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CSPs: Consider These Strategies to Monetize the 5G Revolution

Telcos will spend a trillion dollars building out next-gen mobile networks. Here's how they plan to drive returns.

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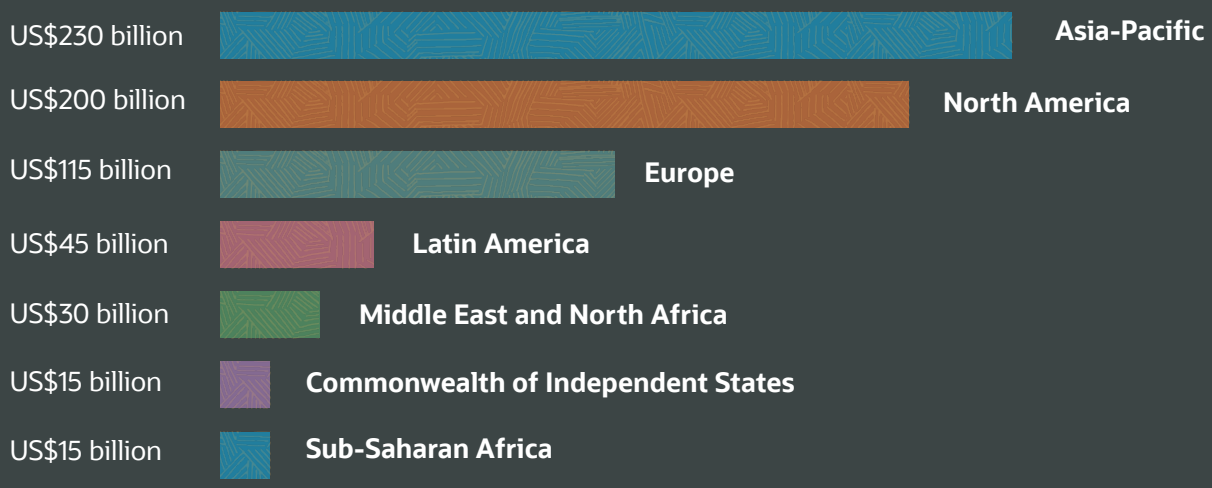
Communications service providers worldwide are investing more than a trillion dollars in building the data networks that will usher in the next industrial revolution. They have poured hundreds of billions of dollars into rolling out 5G wireless infrastructure, and their spending on laying the fiber optic cables that will shuttle the data from the cell tower to the cloud, as well as to homes and businesses, might prove even more substantial.

Estimated 5G Capex Spending by Region



Source: McKinsey forecast for spending between 2022 and 2025

Whereas CSPs may have had a longer runway to profitability for previous infrastructure upgrades, today's ultracompetitive market puts pressure on them to deliver faster returns on their 5G and other investments.

They've learned valuable lessons from their experience a network generation ago, when their investments in 4G spurred a new digital economy that consumer internet service and

streaming content companies, including Netflix, Google, and WhatsApp, cashed in on more successfully.

The main lesson is that what flows through the telecom carriers' pipes can generate more value than the pipes themselves. But something else telcos learned from their ventures into the public cloud infrastructure market in the last decade is that transforming into an IT company—a "techco," as some in the sector call it—may not be for everyone.

Every CSP understands that it can't stand still. Many are investing in a range of technologies—network automation, cloud-native services, data analytics—to help them roll out 5G and other consumer services more quickly and profitably.

> "There's massive potential to generate new revenue streams by working directly with industries as they explore the advantages of 5G. … The more you go up the value stack, the stickier you get with customers."
>
> **Leo Rohlinger**
> Executive Director, Communications, Oracle

Others, especially the largest CSPs, are also moving up the value stack, experimenting with solutions for vertical, Industry 4.0 use cases. That involves leveraging high-speed, low-latency 5G networks in support of "hyperconnectivity"— linking myriad devices and information sources to offer connected car, smart factory, telemedicine, and other higher-margin business applications, on top of a layer of provisioning, network automation, management, and security software.

