**2018
Annual
Report**

IBM

Dear IBM Investor:

2018 was a defining year for IBM and our clients. Your company returned to growth, just as businesses readied to enter Chapter 2 of their digital reinventions.

For years, we have focused on building the tools businesses need in the 21st century. Our investments have reshaped IBM to lead in the emerging, high-value segments of the IT market, including analytics, artificial intelligence (AI), cloud, security, blockchain and quantum computing. At the same time, we have deepened our longstanding commitment to the responsible stewardship of technology.

IBM is now ready to help our clients advance their business transformations.

In my letter to you this year, I will describe IBM's performance in 2018. I will outline how clients are poised to enter Chapter 2 of their digital reinventions, with help from IBM, and how this translates to growth for IBM, for businesses and for the world.

2018: Return to Growth

In 2018, IBM achieved $79.6 billion in revenue and operating earnings per share of $13.81. For the full year, we returned to revenue growth, grew earnings per share and stabilized margins.

Our strategic and continued investment in innovative technology drove our improved competitive position and profit dynamics. Offerings that address data, AI, cloud, analytics and cybersecurity now represent more than half of our revenue—up from a quarter just four years ago—accounting for approximately $40 billion in revenue in 2018.

Our investment of more than $5 billion in research and development produced thousands of breakthrough innovations, which led to IBM's 26th consecutive year of U.S. patent leadership. Of the 9,100 patents granted to IBM in 2018, more than 1,600 were related to AI and 1,400 to cybersecurity—more than any other company in either area.

This focus on breakthrough innovation has created IBM's strongest portfolio ever and has driven results:

– Total cloud revenues were more than $19 billion in 2018, up 12 percent. In the fourth quarter alone, IBM signed 16 client services agreements worth more than $100 million to help optimize business performance on the IBM Cloud. Today, 47 of the Fortune 50 depend on the IBM Cloud.

– IBM is the world's enterprise AI leader. Solutions enabled by IBM Watson are helping produce better decision-making and business outcomes through more than 20,000 client engagements, across 20 industries to date. IDC ranked IBM number one in AI market share. We continue to pioneer innovations in natural language processing, speech processing, computer vision and machine learning.

– IBM Blockchain is the global leader in improving trust and transparency across business networks by creating a new way for clients to share and secure data. IBM Blockchain now powers more than 500 client projects, with more than 85 active networks transforming supply chains, global shipping, and cross-border finance.

– IBM Security, the world's largest cybersecurity enterprise, has 8,000 subject matter experts serving more than 17,000 clients in more than 130 countries. The industry's leading AI and cloud-based security solutions include IBM Security Connect, launched in 2018, which allows clients to gather, integrate and analyze security data across multiple applications and tools, in a vendor-agnostic way.

– IBM Systems produces innovative infrastructure for AI and hybrid cloud. The z14 is one of IBM's most successful mainframe programs in history, with broad global adoption across 27 different industry segments. In addition, the U.S. Department of Energy's POWER9-based supercomputers, Summit and Sierra, were ranked the most powerful supercomputers in the world in 2018.

– IBM Services was a key driver of IBM's performance in 2018. Forty-seven engagements worth more than $100 million each helped major clients—like Bank of The Philippine Islands, Juniper Networks, Nordea, Westpac and Aditya Birla Retail— move to the next stage of their digital transformations.

New IBM investments are further energizing our portfolio. In late 2018, we announced plans to acquire Red Hat, the world's leading open source technology provider for the enterprise. With this acquisition, which is expected to close in the second half of 2019, IBM will enhance our position as the world's number one hybrid cloud provider, helping clients unlock the full business value of the cloud.

We also continued to divest stand-alone software and services assets that are no longer strategic for IBM.

At the same time, we remained committed to returning capital to our shareholders. In 2018, we returned more than $10 billion to you, our shareholders, including dividends of $5.7 billion and gross share repurchases of $4.4 billion. We raised our dividend for the 23rd consecutive year—IBM's 103rd straight year of providing one.

Moving Clients to the Next Chapter of Digital Reinvention
For the past several years, businesses around the world have been driving their digital reinventions as they look to take advantage of data, their most powerful source of competitive advantage.

This first chapter has been defined largely by experimenting with narrow and disparate AI applications and moving simple workloads—typically consumer and customer-facing applications— to the cloud.

Now, we are beginning to see the contours of Chapter 2 among pioneering enterprise businesses: moving from experimentation to true business transformation at scale with AI and hybrid cloud.

This next chapter of digital reinvention will be enterprise-driven. It will be characterized first by scaling AI and embedding it everywhere in business. Second, in cloud, it will be characterized by moving mission-critical applications to hybrid cloud— using a combination of multiple public clouds, private clouds, and on-premise IT capabilities, so businesses can create the environment most suitable for their enterprise workloads. Underpinning it all is the growing importance of trust, both in technologies and their impact on the world.

Scaling AI throughout the Enterprise
In Chapter 2 of their digital reinventions, businesses will begin to scale AI across the enterprise, as some first movers are already demonstrating.

