TAXONOMY

IDC's Worldwide Digital Transformation Use Case Taxonomy, 2017: Communications Service Provider
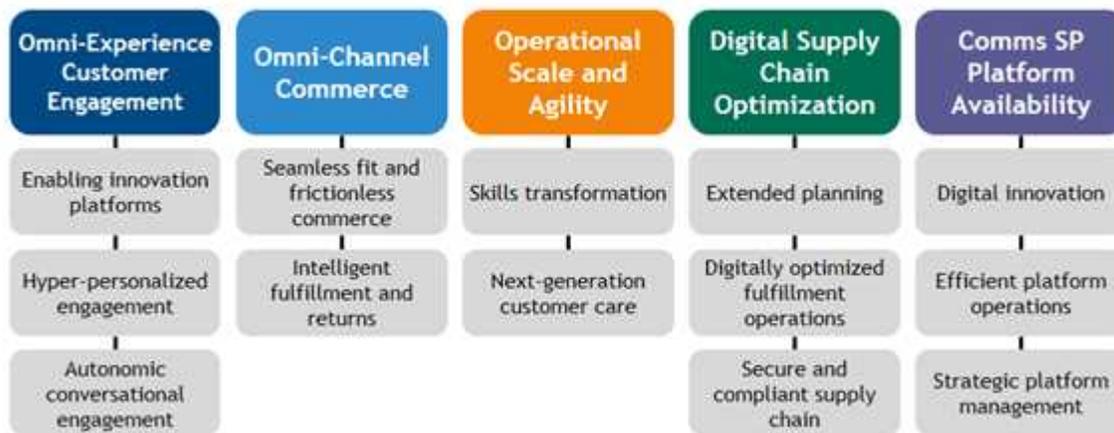
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IDC'S WORLDWIDE COMMUNICATIONS SP DIGITAL TRANSFORMATION TAXONOMY

FIGURE 1

Digital Transformation Primary Segments for Communications Service Providers

Note: DX mission is the blending of digital and physical to make purchases in the stream of life.

Source: IDC, 2018

IDC publishes research on digital transformation (DX) and its influence on technology spending. This research includes both quantitative research in the form of market forecasts and qualitative research that assists technology buyers in making better decisions and technology vendors in better serving their customers.

As an organizing principle for this substantial research effort, IDC has created a use case taxonomy for DX for multiple industry segments. The taxonomies provide the framework for digital journey maps that will assist our clients in understanding the full scope of enterprise efforts.

IDC's Worldwide Digital Transformation Taxonomy

This study articulates and documents IDC's digital transformation use case taxonomy for the communications service provider (comms SP) industry. This use case taxonomy supports and organizes IDC's published research on digital transformation and digital transformation's influence on technology spending.

IDC's DX and technology spending research includes both quantitative research in the form of market forecasts and qualitative research that assists technology buyers in making better decisions as well as technology vendors in better serving their customers.

To help you better understand what digital transformation means for the communications service provider industry, and IDC's research on technology spending for DX, IDC has created this use case taxonomy for digital transformation.

The taxonomy follows a hierarchical structure that begins with the digital mission of that industry, the strategic priorities that support that mission, the programs that will be initiated to satisfy the priorities, and the funded projects or use cases that will be implemented under those programs.

DIGITAL TRANSFORMATION TAXONOMY CHANGES FOR 2018

2018 is the first year of publication for the comms SP digital transformation taxonomy.

Taxonomy Overview

Understanding and Using IDC's Digital Transformation Taxonomy

IDC's DX taxonomy provides structured guidance on how 14 distinct industry and government verticals are creating and enabling digital transformation success in the digital economy. While the taxonomy is an extensive representation, it is not exhaustive.

The taxonomy is a four-level model:

- **Digital mission (one per industry)**. The digital mission is the business organization's overarching aspirational goals and objectives. Each industry has its own unique mission.
- **Strategic priorities (several per digital mission)**. There are several strategic priorities that describe what organizations expect to accomplish over an extended time to achieve their digital missions.
- **Programs (several per strategic priority)**. Several programs support each strategic priority. Each program represents a long-term plan of action to achieve the strategic priorities through a series of use cases.
- **Use cases (several per program)**. Under each program are a set of use cases. These use cases are discretely funded efforts supporting a program objective. Use cases can be thought of as specific projects employing line of business and IT resources, including hardware, software, and IT services. Each use case is organized by the use case name, current situation, business goals and objectives, key technologies used to enable desired business outcomes, and a summary of the results.

Collectively, IDC's DX taxonomy covers 14 distinct industry verticals represented by 14 digital missions, 60 strategic priorities, 160 programs, and over 450 specific use cases.

DEFINITIONS

Telecommunications and DX

Communications service providers are companies that build, maintain, and monetize communications networks, whether wired (using copper, fiber, or other technologies) or wireless (including WiFi, cellular, or satellite), and deliver communications-intensive products and services.

Communications service providers are true global organizations with operations located in diverse areas, spanning urban to the most remote areas globally. These companies operate in heavily regulated, compliance-driven, politicized, and market-driven environments.

Communications service providers must participate in global ecosystems through network-to-network interconnections and IP exchanges to enable delivery of roaming and remote location connectivity to domestic customers.

Communications service providers may be domestic, multicountry, regional, or global in direct focus and coverage.

The market in which a communications service provider specializes is often a function of the industry served. These industries can be divided into three categories: telecommunications, entertainment and media, and internet/web services. Some communications service providers have branched into multiple areas. Others provide communications services across all major categories.

The communications service provider market includes all service providers offering telecommunication services or some combination of information and media services, content, entertainment, and applications services over networks, leveraging the network infrastructure as a rich, functional platform. Comms SPs span the spectrum from pure consumer retail operations, to management of infrastructure, to provisioning of large-scale ICT solutions from major enterprises. Comms SPs include the following seven IDC defined subsectors.

