ICT intuition LLC
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Making Strides in Digital Transformation

The Evolution From Service Provider to DSP Advances Despite Obstacles

Exclusively for: Netcracker

We knew the transition from network operator to digital service provider (DSP) would be long and sometimes painful, but there is good news amidst the negative chatter; the telecommunications industry is making progress.

The telecom industry set out to transform billions of dollars' worth of global infrastructure and systems into an entirely new network. That includes completely replacing the existing, interoperable global network architecture with IP and LTE. Network operators have to make that transition without interrupting service and while depending on legacy processes and business models. As a result, communications service providers (CSPs) are rightly cautious.

Our first survey on CSP digital transformation[1] in 2015 revealed that transformation was underway. In 2017, ICT Intuition took a more in-depth look at digital transformation strategies and implementation efforts among service providers from every major region worldwide.

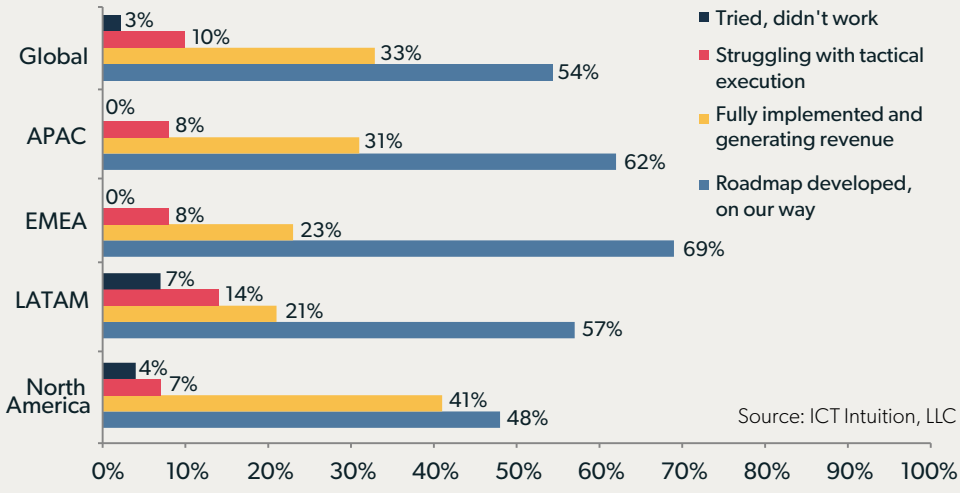
ICT Intuition conducted a global survey of executives from 100 Tier 1 to Tier 3 service providers across five distinct regions. A notable difference between the 2015 survey and this iteration is that the latter now includes Head of Customer Experience or Head of Digital Transformation executives, in addition to those with the traditional titles like CIO, VP of Operations, CMO and Head of Networks.

There are many facets to digital transformation and no two CSPs will approach it in the same way. However, there are characteristics common to both digital enterprises and DSPs. CSPs are making progress toward adopting these characteristics, but there is still work that must be accomplished.

Keeping an Eye on the Prize

Nearly 80 percent of CSPs surveyed in 2017 have either completed a business-wide DSP strategy or are in the process of completing one. Of those that have not finalized a digitalization program, a larger

How Much Progress Have You Made Toward a DSP Strategy?



[1] "So You Want to be a DSP", ICT Intuition, LLC; 2016

percentage reported getting started this year than the first survey, and all said they will be pursuing some type of DSP strategy in the future. This is a major improvement from the first survey, which concluded that approximately 39 percent of CSPs were uncertain about when or if they even would define a digital strategy.

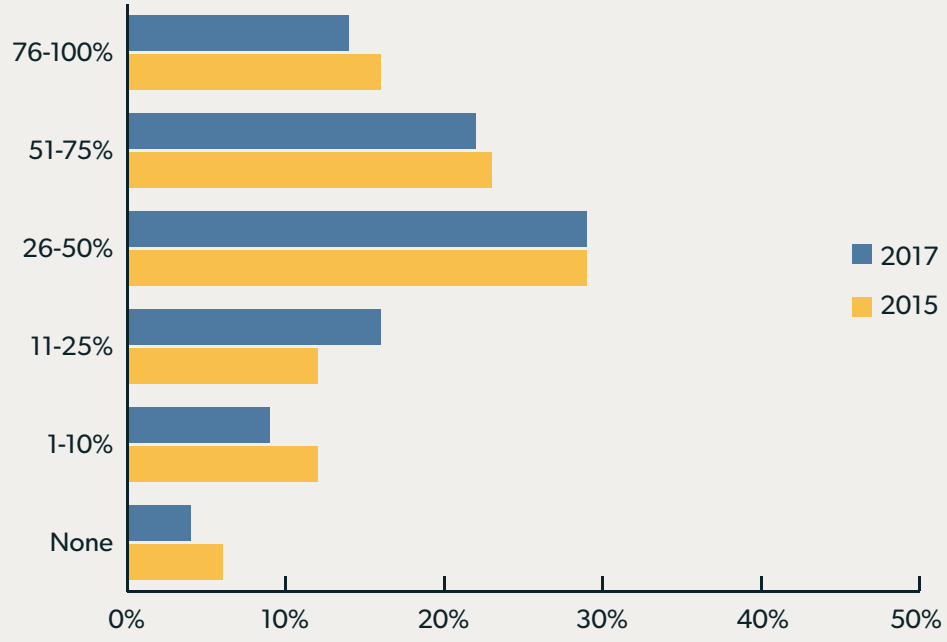
When analyzing the DSP transformation strategies that are underway, the overall sense is that more work is being done, yet revenue generation continues to lag. Only 33 percent of operators surveyed said they are generating revenue from their transformation efforts; that figure has not changed since 2015. The difficulty, according to the latest survey responses, lies with business and service transformation rather than network and digital technology transformation.

