Thinking like a customer

Your cognitive future in the retail industry

IBM Institute for Business Value

IBM Retail

IBM Retail solutions offer long-standing commitment and investment in leading-edge mobile partnerships, cognitive computing solution development, acquisitions and research that provide disruptive creativity and take a new approach (new business models) to solve business problems. Solutions include integrated systems of record, systems of engagement and systems of execution that span all phases of the consumer's brand experience and all channels of brand interaction to consistently deliver on the promise of customer-centric retailing. Deep industry experience—combined with software, consulting and infrastructure—enables IBM to deliver the integrated solutions needed to unite physical and digital worlds, supported by an extensive, collaborative and innovative business partner ecosystem.

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's Watson, visit ibm.com/Watson.

Cognitive + retail = the future

Welcome to the age of cognitive computing, where intelligent machines simulate human brain capabilities to help solve society's most vexing problems. For retail, cognitive computing has already arrived, and its potential to transform the industry is enormous. Cognitive systems are driving more personalized shopping experiences and helping unearth customer trends. Our research reveals that retail leaders globally are poised to embrace this groundbreaking technology more holistically and, by doing so, will redefine the future in retail.

Executive summary

The retail industry is experiencing unprecedented change. Over the past decade, emergence of technology-enabled "smarter consumers" has upended traditional retail business models. The days when department stores or large discount chains targeted promotions to mass audiences according to broad-brush definitions of age, gender and income are giving way to market segments composed of single individuals.[1]

In response, many retailers have attempted to ride the wave of technological disruption by using predictive analytics to discover how to better reach today's empowered customer, generate higher revenues and gain a much broader and deeper perspective of shifting marketplace mandates.

However, as the quantity of customer data continues to grow, retail executives fear that existing analytics capabilities are not sufficient to gain the necessary insights to fully meet ever-growing and ever-changing customer imperatives. Customers today are demanding completely personalized shopping experiences – in which products, services and communications are delivered to them at the time, place and medium of their choosing.

Cognitive computing, with its near real-time learning and decision support, provides a new set of capabilities that can open fresh opportunities for the retail industry by scaling human expertise. Cognitive is already helping retailers provide more personalized experiences, and it is poised to enable a broader range of innovation that promises to redefine the retail industry.

Our research, based on a survey of 100 retail executives from around the world, reveals that cognitive solutions are already helping organizations across industries realize value. Retail leaders recognize the potential to transform their industry, and they are set to exploit cognitive capabilities to accomplish this.

91%

of retail executives familiar with **cognitive computing** believe it will **play a disruptive role** in their organization

83%

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

94%

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

Conquering industry forces

The retail industry is experiencing unprecedented disruption. Retailers must embrace new technologies to address these changes. In the recent past, the store was the cornerstone of all retail transactions. However, new and sophisticated digital technologies have helped shift the entire retail paradigm. Today, whether retailers like it or not, brick-and-mortar stores are often used for "showrooming," in which customers compare products in-store and then purchase online. Retailers that focus only on brick-and-mortar stores are under serious threat.[2]

Five specific forces are changing the retail landscape:

Expanding customer expectations: Customers are empowered and their expectations continually evolve and expand. Customers expect retailers to offer convenient, responsive and personalized services. For example, a recent IBM study revealed that 48 percent of customers say it is important for retailers to provide on-demand personalized promotions when online, while 45 percent want the same options in store.[3] Customers are increasingly demanding that they, not retailers, control the shopping process; they want to discover and purchase products how, when and where they want.

Self-serve retail: Customers are assuming ever-greater ownership over their personal retail journeys. Today's customers have almost limitless choices in their discovery and inspiration about what to buy. They are not constrained by time of day or location in transacting. Customers use numerous self-help technologies in their interaction with retailers – price checkers, self-checkout payment lanes, mobile apps and payments, and information kiosks, to name just a few. This trend will only increase in the future.

