INDUSTRIOUS.

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Disrupt or Else?
A guide to maneuvering your biggest business challenges—and a look at how incumbents can turn the tables on industry upstarts

Where We Stand
Whether you're reinventing retail or fashioning the factory of the future, IBM has a POV on where your industry is headed and how you can get started today

IBM

SHARON T. DRISCOLL
CMO, ENABLEMENT & INDUSTRY MARKETING, IBM

Rapid change is permeating every industry.

In telecommunications, the demand for bandwidth is pushing the limits of the existing networks. In retail, the in-store experience is struggling against the boom of e-commerce and same day shipping. In government, a demand for transparency is putting focus on updating decades old processes to better connect with citizens and keep them safe.

All of these challenges have one thing in common: they can benefit from the exponential growth in technology. From cloud to AI to security, the future of every industry rests on the smart application of emerging technology and the expertise to implement business transformation at scale.

In this edition of INDUSTRIOUS we highlight a series of industry perspectives paired with editorial stories that are relatable, relevant, and timely. These stories give context to the forces shaping every industry and the solutions that can position any enterprise to succeed in the modern market.

GEORGE HAMMER
HEAD OF CONTENT, IBM

Content, as a word, gets thrown around a lot. It can mean a company blog, a massive advertising effort, a how-to video, an infographic.

But strong content isn't any one campaign. It's a story that resonates. A story that can't be ignored. A story that matters.

The collection in this edition of INDUSTRIOUS is cut from the cloth of the challenges we all face on a daily basis: the demand for instant gratification, a deluge of data, a changing workforce.

It's my hope that you'll find these stories to be barometers of the market, a common rallying point—and a source of inspiration for a better future for all.

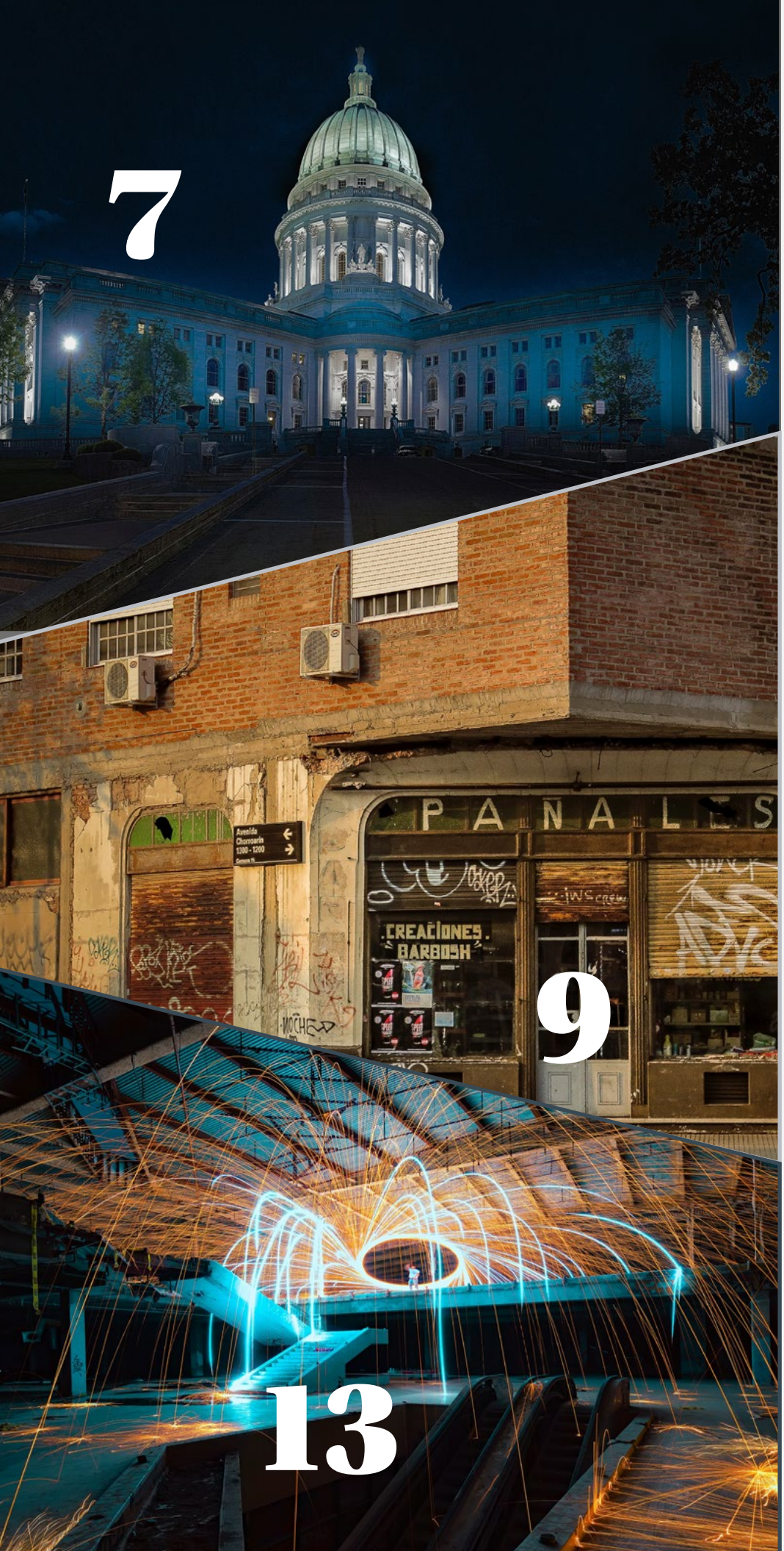

TABLE OF CONTENTS

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AUTOMOTIVE

CONSUMERS ARE DEMANDING NEW RELATIONSHIPS WITH THEIR VEHICLES: A BETTER IN-CAR EXPERIENCE, A SEAMLESS TRANSITION BETWEEN HOME AND VEHICLE. TECHNOLOGY CAN HELP CREATE THE KIND OF EXPERIENCE CONSUMERS WANT.

Planes, trains, and automobiles: 6 ways automation will change everything

When Boeing announced a self-flying plane last year, reactions ranged from philosophical shrugs about the inevitable march of robots across every aspect of industry to panicked declarations about never setting foot on an autonomous airplane or even being in the same airport as one.

Self-driving vehicles? Perhaps. Self-flying choppers that fight wildfires? Maybe. Pilotless airplanes? Too much, too fast.

Except that autopilot technology already does most of the work once a plane is flying. And companies are developing solutions that can achieve autonomous aviation—including AI with the ability to replicate and even improve on the decisions pilots make.

Autonomous transportation has the potential to reshape industries. Our world is perched at the intersection where the Internet of Things, AI, the sharing economy, electric energy, and voice-recognition collide.

And we're close to witnessing this change in our lifetime.

How and why?

1 **Mobility will be democratized.** Imagine the aged or disabled having access to self-driving cars. And what if people unable to afford a car could pay an hourly rate for rides or share ownership within their community?

Major urban areas already suffer severe housing shortages—an issue that will be exacerbated by ballooning urban populations. Even people with access to public transportation endure mega commutes. Cars sit inactive for 95% of the day and could instead be treated as a shared resources.

The average U.S. commute time is 50 minutes. What if we could take back that time? Doctors could prep for surgery—and get to hospitals faster when their vehicle is prioritized via IoT interconnectivity. Law enforcement could spend less time on driving and more time observing and investigating.

2 **Cities will take on a new shape.** The U.S. has 500 million parking spaces that cover ~3,590 square miles (9,298 square kilometers). That precious space could be reused to build housing or pedestrian-friendly, community-building spaces.

Which means that future cities will be less polluted and congested. And just as the traffic cop with a blaring whistle has disappeared, traffic lights too may vanish. Sensor-laden cars will replace traditional traffic lights.

Roads and other infrastructure too can become smarter. The vehicle of the future will be increasingly intelligent, interconnected, and will commute, socialize, and collaborate with other vehicles and traffic lights.

The downside for governments is a loss of automobile revenues like parking fees, traffic tickets, and registration fees. Transportation-related jobs could also suffer.

3 **Cars of the future may become "digital chameleons."** With more free time but still limited to the confines of a vehicle, people will want their cars tailored to them. By 2025, according to an IBM study, our cars will be sophisticated enough to self-diagnose repairs and communicate with other vehicles and also manage their internal environment.

Your routines and moods may differ, and the vehicle will accommodate them with different temperature, music, seating settings. No more telling the car your destination; it will understand you have a lunch meeting at a restaurant and how to get there. It will confirm the reservation on the way and share the most popular menu items, display key talking points and personal details about your meeting partner, and detect if you're stressed and play your favorite song to help you relax.

If people are no longer doing the actual driving, we will need to redesign cars' physical space. All vehicle passengers could face each other to facilitate conversation or a screen for entertainment. Seating arrangements could be inherently social on family trips and weekends, and reset for more personal time during weekly commutes or school drop-offs.

4 **AI will learn to drive**. Today's cars are evolving from a form of transportation to a new type of moving data center with onboard sensors. AI can provide a safer, more positive drive.

By 2020, connected cars will generate 350 MB of data every minute they operate from video, audio, voice, text, and sensor data. From self-flying airplanes to self-driving trains and automobiles, AI can analyze massive amounts of data to personalize experiences, coordinate with other connected "things," and improve on human decisions.

5 **We'll be healthier and safer.** Self-driving vehicles can help save the lives of 1.3 million people killed by cars each year. Accidents caused by human error—distracted driving, fatigue, drunk driving—can be reduced significantly as technology can make decisions on the road faster than people. The horrible impact of vehicle pollution can also be mitigated—if the vehicles combine autonomy with electric.

And don't forget about the stress of driving, particularly the tense bumper-to-bumper traffic jams that raise our blood pressure and anxiety levels, making us more susceptible to risky driving.

Self-socializing vehicles could allow the cameras on their cars to connect to a local department of public safety, which could assist searches for missing children or escaping criminals.

6 **Electric vehicles may have an even bigger impact than autonomous vehicles.** By 2030, 57% of vehicles produced each year will be electric, driven by environmental concerns and cheaper operating costs.

Regulations are tightening, too. Last month Britain joined a lengthening list of electric-only countries, saying that all new cars must be zero-emission by 2050. India will only sell only electric cars by 2030, a bold vow to help clean up its air.

And some predict electrification will prove to be a far greater disruption to the auto industry than other technology changes—with 75% of the industry's top suppliers facing irrelevance.

Specialized manufacturing creates a need for new plants, new products, and new processes. Manufacturing electric cars is simpler than combustion engine vehicles, opening the door for companies like Apple and Dyson to get into the car building business.

With 300 million commercial vehicles on the planet's roads, the environmental impact will be enormous, according to Statista. Existing electric cars reduce carbon emissions by 54% compared with gas-powered ones, according to America's National Resources Defense Council.

The current electric grid cannot support the number of electric cars expected to be on the road by 2040—how can we increase capacity to meet demand?

—Originally published Aug. 24, 2017 in INDUSTRIOUS on Medium

A bus that speaks sign language? Meet Olli

Imagine: a self-driving shuttle bus visually recognizes disabled passengers as it picks them up, activating a ramp so they can board, then guides them to empty seats. It also speaks sign language.

That'll soon be possible with Accessible Olli, an AI-enabled, electric shuttle bus co-created by Local Motors, the CTA Foundation, and IBM, and enhanced with technologies from navigation systems and AI to additive manufacturing and connected devices.

Local Motors' Gina O'Connell said her company is looking at accessibility from four different perspectives—visual, audio, cognitive and mobility—to address the needs of an estimated 15 percent of the world's population with some form of disability.

Olli safely guides visually impaired passengers to empty seats through audio cues and an array of haptic sensors that enable them to feel vibrations on their hands when they arrive at an open seat, according to Drew LaHart, the program director for IBM's accessibility division. For the hearing impaired, LaHart said that Olli will recognize sign language using machine learning and image recognition capabilities—and even respond via a hologram of a person using sign language.

