**NTT**
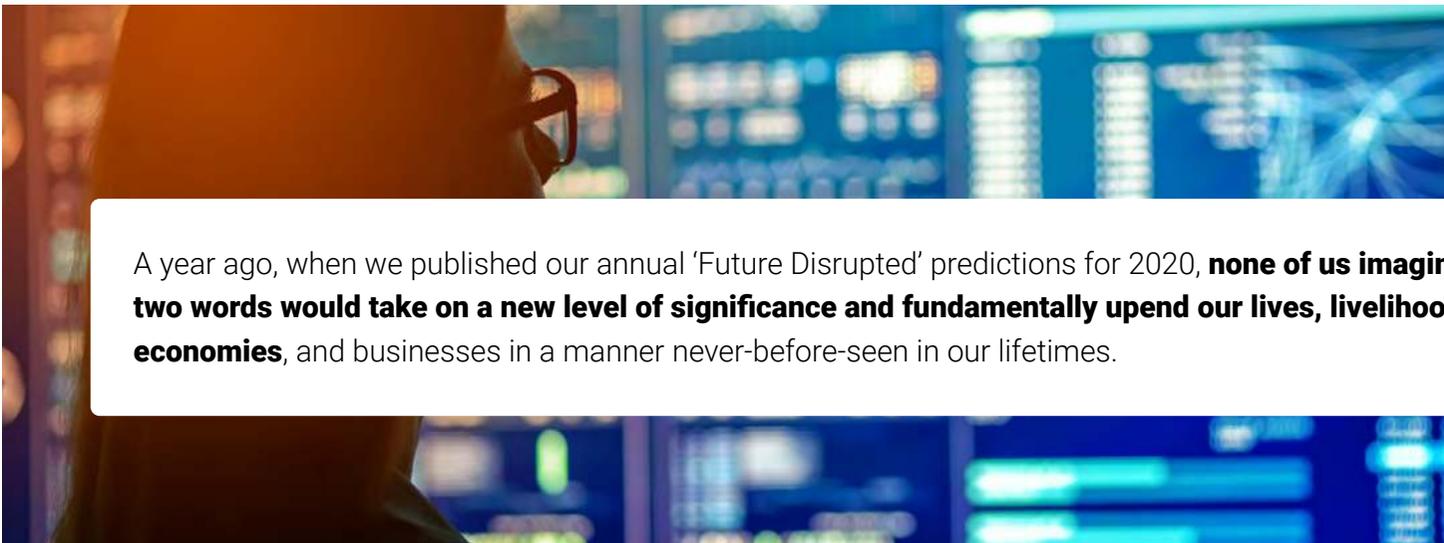
# Future Disrupted:
# 2021 technology
# trends

Great ideas change the future

# Foreword

A year ago, when we published our annual 'Future Disrupted' predictions for 2020, **none of us imagined that these two words would take on a new level of significance and fundamentally upend our lives, livelihoods, health, economies**, and businesses in a manner never-before-seen in our lifetimes.

In this year's commentary, we contemplate the impact of the COVID-19 pandemic on **all spheres of society. We explore the technology disruption that we see on the horizon and examine the emerging technology trends that we believe will define 2021 across key business areas.** While it's difficult to define precisely how the future will take shape, the contributors to this year's Future Disrupted e-book share their thoughts on the inevitable risks and challenges that will need to be negotiated. But they also outline practical steps you can take in 2021, and beyond, to take advantage of the potential that lies in the obstacles we currently face.

## Key technology trends to recognize harness, and capitalize upon

We believe that the **key factors of success** for businesses that we've identified in recent years will prevail, evolve and accelerate. These include a **'digital-first'** mindset; secure, cloud-optimized networks and infrastructure; smart use of **artificial intelligence**, automation, open APIs and analytics; and data management. Collectively, these lay the foundation for creating and sustaining a positive **employee and customer experience.**

**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.**

**Andy Cocks**
Chief Go-to-Market Practices Officer, NTT Ltd.

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# In the pages that follow we'll explore each of these trends in more detail.

We also consider how best to move forward **while budgets remain under immense pressure** and **responsible cash management** sits high on the boardroom agenda. We'll explore how forward-looking businesses are looking at alternative consumption models that allow them to take advantage of **opex-based services** as well as entering into support and managed services engagements.

Although the **transformational potential of automation** has been recognized and adopted by businesses for some years, the pandemic has **reinvigorated organizations' efforts to harness its many benefits**, in both the B2B and B2C worlds.

The pandemic has also had some notable implications on cybersecurity and compliance. While again, these aren't new topics of concern and focus, the sudden requirement for organizations to **introduce work-from-home arrangements for knowledge workers has** elevated these issues to front and center. This has, in turn, spawned renewed acknowledgment of the importance of **security being embedded** in all aspects of organizations' technology estates, whether applications and **workloads are running on-premises or in a public or private cloud**, and irrespective of whether people are working from home, the corporate office or remotely. **Infrastructure needs to be inherently secure by design, not something that's 'bolted on' as an afterthought.**

# Harness technology advances to reimagine a better world

Customer experience has also been fundamentally challenged during 2020. Strict lockdown measures introduced an **exponential rise in use and reliance on digital channels** by **individuals across all demographics**, placing unprecedented pressure on businesses' online capabilities and supply chains. Many have struggled to cope. This has sparked recognition of the value of **digitally integrated supply chains**, and, consequentially, accelerated the adoption of cloud-based models, which allow for faster deployment and the ability to scale, on-demand.

**Robust, reliable networks** have proven to be the backbone of those in the winners' circle.

Organizations are expanding their focus beyond **branch and campus networks to support remote** and distributed working. It's therefore critical that your network is flexible, secure, stable and capable of supporting workloads and applications running in hyperscale as well on-premises, private and/or hosted environments.

While the future remains uncertain on many levels, we should take comfort in the fact that we've never before had so much **powerful technology at our disposal** – technology we can use to answer questions and overcome challenges facing our **societies, businesses, communities and the environment**. There's a huge opportunity to use any and every available tool to support positive initiatives that will truly transform our future, for the better.

**We trust that the insights provided in our e-book will help you to prepare for that future.**

**Disruptive Technologies for 2021 and beyond**

**The gravity of the COVID-19 pandemic and its widespread impact throughout 2020 hasn't been witnessed in most people's lifetimes. But while for us, it's an unprecedented situation, history tells us that it will spawn a transformation of society.**

Against this backdrop, even traditional nay-sayers are starting to acknowledge the reality and **impact of climate change** and **appreciate the urgency** with which we must pursue and adopt more **environmentally sustainable practices** from both our personal and business endeavors.

There are several exciting and potentially fundamentally disruptive technology trends in our industry that hold promise to **help us realize safety and security, support sustainable growth and reduce environmental loads**. In this chapter, we'll explore some of these.

# All-photonics networks will power global communications

It's no secret that current levels of power and energy consumption by IT equipment and networks have a **severe, detrimental effect on our environment and society.** That's because they rely on electronic processing and chips that require **high levels of power**. If we don't make radical changes as an industry, we'll inevitably reach a point where we've **expended all our capacity to operate technology environments** – and then what? The good news is that pioneers in networking research and development believe that they have the answer – 'all-photonics' networks (APNs).

Photonics-based networking involves the use of **optical and hybrid cabling.** These networks enable **end-to-end, information transmission between the terminal and the server.** They're capable of transferring large volumes of traffic while **keeping quality high and latency low.** Importantly, all-photonics networks will allow us to operate a more **environmentally sustainable communications environment.** That's because they're **ultra-low power-intensive,** potentially providing information communication services that use just 1/100th of the power consumption required by today's networks. Transmission capacity could even be increased to the extent that you could download 10,000 2-hour movies, in a **fraction of a second.**

While this may sound complex, these networks will be **intuitive to use,** allowing people to connect from any location or environment. The result? A next-generation communications platform that represents **a significant leap forward towards our goal of realizing a smart, sustainable and energy-efficient society.**
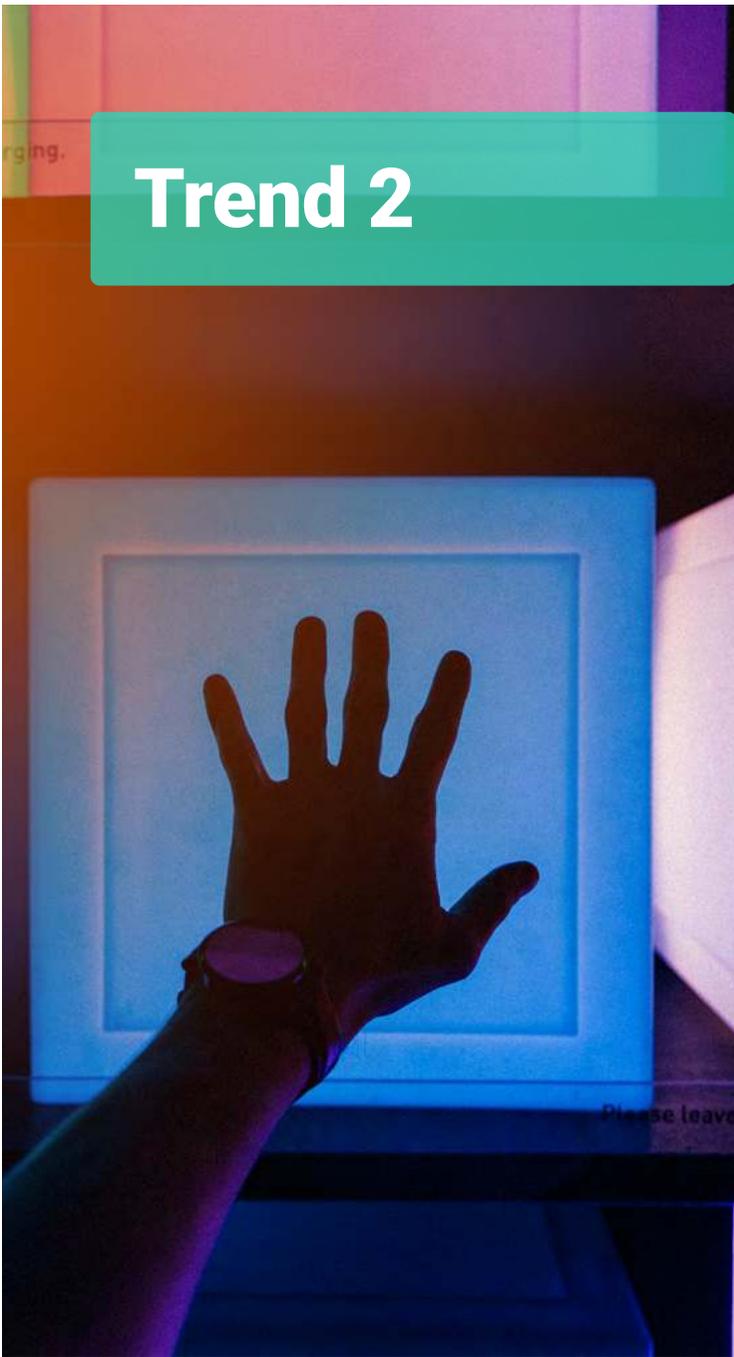
## Trend 2

# Cognitive Foundation technology will connect and control everything

Cognitive Foundation (CF) of computer intelligence focuses on **centralized management and agile allocation of ICT resources.** However, it does much more than allocating wired and wireless technology or communications; it also provides **orchestration capabilities** that allow you to **integrate various interfaces**, whether they be voice, video or other kinds of sensor information that support Internet of Things (IoT) initiatives.

By linking virtualized ICT resources and integrating them with diverse systems and networks, CF creates an information processing platform **capable of analysis and forecasting that isn't constrained by the format of systems or data.**

**CF has already been implemented in a smart city project in Las Vegas** that began in 2019.

This project utilizes orchestration capabilities, based on virtualization software to analyze video, voice and other sensor information for incident response and prediction. But this is just the beginning. The longer-term plan is for this city's digital ecosystem to evolve into a fully automated and autonomous operation. **In essence, a self-evolving service lifecycle management system that not only performs analysis automatically will be able to 'think and act' on its own.**

**READ MORE HERE—**
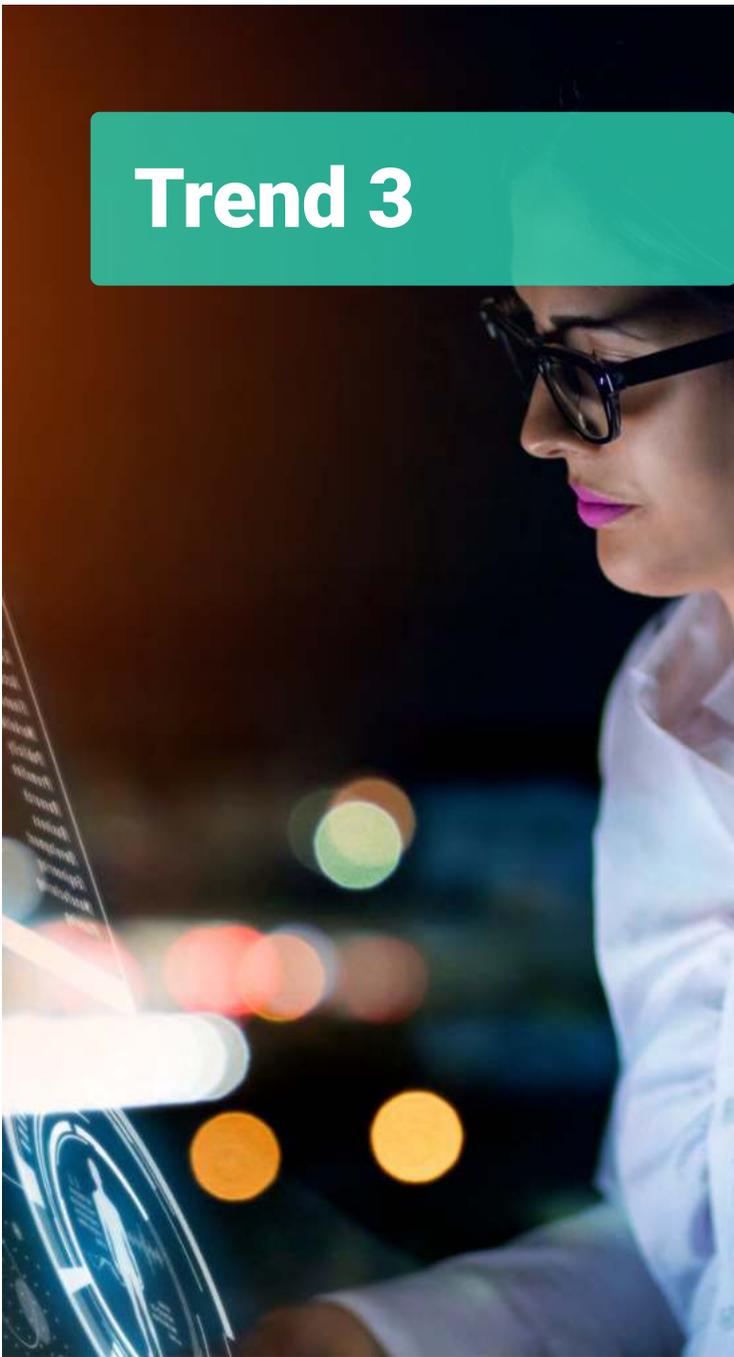
## Trend 3

# Digital twin computing (DTC) will enable predictive analytics by integrating the real and virtual worlds

Digital twins are **virtual representations of real-world environments, products or assets**. Manufacturers use digital twins to manage the performance and **effectiveness of machines and plants**, while city planners use them to **simulate the impact of new developments and roads.**

But what's still on the horizon? Cognitive twins that not only simulate environments but proactively assist in **designing solutions.**

DTC will make it possible to **test different environments** through previously impossible **real-world-scale reproductions** by freely copying, combining and exchanging various digital twins of 'things' and people.