Take the world's leading banks, for example. While many have been applying AI to specific challenges, some first movers are scaling AI across the enterprise. For example, Orange Bank,

one of the fastest growing mobile banks in France, now manages all customer service through IBM Watson. Similarly, Banco Bradesco is now using IBM Watson to assist every member of its services team—resolving customer inquiries in seconds with nearly 95 percent accuracy.

IBM brought AI for business into the mainstream with the introduction of our Watson platform in 2014. Today, IBM Watson is the most open and trusted AI for business, available to run on any environment—on premise, and in private and public clouds. Businesses can apply Watson to data wherever it is hosted and infuse AI into their applications, regardless of where they reside.

With Watson Studio, Watson Machine Learning, and Watson OpenScale, IBM delivers a suite of tools that allow enterprises to build, deploy and manage their AI models in a hybrid cloud environment. IBM Watson OpenScale, a first-of-a-kind platform introduced in 2018, also enables businesses to manage their AI—no matter where it was built or where it runs—with transparency, explainability and bias mitigation. Addressing these factors, which traditionally have held businesses back, is critical for scaling AI throughout an enterprise.

Through IBM Services, we are helping our clients around the world apply AI to core business processes and workflows, infusing their businesses with automation, intelligence and continuous learning to transform everything from supply chains and HR to finance and operations.

In 2018, we also launched a new service called IBM Talent and Transformation that addresses the often overlooked cultural aspects of AI. This service helps our clients ensure their teams have the right skills and talent—and the supporting culture and work environment—to support a new way of working that is critical to scaling AI for business.

Moving Mission-Critical Work to Hybrid Cloud

In the first chapter of digital reinvention, cloud deployments largely focused on easily portable workloads for productivity and commodity computing. This primarily was driven by user-facing applications inspired by advances in consumer technology. As a result, only 20 percent of enterprise workloads today have moved to the cloud.

The remaining 80 percent of enterprise workloads provides the real value opportunity for business—transforming mission-critical workloads and applications for the cloud. The challenge is that most businesses have unique regulatory or data requirements and anywhere from five to 15 clouds across multiple providers.
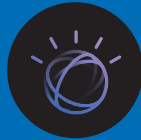

Virginia M. Rometty
Chairman, President and
Chief Executive Officer

IBM Leadership

#1 AI for business
20,000+ IBM Watson client engagements across 20 industries.

#1 in hybrid cloud
47 of the Fortune 50 rely on IBM Cloud. Revenue for IBM Cloud topped $19 billion in 2018.

#1 in enterprise services
IBM Services, with end-to-end cloud and AI capabilities, closed 47 client agreements worth more than $100 million each in 2018.

#1 in enterprise security
IBM Security manages 70 billion cybersecurity events per day for clients in more than 130 countries.

#1 in enterprise systems
IBM Z is at the heart of world commerce with 30 billion transactions per day, including 87 percent of all credit card transactions.

#1 in blockchain
IBM Blockchain Platform was ranked number one by analyst firms Juniper Research and Everest Group.

#1 in U.S. patents for the 26th consecutive year
IBM inventors received a record 9,100 patents, including more than 3,000 in AI, cloud and quantum computing.

#1 and #2 fastest supercomputers in the world
Built by IBM for the U.S. Department of Energy, based on IBM POWER9 CPUs tuned for AI workloads.

That is why businesses moving to Chapter 2 will need to embrace a new, hybrid cloud approach. It is one that will allow them to more easily move data and scale AI and other applications across public, private and on-premise IT in their enterprises, with consistent management and security protocols, using open source technology.

For example, BNP Paribas, a leading European bank, is working with IBM to speed and scale the launch of new digital and AI customer services across the cloud, while protecting the security and confidentiality of customer data. Similarly, global telecom leader Vodafone Business is partnering with IBM to innovate the way it delivers multicloud and digital capabilities—including AI, Edge computing, 5G and software-defined networking solutions—to its customers.

IBM Services provides end-to-end cloud integration capabilities and is helping thousands of businesses migrate, integrate and manage applications and workloads seamlessly and securely across any cloud environment. Industry experts from IBM Services are co-creating cloud-enabled solutions with clients in our IBM Garages. Using design thinking and agile methods, we are helping clients implement new ways of working, such as rapid prototyping and iteration to more quickly move technology projects from pilot to production at scale.

> "We are ready for this moment of moving clients to Chapter 2 of their digital reinvention with our unique integration of innovative technology, industry expertise and a reputation for trust and security earned over decades."

We are ready for this moment of moving clients to Chapter 2 of their digital reinvention with our unique integration of innovative technology, industry expertise and a reputation for trust and security earned over decades. IBM is now moving the world's major enterprises to the next era, an effort that will be enhanced by our planned acquisition of Red Hat.