"There's massive potential to generate new revenue streams by working directly with industries as they explore the advantages of 5G," says Leo Rohlinger, Oracle's industry executive director for the communications sector. "…The more you go up the value stack, the stickier you get with customers."

1 Build, acquire, or partner?

CSPs will need to consider how they're best positioned to participate in the 5G ecosystem and, for those doubling down on business services, which industries they want to focus on.

To that end, some of the world's largest CSPs are recruiting software, data management, and cybersecurity experts. Two UK-based carriers are among the most ambitious: Vodafone has announced plans to add 7,000 software engineers by 2025 to bolster 5G application development, and BT plans to hire 2,800 software developers by 2024, almost doubling the headcount of its digital division.

Acquisitions provide another path to techco transformation, such as Verizon's purchase in 2016 of Fleetmatics so that it could offer cloud-based fleet management services. Cybersecurity is a popular vector for acquisitions, demonstrated by AT&T's 2018 purchase of AlienVault, a leading security information and event management vendor, and the acquisition by TIM (the former Telecom Italia) of TS-Way, an Italian cyberthreat intelligence

specialist, earlier this year. But many CSPs, chastened by previous ventures outside of their core business, are likely to seek partnerships in lieu of internal development or acquisition.

"On the business side, it makes more sense for CSPs to focus on how they take 5G, edge computing, and slicing and go bundle that with other vendors' services," says Rohlinger, referring in the latter case to the partitioning of physical 5G networks into virtualized logical networks. (More on network slicing later.) "How do they help a customer with this new network capability, how do they transform their business? Whether connected vehicles, connected employees, or connected sensors, that's where they have to get to."

Some choose to integrate and co-sell third-party applications, the method by which Telefónica is bringing to market Oracle Cloud platform and application services to enterprise and public sector customers in Spain. Others are standing up third-party platforms that enable customers to define and automate cellular networks, the way that DISH Wireless is using Oracle's capabilities to deploy a service-based architecture that acts as the control tower of its 5G network core. Other telcos can bundle and resell applications, as Comcast and other carriers have done by white-labeling AppDirect's cloud software.

Devendra Pawar, a principal with Grand View Research, says CSPs are likely to focus on two strategies: Experiment with different methods for launching products in partnership with technology companies and develop targeted industry expertise to achieve a competitive edge.

"The ROI will take some time to materialize for these companies because it will involve detailed deploying and optimization of the infrastructure, developing and adopting new use cases, and overcoming the technical regulatory challenges," Pawar says. "Once the telcos focus on the above and achieve them, they can start seeing a return on their 5G investment."

2 Move beyond commodity connectivity

A telco is always going to lead with telecommunications. Connectivity is the core business, and these companies are in their element selling cellular and broadband internet contracts, having already landed more than a billion consumer subscribers worldwide for basic 5G services.

Given the technological and operational challenges of moving up the stack, many CSPs "instinctively want to go out and sell connections," Rohlinger says. "It's revenue, and it increases the value of the network."

