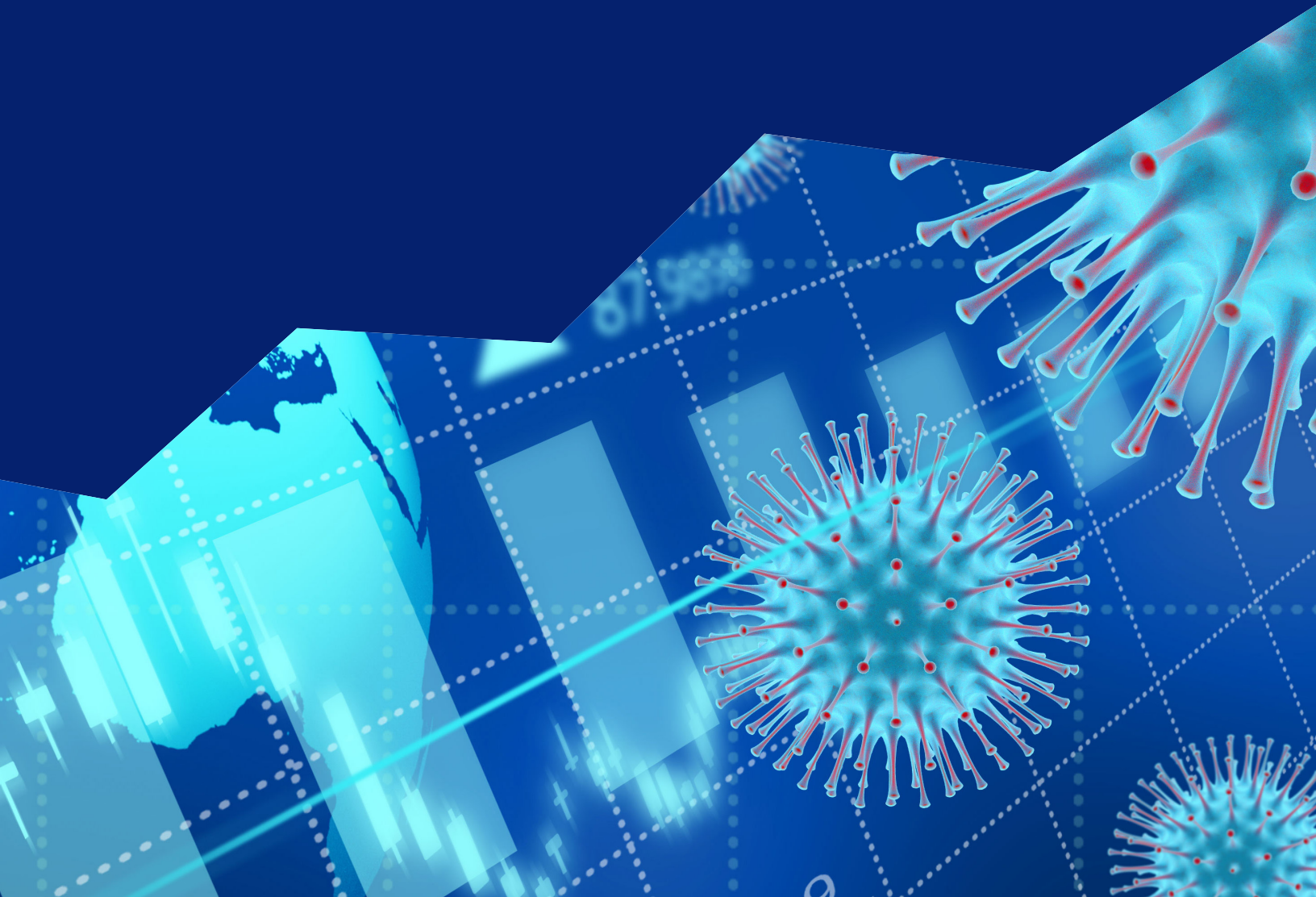




# The State of the Data Center Industry **Post-Pandemic**



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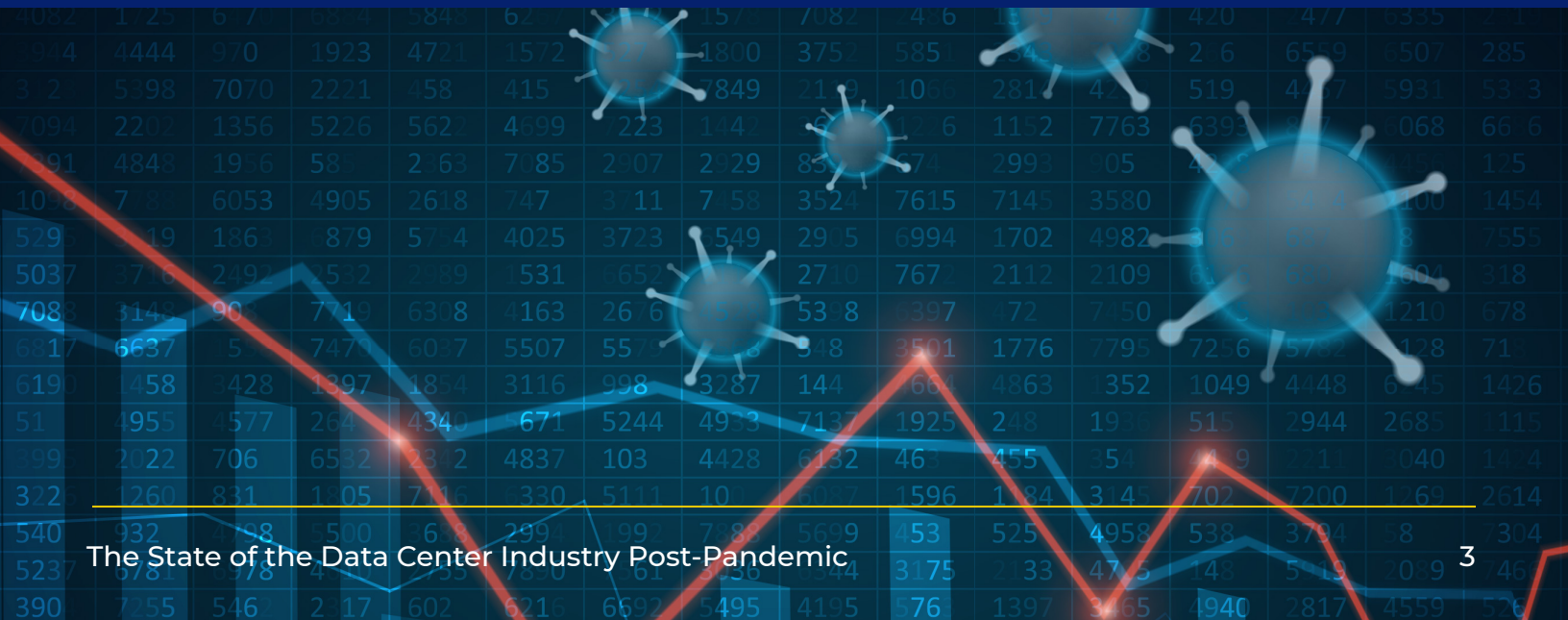
# Introduction

At the beginning of 2020, PCX published a look ahead at how the data center industry was expected to change and progress over the next 10 years.

A few months into the new decade, the world was blindsided by a historic health crisis that changed the business trajectory for nearly every industry.

Though we haven't quite turned the corner on COVID-19, in light of the many changes the virus set in motion, PCX is releasing an updated outlook for the data center industry from a late-to-post-pandemic perspective.

It's important to note that some of the trends we are tracking were well underway before the events of 2020. However, in some instances, the pandemic impacted how these trends progressed.





## The Pandemic's Impact on the Fourth Industrial Revolution

In 2020, we noted that unprecedented growth in data center demand was being driven by the [Fourth Industrial Revolution](#)—a term coined to describe technologies such as artificial intelligence (AI), quantum computing and the Internet of Things (IoT).

Today, the data center industry is experiencing elevated demand, but we now attribute much of this increase to lifestyle and workforce changes precipitated by the pandemic.

The data center industry grew during the pandemic when others did not, due to the need to maintain IT infrastructure and expand computing capacity to support millions of new remote workers and a massive increase in internet usage.

Technologies such as cloud and edge computing have a foot in both camps. They are not only considered drivers of growth in the Fourth Industrial Revolution, but also essential tools for business continuity in a pandemic-impacted economy.



**When the world collectively moved work and social lives online, the demand for data center capacity skyrocketed.**

## External Factors Shaping Data Center Evolution

Unlike other sectors, the data center industry and its subsequent business forecasts grew due to the COVID-19 pandemic.