- **Telecommunications carrier**. Catch-all/generic phrase covering all entities that provide some form of telecommunication services (fixed and/or mobile; voice and/or data) as their primary business to all or a subset of consumers, enterprises, governments, and other telecom service providers.
- **Mobile network operator**. A mobile network operator (MNO), also known as a wireless service provider, wireless carrier, cellular company, or mobile network carrier, is a provider of wireless communications services that owns or controls all the elements necessary to sell and deliver services to an end user, including radio spectrum allocation, wireless network infrastructure, backhaul infrastructure, billing, customer care, provisioning computer systems, and marketing and repair organizations.
- **Content and applications service provider (CASP)**. Content and applications service providers include providers focusing primarily on information and media services, content, entertainment, and applications services.
- **Cable service provider**. A cable service provider owns cable infrastructure and provides cable TV (and increasingly telecom services).
- **Satellite broadcasting operator**. An entity that leverages satellite infrastructure to transmit TV channels to viewers as a main business.

- **Fixed satellite service provider**. A radio communication service between earth stations at given positions, when one or more satellites are used; the given position may be a specified fixed point or any fixed point within specified areas; in some cases, this service includes satellite-to-satellite links, which may also be operated in the inter-satellite service; the fixed-satellite service may also include feeder links for other space radio communication services.
- **Cloud communications service provider**. An entity that leverages the cloud environment to provide telecommunication and other services.

Digital Mission: Support and Enable Diverse, Connected Communities

The digital mission within communications service providers is to create agile connectivity capabilities. This means the development, combination, and delivery of connectivity and related communications products in an environment that can respond dynamically to changing external factors, particularly price, end-user demand, and regulatory instability, while enabling control and visibility across the ecosystem end to end.

Communications service providers must be agile enough to shift resources and priorities to maximize existing resources and capital as external factors, such as markets and price settings, and internal factors, such as network capability, quality, and operational challenges, shift business strategies.

Strategic Priority: Omni-Experience Customer Engagement

Program: Enabling Innovation Platforms

Communications service providers have traditionally been rigid in their product offerings, with long lead times to quote, provision, and substitute product offerings. Attempts at flexibility have led to explosions of product SKUs, confusion among customers and resellers, and unwieldy billing and support models.

As virtualization technologies increasingly gain footholds in communications service provider product offerings, the need to create innovation and proactive product offerings that support the evolving customer demand landscape becomes a key ingredient in reducing customer churn, combatting inroads made by OTT players, and increasing the overall customer profitability.

TABLE 1

Enabling Innovation Platform DX Use Cases

Use Case	Current Situation	Goals and Objectives	Technology Deployed	Use Case Summary
Offering co-creation	The ability to let customers contribute to design and let suppliers participate in R&D is limited.	The objectives are better customer requirements satisfaction and lower R&D failure costs.	Social, industry cloud, BDA, and mobile	Collaboration between the comms SP and the end user to define the requirements for a personalized offering to meet the needs of that customer.

TABLE 1

Enabling Innovation Platform DX Use Cases

Use Case	Current Situation	Goals and Objectives	Technology Deployed	Use Case Summary
B2B marketplaces	Marketplaces are emerging within comms SPs to enable distribution of virtualized network functions (VNF) with some exploration enabling end-user applications by cross-connecting cloud marketplaces.	Provide self-service deployment of network functions along with unified visibility and billing of communications and enterprise applications.	Industry cloud, public cloud, SaaS	Full self-service environments allowing end users to configure, provision, and manage services offered by the comms SP and its partner ecosystem.
Digital product life-cycle management	Comms SPs face challenges around delivery of products to market and management of variations/bundling of those products.	Provide a personalized, flexible product model, maximizing customer flexibility while optimizing the product portfolio within the comms SP.	Cloud, mobile, usage analytics, AI/cognitive analytics, machine learning, customer profiling systems, IoT, social media data collection	Digital PLM is based on the vision that all information should be managed and stored as data objects while giving each user almost real-time information on the product life cycle.
Integrated product development and sourcing management	Product development and sourcing are largely independent functions within the majority of comms SPs.	The objective of integrating product development and sourcing is a shorter, cost-effective design process that ultimately delivers an improved customer experience.	Cloud, analytics, supply chain management, PLM analytics, IoT	Product life-cycle sourcing integrates strategic sourcing and product life-cycle management, enabling common processes and information for engineering, procurement, and suppliers.

Source: IDC CSP Insights, January 2018

Digital Exploration Program: Hyper-Personalized Engagement

One of the key goals of personalized engagement is to deliver a contextualized and personalized customer experience. Contextualization means that the communications service provider is aware, acting on, and shaping the customer experience to multiple demographic, location, day/time, weather, purchasing pattern, and other parameters.

Optimizations can improve on the current state, which primarily involves rule-based planning and composition of promotion events, limited use of predictive analytics, and imperfectly informed marketing mix modeling.

Analytics, AI, machine learning, and other 3rd Platform technologies will enable much more accurate and granular contextualization and optimization of balanced impact on customer lifetime value and return on merchandise investment in promotion strategies and tactics. Optimized marketing and advertising give way to precise customer communications.

TABLE 2

Hyper-Personalized Engagement DX Use Cases

Use Case	Current Situation	Goals and Objectives	Technology Deployed	Use Case Summary
Customer journey mapping	Expectations for speed, convenience, transparency, and personalized engagement are not often met with the current convoluted processes within communications service providers.	Map out the business processes in detail to identify bottlenecks across different lines of business with a customer-centric approach and mindset.	Advanced business process management tools	Map out customer journeys across different product offerings in the comms SP portfolio in preparation for digitally transforming the customer journeys to align with shifts in customer expectations and market dynamics.
	The current customer journeys need to align with the shifts in customer demographics, behavior, and expectations as well as market dynamics.	Undertake a complete redesign of the customer journey involving fully automated customer onboarding, highly optimized straight- through processes, and customer communications through the channel of choice with a view to create unique personalized experiences.		
Contextualized marketing	Contextualization is based on location and day/time and customer purchasing pattern profiles.	Contextualization is informed by data about the person and the dynamic state of his/her world based on what is happening, said, needed, and expected "now" in the context of achieving the comms SP's goals for the relationship, campaign, and message.	Cloud, IoT, time-stamped geospatial analytics, unstructured data analytics, ingestion of worldhood data sources, customer journey analytics, natural language processing, predictive behavioral analytics, natural language expression, and trade-off analytics	Align customer dialogue with the roles, behaviors, and location of the person who needs, buys, and uses the comms SP's products in the context of the person's current world.

