



# Future Disrupted: 2020 technology trends

Connecting people and technology today  
for an intelligent tomorrow

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## Foreword

As several of our contributors in this publication note, the **pace of change in our world is unprecedented** – and it's not going to slow down any time soon.

**Where do we go from here?** What does a disrupted future look like? Our Future Disrupted e-book gives you a view of the **potential** that lies in the changes we are seeing, the inevitable **risks and challenges** that will have to be negotiated; and the **steps you can take in 2020** to take immediate advantage of the trends we see on the horizon.

### Three key themes: data, edge, security

Looking across all the trends and topics we've covered, three key themes emerge:

- **The potential and pervasiveness of data:** Data is everywhere and in every thing that connects infrastructure, systems, organizations and people. It's absolutely critical to have strategies and processes that enable you to use data effectively to solve problems and initiate changes that have a real, positive and lasting impact.
- **Changes at the edge:** The Internet of Things (IoT), next-generation connectivity, container-based architecture, SD-WAN: the impact of edge processing is undeniable. It's affecting infrastructure, applications and security, as well as the way organizations can extract value from new data they're able to collect and process.

- **The adoption of hybrid compute:** The computing model evolution, particularly the shift from multicloud to hybrid cloud, comes with its own challenges. Organizations are grappling with security risks and how to best manage data and infrastructure performance in these environments.

### Prepare and prioritize for disruptive innovation

Going through the different contributions to Future Disrupted, it's clear that we've never before had so much powerful technology at our disposal – technology we can use to answer questions and solve problems in our societies, businesses and communities. There's a huge opportunity to use any and every tool out there to support innovation initiatives in every field, and truly transform our future world for the better. **Successfully leveraging these opportunities requires intelligence.**

Intelligence in the way we look at problems and analyse the data that can help us solve them; intelligence in the way we connect the people who can connect the dots; intelligence in the way we use and manage the technology that underlies the solutions we develop. For us at NTT, intelligent means data-driven, connected, digital and secure – as you'll see in the articles that follow.

**It also requires resources and skills that organizations may not necessarily have today.** The scale and pace of change we're seeing means many organizations are faced with managing the seemingly competing priorities of maintaining business-as-usual operations while driving innovation initiatives and exploring opportunities for disruption.

**In addition to evolving technologies and new technologies, future disruption will, by necessity, see a greater and deeper level of partnership between technology organizations and their clients.**

In sharing their expertise, insights and capabilities, technology providers will be in a strong position to co-innovate with organizations, advising and guiding them on how to do things better – or, if needs be, completely differently.

**Helping people, clients and communities do great things with technology is what we do at NTT.** We're invested in tomorrow's intelligent world and we're here to help our clients do the same. **2020 is a step towards Future Disrupted.** The actions you take now will shape your future. We trust that, as you read further, you'll be better informed about and prepared for that future, and ready to take some bold strides forward.



**Andy Cocks**  
Chief Go-to-Market Practices Officer

Andy leads our go-to-market practices, sales operations and partner alliances globally. He has over 30 years of experience in the technology industry and expertise in various fields, having led technology delivery and performance in IT and telecommunications, systems integration, and user experience planning.

Follow Andy on [LinkedIn](#)

In July 2019, **28 businesses from the NTT Group's international operations** – NTT Communications, Dimension Data, and NTT Security – were **integrated under a new, global operating company, NTT Ltd.** Over the **next five years, we'll be investing** an average of **USD 3.6 billion in innovation initiatives** that will help our **clients develop and execute their innovation agenda**, using **new and emerging technologies to disrupt existing models** and **achieve their business outcomes.**

We gather insights globally to understand the future and shape intelligent technology solutions for our clients. Our Future Disrupted: 2020 technology trends reflect how we're creating solutions that are data-driven, connected, digital and secure in 2020.

