



Organizing a new Telco

The cash cow has dried off, time to take it to the butcher

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1 Background & Challenges

The telecommunications industry is faced with systemic and structural challenges – shallow growth prospects¹ meet heavy capital investment requirements between 3G shutdown, 5G rollout and cloud installations. The technical heritage is paired with legacy organizations and often paralyzing cultures, leaving their marks on the industry. Telco executives need to consider both internal and external factors across a telecommunications operator's entire value chain, navigating carve-outs, mergers and a fast-paced disruptive players' market aiming at their EBIT. For the organizational setup and operating model of the future, this Detecon Whitepaper aims to give an inspirational starting point and highlight a few options that telecommunications operators have.

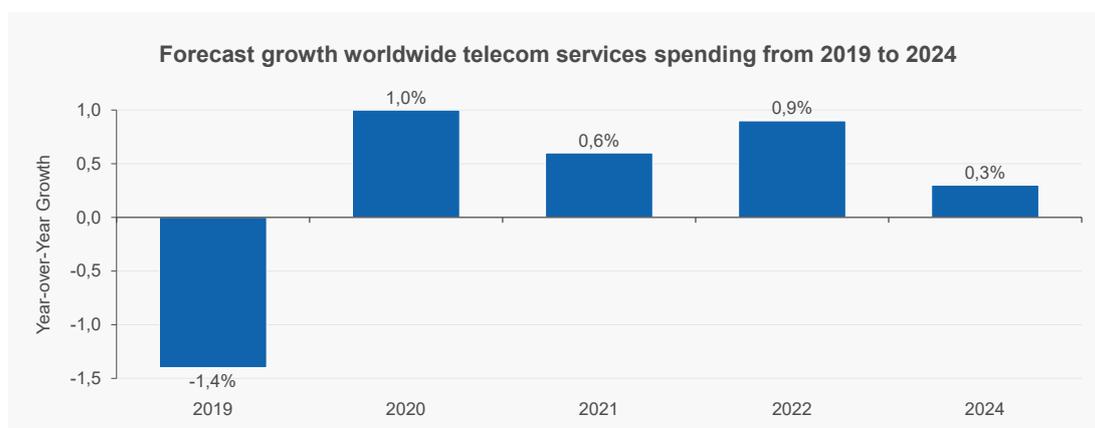


Figure 1 - Worldwide telco growth forecast

Traditional telco revenue streams are stagnating, voice has gone through its lifecycle from one-and-only to key business, from a major to a marginal revenue source. Data revenues have become unlimited flat rates and operators have been and keep looking for new revenue sources in value-added and over-the-top services.

Cost pressure among changing customer expectations has led to asset divestment, outsourcing frenzies and market consolidations. The competition has turned from equal players driven by technology and coverage footprint to a fragmented battlefield of open-access providers digging at the very foundation of a telco while OTTs and new businesses are aiming at top-line revenue.

From the network to the cloud to digital services - increasingly lower entry barriers across the entire value chain attract new players threatening to disrupt the industry and overturn incumbents. This competition and resulting price erosion make it difficult for telecommunications companies to cover the snowballing costs of required network upgrades to fulfill license and service obligations mandated in spectrum auctions and regulatory bulletins on one hand, and the operational expenses increasing with each new technology deployed on the other.

¹ International Data Corporation (IDC), November 2020

The certainty for increased technology investments such as 5G and cloud-native solutions faces the problem of monetizing it – upcoming technologies increase the layers of cost, OTT players drive capacity demand, white label service providers such as MVNOs pressure the retail pricing.

Best fulfilling digital businesses' requirements in the future will reshuffle the cards in the industry. In the medium term, growing demand for data services can only be addressed by expanding capacity and coverage, leading to increasing demand for cell sites and fiber deployment, but this will not suffice for survival in the new telco world.

Operators have been in the connectivity game for much longer than their emerging competition (think OTTs or other content and service providers). While telcos have an excellent track-record of providing connectivity for the masses, their **heritage** is now increasingly holding them back. In many aspects, the sheer mass and variety of existing infrastructure limits the application of new ways of working through complexity. Phase-outs are on the far horizon, but telcos need remedy faster. **Cultural aspects** constitute another challenge that many telcos face. Large corporations have developed cultures focused on risk minimization instead of opportunity maximization. Embracing change is not precisely what large organizations are known for. Many telcos are trying to step away from the status quo, adopt new ways of working, and fill gaps in employee skill sets to address future requirements.