TABLE 2

Hyper-Personalized Engagement DX Use Cases

Use Case	Current Situation	Goals and Objectives	Technology Deployed	Use Case Summary
Omni-channel marketing and advertising optimization	Marketing mix modeling is disconnected from one-to-one customer journey marketing, rules-based or infrequently optimized programmatic advertising bidding, imprecise return on marketing investment, retargeting disconnected from offline transactions.	Customer communications replace marketing and advertising paradigm; unified marketing mix and personalized (microsegment) customer journey strategy, modeling, and tactics; rapid refresh of programmatic rules; and closed-loop retargeting.	Cloud, machine learning, behavioral and personality analytics, trade-off analytics, and optimization	Improve return on demand generation investments with the unified management of marketing and sales funnel.
Next-generation customer retention	Comms SPs have relied heavily on voice and message interactions, usually at a broadcast level, to maintain contact with customers and evaluate their satisfaction with elements of product service.	To proactively reduce customer churn by applying a variety of risk assessment and loss prevention measures that quickly identify potential sources of risk, thus enabling preventive action; similarly, automating the process of compiling evidence of dissatisfaction, risks from competitor's market offerings as necessary to drive self-improving processes and actions.	Usage analytics, AI/cognitive analytics, machine learning, customer profiling systems, IoT, social media data collection, churn analytics	Next-generation customer retention proactively reduces risk of customer loss by applying a variety of risk assessment and loss prevention measures that quickly identify potential sources of customer defection, enabling preventive action, automating the process of compiling evidence, and driving self-improving processes and actions.

Source: IDC, 2018

Program: Autonomic Conversational Engagement

Intelligent content can be used to address customers (i.e., conversational engagement brand marketing and product sales campaigns); social marketing is informed through experiential gut feel and is limited by the ability to scale user-driven content tagging, product, keyword, theme, and campaign taxonomies and by the availability of contextually proficient copywriting expertise. The results too often are low audience reach, low return on social marketing budgets, and poor budget allocation. Artificial intelligence-embedded and AI-enabled processes should significantly inform and improve audience targeting, identification of personality, and behavioral patterns and improve influence through the alignment of content, style, and tone (see Table 3).

TABLE 3

Autonomic Conversational Engagement DX Use Cases

Use Case	Current Situation	Goals and Objectives	Technology Deployed	Use Case Summary
Augmented social marketing	Social marketing campaign decisions are informed by experiential gut feel with limited data on influencers' reach to target audiences, resulting in low audience reach, low return on social marketing budgets, and poor budget allocation.	Brand marketing and product sales campaigns identify audiences via AI-discerned personality and behavioral patterns and reach them via influencers whose personality and content align with and reach the target audience to increase engagement and sales funnel volume and velocity.	Cloud, machine learning, natural language processing, personality, behavioral, and conversational tone analytics, and social network analytics	Amplify traditional broadcast marketing and advertising through social influence channels, reaching precisely defined target audiences to improve return on total marketing investment across channels.
Augmented content optimization	User-driven content tagging is slow, cumbersome, and inconsistent. Product, keyword, theme, and campaign taxonomies are static, with emotive "brand personality" and thematic dimensions poorly understood and inconsistently defined and documented.	AI-enabled characterization, tagging, and selection of textual and visual digital assets via supervised machine learning overseen by creative design and editorial content guidelines. AI-derived asset metadata informs management of content corpus to ensure that the curation of assets and their attributes serves marketing objectives.	Cloud, machine learning, natural language processing, and visual AI analytics	Create single content management system serving all communication channels with consistently applied well-defined content tags to ensure portfolio meets needs of merchandising and marketing.

Source: IDC CSP Insights, January 2018

Next-Generation Customer Care

As the world of customer engagement has taken on increasing complexity — omni-channel commerce from a multitude of devices — customer care has failed to keep pace at the very time that the retail industry has become hypercompetitive. Customer loyalty and customer management capabilities are too often siloed in the enterprise with little, if any, visibility across all retail channels and largely paper-based.

Customer care too often does not have a view to customer context or individualized needs — both at the consumer and enterprise customer levels; execution is inconsistent and limited by legacy technologies, with escalation slow and hierarchical.

New technologies, approaches, and innovation are needed to equip the communications service provider with a 360-degree omni-channel view of the customer.

Communications service providers need to have visibility to the lifetime value of customers and real-time data about the customer's needs and wants. Product information, pricing data, online ordering, product life cycle, and customer feedback in the hands of customer care further enhance the customer experience.

As communications service providers increasingly gear their businesses around metrics, such as net promoter scores (NSP), the measurement of the customer journey becomes increasingly critical.

With customers taking their last best engagement experience as their next minimally acceptable experience, the bar is continually being raised, and only communications service providers embracing a holistic customer engagement strategy will be competitive (see Table 4).

TABLE 4

Next-Generation Customer Care DX Use Cases

Use Case	Current Situation	Goals and Objectives	Technology Deployed	Use Case Summary
360-degree connected customer management	Siloed customer loyalty or customer management capabilities provide a limited view into customer context and individualized needs.	Improve customer experience, engagement, and lifetime value with a 360-degree omni-channel view of customer and engagement tools.	360-degree omni-channel CRM, AI, analytics, loyalty apps, and social media	Providing a 360-degree omni-channel view of customer management enables better engagement and experience through the customer journey and in the stream of life.
Augmented customer support	Inconsistently executed customer support with limited view of customers and their needs, and no ability to escalate proactive processes autonomically.	Goals include the availability of the omni-channel customer support community at all points of the consumer journey, supported by real-time information and analytics to improve the support experience.	Social media, contact center tools, case management tools, and multitouch engagement, including social, chat, email, phone, SMS, voice, bots, AI, and IoT	Creating a proactive omni-channel approach to customer care that understands the consumer shopping context and recommends personalized actions through the customer journey and in the stream of life.

Source: IDC CSP Insights, January 2018

Strategic Priority: Omni-Channel Commerce
Program: Seamless and Frictionless Commerce

The current retail experience for telecom customers exists largely in separate and disconnected domains: physical, online, catalog, and mobile. Buy-and-pay points are not connected; as the customer journey spans multiple devices through multiple channels in multiple sessions, the customer experience is disjointed, inconsistent, and disconnected (i.e., slowed by latencies, inefficiencies).

