your cognitive future" reports, this is the latest in a new series of industry-specific reports based on research conducted in early 2015. This study was informed by a survey of 81 CP executives from around the world. (For more information on our research, see the "Study approach and methodology" section at the end of the report.)

95%

of CP executives familiar with **cognitive computing** believe it will play a **disruptive** role in the industry.

75%

of CP executives familiar with **cognitive computing** believe it will have a **critical** impact on the **future of their organization.**

98%

of CP executives familiar with **cognitive computing** intend to **invest in cognitive** capabilities.

Specifically, this report examines current and future applications across key industry functions and offers recommendations for those ready to embrace the cognitive journey. The study provides deep insights from CP leaders who already understand how cognitive capabilities can help push the current boundaries of innovation and growth. These leaders recognize the potential to transform the CP industry – and are set to exploit cognitive capabilities to do so.

Conquering industry forces

The CP industry is experiencing multiple disruptive influences. From rapidly evolving consumer expectations and shifting demographics to volatile commodity prices and changing regulations, a number of powerful forces are shaping the CP landscape:

Digitally empowered consumers: Rapid digitization is empowering consumers who shop and interact with brands in a fundamentally different way. Consumer expectations are expanding rapidly across service, quality and experience. Sixty-four percent of shoppers say they would like to receive targeted coupons on their phones while they're shopping in a store.[1] When looking for product recommendations, 68 percent of consumers trust what they hear on Facebook over anything they encounter via traditional media, through advertising channels or on other online platforms.[2] CP companies are compelled to provide an end-to-end consumer experience for today's shoppers.

Changing demographics: Demographic and behavioral changes are impacting the CP industry. The population is aging, and older consumers are beginning to demand products and services tailored to their specific needs.[3] At the same time, younger consumers exhibit very different behavior, aggressively embracing mobile technology to engage with brands throughout the path to purchase. CP companies are expected to find innovative ways to meet the needs of aging consumers as well as a new generation customers.

Volatile commodity prices: Globally, fluctuating availability, quality and cost of raw materials are becoming difficult to manage across supply chains. In fact, the price of resources have increased dramatically since 2000.[4] The CP industry cannot simply pass these costs along to shoppers, and many companies are left to consider whether to reduce or eliminate parts of their portfolios. Facing rising input costs and pricing pressures, the industry must focus on improving margins.

What is cognitive computing?

Cognitive computing is a new computation paradigm. Different types of cognitive computing solutions offer various capabilities, including:

- Learning and building knowledge from various structured and unstructured sources of information
- Understanding natural language and interacting more naturally with humans
- Capturing the expertise of top performers and accelerating the development of expertise in others.

These capabilities can lead to several discernable benefits for businesses, including:

- Enhancing the cognitive processes of professionals to help improve decision making
- Elevating the quality and consistency of decision making across an organization.

Disruptive competition: With increasing options and the rise of private labels, competition is fierce in the consumer products industry. Nimble competitors are embracing new technology and turning to social media to provide consumers with new options. Private-label offerings continue to gain in acceptance, with stronger growth in 2014 than total retail growth for the year.[5] And new competition is emerging from non-traditional industries deploying disruptive business models; in some cases, upstarts have been able to turn whole industries upside down. To stand up to these forces, CP companies are increasingly compelled to focus on establishing innovative new operating and business models.

Changing regulations: In an increasingly dynamic regulatory environment, CP companies face complex new challenges. The industry is grappling with evolving environmental, product safety, labeling and other regulations, with costs that are potentially staggering. In Europe, for example, new extended producer responsibility regulation could cost the U.S. CP industry USD 7 billion a year or more.[6] To confront these challenges, CP companies need improved visibility and transparency throughout the value chain to reduce operational risk and more adroitly respond to adverse events in more targeted ways.