While one or two highlighted points may not make a difference, these issues accumulate, and the current state of telecommunications companies is clearly reflected in their valuations as depicted in figure 2. Investors seem to have lost some confidence in the traditional telco business model.

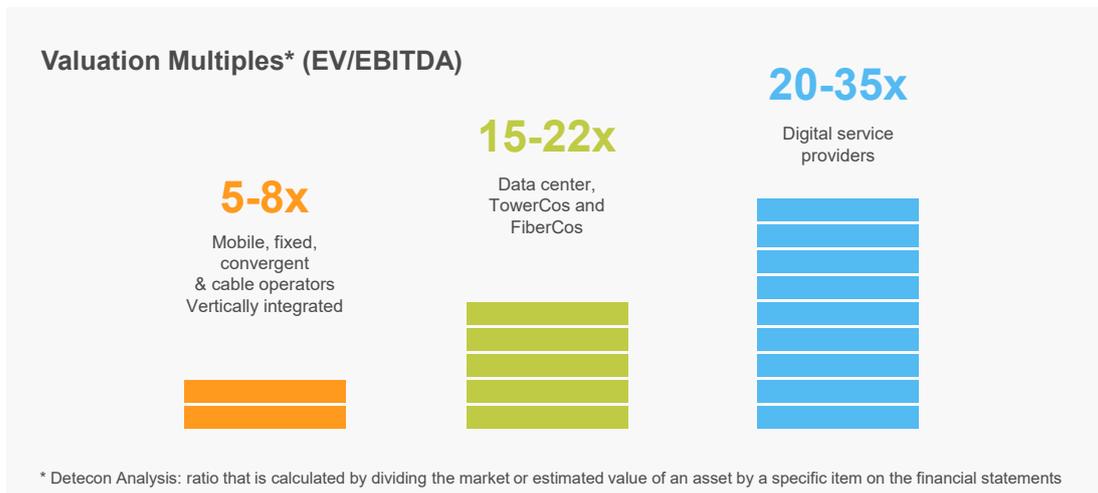


Figure 2 - Valuation multiples (EV/EBITDA)

The telecommunications industry is at a crossroads in need of pivotal decisions. What will be the role of telecom operators in the future?

2 Carrier Evolution

Over the years, telco organizations have grown larger and larger, becoming real monoliths in their area and creating obstacles to innovation. Larger organizations will be more affected by the increased softwarization in the industry as they are too big to transform their existing setups flexibly. Smaller organizations are more likely to shift their organizational structures and reestablish new processes and fields of activity. OTTs will likely set the game's pace, and for large organizations, it will not be easy to keep up with.

The carrier evolution process can be based on ambition levels across three defined representatives as depicted in figure 3 – **Infrastructure Providers**, **Digital Network Providers**, and **Network Centric Digital Service Providers**.