Technological progress: Technology has redefined the ways in which retailers interact with customers. Yet, many retail organizations struggle to keep up with technological change. More than 80 percent of retailers agree that having mobile apps represents a key advantage over the competition.[4] Customers say that a digital device will influence 50 percent of their in-store purchases.[5] Seventy-four percent of U.S. smartphone owners say they would be more likely to shop at a store offering key functions and services via an app.[6]

Eroding margins: Prices of many consumer goods have been falling, driven by intensified competition and global sourcing. At the same time, retailers have been experiencing cost inflation in rents, salaries and strategic investments in such areas as technology. Retailers are also expressing growing concern about declining customer loyalty and profitability. For example, a leading retailer notes that its profitability online is less than half compared to in-store.[7]

Security breaches: Incidence and implications of identity theft and credit card fraud have increased.[8] Malware attacks targeting point-of-sale systems and systems of record, in particular, are becoming more common.

Disruption to focus

It is clear that retailers need to map a clear path to navigate this environmental disruption. To help retailers achieve this, we identified three underlying themes relating to communication and collaboration, innovation, and decisions and outcomes (see Figures 1 and 2).

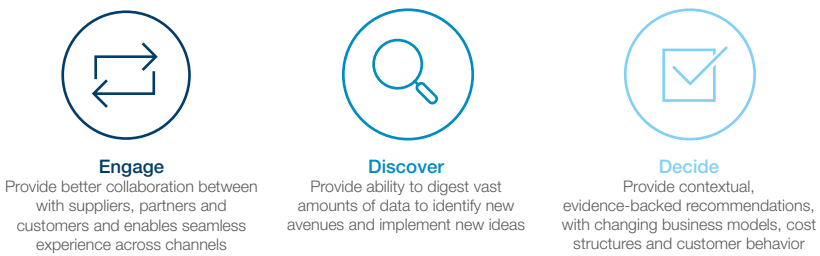
What is cognitive computing?

Cognitive computing is a new computation paradigm that…

- Learns and builds knowledge from various structured and unstructured sources of information
- Understands natural language and interacts more naturally with humans
- Captures the expertise of top performers and accelerates the development of expertise in others
- Enhances the cognitive processes of professionals to help improve decision-making
- Elevates the quality and consistency of decision-making across an organization.

Figure 1

From disruption, three focus areas have come to light for the retail industry



Source: IBM Institute for Business Value.

Engage: Today's customers want speed, transparency and personal interaction with their retailers. Although a majority of retail executives in our survey understand these demands, a significant gap exists between customer expectations and the ability of retailers to deliver.

Retailers find it especially difficult to resolve customer issues because of a lack of standard procedures and insufficient skilled resources. Many retailers lack capabilities to use the vast amount of customer data available to create insights, find patterns and deliver relevant experiences.

Discover: Although 59 percent of retail executives in our study actively pursue industry-model innovation, they are challenged by aggressive return on investment (ROI) expectations and lack of sufficient skills. Nearly six in ten of retailers surveyed indicated that ROI expectations are overly aggressive. More than half indicated they have insufficient business modeling/ business case skills. And nearly half said they have insufficient human resources.

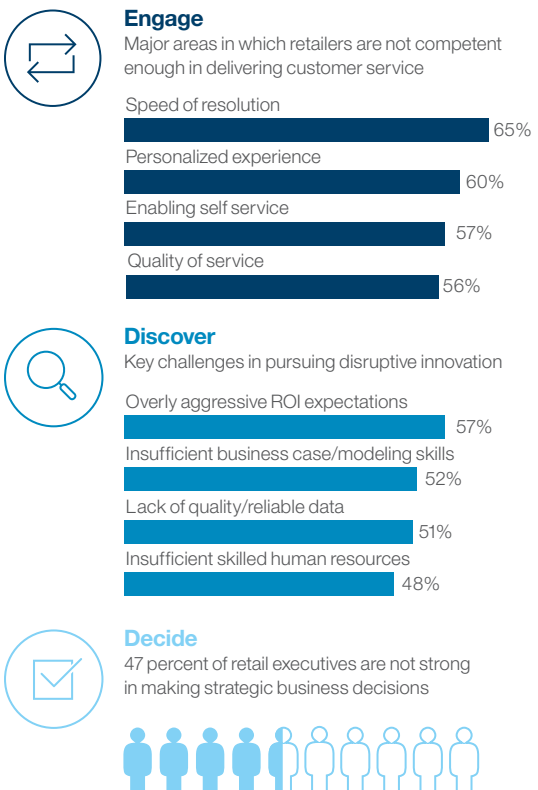
Retailers face challenges in identifying the right value proposition that can win them customer loyalty. As well, they are confronted with challenges in identifying technology and innovation that can differentiate them from others and help them create new, different and sustainable business models.