Chapter 2 of Trust and Responsible Stewardship
We recognize that our clients and the consumers they serve expect more than groundbreaking innovation and industry expertise. They want to work with technology partners they can trust to protect their data and handle it responsibly. They want to work with partners that know how to bring new technologies into the world safely and help society benefit from them. And they want their partners to create inclusive workplaces and communities where diversity thrives.

These expectations are linked by a common theme: responsibility. Responsibility has been a hallmark of IBM's culture for 107 years—from our labs to our boardroom. IBMers' unwavering global commitment to the responsible stewardship of data and powerful new technologies has earned us the trust of clients and society as a whole.

In 2018, as trust in technology came under heightened global scrutiny, we published our IBM Principles for Trust and Transparency, which have long guided our company. They stress our belief that the purpose of new technologies is to augment—not replace—human intelligence, and that the data and insights derived from technology belong to the businesses who own them. The principles also emphasize that new technologies brought into the world must be open, transparent, explainable and free of bias.

We know that AI, like other transformative technologies before it, will have a profound impact on peoples' jobs and the workplace. That is why, in 2018, IBM further expanded access to the pathways through which students and professionals can build skills for today's technology era. That includes "new collar" jobs, where having the right skills matters more than having a specific degree. Through our work in 11 U.S. states and 13 countries, we will have 200 Pathways in Technology Early College High Schools—or P-TECHs—serving a pipeline of 125,000 students in the 2019 school year.

2018 also saw the rapid growth of our IBM Apprenticeship Program, which trains people in 21st-century skills ranging from blockchain and digital design to cybersecurity—and which expanded nearly twice as fast as we had projected in its first year.

Yet skills are only part of today's workforce opportunity. In 2018, fueled by record diverse hiring, promotion and retention, we achieved our greatest progress in a decade on diversity representation among global executive women and underrepresented minorities. We also continued advocating with governments around the world for policies that help ensure workplaces are as inclusive and diverse as the world we live in.

Recognizing that responsible stewardship should not be confined within IBM's walls, we also are working aggressively to empower others to do lasting good. We are, for example, a founding partner in Call for Code, a global initiative that works with software developers to create solutions that can help save lives. Last year, 100,000 open source developers from 156 countries responded to the call, creating more than 2,500 applications to help communities recover from natural disasters.

As IBM sees it, the promise of technology is to empower people to do good, access new opportunities and make the world better, safer and smarter—for the many, not just the few.

IBM Poised to Lead

In summary, we have returned your company to growth. We have positioned IBM's products, services and people to enable clients to write the next chapter of their digital reinventions. And we have done it all while reaffirming IBM's longstanding reputation for trust, integrity and responsibility.

Our work ahead is to build on this progress and bring these capabilities to life for our clients. I want to thank all of our clients for partnering with us while we reinvented IBM, and for choosing us for their own journeys of transformation.

I also would like to thank our investors for their confidence in IBM. Finally, I would like to thank the hundreds of thousands of IBMers whose expertise has prepared us to lead in this new chapter of digital reinvention.

I am honored to steward this great company, and I am filled with optimism about what we can achieve in partnership with our clients and society. Together, we are changing work and business—and ultimately the world.

Ginni Rometty

Virginia M. Rometty
Chairman, President and Chief Executive Officer

Leading businesses are reinventing themselves with IBM Services and Solutions across AI, cloud, blockchain, quantum and more.

IBM Services

United Airlines: Reinvention takes flight

Flight attendant Deb Winchell knows better than most how stressful a delay can be—for customers and staff alike.

To ignite a major business transformation, United Airlines turned to IBM iX—the business design arm of IBM Services—and a set of business applications from a global partnership between IBM and Apple called IBM MobileFirst for iOS. These applications combine the power of enterprise data and analytics with an elegant user experience, allowing United to broadly rethink how its crews work and how its work flows.

More than 60%
savings in app development costs, compared to a traditional approach

United and IBM used the IBM Garage method to design apps for the airline's growing deployment of iOS devices. The IBM Garage method, used by IBM Services with clients around the world, emphasizes co-creation and frequent iteration. It has allowed United to build complete, integrated mobile platforms that start with a user's experience and extend to all the airline's core business processes. United is now able to foster better and faster collaboration across diverse teams and time zones, enabling it to focus on its core mission of transporting customers to their destinations on time. The apps are also giving flight attendants like Deb Winchell new ways to help customers enjoy their flights, which makes everyday travel just a little less stressful for everyone involved.

Front-line crews know that many factors can contribute to delays. "Most challenges stem from things I can't control," Deb says. "But when I can make a difference in a customer's travel experience, it can be huge." That's why it's important to resolve issues before they affect customers. Deb can now be more

proactive with apps co-designed by United and IBM iX. Deb can even report an issue while a plane is still in the air, so the ground crew can get to work as soon as the plane lands. Customers on the next flight are far less likely to be affected because the app streamlines communication. "It's been a game changer for us," Deb says. "It lets us care for our customers right in the moment—and nothing's better than that."