Unnecessary keystroking across multiple systems detracts from an optimal or pleasing customer experience, causing the engagement between customer and telecom back-end system to be frustrating and time-consuming.

The digital transformation will streamline and smooth the customer journey, optimizing the process for an optimal customer experience, with digital connections and enhancements allowing the customer journey to begin on any device in any channel at any point of the customer journey and be completed on any device in any channel.

The customer journey will have very little latency, with duplicative steps and friction points eliminated and the user interface designed outside-in from the customer's perspective (see Table 5).

TABLE 5

Seamless and Frictionless Commerce DX Use Cases

Use Case	Current Situation	Goals and Objectives	Technology Deployed	Use Case Summary
Omni-channel commerce system	Current systems aspire to supporting multichannel commerce: supporting the customer journey in multiple channels (physical, online, catalog, mobile).	Orchestrate sales and service channels (mobile first, ecommerce, omni-channel, in-store) for optimal customer paths to purchase, sales, and service.	Omni-commerce (e-store and m-store, social, voice, chat, one click, etc.)	Enable seamless omni-channel commerce throughout the consumer journey and in the stream of life (search, discovery, buy and fulfill, and service).
Connected buy-and-pay points	Buy-and-pay points are disconnected, making for a linear buy-and-pay process that has latencies, unnecessary friction points, and does not leverage the connected social and mobile technologies that the consumer uses during the customer journey.	The purchase and fulfillment process is fast, easy, and convenient and leverages connected customer journey points via social, chat, and visual and voice technologies while offering speed of purchase, convenience, multiple delivery options, and explicit, easy-to- manage return policies.	Omni-channel cart/order, digital payments, social networking, media, IoT and voice-enabled bots, chatbots, and one-click buttons	Provide mechanisms to buy and pay anywhere conveniently and securely throughout the customer journey and in the stream of life.
Augmented product search	Great product search and SEO is possible online but does not carry into physical spaces well and certainly doesn't leverage the numerous consumer touch points.	Digitally and physically converged product search optimization is augmented by advanced and cognitive analytics and internet of things and is informed with personalized and contextualized customer insights and preferences.	SEO for all interactions, AI, virtual reality, augmented reality, IoT, and voice	Provide mechanisms to find goods that meet personalized and contextualized consumer needs throughout the customer journey and in the stream of life.

Source: IDC CSP Insights, January 2018

Program: Intelligent Fulfillment and Returns

As customers' expectations have risen for an anywhere/anytime experience, comms SPs have had to respond with fast and efficient capture, management, and fulfillment of all business-to-consumer (B2C) and business-to-business (B2B) quotes and orders. Comms SPs must optimize fulfillment cost and capacity, minimize inventory risk, and deliver customer service from enterprisewide and supply network inventory sources to orchestrate custom or build-to-order fulfillment with design, buy, and make workflows. Intelligent fulfillment leverages artificial intelligence (AI)-enabled anticipatory order-to-order, make-to-order, ship-to-order fulfillment processes, supply chain systems, and processes enabling context-aware knowledge worker decision processes (see Table 6).

TABLE 6

Intelligent Fulfillment and Returns DX Use Cases

Use Case	Current Situation	Goals and Objectives	Technology Deployed	Use Case Summary
Procurement and provisioning	Procurement and production planned and scheduled service capacity based on demand forecasts without anticipating material and capacity needs, leading to excessive lead times for service provisioning.	Manage capacity within the comms SP environment to ensure that provisioning times are optimized and predictive models are applied to ensure that capacity is available to fulfill demand.	Cloud, industry cloud, IoT, prescriptive trade-off analytics, artificial intelligence, machine learning, blockchain, 3D printing, 3D product virtualization, and customization	Address the growing challenge of fulfilling demand for configurable products at lower cost to serve optimized customer service-level targets. Also, enable customer-driven customization of products in digital and physical properties.
Omni-channel order orchestration and fulfillment	Separate and sequential capture, management, and fulfillment workflows for store-bound and direct-to-consumer orders primarily optimized for profitability from enterprise points of supply unconstrained by store-labor capacity governed by rules-based systems operating on latent inventory and shipment status data; logistics fulfillment capacity assigned after order capture; sequential single-tier replenishment planning to misalign inventory with demand.	Fast and efficient capture, management, and fulfillment of all store-bound and direct-to-customer orders to optimize fulfillment cost and capacity, inventory risk, and customer service from enterprisewide and supply network inventory sources. Order capture signals multitier replenishment and secures capacity for downstream fulfillment activities. Orchestration of custom or build-to-order fulfillment encompasses design, buy, and make workflows.	Cloud, industry cloud, IoT, prescriptive trade-off analytics, artificial intelligence, machine learning, and blockchain	Use real-time, context-aware analytics and curated network data to anticipate and balance direct-to-customer and store-bound order fulfillment to meet customer service level at lower total cost to serve.

TABLE 6

Intelligent Fulfillment and Returns DX Use Cases

Use Case	Current Situation	Goals and Objectives	Technology Deployed	Use Case Summary
Next-generation payments	Payment processes require a myriad of partners, internal and external processes, and adherence to PCI compliance and PiP requirements and are expensive to operate and support, as changes are required.	To provide comms SP customers with a variety of electronic payment options that make payments convenient, safe, secure, and simple in the stream of life.	Mobility, cloud, multifactor authentication, biometric authentication, APIs, mobile apps, mobile devices, payment devices, one-click digital apps, managed services, and PCI and PiP compliance testing	Next-generation payments enable the customer to pay anyone, from anywhere, anytime, seamlessly, securely, and privately. Comms SPs will engage the digital consumer with seamless payments in the stream of life — so wherever, however goods are purchased, any barrier to safe and secure payments are removed, increasingly masking complexity at the point of purchase — perhaps by leveraging biometrics and multifactor identification as the primary digital mechanism to pay for goods, eliminating physical barriers.
Next-generation digital security	Comms SPs and their customers have focused most of their attention on reducing the impact of digital breaches after the fact. At the same time, threat actors have been getting much more organized and sophisticated.	Security and cybersecurity must be looked at as critical pieces of the communications infrastructure, incorporated into a cybersecurity strategy under a responsible senior executive, and supported with current technologies, giving customers confidence that their security is part of an overall proactive and reactive strategy.	End-to-end encryption; tokenization; multimodal authentication; biometrics; advanced security analytics, threat intelligence platforms; cognitive	Next-generation security providing predictive models based on machine learning to improve resilience of networks and improve detection of intrusion by threat actors.