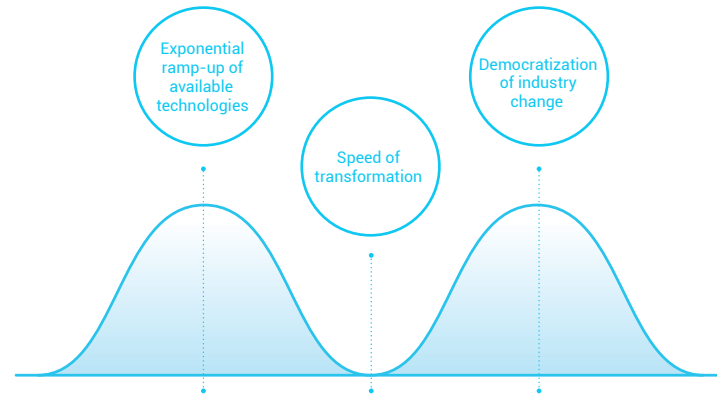
This e-book **summarizes trends across six key themes we believe businesses should be focusing on in 2020** as their first steps towards Future Disrupted. Our experts discuss the trends they see shaping the future.

## Run, change, reinvent – business strategies for the age of digital disruption

**Multiple catalysts of innovation** have been moving at a dazzling speed, creating the **perfect wave for disruption**. There's **enormous potential** for just about anyone to do just about anything. To **succeed in the age of digital disruption**, first find a problem. Then, create an approach which changes the way the problem is solved today.

### Three elements of the perfect wave

This is not the first time in history that innovation and technology have fundamentally changed the way we live and work. But it is the first time we've been exposed to change at this scale and speed.



The age of digital disruption

**The exponential ramp-up of technologies, speed of transformation and democratization of industry change have created a perfect wave for the age of digital disruption.**

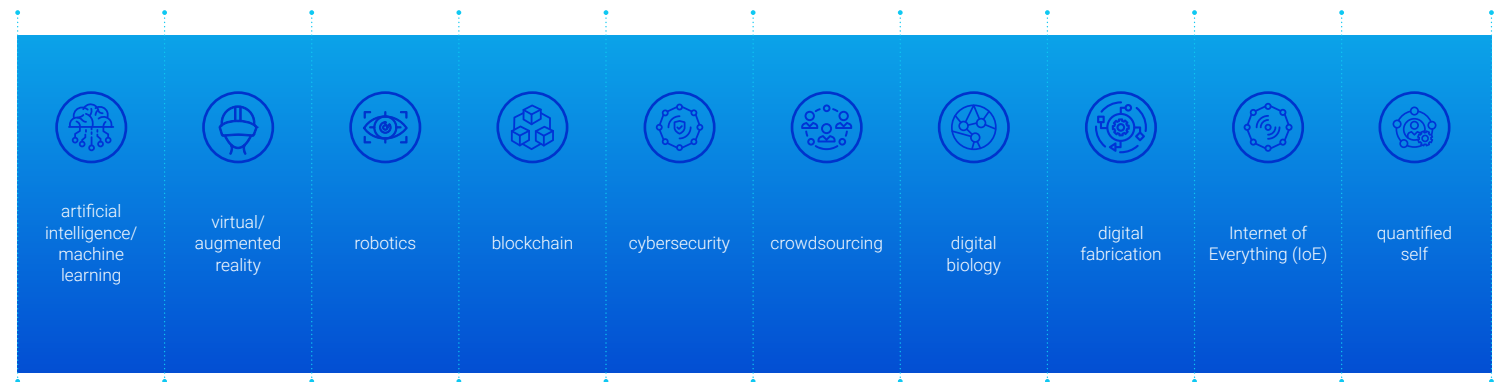
### The question is: How should businesses respond?

**Put the problem before the technology**

**Innovation isn't about the technology itself. It's about new business models that leverage technology.**

Can technology change the world? This is a good question to ask, especially when you look at the list of 10 disruptive emerging technologies we think are the foundation of the digital revolution.

### 10 technologies, 10 agents for change



10 technologies, 10 agents for change



But you could change many industries today with already mature technologies. **Innovation isn't about technology: it's about finding a problem and creating an approach that changes the way the problem is solved today.** Then, when you want to take that approach from concept to reality, you have many technology levers to do so. Five years ago, we had three to five technology levers to create solutions. Today, we have technologies that are already booming – such as social and mobile – as well as emerging technologies such as artificial intelligence (AI) and Internet of Things (IoT).

This really opens the door to create any scenario you can imagine.

