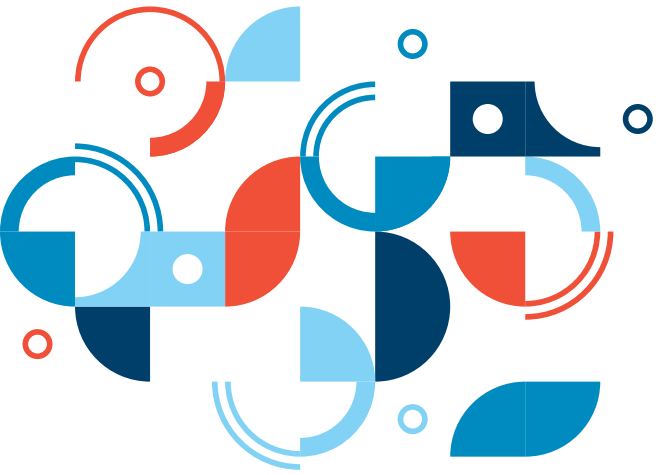
Cloud computing: A tool for telecommunications growth

How embracing cloud can rejuvenate your business

IBM

Contents



Introduction

This paper addresses how the attributes of cloud create unique opportunities for Communications Service Providers (CSPs) to quickly generate new revenue and gain a competitive edge in the emerging cloud provider marketplace.

Until now, cloud computing primarily served as a catalyst for technological change, leaving its potential for driving business innovation virtually untapped. Yet cloud has the power to fundamentally shift competitive landscapes by providing a new platform for creating and delivering business value. We will explore the potential of cloud as a business enabler within the context of current telecommunications industry trends, strategies and calls to action.

CSP organizations need to determine how best to employ cloud-enabled business models that will create a sustainable competitive advantage. By introducing public, private and hybrid cloud offerings to existing and new business markets, CSPs move beyond commoditized voice and data services to drive innovative new revenue streams. Advances in technologies like cloud and next-generation networks challenge the ability of legacy systems to keep pace. But these advances also give telco industries the option to compete in a dynamic and challenging marketplace. In 2013, the worldwide public cloud services market size reached US$45.7 billion and is expected to grow at a compound annual growth rate of 23 percent until 2018.[1]

In translation: A quick glossary

In an acronym-laden industry, it's no surprise that one acronym can have two definitions. **CSP** is a long-standing telecommunication industry term that stands for **Communications Service Providers**. However, it can also refer to cloud service providers. In this paper, we use CSP to indicate Communications Service Providers and spell out all references to **cloud service providers.**

We refer to **telecommunications companies** interchangeably as **telcos and CSPs.**

As well, we reference **Over-The-Top (OTT) applications,** meaning any application or service that circumvents traditional distribution by providing a product over the Internet. Such services often involve media and communication, with Netflix serving as a common example.[2]

A snapshot of telco industry trends

The telco industry faces the following dramatic changes and enormous challenges:

- Revenue and subscriber growth for telco providers have slowed in most markets.
- Providers are forced to invest in their core networks as consumers drive demand for OTT services and revenues shift to new competitors.
- Telcos must reduce costs and increase agility—and cloud can play an important role in achieving these objectives.
- Telcos have built-in direct access to and billing relationships with large numbers of businesses and consumers—creating an unrivaled position from which to sell cloud offerings.
- BUT for telcos offering value-added cloud services to the market, the path to profitability is not always clear. Stumbling blocks can occur.
  - Compatibility issues with legacy network infrastructure and applications
  - Regulatory concerns
  - Security and governance considerations
  - Saturated markets and cost pressures

Meeting economic challenges through four CSP industry imperatives

When mobility, social media, increasing digitization and analytics capabilities integrate with cloud, they create a nexus of technology and business forces that are transforming our world economy.