Here are some of the key factors that have had the greatest impact on where the data center industry is heading post-pandemic:

### Creation and Consumption of Information

Data usage was already on the rise before 2020, but when the world collectively moved work and social lives online, the demand for data center capacity skyrocketed. In the first quarter of 2020, [broadband usage jumped 47 percent](#) year over year, and Microsoft reported that the use of its [cloud services increased by 775 percent](#) in some regions.



## **Changes in Edge Computing, IT Functions and Cloud Migration**

During the pandemic, many organizations added computing power and capacity to support a remote workforce, digitizing operational functions and making company applications and files accessible from anywhere. These activities increased the need for data centers in edge environments to decrease latency issues.

## **Skilled Labor Shortage**

The IT industry was struggling with a lack of skilled technology workers long before the pandemic. However, the data center sector is having an even harder time recruiting and retaining employees than most industries.



## Supply Chain Disruptions

Supply chain disruptions slow the pace of data center construction, but not all of these roadblocks are directly caused by COVID-19. Demand for raw materials has increased since the onset of the pandemic, making it more difficult to source lumber, steel and other key construction supplies. A worldwide computer chip shortage is also slowing data center expansion, but this is a manufacturing issue rather than a pandemic-driven supply chain problem.

## Real Estate Costs and Availability

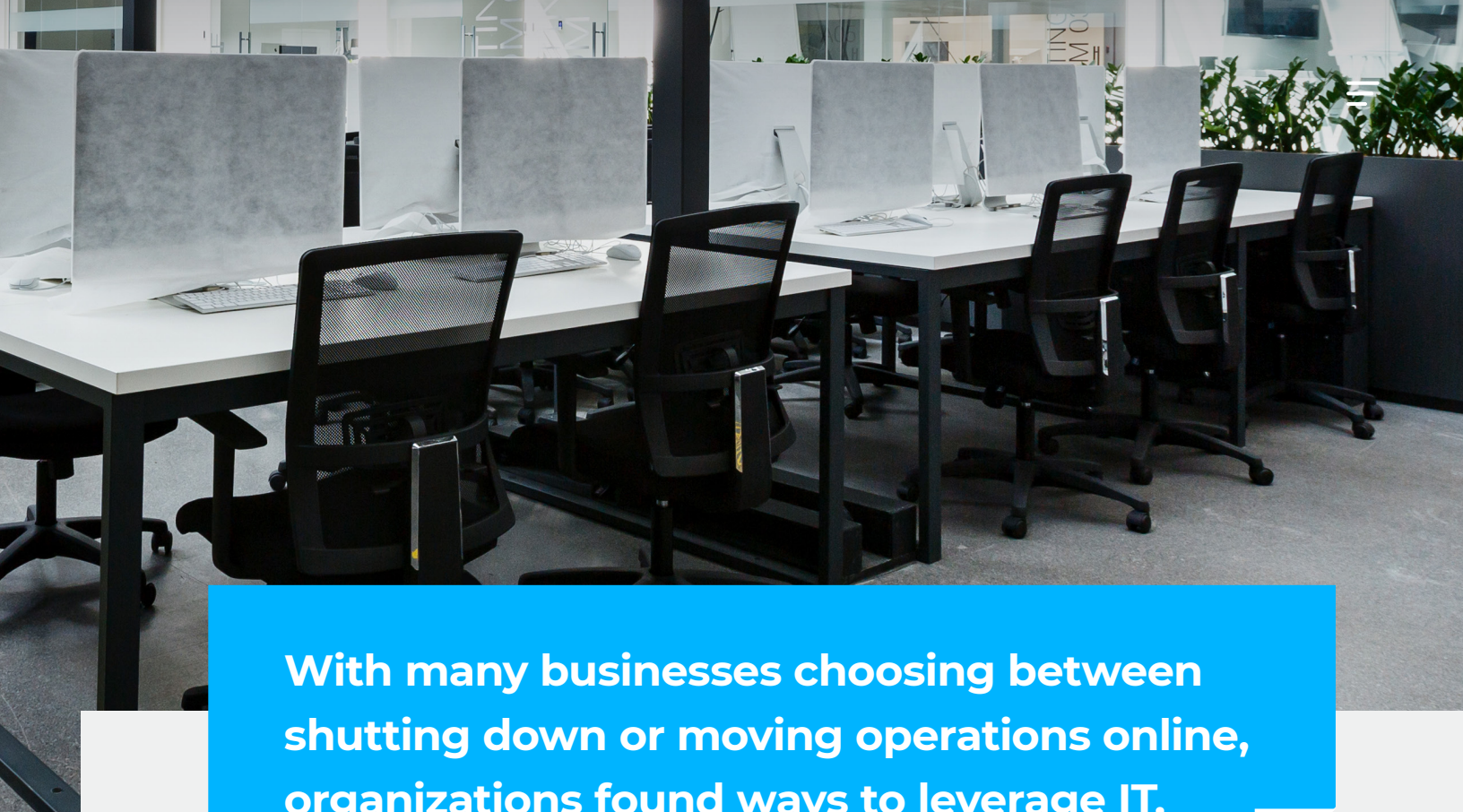
Big-name data center players—such as Google, Amazon and Microsoft—have either bought up all the available space in tier 1 regions or priced the smaller companies out of the market. High demand for capacity is [driving growth](#) in secondary and even tertiary markets, making cities such as [Salt Lake City](#) and Omaha, Nebraska, new data center hot spots.