THE ANGLE:
To power Olli's accessibility, AI and IoT technology collect and analyze mountains of interaction and driving data in milliseconds.

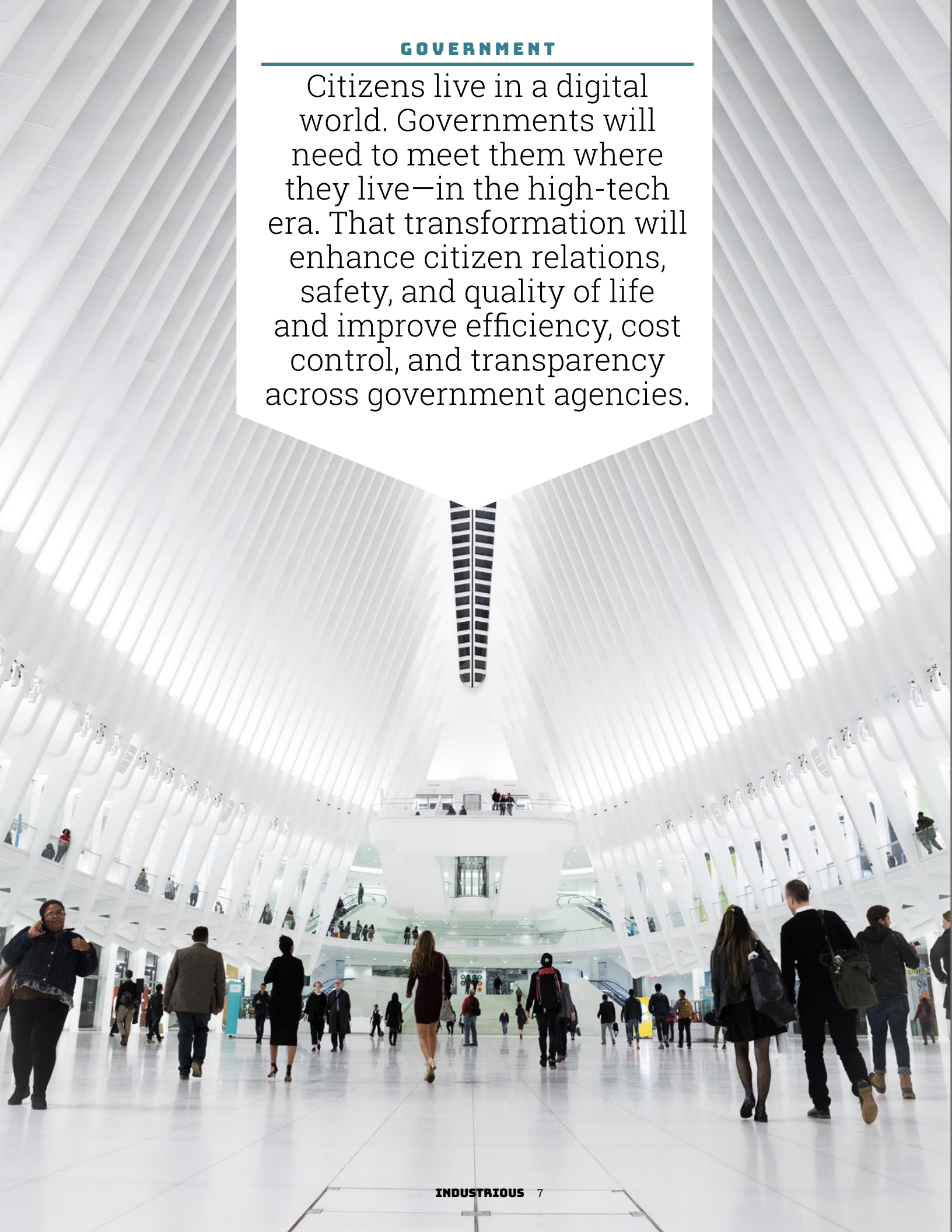
Sachin Lulla, global VP for automotive strategy and solutions leader at IBM, said that Olli's AI-powered riding experience would help "build the world's most accessible vehicle" for people with disabilities.

Besides accessibility, AI technology also helps Olli constantly learn the best routes around a city and make recommendations to passengers about restaurants or to bring an umbrella as rain is forecasted for later.

"It's about mass personalization," Lulla said. "Consumers want things now, or at least in a matter of days. It's no longer about five-year vehicle cycles."

—Originally published Jan. 11, 2018 in INDUSTRIOUS on Medium

Citizens live in a digital world. Governments will need to meet them where they live—in the high-tech era. That transformation will enhance citizen relations, safety, and quality of life and improve efficiency, cost control, and transparency across government agencies.



The incredible ways governments use the Internet of Things

SOURCE: GovTech, Nov. 9, 2017, "Digital Cities Survey 2017 — Winners Announced"

Government and innovation?

Yes: two recent surveys highlight how governments are embracing technology to tackle issues from public safety to social services.

The 2017 Digital Cities Survey ranks cities on how they leverage technology to better serve their citizens. An important takeaway: city size and budget aren't as important as visionary leadership who recognizes technology's potential to transform communities and attract new citizens.

"Techies, startups and recent college graduates seek to live in places that create the best citizen services for them—cities that reduce their traffic, save them time finding parking, allow them to pay taxes online, and are on the leading edge of innovation," said Marquis Cabrera, IBM's Global Leader of Digital Government Transformation. "Cities are planting fertilizer for greener economic pastures; they're setting the conditions for new jobs, new business creation, and new buzz about the city."

So what technology excites the leading digital cities?

81% are actively considering the potential of the Internet of Things. Imagine if your city's infrastructure, roads, traffic lights, buildings had a tiny sensor capturing data. Connecting and learning from that influx of new information would help governments more quickly respond to challenges such as reducing energy consumption or helping first responders safely assess dangerous situations.

At the country level, top-ranked governments optimize public services delivery to be more effective, accessible, and responsive to people's needs. The UK, Australia, Korea, Singapore, and Finland—the top five in the UN E-Government Survey—have doubled-down on digital technology.

The stakes are high: government digitization could generate over $1 trillion annually worldwide.

THE ANGLE:
The future is closer than we think: 20.4 billion IoT devices are forecast by 2020.

Practical uses for IoT in government are everywhere:

- Management of traffic and reduction of automobile pollution with data coming from sensors in roads, weather information, public transportation, and car GPS devices
- Detection of flooding and earthquakes, giving citizens earlier warnings
- Tracking first responders' location, movement, respiration, and exposure to heat and hazardous materials
- When combined with AI, can help monitor the movements of the elderly or transform accessibility for the 650 million people with disabilities worldwide

Fully embracing this new technology may seem like a radical shift for some governments, but the rewards will far outweigh the headaches.

"My recommendation to cities is to take a risk and try to digitally transform citizen services using technology, so more people are inclined to learn about your city, move to your city, and contribute to your city," Cabrera said.

—Originally published Nov. 21, 2017 in INDUSTRIOUS on Medium

Retail and consumer products companies are reorganizing to provide value in unprecedented ways. How can they approach evolving consumer expectations, which are creating non-traditional marketplaces? How do they adapt the value chain for changing consumption patterns? And how do they take on new competitors?

How **smart** is your **jacket?**

Tommy Hilfiger, FIT, and IBM usher AI into the fashion industry

As long as Tommy Hilfiger has been selling clothes, he's been adapting to disruptions—those developments in business, culture, and technology that can send even the most sturdy enterprise scrambling. In Hilfiger's mind, however, disruption isn't merely a hurdle to jump over, but rather an opportunity for discovery. It's a catalyst, he said, that ensures his brand stays forever young and cool.

"I really believe whether you're a retailer, a manufacturer, a designer or a brand, you have to evolve without losing your base," the fashion mogul told IBM's Senior Vice President and Chief Marketing Officer Michelle Peluso at NRF 2018: Retail's Big Show. "We're always striving to find the right balance between tradition and innovation. Reinvention and disruption have served us very well."

If Tommy Hilfiger's NRF presentation is any indication, AI may very well power the brand's next chapter. At the three-day event, Tommy Hilfiger unveiled a partnership with IBM, The Fashion Institute of Technology (FIT) Infor Design and Tech Lab exploring ways the brand can use AI and machine learning to inspire design and enhance experiences across the entire fashion value chain.

As part of the Reimagine Retail project, several FIT Fashion design students were introduced to a range of IBM Research's AI and machine learning capabilities. They learned about visual and voice recognition, social media listening, tone analysis, personality insights and natural language understanding. And then they used

that knowledge to come up with original designs and customer experience optimizations.

"It's unexpected. You'd think machine learning would stifle creativity, but in fact it actually opens up different things that you might not have expected," said IBM project director Erin McElroy.

The results are a testament to AI's power to enhance human creativity. Amy Eun's SolarActive dress uses solar-active yarns that appear when exposed to sunlight. Luis Hernandez's bomber jacket is produced using a 3D knitting machine and styled based on social media feeds and uploaded images. Stefka De Ruiter's avatar jacket is customized to reflect the wearer's personality. Grace McCarty's cognitive print jacket and sweatshirt features prints generated by analyzing hundreds of thousands of Hilfiger archival images.

"What it proved to us was all the information that is out there can be reachable with a click," Hilfiger told Peluso. "When the FIT students took our archives …they were able to access everything we have done in the past from a design standpoint and apply it to today's design concept. For me, that is a tremendous breakthrough."

Over the past few years, even while maintaining the brand's signature look and style, Hilfiger has integrated a variety of next-generation technologies across his business. Ultimately, these innovations have helped shorten the company's production process and exponentially increase its engagement on social media.

In 2016, it rolled out an AI-powered conversational commerce bot for Facebook Messenger. Last year, it created a shoppable live stream and image recognition app, TommyNow SNAP, which includes augmented reality features allowing customers to create their own digital catwalk.

Prints used in Grace McCarty's jacket design were generated using IBM's Cognitive Print tool.

Just as Tommy Hilfiger is no stranger to technology, IBM is no stranger to the fashion industry. In 2016, IBM partnered with Marchesa to create a dress designed with help from AI that lit up according to sentiment of tweets about the dress. And last year, it worked with Falguni Shane Peacock to create India's first AI-driven fashion collection.

AI is an invaluable partner in the fashion design process, and its creative potential is just beginning to be realized. Today, McElroy said, more retailers than ever before are also realizing the value of the technology across an entire product lifecycle, from conception to production to the end consumer.

"It's going to impact every aspect of the value chain, from design to supply to merchandising to the customer experience to revenue," she said.

