

Cognizant®



**The Future of  
Communications**

The future of communications will offer a world of opportunities, but this transformation will require substantial steps and boldness. The industry will need to be open to new insights instead of being mentally closed by existing ones.

Each industry has its own challenges, and digital disruption is everywhere. Organizations must be agile and build new momentum that respects the new reality of their industry. As they continuously try to remain relevant, organizations need to adapt to change not only today, but also tomorrow. Change is the only constant. Constant change requires scenario-based thinking, exploring several paths and crafting a digital strategy based on preparing for the future. For businesses to stay relevant, they need to explore the future and look at next generations.

No one can predict the future; organizations must actively explore various possible futures to anticipate what disruptions are coming. We believe that future winners in the digital economy will be those that can deliver on one key insight: put technology in the background, and focus on people first. Putting customers first does not diminish technology's importance; rather, a deep customer understanding should help guide the choice of which technologies to incorporate in your business.

Cognizant can bring together digital strategy, deep industry knowledge, human sciences, experience design and technology expertise to help companies design, build and scale digital business solutions. Cognizant has both the expertise and experience with digital transformation. Together with clients, we can explore tomorrow's opportunities.

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Center for  
The Future of Work

## A view by Cognizant's Center for the Future of Work

# Meet the customer of the future

Euan Davis leads Cognizant's Center for the Future of Work in EMEA. A respected speaker and thinker, Euan has guided many Fortune 500 companies into the future of work with his thought provoking research and advisory skills.

Within Cognizant's Center for the Future of Work, he helps ensure that the unit's original research and analysis jibes with emerging business-technology trends and dynamics in Europe, and collaborates with a wide range of leading thinkers to understand how the future of work will look. Previously, Euan held senior analyst, advisory and leadership positions at Forrester Research, IDC and CEB. Euan can be reached at: [Euan.Davis@cognizant.com](mailto:Euan.Davis@cognizant.com)

Emily is so glad she invited her aunt and grandma over to her new apartment. It was a great chance to show off her new smart home, and watch their amazement as she demonstrated how her lights, closet and appliances worked in the smart system. As icing on the cake, she took them for a ride in her new autonomous car.

Aunt Helen asked Emily how many different providers she needed, and how complex the billing system was for all those smart appliances. So Emily opened her telecom provider's app, and showed how every device – and her car – were listed there. Emily showed them the real-time usage and cost breakdown. Then grandma told that hilarious story about how her phone used to be attached to the wall, and they had to ask an operator to dial numbers for them.

## Quick take

### Post COVID-19 impact

In the wake of the COVID pandemic, the telecom industry has emerged as a golden child of the global economy. Videoconferencing with loved ones and colleagues, Netflix binging and endless online shopping are all only possible due to our telecom providers. However, all has not been smooth sailing, with the crisis causing increased strain on some providers' infrastructure, resulting in slow download speeds and many dropped calls.

The post-COVID telecom consumer will be acutely aware of just how critical reliable connectivity is. Providers' ability to pre-empt connectivity issues and provide robust infrastructure will be a core differentiator in our post-COVID world.



At that moment, the telecom app sent a push notification: apparently, Emily's router lost connection with the server for about 15 seconds. Her provider had already done an automatic diagnostic test, identified the problem, and fixed it. Emily sent a positive review back to the company. She loves how the problems get fixed before she even notices there is one.

**Think telecom is only about communication? Think again. In 2025 and beyond, the only telecom providers that will be relevant are the ones that offer continuous connection, every moment of the day.**

#### Beyond the call

When the telephone was invented in 1875, many believed it was a useless invention that no one would use. By 1920, nearly every household had one. And in the past 100 years, the telephone has gone from a static, rotary-dial device connected by wires to a hand-held master computer that enables multiple forms of communication – voice, text, video, internet and beyond.

But the technology is far from perfect. Connectivity speed and stability vary greatly per region. Downtime and signal disruptions are still prolific. And customers are still bound by contract to a single provider, which determines the bandwidth, speed and availability of the network, and which can only respond to many disruptions when customers call to complain about them.