The **mobile revolution** is generating exponential increases in access and customer participation. Smart devices are rapidly becoming the dominant means for connectivity. Enriched by mobile apps, these devices are continually getting smarter, increasing the amount of data that organizations can translate into new customer insights. A recent IBM Institute for Business Value Mobile Enterprise Study found that 62 percent of responding CSPs were pursuing mobile for enterprise innovation. In addition, 54 percent said that mobile was critical to improving response time and customer satisfaction.[3]

Social media is exploding. Fueled by Generation Y, or "digital natives," social is quickly emerging as the primary medium for communication and collaboration. At an organizational level, telco enterprises are adopting social media but are struggling to realize the value and manage risk. The most recent IBM Global Telecommunications Consumer Survey found that globally less than one fifth of consumers were identified as "advocates" for their CSP, while 55 percent were considered "antagonists."[4]

Increasingly, our world is **hyperdigitized**, with digital content produced and accessed more quickly than ever before. We create 2.5 quintillion bytes of data daily, and 90 percent of the world's data has been created in the last two years.[5] Internet traffic is growing globally, driven by consumer use of video and mobile data. The Internet of Things is burgeoning, with sensors, actuators, meters and cameras connecting to networks.[6] According to a recent IDC report, the installed and connected base of Internet of Things units will reach approximately 30 billion by the end of 2020.[7]

The power of analytics forges new capabilities for real-time analysis, predictive analytics and micro-segmentation. Analytics is transforming data into easily interpretable, consumable insights, and top performing companies use those insights to drive business value. This new consumability of analytics revamps organization interactions, from customer intimacy to supply chain management. For CSPs, predictive analytics can optimize network capability, utilization and performance. Innovative CSPs use historical trends and other data sets to create personalized solutions, targeted rate plans and other value-add offerings.[8]

Rampant change means challenges but also opportunities. To not just keep pace but also actually excel in a rapidly changing world, CSPs should consider pursuing any or all of these four key industry imperatives:

- **Create and deliver smarter services** to rapidly generate new revenue streams and increase differentiation.
- **Personalize customer engagements** to optimize value with a compelling marketing, shopping and service experience.
- **Build smarter networks** to optimize and monetize next generation networks.
- **Transform operations** to achieve business and service excellence.[9]

Cloud as an enabler for CSP transformation

The good news is cloud computing can serve as an invaluable business enabler, a platform for innovation that powers CSPs through the four industry imperatives (as discussed in the previous section) and beyond. Figure 1 and the section below outline six potentially transformative business enablers provided by cloud computing.[10]

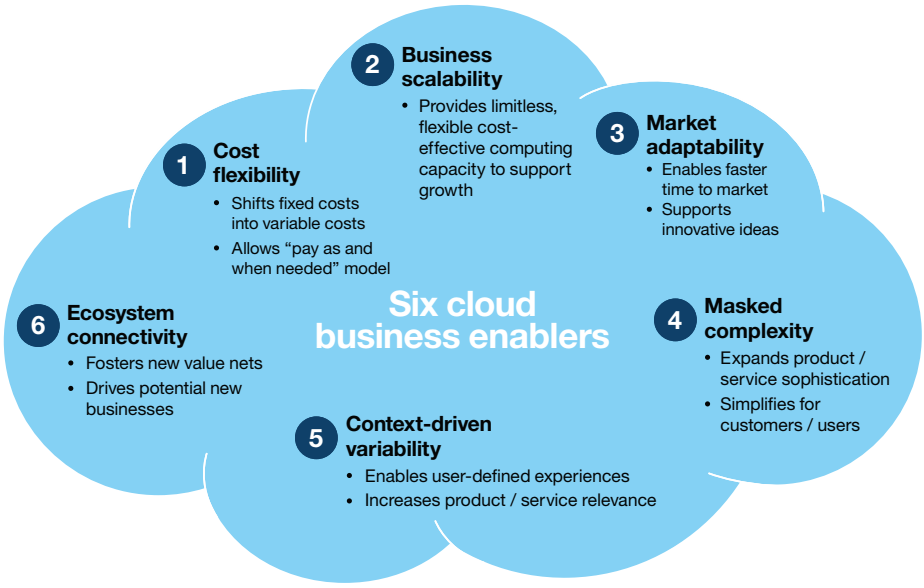


Figure 1. Six transformative cloud enablers that power business innovation

1. Cost flexibility

Cloud helps businesses reduce fixed IT costs and shift to a variable, "pay-as-you-go" cost structure. Telcos that have also become cloud service providers can simultaneously commercialize cloud as a user (realizing cost flexibility for the company) and as a provider (offering cost flexibility for their customers).

As a cloud user, cost flexibility can lead to gains in internal efficiency and substantial cost savings for the CSP organization. As a cloud provider, a CSP can generate new revenue streams by offering cost flexibility based on its own cloud. For instance, CSPs own the connecting networks and many of them already possess large, distributed data centers that have provided both hosting and other services for many years.