This report's research focuses on three related areas.

1. **Implementing digital network technology.** CSPs are primarily focusing on transforming billions of dollars' worth of global interconnected infrastructure.
2. **Delivering digital services.** New services aren't coming to market as fast as most service providers would like, yet there is still reason for optimism.
3. **Becoming a digital enterprise.** CSP executives face legacy thinking that is every bit as challenging as legacy networks and systems.

A key finding of this year's survey is that the number of enterprise customers and enterprise-derived revenues are increasing. Business demand is increasing as service providers bring IoT and advanced

What Portion of Your Revenue Derives From Business Customers?



Source: ICT Intuition, LLC

digital services to market. Operators that regularly derive more than 50 percent of revenues from business customers continue to do so. Those CSPs that previously generated less than 10 percent of revenues from business customers are now generating business revenues at closer to 25 percent of total revenue.

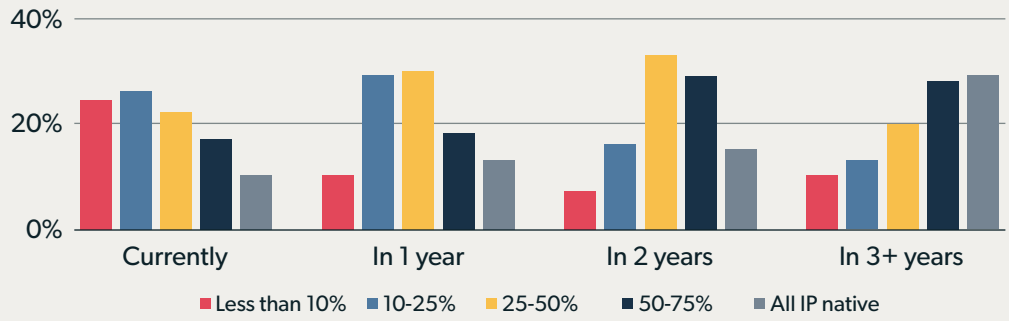
From a regional perspective, the number of operators in the Asia Pacific (APAC) region that derive more than 50 percent of revenue from business customers has doubled since the previous survey. Similarly, respondents from the Caribbean, Central and Latin America (LATAM) have also increased business revenues. Other regions have stayed nearly the same, indicating that prices are falling.

Overall, digital transformation progress is most noticeable in the Europe, Middle East and Africa (EMEA) region. Although the APAC region has remained somewhat constant from the previous survey, progress across the rest of the world has slowed down due to industry consolidation, economic conditions and regulatory changes. Most CSPs have discovered that digital transformation is taking longer than expected.

Incorporating Digital Technology Into a Legacy World

CSPs worldwide have been converting network infrastructure to IP for nearly 20 years, yet more than half of the CSPs surveyed do not currently operate networks that are more than 25 percent IP. Most run IP on top of existing MPLS and frame-relay legacy networks and continue to do a lot of protocol conversions and tunneling to ensure that digital data services operate correctly. So while the industry evaluates cloud technologies, network function virtualization (NFV) and software-defined networking (SDN), there remains a lot of physical infrastructure to be converted to native IP or, in the wireless domain, to LTE.

How Much of Your Network is Native IP or LTE?



Source: ICT Intuition, LLC

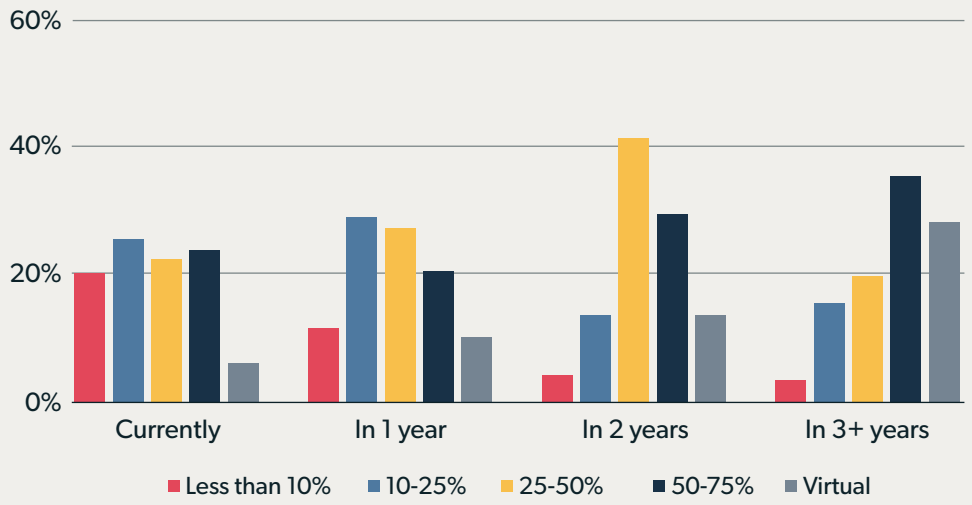
As IP reaches both wired and radio access networks, deployment becomes more complex. There are more physical elements, connection points and switching points. More network elements are involved and the virtual network functions (VNFs) operators are considering may face quality, reliability and performance issues. While progress is slow and expensive, 57 percent of CSPs anticipate that more than half of their networks will be converted to IP within three years.