### Pillars of technology change: artificial intelligence and Internet of Things

AI in all its dimensions, from conversational AI to robotics and machine learning, is having a major impact on how we live and work. On the IoT side, any analog element of our lives – a car, a road, a factory, a house – is becoming digital, allowing us to capture data and create an environment that not only senses change, but also reacts to it in real time.

### Three strategies for disruption

Innovation is only one part of the answer. For any company, in any industry, these three strategies are mandatory: **Run your business. Change your business. Reinvent your business.**

Organizations tend to focus mostly on innovation. Even then, they're applying what we call **incremental innovation**: creating a new or improved version of an existing product or service to **change** the business.

What they also need to consider is **radical innovation**, where you don't start with a product that needs improving but a problem that needs solving – and consider any number of far-out ideas to get to that solution and **reinvent** the business.

### Steps to radical innovation

**Radical innovation poses its own unique problem though:** its aim is to change a business which, by its very nature, is designed to fight the agents that want to change it. So, in its attempts to be disruptive, the incumbent business may very well act as its own worst enemy.

Evidence from multiple industries and companies shows that this is the primary source of failure of radical innovation. **To address disruption effectively, you need to decouple radical innovation from your core business:**

1. Set up a team whose sole mission is to reinvent.
2. Give them the authority to create a whole new way of doing business.
3. Isolate them from the basic operations of the company and your core business.
4. Let them start small and explore.
5. Once they're big enough, they can either come back into the business or develop as a separate, radically different enterprise.

Read the full article [here](#)



**Marc Alba Otero, Senior Vice President, NTT, Inc., and Head of NTT Disruption**

### About the author

Marc is a leading expert in disruptive innovation, entrepreneurship, exponential technologies, and digital transformation.

As Head of NTT Disruption, a newly established business unit of NTT Inc, Marc's goal is to 'create today what really matters for tomorrow' for the NTT Group and our clients. He focuses on relentlessly hacking business models and disrupting industries by leveraging exponential technologies.

Over the course of his 20-year career, Marc has specialized in innovation and transformation, and has extensive experience in a wide variety of roles, including serial entrepreneur, researcher, chief innovation officer, and transformation director. He is also the founder of various non-profit organizations. Marc has been involved in major industries, including automotive, telecom, manufacturing, banking, insurance, government, and energy among others. These diverse experiences give him a unique and holistic perspective of the key socioeconomic challenges facing business and humanity worldwide, which led to the founding of NTT Disruption and its mission: disrupt for good. A citizen of the world, humanist, and work enthusiast, Mark has authored and co-authored five books and more than 100 publications.

## Intelligent business – redefining transformation

Organizations are changing their approach to digital transformation, seeing it as an **ongoing series of small steps rather than a giant leap** with a finite landing place. In a similar way, they're taking a more **long-term view of customer experience**, as they seek to connect the dots in each customer transaction as well as over the customer's lifetime journey with the organization. **Data is central to everything and needs robust systems** to ensure its potential is not overshadowed by the challenges of managing it.



### **Nemo Verbist, Senior Vice President, Intelligent Business and Intelligent Workplace**

Nemo Verbist is the Senior Vice President for Intelligent Business and Intelligent Workplace. In this role he's responsible for delivering the vision, strategy, and go-to-market execution for these two practices.

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# Intelligent business

## five key trends in 2020

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1

### Big thinking, small steps: redefining digital transformation

It's not a once-off project but an ongoing way of working



**83%** of organizations say **digital transformation** should **focus on driving a change in culture and behaviour.**

NTT 2019 Digital Means Business Benchmarking Report

#### Steps to take in 2020

**Start somewhere and keep moving**

Adopt an opportunistic mindset and an iterative, agile approach.

2

### Data-driven dynamics: where CRM meets ERP

Information collected from all systems is used to reengineer the organization



Organizations say **analytics** and **revised operating models** are **top contributors** to improving **workforce optimisation.**

Dimension Data 2019 Global Customer Experience Benchmarking Report

#### Steps to take in 2020

**Unlock the value of data**

Automation, augmented analytics, and artificial intelligence are the keys to unlocking the value of data collected across the enterprise.