The agile IBM Garage method helps organizations think beyond their existing systems and focus on what customers actually need. When combined with IBM Cloud and IBM Watson, it's nothing less than a way for organizations to reinvent themselves—an approach that's being adopted by enterprises around the world as they move to the next stage of digital reinvention. For example, it has helped create a startup culture in Bradesco, one of Brazil's largest banks. Bradesco can now quickly respond to the rising demand from its 75 million mobile banking customers. It has also showed East Carolina University new value in discarded data that enabled the school to predict possible outcomes, report strengths, weaknesses and deficits, and enable advisors to better assist students and improve educational programs. Digital reinvention isn't just a product or a platform. And it's certainly more than just a buzzword. It's a promise: a new way to innovate and rethink a company from the ground up and help customers and businesses alike.

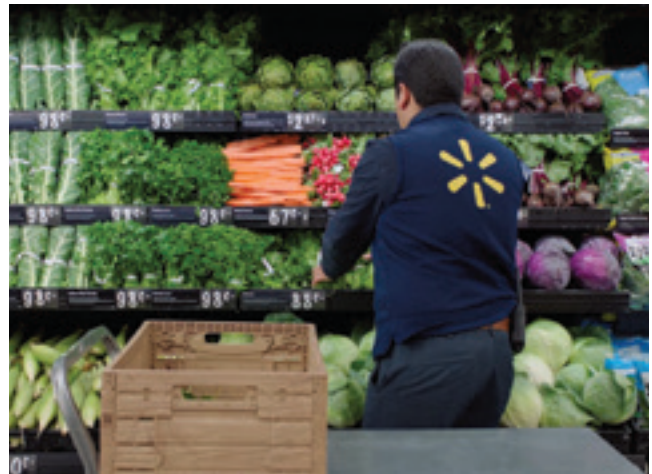With new mobile tools, United staff can quickly report and resolve issues that previously required multiple steps.

Walmart: Linked by safer food

With the IBM Food Trust, Walmart's Food Safety professionals can trace produce back to its source in just seconds.

It starts with a single report of severe food-borne illness. Then more reports pour in from around the country and from them, a culprit emerges: a common type of lettuce. But where, specifically, did the tainted lettuce come from? The work of Walmart and IBM, powered by IBM Blockchain, is giving us a better way to answer this question.

Until recently, tracing food hasn't been easy or fast. And the risk that represents is significant. The World Health Organization has estimated that there are 600 million cases of foodborne illness each year, leading to 420,000 deaths. And it can be daunting to trace how food goes through the supply chain. For example, four days of a farm's production of red- and green-leaf lettuce and cauliflower can generate more than 200 separate tracking numbers that are printed onto cartons and pallets for shipping to buyers. Finding individual boxes of particular at-risk produce in this environment means searching through a haystack of paper records. IBM Food Trust—using blockchain technology—connects growers, processors, distributors and retailers through a permissioned, permanent and shared record of food-system data that drastically cuts the time needed to trace produce from farm to store. In a pilot program, tracing

From
7 days

Down to
2.2 seconds

Worldwide lettuce exports totaled $2.7 billion in 2017.

time was reduced from seven days to just 2.2 seconds. "With blockchain, all the trace media's already there," explains Tejas Bhatt, senior director, Food Safety, for Walmart.

Blockchain technology is also changing the way companies like Walmart collaborate with their supply chains—even with potential competitors. The IBM Food Trust ecosystem connects supply chains like Walmart's and also those of other major retailers and global companies such as Carrefour, Dole, Golden State Foods, Driscoll's and Nestlé—all without sharing any information they don't want to share. Beyond safety, consumers increasingly value the kind of information that a system built on IBM Blockchain can provide. With blockchain, growers, distributors and retailers can provide consumers digitized certifications of existing organic or fair trade products along with detailed documentation from different points in the process, from farm to table. Ed Treacy, vice president, Supply Chain and Sustainability at the Produce Marketing Association, says blockchain "can speed up investigations into contaminated food, authenticating the origin of food and providing insights about the conditions and pathway through which the food traveled."

As more companies adopt a digital, end-to-end traceability protocol, the IBM Food Trust's goal is to make the world's food supply safer—something that is sorely needed. In its 2017 fiscal year, the U.S. Food and Drug Administration recorded 794 food recalls that involved more than 3,000 products. In addition to the societal and business impact, these recalls waste huge stocks of food and erode consumer trust. And if outbreaks multiply and answers are slow in coming, customers can become desensitized and begin to ignore overly broad warnings such as "throw away all lettuce in your refrigerator." Work by companies like Walmart and other participants in the IBM Food Trust are laying the foundation for better management of our global food supply: rapid insight into what's happened when something goes wrong, reducing waste, and a safer journey from the family farm to our local markets and, ultimately, to our dinner table.

Watson eliminates distractions that come between branch director François-Xavier Maille and his clients.

Experts from Crédit Mutuel and IBM Services are working together in a "Cognitive Factory."