—Originally published Jan. 17, 2018 in INDUSTRIOUS on Medium

"It's unexpected. You'd think machine learning would stifle creativity, but in fact it actually opens up different things that you might not have expected."
Erin McElroy, IBM Project Director

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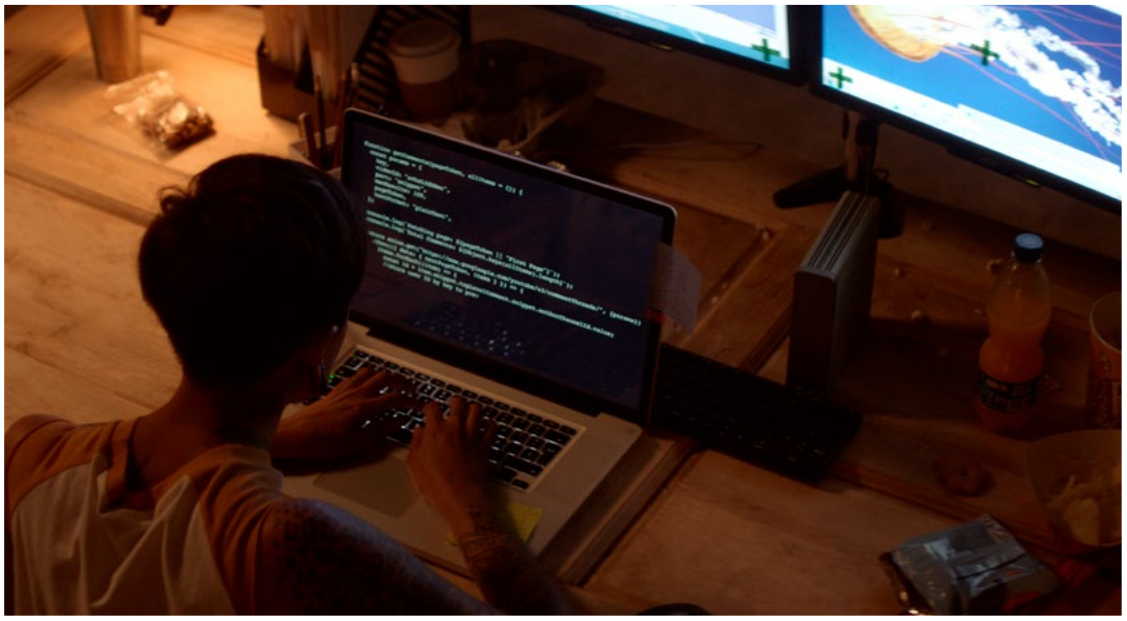
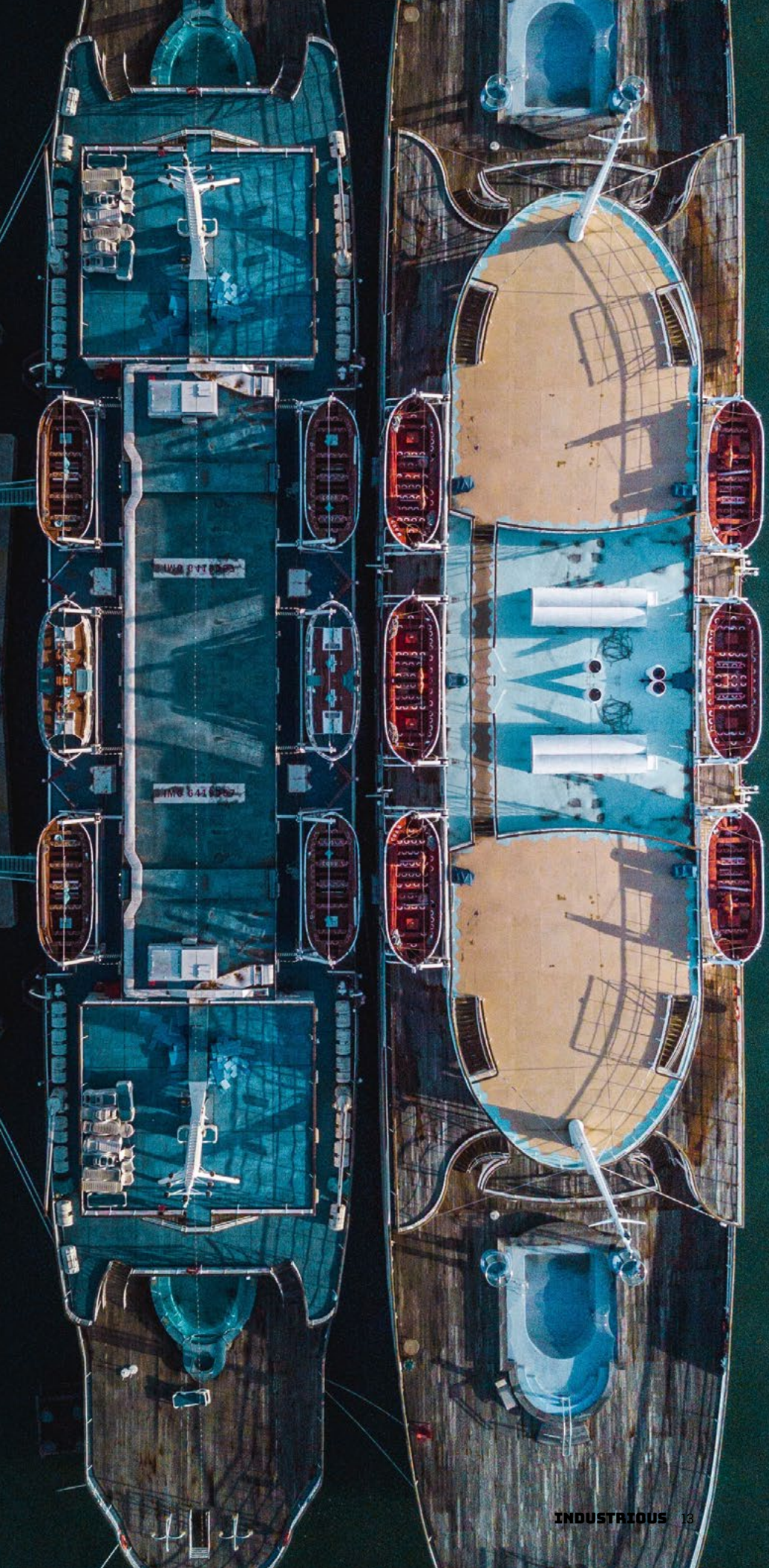




INDUSTRIAL PRODUCTS

MANY INDUSTRIES HAVE BEEN DISRUPTED BY ASSET-LESS PLAYERS. IT'S TIME FOR INDUSTRIAL PRODUCT PLAYERS TO GO ON THE OFFENSIVE, LEVERAGING DATA AND EXPERTISE, AND DRAWING ON NEW THINKING AROUND ECOSYSTEMS AND PLATFORMS, AI AND MACHINE LEARNING TO WRITE THE NEXT CHAPTER: BE THE DISRUPTOR.

The little-known story of the first IoT device

How some techies tinkered with a soda machine and casually made history

Before there were Internet-connected umbrellas and juicers, water bottles, and factories—before there even a modern Internet—there was a humble Coke machine in Pittsburgh, Pennsylvania that could report its contents through a network. Though it was primitive by today's standards, it holds a unique distinction: It was, as far as anyone knows, the world's first IoT device.

Necessity, as always, was the mother of invention. One day in the early 1980s, David Nichols, a graduate student in Carnegie Mellon University's computer science department, was in his office on campus at Wean Hall craving a soda. But his office was "a relatively long way" from the building's Coke machine, and considering his fellow students' substantial caffeine habits, Nichols knew there was a good chance it would be empty—or that, if the machine had recently been refilled, the sodas inside would be tragically warm.

"Suddenly, I remembered tales of the Prancing Pony [the first computer-controlled vending machine] at Stanford and realized that we didn't have to put up with this, that we had the technology," Nichols later recalled.

Nichols wrote a few friends about his idea to track the machine's contents remotely and put an end to unsatisfying soda runs once and for all. Soon, two other students—Mike Kazar and Ivor Durham—and a research engineer at the university, John Zsarnay, began working alongside him to make it happen.

The key to determining the contents of the Coke machine from afar was keeping close tabs on its lights. The machine had six columns of glass soda bottles. When someone purchased a Coke, a red indicator light for the corresponding column would flash for a few seconds before turning back off. When a column was empty, the light stayed on until the sodas were replaced.

To pull data from the machine, Zsarnay installed a board that sensed the status of each of the indicator lights. A line from the board ran to a gateway for the department's main computer, which was connected to the

ARPANET—a precursor to today's Internet, which, at the time, served less than 300 computers worldwide.

Kazar wrote a program for the gateway that checked the status of each column's light a few times per second. If a light transitioned from off to on but then went off again a few seconds later, it knew that a Coke had been purchased. If the light stayed on more than five seconds, it assumed the column was empty. When the light went back off, the program knew that two cold Cokes—which were always held in the machine in reserve—were now available for purchase, while the rest of the bottles were still warm. The program tracked how many minutes the bottles had been in the machine after restocking. After three hours, the bottles simply registered as "cold."

Finally, the group added code to the main computer's finger program, which allowed anyone on a computer connected to the ARPANET—or anyone connected to Carnegie Mellon's local Ethernet—to access information about the machine. With a few simple keystrokes, they could find out if there were any Cokes in the machine, and, if so, which ones were cold.

"I never used it, except to see if it was working," Kazar told INDUSTRIOUS. "I never liked Coke."

8 billion
connected devices today

30.7 billion
estimated connected devices by 2020

$27 billion
estimated IoT sensor market by 2022

SOURCES: Forbes, Nov. 27, 2016, "Roundup Of Internet Of Things Forecasts And Market Estimates" and GlobeNewswire, Oct. 30, 2017, "IoT Sensors Market Size, 2016-2022"

But Carnegie Mellon was full of Coke drinkers, and according to Kazar the program became "pretty popular pretty fast" in the computer science department when it became operational in 1982. "After a while, it became standard procedure to check the status of the Coke machine before you'd go downstairs because you wanted to make sure you got the coldest Coke available," he said. At some point, another graduate student set up a similar system to monitor the status of the nearby M&M machine.

Some years later, the local Coke distributer stopped selling the glass bottles that fit into the department's machine, and eventually the device was replaced with a newer model that students never got around to connecting to the Internet. But in the decades that followed, the new machine continued to be a platform for offbeat experimentation.

In the early 2000s, Mike Vande Weghe, Chuck Rosenberg and Kevin Watkins installed a video camera in the machine that filmed a nearby counter where people sometimes left free food. Students often checked the camera's feed online to see if anything was up for grabs. A few years later, Charlie Garrod and some other students installed a screen in the machine that displayed the weather and other information of general interest.

"We didn't want to get rid of our modified Coke machine entirely, but the people who would have made the deep changes were no longer around. It's not that we wanted less functionality, it's that we didn't have the resources to redesign the system," Garrod told INDUSTRIOUS. "The interesting work on this project was really in the 80s."

For years, members of the computer science department's main graduate student organization, Dec/5, continued to operate the machine. Though Coke owned it, the students kept it stocked and set the prices. Volunteer "machine maintainers" like Garrod attempted to make any necessary repairs to the machine without calling for outside help, since Coke repairmen frowned upon the techy modifications.

"They told us to revert it to its unmodified form, which we didn't do but we reverted it temporarily to its unmodified form whenever they had to come out," Garrod said.

Eventually, Garrod said, graduate students decided operating a soda machine on their own "wasn't worth the time or effort." As of 2014, there was a Coke machine in the Gates Center for Computer Science, but Garrod said "it's just an everyday Coke machine."