**A sustainable communications platform for the future: Explore the Innovative Optical Wireless Network (IOWN)**

Our goal is to explore and push the boundaries of what's possible by further developing technologies around APN, CF and DTC. To find out more about how IOWN defines a sustainable communications platform for the future,

**CLICK HERE** ━

# Trend 3

This information will immediately be integrated into applications such as **traffic congestion prediction systems** and may even go as far as to make **accurate predictions in the field of disease control.**

We foresee DTC making it possible to **integrate people's minds, thinking, habits and attitudes into their digital twins.** This could allow a person's digital twin to perform certain tasks and make decisions in cyberspace **in place of the actual person.**

While this innovation is likely only to be introduced into the mainstream in a decade or so, as a **matter of ethics and social responsibility**, companies like NTT Ltd. are collaborating proactively with an **ecosystem of academic research institutions.**

# The evolution of the 'citizen developer' and robotic process automation will reshape businesses

We believe that among the foundations of future digital transformation are **AI-as-a-service and data-as-a-service**. Microsoft, IBM, Google, Amazon, Facebook and Apple are all developing new services and tools ranging from robotic process automation (RPA) to offering **graphics processing units in the cloud.** Amazon's upcoming project, AWS for Everyone – a low-code/no-code platform built to **enable anyone to create business applications** using their company data – will be a significant differentiator when it launches.

AWS' approach will give birth to the **'citizen developer'** – a business user who **creates new business applications**, with no programming training, for consumption by others using development and runtime environments sanctioned by corporate IT. These 'citizen developers' leverage no-code or low-code platforms to build simple process applications with little oversight, to accomplish their automation goals.

This will have an interesting impact on business as **non-developers are often stronger subject matter experts than programmers** and have a closer understanding of **challenges faced and creative ways of solving them.** By leveraging the expertise of these non-developer employees and empowering them to create solutions, you can accelerate your organization's digital transformation.

# Trend 4

New complexities will need to be addressed, for example, **establishing the correct data strategy** with flexible, intelligent infrastructure and open systems to make this breakthrough **accessible to, but also safe**, for all parties.

We are also seeing the citizen developer approach utilizing technologies like **robotic process automation (RPA)** which enables businesses to automate certain tasks and processes within offices, which allows employees to spend time on higher-value work.

In the coming years, RPA has the potential to **transform the future of work,** which is why so many organizations are researching how to integrate it into their workflows and systems. **Enterprises will need to consider and plan for how RPA** will eventually augment staff and shift their productivity into a higher gear.

## Trend 5

# Quantum and edge computing will usher in a new era of computing

We're at the brink of a new era of computing that will see the rise of powerful computing capability as well as enable more processing **at or near the source of data.** This era involves two types of computing paradigms – **quantum computing and edge computing.**

Quantum computers can solve problems that are **computationally too difficult** for a traditional computer to do, and which can usually only process information in **1–2 seconds**. In the quantum world, those 1 and 0 bytes can exist in two states (qubits) simultaneously, allowing computations to be performed in parallel. Quantum computers require special algorithms capable of performing tasks that we'd never imagined possible, **making them more powerful than anything built to date.**

Edge computing is **closer to becoming mainstream** than quantum computing. Today much of our computing takes place in the cloud, with distributed data centers taking care of the necessary processing elements. **This introduces the potential for delay** (also known as latency). In the near-future, more of the computational work could be done locally, especially for mission-critical applications – for example, an autonomous car's computer vision system would process and recognize images **immediately rather than sending that information to the cloud for verification**. Edge computing requires custom chips and hardware but will work alongside the cloud, rather than replace its functionality.
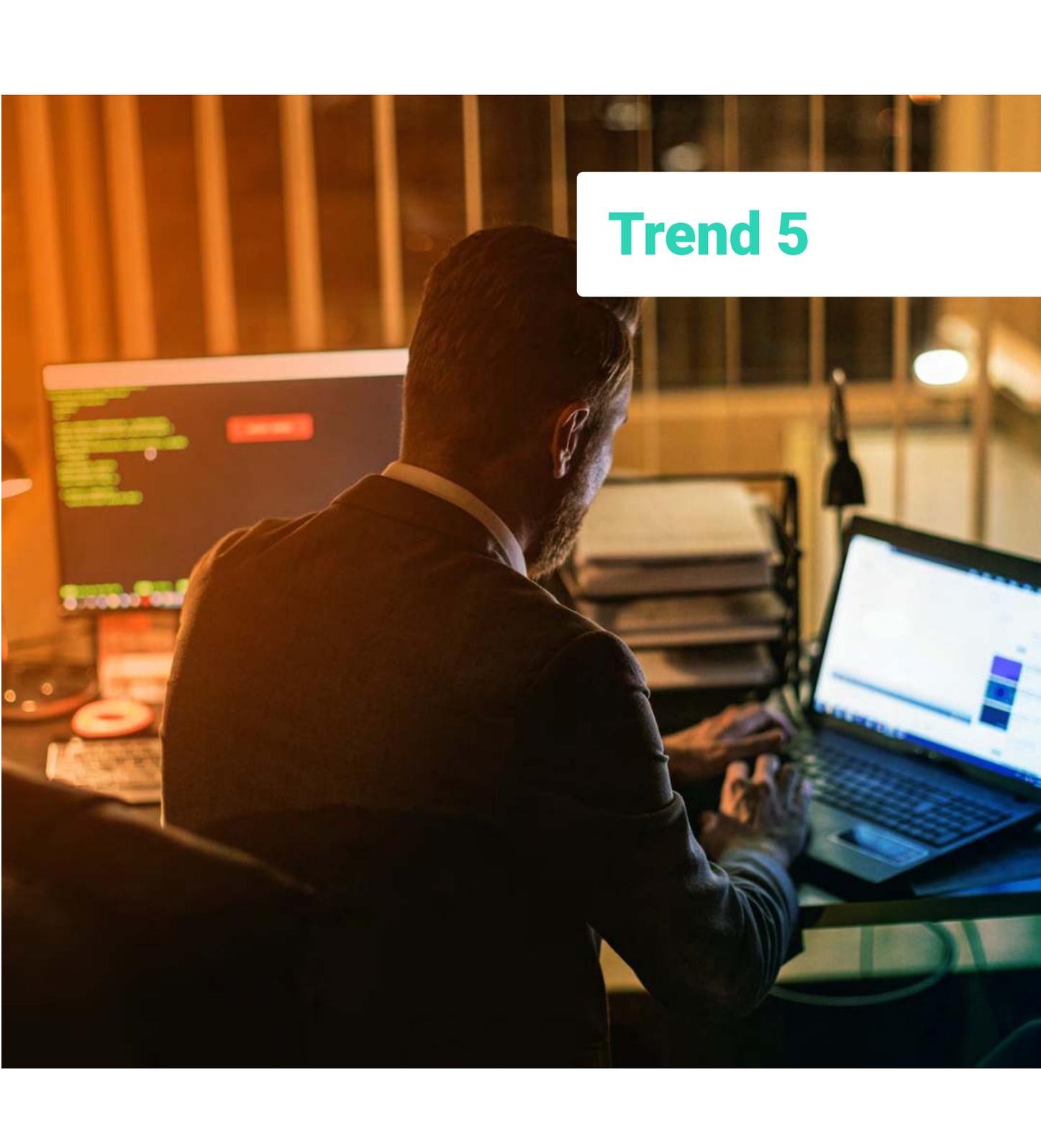
# Trend 5

The edge computing paradigm will be the **foundation for additional technology areas** especially when it comes to **near real-time applications and AI at the edge** where the application environment exists at the edge first, then is transferred to the cloud for machine learning. Within the next decade, **there could be as many as 50 billion devices online generating enormous amounts of data**. Edge computing is **closely tied to the Internet of Things and 5G connectivity**. Finally, as virtual reality and extended reality become popular, more processes will be pushed onto headsets.

## A time to reflect, learn and refocus

Now, more than ever, it's a time to reflect, learn and refocus on crafting a future that's centered on the **wellbeing of people, optimized societies and a sustainable environment.**

## In three to five years' time, which trend will be most important for your organization?

○ All-photonics networks

○ Cognitive Foundation technology

○ Digital twin computing

○ Robotic process automation

○ Quantum and edge computing

○ Other

**SEE RESULTS** —



**Our experts discuss the new and emerging technologies that have the potential to disrupt existing business models and help us realize safety and security, support sustainable growth and reduce environmental loads in the future.**
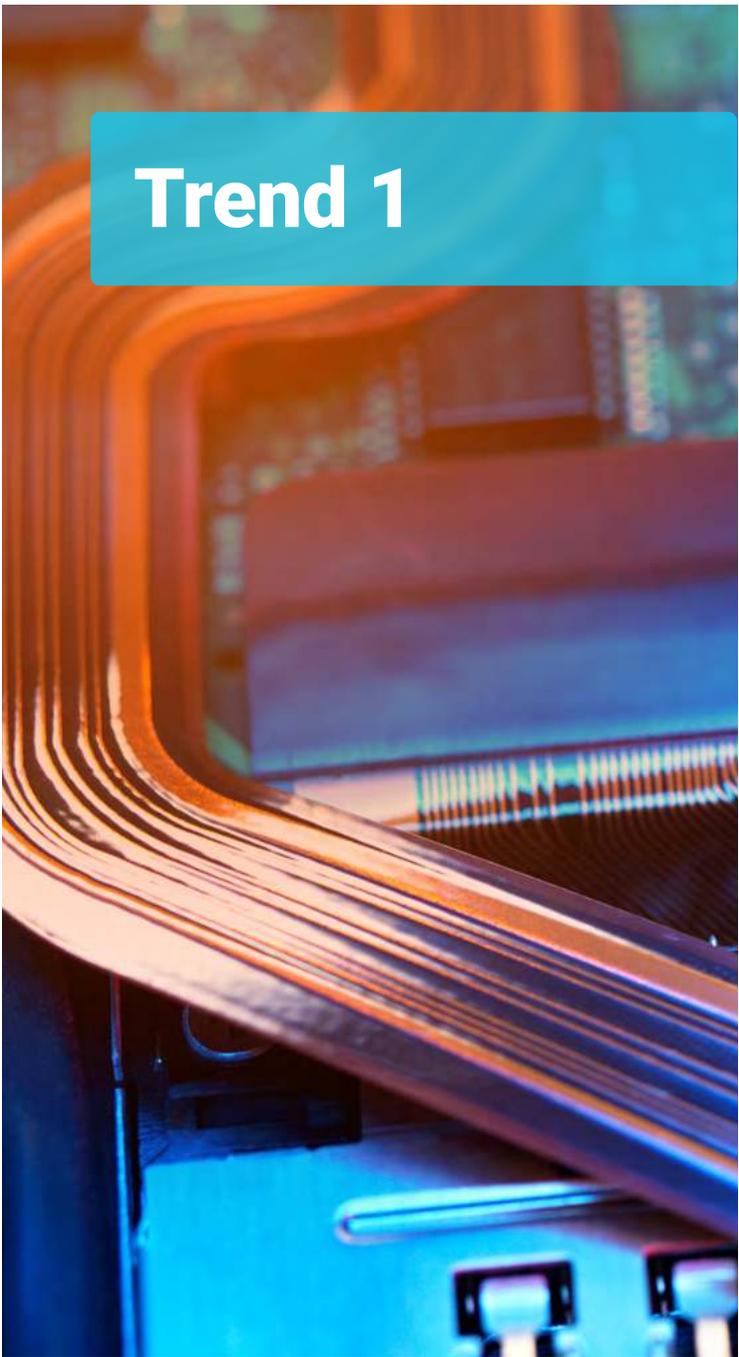
# Top digital transformation trends in 2021

Prior to COVID-19, our research indicated that most organizations recognized the need to digitally transform, but that there was a **significant gap between those who were progressing at pace and those slower off the starting blocks**. According to the [NTT Ltd. 2019 Digital Means Business Benchmarking Report](#) , the gap between the laggards and the leaders is only set to widen unless the former takes the right decisions and actions to catch up, fast.

## The most prominent digital business transformation trends we expect to come to the fore in 2021:
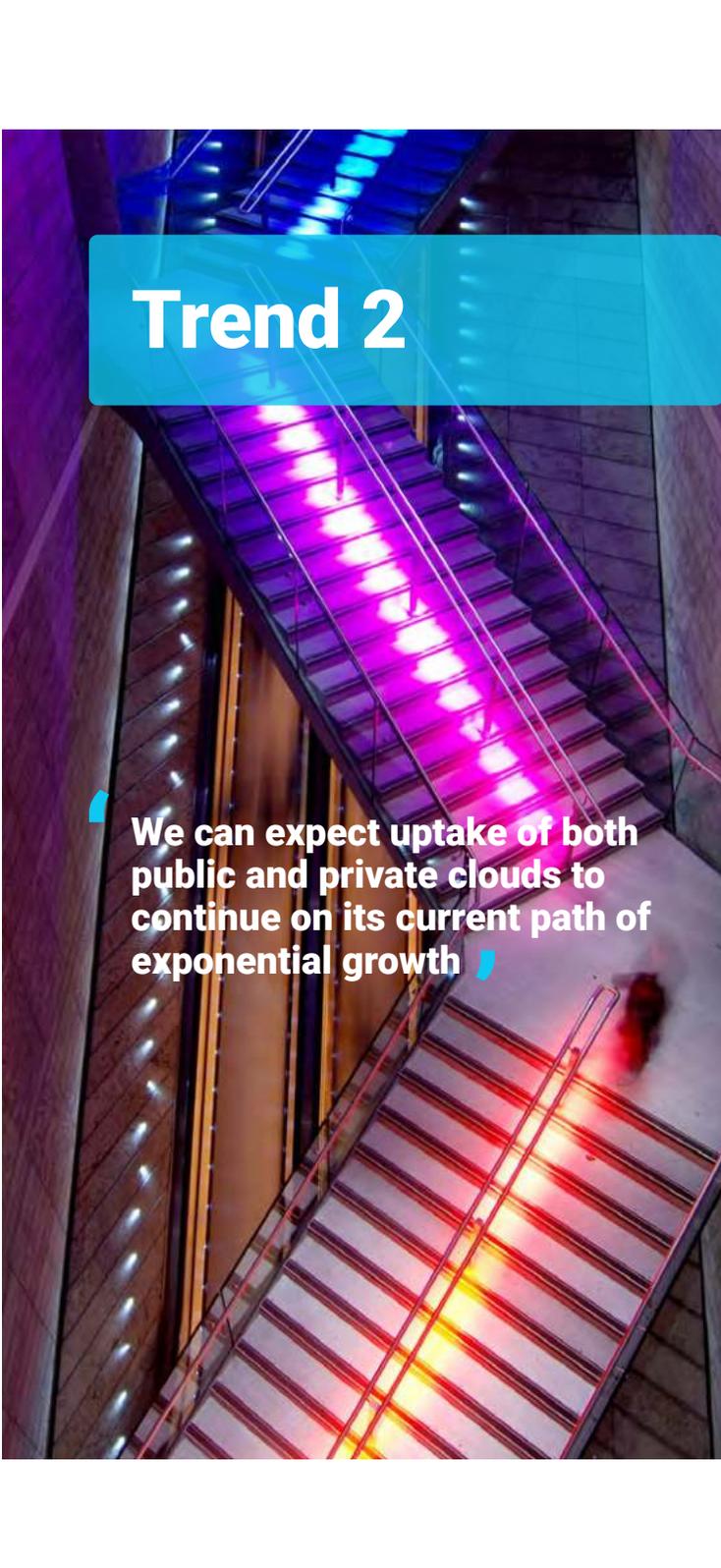
## Trend 1

# Proactive and bold digital transformation is imperative, not a choice

In 2021, **we expect that the link between business value and investment will become amplified.** Now, more than ever, IT needs to be willing and able to **respond to what the business needs.** Moreover, with profitability at an all-time low in many sectors, and budgets stretched to their limits, organizations that hope to successfully persuade their Boards and shareholders to approve new investments will need to **demonstrate tangible business value immediately and iteratively by adopting public and private cloud platforms.** Organizations will also need to look for creative ways to address the most commonly cited barriers to successful digital innovation and transformation cited by

**survey** respondents which **include a lack of skills** (e.g. artificial intelligence (AI) and digital programmers, data analysts and scientists and cybersecurity experts), and as well as siloed behaviours and a lack of fruitful collaboration among discrete functional areas, as opposed to a unified, organization-wide approach.