3

### Lifetime relationships: the cloud-enabled customer journey

Focus on the entire customer journey not just a single successful transaction



**Silo management** is the main challenge to implementing an **omnichannel strategy.**

Dimension Data 2019 Global Customer Experience Benchmarking Report

#### Steps to take in 2020

**Optimize your multi-cloud environment**

You'll need a strong multi-cloud environment to support the infrastructure and workflows behind customer journey management.

4

### Real-time insight: sentiment analysis gets more sophisticated

Customer sentiment analysis allows for a more proactive approach



**72.7%** of organizations are using **analytics intelligence** to inform **product** and **service transformation**

Dimension Data 2019 Global Customer Experience Benchmarking Report

#### Steps to take in 2020

**Enable innovation on demand**

Commercialize the data you have to target smaller audiences, and develop innovative products and services to meet diverse needs.

5

### Data lakes and digital twins: enabling new analytics models

Data lakes will enable new models of predictive analytics



**Organizations** can create a **'digital twin'** of each customer that's the sum **of all their data parts.**

#### Steps to take in 2020

**Get the right skills**

You'll need expertise to set up, manage, and secure your data lakes, and build data models for ongoing innovation.



## Intelligent workplace – optimize the workplace for outstanding employee experience

Designed for productivity and automated for efficiency, the intelligent workplace **works for employees** and **customers** alike. It's also **flexible** enough to accommodate changes in **the work we do**, the **work that machines do**, and how we **cooperate and collaborate** in the era of the **Fourth Industrial Revolution**.



### Nemo Verbist, Senior Vice President, Intelligent Business and Intelligent Workplace

Nemo Verbist is the Senior Vice President for Intelligent Business and Intelligent Workplace. In this role he's responsible for delivering the vision, strategy, and go-to-market execution for these two practices.

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# Intelligent workplace five key trends in 2020

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1

## The rise of the modern collaboration estate Infrastructure generates data that can help improve performance



**Employees** expect the organizations they work for to give them the **freedom, flexibility, and tools** to do what they **love, and do it well.**

### Steps to take in 2020

#### Accelerate your move to a single collaboration platform

With unified communications and productivity systems on the same platform, it's easier to deliver the experience employees expect.

2

## The growing spotlight on agile ways of working Team productivity replaces individual contribution



One of the **top three benefits of digital strategy** is shaping **new ways of working.**

NTT 2019 Digital Means Business Benchmarking Report

### Steps to take in 2020

#### Focus on enabling teams

The tools and applications you use must fit your processes, culture, and way of working – and accommodate a wide range of work styles.

3

## The dual role of smart buildings Workspace design considers employee wellbeing and environmental sustainability



**Workspace environment** is one of the **top two strategies** for meeting **evolving workforce demands.**

Dimension Data 2019 Global Customer Experience Benchmarking Report

### Steps to take in 2020

#### Design spaces that make employees happy

Get employee input into every aspect of design, from the look and feel of the spaces to the names of meeting rooms.

4

## The impact of split-second customer loyalty Every touchpoint on the customer journey must have maximum impact



**56.3%** of organizations have a single person **accountable for CX;** **30.4%** of whom are at **board level.**

Dimension Data 2019 Global Customer Experience Benchmarking Report

### Steps to take in 2020

#### Make the single source of data a strategic priority

Bring together customer relationship management, enterprise resource management, sales, invoicing and data from systems across the organization to create a single, connected, customer journey.

5

## The effectiveness of the data-driven organization Data is the foundation for determining what machines and humans should do



**Automation will replace** between **11% and 25%** of **CX-led activity** currently performed by agents by 2020, say **32.7% of organizations.**

Dimension Data 2019 Global Customer Experience Benchmarking Report

### Steps to take in 2020

#### Implement artificial intelligence and machine learning

Define where you can automate processes, improve the customer experience, and make life easier for employees.

## Intelligent infrastructure – accelerating impact of data

### **The impact of data on infrastructure is accelerating.**

Infrastructure is not only **supporting data for business intelligence**; it's also **becoming a data source**. The shift from a multicloud to **hybrid cloud environment creates new challenges** for managing data, infrastructure performance, and cybersecurity. The software-defined wide-area network (**SD-WAN**) **will be fundamental** to adopting new connectivity technologies to enable your hybrid cloud strategy in a **cost-effective** manner without sacrificing application performance and **end user experience**.