That being said, NFV and SDN trials are underway and many more are scheduled for the next 12 to 24 months. Interestingly, live deployments of NFV seem to be occurring on the same schedule as trials, which indicate relatively short evaluation periods and faster-than-normal rollout for early adopters.

> ***...live deployments of NFV seem to be occurring on the same schedule as trials...***

While 30 percent of CSPs believe NFV will take longer than two years to materialize, a full 70 percent expect to have not only completed initial trials but to have NFV deployed live in their networks within the next two years.

What Portion of Network Elements Providing Service Are Virtual?



Source: ICT Intuition, LLC

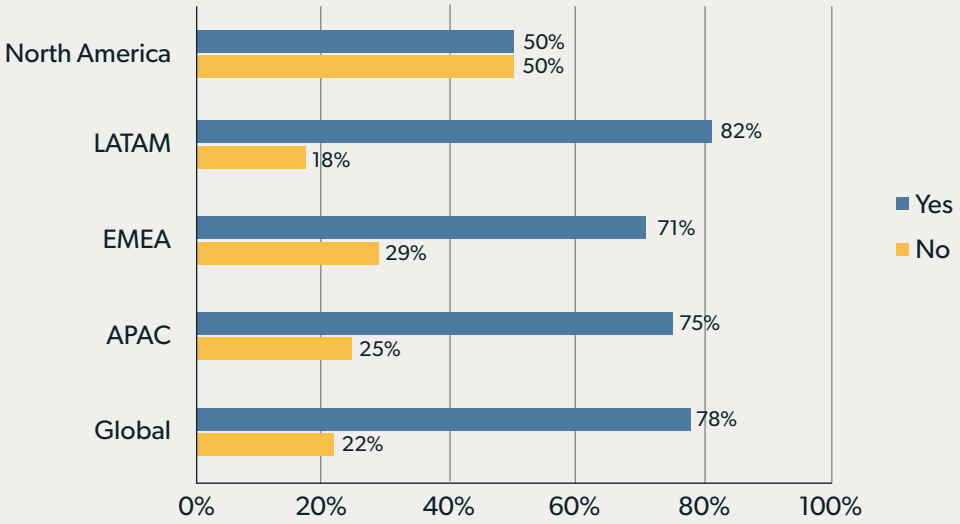
Yours, Mine, Ours: Who Owns the Networks?

Only 11 percent of the operators surveyed own more than 80 percent of their network. Likewise, only 14 percent own less than 40 percent of their network. That means that roughly three quarters own more than half. So while operators don't own the entirety of their networks, they do tend to own a majority of it.

But if they don't own the network from end to end, they aren't managing it end to end. Only 10 percent insist they won't be outsourcing any network management, while 68 percent already do. The remaining 22 percent say they will outsource network management soon.

Regionally, North American operators outsource the least amount of their network management (50 percent), while the LATAM respondents report more than 80 percent of their network management is outsourced. The other regions say 70 percent or more is outsourced.

Is Any Portion of Your Network Management Being Outsourced?



Source: ICT Intuition, LLC

When asked about the technology required to enable digital transformation, CSPs were uncertain. A full 77 percent believe that the technology they need is still lacking. In the LATAM region, where operators are taking advantage of current opportunities to leapfrog legacy technologies, 94 percent say the technology isn't there yet.

While every CSP has to make do with what is available, 71 percent state that technology interoperability remains a significant challenge. In the APAC region, that figure balloons to nearly 90 percent, yet remains less of a factor in areas like North America where there are fewer competitors and wholesale providers.

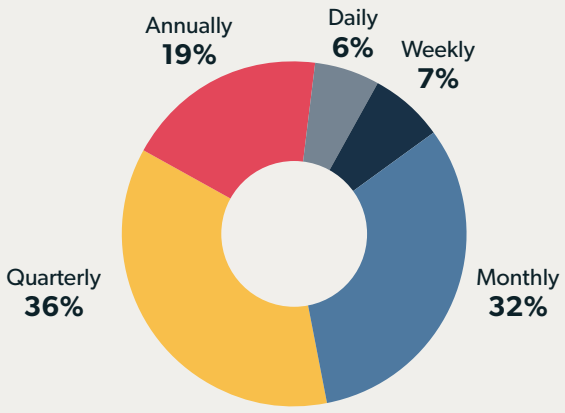
Where Do CSPs Stand in the Digital Race?

Ultimately, the benefits of becoming a DSP will revolve around the ability to roll out a wide variety of new services rapidly, monetize those services and establish automated partner platforms. DSPs need to put themselves in positions to broker access to a wide variety of partners that will come and go based on demand, economics or geography.

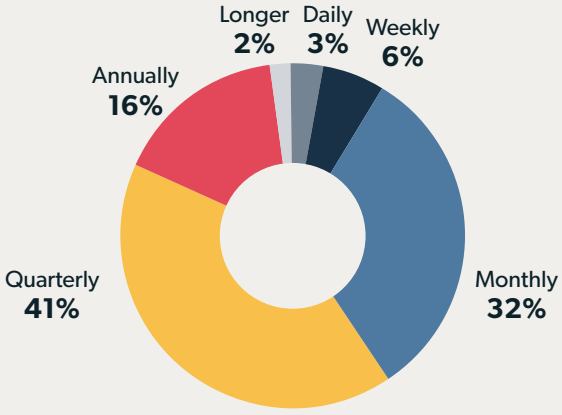
Currently more than 85 percent of the CSPs surveyed stated it takes one month or more to launch a new service, pricing plan or product bundle. While that may be considered progress by CSPs that in the past took six months or more to bring a new service to market, the ability to respond rapidly to customer demand with unique, customized products and offers is one of the end goals of digital transformation.