IBM Cloud · IBM Watson

Crédit Mutuel: A bank thinks bigger

When Crédit Mutuel embarked on its "together#newworld" initiative—a five-year project to become a leading digital bank—it brought in IBM to help it reinvent itself.

Crédit Mutuel's goal: to engage with customers more deeply, both online and offline, while providing new products and the fastest service—all in an environment of trust and security. To do that, the bank is infusing IBM Watson into the applications its advisors use and is embracing IBM Cloud as a platform for innovation, trust and security.

François-Xavier Maille, director of one of the premier branches of Crédit Mutuel bank in Paris, was the first to deploy the initial AI solution: a Watson virtual assistant that helps employees answer customers' questions. "The application has liberated our people from a few recurring tasks so they can devote their time and talents to understanding our clients' aspirations, challenges, and circumstances," says François-Xavier. Today, 23,000 Crédit Mutuel advisers across France rely on the Watson tool, which helps employees answer business-related questions 60% faster. The bank intends to use Watson across all of its business lines.

But that's just the start. Crédit Mutuel is making important decisions—about data, compliance and regulation, cybersecurity, and managing applications across the enterprise. To achieve digital banking at scale, IBM and Crédit Mutuel are crafting a hybrid cloud strategy that encompasses multiple clouds and on-premise systems, including the mainframe. At the same time, experts from Crédit Mutuel and IBM Services are working together in a "Cognitive Factory" that provides a fertile environment for identifying, building and deploying new AI solutions. With many internal IT teams involved, IBM and Crédit Mutuel are also creating industrial tools and training assets to efficiently expand cognitive solutions to 100% of the business lines of the company.

Crédit Mutuel's reinvention represents a synthesis of human and machine that gives banking new power. Employees can find the optimal blend of talent and data, use their talents to the fullest, delve more deeply into clients' financial challenges and develop smarter, more creative solutions. Extrapolate IBM's immediate impact on Crédit Mutuel to the entire world of financial services,

60%
faster responses to business inquiries

175,000
daily emails routed and prioritized

and you can see the implications for how banking consumers experience and engage with their financial institutions: More relevant innovation for customers. Lower client turnover for banks. Greater confidence in asset management for consumers. Higher employee engagement and contributions. Growing customer satisfaction. And more predictable performance for institutions. AI accelerates access to relevant information and liberates people to provide a human touch.

Christina English is helping to lead DeKalb Medical's fight against sepsis.

IBM Watson Health

DeKalb Medical: Stronger medicine

DeKalb Medical takes a systems-based, data-intensive approach to fighting dangerous infections with the help of IBM Watson Health. One of the lesser-known challenges it faces is sepsis, which is caused by an infection that triggers an inflammatory immune response. Sepsis is notoriously difficult to diagnose and treat, making it the third-leading cause of death in the U.S.

Nurses see it all, and sepsis requires them to race against the clock. But with the intelligent use of data, delivered by IBM Watson Health and deployed by a team led by Christina English, a quality management specialist and former bedside nurse, clinicians at DeKalb are getting a step ahead to help patients get better, faster. Previously, Christina and her team had to fight sepsis with siloed and sometimes subjective information. "We knew what to look for, but we didn't understand the importance of the symptoms, how they worked together and how a clearly defined set of treatment measures is critical to success," she says. Using IBM CareDiscovery, part of Watson Health's set of performance-improvement solutions for healthcare providers, Christina and her team were able to gather and analyze industry benchmarks as well as their own performance metrics in order to identify sepsis "flags" and pinpoint where DeKalb could take proactive measures.

DeKalb is shifting to a systems-based approach to care. The IBM Watson Health solution helped Ellen Hargett and her Quality Institute team change the way they measure system-wide performance by organizing data and analysis into a usable dashboard. For each key performance metric on the dashboard, Ellen established tactical teams to fully understand the metrics, determine the "why" behind them and recommend tactics for improvement. Across healthcare, a systems-based approach can also produce a significant positive impact on resources. For example, sepsis is not only a medical challenge for hospitals. It's also the most costly reason for hospitalization, consuming $24 billion each year in the U.S. alone. DeKalb's efforts to quantify, analyze and shift the diagnosis and treatment of sepsis have not only led to a lower mortality rate but also significantly reduced the length of stay for patients.

Individual treatments are now based on data informed by large-scale findings across large populations. Historically, doctors diagnosed through trained intuition. In recent decades, however, this approach has been replaced by "empirical medicine" that's based on data. The result is more standardized treatments and improved outcomes. At DeKalb, data is shared with healthcare professionals, providing them with information to spot large patterns or gaps. Watson Health's data-driven tools allow healthcare institutions to organize and visualize data and take fast action to address weaknesses or roll out improvements. A data-driven approach to challenges like sepsis also helps doctors expand their understanding of the syndrome, improving diagnosis and treatment. This trajectory will eventually create a new era of healthcare. As medical professionals tap data at both the systemic and individual levels, an age of "precision medicine" will arise. It will be a time when understanding derived from the many can be tailored and applied to the needs of the individual.