Decide: Almost half of the retail executives we surveyed report a lack of confidence in making strategic business decisions.

Such strategic decision-making is especially difficult in circumstances where retailers lack understanding about how to use data and analytics to support decisions. For example, many struggle with aspects of merchandising strategy, including synthesizing data on volumes, markdowns, promotion coupons and multi-channel campaigns.

Figure 2

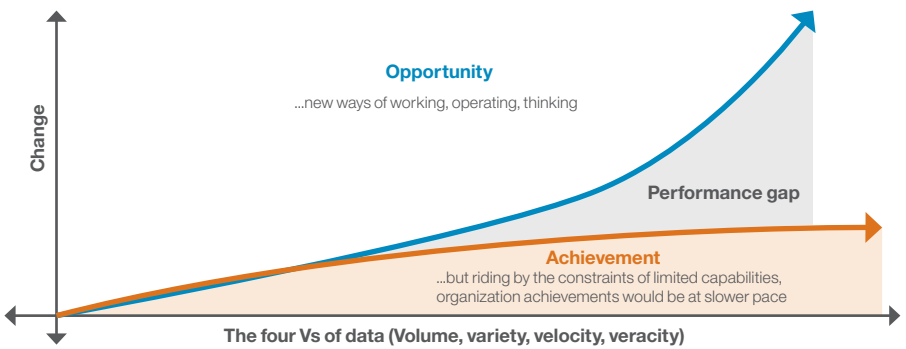
Retailers face challenges in customer service, disruptive innovation and making strategic business decisions



Cognitive opportunity in retail

Traditional analytics, while effective across many areas, are constrained in exploiting the full value of exponentially expanding data. Big data has been called the new natural resource.[9] And this resource continues to rapidly grow in volume, variety and complexity. Business data is estimated to double every 1.2 years.[10] Many retailers lack capabilities to make full use of available data, thereby creating a performance gap (see Figure 3).

Figure 3
Bridging the performance gap



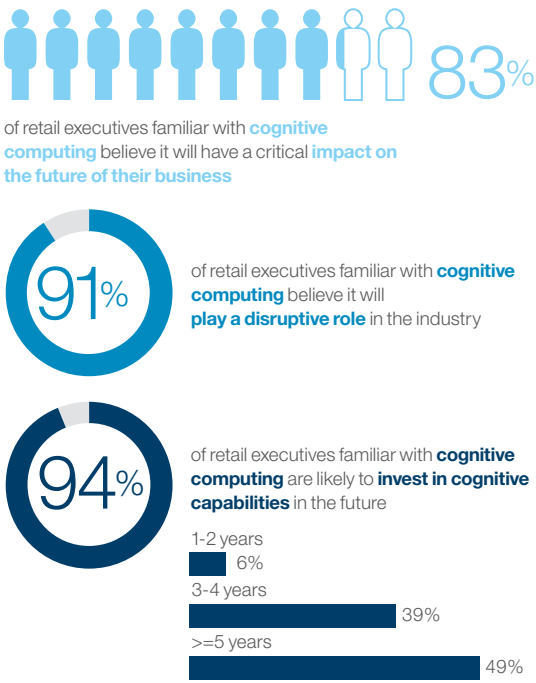
Source: IBM Institute for Business Value.