**Also, bear in mind that 'home is the new branch office' and this requires careful thought regarding how to optimize and secure your connectivity.**

**Now, more than ever, IT needs to be willing and able to respond to what the business needs.**

## Trend 2

# The ability to leverage public and private clouds to be agile and responsive to changing market requirements, is now essential

> We can expect uptake of both public and private clouds to continue on its current path of exponential growth

**Workloads continue to shift to a combination of cloud platforms, with public cloud expected to grow** from 24% to 30% and private cloud in a service provider's data center from **19% to 23%, over the next year**. Look out for more on this topic in our **soon-to-be-published NTT Ltd. 2021 Hybrid Cloud Report,** which will uncover more about the acceleration of those trends.

We believe that the only way to tangibly link technology investment to real business value is by **embracing digital IT infrastructures that allow for agility and responsiveness – and therein lies the value of public and private clouds.** If you attempt to leverage more traditional approaches and technologies, it will take months to set up and **deploy new**

**structures – that's no longer acceptable. In our reshaped reality**, new products and services have to be 'ready tomorrow' and there's an expectation for time-to-market and time-to-value to be realized faster than ever.

It's no secret that upon the onset of the COVID-19 pandemic, businesses that were able to be much more responsive and resilient were those that had **already made these investments and transitions**. Others who hadn't had to scramble to do so and many are still playing catch-up.

## Trend 3

# Increasingly, automation will lie at the core of successfully transforming digital businesses

**Both B2B and B2C organizations** (and their end-customers) are increasingly **buying more through digital channels**. We believe that the **automation of processes and tasks** that currently rely on manual human intervention will be the common element underpinning the most successful digital transformation initiatives, in the year ahead.

But it's important to note that this will require businesses **to automate everything from the application layer to the cloud layer** … **and then on to the edge** (which involves automating the **way you provision to a branch or users** at home or on the road.)

Essentially it's a **three-pronged approach** which means that when you make a change due to a data or workload requirement, for example, you

want those changes to automatically cascade downstream to your **cloud infrastructure, network, branches and end users**. That's the end-to-end automation 'nirvana'.

Among the many benefits that flow from automation is **cost savings**. This is because you can redirect people's time and expertise towards higher-value activities that support the core business. Other advantages include **improved efficiencies and swifter time-to-market:** the faster you can make changes to your infrastructure, the less time it will take you to launch new products and services.
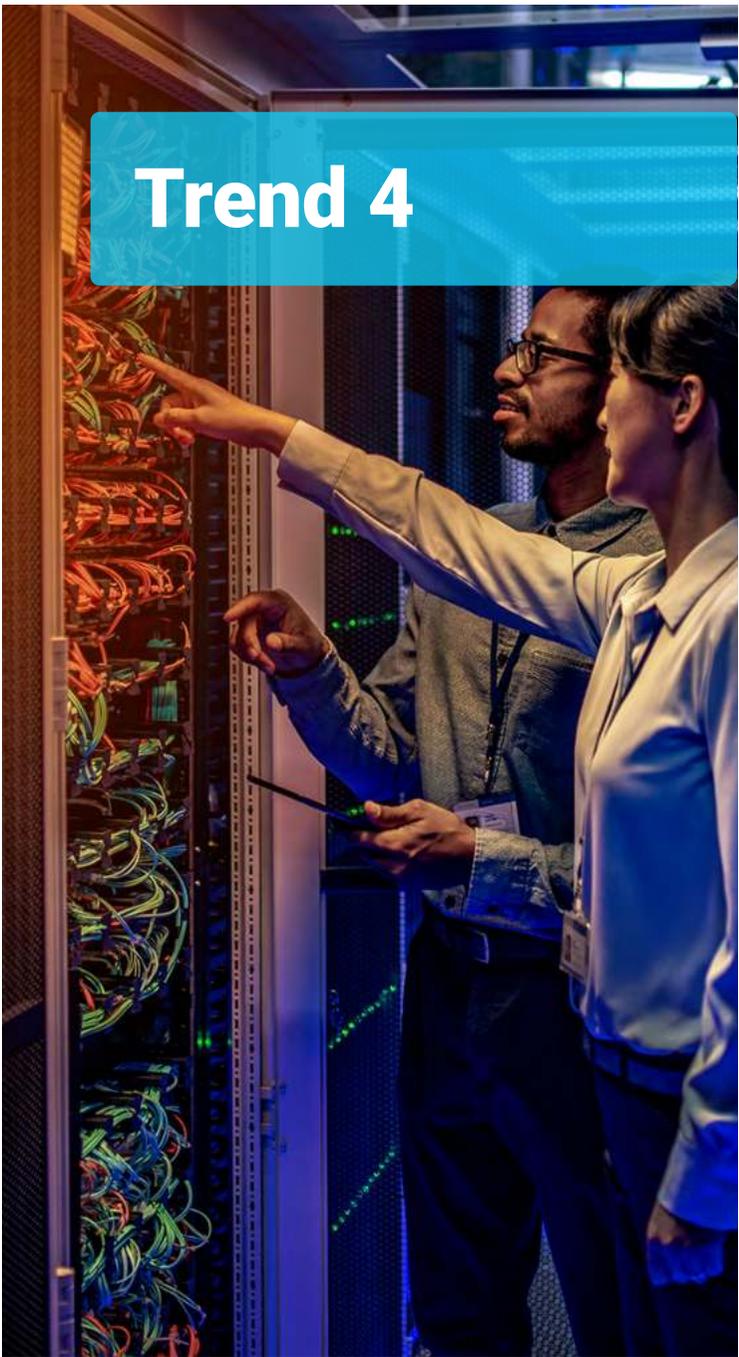
# Trend 3

Let's consider **automation in the realm of customer experience,** by way of example. According to NTT Ltd.'s recent **research** , 70.5% of organizations, cite improved CX as the top factor driving their digital transformation. **We foresee greater adoption of chatbots** and AI-driven natural language processing bots – which will increasingly undertake businesses' first- and early-stage interactions with customers.

**Automation will also play a critical role in employee experience initiatives. Here, we can expect to see advances in and adoption of robotic process automation, machine learning and AI.**

Nevertheless, be mindful that automation can present its own challenges when it comes to effective deployment.

## This is due to two factors:

- Today, typical enterprise ICT ecosystems comprise a variety of products and technologies from different vendors.
- The modernization of ICT and the associated automation of previously manual processes require a mindset and skills shift. The focus is now on establishing a DevOps cycle that revolves around cloud and software.

## Trend 4

# Infrastructure will become the leading generator of data

In years gone by, data was something you used for intelligence purposes and **the infrastructure carried the data. Infrastructure is now a major generator of data.**

Just think of things like **data and analytics** in an office environment where the network can **track people's location, movement and where they're stopping**. Likewise, in the retail environment, businesses **follow people's footfall** to ascertain what products they typically look for and purchase and whether they'e having **positive or negative experiences**.

In both these business and consumer environments, every time an **individual connects and disconnects to a network**, that information is **captured, stored** and ultimately acted upon to optimize or improve **employee or customer experience**.

By **intelligently blending network data engineering and science**, together with **AI** and **machine learning**, successfully transforming businesses are set to push the boundaries of what it's possible to do with data, in ways never before imagined.

## Trend 5

# Recognition of cybersecurity's role in a business' digital enablement will intensify

It's important to be clear about what you need to do from a cybersecurity standpoint to enable your digital transformation. We believe that the term **'secure access service edge' (SASE)** is going to influence decision-making over the next 12 months. It's all about getting the best end-user experience in this increasingly SaaS- and software-defined network paradigm.

**Our advice is to start with the foundations and then work up the stack:**

- **To start, look at data protection.** Pinpoint exactly what you absolutely have to protect. What are your 'crown jewels' data and information versus what's not? And then go back to the basics: good operations hygiene and due diligence.
- **Next, turn your attention to understanding**

**where various workloads are running.** This will mean implementing appropriate firewalls and micro-segmentation.
- **Then consider your applications and how they're being consumed.** How does this tie back to your platform strategy and related end-user/customer and end-point protocols and how they're interacting with various workloads and applications?
- Finally, recognize that there's no better time than now to **'dust-off' your existing network and application security strategies** and ensure that they're still fit-for-purpose. **This will likely include making decisions about your path to SD-WAN adoption.**

> There's no better time than now to 'dust-off' your existing network and application security strategies and ensure that they're still fit-for-purpose.

# Steps to take in 2021?

## 1.

**Consider adopting various combinations of public and private cloud to gain the agility you crave**. However, don't neglect on-premises solutions, which also have an important role to play. **Approach seasoned experts** in these domains for **advice and help in migrating and transforming** your environment and to take care of essential but complex elements such as **adjusting business processes and re-platforming.**

## 2.

**Think like a software company:** Businesses and providers alike are increasingly **adopting best practices learned from the software development world**, and recognizing the merits of adopting Agile development approaches, as opposed to traditional Waterfall models. An Agile approach typically involves the provider committing to working with the client in a **series of two-week sprints,** during which a workable outcome is developed, and its capabilities presented to the business for scrutiny. This creates an expedited feedback loop between business and IT. Approaches like Agile can only be successful in the context of a true partnership … but when they do work … **that's when the magic happens!**

## In 2021, which trend will be most important for your organization?

- ⭘ Proactive digital transformation
- ⭘ Public and private cloud
- ⭘ Process automation
- ⭘ Infrastructure-generated data
- ⭘ Secure access service edge
- ⭘ Other

**SEE RESULTS** —

**ASSESS YOUR ORGANIZATION'S DIGITAL MATURITY** —

Use our Digitally Astute Index to benchmark yourself against your industry peers.



**Now, more than ever, IT needs to be willing and able to respond to what the business needs. Our experts discuss the emerging trends that will drive digital transformation in 2021.**

**Strong customer experience management** and employee experience capabilities will empower you to serve your customers better. Remember, now employees are serving your customers from any location, no longer just from the campus, branch, home or on the road. **Organizations have long spoken about 'connectivity for anywhere'.** 2020 became the year where they were tested … and many were found wanting.