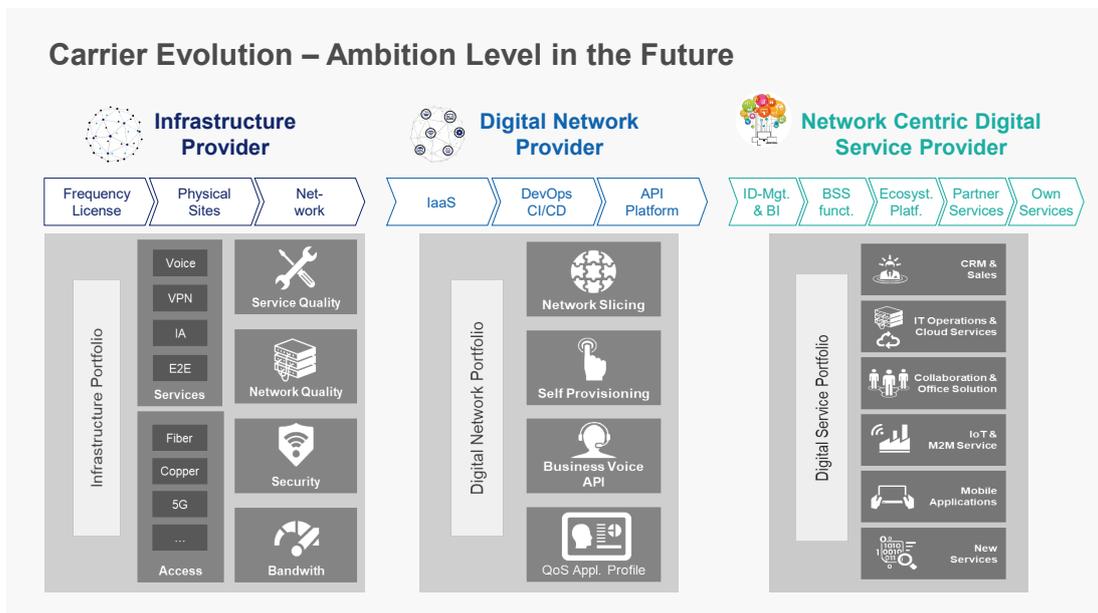


Figure 3 - Carrier Evolution

Infrastructure Providers identify themselves through technology (FTTH, 5G, etc.), coverage footprint and technical KPIs such as drop call rate. Their business value creation remains around traditional values of availability, accessibility and retainability.

Digital Network Providers provide a digital network portfolio based on their infrastructure. Customer experience supplements the traditional lifecycle while much of the digital portfolio is partnered and played out on a classic Telco foundation. They aim at differentiating themselves by Network Slicing, Self-Provisioning, or use-case centric connectivity offerings.

Network Centric Digital Service Providers explore new opportunities in digital ecosystems beyond connectivity and communication. They aim to provide an all-access digital service portfolio without concerning themselves with the lower layers of the OSI² model.

² Open System Interconnection model, a conceptual model characterizing communication functions of a telecommunication system

Naturally, ambitious executives are looking to leverage their existing resources, expand their footprint, and transition their organizations towards becoming Network Centric Digital Service Providers offering content, smart homes, gaming, financials, and other digital services. For legacy-burdened telcos, however, protecting their turf while expanding their portfolios at the same time may prove to be a rocky road.

The key questions telcos have to ask themselves are strategic in nature, and we are curious to find out about the options they are evaluating to address shifts in the industry.

One of the more prominent aspects lies in the configuration of horizontals and verticals – within the business model and the organization. Some telcos may opt for the Infrastructure Provider scenario, build high-quality networks focusing on connectivity services such as voice, internet and virtual private networks and supply the bandwidth necessary for other services provided by, for example, over-the-top providers. Sharp tongues argue that telcos may be degraded to mere utility providers, providing connectivity as a service. Nonetheless, this could be a viable strategy if the organization is properly set up and able to support it. Instead of trying to innovate, the organization would then need to focus on a lean structure.

Some telecommunications companies may not be satisfied with this role and look at positioning themselves further up the value chain. These Digital Network Providers would be offering their customers a digital network portfolio featuring dedicated network slices, self-provisioning of connectivity, or use-case centric Quality-Of-Service offerings. They could also provide a connectivity platform via which providers further down the value chain can deliver their services. This setup would require a higher degree of investment in innovation to capitalize on opportunities and spur potential revenue growth.

And more ambitious telcos may even be looking at extending their service offerings, pushing deep into the verticals, and exploring new opportunities beyond connectivity and communication. Following this trajectory, however, they need to brace themselves for direct competition within the domain of digital service providers and hyperscalers. They need to consider aspects such as shorter lifecycles, faster time-to-markets, separation of infrastructure/hardware and software as well as rethink their skill & competency frameworks.

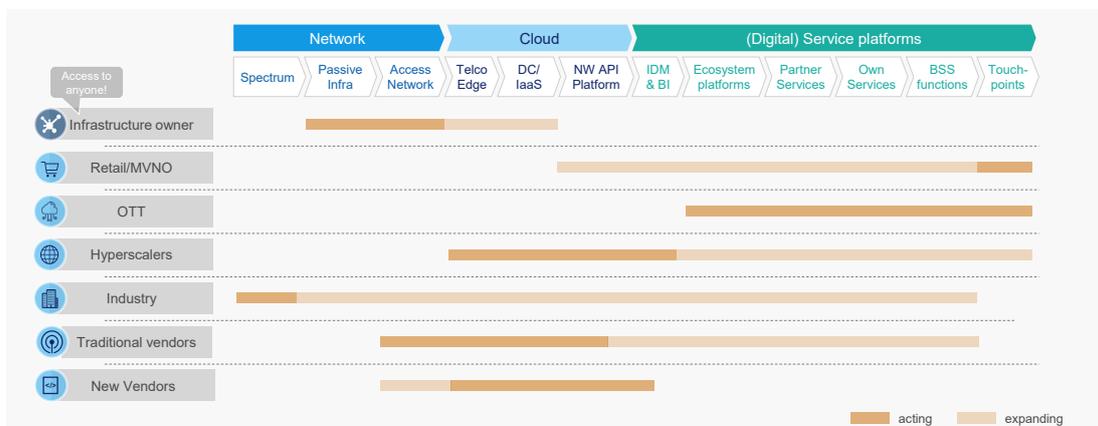


Figure 4 - Action areas of market players

The degree of change necessary to achieve the desired target state will depend on strategic ambitions and where telcos see themselves in the future. Figure 4 gives a quick overview of action areas of acting and expanding market players.