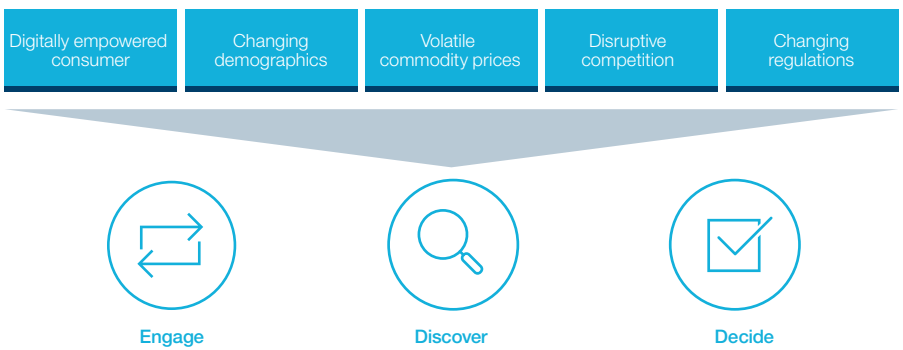
From disruption to focus

It's clear that CP companies are operating amid turmoil. To rise above the disruption, we suggest consumer products companies focus on improving their capabilities to engage, discover and decide (see Figure 1). Increased engagement can foster better collaboration between consumers and brands and can result in a better experience for consumers at every

touch point. New discovery tools and capabilities can provide the ability to digest vast amounts of data to help companies discover new product trends and consumer needs, and innovate new products. And better decision capabilities will allow for evidence-backed recommendations to support better horizon planning, targeted marketing and inventory management.

Figure 1

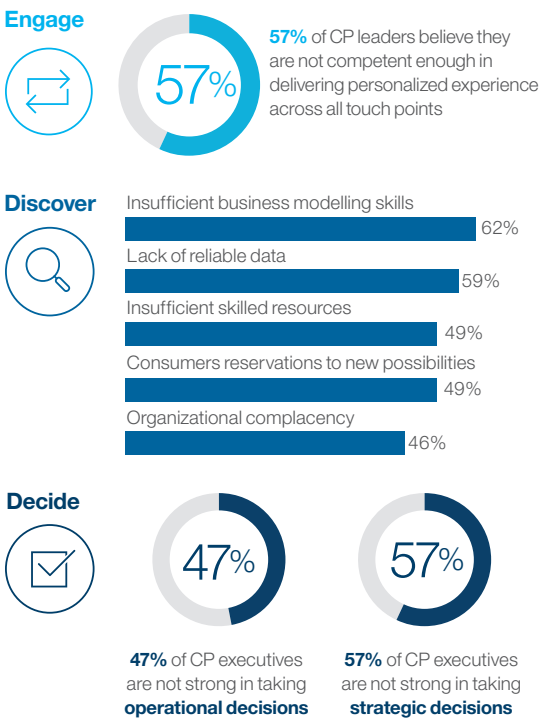
To cope with a broad range of disruptive forces, the CP industry needs strong capabilities in engagement, discovery and decision making



Source: IBM Institute for Business Value.

Figure 2

Cognitive capabilities align to the most pressing issues facing leaders in the CP industry



Source: IBM Institute for Business Value.

Engage: Today's empowered consumers seek personalized, convenient and consistent service across multiple channels. More than two-thirds of CP executives surveyed understand that customers want personalized experiences. However, more than half of the executives surveyed do not believe their companies are competently meeting this demand (see Figure 2).

Discover: Sixty-four percent of CP executives surveyed are actively pursuing industry model innovation. However, they cited insufficient business modelling skills, lack of reliable data and insufficient skilled resources among their greatest challenges in pursuing disruptive innovation. Organizational complacency is also holding the industry back.

Decide: Effective decision making is important in any industry. According to our survey, CP executives expressed reservations about their organizations' decision-making capabilities in a number of areas. Forty-seven percent were not confident in their organizations' operational decisions, and 57 percent lacked confidence in strategic decisions. While the industry has fairly strong analytics capabilities, companies have difficulty considering the vast amount of unstructured information available while making decisions.

Cognitive opportunity in CP

Big data has been called the new natural resource.[7] And this resource continues to rapidly grow in volume, variety and complexity. Despite the explosive growth of information across industries, less than 1 percent of the world's data is currently analyzed.[8]

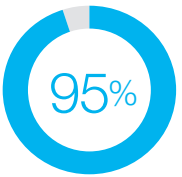
While effective for a number of applications, traditional analytics solutions cannot fully exploit the value of big data. They are unable to adapt to new problem domains or handle ambiguity and are only suitable for structured and unstructured data with known, defined semantics (the relation of words and phrases and what they mean). Without new capabilities, the paradox of having too much data and too little insight will continue.

How can CP companies bridge the gap between untapped opportunities and current capabilities? How can hidden insights that reside in data – structured and unstructured – be fully harnessed for discovery, insight, decision support and dialogue? The answer is cognitive computing. Cognitive-based systems are able to digest and analyze vast amounts of disparate data, build knowledge and learn, understand natural language, and reason and interact more naturally with human beings than traditional programmable systems.