2. Business scalability

Cloud's nearly unlimited computing power enables business to grow efficiently and expand the range of business options. CSPs exercise control over access networks and data centers and can adjust peak and nonpeak responsiveness to customer needs—an important edge over other types of cloud providers. For example, by dynamically upgrading the connectivity between sites engaged in high-definition video streaming, CSPs can cope with large surges of capacity during spikes in usage.

3. Market adaptability

Cloud-enabled services can be adjusted for market dynamics and then rapidly updated, revamped and deployed via web services. Cloud facilitates rapid prototyping and innovation and enables CSPs to easily test and integrate partner solutions into their own systems, thus bringing new offerings to the market more quickly. CSPs can also accelerate time-to-market solutions for their customers by using distinctive advantages such as usage-based billing or cloud-based Machine-to-Machine (M2M) capabilities. (M2M refers to networked devices that can exchange data and perform tasks autonomously.)

4. Masked complexity

Cloud-enabled services are often complicated, but the end user does not typically experience this. CSPs can play an important role in masking the complexity of services and products for both their own organization and its customers. Hidden actions include performing upgrades and background maintenance with no participation required by the end user.

5. Context-driven variability

The computing power and capacity of cloud enables individualized customer experiences. CSPs can exploit features such as location, presence and subscriber profiles—and related activities and analytics—by embedding these attributes with third-party cloud offerings, enhancing their value by customizing them to users. Of course, CSPs can also embed these attributes within their own cloud offerings.

6. Ecosystem connectivity

Increasingly, companies rely on collaborative ecosystems to provide key input for innovation—innovation that will ultimately drive growth. Cloud-based platforms bring together disparate groups of people who collaborate and share resources, information and processes. As assimilators of connecting networks, CSPs are primed to deliver fully integrated services.

For example, CSPs can provide hosted integrated communication services (such as voice, short message service [SMS], instant messaging [IM], video conferences, and collaboration) cost effectively from the cloud. [11] This is illustrated in the healthcare industry, with CSPs supporting the exchange of health information and transactions among healthcare providers, insurance companies, practitioners, third-party administrators and patients to facilitate better collaboration and improve care.[12]

Using a partner to help you navigate the cloud environment can help your organization gain the most benefit. In one scenario, Health Insurance Portability and Accountability Act (HIPAA) workloads can be hosted on IBM clouds using bare metal or a private dedicated cloud. SoftLayer*, an IBM company, handles the initial provisioning of the server in which the environment is run and managed by the client. SoftLayer retains responsibility for the data center and physical controls for HIPAA.*

Cloud as an enabler of the four CSP industry imperatives

Cloud has enormous potential as a business enabler. Consultants in cloud technology help clients evaluate workload attributes for cloud and prioritize which enablers are most critical to their particular organizational strategy. Figure 2 frames the six cloud business enablers in the context of the four CSP industry imperatives.

Cloud business enablers can drive CSP industry imperatives.

Six cloud business enablers	CSP industry imperatives: Create and deliver smarter services to generate new revenue streams and increase differentiation	Personalize customer engagements to optimize value with a compelling marketing, shopping and service experience	Build smarter networks to optimize and monetize next generation networks	Transform operations to achieve business and service excellence
1 Cost flexibility	☑		☑	☑
2 Business scalability	☑	☑	☑	☑
3 Market adaptability	☑	☑		☑
4 Masked complexity	☑	☑		☑
5 Context-driven variability	☑	☑		
6 Ecosystem connectivity	☑	☑	☑	☑

Figure 2. The six cloud business enablers can have direct impact on fulfilling the four CSP industry imperatives.

Cloud archetypes: Are you a cloud optimizer, innovator or disruptor?

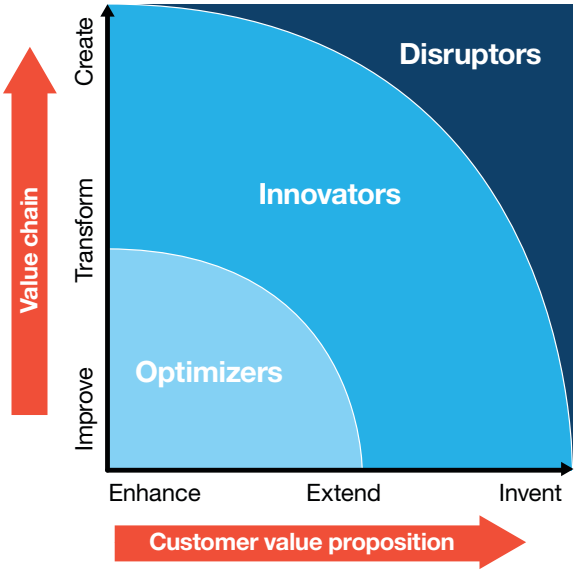
Cloud adoption is not an all or nothing proposition. Figure 3 and the following section illustrate and describe a Cloud Enablement Framework in which CSPs can opt for varying degrees of cloud adoption, enablement and innovation—what we call cloud archetypes.[13]