Targeting the state of a network-centric digital service provider, organizations will need to be prepared for significant transformation and restructuring efforts. To become a digital service provider, telecommunications companies need to change how they build their networks and run their organization. They need to rethink their organization's very foundation and revisit the blueprint of how they intend to deliver value to customers. On top of that, they will need to juggle all of that while keeping existing customers happy and migrating them off the legacy stack.

To achieve such shift, the entirety of the organization should be viewed from an end-to-end perspective. End-to-end frameworks such as the **Digital Transformation Ecosystem** (Figure 5) can support organizations in understanding all components and their interrelations to design appropriate operating models. The four cross-functional layers ensure a holistic view on the various challenges of an organization while modularity and adaptability ensure that design approaches can be adjusted according to the specific needs and requirements of an individual organization.

This article mainly explores aspects of the Operating Model.

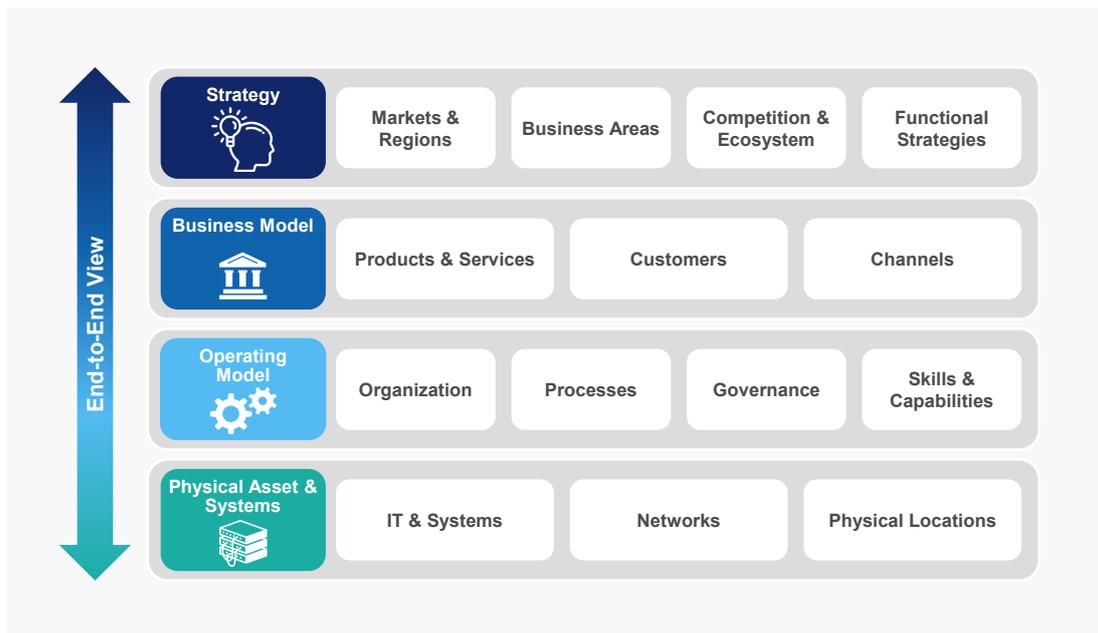


Figure 5 - Digital Transformation Ecosystem

3 Implications and Operating Model Explorations

An operating model defines how the organization functions and how it delivers value. A target operating model is a blueprint of the preferred "target state organization" that includes, i.a., organizational structure & governance, processes, and skills & competencies necessary to keep the organization running.

The operating model is the foundation of an organization, enabling it to deliver current and future services, preferably independent of infrastructure technology. The correct selection and implementation of an operating model is detrimental and can significantly impact business success.

Changes triggered by technology generation jumps in the telco space used to be easier to manage. From 2G to 3G to 4G, significant technology jumps created millions of opportunities, jobs, and end-customer services. But none of these technology jumps fundamentally changed the operating model of a telco's network organization and flip it upside down.