#### Enabling the future

As the era of Internet of Things (IoT) dawns, telecom providers will play a pivotal role in the development and use of smart technology. Far beyond enabling our smartphones, the telecom industry will provide the super-fast connectivity and stable platforms needed to power consumers' lives, as well as the advancements that will make calls to customer service a thing of the past.

That's why future-focused telecom companies are investing heavily in 5G, artificial intelligence and IoT. Current trends show that people are ready to include all that high tech convenience in their lives. They're simply waiting for the system to be strong and stable enough to support it. They're waiting for a system that's always on and always reliable.

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# Connectivity without disruption is what will be needed in the future.

## **The future of telecom is human**

As is the case with nearly every new technological development, telecom companies are investing in ways to make consumers' lives easier and more pleasant. In addition to more speed and higher bandwidth, they aim to offer more transparency, more reliability and better service than ever before possible.

Think, for example, of AI-enabled technology that automatically monitors and diagnoses network connections to identify issues before they occur. Angry calls from irritated customers about lost connections will be replaced by proactive problem-solving that results in disruption-free service, 24/7, 365 days a year.

And connectivity without disruption is what will be needed in the IoT future. Because, while it's certainly no disaster if your smart refrigerator loses its network connection for 15 seconds, it can be catastrophic if your autonomous car does, especially when it's barreling down the highway at 120 km per hour. An outage would be equally devastating for smart public transport systems that require connectivity to keep trams and trains running safely and on time. For these innovations to truly take off, only the power of a ubiquitous 5G network will suffice.

## **The platform for performance**

In order to deliver on the promise that new technology offers, leading telecom companies are investing in the platforms that will enable consumers to harness the power of all that connectivity. The future of telecom lies in its ability to construct platforms that help consumers transition seamlessly from home to mode of transportation to work to entertainment. They need to smoothly shift from phone to smartwatch to other devices, without giving a second thought to the network or accessibility.

Nowhere is this more evident than in the case of autonomous vehicles. Here, the case for shifting from cloud computing to edge computing becomes most clear. Only when telecoms make it possible for cars to process tremendous amounts of data – instantly, intuitively and without interruption – can autonomous vehicles offer a safe and viable alternative form of transport.

A strong platform will also give consumers what they want most: clear, transparent, secure connections that offer insight into usage, suggestions for more efficiency and immediate troubleshooting. Living in a connected world means never needing to think about your telecom provider, but trusting that that provider will always be there to help.



### Making the call

We've already come a long way from the time of rotary dialing and voice-only calls. But the relevant telecom companies of the future still have a long way to go. Because no matter how much is technologically possible in the future, innovations will be useless unless telecoms provide continuous, uninterrupted service that customers can count on.

The result? Seamless and always-on connectivity. Predictive maintenance and automatic troubleshooting. Autonomous vehicles with the power to take us anywhere we want to go. So when Emily puts her grandma in the car, she can be certain that the ride will go off without a hitch.

“the **future** of  
**communications**  
is human”



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## An external perspective by futurist & trendwatcher Tony Bosma

# Communications reinvented

Tony Bosma (1973) is a futurist and trendwatcher. He is the founder of futuring and consultancy organization Extend Limits ([www.extendlimits.nl](http://www.extendlimits.nl)). Extend Limits does not predict the future but helps organizations anticipate it. Do not ask yourself why things are happening. Ask yourself why hasn't it happened yet? This is the mindset companies need to adopt in this era of change.

Tony Bosma is an authority in future thinking and trendwatching and was nominated in The Netherlands several times for trendwatcher of the year. He is an internationally renowned keynote speaker. He is known for his confronting, inspiring, visually attractive and surprising sessions about a wide variety of topics. He also works for a variety of companies and governments, helping them anticipate the future and, more important, challenge and question today's world and mindset.

In collaboration with Cognizant, Tony Bosma did extensive research into near future trends across industries. Together with Cognizant, he made abstracts of the most dominant developments – not far fetched futuristic worldviews – but realistic developments which are seen right now. These are not only plausible future developments but also the challenges of technological developments.