**In the next two chapters, we explore these trends in more detail and offer recommendations on steps to take in 2021.**
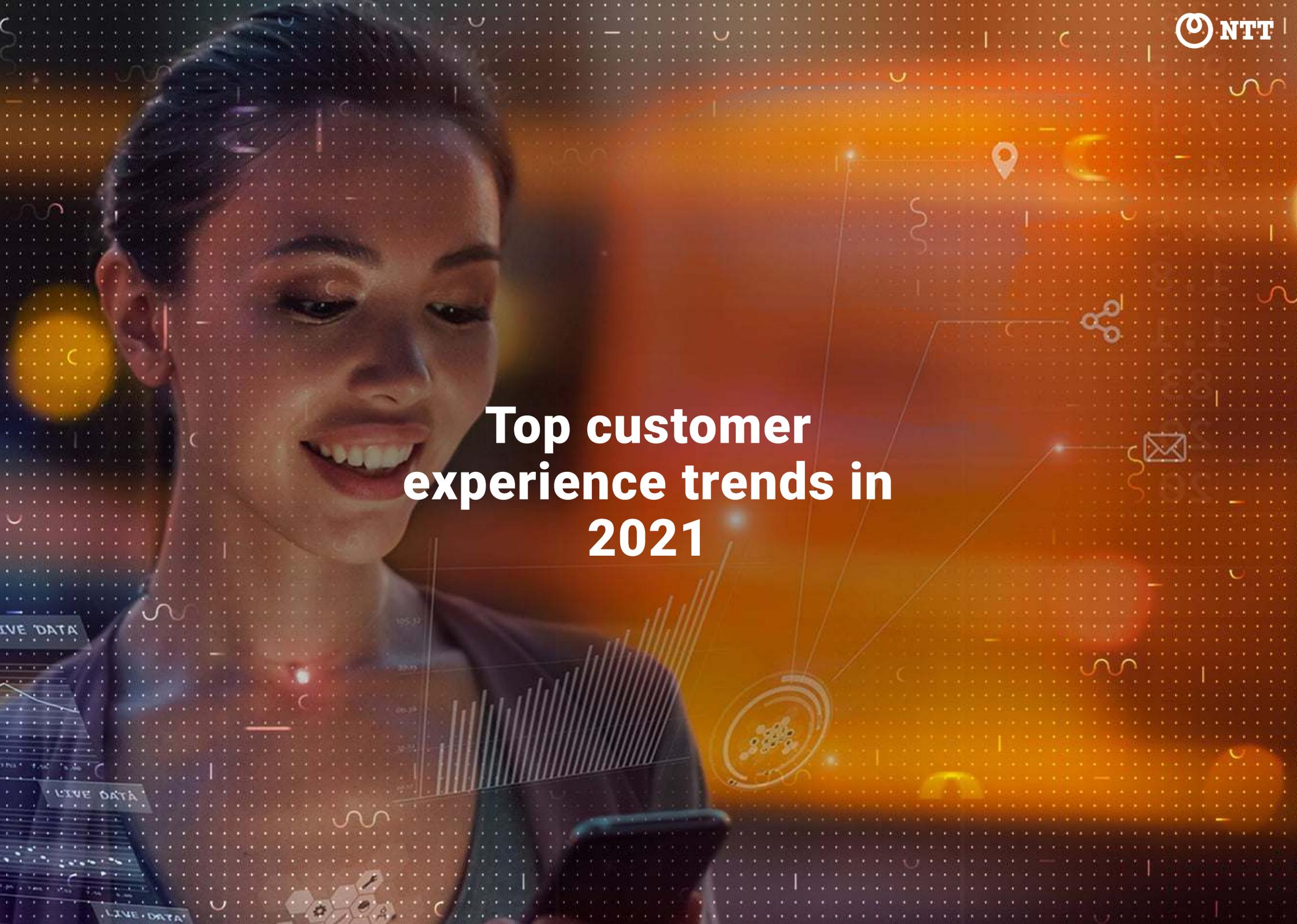
# Top customer experience trends in 2021
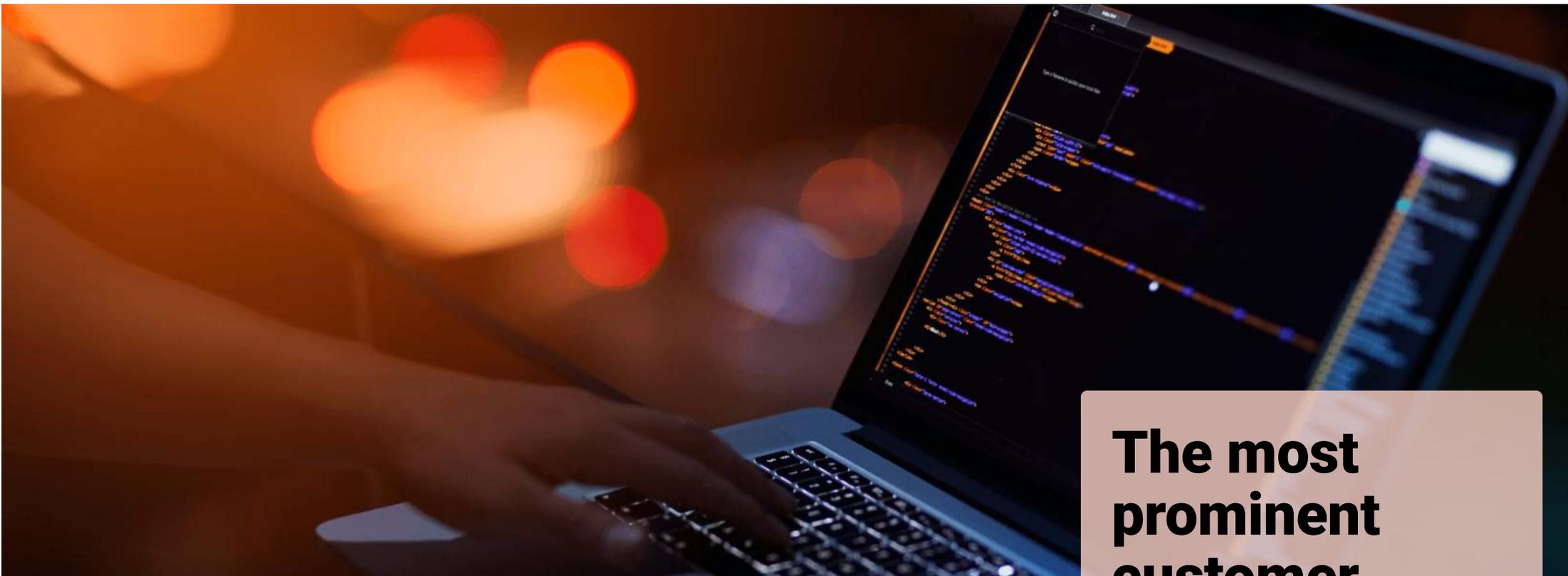
In 2021, we expect to see **the race to provide an effective, digitally focused customer experience (CX)** accelerate. A harsh light has been shone on **'dead-end' design and siloed thinking** that leaves customers exasperated. The winners' circle comprises organizations that have **integrated their channels and connected them to the ecosystems** that their customers inhabit.

# The most prominent customer experience trends we expect to play out in 2021:

## Trend 1

# COVID-19 has made customer behaviours across all demographics more digitally focused

According to the **NTT Ltd. 2020 Global CX Benchmarking Report**, **81.6%** of businesses acknowledge that customer experience offers a competitive edge and **58.0%** consider it a primary differentiator. The COVID-19 pandemic has heightened the need to have a digitally focused CX strategy in place because the presence of the virus has **fundamentally changed customer behaviours across all demographics.** People of all generations — not just 'digital natives' — have become **more confident and comfortable with online engagements and transactions**. In 2021, the organizations that will win will be those able to interact with customers virtually. However, this should not negate the value of the power of the human touch, which is still a fundamental part of the **marketing, sales and service mix that builds successful CX.**

With this in mind, creating and managing customer journeys to create a personalized experience, are critical. Leading organizations are **gathering and understanding data** to gain visibility into how people behave and aggregate this information across different verticals to **proactively identify the most effective service experience points or to serve up relevant offers.**

> **In 2021, the organizations that will win will be those able to interact with customers virtually.**
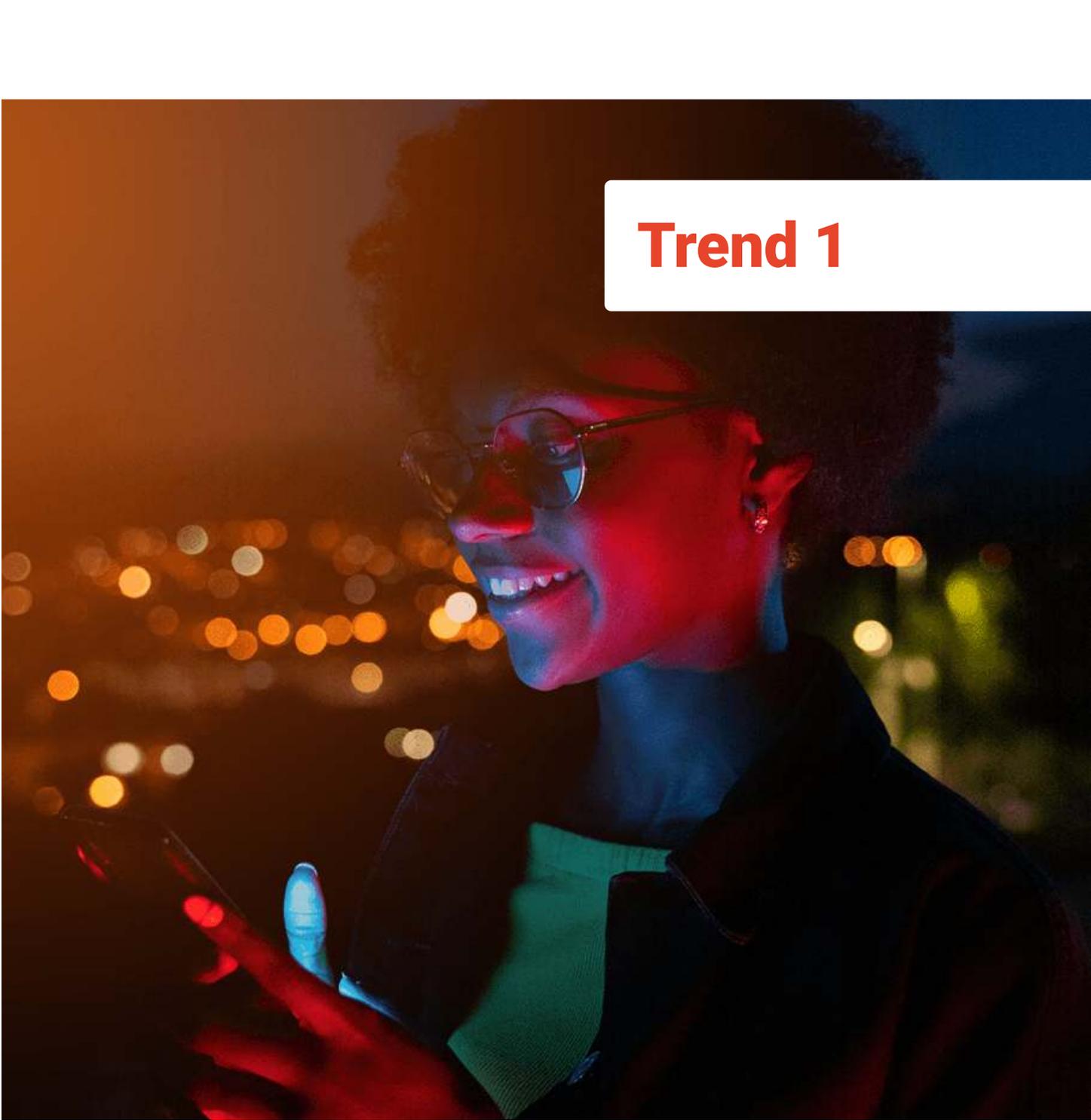
# Trend 1

Businesses that can **proactively reach out** and offer buyers a broad selection of choices and **deliver within a short timeframe** are going to start claiming increasing levels of market share. Once you've won that loyalty you need to **continually respect** the fact that you've got information and created a relationship but **also keep that relationship dynamic, and maintain customers' trust that their data won't fall into the wrong hands.**

**Ensuring adequate levels of secure connectivity to the cloud and software-as-a-service (SaaS) applications – and being able to manage this proficiently – is crucial to achieving this.** Businesses should scrutinize their existing digital channels to ensure that they're able to connect to all their **public and private cloud providers**, in a simple, secure and efficient manner.

# Rich and personalized content will be king

The enablement of customers to **immediately compare** offerings within different marketplaces is going to move front and center. We'll also see an uptick in the requirement for **content-richness within the online world and the ability to personalize that content, make it dynamic and excite people.**

Customers now expect enterprises to **know them, to remember them, and to understand – possibly even anticipate – their needs**. This leads to an expectation that the enterprise they choose is prepared and able to **meet and serve** them at their **preferred location, physical or digital, at a time** of their choosing. Instead of merely mapping a customer's transactional and

interaction flow, businesses will now have to work on becoming a part of the customer's life: the true customer journey map. Each interaction needs to be **meaningful and memorable**, as customers now understand they are the ones bringing in their 'custom'.

An **enterprise-wise integrated mindset** and **experience and a design-led approach** to product and service delivery is needed. When successful, such integrated delivery teams bring **cohesive creative, content, design, technology and analytics capabilities together to create a differentiated experience.**

'
**An enterprise-wise integrated mindset and experience a design-led approach to product and service delivery is needed.** ,

# Trend 2

Here, the **union of 5G, Wi-Fi 6, SD-WAN, home connectivity and public cloud** is where the magic happens.

The greatest dependency on your ability to deliver rich and personalized content is going to be based on **location and analytics**. Collectively, these technologies are what provide you with a **direct link to individuals**.

**Many organizations still have a way to go, however.**

**'According to the NTT Ltd. 2020 Global CX Benchmarking Report, 40.9% of businesses struggle to optimize customer journeys due to a lack of expertise in-house. '**

# A move towards a CX environment that balances virtual and physical presence

In 2021, we'll see a move to a virtual environment that **balances human intelligence and artificial or machine intelligence**, but also creates an **equilibrium between physical presence** at the appropriate points in time. The trick is to reflect the **appropriate mix within** your operating model so you can harmonize the customer experience while also adhering to the **correct standards**. Organizations that can seamlessly and proactively combine the power of their digital capability with 'hand in glove' **advisory human capability** will reap the rewards of providing a concierge capability and retain and grow the value of their relationships, through repeat business.

During the COVID-19 pandemic, **employees supporting customers** have had to do so from home. It follows, therefore, that the effectiveness of the toolsets, infrastructure and connectivity that you provide them with, is fit-for-purpose. Effectively, the **notion of virtual versus physical now extends to the contact center** – or the provider's operations center.

What's the **impact of work-from-home scenarios on cybersecurity?** Most consumers don't initially fret about the security of their online interactions; they assume that their data is secure … until a breach occurs. Such incidents will immediately prompt people to **change their buying patterns and platform usage** and lead to a long-term, if not permanent, eradication of brand reputation and customer loyalty. How do you manage and protect your customers' data when more people are working remotely, while staying compliant with relevant government rules?
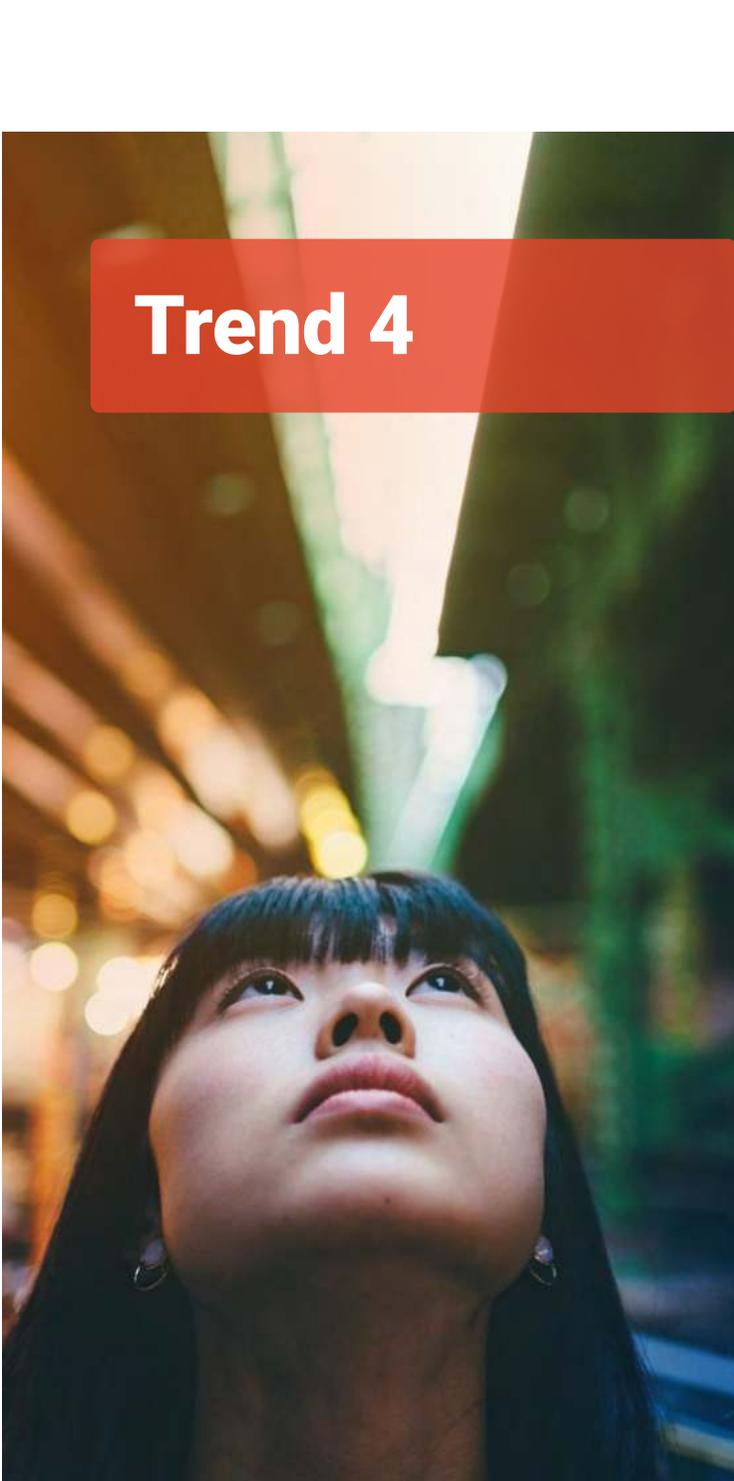
# Core CX competence will hinge on having a data-driven and well-documented strategy

We also predict that CX success will depend on whether you have a **data-driven and well-documented strategy in place**. The immense amounts of customer data that most organizations access, capture and manage from multiple sources are only set to grow in the year ahead. This makes it more important than ever to have clear **data policies, strategies and management capabilities** in place and **comprehensively documented.**

All the points covered above are **underpinned by the cloud**. Many CX technologies have been relatively slow when compared to other applications in terms of their move to the cloud. That's because the **mission-critical nature of CX technologies** has led to businesses being very cautious about migrating them. However, it's encouraging to see more organizations getting to grips with the performance challenges of cloud and recognizing the ability it gives them to scale. Many have successfully put in place controls and policies around data and security and **concluded that it makes better sense to then outsource** some of the additional complexities related to cloud migration and data management.