### **Rob Lopez, Executive Vice President, Intelligent Infrastructure**

Rob is accountable for transforming NTT's services, capabilities and go-to-market. This is to assist clients in building and managing cloud, data centre, networking and security infrastructure that's responsive to their businesses, applications, and data needs while reducing overall costs and operational complexity.

Follow Rob on [LinkedIn](#)

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# Intelligent infrastructure

## five key trends in 2020

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1

### IT infrastructure: from multicloud to hybrid cloud

Simultaneously managing workloads and data across hybrid cloud



Managed services leveraging automation, AI and ML will address **performance, cost** and **complexity challenges** associated with multicloud.

#### Steps to take in 2020

##### Optimize lifecycle management in a hybrid cloud environment

Uncover which platform is best suited for each workload and plan a migration and data management strategy accordingly.

2

### SD-WAN meets cloud networking

Multiple ways of providing a network backbone and access



Organizations will have **multiple connectivity options, such as hyperscale, as network providers and 5G** will complement existing **backbone and access network options** respectively.

#### Steps to take in 2020

##### Explore all network connectivity options

Invest in appropriate skills for design, installation, and management of your new WAN, for optimal performance.

3

### Connectivity at the edge

Internet of Things requires more processing and storage at the edge



By 2025, there will be more than **55 billion IoT devices**, up from about 9 billion in **2017\***.

\*IoT Report: How Internet of Things Technology Is Now Reaching Mainstream Companies and Consumers. By Peter Newman. Business Insider. July 27, 2018

#### Steps to take in 2020

##### Have the right management framework for hybrid networks

Focus on your SD-WAN strategy, software-defined access, and intent-based networking to drive more agility in upgrading your infrastructure.

4

### Managed services platform and automating the network with intent

Agile infrastructure needs create demand for automation and analytics skills



Organizations will need **appropriate automation, operational processes, and platforms** to manage large-scale infrastructure rollouts.

#### Steps to take in 2020

##### Partnering for the right skills

Given the massive skill shortages, partnering for required software DevOps and data science capabilities will be necessary.

5

### Security becomes central to infrastructure design

Security is no longer the domain of security specialists only



The sheer scale of current threats **moves security from 'after the fact' to 'before the build'** in infrastructure design.

#### Steps to take in 2020

##### Build in security from the start

Adopting a 'built-in' instead of a 'bolt-on' approach will ensure that infrastructure is secure by design.

## Intelligent cybersecurity – automation and orchestration

While **cloud-based security, machine learning**, and the move from zero trust to **digital trust** are common threads from last year, there's been a **fundamental shift in how security is being acquired. Automation and orchestration** are the watchwords for 2020: security orchestration, automation, and response (**SOAR**) will be the **hottest area in cybersecurity** in the year to come.



### **Matthew Gyde, Chief Executive Officer, Security division**

As Chief Executive Officer, Matthew is responsible for executing our security strategy, services, and go-to-market with the goal of building the world's most recognized security business, supported by a team of highly talented security professionals.

Follow Matthew on [LinkedIn](#)

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# Intelligent cybersecurity

## five key trends in 2020

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1

### SOAR rockets to the moon

Attacks happen at machine speed and need machine-speed responses



**75% of threats** detected in our SOC are by **supervised machine learning and threat intelligence**.

#### Steps to take in 2020

**Embed intelligence into infrastructure and applications**

Use algorithms to recognize patterns, identify anomalies, and automatically orchestrate security controls.

2

### Security goes to the cloud

Moving to the cloud? Know the risks



**Attacks on critical infrastructure** are one of the **top five issues** facing businesses today.

NTT Security Risk-Value Report 2019

#### Steps to take in 2020

**Test your security posture across all types of infrastructure**

Work with a security vendor that can help you manage security from the data center to the edge.

3

### Hyperscaler patterns continue to be elusive

It's almost impossible to detect anomalies in hyperscaler infrastructure



We **analyze 19.6 billion security events** every day to find the **needle in the haystack**.