Cognitive computing allows organizations to bridge this performance gap, overcoming limitations of both humans and systems. The human brain can consume and process only a limited amount of information. People are also prone to physical and mental fatigue, as well as mistakes. Traditional analytical systems struggle with ambiguity. The traditional paradigm of computing is pre-programmed and rigid, unable to learn, reason, relate or interact in natural language. Cognitive systems, however, build knowledge and learn. They understand natural language, and they reason and interact more naturally with human beings.

Retail executives agree that cognitive computing has the potential to radically change the industry. Among retail leaders familiar with the technology, 91 percent believe it will play a disruptive role in the industry, and 83 percent believe it will have a critical impact on the future of their businesses. Further, 94 percent of retail executives familiar with cognitive computing say that their organizations are likely to invest in cognitive technologies in the near future (see Figure 4).

Figure 4

Cognitive computing has the potential to radically change the retail industry



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 insight and bringing this information to people in a timely, natural and usable way. Cognitive systems can play the role of an assistant – albeit one that does note require sleep – and can consume vast amounts of structured and unstructured information, can reconcile ambiguous and even self-contradictory data, and can learn.

Retailers can use cognitive to understand shoppers' behavior, search their intent and guide them with personalized advice and accurate product recommendations. As a result, retailers will gain deep insights using data from disparate sources that can help them to provide highly tailored experiences to the customers.

Engage

Cognitive solution can help in provide rich customer experiences

Cognitive applications are already in market, helping enriching customer experience:

- RedAnt uses cognitive to let employees easily identify individual customers' buying preferences by analyzing demographics, purchase history and wish lists, as well as product information, local pricing, customer reviews and tech specs.[11]
- Sellpoints, a provider of e-commerce and customer engagement solutions, has introduced Natural Selection, a new app powered by cognitive computing that helps users to better understand individual shopper preferences and intent. Instead of complicated questions or surveys, the app allows consumers to ask questions in natural language, quickly returning a set of relevant and personalized offers in just two taps or clicks.[12]

Discover capabilities

Retailers around the world have access to huge volumes of information from internal and external sources. This access provides organizations with opportunities to find valuable and useful insights across vast amounts of information available within or external to the enterprise.

By analyzing diverse data, cognitive can provide a complete view of customers. Cognitive can analyze behavior and discover personality insights to help retailers more effectively run campaigns and promotions.

Discover

Cognitive can help discover valuable insights for retailers

Cognitive systems are already in market helping retailers find valuable insights for their customers:

- NextUser uses cognitive computing to find user preferences so that the marketers can better personalize communications to individual users.[13]
- StatSocial analyzes social and blog content to understand consumer demographics, affinities, and personality types. It can enable the brands and marketers to understand intrinsic needs and values of their customers.[14]

Decision capabilities

Cognitive systems aid in decision-making and reduce human bias by offering better, evidence-based recommendations. They continually evolve based on new information, outcomes and actions. Current cognitive systems perform more as advisors by suggesting a set of options to human users, who use information gathered and analyzed through cognitive, to make business decisions.

These systems are helping retail professionals make more informed and timely decisions. For example, cognitive can help in fraud and threat detection, increasing customer confidence and loyalty. And it can help retailers better optimize supply chain and inventory management.

Decide

Major global digital technology company uses cognitive to generate insights to make fundamental changes in its business[15]

In the light of major technological shifts in imaging products, one corporation decided to make fundamental changes in its business: marketing operations, customer call center and product development.

The company wanted to understand how people of all ages relate to digital visualizations. As well, it wanted to analyze other customer communications to obtain a holistic sense of the thoughts, feelings, opinions and sensibilities of its customer base.

The company deployed a content analytics solution to analyze customer sentiment on social media and the voice of the customer through the company's call center. Using the solution, the corporation quickly identifies problems to determine solutions (for example, why the shutter speed was high or a printer connection was bad).

As a consequence, the company hopes to achieve a major increase in the operating profits through 2016.