In today's society, we have nearly unlimited options to quickly and easily connect with and transfer information to each other, whether via text, face-to-face or speech. As a human race, we've become connected to our communication devices. With the combination of rapid adoption and the accelerated emergence of technological developments, the face of communication will likely introduce change beyond what we could even imagine.

But even with today's unprecedented ability to communicate quickly and cost-effectively, are we able to communicate better? Even with the world's abundance of communication devices, people are more lonely than ever. Technology has made it easier to connect with someone on the other side of the planet yet more difficult to connect with someone on the other side of the room.



As technological developments like 5G, wireless sensors and data analytics accelerate, they'll continue to introduce opportunities as well as challenges, and organizations will need to anticipate both. To remain relevant, organizations will need to open their minds to new ways of doing business and reset their views on customer relationships. "Embrace change in communications or die" is the new battle cry. Telecom and communications organizations need to adapt toward service-based organizations, where networks are nodes of personalized services. The biggest challenge for the communications industry is not only the speed of change but also using technological opportunities to radically change the business field of communications.

In just a few decades, the rapid and dramatic changes in how we communicate have turned businesses upside down, led to the fall of regimes and put once powerful and traditional

organizations under pressure. Society changed with each introduction of a new technologically derived communications possibility. Through our virtual selves, which extend our limited physical worlds to the boundless virtual world, we can be anyone or anything, anytime. Our relationships start and end online, and algorithms shape our world views and opinions. Our chats with bots make them our new mates with whom we share our deepest secrets.

There's a new breed of communicators who are accustomed to these new means of communication. These digital natives are the so-called experts in new media and live for access to terabytes of data. They see the digital world as their personal answering machine and social playground in which they can get satisfaction when they need or want it. This world adapts to them instead of the opposite; with one push of a button or by talking to their devices, their needs are instantly gratified.

“**By 2025, an average connected person anywhere in the world will interact with connected devices nearly 4,800 times per day – basically one interaction every 18 seconds.**”

*SIDC/Seagate*

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# Smart networks are the new normal.

New technologies also have their limitations. The need to adapt to these limitations has given rise to new vocabulary and even a change in human communication styles. Our small keyboards and screens have shortened our words and sentences and increased the use of symbols. We prefer to read short summaries rather than in-depth articles. All content needs to be snackable and sharable as our communications have become on-the-go, fast and limitless.

Advancements in technology like AI, machine- and deep learning are also changing the relationship between companies and consumers. As technology moves from a mobile-first world to an AI-first networked world, our societies become artificial-driven. Important future words for network carriers are now “smart” and “connected”. As we see the rise of smart cities, smart cars, smart clothes and smart devices, the network becomes a key element in this smart world. And there is no smart if connectivity isn’t available. The IoT emerges everywhere, from healthcare to retail and sports and from energy to travel. Our world becomes an artificial network, and everything relies on its speed, dependence, safety and availability.

Without the network, future societies will stop. Downtime will mean disaster. The future of networks is not only about higher speeds, smoother browsing and live streaming, but also about adaptability and flexibility. Smart resilient networks will need to cope with the ever changing demands from customers and society.

In this dominant networked world, telecom and communications organizations need to become data-enabled services companies that are able to optimize traffic and data sharing and analyses. Services on these networks can differ from enabling connected cars and other smart mobility services to securing long-distance operations in hospitals of future “hospitals”. As humans and their surrounding networks become data-driven, reactive

communication and services between consumers and companies transform toward proactive, predictive and even prescriptive services and communications. As bots take on adaptive personalities, they’ll fulfill the needs and desires of individual customers with nuanced, contextual communication.

## Virtual identities on networks

In a world of rampant interconnectivity, increasingly intelligent networked technologies and enhanced machine-to-machine communication, interactions and engagements between organizations and customers will be fully driven by smart machines. Humans will be represented by algorithmically driven virtual identities that increasingly interact with devices and customer service bots. Already, in our own living rooms, devices evolve via updates to add extra functionality, and our smart surroundings add more context to our everyday conversations by sharing this information that our human-to-machine conversations will enhance.