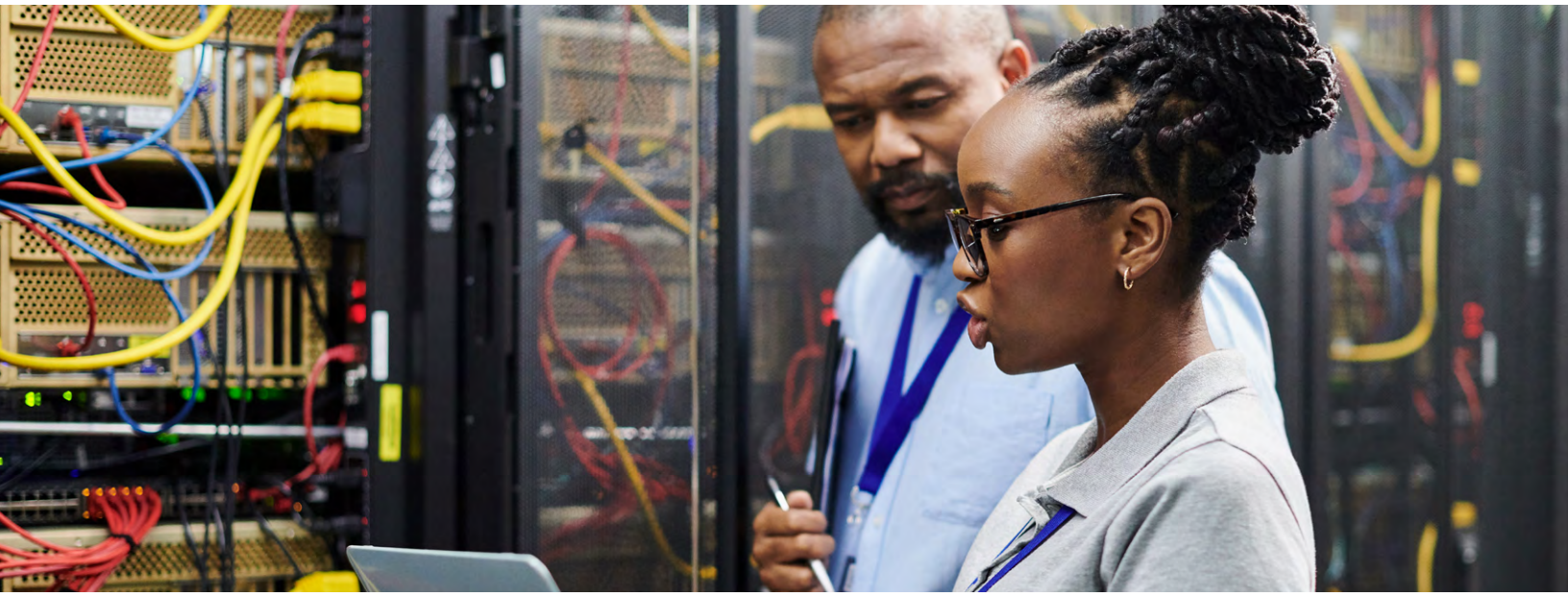
The problem is that connectivity, like any mature service, can end up priced as a commodity—the fate of 4G LTE cellular. But that doesn't mean the latest round of telecom investments won't spawn cutting-edge, high-margin network service markets, Rohlinger says.

Industry association CTIA estimates that CSPs are investing US$275 billion in the United States alone in the cellular towers, mobile core networks, management software, and radio spectrum needed to roll out comprehensive 5G. While some of these next-gen networks are already commercially available, the technology is only on the verge of meeting its promise of massive

performance and reliability benefits. Delivering much lower latency and 10 to 20 times greater bandwidth than previous-generation networks, 5G capacity allows exponential scaling of endpoints and impressive uptime for mission-critical functions.

And thanks to the aforementioned slicing technology, physical 5G networks can be partitioned into virtualized logical networks that deliver isolated resources to individual customers and for specific applications. That functionality empowers CSPs to offer service level agreements, a critical demand of enterprises, as they need confidence in reliable network performance.

For those customers—especially in the financial services, healthcare, and government sectors—that want an even greater level of security, privacy, control, and flexibility, a solution gaining popularity is private 5G, whereby dedicated cellular hardware and software is situated within customers' facilities. They can even be allocated their own part of the radio spectrum.



Enterprises are eager to take advantage of these superior capabilities to connect workers in the field; run vast arrays of sensors and devices on factories and farms; bring broadband into remote facilities with fixed wireless access; provide simultaneous cellular service to thousands of people packing stadiums, entertainment venues, and college campuses; stream

data to virtual reality/augmented reality and mobile gaming systems; and connect fleets of autonomous vehicles.

Some forward-thinking enterprises already are tapping CSPs to implement large-scale projects. Among them, Mercedes-Benz is working with Telefónica Deutschland to build a private 5G network that will track S-Class luxury sedans and EQC electric SUVs on the production line at the company's factory in Stuttgart, Germany. Financial services giant BlackRock is working with Verizon to deploy a private 5G network at its New York City headquarters to support mobile trading-floor applications that require ultra-high speeds and low latency.