## Remote Work

The mass pivot to remote work environments is a huge driver of the increase in capacity demand. Remote workers rely on web-based meeting and productivity tools, software-as-a-service (SaaS) applications and online storage, all of which require data center resources to power and enable.



**The mass pivot to remote work environments is a huge driver of the increase in capacity demand.**



**With many businesses choosing between shutting down or moving operations online, organizations found ways to leverage IT.**

### **Digital Transformation**

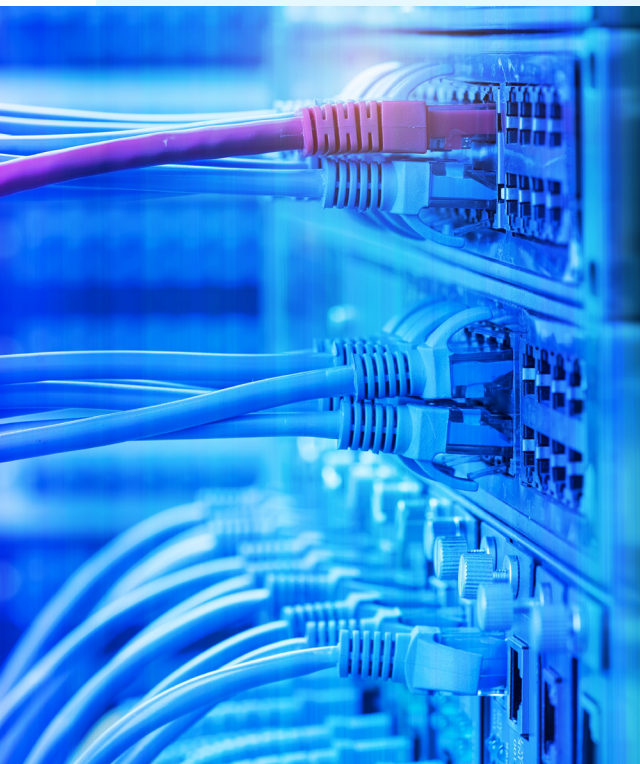
The pandemic sent enterprises into digitization overdrive. With many businesses choosing between shutting down or moving operations online, organizations found ways to leverage IT—such as cloud and microservices—to meet client needs in more modern and operationally efficient (i.e., digital) ways.

### **Changing Urban Landscapes**

Remote work eliminated the desire of many employees to live near their workplaces. With more options available, many chose to move out of the urban core. This migration away from primary data center markets led to an expansion into smaller markets and edge locations to keep both data storage and processing closer to users.

# Pressures Driving Changes in Data Center Design

In early 2020, we recognized that businesses were demanding more and more data to drive operations and that this data often came from disparate sources.



These factors had already begun to shape how data centers were designed and manufactured to accommodate new ways of consuming and sharing data.

Before the pandemic, the main pressures driving changes in data center design were:

- Cloud computing
- IoT
- 5G
- Big data
- Artificial Intelligence (AI)
- Climate risks
- Clean power
- Growth markets

Today, we see that we were right in predicting that several of these factors would continue to motivate change within the industry.



**Many companies are opting to maintain their remote and hybrid work environments indefinitely.**

## Edge, IoT and 5G

Edge computing is hitting its stride in the current technological climate. IoT and smart devices are becoming ubiquitous, taking computing needs further from the primary data center hubs. 5G networks are poised to hit the mainstream, which will create even more need for edge facilities to mitigate latency issues.