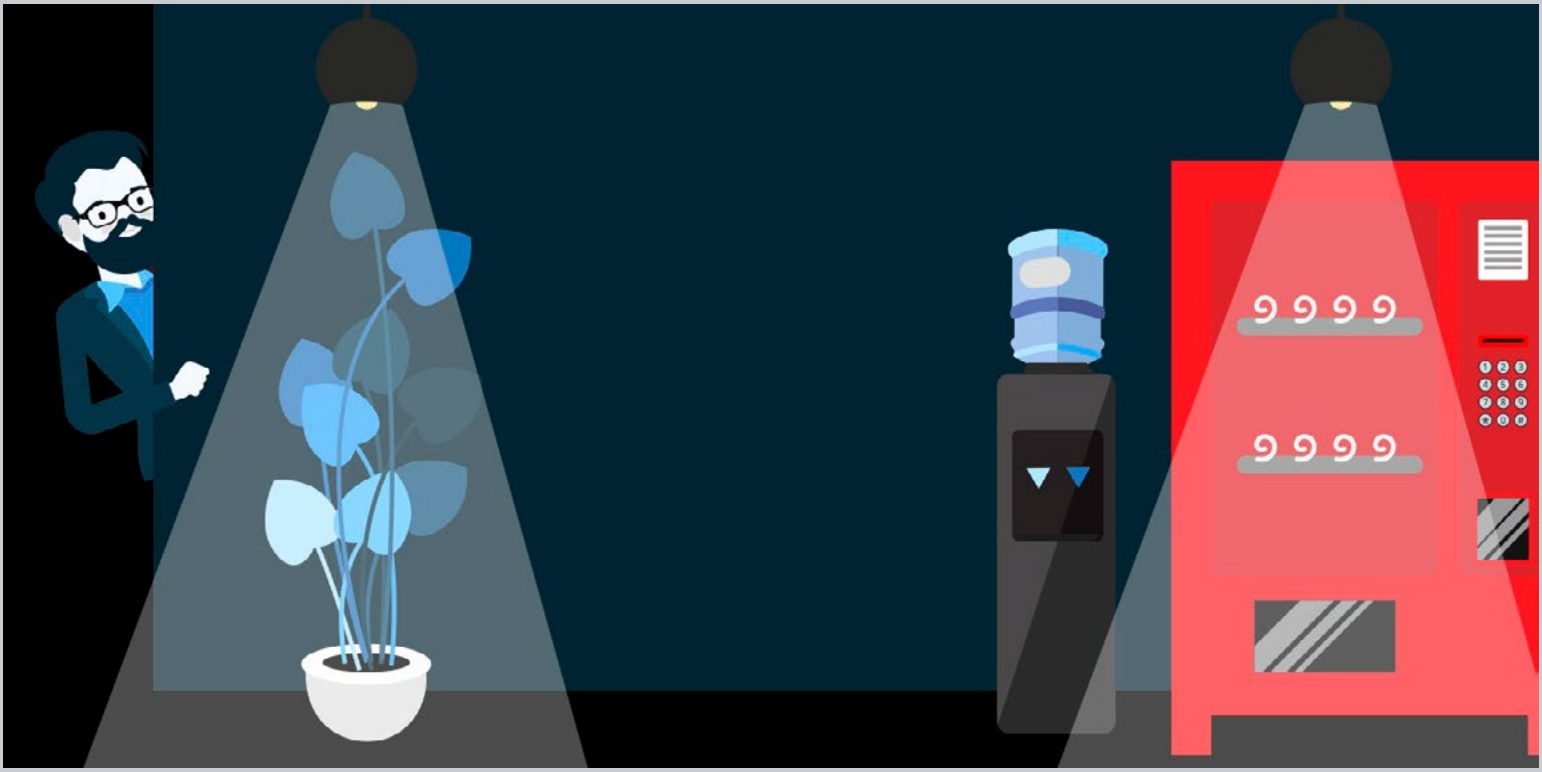
While the history of the computer science department's Coke machine is preserved on the Carnegie Mellon website, Kazar said the university didn't formally celebrate the original invention at the time, and it never occurred to him in the 80s that the device was particularly groundbreaking. "I never thought anyone would be asking me about it 30 years later," Kazar, now CTO at Avere Systems, said.

Kazar certainly never imagined the Coke machine would be just the first of billions of everyday devices connected to the Internet. Today, there are more than 8 billion connected things in use worldwide and by 2020, that number is expected to grow to 30.7 billion. The market for IoT sensors alone is expected to be worth more than $27 billion by 2022.

But back in 1982, when computers cost a million dollars and the ARPANET was still the only game in town, Kazar said a world dominated by IoT seemed like a far-off fantasy.

"There was a running joke about how your toaster was one day going to be on the Internet," he said. "People laughed at that."

—Originally published Feb. 7, 2018 in INDUSTRIOUS on Medium



THE KEY TO DIFFERENTIATION IN ELECTRONICS? AI, DATA, AND PLATFORM. DATA-SAVVY COMPETITORS APPLY EQUAL EFFORT TO PLATFORMS AND ECOSYSTEMS AS TO THE DESIGN OF THEIR DEVICES. CERTAIN COMPANIES WILL THRIVE IN THIS ENVIRONMENT: THOSE WHO BUILD SCALABLE, INSIGHT RICH APPROACHES AND NEW BUSINESS MODELS TO GROW WITHIN AND ACROSS THEIR VERTICALS, DEMONSTRATING AGILITY AND FLEXIBILITY ACROSS THE ENTERPRISE.

The key to tracking next year's flu outbreak? Try wearables

Every winter, the influenza virus triggers sniffles, aches, and fevers. And every winter, people try to reduce their risk by getting vaccinated and loading up on disinfectant, medicine, and OJ.

But there's one thing missing from this anti-flu arsenal: Wearables.

Newly developed wearables are revealing previously opaque insights about individual health that could help control a disease that the Center for Disease Control estimates kills up to 646,000 people worldwide.

Getting health data in a timely manner is a challenge for health officials. In the U.S., for example, the CDC gathers data from hospitals and clinics that report how many cases of flu-like symptoms they treat. But this information can be delayed if a hospital doesn't have adequate personnel or time to compile data. The length and severity of flu season is hard to predict because the virus evolves quickly. Manufacturers must reformulate flu vaccinations six months in advance each year, but they sometimes miss the mark. In Australia, vaccines have been effective in only 10 percent of cases this flu season.

But through a wearable thermometer and an app, researchers at Boston Children's Hospital were able to predict flu outbreaks a month faster than conventional methods. In the U.S., a company that makes smart thermometers claims to be able to spot fever spikes among populations at the city and neighborhood level faster than health authorities.

This technology is also set to transform the way companies care for their employees. The same manufacturers that use IoT technologies to track the health of their machines and predict equipment failures are applying the same thinking to their ever valuable labor force.

In high-stress manufacturing and industrial environments, companies are starting to use wearables to monitor the health of workers in stressful work conditions, indicating when fatigue or other biometrics negatively impact safety.

THE ANGLE:
The industry applications for wearables are enormous—from using data to create new products and services to making personalized recommendations. That's why a growing number of technology companies are getting into the health and wellness space, Scott Burnett, IBM's Managing Director of Global Consumer Electronics, told INDUSTRIOUS.

"At CES this January, we saw 4,000 exhibitors, many start-ups and new firms focused on the health and well-being marketplace and addressing a wide variety of topics from sleep to nutrition," he said.

While wearables have the potential to serve the public good and provide business value, there are still questions about how companies will use the data they collect before many may be willing to put one on.

"The new combinations of multiple devices and data—Fitbits, smartphones, the weather, what we eat, how far we drive, our sleep—will bring new insights and value." Burnett said. "There are, however, some tough questions ahead. Who owns the data? Who has the right to use my personal data? Who do I trust?"

—Originally published Feb. 2, 2018 in INDUSTRIOUS on Medium

FAQ: Who owns the data?

BY Bruce Anderson, Electronics Industry Global Managing Director, IBM

As billions more sensors and other IoT-enabled devices come online, the question of who owns the data—and what they do with it—is about to get a lot more complicated. In a world where everything is connected— by 2020 there will be ~25 billion Internet connected "things"—many previously opaque aspects of our lives will generate data—with tremendous value and far-reaching ramifications.

When companies work with IBM, they retain all data rights; this doesn't appear to be the case with other leading cloud and AI providers.

Anxious for data monetization, these new service providers are demanding data rights to support their advertising and commerce business models, and data ownership —between end user, device manufacturer and service provider—becomes murkier.

That's because data is often—or should be—the end game for manufacturers. It is a natural resource that fuels the new future, like oil, and connected devices are the drills to get at that data. The power of data to reveal new insights attuned to our personal behavior enables product companies to become service companies that link to an ecosystem of partners. And consumers are trusting the device manufacturers to treat them (and their data) with respect.

Your commuting habits, your physical activity down to heart beats, the stores you visit, the food you eat, how much water your dishwasher consumes—all will reveal your unique digital footprint that companies and governments will ostensibly use to improve experiences, and run for effective businesses.

To some, this may not be a big deal. From Facebook to Fitbit, we're already sharing personal data with an array of companies.

After all, to get personalized and faster services, we may need to give up a little information. But how much are we willing to share, with whom, and who ultimately claims ownership—or the more altruistic stewardship—of that data?

For example, people may be OK with a refrigerator that automatically orders groceries from a food delivery service when they run low. But what if the device also shared how much beer they drink with their doctor or insurance company? What about a connected car that shares your average commuting speed with the police or auto insurers? And to make it even trickier, there are numerous sources of data that are aggregated, analyzed, sliced and diced, and stored.

Determining the exact provenance of the data across of value chain of connected devices is not a straightforward task. Take the example of a connected home that has a Whirlpool washing machine, Samsung TV, and Meile refrigerator. To reap the benefits of a connected home, all those devices should work in harmony, but this means sharing data. Whose data is it anyhow?

As the number of connected things increase, so will the data complexity. Consumers should be concerned about their digital footprint in this world; manufacturers should be clear on data ownership when their product is being collecting it. And service providers should do just that: provide a service; and not be coy or opaque about where data they are entrusted with is being stored, how it will be used in their other businesses. Only with this level of understanding and trust will consumers (and the governments that protect them) embrace a connected world.

—Originally published Jan. 9, 2018 on LinkedIn

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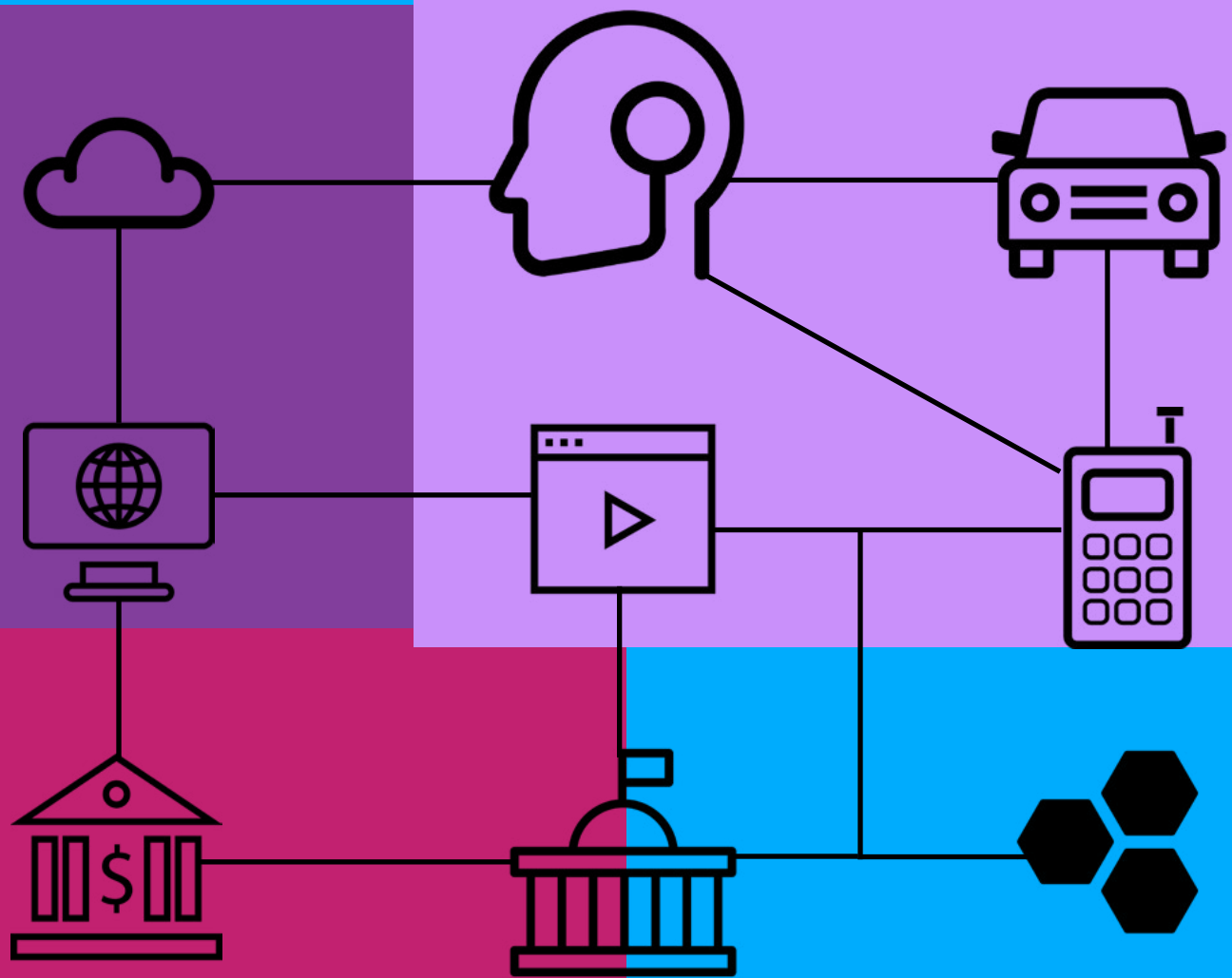


TELECOMMUNICATIONS, MEDIA, AND ENTERTAINMENT

CHANGING CUSTOMER EXPECTATIONS AND BEHAVIORS, NEW DIGITAL TECHNOLOGIES, AND FREE COMPETITION FROM OUTSIDE THE INDUSTRY WILL ALL CONFRONT THE TELECOMMUNICATIONS INDUSTRY IN THE COMING YEARS.