Generic 5G mobility services (the lion's share purchased by enterprises so far) generated US$60.6 billion in revenue globally in 2022, and that market will likely grow almost 60% a year until the end of the decade, Grand View Research estimates. Enterprise 5G—selling dedicated sliced or private networks tailored to each customer's business demands, such as what Telefónica Deutschland and Verizon are doing for Mercedes-Benz and BlackRock—is a more nascent line of business for CSPs. That global market generated only US$2.8 billion in revenue in 2022, according to Precedence Research, which projects it to reach US$47.07 billion by 2032.

The latter market, still in its early days, is the one coveted by CSPs and likely to justify their 5G investments. "The money is in enterprise sales—all of the margin is in enterprise sales," Rohlinger says.

Seizing the enterprise opportunity starts, he says, with CSPs extending beyond their domain expertise to tailor their 5G offerings to select industries—both with granular, application-specific controls and in their proficiency in business operations.

3 Climb the techco value stack—carefully

The next-gen wireless and fixed networks that CSPs are building will connect people and machines like never before. On these high-speed data links, enterprises will scale the Internet of Things—the sensors, devices, transmitters, and actuators used to automate and optimize operations in almost every industry. For example, in his 2022 note to shareholders, AT&T CEO John Stankey reported that the company had become the first US carrier to exceed 100 million connected devices.

Bringing to market software that defines, provisions, and manages these networks and networked data streams is foundational for those CSPs testing the techco waters. “They need a layer that is all about how I define these multitude of services, how I manage the multitude

Ways of Monetizing 5G

Key network and service offerings, with their potential market size

Basic 5G Services [Core Connectivity]

Key offerings: fixed wireless access, enhanced mobile wireless

Value pool by 2028: US$10 billion to US$20 billion

Number of capable operators globally as of February 2023: 32

Tailored Network Solutions [Premium Connectivity]

Key offerings: edge computing, private 5G, network slicing

Value pool by 2028: US$30 billion to US$50 billion

Number of capable operators globally as of February 2023: 19

Commercially Available 5G End Solutions [Platforms and Solutions]

Key offerings: AR/VR, computer vision, connected cars, IoT

Value pool by 2028: several times higher than for Premium Connectivity

Number of capable operators globally as of February 2023: 7

Source: McKinsey

of business models, how I provision delivery and assurance," says Antonio Mosca, director of Oracle's Communications Industry Advisory Group. "This is where a lot of money will be spent."

Selling connectivity segues nicely into selling data, mobile device, and mobile application management tools. Cybersecurity is another logical software offering for CSPs already adept at network security and cryptography. "They understand the regulations, they understand the issues around security," says Riccardo Ottolenghi, a telecom industry senior director with Oracle. "They have the assets and the ways of offering services."

The next step up the value stack still shouldn't stray too far from their core business, Ottolenghi adds. "You want something that has an element of connectivity associated with it," he says. "It benefits them to enable any sort of technology that will drive traffic through their own networks."

CSPs can explore offering higher-level solutions still tightly integrated with networking components, such as Internet of Things (IoT) platforms, AI-enabled image recognition, vehicle tracking, time-and-reporting tools, even drone tracking. These services add value while also pouring fuel on the core business, Ottolenghi says.

> "[CSPs] need a layer that is all about how I define these multitude of services, how I manage the multitude of business models, how I provision delivery and assurance."
>
> **Antonio Mosca**
> Director, Oracle Communications Industry Advisory Group

"Immediately they can generate more traffic from these types of applications, because they are also dependent on their bread and butter of connectivity," he says.

McKinsey & Company forecasts that core 5G connectivity services will create a value pool (the potential a new product creates in the market for added revenues and avoided costs) of US$10

billion to US$20 billion by 2028. The estimated value pool for premium 5G services, such as private networks and edge computing, tacks on another US$30 billion to US$50 billion. But 5G-enabled platforms and solutions—the "furthest from telcos' core business" and requiring "the most capability building"—could generate several times more additional value, McKinsey wrote in a recent report.