For the most part, Plan-Build-Run concepts in the network sphere featuring technology departments in areas like Access, Transport, Core, IT, etc., remained somewhat similar or were at least to some degree based on previous setups. This classic network organization did have its benefits: everybody knew what to do and how to do it. **Technology experts were placed in precisely the technology department they were experts for.** In the new world, however, in which networks no longer are at the heart of the business model, a paradigm shift is to bring about change in a fundamentally different way. With changing customer preferences, requirements, and expectations, increased attention will be laid on services. The sheer amount of potential applications of 5G ranging from massive broadband to critical communication and massive machine communication also pays tribute to that.

Let's say a manufacturer wants to build a private network with a dedicated radio access network on their premises – can the telco make a better offer than a small company specialized in building localized private networks? And does it want to? Once the private network is built and operational – can the telco integrate sufficient self-service capabilities for a tailored network configuration to their clients and automatically deploy additional services? This is not only about the already existing private network, but it requires a solid operating model and a flexible organization in the background to enable these capabilities.

There are many questions about how telcos can leverage their experience in building networks and position themselves as the go-to address for smaller private deployments. How they could provide tailored service offerings in a "no size fits all"-approach. And, of course, once private networks are built and operational, how telcos can maximize QoS and customer satisfaction. For telcos, an increased service focus will result in initiatives driving automation and self-organization of the network and providing self-service capabilities for customers to minimize necessary human interaction where possible (figure 6).



Figure 6 - Drivers for telcos' transformations

To manage their transformation journeys and achieve their strategic ambitions, telcos will need to get back to the drawing board. They will need to define an overarching view amalgamating business and technology, using modularity, and following a structured approach to transition their operating models towards lean and agile digital service provisioning.

To achieve a better and future-proof way of working for their organization, telcos should assess their organizations' (digital) maturity or parts thereof. This can help them in understanding their existing resources, capabilities as well as ambitions, and aspirations. Restructuring and transformation are of little value if underlying issues and desired target states are not well understood. Knowing the strengths and weaknesses of an organization and identifying pain points and potentials are crucial to any transformation.

Fostering cultural change and promoting a new way of working needs to be enabled by simplified and transparent governance to focus on strategic control and guidance. These aspects can be underpinned by a push for integrated tools and end-to-end process automation. To subsequently jump into the design of a target operating model, stakeholders should consider a stepwise approach:

- I. **Define the leading design imperatives** of the operating model and link them to the overall corporate strategy
- II. **Define key activities** that the (sub-)organization is intended to address to support the overall corporate strategy
- III. **Develop and evaluate organizational scenarios** based on design principles and critical activities and define the most promising scenario
- IV. **Define governance & required processes** to execute on the (sub-)organization expectations
- V. **Define a competency framework and required skills** that will enable the (sub-)organization to deliver
- VI. **Implement & operationalize** the newly defined target operating model

3.1 Organizational Structure & Governance

The traditional telco network architecture is organized in silo-type setups across technology domains such as access, core and transport. The organization and operating model followed suit. These domains had a vertical plan-build-run logic that they followed. Monolithic legacy applications with tight coupling and fixed linkages, a high number of interfaces, and nonlinear dependencies led to an overall high complexity level. Looking forward, operating the networks of the future requires a dramatic shift in the architecture as the focus shifts towards integrated, convergent services. Such an architecture shift, undoubtedly, also spills over into operating model considerations of the technology organization.

To develop an organization that can deliver digital services and compete with established IT players, telcos are increasingly looking at learnings from agile software development and DevOps. But are telcos on their ongoing transformation efforts and conquest of operational efficiencies heading into the wrong direction, or are **agile software delivery** and **cloud-native operations** something that they can sustainably benefit from? And even if they could benefit from it – can these approaches be satisfyingly implemented in an existing organization? Does the evolution to an agile organizational structure and its implications make sense only for an integrated connectivity & service provider or for a pure network operator? And if so, to what degree? Are we only looking at structuring the organization in chapters, tribes, and squads to foster cross-business-unit-collaboration, or are we also looking at the separation of disciplinary and functional steering, the adoption of DevOps, and its implications of newly required skills & competencies? Such profound and pervasive organizational setup changes do not come easy and pose a massive intrusion to the modus operandi of a telecommunications operator. Of course, **it does not make sense to transform all parts** of a technology/network organization into an agile working model (figure 7).