CP executives agree that cognitive computing has the potential to radically change the sector. Among CP leaders familiar with the technology, 95 percent believe it will play a disruptive role in the industry, 75 percent believe it will critically impact the future of their organizations and 98 percent intend to invest in cognitive capabilities.

Figure 3

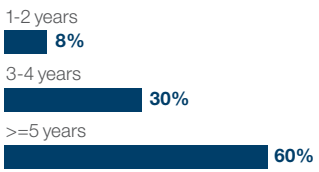
CP executives globally see the value in cognitive and intend to leverage it in their organizations



95% of CP executives familiar with cognitive computing believe that it will play a disruptive role in the industry.

75% of CP executives familiar with cognitive computing believe that it will play a critical role in the future of their business.

Nearly all CP executives familiar with cognitive computing indicated that they are likely to invest in cognitive capabilities in the future.

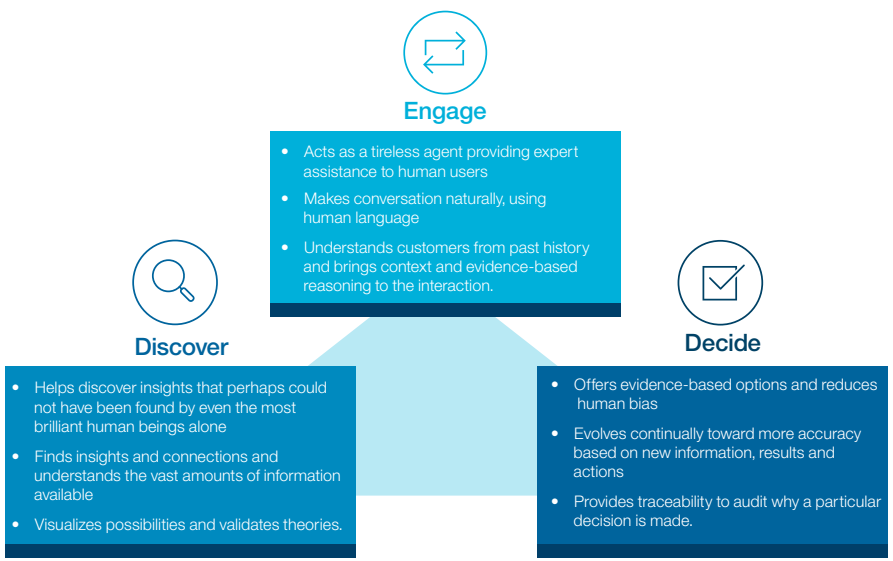


Source: IBM Institute for Business Value.

So, how specifically can CP companies leverage cognitive computing to address issues currently plaguing the industry? This new computing paradigm can help address the three critical areas of focus for CP companies: engage, discover and decide (see Figure 4).[9]

Figure 4

There are three emerging capability areas for cognitive computing



Source: IBM Institute for Business Value.

Engagement capabilities

Cognitive systems can fundamentally change the way humans and systems interact and significantly extend the capabilities of humans by leveraging their ability to provide expert assistance. They provide advice by developing deep domain insights and bringing this information to people in a timely, natural and usable way. Here, cognitive systems play the role of an assistant – albeit one who does not require sleep, can consume vast amounts of structured and unstructured information, can reconcile ambiguous and even self-contradictory data, and can learn.

Because they are able to engage in deep dialogue with humans, these systems can understand humans based on natural language interactions, and can deliver personalized services. The technology can help to draw insights about consumers from internal and external, structured and unstructured data to provide a seamless experience. In addition, cognitive systems can help understand consumer preferences and behaviors based on their past purchases, demographics, weather conditions and other factors (see sidebar, "IBM Watson Trend predicts the season's hottest toys and gifts").

Future cognitive systems likely will have free-form dialogue capabilities, which could power transformative service initiatives.[10] For example, customers could engage in dialogue with a virtual customer service representative that could answer questions and gather feedback in natural language. Such capabilities could help CP companies as they move to connect more directly with consumers as they research and evaluate products throughout the path to purchase.