The way forward

Despite the enthusiasm for cognitive, retailers 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] Retailers are particularly concerned about having the right skills and expertise to move forward. There are three critical success factors for cognitive computing pioneers (see Figure 5).

Figure 5
Organizations with cognitive computing experience have identified three critical action areas for success

Source: IBM Institute for Business Value.

Define the value

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

Find the right opportunity – Cognitive solutions are well suited to a defined set of challenges. Retail organizations 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 in making a decision or thinking through a problem, such as seeking timely answers and insights from various information sources – for example, social media, purchase history and weather reports?
- Is there a need for users to interact with the system in natural language (such as a customer on a mobile device trying to find the right product suitable to his/her specific need)?
- Does it involve a process or function that requires providing transparency and supporting evidence for ranked responses to questions and queries (such as procurement decisions in a retail chain)?

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, such as employees and business partners.

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 organization, customers and business partners. Consider using a phased rollout or deploying the solution to a subset of trusted users who understand the technology's evolutionary nature.

Lay 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 to 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. An additional intangible "skill" is required for team members: intellectual curiosity. The learning process never ends for the system, the users or the organization.

For large retail organizations, forming a cognitive computing center of excellence may help to secure the required talents and repeat the success.

Build and maintain 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 (such as purchase history) and unstructured (such as social media) 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, economic reports and weather updates. 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.

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.

Confirm 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, including executives, employees, customers and business partners, in the complex retail 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.

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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IBM Institute for Business Value

The IBM Institute for Business Value, part of IBM Global Business Services, develops fact-based strategic insights for senior business executives around critical public and private sector issues.

Ready or not? Ask yourself these questions

- How do you plan to create more engaging and personalized experiences for your customers?
- How do you assess the extent to which you use your structured and unstructured data effectively across all business lines and functions?
- What is the cognitive computing IQ of your organization? How aware is staff of cognitive computing, and of its benefits?
- What capabilities do you require in order to support and manage cognitive computing services in your organization?
- How would you implement cognitive computing in your organization? Have you thought of what your business and operating models would look like? How would you measure the success of cognitive computing in achieving your strategic goals?
- How do you plan to secure senior management commitment for a cognitive computing business case?

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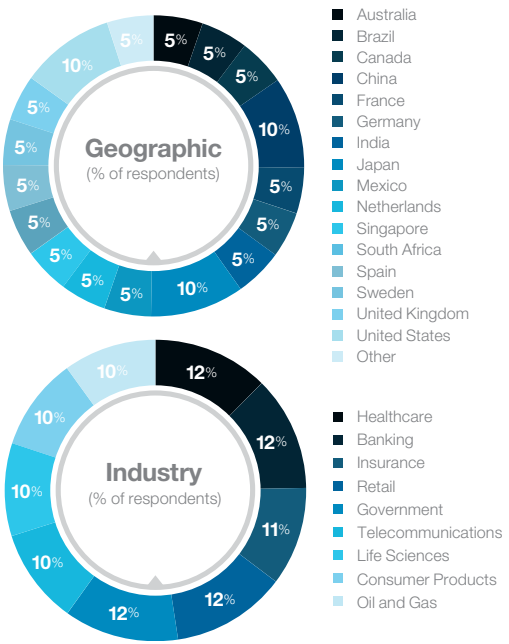

Contributors and acknowledgments

The authors offer thanks to the following individuals for their contributions: Michael Holmes of IBM Watson Group; and Amarenda Hota, and Anupama Shukla of IBM Global Business Services.

The authors also would like to recognize the report's executive stakeholders: Jay Bellissimo, General Manager, Client Experience, IBM Watson Group; and Shanker Ramamurthy, Global Managing Partner, Business Analytics and Strategy.

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 100 from retail industry, plus others from healthcare, banking, insurance, retail, telecommunications, life sciences, consumer products, and oil and gas. The study also included interviews with subject matter experts across IBM divisions, as well as supplemental desk research.

Related publications

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Produced in the United States of America
January 2016

GBE03731-USEN-01