Optimizers

*Optimizers use cloud to perform **current business** more efficiently and effectively, in this way incrementally enhancing their customer value proposition.*

As cloud optimizers, CSPs use their strengths in communications and data centers to optimize their current connectivity and communications offerings. For example, CSPs can tailor connectivity in the cloud environment to the needs of their customers. They can make connectivity smarter using network-based techniques such as caching, optimization and data acceleration. In addition, they can incorporate their communication technology and key strengths into their data center strategy, offering hosted cloud-based integrated communications and collaboration services in an efficient, cost-effective way.

Cloud Enablement Framework



Disruptors rely on cloud to develop ***radically different value propositions***, as well as to generate new customer needs and segments, by enhancing the end-customer experience. In this way, disruptors create entirely new businesses.

Innovators use cloud to significantly improve customer value through leveraging CSPs' distinctive capabilities in the delivery of current services, resulting in new revenue streams based on ***new business models.***

Optimizers use cloud to perform ***current business*** more efficiently and effectively, in this way incrementally enhancing their customer value proposition.

Figure 3. The Cloud Enablement Framework describes three increasing levels of cloud adoption, enablement and innovation.

Many providers are embracing cloud as part of their new business as usual. For instance, telecommunications and Internet provider CenturyLink is adding public cloud offerings to more than half a million miles of fiber internationally.[14] And China Telecom Corporation Limited's cloud division, CT Cloud, is one of the largest cloud computing providers in China.[15]

Telefonica O2 aggregates voice, video and instant messaging into a single cloud-based service

Ireland's Telefonica O2 offers a hosted IP telephony service aimed at large businesses and public sector organizations that want to outsource telecommunications infrastructure management to the cloud. The service, called O2 Unified Communications, allows businesses to combine their fixed and mobile telephone, voicemail, instant messaging and videoconferencing operations into a single managed cloud-based service with no up-front capital expenditure. The service enables users to interact in real time, from practically any location and from almost any device (landlines, smartphones, desktop PCs, laptops and tablets). This capability allows businesses to smoothly integrate onsite workers and telecommuters without additional investments or complexity.[16]

O2 Unified Communications charges a monthly rental fee based on the number of users. It is available to large organizations, including enterprise customers and public-sector entities, in Ireland.

French telco Orange targets European multinationals with international data sharing requirements

In response to global companies based in Europe that are interested in using cloud services to share information with their operations around the world, French telco Orange has created a network of 30 data centers globally. Since the revelations about the United States National Security Agency and information surveillance, European companies have become increasingly concerned about data security. Orange has implemented mechanisms that restrict the physical locations where data is stored in order to abide by specific domestic privacy regulations.[17]

Innovators

Innovators use cloud to significantly improve customer value by using CSPs' distinctive capabilities in the delivery of current services, resulting in new revenue streams based on ***new business models****.*

A CSP's distinctive capabilities (assured quality of service, guaranteed low latency, security, Content Delivery Networks [CDNs], and usage-based billing) provide a solid foundation to deliver, either as a vendor or partner, both horizontal and vertical cloud-based applications. These applications can be delivered to large enterprises, vertical industries and Small and Medium Businesses (SMBs).

Delivering horizontal cloud-based solutions to large enterprises can utilize a CSP's key strengths in delivering solutions such as communication and collaboration services, sales force automation (SFA), work flow management (WFM), enterprise resource management (ERP), and customer relationship management (CRM), in many cases partnering with third parties.

Delivering vertical cloud-based solutions to industries involves building on the CSP's strength and reputation in data integrity, security and trusted relationships. CSPs can offer specialized applications and options to security- and privacy-conscious industries such as healthcare, government and financial services.