This trajectory will eventually create a new era of healthcare.

30%
fewer lives lost to sepsis

Hydro One: Outsmarting the storm

With Watson, Hydro One's Derek Roles can restore power more quickly after a storm.

Another late spring storm was rolling toward the Canadian utility Hydro One. But in its ongoing battle with ice, snow, wind and thunderstorms, this time the utility found calm in the predictive power of The Weather Company and IBM Watson.

Derek Roles is Hydro One's first line of defense for a service area that covers most of Ontario. 20 years of experience and an encyclopedic knowledge of winter storms have helped him manage through many major disruptions, so Derek can usually plan for the worst. Now, though, he can predict it. And that changes everything. In the past, recovery teams were deployed only after the weather had passed. Now, however, Derek doesn't just keep up with the weather—he stays ahead of it. This shift was made possible because Derek and his team put data and AI to work: they trained Watson to predict outages using five years of Hydro One historical outage data and a massive amount of Ontario's historical weather information. Derek's new predictive tools help him paint a clearer picture of how a storm will affect the utility's electrical distribution network.

Hydro One has committed itself to a more proactive approach, and the utility has not only gained a new way to fight storms, but has also changed its basic business operations to strengthen its customers' experience and service quality. The predictive power of AI enables Hydro One to activate its emergency organization structure in advance and create detailed team deployment plans, positioning some crews in the storm's predicted path while making sure other crews are well rested. The utility is also able to staff call centers more effectively and notify customers of a storm's potential impact on their service. So when a storm hits, restoration plans are already in motion and work crews can spring into action faster than ever before, quickly and safely scaling repairs from the main transmission grid to smaller circuits to individual customer locations in remote areas.

Predictive intelligence is starting to create new options that can make extreme weather more manageable and less disruptive.

33%
faster electricity restoration than similar storms

Emergency Recovery Award
from the Edison Electric Institute

Weather exerts a tremendous influence on the economy. It affects productivity, sales and energy consumption, and it can disrupt supply chains and transportation systems. Severe weather can upend lives and businesses for hours, weeks, years or even forever. So there's a logic behind the expression "ride out the storm"—that's often been the only option. But predictive intelligence is starting to create new options that can make extreme weather more manageable and less disruptive. This is especially critical at a time when severe weather is the leading cause of power disruptions in many countries. Global economic losses resulting from weather disasters totaled $215 billion last year. By putting the power of data and Watson to work, Hydro One is modeling new solutions for previously intractable weather problems everywhere—problems that can now be better understood and managed, along with human risks that can now be met head-on with artificial intelligence.

IBM Quantum

ExxonMobil: Quantum understanding

ExxonMobil's vice president for Research and Development, Vijay Swarup, is leading the company's exploration of quantum computing.

Every energy company's dual challenge:

Provide access to scalable, affordable energy

Address climate change

Vijay Swarup, ExxonMobil vice president for Research and Development, says energy research requires curiosity, optimism, patience and dissatisfaction. Dissatisfaction because he believes things can be better. But what, exactly, can be better? Nothing less than our understanding of the world.

Researchers now have a new tool to explore new ways to solve problems: quantum computing. And Vijay's quite precise about the trouble with our current understanding. "There are some problems so big, all we can do is approximate," he says. Whether he's in a business suit or the lab coat he wears at ExxonMobil's expansive New Jersey research facility, Vijay clearly enjoys trying to solve what he calls today's pressing dual challenge: ensuring that people have access to scalable, affordable energy, and doing so in the context of climate change and the need for sustainable solutions. This is where IBM Q comes into the picture. Quantum computers have long been considered theoretical. But today, they're becoming a reality, with huge potential for energy companies like ExxonMobil. That said, using a quantum computer also calls for significant change in how researchers think about approaching their work. "Computation has always been an integral part of the research we've done here, but quantum's radically different," Vijay explains. "Now, we must first figure out which problems are most suited to a quantum approach and only then can we answer a more interesting question: How can you program a quantum computer to solve energy problems?"

ExxonMobil joins a group of global corporations partnering with IBM to work side-by-side on IBM's fully functional quantum computers. As Vijay says, quantum's a priority that requires pairing the "best minds with the best minds." So ExxonMobil has a team that will meet regularly with IBM's quantum researchers. Barclays has its own team working on

quantum, as do Samsung and Daimler. Working as part of the IBM Q Network alongside global universities and national research labs, these corporations see the potential of a massive shift in how computers can help solve some of the most enduring challenges—issues that, once solved, could transform entire industries. "IBM Q System One is the world's first integrated universal quantum computing system designed for scientific and commercial use," says Dario Gil, director, IBM Research. "We are at the beginning of an exciting journey. Our research, systems, and business teams—along with our IBM Q Network partners—have a bold vision. They are thinking big. These are the true pioneers."