Partnerships also open the door for some ambitious CSPs to continue up the stack—to offer enterprises third-party business applications such as financial and supply chain management systems. While those products are far from their wheelhouse, CSPs are well positioned to drive deals because of the customer relationships they forged around the core component of connectivity. While telco executives are eager to develop these kinds of partnerships, Ottolenghi says, large enterprise-oriented deals have yet to materialize.

However far CSPs opt to move up the value stack and regardless of whether they do it through internal development, acquisitions, or various partnership models, they will run up against the same challenge presented by the enterprise 5G market: attaining a level of expertise never before required of them.

4 Go to the edge of the compute continuum

In the last decade, almost every major telecom carrier had the same revelation: Since we're already operating large data centers to control our communications networks, why not also sell cloud infrastructure services? For the most part, however, their attempts to compete against hyperscalers such as AWS, Microsoft, and Oracle didn't pan out.

CSPs are willing to test the cloud infrastructure market once again, but this time around, rather than go head-on against the public cloud giants, they're leveraging their existing assets and strategic positioning—and, once again, looking at partnerships

The focus has shifted away from centralized data centers. CSPs are now building a "continuum of distributed architecture" that bridges the gaps between hyperscalers' public cloud regions and their clients' facilities. Proximity matters, especially for clients in latency-sensitive industries such as finance and manufacturing, Oracle's Mosca says.

By reducing the physical distance between the data processing and end users, CSPs can offer lower latency and faster data transfer, crucial for applications that require real-time processing and/or quick response times. They're doing that by building smaller, distributed data centers or partnering with cloud providers that already operate such facilities. These "near edge" environments, often located within metropolitan areas, can reduce latency to tens of milliseconds. They not only enable CSPs to deliver newly developed services with little lag, but they also offer enterprise customers infrastructure on which they can run custom and third-party applications with the same speedy data transfer benefits.

The next step lands on the far edge of the cloud network—servers typically collocated at 5G base stations, close enough for the carriers, their partners, third-party application and content providers, and their customers to run workloads demanding ultra-low latency of single-digit milliseconds. The multi-access edge computing (MEC) network architecture enables this direct radio hop from a cell tower to the customer's store, factory, farm, or office.

It's a logical move for telecom carriers to bring edge infrastructure to the market, Mosca says, as they're already running network management, control, security, and slicing software in