Engage

IBM Watson Trend predicts the season's hottest toys and gifts[11]

IBM Watson Trend is an app that relies on the cognitive prowess of Watson to dissect the often complex and fluid preferences of shoppers. The app analyzes tens of millions of consumer conversations on social media and elsewhere in the digital universe and presents the top trending products. The app also reveals why these products are trending, describing the underlying drivers of each trend, and provides foresights into where the trend is going – whether it will rise, fall or plateau in the weeks ahead.

For the 2015 holiday shopping season, IBM Watson Trend correctly predicted the brands at the top of shoppers' lists and pinpointed several of the products that consumers favored above all others. When Watson Trend named the Apple Watch its top trend for the season, many naysayers decried the prediction, citing sluggish year-to-date sales. But the Apple Watch exceeded all expectations for holiday sales, launching Apple into the leading position in the wearables market with a 51 percent market share.[12]

For manufacturers and retailers, IBM Watson Trend provides invaluable insight into consumer attitudes, offering a real-time look at what people like and don't like. This information can help companies devise new ways to reach out to consumers, anticipate inventory requirements and garner new product ideas.

Discover

Bon Appétit teams with Chef Watson to explore cognitive cooking[13]

In 2014, IBM and Bon Appétit announced the release of the first-ever cognitive cooking beta app, called "Chef Watson with Bon Appétit." The app, which helps home cooks discover new and flavorful recipes, also served to help Watson increase its culinary knowledge by leveraging Bon Appétit's 10,000 recipes.

In 2015, "Chef Watson with Bon Appétit" moved out of beta to give cooks everywhere a chance to try their hand with Watson. Over the past year, thousands of home cooks have been using Watson to push the boundaries of what they make at meal times and discover creative ways of tackling very common food challenges. During the past year, IBM and Bon Appétit have continued to expand Watson's knowledge of ingredients, collaborated together on the app's design, and incorporated valuable feedback from the app's early adopters on how to interact with a discovery system such as Watson.

Discovery capabilities

CP companies around the world have access to huge volumes of information. This access provides companies with an immense opportunity to find valuable and useful insights. Cognitive systems can help users find insights that even the most brilliant human beings might overlook. Discovery involves finding insights and connections and understanding the vast amounts of information available within an enterprise and around the world.

Some discovery capabilities have already emerged. For example, a cooking magazine is using a cognitive computing solution to drive a web-based app that helps readers create new dishes. The system relies on algorithms that draw upon a number of datasets, including regional and cultural knowledge, as well as statistical, molecular and food pairing theories, to help users discover unexpected flavor combinations (see sidebar, "Bon Appétit teams with Chef Watson to explore cognitive cooking").

In the near future, cognitive solutions are expected to discover insights by connecting many more disparate factors, which otherwise would not have been possible by human experts. For example, cognitive solutions could help CP marketing organizations analyze attitudinal and behavioral insights to better develop and execute more personalized campaigns. The technology could also help companies build and prioritize their innovation pipeline by predicting new product trends and discovering new material and ingredient combinations.

Decision capabilities

Cognitive systems aid in decision making and reduce human bias by offering evidence-based recommendations. They continually evolve based on new information, results and actions. Current cognitive systems perform more as advisors by suggesting a set of options to human users, who ultimately make the final decisions.

For a number of industries, these systems are already enabling more informed and timely decisions. In healthcare, for example, IBM Watson for Oncology can quickly analyze patient data, fast-growing medical literature, guidelines from world-class experts and the experience of specialists – and then identify personalized treatment options for a clinician to consider.[14] For the consumer products industry, future cognitive solutions will help companies hedge against fluctuations in raw material costs by considering external factors such as regional news and weather forecasts. The technology will also strengthen horizon planning and help companies improve working capital efficiency (see sidebar, "Cognitive helps improve strategic and operations decision making").

Decide

Cognitive helps improve strategic and operations decision making[15]

CogntiveScale, an Austin, Texas-based software company established in 2013, has found that cognitive technology helps to improve key business processes, including supply chain, procurement and revenue cycle management processes. The company's cognitive solutions, powered by IBM Watson, analyze content from core business processes to drive proactive insights and recommendations directly to consumers while also addressing questions in natural language. CognitiveScale's Cognitive Procurement solution examines reams of multi-structured data buried within internal contracts, spend guidelines and transactional systems and cross references that against external information such as reviews to help organizations better comply with procurement guidelines to reduce costs.