The figures are the same for rolling out new bundles, features, or options. The biggest obstacle is that the go-to-market process is the same whether rolling out a service that requires network, OSS/BSS and personnel changes or a new offer that should be easy to add to product catalogs and revenue management systems without affecting the rest of the business.

How Often Do You Roll Out a New Service?



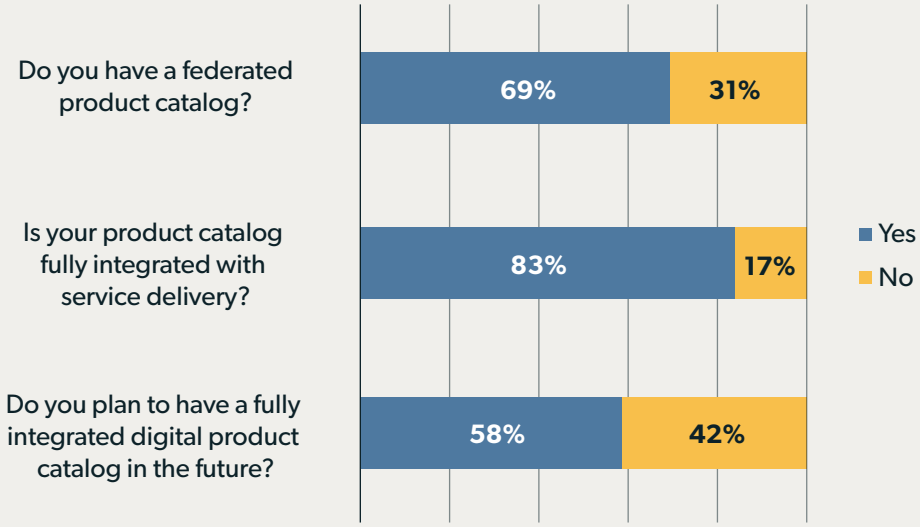
How Often Do You Roll Out a New Price Plan?



Source: ICT Intuition, LLC

Nearly 70 percent of operators surveyed have a single integrated or federated product catalog. More than 80 percent confirm that their product catalog is fully integrated with the service delivery catalog and resource inventory. Of those that have not yet implemented a product catalog, most plan to within the next two years. Regionally, North America lags due to longstanding legacy challenges, disparity of existing systems and scale. Consolidation, especially in the cable arena, also complicates North American CSPs' ability to implement common catalogs.

Are You Adopting a Digital Product Catalog?



Source: ICT Intuition, LLC

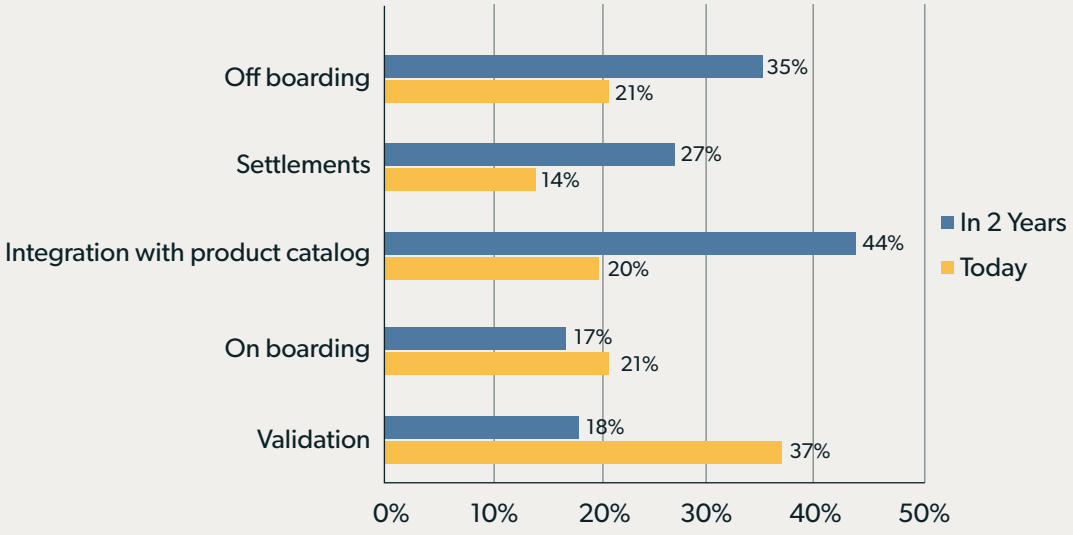
Climbing the Value Chain

CSPs wanting to sell digital services recognize the need to more closely resemble a digital retailer than a network operator. Most CSPs act as landlords that provide infrastructure access to tenants. Yet, there is value in offering additional services. Done efficiently using the cloud, more revenue can be realized by delivering over-the-top (OTT) services, but not without partners.

Two-thirds of CSPs currently sell services that include transparent or bundled access to apps hosted in the cloud. These are network-related services like storage, virtual CPE or offers that derive from just a few large partner agreements. DIRECTV® owes much of its early success to being the sole distributor for NFL Sunday Ticket™ (a high-value subscription service that enables a customer to watch any and every American football game). Large, complex partner agreements like the DIRECTV® and NFL relationship, or the Comcast Xfinity® and Netflix® partnership, take a long time to establish. Even customers that use these services may still change providers. In this new broad market, it will take more than a single, central offering to increase customer loyalty and stickiness as OTT provider agreements become less exclusive.