More secure and reliable networks become essential as we physical humans become digital entities. Our network providers need more than ever to protect our virtual identities and excel in building trust and security into our transformative networks. According to the U.S. Federal Reserve, synthetic identity fraud is on an exponential rise. This new fraud is a combination of fictitious and real information to create new identities. Besides fraudulent identities, our products and services at home will be updated with a push of a button. But who will protect us from malicious updates? Our network providers could start much needed services in this field of play.

## Communications merging with our human body

As we increasingly use speech as a machine interface, our devices listen to us every second of the day, and are learning to analyze and interpret what we say. Searchable speech will



become possible in the future, and our emotions, personality, tone, gestures, location and context will all be taken into account by our devices and networks.

Our attitudes about communication are still very entrenched in traditional mindsets, but the future could introduce even more new forms of communication. Consider that research is already being conducted into the “brainternet,” which turns the brain into an IoT node on the web (according to a release published on Medical Express). How would communication transform if human brains got connected to the Internet? How about a world where we are connected to the web and browse the unlimited amount of data there?

As Ben Goertzel, founder of Singularitynet, once described: “Imagine it’s eight years from now. All the other kids in your daughter’s third-grade class are way ahead of her because their brains are connected directly to Google and a calculator, and they’re SMSing back and forth by WiFi telepathy between their brains while your daughter sits there in class being stunted because she must memorize things the old-fashioned way and can’t send messages brain-to-brain.” Neuralink, which counts Elon Musk among its founders, is one company that’s trying to connect the human brain with computers without a physical connection. Will this technology really make enhanced humans a reality?