Source: IDC CSP Insights, January 2018

Strategic Priority: Operational Scale and Agility

The need for operational excellence and organizational agility in high-performance organizations as a source of strategic renewal is key to transformation of communications service providers.

Operational excellence is central to creating strategic advantage and can be a catalyst for strategic renewal. High-performance organizations exhibit operational excellence and organizational agility in many ways.

Operational excellence is a state in which the organization exists — constantly. Operational excellence must be extended to all relevant functions, processes, and interactions, including those that are external to their organizations and especially to those that involve customer interactions, key suppliers, and product/service design and delivery or manufacturing.

Operational excellence can be used as a catalyst for strategic renewal and change. As a strategic imperative, it enables the communications service provider to selectively integrate portions of business designs, technologies, and outsourcing partners for leverage and economies of scale.

Program: Skills Transformation

At a time when consumers are better connected than ever, equipped with knowledge and resources on products, and expressing heightened expectations, the workforce at many communications service providers is under-equipped and undertrained.

Communication and scheduling are often paper-based, and processes for peer support, personal and team performance, skills development, and career management, if unsupported by current technologies, are woefully outdated for today's demanding environment. Information that is inaccurate or out of date, and paper-based, cannot catch up with the cadence of the modern communications service provider, thereby causing unproductive human rework and intervention, errors, delays, poor execution, and higher employee turnover.

The digital transformation infuses organizations with intelligent collaborative, social, and self-service applications, presented in intuitive interfaces and ergonomically appropriate devices and formats. Knowledge workers will be able to access curated, structured, and unstructured information, "ready to eat" as and when needed; intuitive analytic tools for ad hoc exploration; and collaborative technologies that facilitate sharing knowledge with rich embedded problem solving.

To attract the best employees needed to deliver the expected customer experience, communications service providers will need to digitally transform with collaborative tools and practices; flexible work environments; intelligent, intuitive technologies with familiar leading-edge look and feel; optimized instruction; and technologies that appeal to the modern workforce and improve productivity and worker satisfaction.

TABLE 7

Skills Transformation DX Use Cases

Use Case	Current Situation	Goals and Objectives	Technology Deployed	Use Case Summary
Mobile task management	Even as communications service provider business models and operations are becoming more complex, tasks are still communicated by email, mailbag, and excel spreadsheet.	Ensure that tasks are accessible anywhere anytime consistently across the communications service provider for more efficient communication, assignment and delegation, coordination, monitoring, and tracking of tasks enterprisewide, with greater visibility, clarity, consistency, and accountability across teams.	Mobile devices, task management, mobile apps, and IoT	Digitization and automation of the task management function.
Digital workforce management	Workforce development is heavily siloed and ad hoc.	Ensure that skills are available to meet the needs of the customer and evolving market conditions.	Mobile devices, task management, learning and development applications	Equip comms SPs with intelligent collaborative, social, and self-service applications for improving skills; communicating informally and formally; jointly scheduling work; tracking, improving, and rewarding performance; and managing careers.
Empowered worker	Inaccurate, incomplete, or out-of-date information for execution of inline process tasks delays completion, creates rework, reduces job satisfaction, and adds cost.	Support execution of inline process tasks with information as needed in role-friendly formats on ergonomically appropriate devices to increase process speed and improve outcomes, worker experience, and job satisfaction.	Cloud, machine learning, IoT, AI knowledge search and retrieval, intelligent assistants, mobile, and social collaboration	Direct inline task execution with optimized instructions and appropriate information to improve productivity and worker satisfaction.
Ecosystem collaboration	Inaccurate, incomplete, or out-of-date information with a lack of skills awareness and limited collaboration platforms to connect knowledge workers, both internally	Encourage innovation by capturing knowledge and experience across the comms SP and its extended ecosystem, to support process improvement, product	Cloud, machine learning, IoT, AI knowledge search and retrieval, mobile, and social collaboration	A collaborative ecosystem breaks down and goes beyond geographic, industry, and organizational boundaries. It lets enterprises use multiple technology solutions and

TABLE 7

Skills Transformation DX Use Cases

Use Case	Current Situation	Goals and Objectives	Technology Deployed	Use Case Summary
	and externally, with the comms SP.	ideation, and customer engagement.		services to collaborate with partners, suppliers, and customers.
Augmented knowledge worker	Workers handling nonroutine problem-solving tasks in collaborative workflows spend too much time retrieving, validating, consolidating, and normalizing data spread across enterprise systems, desktop applications, and external sources with little analytical support for the problem-solving tasks themselves.	Provision knowledge workers with curated structured and unstructured data as needed during their work, analytic tools for ad hoc exploration and interrogation, and collaboration tools to exchange knowledge work products with intact problem-solving context and data lineage.	Cloud, machine learning, text analytics, natural language processing, AI-enabled image analytics, IoT, AI-enabled knowledge search and retrieval, intelligent assistants, causal reasoning and hypothesis generation, dialog management, training, and social collaboration	Empower knowledge workers with AI-assembled or easily assembled information and analytics tools to handle problem- solving tasks in operations, merchandising, marketing, supply chain, and human resources.

Source: IDC CSP Insights, January 2018

Strategic Priority: Digital Supply Chain Optimization

The efficient supply chain now requires more than ever that communication between suppliers and communications service providers contain the least amount of latency. Information about capacity, availability, and scheduling is critical to accelerating the performance of the supply chain.

By shifting to software updates in place of hardware replacement, some quicker technology updates have been achieved. Further, decoupling of hardware from software and API integrations will speed up the implementation and turnup of new technologies and features for the benefit of the telco customers.