## Trend 5

# Ongoing performance management of infrastructure to meet customers' expectations, will become critical

Even pre-COVID-19, the ability to **constantly monitor, tweak and manage** the performance of your digital infrastructure to ensure your customers were getting **an adequate experience, was essential**.

One major impact of the pandemic was that **critical customer contact personnel in call centers and operations centers** were sent home.

Suddenly, connecting your employees to your network was about **much more than internal productivity:** customer experience is dependent on end-to-end infrastructure performance … **and now that infrastructure extends all the way into your employees' homes.**

Established **managed data center, cloud and networking experts** can help you pinpoint the **business processes** you perhaps need to change to better manage your customer experience. In other instances, they may advise and assist you to **migrate certain applications to a public or private cloud environment** to further mitigate the risk of poor online customer experiences.

# Steps to take in 2021?

## 1.

**Be clear about your value proposition:** Gain clarity on how you want to position your brand, on your ability to personalize your CX dynamically and in a way that's driven by data. Seek to **learn continually** and **adapt** your business operations when necessary.

## 2.

Engaging large, established providers **who've already invested in the underlying platforms and infrastructure** that underpin seamless public and private cloud connectivity, **cybersecurity and compliance** is a sensible move.

## In 2021, which trend will be most important for your organization?

- ◯ Digital CX
- ◯ Personalized content
- ◯ Balancing human and artificial intelligence
- ◯ Data-driven CX
- ◯ Infrastructure performance management
- ◯ Other

**SEE RESULTS** ▬



**In the last year, a harsh light has been shone on 'dead-end' design and siloed thinking that leaves customers exasperated. In 2021, the race to provide an effective, digitally focused customer experience (CX) will accelerate. Our experts discuss this and other emerging customer experience trends in 2021.**

**ASSESS YOUR CX READINESS**

Determine how your CX strategy and execution compare with the progress being made by other organizations.

# Top employee experience trends in 2021

NTT

COVID-19 has been a driver of change for **employee engagement** and experience across **all industries and geographies**, since early 2020. According to **NTT Ltd.'s 2020 Intelligent Workplace Report**, around **30%** of employees were working remotely prior to the pandemic, but this number has since risen dramatically to over **50%** and they will continue to work remotely at least some of the time. This has significant **knock-on effects for IT and HR** with respect to delivering an appropriate employee experience. In turn, employee experience is being driven by **the concept of 'wellbeing', which has a profound impact on employee productivity.**

When the pandemic struck, the **immediate focus was on business continuity** and ensuring that employees could work from home during the first wave of lockdowns. As the weeks and months passed, this approach **quickly morphed into one more centered on maximizing employee productivity** in remote working scenarios, **so that they could maintain** an adequate customer experience, at the same time.

Our conversations with clients over this period have centered on how they can **use cloud-based tools to give people the flexibility to 'securely work from anywhere'**, enjoying the same application access, user experience and security that they would in the traditional corporate office environment. We saw a spike in demand for more **video, audio and collaboration technologies, as well as virtual 'one-to-many' events** to enable **marketing, internal employee communications and training efforts.**

# The most prominent employee experience trends we expect to come to the fore in 2021:

# Distributed working scenarios will become the norm

We're now moving into a period where most businesses will have **three physical locations:** home, the corporate office and remote/mobile settings. As you embrace this more **distributed workforce model**, you need **IT and HR policies** that provide for greater employee empowerment. Remember, people can only be empowered if they can **securely access the content and applications** they need to carry out their tasks ... which means that the technology they're provided with must be **easy to use**, wherever they're **geographically located**.

> **"As you embrace this more distributed workforce model, you need IT and HR policies that provide for greater employee empowerment."**

Collectively, these considerations are driving a **move to cloud** where access to applications is more readily available but can introduce a potential greater risk when compared to traditional siloed on-premises applications secured behind corporate firewalls. It's essential to ensure that the **performance of cloud-based software-as-a-service, be they collaboration or enterprise applications,** meet employee expectations, and that they're secured appropriately as cyber-risk has increased while visibility of **risk has decreased, given organizations' expanding digital footprint.**

As we look ahead to 2021, when all hopes are that we start returning to some level of normality, we need to **consider what's changed** in the way people connect, be it from home, office or remote locations.

# Trend 1
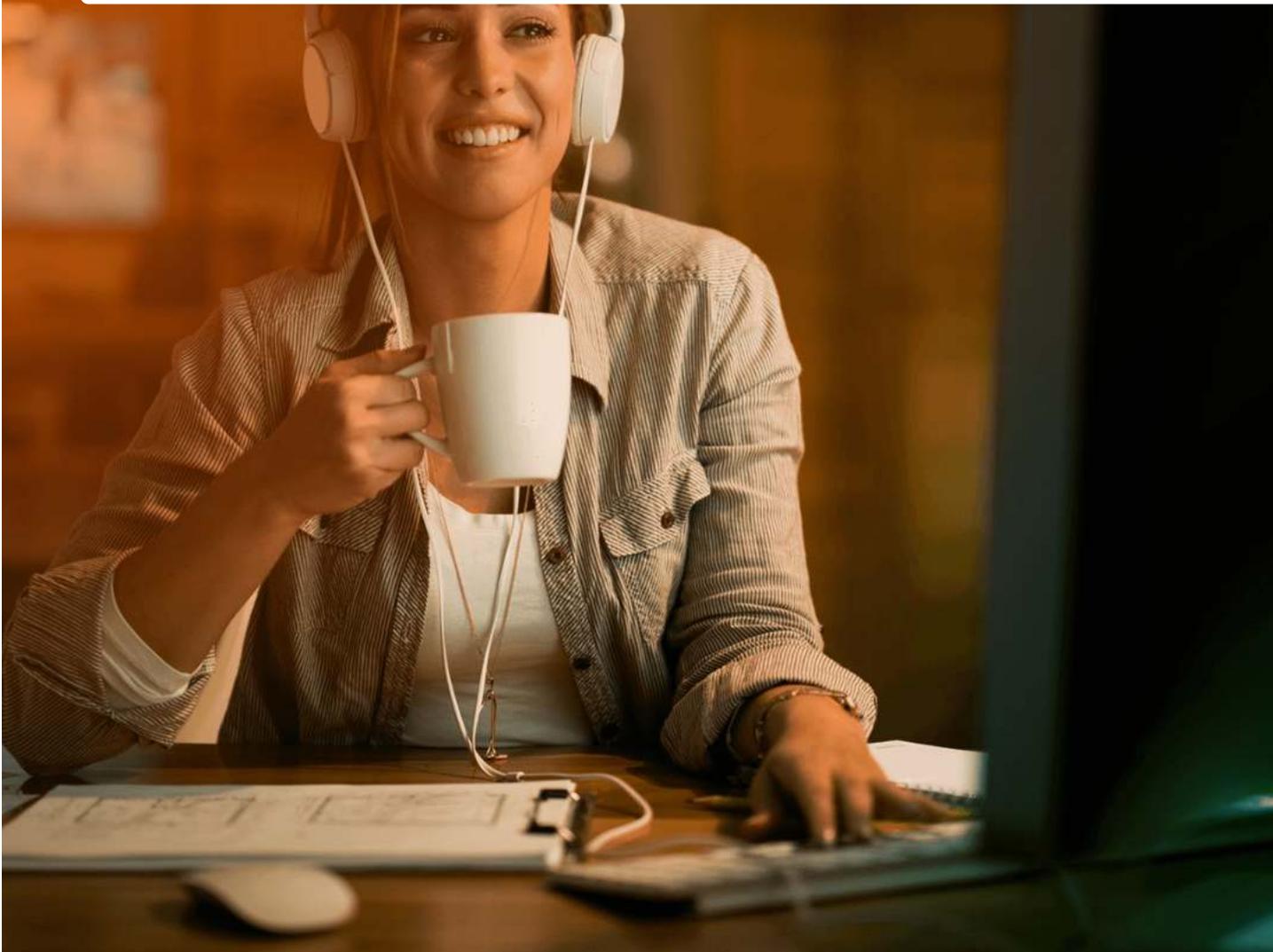
It's also useful to consider **policy issues. In the instance of HR, organizations may look to create benefit packages associated with home office locations, for example, corporate-funded connectivity** or technology such as **video display screens and even ergonomic furniture** that supports wellbeing. If they do, then **changes to IT policy** will also be required to consider how those services are **delivered and supported**. The decisions made today will impact the way we work for **generations to come and organizations** will need to calculate the opportunity, versus the cost to deliver, of such transformational programs.

It's also important to note that the **abovementioned policy decisions should be based on the role and/or value that the individual brings to the business** … as opposed to simply taking a seniority/top-down approach. Here, connectivity and tool considerations such as access to IP backbones that guarantee performance and security as well as access technologies like high-speed broadband, **4G, 5G, WiFi6 and SD-WAN**, need to be thoughtfully considered and implemented.
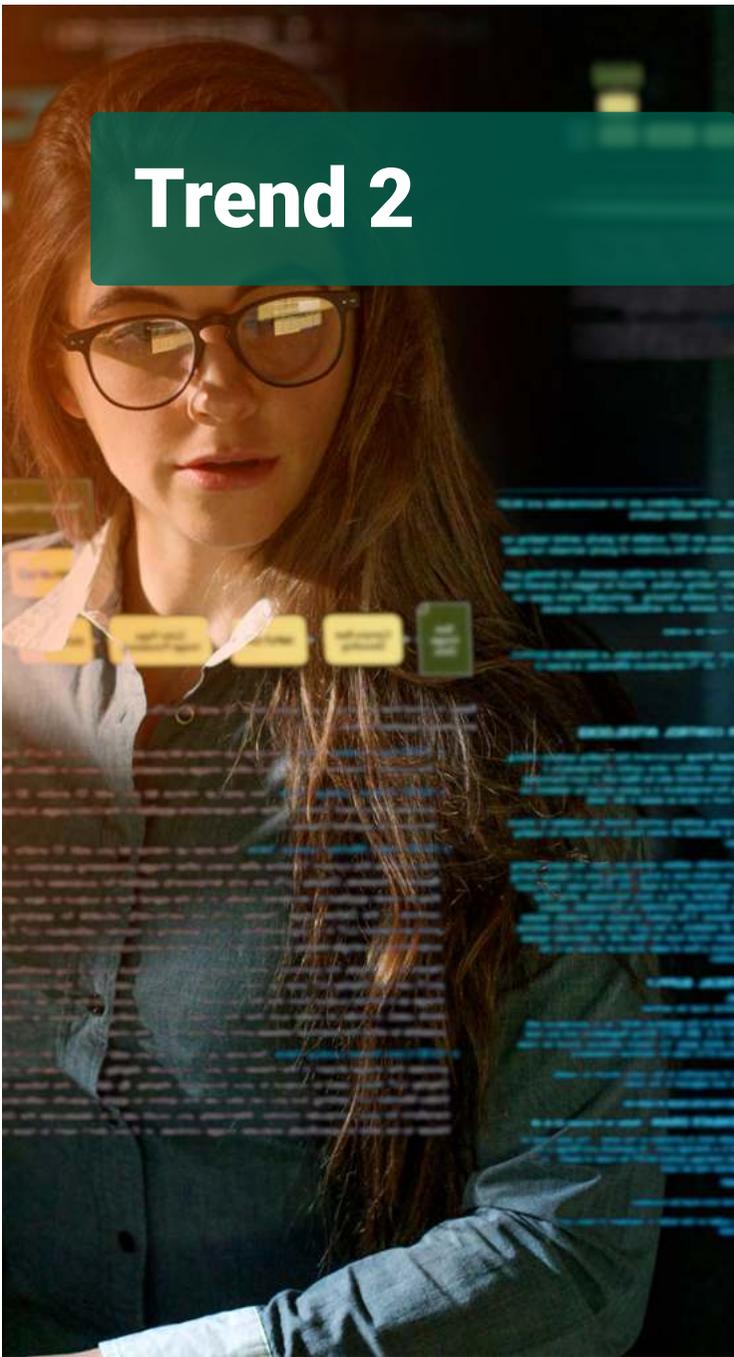
**Trend 2**

# Identity, data and workplace analytics become the foundations for enhancing employee experience

According to our **NTT 2020 Workplace Report**, 88.9% of organizations recognize the value of employee experience as a crucial strategic differentiator however, just 38.3% are very satisfied with their current capability. Data will increasingly become an essential tool to highlight trends in employee experience, be they from a **productivity, sentiment, wellbeing or community perspective.** Also, employee recognition platforms designed and deployed with a clear purpose to improve engagement, **integrated with nudge engines** can motivate individuals and teams to achieve the goals they've set.

For analytics tools to be effective, organizations will have to **define an accurate way to show improvements, or lack thereof**. Traditionally, organizations have found it difficult to integrate data from disparate platforms into an overall benchmark such as a **Net Promotor Score (eNPS).** With further maturity in APIs, we believe improvement from both a technology and process standpoint will occur in 2021 as **HR and IT teams engage collaboratively on their future of workplace programs.**

**Technology is becoming key to delivering insights that identify which teams may be experiencing a dip in productivity, or alternatively, those who are now working too hard.**

## Identity, data and workplace analytics become the foundations for enhancing employee experience

Employees will also need to **feel comfortable** about how data is being used. There must be **an opt-in or opt-out process**. It's incumbent on the employer to outline the benefits of opting in and ensure that any data usage **adheres to regulations such as GDPR**. Where we see short-term opportunity is using insights at a team level, involving no fewer than five people. This will allow the organization to pick up trends and insights in real-time without worrying about the **technical, cultural and regulatory** issues associated with the use of personal information.

Data can also provide insights regarding your **brand perception** in the market with respect to **how you've responded to the pandemic and how well you're deemed to have treated your people.**

The security landscape is undergoing a fundamental shift, one that moves businesses beyond traditional perimeter-based security models to instead **analyzing the behaviors and patterns** of individuals. Traditional, perimeter-focused approaches to security are no longer fit-for-purpose. Increasingly, **security is becoming identity and activity-based** rather than all about 'building a big firewall.'