Nature is no longer estimated but predicted and understood. That's the goal. So when IBM unveiled its quantum machines, companies like ExxonMobil saw great promise. But when you talk to Vijay about promise, his thoughts turn to the great needs that are facing the world. "Our global population is increasing from 7 billion to 9 billion and, all across the world, a growing middle class requires more resources and, especially, more energy." Quantum might be well suited to solve super-complex problems, such as advanced models which could lead to better approaches to carbon capture and lower emissions sources of energy. But what excites Vijay most is that the collaboration with IBM researchers could lead to a fresh ability to predict and anticipate how nature operates—which could lead to an understanding of what's *actually* happening, as opposed to an approximation of what *might* be happening. "With a little curiosity, patience and not settling for the status quo, I know we can get there," he says.

IBM Q System One is the world's first integrated quantum computing system for commercial use.
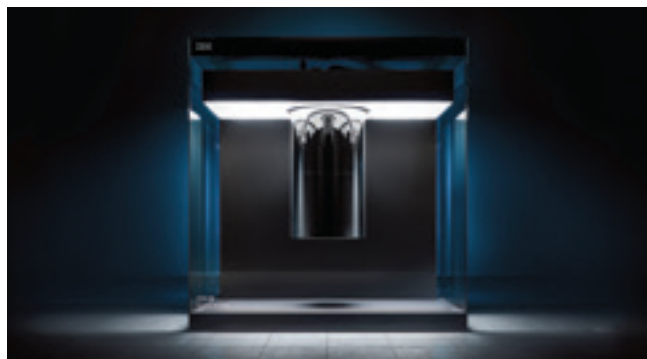
More clients are partnering with IBM to write the next chapters of their digital reinventions.

Belron applied **IBM Watson** Visual Recognition to its Autoglass Body Repair business to speed up insurance processing, move repairs along quickly, and help its customers get back on the road fast.

Thought Machine, a London-based fintech startup, has built Vault, a new, cloud-native core banking infrastructure launching on **IBM Cloud**. It has also partnered with **IBM Services** to provide advisory and delivery capabilities to its clients.

Travelport, a travel commerce platform, is working with **IBM Watson** to integrate disparate information sources and make stronger corporate travel recommendations. As a result, finding the lowest travel costs for a company will be quicker and easier.

Japan Airlines is using an **IBM Watson**-powered chatbot, Makana-chan, to answer customers' questions about its popular Tokyo-to-Honolulu flights. Makana-chan eases the burden on live agents and is very popular with passengers.

Maersk, the container logistics giant, is using **IBM Blockchain** to create TradeLens, a global blockchain solution for the shipping ecosystem. This global transformation will lead to faster delivery times, lower costs and a noticeable difference in the way we get the things we use every day.

KMD, Denmark's largest technology company, is dedicated to connecting its clients to the latest technologies. The company is using **IBM Services** to provide a critical foundation of servers, networks and other technologies that help it handle large volumes of data with high levels of security.
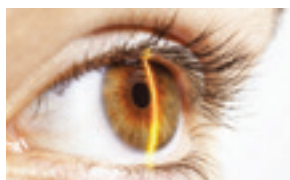
Bausch + Lomb simplified the service and maintenance process for its high-tech Stellaris Elite Vision Enhancement System for cataract and retina surgery. Using **IBM Cloud**, the company can now pinpoint or respond to technical and service requests and limit or minimize downtime.

Fluor Corporation builds mega projects across the globe. Data generated by these projects has been harnessed by working with **IBM Research** and **IBM Services**. Fluor recently introduced two new AI-powered systems to uncover and predict how unmitigated trends could affect key project indicators.

BNP Paribas is accelerating its digital transformation and improving its operational efficiency. The bank will now integrate **IBM Cloud**-hosted data centers dedicated to the bank, and will strengthen its hybrid cloud "as a service" capabilities while ensuring the security and confidentiality of their customers' data—including not using public clouds for hosting any customer or other production environments with sensitive information.

Whirlpool Corporation is using **IBM Cloud** to help manage all the data from its manufacturing of connected home appliances. Whirlpool will be using the cloud to manage critical enterprise applications, which will give it more flexibility to scale and innovate.

Telefónica turned to **IBM Blockchain** to capture call data in real time and save it in a format that's trusted, traceable and accessible to network providers and carriers worldwide, making international phone calls feel seamless despite all the technological leaps they require.

Smart Dubai, working with **IBM Blockchain** and **IBM Cloud**, has launched the region's first government-endorsed blockchain service: Dubai Blockchain Platform. It is designed to make the technology more accessible to the Dubai government, the UAE national government and private companies.

Suunto, creator of the Movesense microsensor, launched a Movesense development community enabled in the **IBM Cloud**. This let Suunto dramatically scale its offerings. Today, more than 800 developers are working with Movesense, helping Suunto bring the device to new customers all over the world.

KPMG is using **IBM Watson** to power a contract analysis solution for its clients. The solution examines contracts, breaks them into their component parts and interprets each part with a high degree of accuracy. It's faster and less expensive than manual methods, while freeing up skilled resources to perform more productive tasks.