As the degree of software-based automation increases in ordering, service changes, and the bearer network, cognitive and analytics technologies can enable many points in the supply chain to operate autonomously, particularly in intelligent communication and scheduling of workloads and traffic management, reducing latency at key points substantially. For retail and customer care teams, predictive analytics will anticipate bottlenecks in distribution and supply before they happen, allowing intelligent systems to respond and prevent the potential delays.

Program: Extended Planning

Digital transformation dictates that supply chain decisions be made using near-real-time information. Often constrained by capacity, communications service providers must look to embed real-time intelligence in the supply chain planning process to better leverage planning as a meaningful source of input to maximize capacity utilization and optimize resource utilization.

Communications service providers are shortening planning cycles but remain tied to major update cycles for mobile networks (such as 5G) and fixed networks (such as fiber and copper build-outs). Planning involves real estate management, local land approvals, and workforce management. Technology cycles are increasingly pliable because of software feature updates, such as software-defined radio interfaces for mobile networks.

TABLE 8

Use Case Detail for Extended Planning Program

Use Case	Current Situation	Goals and Objectives	Technology Deployed	Use Case Summary
Extended S&OP	S&OP is often an insular process that fails to adequately understand granular demand, broader supply, and the constraints of constituents beyond the narrow definitions of demand and supply balancing.	Engage all planning constituents, both inside and outside the enterprise, in a timely and productive way to both ensure that existing plans are viable and understand future opportunities to recalibrate plans.	Cloud, social, BDA, cognitive, IoT, and mobile	There are modern, cloud-based tools integrated to instrumented inputs across a broad and diverse set of connected constituents. There is also rapid iteration of plans and scenarios with next-generation optimization capabilities.
Demand and consumption processing	Implemented as part of siloed service offerings with the comms SP, demand analysis is applied to capacity planning within the comms SP.	Near-real-time availability of demand will support higher revenue, especially in aftermarket parts and services.	Cloud, IoT, mobile, and industry cloud	Instrumenting demand signals from customers and channel partners creates an accurate representation of real-time demand in the digital supply chain.
Thinking supply chain	Various analytic models support different planning stages, but the models are loosely integrated.	The objectives are better allocation of resources and risk mitigation, better optimal sales and operations plans, and better next-best-action determination.	Cognitive, BDA, AR/VR, and mobile	A closed-loop analytic model connects portfolio, scenario, value, and situational analysis to drive supply chain innovation.
Risk management, compliance, and governance	Risks associated with external regulation, technology investments, and business model changes are largely independent, informing strategy without directing it.	The objectives of risk management and compliance are to ensure that a series of different risk categories, all of which can affect the successful operations of the comms SP, have minimal impact on operations.	Cloud, machine learning, IoT, AI knowledge search and retrieval, mobile, and social collaboration	Initiatives aimed at allowing the communications service provider to remain in compliance with the domestic market regulations, covering spectrum, service provision, pricing, and offering management.

Source: IDC CSP Insights, January 2018

Program: Digitally Optimized Fulfillment Operations

The increasingly complex connectivity landscape, with competing B2C and B2B2C and D2C models, rapidly rising consumer expectations, and the Amazon effect have complicated fulfillment.

The old days of forecast-driven network inventory positioning, operations predominated by manual hand-offs, and processes with limited visibility, no connectivity, and latencies throughout can no longer respond to the realities of today's networking environment.

To digitally transform, communications service providers need to leverage sensors, IoT, AI/cognitive, robotics and drones, and predictive analytics. Communications service providers leveraging these and other technologies are optimizing the number and location of nodes in the network, gaining visibility into cross-channel network inventory, and optimizing safety stocks across the network.

If the communications service provider is to be able to allow the customer to buy anywhere, provision anywhere, and access support anywhere, fulfillment should be digitally optimized.

TABLE 9

Digitally Optimized Fulfillment Operations DX Use Cases

Use Case	Current Situation	Goals and Objectives	Technology Deployed	Use Case Summary
Predictive network orchestration	Network inventory positioning is largely forecast-centric, with reactive adjustments.	Goals include orchestrating capacity across the network to ensure comms SPs can meet performance and availability expectations of customers, from source of ingress to the network through backhaul and distribution.	Predictive analytics, IoT, WMS, TMS, and GTM	Predictively optimized network assets optimized for deployment against forecast demand and maintenance schedules.
Advanced tech augmented work	Voice is used extensively in warehouse operations to aid order fulfillment operations.	Leverage the best of advanced technologies to increase worker productivity.	Mobile, voice, AR, VR, 3D printing, task management, WMS, TMS, and GTM	Increase productivity of the supply operations workforce by increasing the efficiency and effectiveness by which the workforce can accomplish its jobs.
Autonomic operations	Fulfillment has been predominated by manual operations, requiring manual hand-offs, conveyance, and pack and ship	Goals include increasing efficiency and work throughput more cost-effectively and allowing for the more productive allocation of manpower in fulfillment operations.	Robotics, drones, AGVs, AI/cognitive computing, sensors, IoT, WMS, TMS, and GTM	The autonomic operation of pick, pack, and ship processes with the aid of various sensors, robotics, and machine handling equipment.

TABLE 9

Digitally Optimized Fulfillment Operations DX Use Cases

Use Case	Current Situation	Goals and Objectives	Technology Deployed	Use Case Summary
	throughout fulfillment operations.			

Source: IDC CSP Insights, January 2018

Program: Secure and Compliant Supply Chain

Communications service providers are seeking a steady, reliable, and efficient flow of supply to maintain network operations that optimize the use of traffic and content capacity. However, as the pace of innovation accelerates to meet the evolving needs of the customer, managing supplier relationships becomes critical to ensure availability, reliability, and quality of supply. Key innovations in dynamic sourcing plus business-led criteria for capacity thresholds and planning are shortening the time required to respond to network operations requirements.

Supply chain security is defined as the protection of products, facilities, equipment, information, and personnel from theft, damage, or terrorism as well as preventing the introduction of unauthorized contraband, people, or weapons.

Comms SPs should make sure that they focus their efforts and investments in a way that will provide sufficient payback. Regardless of size, they inevitably have limited resources and need to determine which security investment will provide the biggest benefit.