HOW GIFS TOOK OVER THE WORLD

Feeling happy? Sad? Angry? Excited? Chances are, you've expressed that sentiment with a GIF.

Today, GIFs are essential to the way we communicate. Every day, more than a billion GIFs are sent through GIPHY—a GIF search engine valued at $600 million—alone.

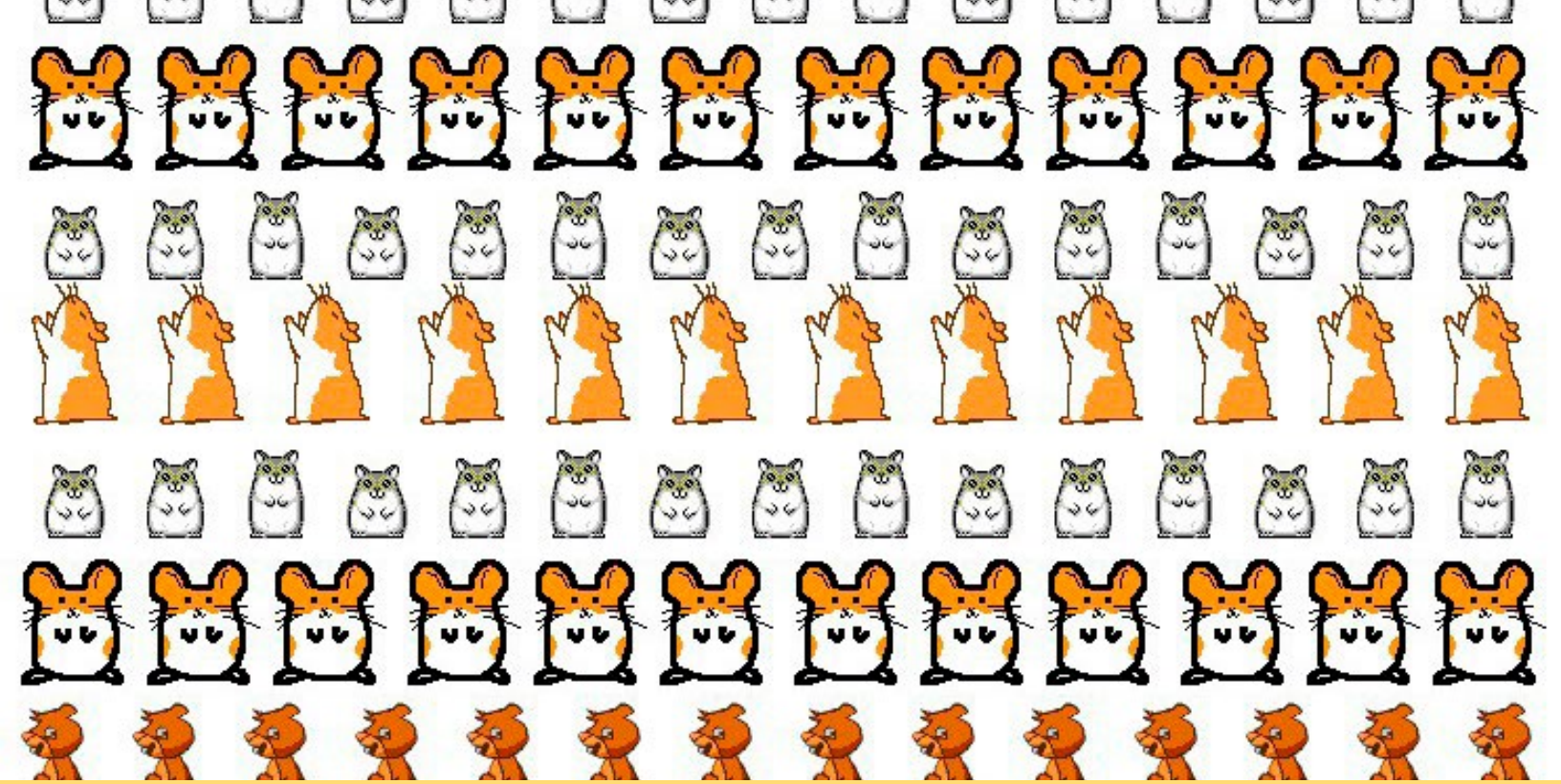
Now more than 30 years old, the GIF certainly wasn't initially designed to become an economic powerhouse, a fixture of social interactions, or a form of art—and yet, improbably, it has become all of those things.

"The GIF has really gone through a lot of unexpected reinvention," said Jason Eppink, the curator of "The GIF Elevator," an installation of newly commissioned GIFs at the Museum of the Moving Image in New York City.

GIFs have broken through to the art world. Throughout its history, Eppink told INDUSTRIOUS, the evolution of the GIF has been driven by shifts in technology, including network speeds, browser capacities, and upload restrictions on popular GIF-sharing websites.

But today the tables are turning, and the success of the GIF is in part responsible for necessitating changes in network technology.

As media platforms like Facebook, Twitter, and Imgur decide to convert user-uploaded GIF files into MP4 video files—to support faster load times and larger larger files—the popularity of the short loop format is now contributing to the explosive adoption of mobile video. That growth is expected to drive mobile data consumption up 700% by 2021 and push networks to their physical limits. To accommodate the demand, many service providers are virtualizing their networks in the cloud.



The "Hamster Dance," a GIF relic of the 1990s

So, how did we get here?

The history of the GIF starts with CompuServe, a large information network system that predates the modern internet. In 1987, it released GIF 87a, a format designed to compress multiple images in a way that slow modems could easily load. It took two years before those images could become animated, and it took another six years after that before a web browser, Netscape Navigator 2.0b4, was able to run an animated GIF in a loop.

The GIFs of the late 1990s were used to decorate personal webpages hosted on services like GeoCities, and designed to accommodate the limitations of 56k modems and slow web browsers. According to Eppink, these GIFs typically had small file sizes less than 100K, low resolutions, limited color palettes, and few frames. They had more in common with clip art, he said, than photography.

Some, like the Hamster Dance or the Dancing Banana, had a certain cultural cachet, but many served more utilitarian purposes, like signifying that a webpage was under construction. Generally, they were seen as pretty tacky.

GIFs fell out of favor for a time during the early 2000s as internet users migrated from personal webpages to social media platforms like Facebook, which, Eppink said, resisted GIFs in an effort to craft a "sleek, homogeneous, aesthetic" distinct from that of earlier sites like MySpace and LiveJournal.

But GIFs came back into the spotlight around 2007 with the rise of smartphones, which required "a simple, quick, and more lightweight substitute for Flash animation," and the introduction of Tumblr, which from the get-go allowed GIFs as large as 500KB. These larger files could support GIFs with photographic images derived from film, TV, and the booming user-generated media of YouTube—including the first celebrity reaction GIFs millions know and love today.

On Tumblr, GIFs weren't mere ornamentation on a page—they were themselves the destination, worthy of their own wide mainstream audience.

"With Tumblr, for the first time on a major platform, the GIF existed on its own. That's when it became a real site for innovation and experimentation," Eppink said.

The social media giants eventually took notice and started embracing GIFs. But by then GIFs were already an unstoppable cultural force. The world had become one big GIF waiting to happen.

GIFs now, GIFs forever

Today, Eppink said, most people can make simple GIFs with the computers they carry around in their pockets, and they can access vast libraries of existing GIFs to use in everyday virtual conversations.

But others, like the animators exhibited at the Museum of the Moving Image, are using the GIF format to create original works of art. They're attaching their names to them. And they're driving conversations not explicitly tied to pop culture.

Artists have worked with GIFs from the format's very beginning, Eppink said, but their work only began appearing in major museums in the 2000s. Now, their rising status in the art world mirrors their elevated status in the culture at large.

"They're creating these works on their own terms, the way a painter makes a painting and a sculptor makes a sculpture," he said.

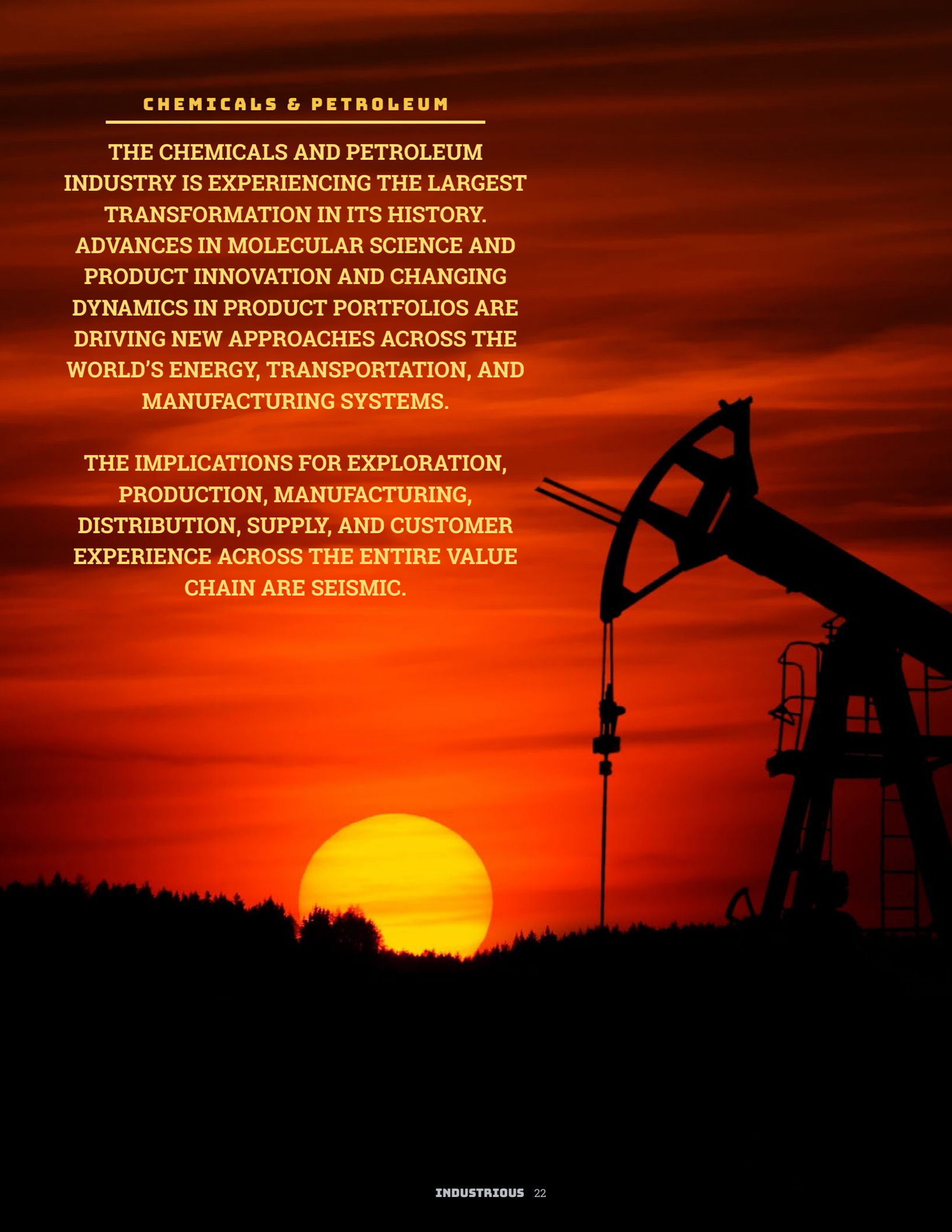
Over 30 years, GIFs have weathered shifting tastes and technologies in a fight to survive. Now, they're changing our cultural institutions, our networks, and our lives. The battle is over. GIFs have won.