#### Steps to take in 2020

**Apply intelligence to security around applications and workloads**

Partner with us to get the intelligence you need to respond to breaches faster.

4

### Applications are the new attack vector

Applications are quickly becoming the easiest way to compromise data



**Application-specific and web-application attacks** accounted for over **32% hostile traffic**, making them the **top category of hostile activity**.

NTT Security 2019 Global Threat Intelligence Report

#### Steps to take in 2020

**Run regular hygiene checks**

Evaluate the security hygiene of applications regularly and apply the necessary patches.

5

### Identity is being redefined

It's not only human identities that need security controls



The **identity of a digital twin** will be just as **important to secure**, as this is where attackers **will focus next**.

#### Steps to take in 2020

**Identify and secure humans, machines and applications**

Monitor their behaviour to identify anomalies that indicate a security threat.

## Technology services – mile wide, mile deep

**Digital transformation** initiatives and the growing adoption of **multicloud** continue to **shape the IT services market**. **Client expectations** are a **mile wide**, and **service providers** must be a **mile wide** and a **mile deep**. They need to deliver across the **entire services continuum**, cover **multiple technology domains**, and relook at how they can **innovate** to meet the needs of clients in a **standardized way, at scale**.



**Daniel Greengarten, Senior Vice President, Client Success**

In his role as a Senior Vice President, Daniel is responsible for driving managed & support services to market via through platform-enabled Managed Services, from multicloud, managed security and collaboration right through to the micro services that drive automation across it all.

He is also responsible for client success management, ensuring clients effectively adopt and use NTT services, so they obtain maximum business benefit and value as they strive to navigate their digital future.

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# Technology services five key trends in 2020

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## 2020 and beyond – disruptive technologies

### Technology is changing at the speed of light...

but this is the slowest pace of change we'll ever see.

The **democratization of innovation** is providing companies with greater access to **new technologies**, fuelling the **increased tempo of change** and **adoption**.

While the scale and use of some of these technologies is some way into the future, the rate of change we're experiencing means **the future is not as far off as we may think. Today's trend is tomorrow's mainstream adoption**, and organizations need to consider how this is affecting their businesses, and **what they should prioritize**.



### Etienne Reinecke, Chief Technology Officer

Etienne is responsible for NTT's technology strategy, enterprise architecture and innovation frameworks, positioning our capabilities with external stakeholders, and providing input into new-offer creations.

Follow Etienne on [LinkedIn](#)

Read the full article [here](#)





# Disruptive technologies

## five key trends in 2020

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1

**Data becomes the center of the IT universe**  
How you collect it, what you do with it, the platforms you have to manage it, and how you make it available



Organizations that don't **build disciplines around data** will find themselves swamped by its scale.

### Steps to take in 2020

#### Data lake or data swamp?

Data strategies must consider architecture for capturing and managing data, then make widely accessible to create new value.

2

**Massive changes on the edge will transform the technology landscape**  
Edge processing is having a pervasive impact on the industry



**In Las Vegas**, high-definition video cameras, sound sensors, and IoT devices have **improved situational awareness** through video and sound data.

### Steps to take in 2020

#### 5G, Wifi6, IoT, audiovisual

There will be a profound impact on how we design and run everything. Value is derived from new data collected and processed.

3

**Applied technology explodes to bridge the digital and physical**  
Technology that's applied with a specific outcome brings exciting 'phygital' intersections between the physical and digital worlds



**NTT and Major League Baseball** will create a **new fan experience** where audiences will be able to view **sports content** as if they were **watching it live**.

### Steps to take in 2020

#### Opening new worlds of possibility

Data modeling will encompass all systems and processes, with application into areas previously unthinkable at a speed previously unforeseen.

4

**Computing model evolution and hybrid compute raise big questions**  
This impacts applications, workloads and the broader business



**A hybrid world** is likely where everything is used in the context of **each architecture's merits and strengths**, to form a truly hybrid compute model.

### Steps to take in 2020

#### Servers to serverless: where to from here?

The answers will inform important decisions about investment, operations, security and skills.

5

**Programmability and predictive capabilities reshape cybersecurity**  
New technologies enable greater predictive capabilities and security at an atomic-unit level



**NTT's Piper platform**, a highly-scalable machine learning pipeline, enables us to handle **billions of flows hourly** – generating over 300 unique statistical features for **each internet host** – and track their locations.