We believe that a '**zero-trust' approach** to security is key to supporting and protecting businesses, as they undertake this shift. Regarding **data collection**, according to a recent **Gartner survey** , **16% of organizations are passively tracking employees** via methods such as virtual clocking in and out, tracking work computer usage and monitoring employee emails or internal communications/chat. Technology is becoming key to delivering insights that identify which people may be experiencing a **dip in productivity**, or alternatively, those who are now **working *too* hard**. But also, be aware that it can be perceived as 'big brother'.

# Next-generation meeting spaces will inject more innovation into the way employees collaborate in the office

Those that are striving to become more agile and **digitized are recognizing** the benefits of physical workspaces that encourage **engagement, collaboration and creativity**, all with a view to gaining the most out of their teams' **intellectual property**.

If certain tasks can be **performed easily at home**, people will need a reason to travel to an office – particularly if **HR policies prescribe less travel to meet sustainability targets**. And when they do return to the office, they'll expect the **same frictionless experience that the digital tools** they use for remote working offer.

So, if you enter a meeting room, it should be able to **detect who you are** and **with voice activated digital assistants** allow the room to automatically start the meeting for you, allow

participants to join, close the blinds, dim the lights … all of which ensure that the **meeting begins on time and without any technical glitches.** This will go a long way to making employees' in-office experiences that much richer.

We'll also see the emergence of pilots for **fully immersive meetings**, where people can connect from anywhere through the use of **virtual reality, augmented reality** and mixed reality to create real-world experiences.

## Trend 4

# Employee wellness will become a fundamental requirement of employee experience

How do you **motivate people to come back into your physical office** building, confident that their working environment is **safe**? People need confidence and assurance before they're comfortable to return to work to perform more collaborative tasks that require **face-to-face**, human engagement as opposed to virtual interactions.

The concept of employers meeting minimum **'duty of care'** standards to their employees is becoming a matter of **strategic importance and focus** at the boardroom level. Some Governments have already made it mandatory for businesses to report on the number of individuals that were physically in their office on any given day, per square meter. Hefty **fines** may follow if you **fail to submit such reports**, or if

they reveal that you've **exceeded certain space occupation limits**.

Employers are having to think hard about **optimizing the wellness** and safety of their workspaces, using the relevant technologies including data, analytics, security and automation.

**Buildings are already becoming smart to adapt to this new reality:** we're already seeing organizations implementing technology that allows them to gather and analyze data to ensure that they're adhering to **air ventilation, heating, lighting and** hygiene standards and **maintaining adequate social distancing within their buildings.**

**Trend 5**

# Digital twins: prepare to welcome a new level of insight and wellbeing into our workspaces

We're seeing increasing interest in the notion of **'digital twins' of our workspaces.** A digital twin becomes a central location where **previously siloed data from platforms** such as building management systems, maintenance platforms, space occupancy, energy consumption and health/wellbeing indicators can **interconnect** with productivity and HR platforms.

> **We're seeing increasing interest in the notion of 'digital twins' of our workspaces.**

All the data gathered by these respective platforms may be **aggregated into a single location** where **data modeling with artificial intelligence and machine learning can occur.**

**This will provide you with insights to make more informed decisions, such as the required number of office locations and the overall space required for a new model of distributed working;** what impact intelligent environmental systems for air, light and noise have on productivity, sick leave as well as attraction and retention of talent; and whether your organization is achieving their environmental and sustainability (ESG) goals, including energy consumption.
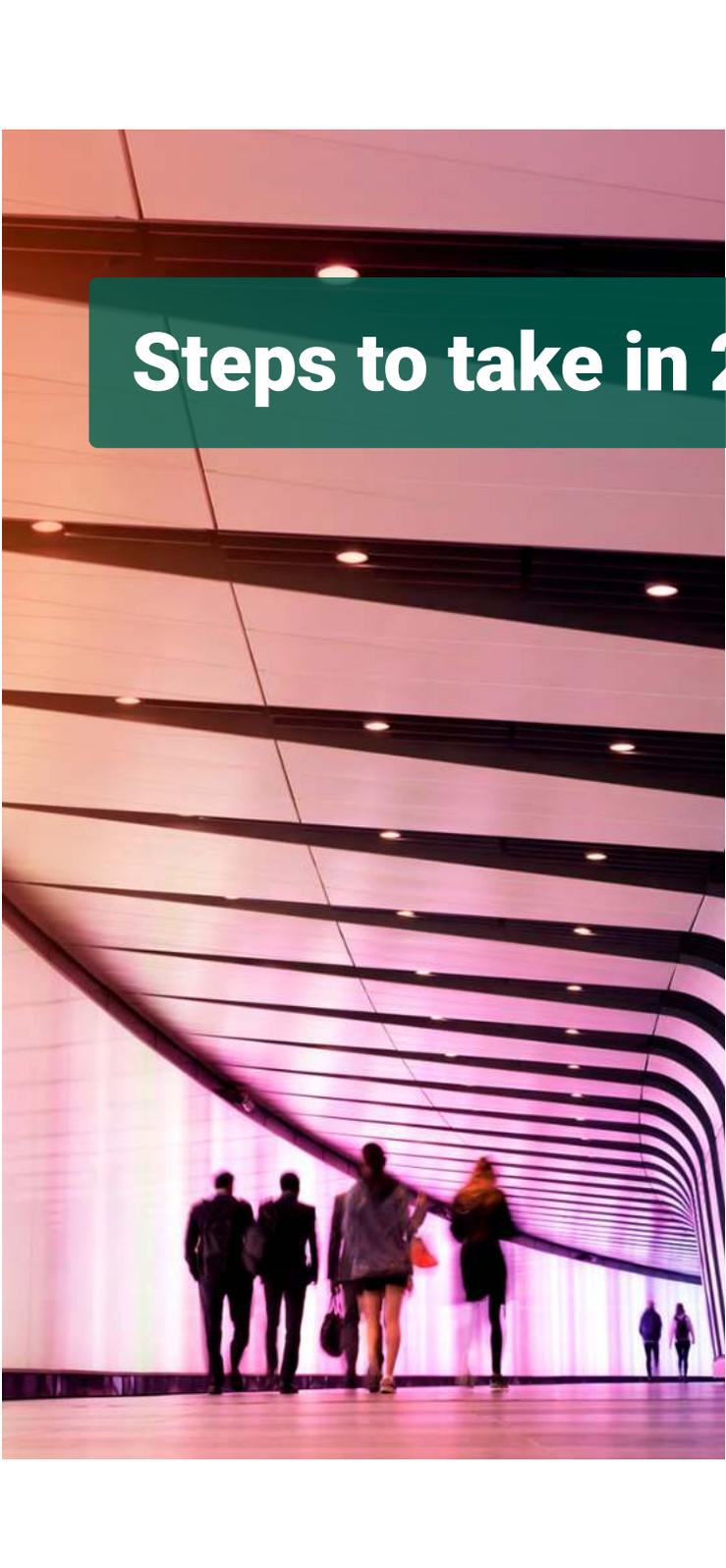
# Steps to take in 2021?

## 1.

**Ensure workplace analytics is positioned as something that provides value back to the employee, as opposed to something negative and dictatorial:** Also ensure employees are given the appropriate levels of training to use new technology, an often-seen mistake is to assume everyone will just consume a new service that's deployed, but many aren't digital natives and will require support.

## 2.

**Leverage technologies that are extensible and can integrate data from across IT, HR and facilities management to ensure you meet your 'duty of care' to your employees and any ESG goals that you've set:** Create an office environment that motivates people to return, knowing that their health and safety have been considered, and where all the benefits of social collaboration can take place.

## In 2021, which trend will be most important for your organization?

( ) Distributed workforce

( ) Employee identity, data and analytics

( ) Collaboration innovation

( ) Employee wellness

( ) Digital twins

( ) Other

**SEE RESULTS** ▬



**Modernize workplaces and accelerate teamwork, create meaningful employee experiences and provide seamless collaboration across distributed teams. Our experts discuss these and other emerging trends that will drive employee experience in 2021.**
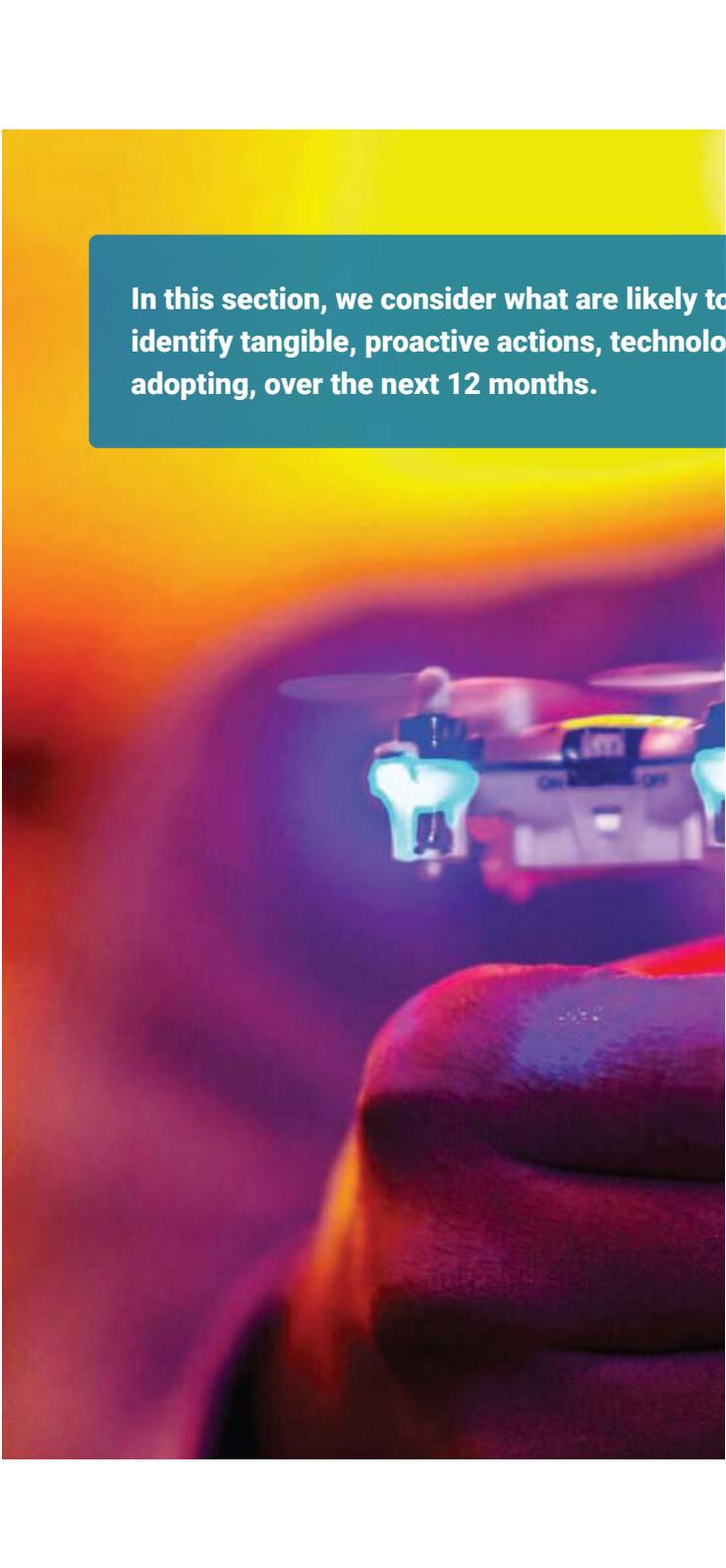
**WORKPLACE ASSESSMENT** ▬

Benchmark your workplace transformation progress against other organizations.

# Spotlight on cybersecurity

Top cybersecurity trends in 2021

In this section, we consider what are likely to emerge as disruptive cybersecurity technologies and concepts, over the next 3 — 5 years. We also identify tangible, proactive actions, technology investments and mindset shifts that security executives and professionals should consider adopting, over the next 12 months.

### 1. Artificial intelligence (AI) and machine learning (ML) will augment, not replace, people skills

A major hurdle facing businesses is effectively **blending the power and principles of AI with ML** with the **insights, expertise and experience of (scarce) cybersecurity professionals**. Then there's the issue of **product maturity**: Today, many of the solutions in the market are leveraging ML, but not yet unleashing AI in its fullest capacity. We believe that the solution to this two-pronged conundrum is for the industry to ramp up their efforts to **recruit, train, and educate** cybersecurity specialists and generate rewarding opportunities for them. At NTT Ltd., we've found that the quality of output from our ML and AI-enabled processes is based on the learning and training from their human counterparts. **Highly skilled security analysts have contributed to our success.**

### 2. Identity and 'zero-trust' will take center stage

As the pandemic has made **work-from-home scenarios** the norm, and employees have become more reliant on **cloud collaboration tools, traditional, perimeter-focused** approaches to security are simply no longer fit-for-purpose.

Now's the time for organizations to refocus on **implementing a 'zero-trust' approach** to security, along with strong identity and access management policies. It also calls for a renewed focus on engaging cloud access security brokers (CASBs) to ensure that our applications and data are secure in the cloud.
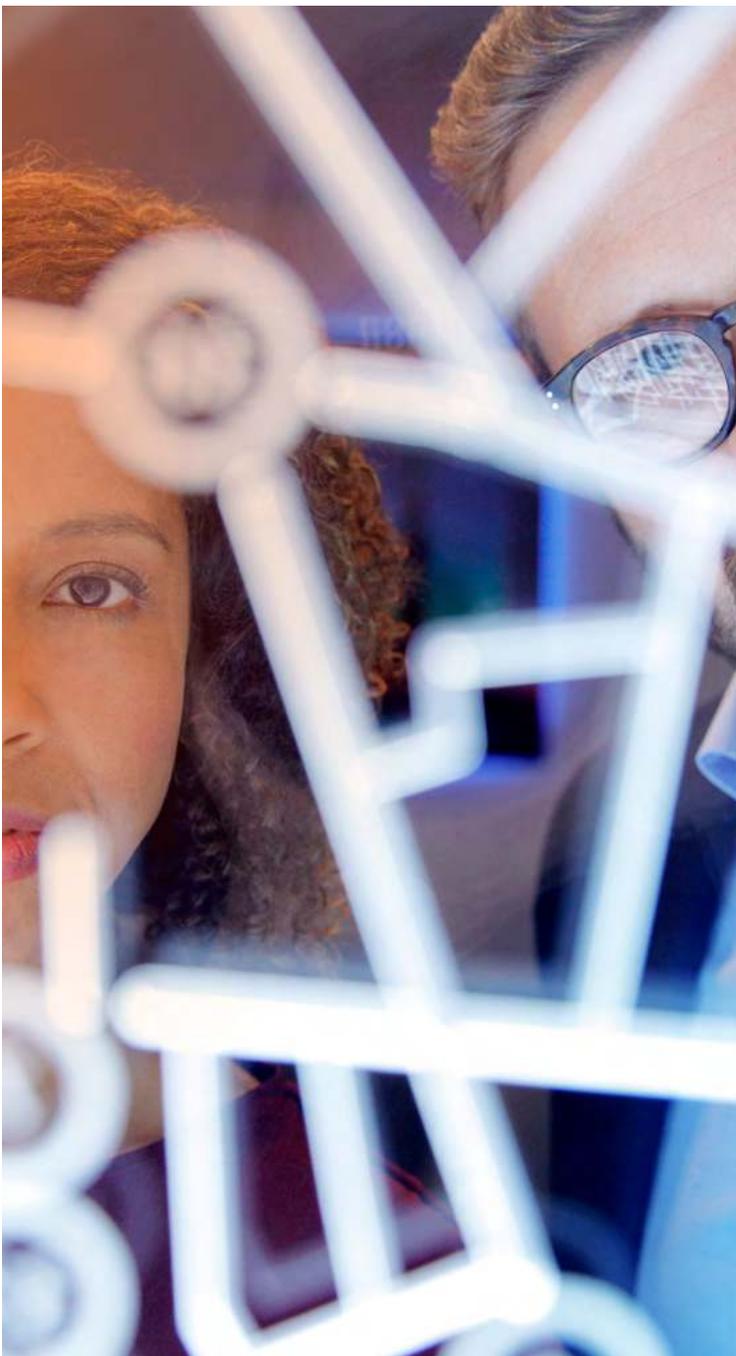
### 3. The impending rise of quantum computing

**How do you secure your business in an era of quantum computing?** We've spent the last two decades building encryption systems based on asymmetric or public-key cryptography. **It's fundamental to how businesses secure data today.** Quantum computing has the potential to perform calculations exponentially faster than classical computers, **threatening the current approach and encryption infrastructure.**

Yes, it's still early days … but once quantum computing starts to see an uptick in adoption, **we predict that it will cause a wave of disruption regarding how businesses encrypt data.**

**The basics still apply in the future.** In the world of remote working, the human interface will be targeted more than ever before. Threat actors know that humans are the **weakest link in your security**, and more so once they're outside of the traditional perimeter.