—Originally published Feb. 1, 2018 in INDUSTRIOUS on Medium

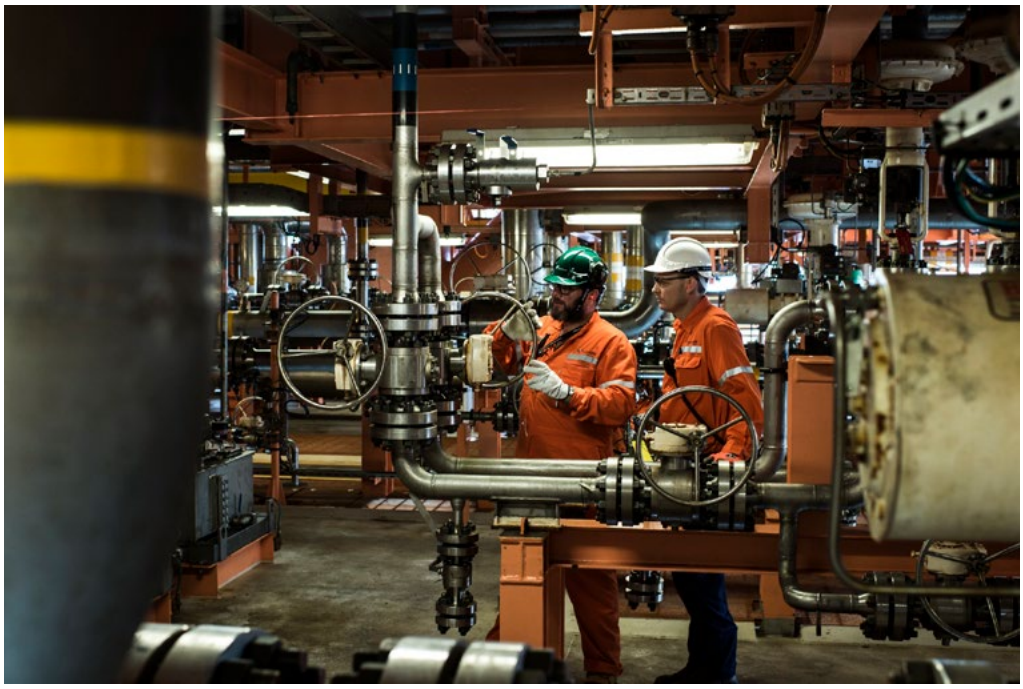
CHEMICALS & PETROLEUM

THE CHEMICALS AND PETROLEUM INDUSTRY IS EXPERIENCING THE LARGEST TRANSFORMATION IN ITS HISTORY. ADVANCES IN MOLECULAR SCIENCE AND PRODUCT INNOVATION AND CHANGING DYNAMICS IN PRODUCT PORTFOLIOS ARE DRIVING NEW APPROACHES ACROSS THE WORLD'S ENERGY, TRANSPORTATION, AND MANUFACTURING SYSTEMS.

THE IMPLICATIONS FOR EXPLORATION, PRODUCTION, MANUFACTURING, DISTRIBUTION, SUPPLY, AND CUSTOMER EXPERIENCE ACROSS THE ENTIRE VALUE CHAIN ARE SEISMIC.



Tapping into tribal knowledge and outthinking uncertainty



70 miles off the coast of Australia, in the deep waters of the North West Shelf, you'll find what looks like a gas platform. But don't be fooled. This massive tapestry of pipes and shafts, gauges and steel is more than a piece of machinery—it's a prototype for a cognitive business.

Woodside, Australia's largest independent energy company, has been a global leader in oil and gas for over half a century. Their secret? Hire and develop heroes.

This formula has helped Woodside build some of the largest structures on the planet, in some of the most remote parts of the ocean, and safely transport the energy they produce to people around the globe.

To ensure the next generation could successfully carry the torch, Woodside knew they had to harness the instinctual know-how of their best employees. This goal—to create a cognitive business to augment and share their tribal knowledge—is what led Woodside into an industry-first partnership with IBM and Watson.

That industry—offshore energy—is as expensive as it is intensive. A gas platform can cost $500,000 per day to operate, and require real time monitoring of thousands of inputs 24/7 by a crew living on top of 100,000 tons of steel in the middle of the ocean. The stakes—from human lives to environmental safety to shareholder results—are incredibly high.

To meet these demands, Woodside hires and nurtures "heroes"—highly intelligent employees whose natural instincts are honed by years of experience. While Woodside has been archiving their employees' reports, decision logs, and technical evaluations for decades, they've also been losing swaths of irreplaceable corporate memory as older engineers retired, taking their instincts and experience with them.

To remain competitive, Woodside knew they had to streamline corporate-wide access to their archives and tribal knowledge, to spread not just information—but the contextual relevance of this information. They knew they had to apply deep learning to shorten employee learning curves, and add cognitive to their decision making.

Watson could enable Woodside to mine their millions of documents, serve up relevant insights to their engineers instantly, and do it all in language that engineers spoke and understand. Most importantly, Woodside would do more than just save time and money: Finding the right advice faster would give them a competitive head start, leading to safer and better decisions across the company, and ultimately more energy getting to more people in more effective ways.

But before Watson could help a new wave of "heroes," Woodside and IBM needed to teach Watson to think like one.

The term "cognitive business" might sound ambitious, especially from an IT perspective, but IBM showed Woodside how digital reinvention could happen without reinventing their infrastructure.

One reason is that Watson's services and APIs are hosted on the cloud and designed to be deployed across various corporate platforms. Another is the fact that Watson learns a business the way people do.

Like any new hire that needs to be on-boarded, Watson needs large quantities of industry information coupled with quality insights from experienced employees. Thanks to their massive archives and world-class workforce, Woodside had both.

To start, Woodside worked together with IBM to create the corpus—the body of materials Watson would learn from now and continue to collect into the future. Woodside compiled a stack of structured and unstructured data from their archives. All of this was uploaded and ingested by Watson.

A core group of Woodside's current and former employees began to test Watson on what it had learned, guiding Watson's answers and teaching the system to think like one of them.

Based on a series of questions posed to Watson, the group used their expertise to

rate the responses, which were fed back into the system, allowing Watson to learn and become smarter. By combining years of data with years of experience, Watson tapped into Woodside's tribal knowledge and discover the best advice of thousands of engineers, as well as learn how to process new information as it was added to the corpus.

When Woodside and IBM were confident in Watson's abilities, it was time to deploy in the real world—in the hands of engineers on a gas platform in the middle of the Indian Ocean.

Deploying and building with Watson Woodside developers had a challenging task—how do you take something as powerful and complex as Watson and deploy it in a way that is useful and understandable to non-developers?

Working with IBM and the Watson Developer Cloud, Woodside developers identified the APIs needed to craft an architecture and build an intuitive design that lets engineers find the advice they need.

Natural Language Classifier: This API allows users to search a corpus by asking questions as if they were talking to another person. Watson uses Natural Language Classifier to parse out the intent of a question even if it is asked in different ways.

Retrieve and Rank: After understanding the question, Watson retrieves all relevant information from the corpus, ranks them in terms of relevance, and responds with the best matches, as well as related points of inspiration.

Conversation: By incorporating a human tone, Conversation creates a better user experience and allows Watson to interact with engineers in their own language.

While Woodside's partnership with IBM and Watson is on-going, certain results have been seen almost immediately.

Watson has ingested tens of thousands of Woodside documents related to project development in the system, each typically over 100 pages in length. It would take a human being, working 24 hours a day, more than five years to read all this information. Watson can process it and produce meaningful answers in seconds.

Woodside is just one example of how becoming a cognitive business can positively impact any business—in almost any industry—by leveraging existing tribal knowledge to augment employee skills and improve the bottom line with easily deployed applications.

—Originally published Aug. 19, 2016 by IBM Cognitive Business on Medium

THE TRANSPORTATION INDUSTRY FACES DEEP CHALLENGES IN THE IMMEDIATE YEARS—INCLUDING HOW TO INCORPORATE DISRUPTIVE TECHNOLOGIES LIKE AI AND BLOCKCHAIN INTO ITS ECOSYSTEM, ADDRESSING CHANGES IN OWNERSHIP STRUCTURES, PARTNER ARRANGEMENTS AND SHARED FACILITY ARRANGEMENTS, AND DEALING WITH POTENTIAL CHANGES IN THE BUSINESS MODELS OF LARGE CUSTOMERS AND PROVIDERS.

What the dream of dome cities tells us about urban sustainability

Futurists have long imagined we'd one day live in energy efficient domes, but today's planners have other ideas

In 1960, futurist Buckminster "Bucky" Fuller had a wild thought: What if part of midtown Manhattan were enclosed in a geodesic dome?

An unlikely idea, yes. But for Fuller, the man credited with popularizing the concept of the geodesic dome, one worth exploring. Fuller had a sketch drawn up, and made a few rudimentary calculations. The dome would be two miles across, and cover the island from the East River to the Hudson River, from 21st Street to 64th Street.

Shoji Sadao, Fuller's longtime business partner, told IBM the plan was a "visionary" one, and that while Fuller thought a dome that size might be "technically feasible," he knew it was unlikely to become reality. But the fantastical idea was rooted in a very serious desire to make cities more energy efficient.

"Bucky thought it would be a much more efficient way to create a sustainable environment," said Sadao. "You'd be able to control the sunlight and the temperature and the humidity through various means on the surface of the dome. Rainwater could be collected at the perimeter and put in a cistern. You wouldn't have to worry about cleaning the streets after a snowstorm."

Fuller's plan never got off the ground. But the dream of the dome city persisted. Images of rounded space colonies proliferated during the Space Age, inspiring architects designing structures on Earth. In science fiction, meanwhile, dome cities remained a staple, fueling the notion that enclosed metropolises might just be around the corner.

The 50s and 60s and 70s were obsessed with the future—and domes, for various reasons, have a naturally futuristic look to them. "They're very sleek and simple, and they have a Space Age look," said Sam Lubell, co-curator of the Queens Museum exhibit, *Never Built New York*.

In reality, dome cities are easier dreamed than done. Construction comes with significant engineering hurdles, and organizing a society within is an even greater challenges. Politics are also an obstacle.

In the 1970s, futurist Athelstan Spilhaus discovered that firsthand when—with Fuller's strong input—he proposed the Minnesota Experimental City, a self-sustaining dome city designed for scientific advancement on the swamps of north central Minnesota. It was to house 250,000 people and include a power plant, a monorail system, and high-rise parking garages filled with cattle. Ford, Boeing, Honeywell and the state legislature all got on board. But local opposition and concerns about cost and feasibility ultimately sunk the project.

This was not a community or an area where people wanted a giant city. "It would have been like building a nuclear power plant in the backyard," said Sharon Moen, senior science communicator at Minnesota Sea Grant and the author of *With Tomorrow in Mind: How Athelstan Spilhaus Turned America Toward the Future*.

While domes can make great stadiums and terrariums, Lubell said, they "don't really have all that much success" on a larger scale. The dream of a dome city, he said, stems from a "utopian impulse" to create an entirely human-made environment separate from nature—and that impulse seems to have subsided. Plans for dome cities still emerge from time to time, but visions of urban sustainability in the 21st century look a lot different.

Rather than wall off the world, the cities of the future, Lubell said, are much more likely to "embrace nature and use natural systems."

And today's real estate and facilities management professionals are as interested in innovative new structures as they are in technologies that reduce waste and conserve energy in existing buildings. In the U.S. alone, buildings produce 38 percent of green-house gas emissions. Cognitive building solutions can effectively manage energy use, optimize space, and reduce operating costs.