CSPs are in a unique position to link their millions of customers to cloud partners and become the trusted source providing customers with many choices of applications and services. To do so, CSPs will need to take their game to the cloud and establish automated partner platforms that accomplish rapid evaluation, certification, onboarding, off-boarding, integration and settlements for hundreds or even thousands of partners.

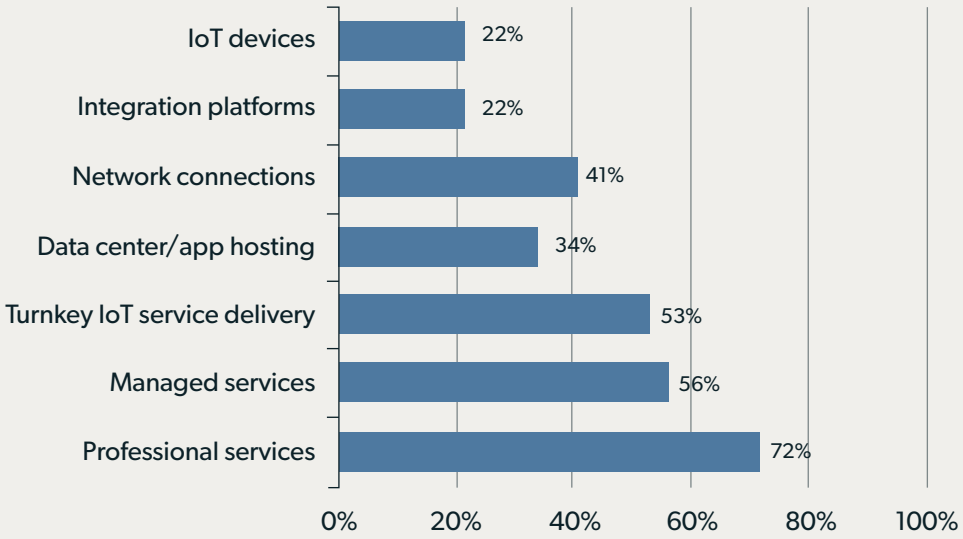
Do You Have a Partner Platform With These Capabilities?



Source: ICT Intuition, LLC

Until service providers can quickly integrate partner settlements, they won't be comfortable onboarding. CSPs are also anxious to start generating revenue from partners; they need to adopt a strategy and structure that enables a hybrid, distributed operating model. Otherwise the processes and systems remain the same, though they were never intended to support or enable this set of business needs.

What Do You Offer Business Customers That Want to Use or Resell IoT or Other Digital Services?



Source: ICT Intuition, LLC

Using Partnerships to Address B2B Demands

Business markets provide DSPs a bright spot for digital services delivery. The business demand for IoT and connected services is evident, but businesses also want to sell their own digital services. If DSPs aren't comfortable adding hundreds or thousands of partners, they can flip the model and become the trusted partner that enables businesses to sell digital services.

Technology-focused businesses remain the primary target for 60 percent of CSPs, while 31 percent have begun to focus on financial and manufacturing sectors. In other parts of the world, emphasis is also being placed on delivering digital services that meet the unique requirements of retail, healthcare, government and education applications.

DSPs are adding professional services units to support business customers and are partnering with those customers to enable them to resell digital services. Currently, 67 percent have established those partnerships, while more than 90 percent expect those arrangements to be in place within two years. However, most sales to business customers continue to require labor-intensive efforts to define, propose, price, deliver and support service delivery, which dramatically increase the cost of sales.

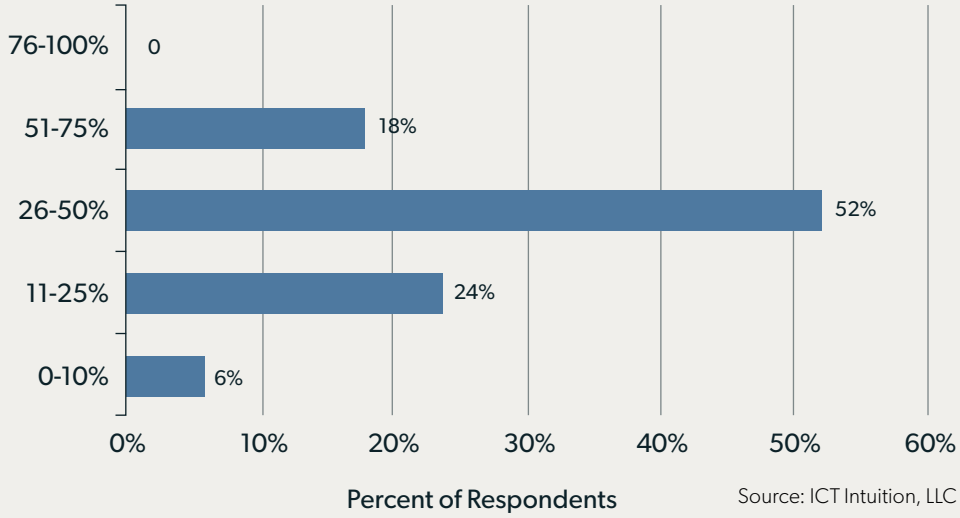
While more than 70 percent of CSPs will have partner validation and onboarding within a year, less than 45 percent will have completed back-end integration to OSS/BSS. More than half of CSPs say that lack of standards for APIs, partner integration and orchestration is a major challenge. Seventy-two percent rated overall infrastructure and system interoperability as the biggest challenge to delivering digital services.