### Steps to take in 2020

#### Predictive power for detection and prevention

Cybersecurity is one of the first IT functions to mature in using large-scale data with machine learning, analytics and artificial intelligence to become more predictive.

## Co-innovation for complete solutions

Most organizations simply will not have the skills or resources to keep pace with every aspect of change in technology.

Co-innovation will become increasingly important as they look to partner with technology providers that can offer R&D resources. They'll need skills that can address and solve these business challenges, give guidance on the best way forward, and demonstrate proven use cases for proposed solutions. Above all, they'll expect business outcomes, not technology solutions – which means technology companies will need both depth and breadth in their offerings to meet coming demand.

Frameworks for sharing intellectual property will be redefined, and co-innovation partners will contribute intellectual property assets, evolve jointly to solve specific business challenges, and review monetization models.

## Contributors

We'd like to thank the following NTT executives who contributed to the thinking behind Future Disrupted: 2020 technology trends

**Adam Skovron**, Senior Vice President, Innovation Frameworks & IP Capture

**Andy Cocks**, Chief GTM Practices Officer

**Chris Heidbrink**, Senior Vice President, Development, Cloud Infrastructure division

**Damian Skendrovic**, Executive Vice President, Managed Services Go-to-Market

**Daniel Greengarten**, Senior Vice President, Client Success

**Debra Bordignon**, Senior Vice President & Chief Technology Officer, Australia

**Dilip Kumar**, Executive Vice President, Global Service Delivery & Operations

**Doug Adams**, CEO, RagingWire Data Centers, an NTT company

**Dr Fiona Lodge**, Product & Strategy Officer, Cloud Communications division

**Ettienne Reinecke**, Chief Technology Officer

**Jacques Bonifay**, CEO, Transatel, an NTT company

**Jay Reddy**, Chief Technology Officer, Dimension Data, an NTT company

**John Cummins**, Senior Vice President, Research and Development

**Kazu Yozawa**, Chief Technology Officer, Security division

**Marc Alba Otero**, Senior Vice President, NTT, Inc., and Head of NTT Disruption

**Mark Alexander**, Executive Vice President, Cloud Communications division

**Mark van Bavel**, Executive Vice President, Digital Platform Architecture

**Matt Drayson**, Practices, Partners & Alliances, Australia

**Matthew Gyde**, Chief Executive Officer, Security division

**Mihoko Matsubara**, Chief Cybersecurity Strategist, NTT Group

**Minoo Dastur**, President and CEO, Nihilent, an NTT company

**Nadeem Ahmad**, Senior Vice President, Technology Strategy

**Nemo Verbist**, Senior Vice President, Intelligent Business & Intelligent Workplace

**Oscar Garcia**, Senior Vice President: Managed Services & Platform Automation

**Rob Lopez**, Executive Vice President, Intelligent Infrastructure

**Roger Vila**, Senior Vice President, Cloud Infrastructure division

**Sean Donaldson**, Chief Technology Officer, Secure-24, an NTT company

**Simon Chassar**, Chief Revenue Officer, Security division

**Vangelis Tsingos**, Strategic Initiatives Director, Europe

**Wolf Stinnes**, Senior Solutions Architect, Dimension Data, an NTT company

## About NTT innovation

We help you develop and execute your innovation agenda using new and emerging technologies to disrupt existing business models and achieve your business outcomes. Our open-innovation framework harnesses the collective effort of internal and external innovators and innovations. Through innovation in partnership, and innovation through collaboration, we work together to seek new ways to help you drive market differentiation and harness our collective innovation intelligence.

### About NTT innovation



#### **NTT group's USD 3.6bn annual investment in R&D**

2,500+ research engineers, 16,000 patents and inventions such as emojis and mobile phone technology



#### **Ongoing commitment**

Continuous service innovation and development through SAFe Agile.



#### **Global scale and expertise**

Breadth and depth of innovation capabilities and experiential showcases.



#### **NTT Group is a Top 100 Global Innovator**

100 prestigious industry awards for our commitment to innovation.



**Together we do great things**