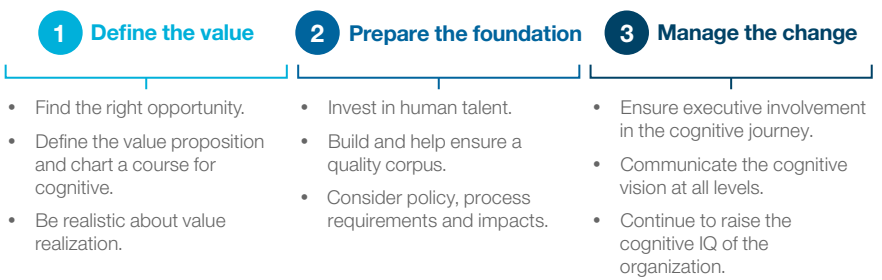
The company's Cognitive Process Cloud generates actionable insights that can play a major role in building resilient and cost-optimized supply networks. These insights can identify trends and events that can serve as warning signs for supply-chain risks, uncover opportunities for better sourcing using first- and third-party business signals and patterns, and speed up strategic and operational procurement activities to reduce costs, drive compliance, mitigate risks and manage and develop suppliers.

The way forward

Despite the enthusiasm for cognitive, companies should realize there is often a steep learning curve. In terms of system implementation and user interaction, cognitive systems are fundamentally different than traditional programmatic systems.[16] CP companies can learn from pioneering organizations that have already implemented cognitive by following three key sets of recommendations (see Figure 5).

Figure 5

Organizations with cognitive computing experience have identified three critical action areas for success



Source: IBM Institute for Business Value.

1. Define the value

Early planning helps ensure the greatest return on investment of resources. Defining the value of cognitive to your company is critical and includes several steps:

Find the right opportunity – Cognitive solutions are well suited to a defined set of challenges. CP companies need to analyze the specific problem to determine if cognitive capabilities are necessary and appropriate:

- Does the challenge involve a process or function that today takes humans an inordinate amount of time to seek timely answers and insights from various information sources, such as analyzing customer preferences over long periods of time, using various techniques in making a decision or thinking through a problem?
- Is there a need for users to interact with the system in natural language (such as a customer service or a customer feedback app)?
- Does it involve a process or function that requires providing transparency and supporting evidence for ranked responses to questions and queries (such as regulatory compliance)?

Define the value proposition and chart a course for cognitive – Identify both the differentiated value provided by cognitive computing and the business value up front – from quicker decisions about budget allocations to cost savings. In addition, establish a cognitive computing vision and roadmap with executive-level support. Continuously communicate roadmap progress with appropriate executives and stakeholders.

Be realistic about value realization – The benefits of cognitive computing systems are not realized in a single "big bang" at the time of initial deployment. Rather, these systems are evolutionary and improve and can lead to increasing value over time. Communicate this reality to stakeholders and specify benefits for the CP industry, consumers and others. Consider using a phased rollout or deploying the solution to a subset of trusted users who understand the technology's evolutionary nature.

2. Prepare the foundation

Prepare the foundation for a successful cognitive computing solution implementation by focusing on the following:

Invest in human talent – Cognitive solutions are "trained," not programmed, as they "learn" with interactions, results and new pieces of information and help organizations scale expertise. Often referred to as supervised learning, this labor-intensive training process requires the commitment of human subject matter experts (SMEs).

In addition to domain expertise, a cognitive implementation also requires expertise in natural language processing, machine learning, database administration, systems implementation and integration, interface design and change management. There is an additional intangible "skill" required for team members: intellectual curiosity. The learning process never ends – for the system, the users and the organization.

Build and help ensure a quality corpus – Cognitive systems are only as good as their data. Invest adequate time in selecting data to be included in the corpus, which might include structured and unstructured data from multiple databases and other data sources and even real-time data feeds and social media. Data will likely emanate from new and untapped sources as well, including social media. In addition, invest in records digitization to secure the future of your organization's corpus, focusing on both historical and new documentation.

Consider policy, process requirements and impacts – Assess any potential impact on processes and how people work. Because users interact with cognitive systems in entirely different ways than traditional input/output systems, processes and job roles could be impacted. In addition, consider whether any data policy changes are necessary. Obtaining necessary data could test the boundaries of existing data-sharing policies and might require new or modifications to existing policies, regulations and agreements. CP companies should also explore and evaluate how cognitive computing will strategically fit into their mission. Prepare your business platform for a cognitive future by fully considering cloud, dynamic infrastructures data lakes and other factors.