"We're enabling the next level of energy efficiency," said Joern Ploennigs, an IBM research scientist specializing in smart buildings, environment and industry.

Today's urban planners, meanwhile, are devising intelligent transportation systems by using sensor networks, digital information, and cognitive computing technologies. These sustainable initiatives are emblematic of the kind of transformations taking place across industries, said Miro Holecy, an IBM transportation and national infrastructure CTO.

"We're experiencing the fourth industrial revolution," Holecy said. "The previous one was about digitization. Before, it was electricity. Now it's data, AI, and the Internet of Things. That's the era we're living in."

Domes may not be a staple of this new era, but 20th century inventors like Fuller and Spilhaus would have been happy to know that today's designers are still working toward a sustainable vision of the future—even if it's not exactly what they imagined.

"The goal is the same but the message is very different," said Lubell.

—Originally published Oct. 3, 2017 in INDUSTRIOUS on Medium

IMAGE: Artistic rendering of 1970s space colony concept | NASA Ames Research Center/Rick Guidice

A STRANGE EXCHANGE

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BANKING

THE AGE OF DIGITAL TRANSFORMATION AND REINVENTION IN BANKING AND FINANCE HAS ARRIVED. DISRUPTION IS THE NEW NORMAL, WHERE EAGER STARTUPS ARE COMPETING WITH ESTABLISHED FINANCIAL INSTITUTIONS—CREATING A FERTILE ENVIRONMENT FOR FINTECH.

How to humanize virtual agents, just enough

BY Preeti Gupta, Senior Managing Consultant, IBM iX and Natalie Ofoche, Senior Consultant, IBM iX

We are currently at a moment in time where virtual agents (VA's) have become more commonplace within customer service than ever. The global chatbot market is expected to reach $1.23 billion by 2025. Now, interacting through a text or a web app for customer service is not all that awkward and has gone mainstream. A growing number, starting with millennials, would even prefer doing business through a VA, or chatbot. The technology has advanced to the point that building VA's is no longer a discussion around functionality and technology, but organizations are now dedicating more time developing the VA's "personalities" to reflect the company's mission, vision, and brand.

Virtual agents use natural-language processing and analytics together to create an engaging human-like interaction with the end-user for simple or complex tasks and conversations. By including avatars traditionally used to visually represent people in the virtual world, you are on your way in creating a simulated and meaningful human-to-VA interaction. However, don't confuse the avatars of the virtual agents with the ones we used in chatrooms and games like The Sims in the past. These virtual humans are consuming information, processing it, and making educated and cognitive-driven decisions based on that data. Their outward appearance, personality and speech makes an apparent difference with their conversation counterparts. In the process, they are freeing up valuable human resources to address the less mundane, more individualized and higher level customer service requests.

Virtual agents becoming more ubiquitous

According to recent research by Forrester, the #1 trend for customer service in 2017 is "smarter", "self-served" and more automated customer service. As the financial industry adopts artificial intelligence in the form of virtual agents, companies are exploring new and innovative ways to ensure their virtual agent not only fosters relationships with customers, but also embodies their brands. These virtual agents revolutionize customer experience in financial services by offering more ways for customers to interact with their financial institutions, faster response times, 24×7 availability, and instant, personalized service, using cognitive data. Today's customers desire faster, efficient, thorough customer service, and the innovative AI technology can actually provide it. However, are your customers still looking for that "human" connection to have a trusted experience?

VentureBeat found that humanizing a virtual agent increases customer engagement, creates trust, and personalizes the experience. Some brands have attempted to do this simply by using a "human" avatar and name, but does that go far enough to create a comfortable, natural experience? How does this bot, named and personified, support a brand's vision and promise?

This is a field that is still very new and the research is limited. That said, consumer trends suggest that consumers connect with virtual agents when they have names, especially unusual ones — think Siri or Cortana. They also suggest that human-like avatars can leave end-users feeling uncomfortable—a phenomenon known as an Uncanny valley, or almost "too human" experience.

Hey [insert virtual assistant name here]!

So if human-like avatars do not resonate with customers, how do virtual agents like Siri, Alexa, Cortana—even Watson—manage to foster an engaging, human experience? Especially in an industry built on customer trust, virtual agents used by financial institutions must interact with users in a way that leaves the user feeling understood, listened to, and taken care of—all very simple human emotions. The key to fostering that humanized customer experience—where the agent can build trust with the customer—is to set the content for engaging communication and interaction. Without an actual face, the most successful agents create human interactions with anthropomorphic representations, "having human characteristics."

Customers can relate to the agents that possess some human-like nature in the way they converse, engage, and empathize with their needs. For example, to feel connected, the customer is looking for the impression that the virtual agent is alive and thinking. Animations, sound, and colorful images help to showcase the effect—Watson's icon rotates and lights up as it thinks and speaks. The tone of the text or voice-based conversation matters; it is not necessary for it to be convincingly human since the user knows the agent is not a human being. But it is also not personable if it is too robotic. Something in-between is the best choice.

As with training human agents, ensuring every interaction with customers represents your brand is critical. Simply using the company's name or logo is not enough to create an engaging interaction as the customer will only feel like the agent is performing rudimentary tasks that can just as well be done on the website or app. Virtual Agents should have the same "attitude" as your brand, and as they use human-like visual effects, the identity of their virtual personality needs to connect into brand look, feel, and tone.

Finding the right balance for your brand

Overall, AI and cognitive technology is a rapidly evolving space and the use of virtual agents in it is still very new. As companies start to adopt the use of virtual agents, here are a few key design principles to consider:

- Focus should be on humanizing the content of the virtual agents and not just the look. The idea is to design and create a genuine, engaging experience with the user, while making them relatable, comfortable and familiar.
- Be mindful when choosing human-like avatars for your virtual agent as it may alienate customers when the features of the avatar do not reflect the customer's own diversity.
- Align the visual appearance of the virtual agent with the company's brand along with maintaining an identity with which the user can form a human connection.
- Use animation, color, and motion to help the user visualize and feel like this virtual agent is alive and thinking.
- Think about how robotic or human-sounding the voice of the virtual agent should be, so the user can make appropriate levels of empathetic connection.

It is a testament to tremendous progress made in the field of cognitive and artificial intelligence that now the personality of these virtual friends is a point of discussion and refinement. Embrace the future and befriend a virtual assistant in your next customer service journey!

—Originally published Feb. 12, 2018 on IBM Insights on Business Banking

THE PRESSURE ON INSURERS TO INNOVATE AND CONTROL COSTS HAS NEVER BEEN HIGHER. INDUSTRY EXECUTIVES ARE CHALLENGED TO NAVIGATE A STEADY STREAM OF TECHNICAL ADVANCES TO STAY A STEP AHEAD OF THEIR COMPETITION.

Breaking the mold of traditional insurance

Parametric insurance goes beyond the traditional model

Because extreme weather events are now seemingly more common than ever before, insurance claims are seeing record increases, and the demand for disaster insurance is reaching unprecedented levels. Insurance companies are being challenged to offer new ways to respond to these disasters, both to expedite relief for their clients and to develop cost-friendly and profitable products, all while reducing operating costs. Parametric insurance, also known as index insurance, is an innovative product that functions differently than the traditional model of insurance coverage. It's initiated by and paid to the policyholder based upon a set of specific parameters, along with a predetermined sum that foregoes the traditional claims process.

Expedited real-world applications
Parametric insurance, in its current form, is often related to weather and other natural occurrences. Parametric insurance can be used in place of traditional insurance policies in scenarios such as earthquakes, storms, and floods. Hurricane wind speed and strength metrics could trigger activation of a parametric insurance policy. Parametric insurance is measured by an agreed upon independent third-party metric, that with an evidenced presumed loss is the trigger which determines the payout.

The owner of a farm could purchase a parametric insurance policy for air pollution, outlining a specific threshold of the air quality index scale, a commonly used and accepted metric of air pollution, that would stunt crop output. When the air quality index reaches a certain level, a farmer's crop yield would decrease, triggering the parametric insurance policy. Measurable, objective metrics such as soil moisture, biotic or abiotic data, and other distinct environmental variables will prepare an insurance company to underwrite and offer financial protection against these disasters.

The relationship between environmental factors and a parametric insurance contract positions the IBM Weather Company insurance solutions to deliver predictions and real-time alerts and to help insurers and businesses plan for a seasonal event. After an incident, The Weather Company acts as a third-party ledger and system of record confirming the event with precise data analytics. Future predictions for parametric contracts are made easy by using historical data API's with History on Demand Data.

Parametric insurance is not only applied in industrial and commercial scenarios, but also applied on a more personal and individual scale. An innovative example is travel insurance provided by fizzy. Fizzy offers tailored coverage for an airline traveler who has the option of purchasing a parametric insurance policy that returns a portion of their airfare in the event of a flight delay. Travelers can subscribe to a personalized parametric insurance policy up to 15 days before departure without the hassle of endless paperwork like in traditional insurance claims.

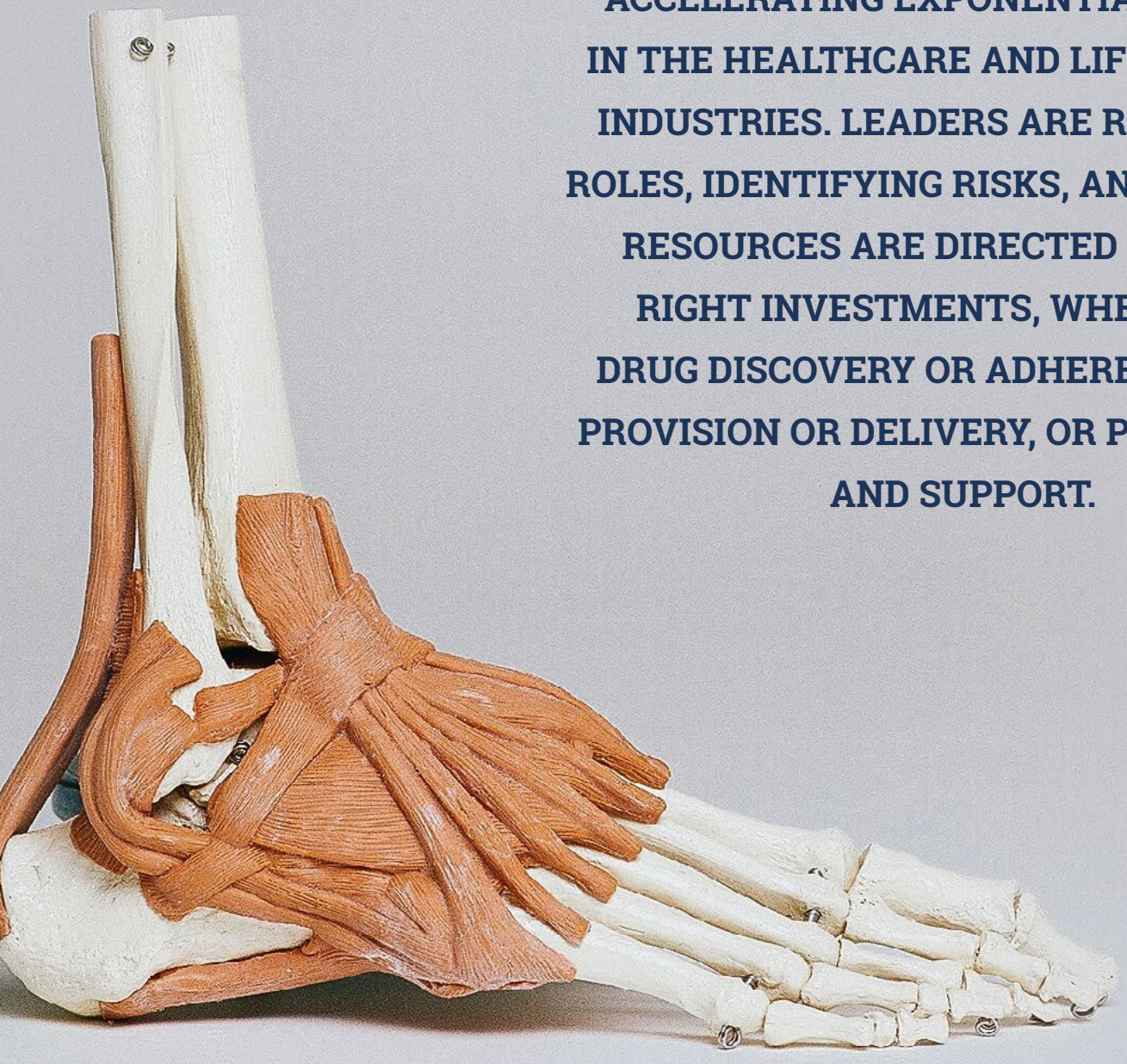
Streamlined insurance claims process
Unlike a traditional insurance policy that involves filing a post-event claim with the subsequent investigation and adjustment, a parametric claim improves the claims process efficiency. Once the parameters of the policy have been met, the policy is automatically activated, and a payment is dispersed in a simplified manner for payment of damages suffered during any type of natural disaster. With no documented proof necessary of losses beyond the predetermined parameters, the claims process is settled immediately. This expedited claim process features a vast reduction of paperwork, fewer claims investigation hours, and an overall lower operational cost to the insurer.