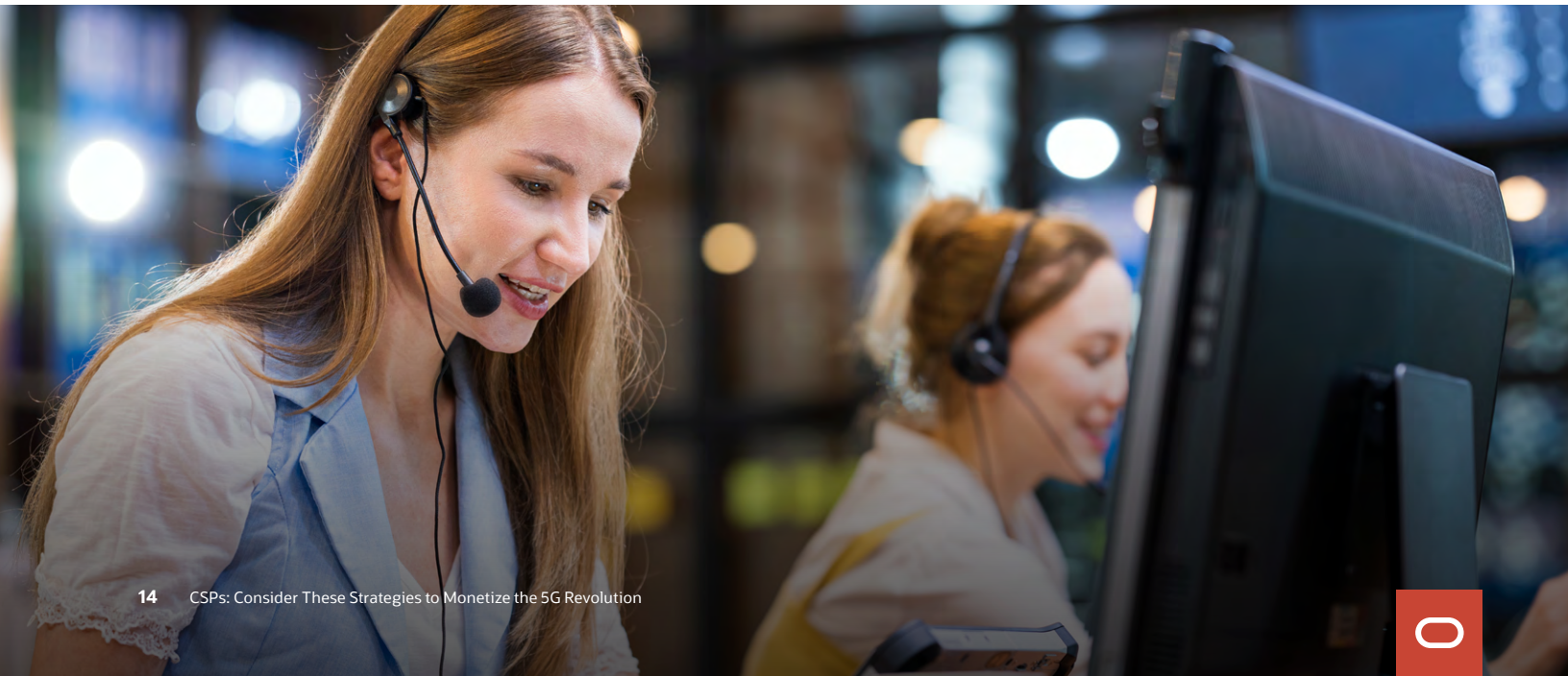
these environments, along with any higher-level application services offered directly to customers.

The “real 5G”—5G standalone (SA)—is just arriving this year and next, bringing new business opportunities, enhanced end user experiences, network efficiency, and less complexity than the currently prevalent 5G non-standalone (NSA), Mosca notes. As a result, telcos must distribute data and computing capacity geographically to ensure adequate service levels in terms of latency. “As CSPs are compelled to distribute computing power, they will uncover ways to monetize this distributed capacity,” he says.

For some CSP customers, a nearby cellular base station isn’t close enough to satisfy certain use cases. Businesses with extreme mission-critical workloads, such as nuclear power plant monitoring, find it optimal for their cloud infrastructure to be located in the same building as the systems they oversee.

AT&T and other carriers are catering to this demand, incorporating not only dedicated radios, spectrum, and SIM cards, but also deploying edge servers on customers’ premises as part of private 5G offerings.

CSPs’ opportunity to provide edge infrastructure stemming from their 5G network investments aligns with customer preferences, Mosca says. “When you sell an enterprise a private 5G network or a software-defined network, you must seamlessly integrate everything,” he says. “Enterprises seek an all-inclusive solution, and that includes their edge compute.”



Oracle Communications powers next-gen networks for the world's largest telcos

The world's largest CSPs are using Oracle's specialized communications solutions to build out their 5G infrastructure and roll out next-gen network services, while preserving the value of their prior investments. Oracle Communications puts in the hands of carriers integrated communications and cloud solutions that drive programmability to the core of the 5G network.

5G is the first generation of cellular technology to take advantage of innovations in cloud native architecture, defining core network functions with microservices deployed in orchestrated application containers. And the shift to 5G has spurred advances in software-defined networking that allow carriers to offer their customers more control, scalability, security, and tailored service quality.

Rakuten Mobile recently chose Oracle Communications' cloud native converged policy and charging solutions to support its fast-growing 4G and 5G services. These solutions, which will run on Rakuten Symphony's Symcloud Cloud Native Platform, will help the company implement its vision for an automated, high performance architecture that easily scales to support consumer and business use cases.