3. Manage the change

Compared to traditional programmable systems, cognitive systems are a whole new ballgame. As such, change management is more critical than ever – even more so in an industry already experiencing so much change across its ecosystem.

Ensure executive involvement in the cognitive journey – Executive involvement should begin with active participation in defining the cognitive vision and roadmap and continue throughout the journey. This includes executive participation in regular reviews of incremental progress and value realization.

Communicate the cognitive vision at all levels – Because cognitive computing is new and not completely understood by most, regular communication at all levels is critical. Communications should consider all stakeholders within the ecosystem that may be impacted. Address any fears, uncertainties and doubts head on, and leverage executive sponsors to reinforce the value of cognitive to the organization's mission.

Continue to raise the cognitive IQ of the organization – Education is critical to assuring that cognitive is understood and adopted. Of particular importance is managing expectations related to system-generated recommendations. Cognitive systems are probabilistic (where several possible outcomes exist, with assigned probabilities) and not deterministic (where every input has fixed outcomes). While accuracy rates will improve as a system learns over time, the rate will never reach 100 percent. Educate stakeholders early on about accuracy rates, and conduct regular reviews on incremental improvements. CP companies should be sure to involve employees, trading partners and consumers in creating use cases for cognitive computing. Be experimental and adopt a "test and learn" approach.

Ready or not? Ask yourself these questions

- What opportunities exist to create more engaging and personalized experiences for your employees, consumers, customers and other stakeholders within the wider consumer products ecosystem?
- What industry data aren't you leveraging that, if converted to knowledge, could allow you to meet key objectives and business requirements?
- What is the cost to your organization and the wider consumer products ecosystem associated with making non-evidence-based decisions, or not having the full array of possible options to consider when actions are being taken?
- What benefits could you gain in being able to detect hidden patterns locked away in your data?
- What is your organizational expertise skill gap in cognitive computing? What might change if you could equip every employee to be as effective as the leading expert in that position or field?

For more information

To learn more about this IBM Institute for Business Value study, please contact us at iibv@us.ibm.com. Follow @IBMIBV on Twitter, and for a full catalog of our research or to subscribe to our monthly newsletter, visit: ibm.com/iibv

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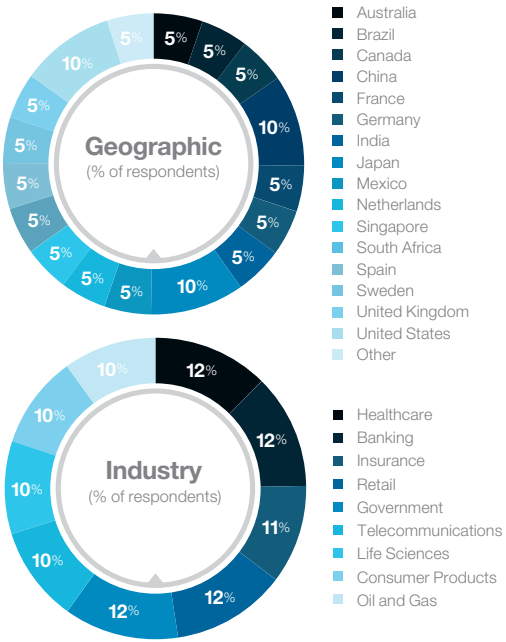
Contributors and acknowledgments

Thanks to the following individuals for their contributions: Michael Holmes, IBM Watson Group, and Neha Tuli, IBM Global Business Services.

Study approach and methodology

As a follow up to the initial IBM *Your cognitive future* research study, we conducted additional research in early 2015 to dive deeper into select industries and explore opportunities for cognitive. Through a survey conducted by the Economist Intelligence Unit, IBM gained insights from more than 800 executives from around the world representing a variety of industries, including 81 from consumer products, plus others from healthcare, banking, insurance, retail, telecom-munications, life sciences, consumer goods, and oil and gas. The study also included interviews with subject matter experts across IBM divisions, as well as supplemental desk research.



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Sarkar, Sandipan, and David Zaharchuk. "Your cognitive future, How next-gen computing changes the way we live and work, Part I: The evolution of cognitive." IBM Institute for Business Value. January 2015. ibm.com/business/value/cognitivefuture

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Produced in the United States of America
February 2016

GBE03740-USEN-00