TABLE 10

Secure and Compliant Supply Chain DX Use Cases

Use Case	Current Situation	Goals and Objectives	Technology Deployed	Use Case Summary
Supplier network management	Comms SPs source from suppliers based on historical experience, patterns, and standard bidding processes, not always digital.	Instrumenting supplier production and warehousing facilities to create a fully informed digital twin.	Predictive analytics, RFID, IoT, ERP, and supply chain optimization applications	Buying technology and skills from suppliers that are prepared to integrate with legacy platforms will yield fewer rip and replace deals, especially as the software capabilities of buyer and supplier teams continue to expand.

TABLE 10

Secure and Compliant Supply Chain DX Use Cases

Use Case	Current Situation	Goals and Objectives	Technology Deployed	Use Case Summary
		For on-premise deployments and maintenance, near-real-time awareness of suppliers' positions will yield lower transportation costs and better on-time delivery of connectivity services.		
Sourcing intelligence	The current best practice looks at aggregate buying volumes with vendors for negotiation.	Buying based on capacity reservation at suppliers based on a digital twin of the entire supply chain will yield lower inventories and higher perfect order results.	Cloud, industry cloud, cognitive, and blockchain	An understanding of supplier capacities at a deeper level, such as machine capabilities, certifications, capacity, and company demand for those items as well as continuous rebalancing of the supply of critical items based on capabilities rather than units and quantity.
Governance, compliance, risk management	Comms SPs apply uneven processes for governance, compliance, and risk management.	Enact a holistic approach to data, process, and procedural governance to maintain regulatory compliance and minimize risk to the comms SP.	Industry cloud, data management, risk assessment	The internal processes ensuring that the communications service provider manages the risks that arise in its environment. Regulatory and compliance risks must be managed in each jurisdiction the comms SP operates in, while competitive and strategic threats can be managed by managing skills, ensuring consistent customer engagement, and maintaining awareness of market forces.

Source: IDC CSP Insights, January 2018

Strategic Priority: Communications SP Platform Availability

The ability of a communications service provider to deliver targeted outcomes of production and cost is defined by its assets. Communications service providers have fixed (e.g., routers, switches, base stations) and mobile (e.g., trucks, ships) assets operating across the value chain of the operation.

Ensuring these assets perform well and avoiding unplanned outages are significant focus points, if not the focus, of communications service providers operating fixed and mobile networks. Equipment costs

and maintenance and repair costs are huge components of communications service providers' capital and operational costs.

Communications service providers have always operated with connected assets, but now, the number of sensors, the volume of data, and the capacity to integrate equipment data and other data sources embedded within business processes to predict and prescript maintenance activities are changing the potential outcomes that comms SPs can achieve.

The potential for cost efficiency improvement is substantial. Using the data from equipment as part of an overall asset performance strategy is key to continuous improvement within network platform process operations.

Program: Digital Innovation

The focus is on broad collaboration, formulation efficacy, and driving overall service-level improvements. Emphasis is placed on delivering an ecosystem-driven approach to innovation, wherein value stream stakeholders work together to deliver new products, improved processes, and innovative business models. Accelerating comms SP service life cycles, especially in the evolution of software-defined networking and changes in mobile and WiFi infrastructure, is placing pressure on communications service providers to do more with less while responding more quickly to increasingly complex demands. This transformation is about delivering a collective approach to meeting the demands of the customer through the application of modern digital technology.

TABLE 11

Digital Innovation DX Use Cases

Use Case	Current Situation	Goals and Objectives	Technology Deployed	Use Case Summary
Advanced network simulation	Comms SPs source from suppliers based on historical experience, patterns, and standard bidding processes, not always digital.	Network emulation allows users to introduce real devices and applications into a test network (simulated) that alters packet flow in such a way as to mimic the behavior of a live network. Live traffic can pass through the simulator and be affected by objects within the simulation services.	Predictive analytics, RFID, IoT, ERP, and supply chain optimization applications	Deliver real-time simulation of the impact of changes in network demand, along with automated responses to those changes. Comms SPs will consume increased data volumes to drive predictive models to improve availability and performance of the network.
Product innovation platform	Comms SPs are increasingly deploying platforms to enable API-driven access to comms SP services. However, the process of	The real strategic value of a digital platform is to harness the service offerings from a diverse supplier base, and then to use shared orchestration, monetization, and	Social, industry cloud, BDA, and mobile	Over time, the telco's platform should grow to host many tenants paying to use its infrastructure — fostering a marketplace for innovative service bundles and channels to new market segments. By adopting this strategy, this

TABLE 11

Digital Innovation DX Use Cases

Use Case	Current Situation	Goals and Objectives	Technology Deployed	Use Case Summary
	incorporated customer and internally driven innovation to enhance service development is limited.	administration tools to offer new service bundles.		supports the move from being providers of telecommunications and ICT services, to creators of digital innovation platforms that drive local economic growth.
Curated product assortment and positioning	Product positioning and organization is highly siloed depending on customer segment being addressed with minimal cross-fertilization of solutions.	Comms SPs that incorporate intelligent product design into their value chains, and can use intelligent product design to respond near term to customer requirements, will achieve higher customer satisfaction.	Analytics, BDA, IoT, cloud	Product design needs to take advantage of the digital transformation, leveraging leading-edge technologies to generate product designs at the product and portfolio level that are closer to how the products and portfolios will appear to the consumers.

Source: IDC CSP Insights, January 2018

Efficient Platform Operations

Before you can have a fully functioning and efficient asset within the network infrastructure management operation, assets in that infrastructure must be smart.

Communications service providers realize that it's not just about collecting performance data in a central control room. Assets also need to be able to diagnose themselves and, in some cases, fix themselves in an effort to not only minimize the operational cost of maintaining those assets (exchanges, base stations, radio and wireless network components, fixed network elements) but also deliver the efficiency and flexibility demanded by internal product managers, along with external partners, ecosystem members, and customers who rely on the communications service provider's infrastructure to deliver their own solutions.