Digital Business

A digital network does not make a DSP, just as having a website does not make an enterprise digital. A digital enterprise uses its own products, automates employee administrative tasks and embodies what it sells as part of its daily business. As part of the exploration into DSP transformation, DSPs were asked how "digital" their dealings are with employees and customers.

...for 82 percent of CSPs, less than half of all customer transactions are handled via digital channels.

What Percent of Your Customer Transactions is Digital?



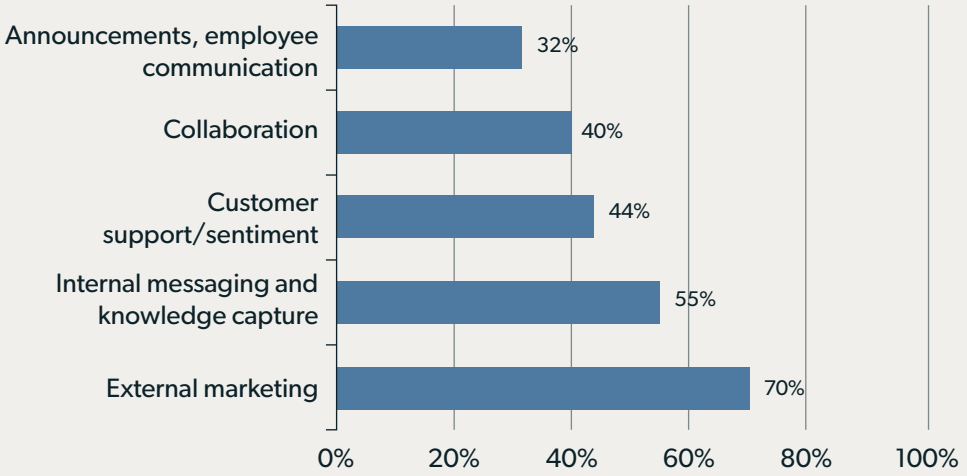
Source: ICT Intuition, LLC

A key indicator of the industry's overall transition to digital is the finding that for 82 percent of CSPs, less than half of all customer transactions are handled via digital channels. Some of that is intentional. For example, most CSPs do not let customers cancel services online. Similarly, the degree of support available online is often limited to frequently asked questions and account look-ups. As customers expect to conduct more transactions and care scenarios digitally, CSPs must greatly increase their digital abilities across customer-facing channels and processes.

Employee interactions provide another measuring stick for a CSP's transition to a DSP. Our survey finds that for nearly 70 percent of service providers, fewer than half of all employee transactions are digital. Though all service providers likely utilize online forms, those forms often are printed, signed and stapled with receipts; they are not necessarily digital. If the only advantage of an online form is enforcement of corporate rules, reliable math skills and the ability to convert currency, the existing business process doesn't translate to digital.

Another core practice among digital enterprises is to harness social platforms for employee communication, collaboration and knowledge capture. While 70 percent of CSPs use social platforms for external marketing, only 32 percent use them for internal announcements and employee communications.

For What Purposes Do You Use Social Platforms?



Source: ICT Intuition, LLC

Access to data, another indicator of digital behavior, remains limited for both customers and support personnel. While some data is available online and a few tasks have been automated, processes haven't changed. When calling in for support, a customer is still bounced from one area to another because relevant data is stored based on location, product or service rather than by customer. There is no automation or intelligence that ties all disparate data to an individual customer, but there is positive movement in this area.

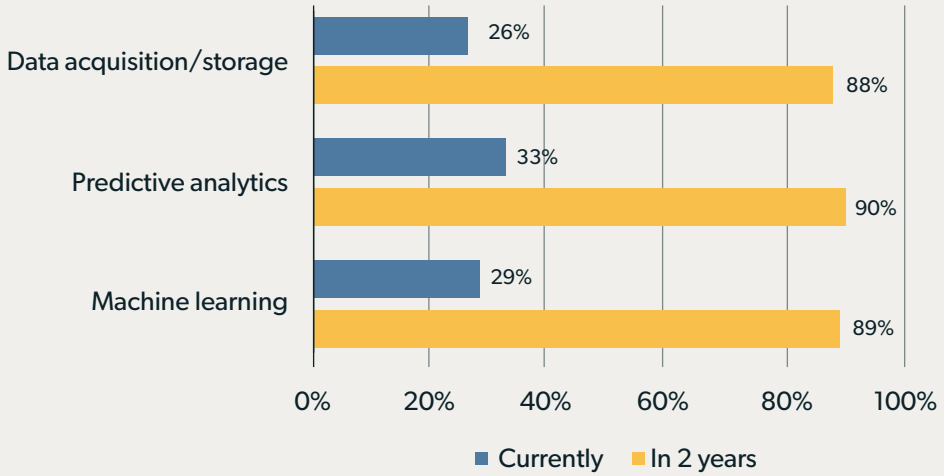
The Analytics Evolution: What and When?

Analytics is critical to understanding both the digital customer experience and the digital employee experience. Analytics can point to what tasks are taking too long, where the systems slow down and where performance issues impact experience. That eliminates finger pointing and makes fault isolation and recovery much faster. Our survey participants were asked about three stages of analytics adoption across a variety of business functions. We assessed progress in the areas of data acquisition and storage, predictive analytics and machine learning.