## Cloud Computing

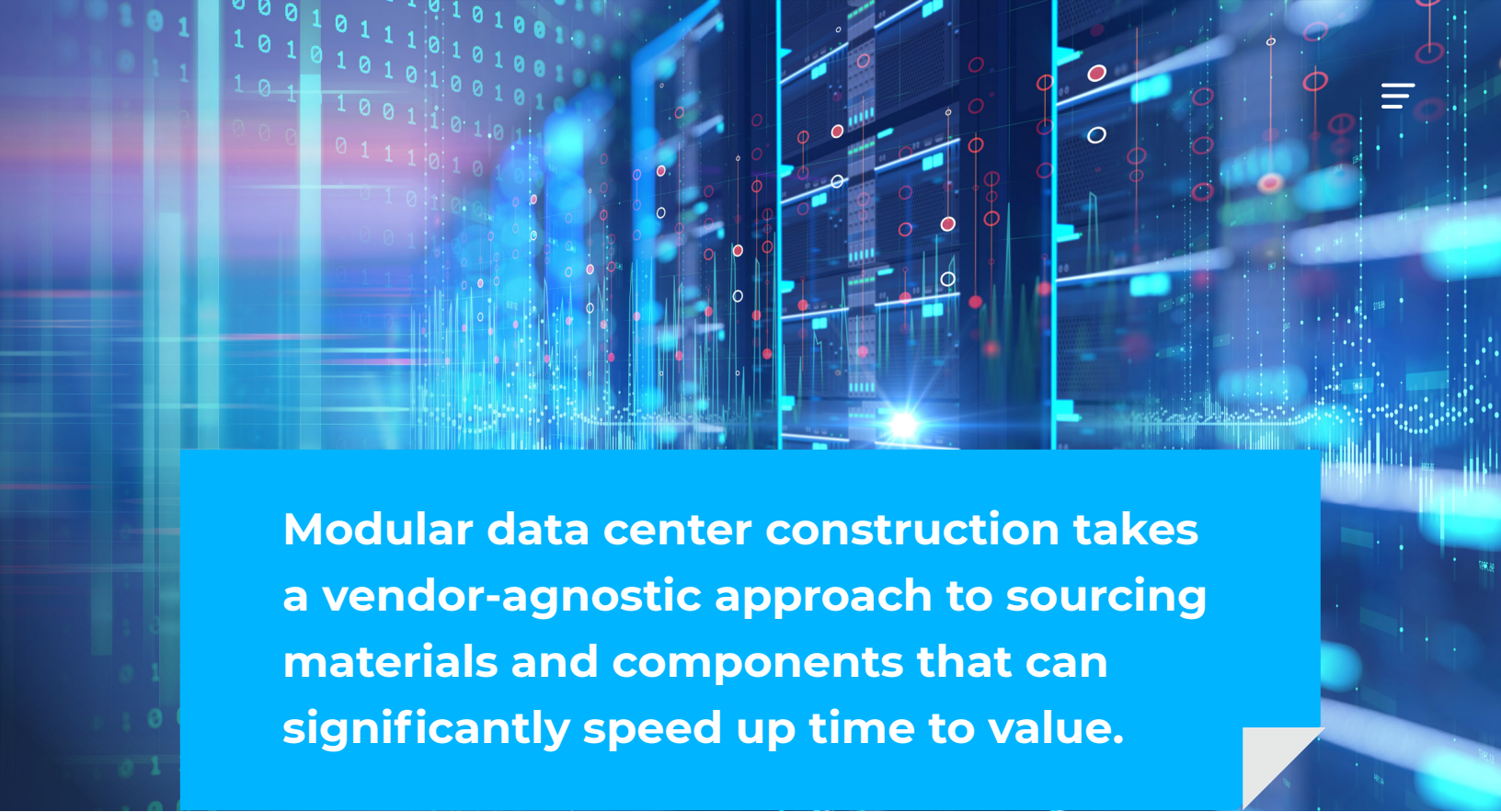
Many companies are opting to maintain their remote and hybrid work environments indefinitely. Cloud-based SaaS solutions have become the platform of choice for organizations to support collaboration and productivity for distributed teams.