TABLE 12

Efficient Platform Operations DX Use Cases

Use Case	Current Situation	Goals and Objectives	Technology Deployed	Use Case Summary
Self-healing platforms	Though increasing levels of automation are being implemented, most of processes are manual, spanning multiple systems and touch points.	To increase the use and availability of comms SP services (including IT, OT, and networks); to resolve issues automatically, leading to an increase in uptime; and to increase efficiency and throughput.	Analytics, cloud, network monitoring, orchestration tool	Components within the comms SP infrastructure monitor themselves and their peers and react to reroutes, shed load, or shutdown to minimize outage and asset damage.
Infrastructure virtualization	Virtualization is widespread throughout the IT side of the comms SP business, but it has minimal impact on the operations side of the carrier business.	Increase the utilization of resource, improve the overall software-defined nature of core comms SP operations, and allow for shared skills across IT/OT sides of the comms SP. Virtualizing infrastructure increases the flexibility of provisioning and reduces the cost of service delivery by increasing the use of hardware components.	Orchestration and automation tools, hypervisors	Virtualization enables the consolidation of multiple servers onto fewer physical devices, to reduce space, power, and administrative requirements, along with application availability and disaster recovery.
Platform operations automation and orchestration	Platforms tend to have alignment to solutions and lines of business within the comms SP, with automation applied unevenly across departments and product groups.	Enable comms SP platforms to respond to customer requests for service change and repair detected issues without requiring human intervention, thus increasing availability and reducing operational and maintenance cost for the comms SP.	Usage analytics, BDA, cloud, monitoring tools	Comprehensive data collection and analysis with automation tools engaging with platform orchestration to optimize the platform (fixed and mobile networks, IT infrastructure, IoT endpoints) in real time.
Platform DevOps	Though experimentation is progressing around DevOps, migration from traditional deployment remains in progress, resulting in delays in implementation of new services and offerings for customers.	Build the support infrastructure to enable platform innovation by expediting the development and deployment of new/revised functions into the comms SP platform infrastructure.	Cloud, DevOps tools, analytics	Utilizing a microservice architecture, DevOps in comms SPs makes full use of the capability of cloud technology and the network.

Source: IDC CSP Insights, January 2018

Strategic Platform Management

As smart assets become the norm, communications service providers must move away from traditional inspection and fixed asset management operations. Strategic asset management requires the ability to collect, analyze, and act on the large amounts of data coming from smart assets. One of the biggest changes is the move from inspection-based processes to predictive management of assets.

It also means using that same analytics capability to manage assets in the context of the business and enable its processes and not just the asset itself.

TABLE 13

Strategic Platform Management DX Use Cases

Use Case	Current Situation	Goals and Objectives	Technology Deployed	Use Case Summary
Infrastructure and network process insight	There exists some connectivity to the comms SP operations through sensors, but the ability to draw actionable insight out of the data generated through this connectivity remains limited.	Increased visibility into the efficiency and effectiveness of network operations, resulting in improved efficiency, increased throughput, and reductions in unscheduled downtime.	IoT, BDA, advanced network analytics	Advanced analytics provides real-time visibility into the network (both fixed and mobile) along with cloud, application, and SaaS supporting infrastructures through IoT sensors and connected equipment.
Augmented maintenance	Most assisted maintenance involves documented work instructions, but little is directly integrated into maintenance technician tooling.	Lower time and cost to repair, longer mean time between failure, higher first-time fix rates, and lower network downtime.	AR/VR, cognitive, IoT, mobile	The use of AR/VR provides maintenance technicians with relevant information and guided work instructions.
Predictive analytics (performance and capacity)	The most advanced asset management strategies usually involve condition-based monitoring, but there is limited ability to predict failures.	High levels of asset availability resulting in less downtime and interrupted production. Reduced cost of maintenance delivery.	Cognitive, IoT, mobility	Machine learning algorithms are built on accurate predictive models of potential failures.
Security management	Security is becoming a larger component of network management services, with increasing use of managed security offerings to detect and deter threats before they impact customer availability.	Reducing physical inspection costs and increasing system performance.	Sensors, communications networks, cloud, analytics, drones, robots, machine learning	The use of predictive models manages asset availability within the network and the need for reducing physical inspections. Real-time performance data combined with external data sources to predict failures in fixed and mobile assets.

Source: IDC CSP Insights, January 2018

LEARN MORE

Related Research

- *IDC's Worldwide Semiannual Digital Transformation Spending Guide Taxonomy, 2017: Update, November 2017* (IDC #US43205517, December 2017)
- *IDC FutureScape: Worldwide Telecommunications 2018 Predictions* (IDC #US43155617, October 2017)
- *IDC FutureScape: Worldwide Digital Transformation 2018 Predictions* (IDC #US43154617, October 2017)
- *IDC's Worldwide Digital Transformation Use Case Taxonomy Update, 2017: Retail* (IDC #US43009517, September 2017)
- *IDC's Worldwide Digital Transformation Use Case Taxonomy, 2017: Asset-Oriented Value Chains in the Manufacturing Industry Update* (IDC #US43035717, September 2017)

Synopsis

This IDC communications service provider (comms SP) digital transformation (DX) use case taxonomy describes the most prominent use cases for digital transformation in the communication services industry. The use cases detailed in this document are the most prominent use cases, among many, that comms SPs will use to embrace digital transformation and leverage the 3rd Platform technologies, culture of innovation, and continual transformation that digital transformation represents. The tables in this document illustrate the hierarchical nature of IDC's use case taxonomy, making up, first, the digital mission of that industry and then the strategic priorities that support that mission, the programs that will be initiated to satisfy the priorities, and the DX use cases that we expect to see comms SPs initiate.

"These use cases will be critical for comms SPs to integrate into their own technology road map planning, as they develop a better understanding of digital transformation. Technology suppliers will use these use cases to better understand the needs of retailers and to better tailor their strategies and product plans to respond to the needs of retailers. While this taxonomy addresses the communications services industry, these use cases emanate from our research into the comms SP landscape across seven subsectors: telecommunications carrier, mobile network operators, content and applications service provider (CASP), cable service provider, satellite broadcasting operator, fixed satellite service providers, and cloud communications service providers. Providers in each of these sectors are trying to digitally transform their businesses to deliver exceptional customer experiences and thrive into the future," says Courtney Munroe, group vice president of IDC Worldwide Telecommunications Research.

About IDC

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