Krungsri Bank, one of Thailand's largest financial institutions, is working with **IBM Services** to lay the foundation for its future. An **IBM Blockchain** pilot is in progress, and the bank is planning to develop new services for its customers.

Profility, a post-surgery rehabilitation solutions provider, needed to integrate large volumes of data as well as meet stringent HIPAA regulations. They chose the **IBM Cloud** because of its flexible software and secure, dedicated hardware. Their system is widely used and has resulted in shorter rehab stays and fewer hospital readmissions.

The Australian Federal Government has set its sights on being one of the world's top three digital governments by 2025. In July 2018, it announced a five-year agreement that covers solutions from **IBM Cloud**, **IBM Watson**, **IBM Security**, **IBM Research** and the **IBM Q** quantum computing initiative.

View these stories and more at ibm.com/annualreport

Responsible stewardship and trust have been hallmarks of IBM's culture— from our labs to the boardroom— for more than a century.

IBM is recognized as one of the World's Most Ethical Companies by Ethisphere, highlighting our influence in driving positive change in business and society around the world.

Data Responsibility

At IBM, we've always followed straightforward principles to act responsibly and earn trust. Today, our principles include:

– The purpose of new technologies is to augment—not replace— human intelligence.
– Data and insights belong to their owner.
– New technology, including AI, must be transparent and explainable.

Recent actions demonstrate our principles at work, including:

- **Advocating for public policies to protect the privacy and security of data**, working with governments worldwide on strategies that will ensure privacy and responsible handling of data, without undermining innovation.

- **Partnering with STOP THE TRAFFIK**, law enforcement and financial services institutions to stop human trafficking by using IBM software analytics to identify suspicious trends, hotspots and financial transactions.
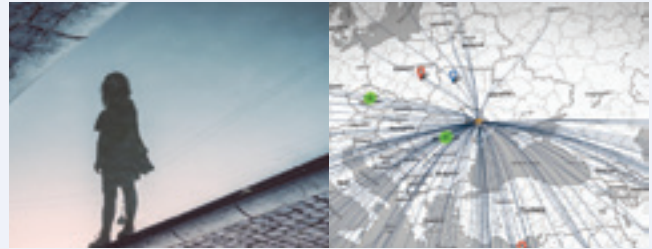
Modern slavery, a $150 billion business, has a new foe: an AI data hub on the IBM Cloud.

- **Launching AI Fairness 360**, an open source software toolkit to help developers actively detect and reduce bias in datasets and AI.

- **Releasing Diversity in Faces**, **a first-of-its-kind dataset**, to help reduce bias in facial recognition systems, making them fairer and more accurate.

1 million annotated human facial images

Jobs and Skills

In the 1940s, IBM partnered with Columbia University to create a new discipline: computer science. In 2018, we continued this tradition by expanding training and education for the growing number of "new collar" jobs for today's era of data and AI. Recent examples include:

- **Developing new talent with our 12-month IBM Apprenticeship Program** in areas including cybersecurity, digital design, mainframe administration and software development. Hundreds of apprentices—ranging in age from 18 to 59—have joined the program, which includes training and on-the-job experience guided by an IBM mentor.

Brandon Whittington, IBM Blockchain Solutions support engineer and graduate of IBM's apprenticeship program

- **Launching Skills Build, an IBM volunteer initiative** that helps more than three million primary and secondary school students learn about new technologies.

- **Continuing to transform education via P-TECH**—Pathways to Technology Early College High School. In the 2019 school year, there will be:

200 P-TECH schools serving a pipeline of

125,000 students across

13 countries and **11** U.S. states

P-TECH students at a graduation ceremony
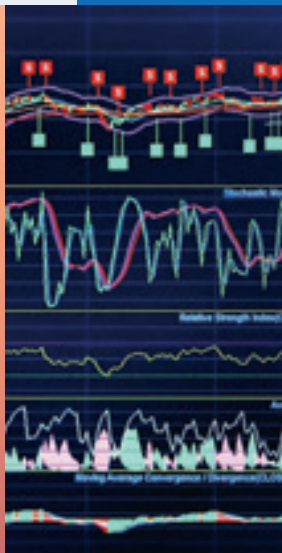
Diversity and Inclusion

In 2018, fueled by record diverse hiring, promotion and retention, IBM achieved our greatest progress in a decade on diversity representation among global executive women and underrepresented minorities. We also continued advocating with governments around the world for policies that help ensure workplaces are as inclusive and diverse as the world we live in. We received widespread recognition in 2018 for this leadership, including:

- **Being honored with a 2018 Catalyst Award** for leadership in advancing women in business, becoming the first company to win the award four times and the only tech company so honored in the last 20 years.

- **Being named a 2018 Diversity Best Practices** Leading Inclusion Index Company by *Working Mother.*

- **Scoring a perfect 100 percent for the 15th consecutive year** in the Human Rights Campaign (HRC) Corporate Equality Index.

IBMers at the Pride March in New York

[Financial Section Starts Here]

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smart
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