The pandemic has forced our **IT environments to change rapidly** to adopt remote working and cloud collaboration tools more, yet **many organizations haven't provided cybersecurity training** for their employees to educate them about remote work-related cyberthreats. That's despite knowing the risk: **just 42.8% of organizations have put in place training on new applications and ways of working.**

**Businesses should offer cybersecurity training** … not only COVID-19 related **'hygiene'** practices but also the latest trend of cyberattacks and **basic cybersecurity protocols that their people need to observe.**

## 4. The concept of 'secure access service edge' (SASE) will become understood and embraced

A new concept which Gartner has termed **'secure access service edge' (SASE)**, is going to become a mainstream trend in the next 12 months. **Most major networking vendors** have already bought into this notion and have a SASE 'play' and **it's already sparked the interest** of many enterprises.

Essentially, SASE focuses on achieving the **best end-user experience in an increasingly SaaS and software-defined network paradigm**, securing APIs and capitalizing on 'as-a-service' scenarios such as firewall-as-a-service or CASB-as-a-service.

## 5. 'Secure by design' will become an imperative and managed services provider' expertise will become sought after

Ultimately, cybersecurity must **protect your internal operations and employees** … as well as your **customers'**. Today, this means that simply buying **'point' security is no longer a viable approach**. Security must be embedded into every aspect of your environment, rather than 'bolted on' as an afterthought. This will ensure that everything you deploy and operate is inherently secure.

We foresee **this sparking discussions regarding the merits of engaging with specialist managed security services providers**. Their role will become increasingly focused on ensuring that cybersecurity is an enabler, not a hindrance, to digital transformation.

## 6. Power in unity: information-sharing and community building

It's never been a more critical time for **stakeholders across the entire ecosystem to come together** to mount a **powerful defense against ever-mounting and ever-evolving cyberthreats.**

Just like the COVID-19 virus itself, **cybercriminals and spies aren't becoming fatigued or weary** by its impact on our personal and professional freedoms and prospects, as many of us are. Threat actors and organizations are **opportunistic, and both well-organized and funded** enough to ramp up their nefarious activities despite the current worldwide crisis. We believe that now, more than ever, it's time for all industry players to unite — unselfishly — by sharing our cyberthreat intelligence and best practices. This is the only way in which we can shore up enough capability and re - invigorate our efforts towards prevailing over the scourge of cyberattacks.

We believe that it's **important to launch or expand a community to build trust and discuss cybersecurity concerns and solutions** with your industry peers. One way to do this is to ask your **local chamber of commerce** to host cybersecurity webinars to discuss key issues. Another option is to have leading technology organizations host cybersecurity study sessions, as NTT Ltd.'s Australian business did for **local universities and businesses, in August 2020.**

> NTT is investing heavily in **new cryptographic techniques** to enhance the security of post-quantum public-key encryption.

## In 2021, which trend will be most important for your organization?

- ◯ Artificial intelligence and machine learning

- ◯ Identity and zero trust

- ◯ Cloud and data security

- ◯ Secure access service edge

- ◯ Information sharing

- ◯ Other

**SEE RESULTS** ▬



**Our experts discuss cybersecurity trends that are likely to emerge in 2021 and beyond. They also identify tangible, proactive actions, technology investments and mindset shifts that security executives and professionals should consider adopting, over the next 12 months.**

**ASSESS YOUR CYBERSECURITY MATURITY**

How cyber-resilient is your business in a time of crisis?

NTT

# Top technology services trends in 2021

Create efficiencies and optimize IT for better business outcomes

COVID-19 has quickly brought **the stark reality of change** to many organizations. While transformation is relatively **commonplace** among a majority, it's the nature of transformation in our current reality that's posing questions among senior leadership teams. For so long, the customer was front and center of digital strategy; **now employees bear equal consideration** as the way in which businesses operate has been turned upside down, literally overnight.

Addressing this **change can't be done alone**. Even with well-resourced teams and sizeable budgets, IT has become such an integral part of operating and innovating the business, that **great partners are a critical component** of the people, process and technology mix. Success depends on how willing and able organizations are to capitalize on **smart sourcing** practices, **collaborating with service providers to**

**reimagine** what digital transformation now really means. And service providers are on notice too. They need to ensure their focus is on delivering quality outcomes and business value.

Much of that quality and value was **already in-demand** pre-COVID-19, such as requirements for **deep technical expertise and simplicity of engagement**. And the need for these attributes will only intensify. This was echoed in NTT Ltd.'s recently released **2020 Global Managed Services Report**, which states that pressures placed on in-house IT teams are set to be further be compounded by a lack of resources and skills. The research also points to the **ongoing expansion of the influence of business units**, with IT strategy increasingly becoming organizational strategy. Decisions as to what new technologies and services are required will no longer be driven by the IT alone, but by cross-functional teams.

**In this chapter we'll take a closer look at some of the key trends impacting the technology services industry, as we move into 2021:**

# Cloud-based, on-demand platforms supporting remote working scenarios will need to be deployed – fast

**Cloud adoption has increased significantly** since the pandemic started. And it won't stop as organizations embrace the **new reality of how work will 'work'** and a culture of 'remote connection'. We expect to see increased demand for technologies that can be swiftly deployed through **cloud-based, on-demand platforms**. This will be essential to ensuring relevant services are **within easy reach of employees**, where and when they need them.

**Zoom** for example, became an (almost) overnight success during the pandemic. **It allowed video collaboration technology to be used easily, cost effectively and quickly**, increasing capacity to meet demand where needed. We predict the accelerated **adoption of**

**consumer-grade technologies** within the enterprise will continue.

As such, hyperscalers and other cloud service providers **have ramped up capacity to meet increasing demand** for resources and have made it easier to deploy cutting-edge technology with minimal upfront investment, and without specialized people skills. These efforts will be largely successful in ensuring **a sufficiently robust data backbone** that supports organizations' need to provide **reliable, efficient remote services and delivery capability.**

# Trend 1



Specifically, **remote working scenarios** will see greater interest in infrastructure-as-a-service, colocation and hosting support, which **drive faster and scalable bandwidth** for initial and on-demand increases in capacity. Additionally, we'll see more uptake in enterprise network managed services, which mitigate and **manage bottlenecks between public cloud and on-premises data centers.**

Against this backdrop, the **need for enhanced connectivity shouldn't be underestimated.** Increases in virtual working and the notion of the 'distributed organizational workplace' means it's critical that businesses have **access to reliable, high-speed networks that scale quickly and effectively.**

As organizations increasingly rely on **cloud-based platforms** and other advanced technologies, such as **augmented reality and artificial intelligence (AI)**, 5G for example will also become a more viable proposition. **While 5G is still in its infancy, organizations are already looking to reduce reliance on traditional networking** technologies (e.g. cable and fiber),

leaning more towards software-defined networking – one of the fastest-growing segments in IT.

However, this **will create challenges** in other ways. Organizations will need to fundamentally re-evaluate their enterprise security policies and protocols, while also be on the **look-out for shadow IT**. This is where a **strong CIO, with great relationships** across the business is critical. More and more, they will require a **centralized view** of their IT estate. The ability to not only see what's going on across the organization, but to **work in partnership with line of business stakeholders** to understand how they can help innovate and meet their various objectives and outcomes. IT needs to truly become the **enabler of innovation – and cloud is the answer.**

# Increasing need for automation, process integration and optimization due to skills gaps

The ability to **find and retain appropriately skilled IT resources** has been a perennial problem for many organizations. To address this, **automation in the workplace will play an increasingly critical role. Process automation** for example, not only compensates for a lack of human resources and specialist skills, it **also reduces cost and improves the availability and overall quality of service delivery.** The process effectively becomes the 'skill', allowing organizations to adapt quickly in what is currently a very fast-moving environment. Additionally, **it minimizes the risks typically associated with manual provisioning** and patching processes, which can introduce costly errors and delay implementation.

We'll also see increasing interest in **dynamic platforms** delivering reliable, secure business outcomes through **SecDevOps frameworks.** This allows for **more secure, rapid deployment of new technologies and accelerated software development. Security plays a crucial role in the software development lifecycle (SDLC),** both in the early and latter stages of the process. While it's important to **embed security early** on in the SDLC (Shift Left), ensuring quality and business objectives are met; user experience, functionality and performance are delivered by testing in production (Shift Right). Gone are the days of security being viewed as a cost center. **It delivers real value** around **user experience** in the digital transformation process.
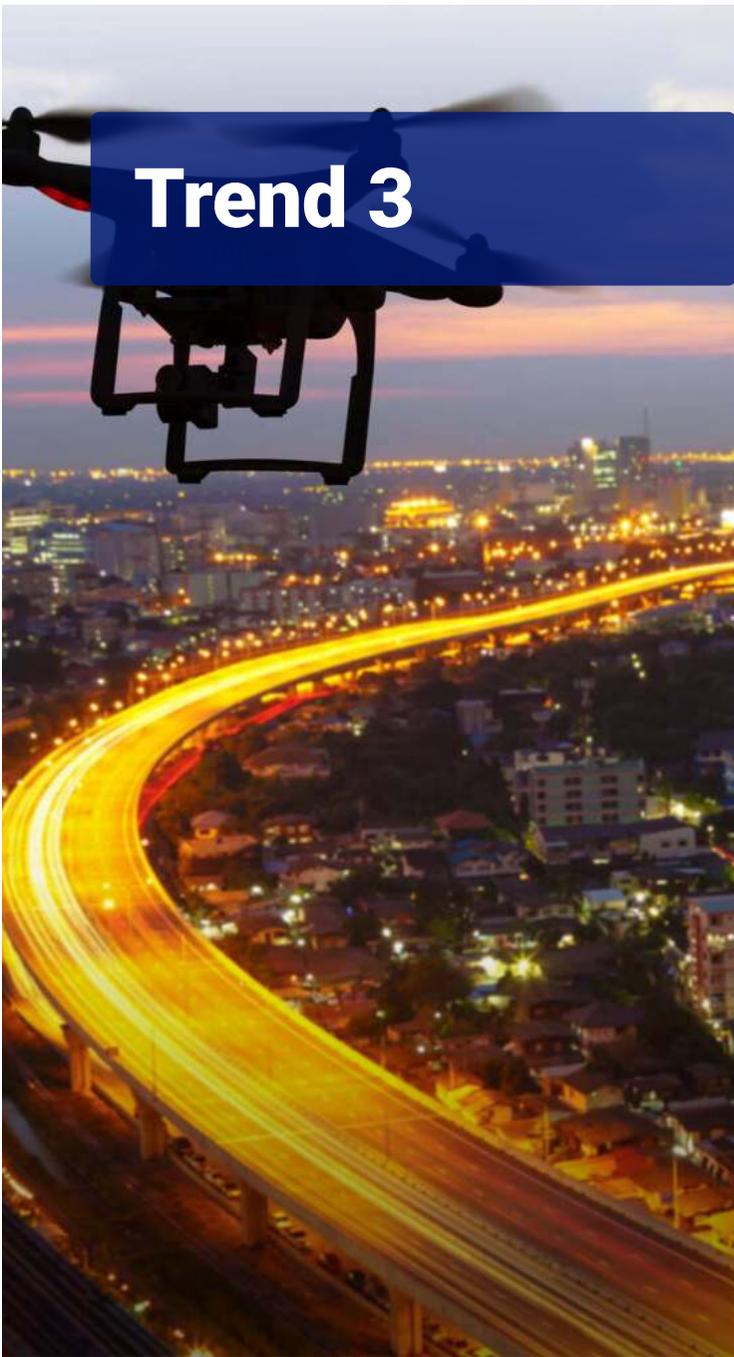
# Surge in virtual, remote services and digital reality

Businesses will need to **establish and entrench new ways to operate efficiently and effectively** now that many have **primarily virtual, remote workforces.** This will include implementing remote workforce collaboration processes and solutions, and further harnessing tools such as AI and machine learning (ML) **to deliver services in an automated and remote fashion.**

The **use of AI continues to grow rapidly and scale faster than ever,** which is timely and relevant given the current climate we live and work in. These technologies will have a big impact on **supporting the challenges** the world faces currently, particularly those in **health and education.** This is just as well, as AI and ML tools and resources are becoming **less expensive, and more available to businesses** around the globe. As such, organizations will place a significant focus on these tools/ platforms to provide them **insights into**

**changing patterns and behavioural shifts.** This is crucial towards being able to adapt and evolve, and essential given the fluid nature of work and society currently.