CSPs can also tap into their substantial SMB customer base. Given that SMBs strongly prefer bundled hosted services, CSPs can offer SMBs cloud-based solutions such as "office-in-the-box" applications, sales force automation, and invoicing and billing.

AT&T's Healthcare Community Online supports collaborative care through the cloud

The number of healthcare provider locations is proliferating, along with the high cost of deployment and maintenance for traditional client-server models. As a result, eHealth systems using cloud technologies are gaining traction. Using cloud to offer large-scale, flexible and security-rich storage of heath information is a natural extension of many CSP cloud strategies. For example, AT&T's Healthcare Community Online is a cloud-based health information exchange that supports collaborative care through security-rich messaging, access to multiple applications through one portal, and integration with the American Medical Association's portal.[18]

SingTel launches a cloud-based video analytics solution for the retail industry

Singaporean telecommunications company Singtel launched SingTel Video-Analytics-as-a-Service (VAaaS), a solution developed by KAI Square Pte Ltd, a Singapore-based start-up. The service uses a state-of-the-art cloud-based analytics platform to convert video data into customer intelligence.

The affordable service takes untapped video images and uses powerful analytics to translate them into commercially useful data. Businesses use this information to:

- Analyze customer profiles and tailor the customer experience accordingly.
- Increase sales by placing ads where customers are most likely to encounter them.
- Enhance staffing effectiveness.
- Gain rapid insights into performance across multiple store locations, enabling quicker, more efficient business decisions.

By harvesting this onsite information, retailers can improve the effectiveness of sales and marketing campaigns, and use in-store traffic flow and consumer behavior data to their advantage.[19]

Disruptors

Disruptors rely on cloud to develop radically different value propositions, as well as to generate new customer needs and segments, by enhancing the end-customer experience. In this way, disruptors create ***entirely new businesses.***

CSPs have distinctive capabilities, including:

- End-to-end Quality-of-Service (QoS)
- Reliability, security and trust
- Customer insight
- Aggregation expertise
- Existing relationships with customers
- Local presence[20]

These capabilities can accelerate new services, developed either by CSPs themselves, partners or in collaboration with third parties such as OTT providers. In particular, CSPs can offer OTTs prioritized or guaranteed services on selected OTT cloud applications. By empowering third parties to develop innovative services and enhance customer experience, CSPs can generate revenue from both their own customers and third parties—a two-sided business model. Exploiting the avenues afforded by OTT providers (such as Netflix and Hulu) also offers new opportunities to enhance advertising revenue and yield.

Deutsche Telekom (DT) launches a business unit dedicated to cloud

Deutsche Telekom (DT) established a dedicated cloud business unit to create and implement business strategies around cloud. This business unit is focused on the SMB and consumer markets and manages the company's ecosystem of cloud partnerships, primarily Independent Software Vendors (ISVs). The goal is to provide cloud services similar to the iTunes experience: easy to use, fast and intuitive. Accordingly, DT's Business Marketplace provides customers with a single point of contact, platform, interface, privacy policy and bill, whether sold direct or through the channel.[21]

Verizon Digital Media Services takes a web application firewall to the cloud

Verizon Digital Media Services has taken a major step in protecting web applications and websites against cyber attacks with the beta launch of a cloud-based web application firewall (WAF). WAF rule sets (the procedures that police access to websites) can be deployed globally within just minutes—nipping any new incidents in the bud.

In the past, WAFs have been deployed on client premises and required detailed customization to effectively protect the supported applications. In comparison, a cloud-based WAF offers on-demand scalability, always-on capabilities and rapid time to market. Cloud-based security also offers a more stringent level of control to customers. All Verizon EdgeCast servers worldwide can receive updates in less than five minutes. When compared to competitive offerings, this is up to 900 percent faster.[22]

Privacy and data regulations: The benefit of a local perspective

Concerns about privacy and data protection are often barriers to cloud adoption. In fact, 56 percent of Open Data Center Alliance members (a group of global IT companies like Infosys, Deutsche Telekom and SAP) said regulatory issues will limit their cloud adoption.[23] Because there is no single, agreed-upon over-arching regulation governing data privacy, cloud providers usually have to deal with local legislation and regulations. Unlike global brands such as Google and Amazon, CSPs have strong footprints in locally regulated markets. They are experienced in dealing with regulations related to privacy and data protection and can flexibly adapt to local legislation. (Note: Personal data used by CSPs must comply with data privacy laws in effect where the data is physically stored.[24] When data is stored in one location and accessible from other locations, this impacts which data privacy laws apply.)