Roughly one-third of all operators apply analytics to their accumulating data. And while machine learning has just begun to appear in the OSS/BSS market, more than 25 percent of operators are implementing machine learning solutions to improve network, business and employee productivity and performance.

Nearly 90 percent of respondents expect to be using predictive analytics, machine learning and enhanced data acquisition and storage within two years for business performance and decision-making and employee productivity and development. The same is true for product development and marketing organizations. Most operators expect that the network side of the business will take longer to embrace analytics for network management and network optimization, but greater than 80 percent hope to begin applying advanced analytics to network operations within two years.

Do You Use These Advanced Analytics Functions?

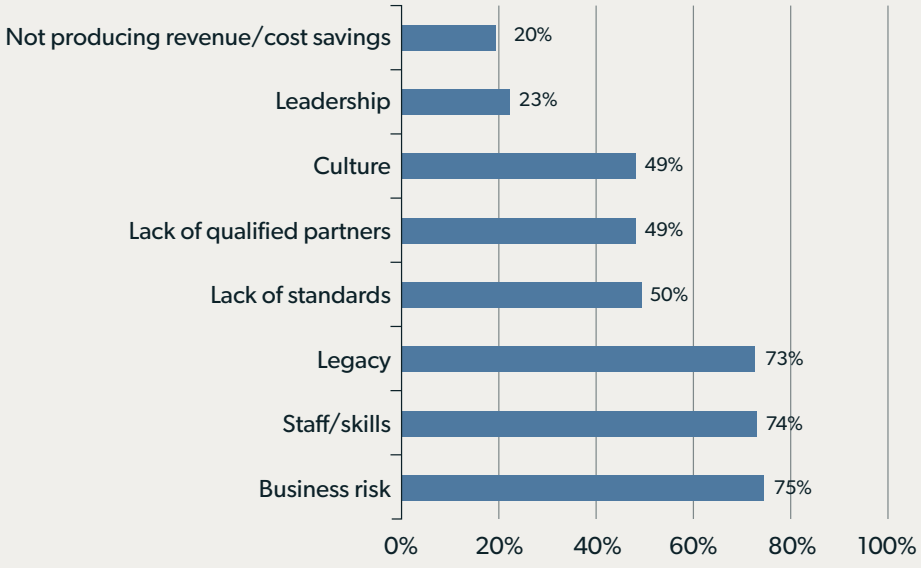


Source: ICT Intuition, LLC

What Hurdles Are Impeding Digital Transformation?

CSPs' greatest common challenge continues to be business risk. Having typically been risk-averse players in the broader landscape, 75 percent of CSPs rate business risk as their biggest obstacle to digital transformation. Business risk and staffing present the greatest business challenges while technology and timing seem to be major challenges for network and services transformation.

Which Are the Biggest Hurdles to Transforming the Delivery of Digital Services?



Source: ICT Intuition, LLC

The primary component of that business risk is a lack of qualified staff and skilled employees. Legacy infrastructure, lack of qualified partners and changing culture were also recognized as significant challenges that contribute to CSPs' overall business risk. Half of CSPs cite a lack of standards as a major challenge, and many are waiting for standards before deciding to replace legacy systems and go all in on transformation.

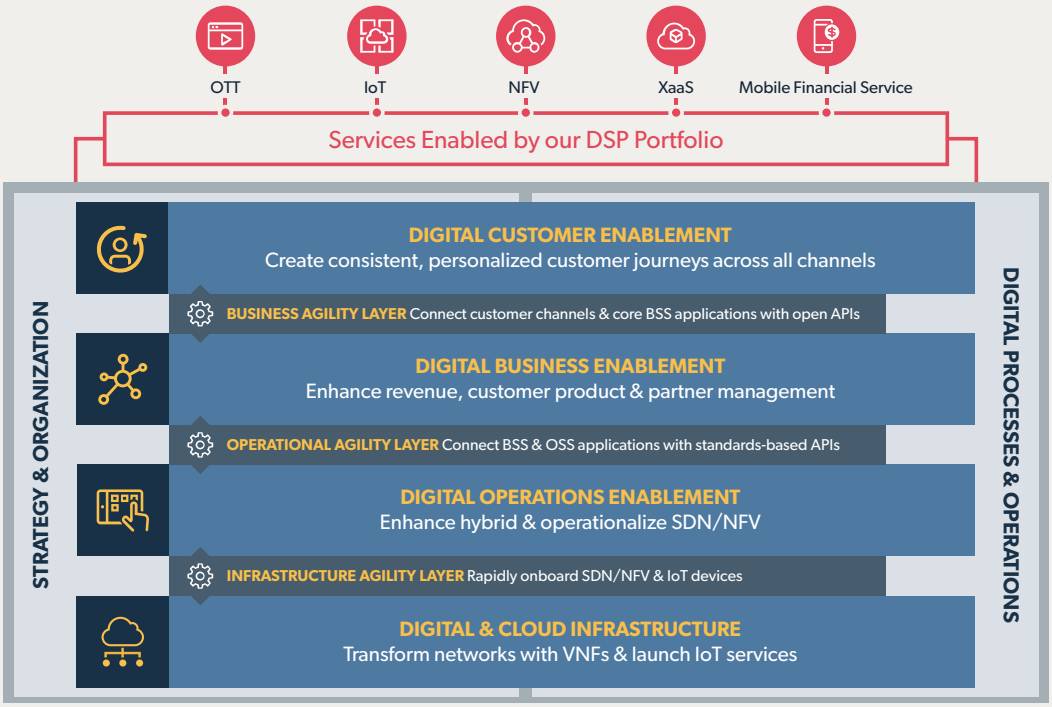
Despite these challenges, most transformation efforts are producing results.