The reality for organizations right now, however, is that they are **starved of the key skills** and resources to analyze **huge volumes of data**. Thus, interpretation only focuses on **immediate data trends or patterns**; whereas they want to utilize AI to better **understand and interpret the vast array and volume of data** they're collecting. Service providers will step up to the plate to offer deeper insights for clients through their own platforms, with **AI and ML tools embedded**. Through highly personalized dashboards, enterprises will be able to better spot connections and insights **normally missed by manual human analysis.**
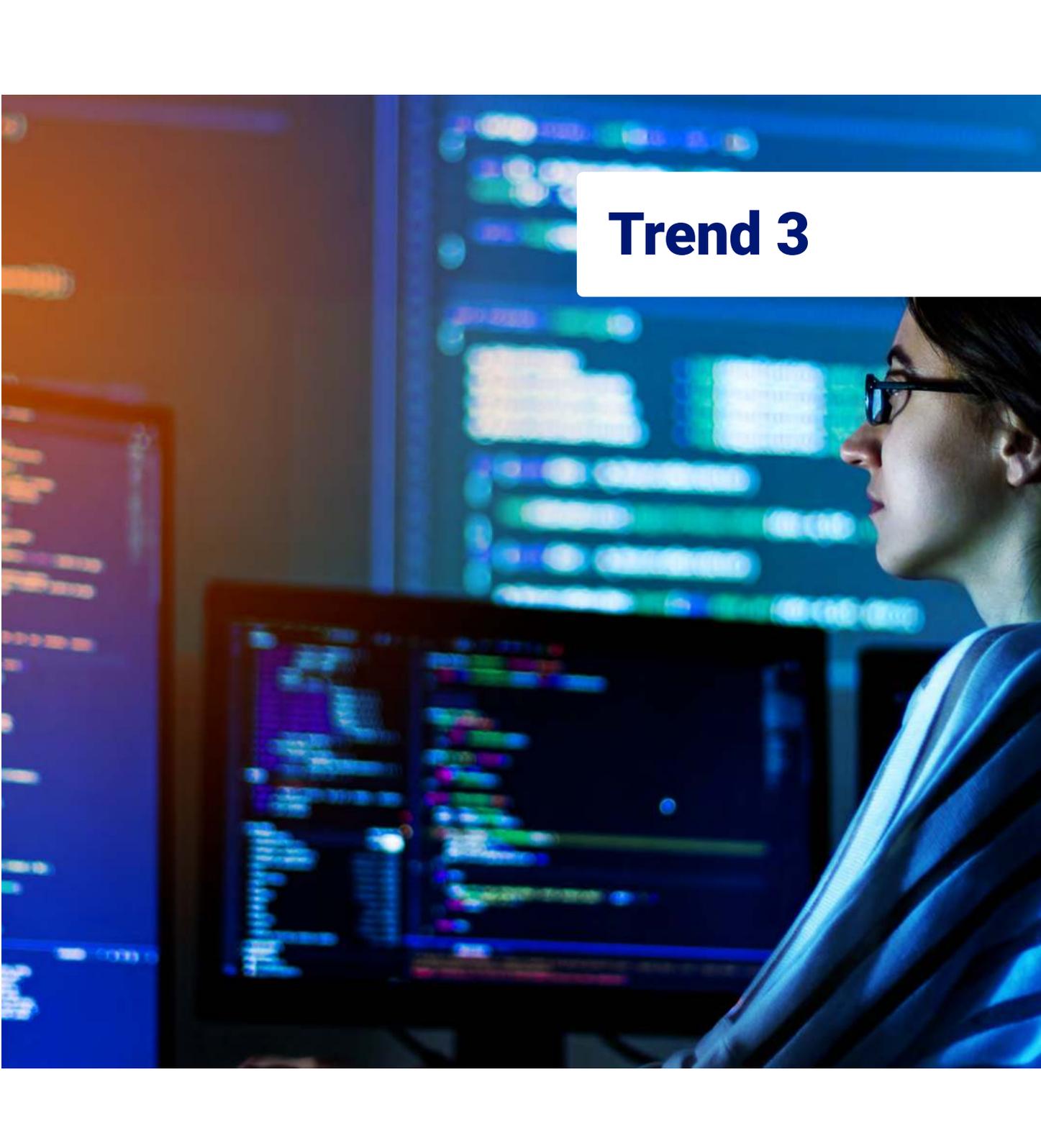
# Trend 3

ML algorithms will also become **better informed and increasingly sophisticated in the solutions they uncover. Businesses will then use this data** to better understand the changing patterns in user and consumer behaviour, especially as **more behaviour and interaction now takes place online, from shopping** to socializing and now virtual working environments, recruitment and meetings. As a result, these advancements will have a big impact on the nature of infrastructure, as well as the services that have **AI and ML tools embedded within them. They must allow organizations to easily deploy, manage** and consume them both cost effectively and efficiently.
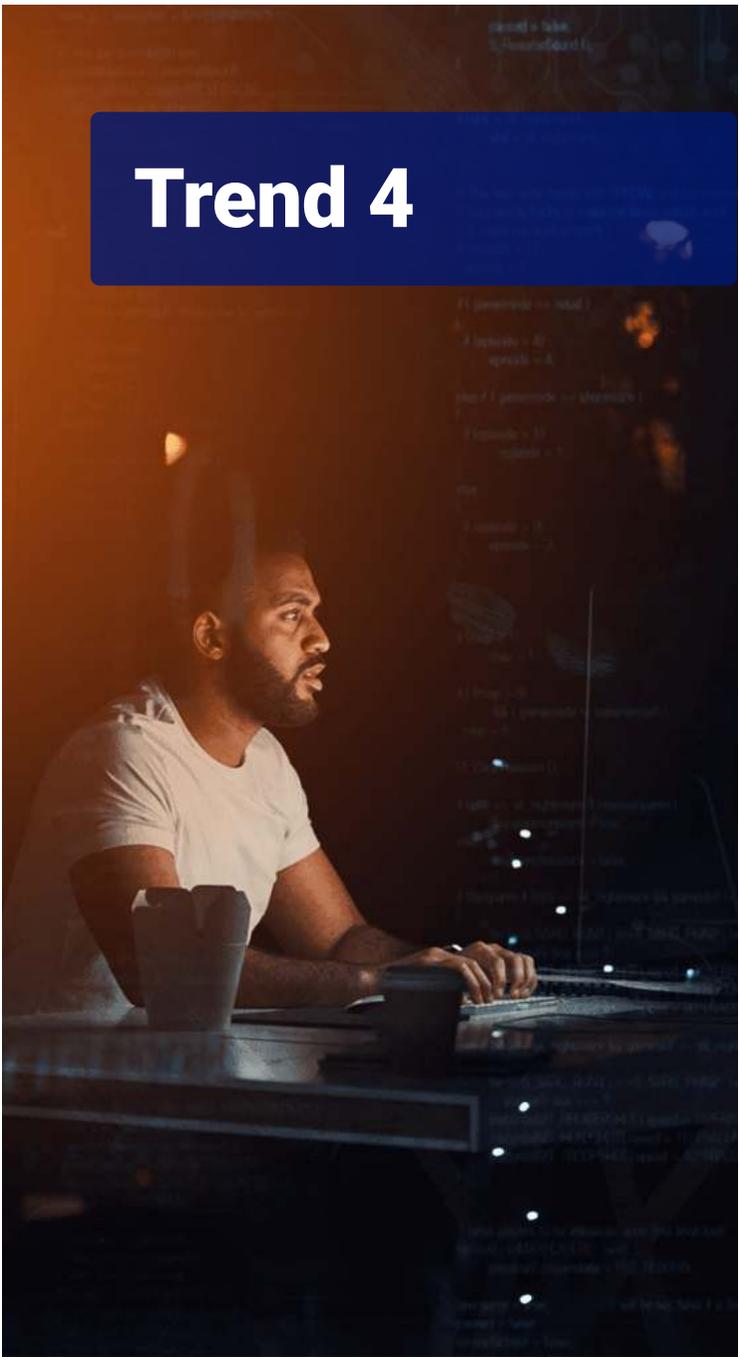
**Trend 4**

# Distributed organizations and workforces will introduce new cybersecurity threats

Organizations have become **considerably more distributed** in recent months, and that doesn't just mean **working from home**. The concept of **work from anywhere** is now firmly established, which means organizations are dealing with less-controlled places of work, meaning a **larger attack surface** and greater potentials for breaches. As such, CIOs and CISOs are grappling with the **overwhelming demand for cybersecure work-from-anywhere technologies.**

Areas of particular **concern will include cloud security and governance** – given the way in which the pandemic has changed our traditional notion of how we address security. **Application modernization and 'going serverless'** will usher in new application security considerations. This is because the processes used to support or manage these environments will have **fundamentally changed** – many physical technologies simply no longer exist.

# Trend 4

Organizations will need to deal with the additional complexity associated with **distributed applications and data through cloud-delivered security** and threat detection:

- Where's your **data stored**?
- Who's **monitoring and supporting** the environment?

They'll also need to find ways to gain increased **visibility of service performance** and ensure compliance with service level requirements.

In 2020, we've already seen **increased numbers of attacks** on big businesses. But on the upside, we're observing the **emergence of new technological advances** allowing them to better identify and manage breaches and vulnerabilities. These include **technologies to combat** deepfakes and advancements in **blockchain security**.

**Deepfake technology i**s used in malicious ways, such as spreading false information on **social media**. In fact, recent advancements in machine learning have allowed fakes to be created **using a single picture of the target and just a few seconds** of a recording of their voice.

# Steps to take in 2021?

**Capitalizing on these technology services trends is well within your reach. Here are our top pieces of advice to organizations seeking to draw upon them as they navigate these uncertain times:**

## 1.

**Smart-source, don't outsource:** Work with a trusted partner, rather than a transactional supplier. Among other initiatives, a seasoned service provider will help you harness the power of automation, reduce the amount of time spent on everyday tasks, and increase operational and cost efficiencies across your secure IT estate.

## 2.

**Ramp up your DevOps capabilities, now:** Working with a service provider that offers a platform-based approach to facilitate DevOps releases is a great way to ensure you gain the benefits of rapid, continuous and iterative innovation without the upfront costs of the human capital.

## 3.

**Innovation and integration go hand in hand:** Dealing with the realms of IT complexity means any service provider serious about advancing your organization can no longer be just a technology service provider; they need to be a software development house too and the digital fabric of your hybrid IT environment.

## In 2021, which trend will be most important for your organization?

○ Cloud-based, on-demand platforms

○ Automation, process integration and optimization

○ Virtual, remote services and digital reality

○ Cybersecurity for distributed workforces and organizations

○ Other

**SEE RESULTS** —



**Our experts discuss ten technology services trends that will create efficiencies and optimize IT for better business outcomes in 2021.**

**ASSESS YOUR MANAGED SERVICES LANDSCAPE**

How cyber-resilient is your business in a time of crisis?

# Contributors

**Alex Bennett,**
Vice President, Intelligent
Workplace,
NTT Ltd.

**Andy Cocks,**
Chief Go-to-Market Practices
Officer,
NTT Ltd.

**Adam Skovron,**
Senior Vice President,
Innovation, NTT Ltd.

**Atalanta Kar,**
VP and Global Head of Sales,
Nihilent,
an NTT company

**Damian Skendrovic,**
Executive Vice President,
Managed Services GTM, NTT
Ltd.

**Deidre Smith,**
Senior Vice President, Global
Cybersecurity Services, NTT
Ltd.

**Dipankar Mukherjee,**
Chief - Innovation, Nihilent,
an NTT company

**Gary Middleton,**
Vice President, Networking
GTM,
NTT Ltd.

**Mark Alexander,**
Chief Executive Officer, Cloud
Communications division,
NTT Ltd.

**Matthew Gyde,**
President and CEO, Security
division,
NTT Ltd.

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

**Muna Khurshid,**
Vice President, Intelligent
Infrastructure GTM, NTT Ltd.
Americas

**Nadeem Ahmad,**
Senior Vice President, Group
Technology Strategy, NTT
Ltd.

**Nemo Verbist,**
Senior Vice President: Digital,
Workplace and Customer
Experience GTMs, NTT Ltd.

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

**Rob Allman,**
Vice President: Customer
Experience,
NTT Ltd.

**Rob Lopez,**
Executive Vice President,
Intelligent Infrastructure, NTT
Ltd.

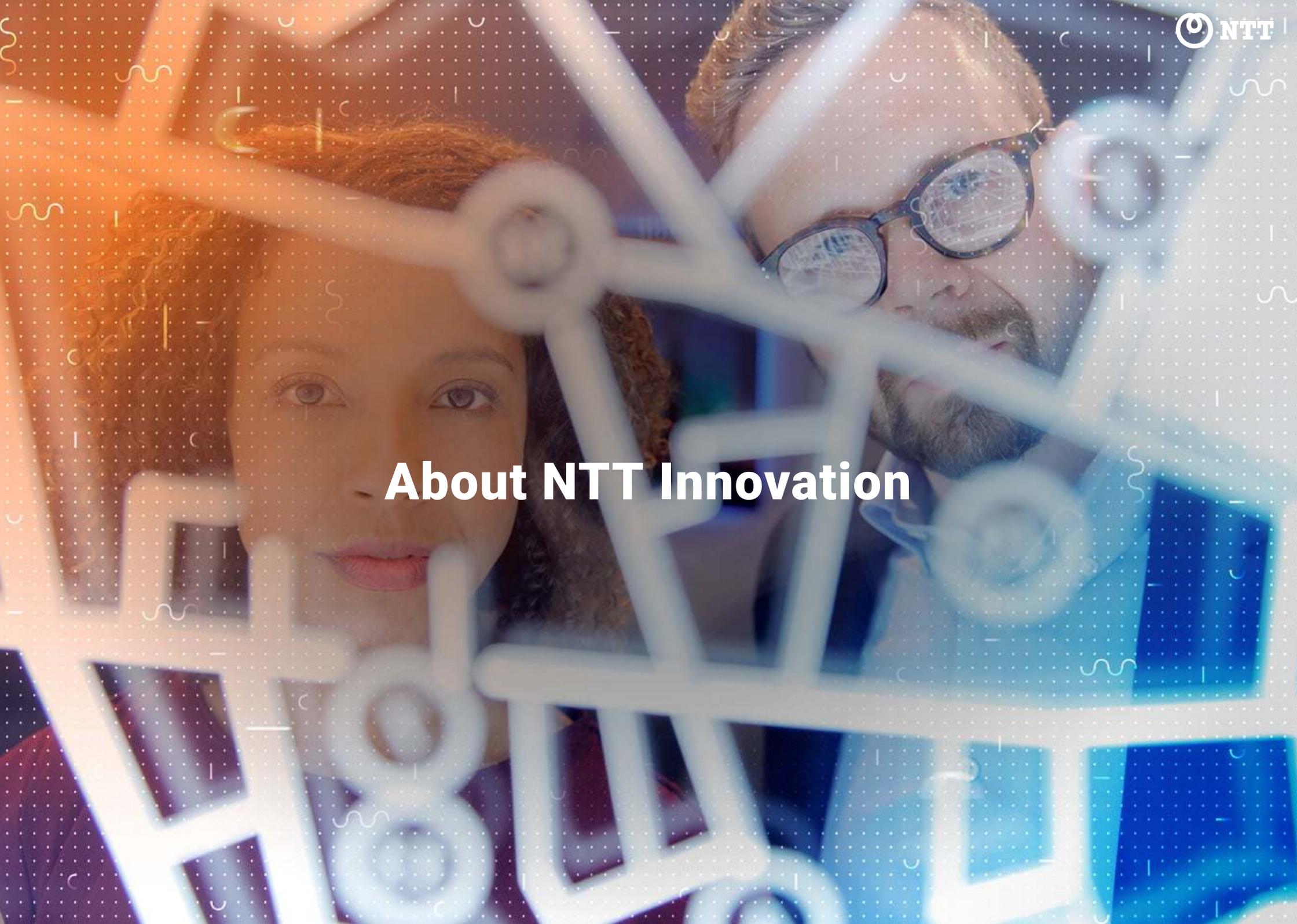**Terry Bebbington,**
Senior Security Strategy,
Security division,
NTT Ltd.

**Vineet Bahal,**
Senior Vice President,
Nihilent,
an NTT company

# About NTT Innovation

## 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.

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

**5,000 R&D professionals, 2,500+ research engineers, 17,000 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.

\*5-year average

Thank you for reading

# Future Disrupted: 2021 technology trends