## Big Data and AI

In today's business environment, data is a highly valued asset. And most of that value stems from an organization's ability to extract actionable insight from it. AI drives today's big data analytics, requiring considerable data center capacity.

## Colocation

The pandemic prompted businesses to fast-track their digital transformation initiatives. Many are choosing to migrate from their on-premises data centers to colocation facilities to take advantage of economies of scale and efficiency.



**Modular data center construction takes a vendor-agnostic approach to sourcing materials and components that can significantly speed up time to value.**

## **A Need for New Engineering and Design Skills**

Changes in data center design require different engineering and design skills. Modern demands for capacity cannot be accommodated with traditional stick-built designs.

Data center owners necessitate turnkey modular data centers that are quick to deploy and are scalable to meet today's needs and increase capacity later.

Although there is no real work-around for the current supply chain situation, modular data center construction takes a [vendor-agnostic](#) approach to sourcing materials and components that can significantly speed up time to value.



The data center industry is also notorious for the amount of power required to cool and operate facilities. There has been a push in recent years to make the industry “green” by introducing environmentally friendly power sources, energy-efficient systems and green building practices.

Retrofitting existing stick-built facilities with green technology is cost-prohibitive at best and often not even possible.

Modular data center design provides a cleaner alternative to traditional construction methods because modular data centers generate fewer carbon emissions—especially Scope 3 emissions—than facilities built on-site.

The smaller enclosures are easier to cool, reducing the amount of electricity used. And because they are manufactured in a controlled factory setting, modular units produce less waste, and many materials and components can be recycled or reused.

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# The New Data Center Forecast

Although the pandemic didn't change the data center industry as extensively as other industries, it had a significant impact.

Some obstacles—such as slowed construction timelines due to supply chain issues and the skilled labor shortage—existed before the pandemic and were exacerbated by COVID-19.

Other factors directly related to the pandemic have driven data center business growth, including an expedited shift to remote and hybrid workforces, accelerated digital transformation initiatives and increased reliance on SaaS applications and online entertainment.





At this point, it's difficult to make a long-term forecast for the data center industry at large. However, one lasting impact of the pandemic is how the demand for capacity, the evolution of edge computing and the migration of enterprises away from on-premises data centers will fuel the growth of the modular data center industry.

Post-pandemic, modular data center construction and deployment will be more critical to IT infrastructure across all industries. COVID-19 forever changed our work environments and data consumption habits, revealing that many organizations are ill-equipped to deal with increased data demands and remote workforces.

As we humbly learned from the events of 2020, predicting industry trends is an imperfect science. The forecast for your business will depend on its priorities, whether it's undergoing digital transformation, reducing capital expenditures or bringing your services closer to your end users.

**COVID-19 forever changed our work environments and our data consumption habits.**



## How PCX Helps Customers Navigate Late-Pandemic Data Center Deployment Challenges

PCX specializes in the design and manufacturing of modular electrical and mechanical solutions—such as skids, switchgear and all-in-one data centers—and serves the data center, commercial construction and energy markets.

For over 26 years, PCX has delivered more than 12,000 systems throughout North America and Europe, including 500MW of modular data center solutions with 300 electrical skids since 2019.

But customer needs have changed throughout the pandemic, and PCX is working hard to anticipate new solution requirements and develop new capabilities around our offerings to address these evolving needs.