Continuing the Journey

Not only is the telecom industry changing technology strategies from physical point-to-point networks to virtual, software-defined networks, it is also changing business strategies from selling infrastructure to selling services. Those are big changes that affect every aspect of a service provider's business. CSPs retain the most valuable asset of all—customers. Digital transformation enables DSPs to become the supplier of choice for consumers and businesses. But in order to do that, CSPs must:

- **Stick to the plan.** Most, if not all, CSPs have a strategy and plan in place for transformation, and progress is being made. Adjustments will be necessary, but the end goal remains the same: Enable a more automated and productive business that delivers a wide variety of digital services to consumers and enterprises.
- **Design for now and later.** The presence of legacy technology is unavoidable and will always be a consideration when upgrading infrastructure and systems. However, to completely transform their businesses, DSPs must execute roadmaps that accommodate legacy while planning for its retirement.
- **Ensure scale.** Today's innovation will become tomorrow's re-engineering if the technology is unable to scale to support millions of customers, multiple channels and a wide variety of services.
- **Prioritize the process.** Plan for infrastructure and systems rationalization to streamline operations and reduce costs. Carefully evaluate business processes before implementing new systems to achieve efficiency, not just functionality.
- **Engage with reliable partners.** Gone are the days when a CSP owns and operates in a vacuum. There are many vendors and solution providers and each has to take responsibility for its own contributions as well as the way its solution fits with the technology, services and businesses where it is deployed.

The inability to acknowledge the need for change or to accept change is a human obstacle to transformation. As the world goes digital, the DSP's role is decidedly different than that of a traditional CSP. The most difficult part of the current transformation continues be cultural and operational. A successful shift from CSP to DSP requires an executable strategy that encompasses everything and everyone from the core of the network to the partners providing applications and content. As CSPs continue to climb the value chain and deliver the end-to-end, "put together" digital services that both businesses and consumers now demand, progress is being made and CSPs are staying in the race.



Netcracker's Approach to Becoming a DSP

Netcracker believes that digital service provider transformation is a prerequisite for any traditional operator as it engages with the new digital economy. As telecom and cable service providers look to launch new services and to improve interactions with customers and partners, they often need to review existing network, operational, business and customer-facing systems and determine a new design to enable transformation.

Netcracker DSP transformation initiatives focus on creating the appropriate digital user experience (on-demand, online, real-time) for each customer by ensuring that a service provider's people, processes and technologies are aligned around a common goal: to deliver digital services to any customer on any device or end point with a customer journey that is personalized and impactful.

Netcracker has vast experience delivering digital transformation for service providers worldwide. Netcracker's methodology assesses digital maturity, creates a long-term roadmap and vision, defines effective business cases, develops and aligns digital skills and lays out near- and long-term blueprints for transforming IT environments.

Netcracker's Digital Transformation methodology spans:

- **Strategy & Organization** helps service providers build successful business cases along with effective implementation roadmaps. Netcracker's Planning & Consulting Services drive solution development activities based on expertise and a deep understanding of its customers.
- The **Digital Customer Enablement Layer** enables true omnichannel, personalized customer journeys across conventional and digital channels. This helps service providers to enhance

customer experience, accelerate time-to-market and increase sales efficiency. This analytics-driven layer brings together customer data to build intelligent customer profiles and ensure correct actions, effective recommendations and personalized interactions.

- The **Business Agility Layer** enables abstraction and flexible integration between customer engagement layers and core BSS to empower business units to make changes. It ensures that any third-party or channel applications can access necessary information without exposing unnecessary information or architecture details.
- The **Digital Business Enablement Layer** includes IT systems which serve as a core for BSS digital transformations – Unified Customer Management, Centralized Product Management, Digital Partner Ecosystem and Converged Revenue Management. It aligns the most critical BSS functions and business processes with what a DSP requires.
- The **Operational Agility Layer** enables easy integration of BSS and OSS applications through standards-based APIs and integration adapters. It ensures that any component of the Netcracker solution can be integrated easily with any other IT system.
- The **Digital Operations Enablement Layer** includes IT systems which serve as a core for OSS transformations – Hybrid Service & Resource Management and physical Infrastructure Management. It also includes systems which help to operationalize SDN/NFV at scale including SDN Controllers and NFV Management & Orchestration.
- The **Infrastructure Agility Layer** provides integration tools and libraries necessary to onboard new network and infrastructure services rapidly, including VNFs and M2M devices. This layer leverages continuous integration tools and relies on widely adopted standards for SDN/NFV and IoT to ensure interoperability and the continuous growth of service provider ecosystems.
- The **Digital & Cloud Infrastructure Layer** introduces an extensive selection of VNFs and a sophisticated management and control layer for data center virtualization. A unified IoT platform helps service providers maximize the value of emerging IoT services by creating and testing their own IoT applications and commercializing a wide range of existing ones.
- **Digital Process & Operations** provides the full set of operations and maintenance capabilities today's marketplace demands. It spans all Netcracker solutions as well as those based on third-party products.

Netcracker is recognized worldwide as the market leader in digital transformation solutions and services for service providers.

For more information on Netcracker's Digital Transformation solutions, please contact: sales@netcracker.com.

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