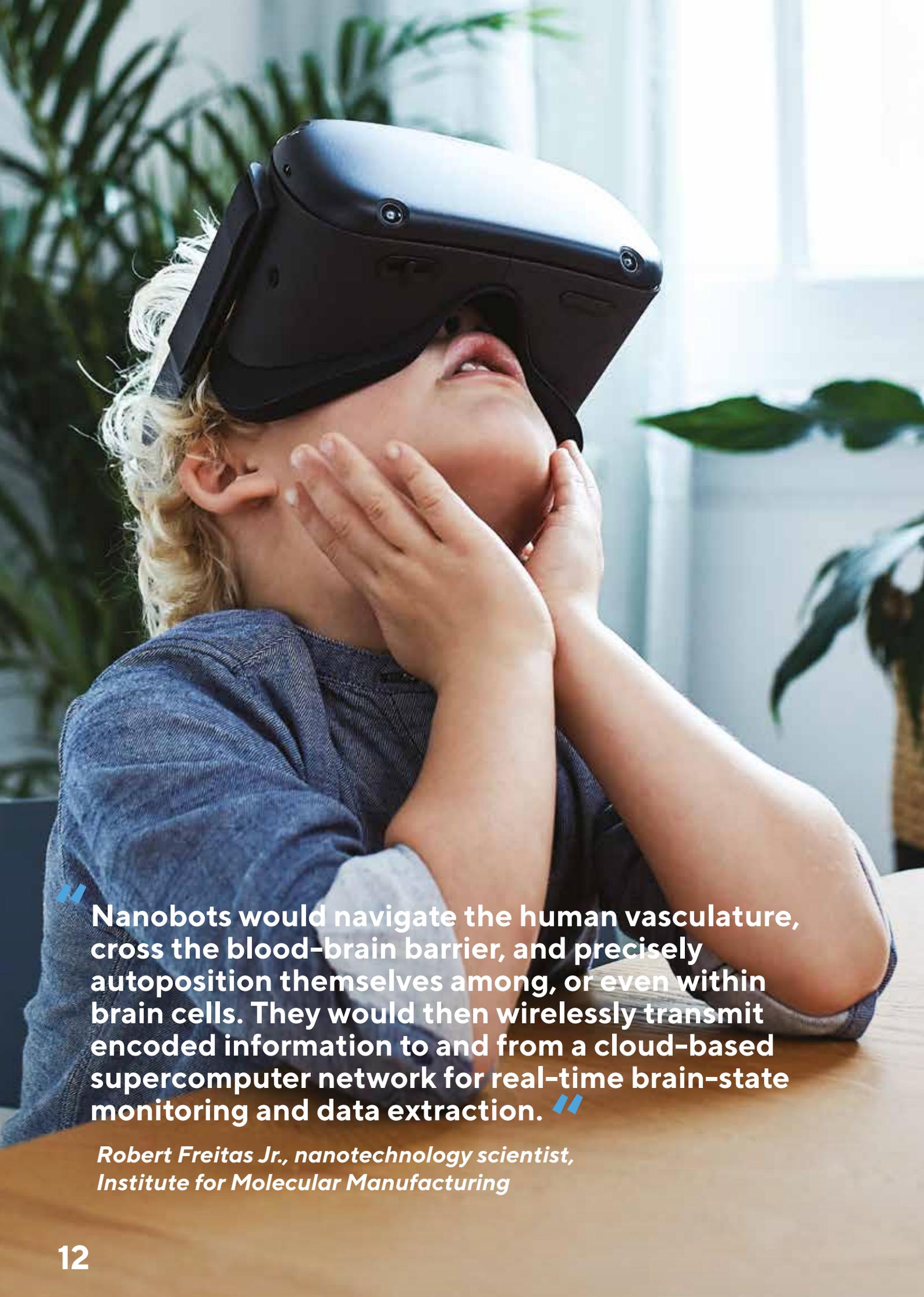
### Reputation and purpose by analytics

In an interactive world of instant access and gratification, the words of one individual can have more impact than a million-dollar marketing or media campaign. With global interconnection and instantaneous communication, the reputations of brands, organizations, governments and individuals can flourish or be destroyed instantly. Strong reputations are now being threatened by the very means of communication once used to build them. As a result, brands need to change their mode of communication from “command-and-control” to “connect-and-engage.”

Reputation is now built by facilitating dialog with the outside world, focusing on societal purpose and delivering useful and authentic information about the brand or organization. The use of data and analytics in brand and reputation management has become crucial, as these provide insights into a company’s reputation over time. Real-time data analysis and storage becomes the services of the near future for telecom providers as reputation in the digital world becomes more important.

**“ 70% of respondents still prefer to speak to a human than an AI system or a chatbot when dealing with customer service, and 69% of respondents agree they would be more inclined to tell the truth to a human than to an AI system.”**

*Pegasystems, 2019*



**“Nanobots would navigate the human vasculature, cross the blood-brain barrier, and precisely autoposition themselves among, or even within brain cells. They would then wirelessly transmit encoded information to and from a cloud-based supercomputer network for real-time brain-state monitoring and data extraction.”**

*Robert Freitas Jr., nanotechnology scientist,  
Institute for Molecular Manufacturing*

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## Imagine, one day...

Imagine it's 2050, and we're continuously connected to a web of smart machines and sensors. Intelligent machines know what we want and need. Getting ill is a thing of the past because these systems analyze our health and take remedial action. All the new services and companies that thrive do so by embracing new possibilities of communication and harvesting the data we provide to smart machines.

Our virtual representations represent us online and interact with digital agents for products, service delivery and pricing. With everything seamlessly connected and digitized, technology manages all of our everyday needs. Human-to-human contact is a choice and becomes more intense as we can be everywhere and experience anything, with our five senses enhancing our communication.

Our data is shared without our intervention but only when and with whom we want it to be. We even relate with "affective AI," bots that can recognize, interpret, process and mimic human emotions. Communication between organizations and humans is driven by human demand and not by organizational possibilities. New regulations and digital human rights protect privacy, data and free will. In this future, we know when our decisions are being influenced by technology. We know which data we share and when our worldview is limited by algorithms.

Questions abound about this imagined future: What does it mean for the relationship between companies and consumers, privacy and human values? Can technology create real progress by fundamentally changing communications and bring humans closer together? The possibilities are endless.

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# Communications reinvented

## New challenges and questions

It's riveting to imagine the technological-driven future of communication. Every day, we see new start-ups and services appear. Some emerging services promise in the near future that we'll be able to communicate with our dogs.