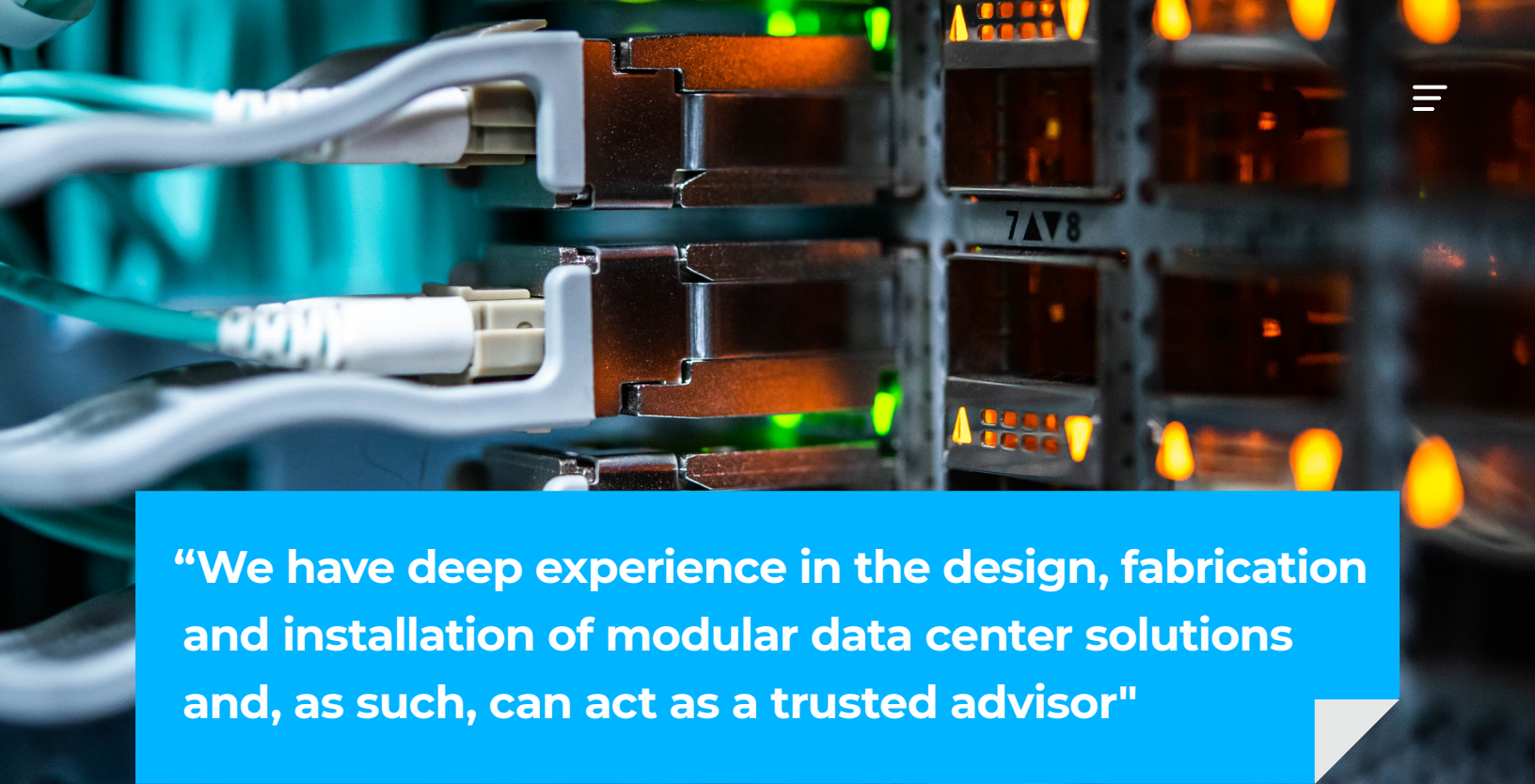
**PCX procures components from a diverse base of suppliers based on what best meets the client's technical, delivery and cost requirements.**



There are two particular challenges we are navigating in the late-pandemic recovery process. The first is the cost and availability of everything from raw materials to standard commodities. And the second is attracting and maintaining the skilled labor force required to create and integrate the solutions we deliver to our clients.

However, unlike other modular data center solutions providers, PCX has strong, streamlined prefabricated build processes to overcome and mitigate these challenges.

The pandemic has created issues throughout the supply chain. But as a vendor-agnostic solution integrator, PCX procures [components](#) from a diverse base of suppliers based on what best meets the client's technical, delivery and cost requirements. We continually assess alternate means for achieving these goals on every project.



**“We have deep experience in the design, fabrication and installation of modular data center solutions and, as such, can act as a trusted advisor”**

As an integrator that is an [original equipment manufacturer \(OEM\)](#), we can offer the most cost-effective solutions and manage component availability challenges using multiple sources for parts.

PCX is also vertically integrated from base frame construction to factory witness testing, with all welding, cleaning, painting and electrical assembly performed in-house by PCX employees.

Our in-house field services team coordinates the transportation, on-site rigging and installation for fast, cost-effective, turnkey deployment of the solutions we produce.

“PCX’s modular construction and deployment typically remove roughly 30% of the time from the project schedule when compared to traditional construction,” said [Bret Lehman](#), Director of Product and Business Development at PCX.

“We have deep experience in the design, fabrication and installation of modular data center solutions and, as such, can act as a trusted advisor on how to design solutions that meet customers’ needs and deliver them in both timely and cost-effective ways.”



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