A progressing blockchain application
Parametric insurance coverage is typically used for difficult-to-insure risks. For a coverage-type event, all clauses in the parametric contract can be encoded using smart contract language, allowing blockchain to keep track of all claims. Insurer payouts and account adjustments are automatically performed based on event trigger confirmation by the trusted source. For a contract event, parametric contracts are not related to actual loss, but to actual event occurrences or certain index thresholds. The smart contract, combined with event triggers from off chain data sources (trusted & secure information), can be used to partially or fully automate the operation of these policies (e.g. CAT swaps setup). Off-chain data sources (such as IoT device events) capture data on usage related to shared automobiles, homes, commercial spaces, etc. and offer on-demand utilization related policies. This gives rise to a whole new class of on-demand insurance products. Creating a no-touch, frictionless procedure can eliminate human error in the claims process and could potentially save insurers millions every year and produce a better customer experience. Blockchain and parametric insurance have limitless possibilities. Take the recent IBM and Maersk demo cross border supply chain solution on Blockchain Hyperledger as a starting point. In the future, if parametric weather data was integrated into the perishable product and the transportation life cycle, the entire supply chain readiness would take this to the next level of business readiness.

Disruption in the insurance industry
Recently, we've been hearing about disruption in the insurance industry. The fundamental potential for disruption in the insurance industry is displayed in the vulnerability of both mature and emerging markets. Many risks are under-insured, leaving ample room for digital competitors and new business models. In some cases, old processes, limited customer connections, and complex products hinder some insurers and pave the way for precise differentiation by new entrants. Parametric insurance is another example of how this is happening.

—Originally published Jan. 22, 2018 on the IBM Insurance Industry Blog

AGING POPULATIONS WITH LONGER LIFE EXPECTANCIES AND AN INCREASE IN MULTI-CHRONIC CONDITIONS ARE COMPOUNDING COST BURDENS ON SOCIETIES. NEW TECHNOLOGIES AND GROWING CONSUMERISM ARE ACCELERATING EXPONENTIAL CHANGE IN THE HEALTHCARE AND LIFE SCIENCES INDUSTRIES. LEADERS ARE REDEFINING ROLES, IDENTIFYING RISKS, AND ENSURING RESOURCES ARE DIRECTED INTO THE RIGHT INVESTMENTS, WHETHER IN DRUG DISCOVERY OR ADHERENCE, CARE PROVISION OR DELIVERY, OR PREVENTION AND SUPPORT.



WATSON FOR DRUG DISCOVERY IDENTIFIES PROTEINS ASSOCIATED WITH CARDIOVASCULAR DISEASE

BY Watson Health

Heart attack and stroke are 2 of the top 10 causes of death worldwide. Identifying the proteins involved in each of them is the beginning of a journey to understanding how these diseases develop.

In a novel experiment presented at the American Heart Association Scientific Sessions on November 12, 2017, and published in a supplement of the journal Ciruculation, cardiology researchers tested Watson's ability to rank proteins they knew were associated with cardiovascular disease.

In the experiment, researchers gave Watson a list of 1,274 proteins associated with many diseases, some of which the researchers knew were associated with atherosclerosis and heart failure to see if Watson could identify them.

Watson used a training sample of proteins known to be associated with atherosclerosis and heart failure to rank the remaining proteins, by comparing literature fingerprints. Watson ranked the cardiovascular proteins significantly higher than non-cardiovascular proteins and its predictive ability improved with increased specificity of training on the cardiovascular disease phenotypes of coronary atherosclerosis and heart failure.

These data demonstrate that Watson for Drug Discovery does have the ability to help researchers by classifying proteins associated with cardiovascular disease and that the predictive ability is honed with increasing specificity of disease phenotype[1].

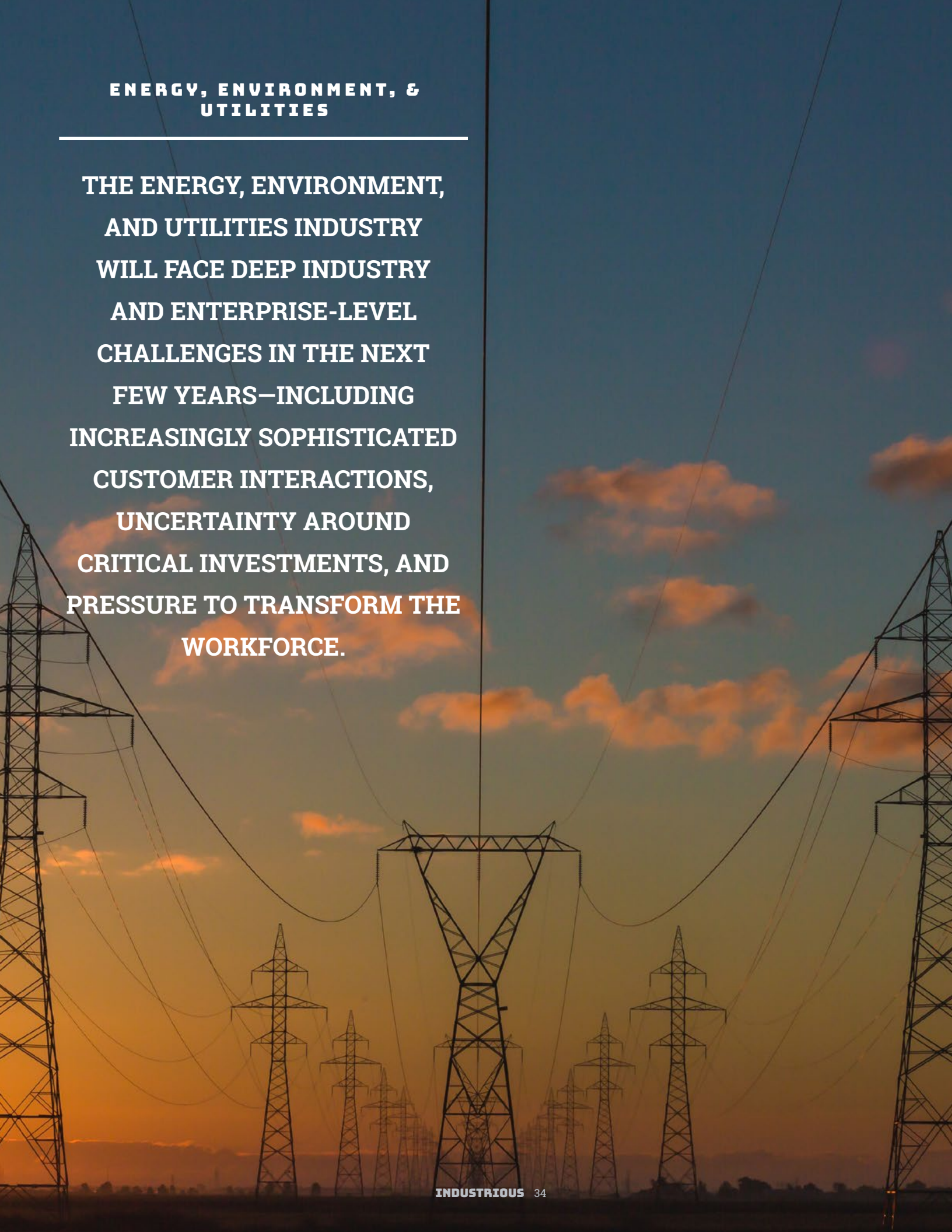
The next step will include analyzing blood samples taken from about 20,000 patients to evaluate whether Watson can successfully identify new proteins for researchers that have not previously been associated with heart failure and atherosclerosis.

[1] Christian T Ruff, Alix Lacoste, Francesco Nordio, Christina L Fanola, Michael G Silverman, Elenee Argentinis, Scott Spangler, Marc S Sabatine. Classification of Cardiovascular Proteins Involved in Coronary Atherosclerosis and Heart Failure Using Watson's Cognitive Computing Technology. Circulation. 2017;136:A16678

—Originally published Nov. 16, 2017 on IBM Watson Health Perspectives

ENERGY, ENVIRONMENT, & UTILITIES

THE ENERGY, ENVIRONMENT, AND UTILITIES INDUSTRY WILL FACE DEEP INDUSTRY AND ENTERPRISE-LEVEL CHALLENGES IN THE NEXT FEW YEARS—INCLUDING INCREASINGLY SOPHISTICATED CUSTOMER INTERACTIONS, UNCERTAINTY AROUND CRITICAL INVESTMENTS, AND PRESSURE TO TRANSFORM THE WORKFORCE.



HACKERS HAVE THEIR SIGHTS SET ON ENERGY AND UTILITY COMPANIES

Energy and utility companies have long been prime targets for hackers. But in recent years, power grid hacks have grown more frequent, and the threat they pose to national security has become impossible to ignore.

In September, the American cybersecurity firm Symantec reported that a group of hackers broke into dozens of energy firms in the US, Turkey and Switzerland as early as 2015, and in some cases were able to gain "operational access" to vital equipment. In October, North Korean hackers breached an American energy utility. In 2015, hackers shut off power for 225,000 Ukranians, and in 2016, they carried out the world's first fully automated grid attack.

Not all hacks have the same intent or outcome. While some hackers, like the ones who attacked Ukraine, are looking to wreak havoc, others are simply looking to steal information.

Governments are nonetheless raising the alarm and preparing for the worst. This summer, FEMA and the Department of Energy sponsored an exercise to examine the hazards of "Black Sky" scenarios—months-long, widespread electric outages caused by natural disasters or malware attacks that could trigger global catastrophe.

"Responding to 'Black Sky' events is all about industry in the lead and government in support,' said former Assistant Defense Secretary Paul Stockton.

To prevent disruptions and disasters alike, experts say, the energy industry needs to invest more in improvements to identify and patch vulnerabilities in the grid. While investments to detect breaches are expensive, according to the IBM Security-sponsored Ponemon Institute's 2017 Cost of Data Breach Study, a successful breach is even more costly.

THE ANGLE

The threat posed by hackers may be intimidating but it can be beat, Jeffrey S. Katz, IBM's Head of Grid Technology for the Energy, Environment and Utilities industry, told Industrious.

> **"Responding to 'Black Sky' events is all about industry in the lead and government in support,' Former Assistant Defense Secretary Paul Stockton**

Companies looking to defend themselves against cyberattacks, Katz said, should make sure they discover vulnerabilities in their systems before hackers do. Few energy companies have the personnel to do that internally, so they must rely on outside experts. [5] To that end, they can enlist IBM to conduct a North American Electrical Reliability Corp. (NERC) Critical Infrastructure Protection (CIP) evaluation or a penetration test.

"The attack vectors are there. The question is who finds them first," Katz said.

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