But even as technological advancements in communication ease and enhance our lives, they can also be put in a different context: We need to think about the shifting responsibilities that come with them. In addition to all the good that technology can do, we're also experiencing the bad it can bring. We live in a world of accelerated addictiveness to our devices, exposure to surveillance devices disguised as household items and a constant onslaught of noise, content and diversion. We find it harder to control our attention spans, with free digital services available anytime and anywhere, many of which have turned from nice gimmicks to behavior manipulators.

It's become so easy to connect and communicate with each other via technology, but our differences have become more pronounced. Is this what we call technological progress, or have we just not embraced all the new possibilities? The crucial question is: Is what we technologically can achieve in communication the same as what we actually want? We need to enable the next step in human communication, where the biggest challenge is creating real human progress out of the technological expansion. Let's embrace all the possibilities of technology to connect with each other and share and create a new mindset about society, economy and technology. Let's turn away from the sinister side of technological possibilities and connect and empower people, fight inequality and improve transparency.

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“ We have **suffered**  
a loss of **ability** to focus  
without **distraction**.  
The **result** is mental  
health issues, **less empathy**  
and **more confusion**. ”

Technologies like smart and connected sensors, intelligent bots and natural language processing make our lives easier. But these advancements also have negative impacts, among them, misinformation, filter bubbles and privacy conflicts. As businesses strive to keep up with accelerated technological innovations, they need to put digital ethics at the center of everything. Technologically enabled, ethics-driven and human-centered organizations will be the new winners of tomorrow.

Ethical issues become more complex with every innovation that emerges in the field of communications. Chatbots will become so sophisticated that they will decipher customer intent at a detailed level, and their communications will become indistinguishable from that of a human. For now, these bots are used to make communication processes more efficient. But in the near future, their purpose will be to engage consumers proactively. Do we need to warn consumers that they're interacting with a bot? Is it ethical that in the near future we see, hear or experience no difference between technology and humans?

Going even further, what is free will in an ever-connected world where our emotions, needs and wishes are being monitored? Algorithms that decide what we need are part of our futuristic worldview, as are machines that learn from us and act for us. In this scenario, are our personal choices really free, or are smart technologies and algorithms influencing them for the sake of profit? What are the enabling technologies really enabling? These questions will become more important to think and act upon.

Privacy has entered a time of flux, and while new legislation is being introduced, it seems to be behind technological progress. The reality is that as organizations continuously work to gather more data from us, we become the product even when we pay for a product or service. We're no longer able to escape the watchful technologies that monitor us because our data has become too valuable. Privacy is becoming a luxury good and the means of a unique selling proposition for innovative companies. Consumers need to be fully aware of the dangers and risks accompanying the new tools of communication. While governments will continue to enact legislation to protect citizens, the best protection is awareness and knowledge about how to deal with all the technological challenges. The future requires people to be digitally literate. In response to the digital overload brought on by constant connectivity, countertrends have emerged, such as the need for depersonalization, offline astonishment and less attainability. In a world where digital experiences are the new normal, interaction with the physical will become the new unique. In an increasingly digital and artificial world, human interaction will become the new luxury good and status symbol.



**“By 2020, customers will manage 85% of their relationship with the enterprise without interacting with a human.”**  
*Gartner*



# The future is already here

Communications is evolving from human-to-human interactions to conversations with, and between, machines. Machines not only react to our conversations, but they also use algorithms to communicate with us based on past dialogs, current context and AI-driven predictions. Communication via technology is no longer based just on words and text but also on facial expressions and emotions, all in a seamless and natural human way. No longer do humans have to adapt to technology to communicate; our whole body has a role in the communication process. While data will be extracted from everywhere, it will be used in ethical ways and will be focused on quality, not quantity. In this future world of interactivity and continuous connectivity, organizations will focus on reputation and adding purpose to people's lives. These new possibilities of communication will put pressure on the level of trust we have in our traditional economic models and speed the transformation toward a purpose-driven business world.