In the United States, the **Telecommunications Act of 1996**[25] was intended to foster competition among companies that used the same underlying technology to provide service. But this legislation did not envision the complex competition that has subsequently evolved, such as:

- Wireless service competing with both local and long-distance wireline service
- Voice over Internet Protocol (VoIP) competing with wireline and wireless telephony
- IP video competing with cable television

These complexities and blurred lines have opened the door for CSPs to cloud-enable organizations in other industries. While creating sizeable business opportunities, CSPs must be cognizant of industry-specific regulations. For example, when providing cloud services to healthcare providers, CSPs must follow HIPAA compliance.

Another scenario involves delivering cloud services to retailers. In those situations, CSPs must understand the complexities of the Payment Card Industry Data Security Standard (PCI DSS), www.pcisecuritystandards.org. If any customer of an organization ever pays directly using a credit card or debit card, then the PCI DSS requirements apply. To learn more about PCI DSS, please see the white paper "Payment Card Industry compliance on the cloud" at http://ibm.co/1swRdDk.

Regulatory oversight by the United Nations: The International Telecommunication Union

The International Telecommunication Union (ITU) is a specialized United Nations (UN) agency that is responsible for issues concerning information and communication technologies.[26]

The ITU is active in broadband Internet, latest-generation wireless technologies, aeronautical and maritime navigation, radio astronomy, satellite-based meteorology, convergence in fixed-mobile phone, Internet access, data, voice, TV broadcasting and next-generation networks.

However, the prevalence of data communications has led to new proposals that broaden regulatory oversight by the UN. For instance, the UN could gain jurisdiction over security, fraud, traffic accounting and traffic flow, management of Internet domain names and IP addresses. This could also include other aspects of the Internet that are currently governed either by community-based approaches such as Regional Internet Registries, Internet Corporation for Assigned Names and Numbers (ICANN) (https://www.icann.org) or large national regulatory frameworks.

Recommendations

CSPs can explore these suggested steps to optimize value from cloud-enabled business models:

1. Determine which cloud business enablers to apply and how to use them:

- Develop and oversee the implementation of business changes (for example, processes and outcomes) that cloud can enable within your organization and throughout the telecommunications industry ecosystem.
- Evaluate whether cloud can or should change your role in the ecosystem.
- Identify new partners that cloud can draw into your ecosystem.
- Investigate consulting services that explore how cloud can enhance your value proposition with current customers, and examine whether you can reach other customer segments through cloud.

2. Decide whether your organization will be an optimizer, innovator or disruptor:

- Examine organizational and market factors that impact your cloud strategy, such as corporate objectives, competitive dynamics, customer strategy, your firm's risk profile, and customer empowerment.
- Establish where—if at all—your organization is positioned in the Cloud Enablement Framework today.
- Determine your organization's level of cloud adoption in the next three to five years (optimizer, innovator or disruptor).
- Educate your organization on public, private and hybrid clouds and the optimal combination for your objectives. This can help you align your enablement goals with the growing trend toward hybrid cloud environments.
- Build business and technology skills and capabilities to close the gap between your current and future Cloud Enablement Framework position, or maintain your current position if that is the goal.
- Investigate how IBM's Cloud Infrastructure Strategy and Planning Services can enable you to define your cloud strategy and develop a roadmap to align with the strategy, including the latest thought leadership and guidance around hybrid clouds.

3. Use industry-leading solutions for regulatory compliance management, in particular to address the issue of unprotected data. Consider IBM and partner solutions that can range in scope from providing insight into your business security exposures to delivering a front end to hosted email on a bare metal SoftLayer cloud solution. These solutions can serve to:

- Integrate a compliance solution that is compatible with your existing data center relationships.
- Combine a technology solution with third-party end-to-end audit processes and reporting solutions.
- Reduce legal and financial risk by demonstrating due diligence and attention to specifics through detailed security reports.

Embracing cloud: A challenge to your current approach

As Figure 4 shows, CSPs that optimize the potential of cloud's business enablers can position themselves to capture significant value and sustainable advantage. However, this can require those CSPs to challenge existing approaches to their business and industry. What would your business do if it could:

- Only defend your core business—telecommunication services—by adopting cloud?
- Reach previously unaddressed customers or markets, and target them based on their individualized preferences through analytical insights?
- Give customers access to any product or service "anytime, anywhere," on any device?
- Inexpensively and rapidly develop and launch new product and service offerings?
- Seamlessly connect and collaborate with business partners and customers?
- Redefine your role in the industry, changing your competitive positioning?