Salam (previously known as Integrated Telecom Company) offers another example of how Oracle can drive 5G innovation. The company, recently recognized as Saudi Arabia's fastest-growing and most innovative telecom brand, has turned to Oracle Communications' monetization and unified operations solutions to deliver differentiated services, such as 5G-enabled streaming, AR/VR gaming, and IoT-connected devices, to its consumer and enterprise customers. Oracle is helping Salam create a digital society in line with the Kingdom's Vision 2030 digital transformation plans.

Oracle Cloud Infrastructure: the foundation of telco transformations

Oracle's approach to growing its public cloud footprint differs from those of other hyperscale providers. Rather than standing up megalithic data centers in far-flung regions, Oracle Cloud Infrastructure (OCI) is deployed out of smaller, more dispersed facilities, closer to the operations and within the sovereign borders of our enterprise customers.

OCI currently runs out of 44 public cloud regions across 23 countries, all offering the full array or more than 100 Oracle Cloud Infrastructure services. These distributed regions make it more likely that major CSPs will find public cloud infrastructure close to the areas in which they're delivering next-gen connectivity services.

But Oracle doesn't expect all workloads to run in its facilities. Dedicated Region Cloud@Customer is a solution that brings OCI to wherever customers need it. Oracle manages the infrastructure and bills for usage while providing the same security, functionality, and managed capabilities as in its public cloud.

That was the infrastructure selected by Vodafone when the European telco giant looked to migrate thousands of Oracle Databases and WebLogic servers, and many applications that ran on them, to accelerate its transformation to a software-led communications company—one that transcends commodity voice and data connectivity services.

Vodafone placed those OCI instances in three sets of twin data centers it operates in Ireland, Italy, and Germany. That infrastructure has provided the foundation for Vodafone's platform for rolling out IoT, unified communications, and other high-margin digital services, many of them tailored for specific industries.

Oracle Cloud Applications enable telco-to-techco business transformation

Moving higher up the value stack involves more than developing new product lines and cultivating industry expertise. CSPs making this complex move need to diversify business processes, bring aboard new talent, account for new revenue streams, expand their supply chains, and engage new customer demographics.

The Oracle Fusion Cloud suite of enterprise applications can aid every step of these business transformations.

Oracle Fusion Cloud Human Capital Management (HCM) eases the recruiting and hiring of skilled workers, adding those workers to the payroll, training them, engaging them, and managing their performance. Oracle Fusion Cloud Enterprise Resource Planning (ERP) simplifies how new product lines and business divisions are incorporated into diverse financial management processes, while the application suite's Oracle Fusion Cloud Supply Chain Management (SCM) & Manufacturing provides essential supply chain planning, inventory management, logistics management, and other applications.

It was Oracle Cloud SCM that allowed MTN Group, a Johannesburg-based CSP offering cellular, internet, and mobile money-transfer services to 300 million subscribers across Africa and the Middle East, to provide a single platform for digitizing a supply chain that sources products and services from more than 15,000 vendors worldwide. MTN accelerated sourcing cycles by a month and gained greater visibility into its global supplier base while improving the resilience of that supply chain—helping the company add 1,200 new suppliers.

Among the many features of the Oracle Cloud CX application suite, it helps CSPs deliver a stellar customer experience while ensuring field technicians are effectively deployed. Swisscom deployed Oracle Digital Experience for Communications to improve its lead generation and marketing campaign management processes. Switzerland's leading carrier has been able to double opt-in clicks, from 40% to 80%, capturing significantly more quality leads.

All Oracle Cloud Applications are connected across a common platform, so they're entirely integrated out of the box.

Oracle Communications: Reimagined for 5G and Beyond

Create new digital experiences, deliver on the full potential of 5G wireless, and easily deploy new IoT business models. Oracle's complete suite of cloud-native applications and secure network infrastructure helps communication service providers evolve their networks and grow their revenues and profits.

Learn more