# Real-life cases

The following cases are inspirational and show how the world of communications is changing. Startups and innovative ideas can grow but also fail fast – that is innovation at the frontiers of an industry. (No business relationship exists between the cases below and Cognizant.)

## **Dowse**

Dowse puts the consumer in control of the Internet of Things in their home. The startup wants to make consumers more aware of the IoT devices in their home and give them more control over them. The company gives users a window into the security of their IoT-connected devices and an on/off switch for the data these machines share with third parties.

[www.dowse.eu](http://www.dowse.eu)

## **DataGrid**

DataGrid uses AI to create virtual humans for businesses to use for anything from advertising to displaying apparel. The startup uses generative adversarial networks (GANs), which process large data volumes to create content similar to what it sees. The system has even made realistic faces of Japanese idols who do not exist.

[www.datagrid.co.jp/en/creative-ai](http://www.datagrid.co.jp/en/creative-ai)

## **HoloME**

HoloMe is a startup that has created a self-serve platform that brings humans to life via augmented reality. This could help organizations tell their story in the consumer's environment by mixing humans with virtual reality.

[www.holo.me](http://www.holo.me)



“Technology  
changes  
all the time,  
human nature  
hardly ever.”

*Evgeny Morozov*

### **Solid**

Solid was started by Sir Tim Berners-Lee, the inventor of the World Wide Web, with the mission of reshaping the web as we know it. Solid empowers users and organizations to separate their data from the applications that use it. It allows people to look at the same data with different apps at the same time, opening new avenues for creativity, problem-solving and commerce.

[www.inrupt.com/solid](http://www.inrupt.com/solid)

### **Stealthy**

Stealthy offers a decentralized, encrypted messaging protocol enabled by blockchain and owned by the individual. The company's goal is to help individuals protect their privacy through a blockchain approach.

[www.stealthy.im](http://www.stealthy.im)

### **Mirror**

Mirror offers a smart interactive full-length mirror that enables users to exercise at home, guided by an instructor. When the mirror is activated, users see themselves surrounded by classmates and led by an instructor. Any

workout or training routine can be guided by the mirror and done in the room.

[www.mirror.co](http://www.mirror.co)

### **The future is human**

Humans excel at being creative, in seeing, identifying and investing in opportunities, and solving problems. Our human experiences and emotions – anger, sadness, love – will drive the future of communications. No matter how effective and intelligent technology becomes, it will never replace the human need to experience unique feelings.

The biggest challenge of communication technology will be to enable better connections among humans, facilitating human dialog to bring us closer together, express ourselves and narrow the gap between our distance and differences.

Let's be curious about the future and not fearful. Let us, as a society, create and discover the future of communication and enhance it – together.

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# Key take-aways

1. Put customers in control of their own data, and enable them to utilize it their way.
2. Use technology to predict and prescribe data usage. Say goodbye to reactive services, and become proactive.
3. Digital trust has become mission critical for the telecom industry.
4. Telecom providers move toward becoming the platform owner.
5. Look to collaborate with adjacent industries to build a platform ecosystem.
6. As digital and connectivity are the new normal, offline and disconnecting is the next unique.

# Cognizant<sup>®</sup>

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## **ABOUT COGNIZANT**

Cognizant (Nasdaq-100: CTSI) is one of the world's leading professional services companies, transforming clients' business, operating and technology models for the digital era. Our unique industry-based, consultative approach helps clients envision, build and run more innovative and efficient businesses. Headquartered in the U.S., Cognizant is ranked 193 on the Fortune 500 and is consistently listed among the most admired companies in the world.

Driven by a passion to help our clients build stronger, more agile and more innovative businesses, we enable global enterprises to address a dual mandate: to make their current operations as efficient and cost-effective as possible and to invest in innovation to unleash new potential across their organizations. What makes Cognizant unique is our ability to help clients meet both challenges. We help them enhance productivity by ensuring that vital business functions work faster, cheaper and better. And, our ability to conceptualize, architect and implement new and expanded capabilities allows clients to transform legacy models to take their business to the next level.

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Learn how Cognizant helps clients lead with digital at  
[www.cognizant.com](http://www.cognizant.com)

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