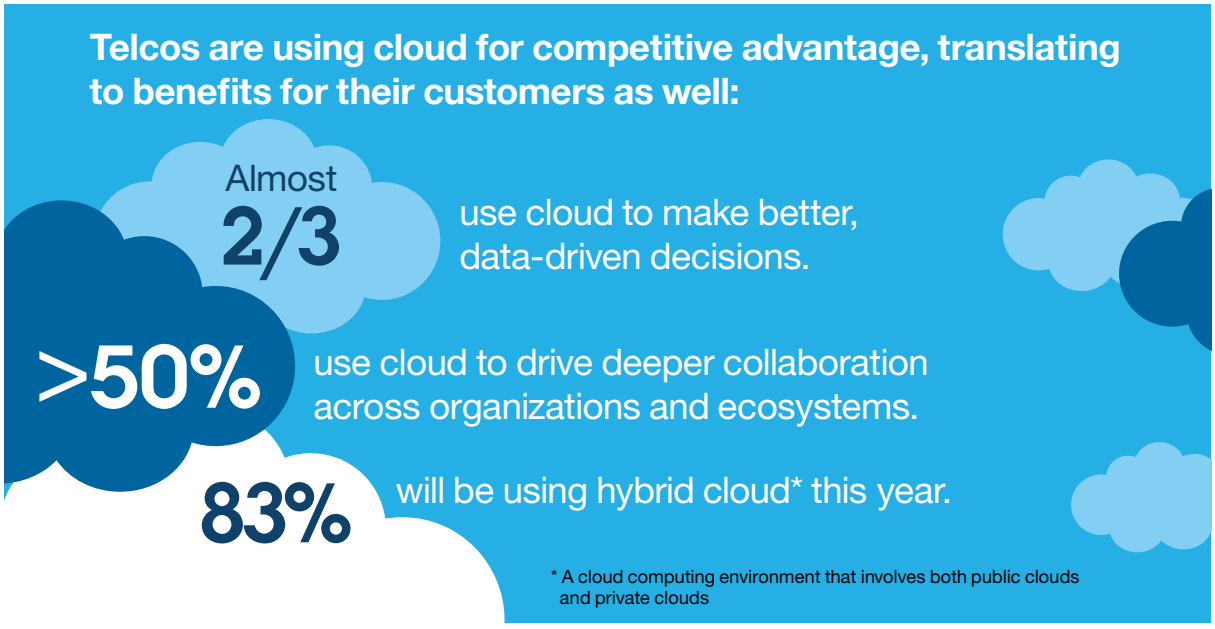


Figure 4. Telcos are using cloud to their competitive advantage, translating to benefits for their customers as well (IBM Center for Applied Insights).[27]

Enlist the right partner to fully realize cloud benefits

To help with strategy discussions as outlined in the previous section, IBM provides a range of professional services that support the rich set of capabilities cloud technology brings to organizations everywhere, using a strategic framework as a lens, defined from our own experience. Our expertise encompasses:

Business models

- Revenue impact of cloud on business processes and go-to-market channels
- Consultations on industry, enterprise and business unit initiatives to drive step-change market performance

Application and delivery platforms

- Cloud-based environments for fast development and deployment
- Competitive software delivery strategies
- Variable service models for provisioning and performance that scale to peak and non-peak demand

Data platforms

- Methods to increase business intelligence
- Deep analytics for decision making, anticipating the most effective next action in a company's response to the market
- Use of variable service models to align capabilities in data management and flex-to-consumption cycles

Infrastructure platforms

- Cloud infrastructure strategy designed to help clients take advantage of the transformative value of cloud for leading edge, standardized and virtualized capabilities
- Development of a cloud infrastructure environment that helps organizations to achieve business objectives

IBM GTS Cloud Advisory Services provides thought leadership across the service lifecycle, from formulating a cloud vision and strategy to regulating the cloud service portfolio (which can increase in complexity, especially in a hybrid environment where clients broker and integrate service elements among multiple providers) to implementing cloud solutions.

For more information

To learn more about IBM GTS Cloud Advisory Services, please contact your IBM representative or visit the following website: **ibm.com**/cloud computing

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