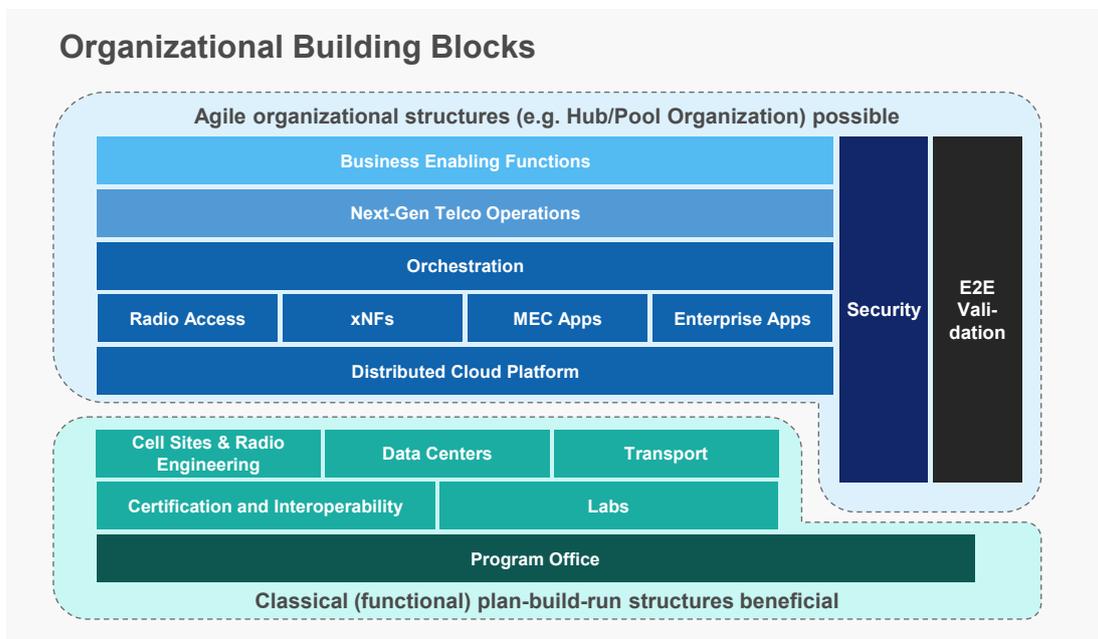


Figure 7 - Organizational Building Blocks

Classical physical infrastructure functions focusing on deploying and operating towers, fiber networks, and data centers have long investment/depreciation cycles, planning horizons, and slow deployment procedures. For these activities, plan-build-run structures with strict governance and classical process-based cooperation are beneficial.

Software-related functions focusing on developing and operating distributed cloud platforms based on services produced for customers, however, have short release cycles, dynamic planning, and rapid deployment and commissioning. For these activities, hub or pool structures to foster faster innovation cycles and improve cooperation between different functions make sense. The first question is which activities and departments can be 'agilized' or improved by applying new working methods.

An approach to new telco architecture initiatives and challenges revolving around agile & traditional could also be the path from a technology-oriented to a function-oriented workflow. Instead of separating the technology domain by technology (e.g., core, mobile, fixed, transport, ...) and its subdomains, the organizational structure is rotated by 90° covering the lifecycle (from strategy to design to operations). A functions-oriented workflow could support many operators in bundling knowledge across the value chain and multiple business units. Creating meaningful interfaces to other units and interfaces to commercial departments may not be enough to leave the 'old' world behind, but it certainly is a good starting point. Further operating model explorations can also tap into the creation of centers of excellence, e.g., automation, security, agility, etc., or implementing a pool or hub organization in which resources are allocated to selected projects or special purpose vehicles to carve-out these functions.

3.2 Processes

If one knows, what he/she wants to do and achieve, he/she can best build the processes that enable him/her to do it. These processes need to be based on strategic ambitions and key activities. Transitioning from an infrastructure provider to a digital network provider and eventually a network-centric digital service provider, different processes and frameworks can be applied to get the most out of the organization. Naturally, an infrastructure provider will put a stronger emphasis on traditional telco processes, such as defined in the eTOM framework. A digital network provider or a network-centric digital service provider may benefit from frameworks such as ITIL (service-based) and look at transitioning parts of their organization towards an agile working mode. This is not to say that one of the frameworks will fit the organization the best, as this depends on the organization's specifics, and for some functions, combinations may come in handy as well. However, what can be said for sure is that defined processes need to be in line with the (new) organizational structure and clearly defined.

Along with that, clear roles and responsibilities need to be established, supported by automation where possible. Processes come in all shapes and sizes – and all too often, there are many process variations and deviations for any single process. Just reducing process variation and streamlining can already bring about massive benefits in time and cost. Nevertheless, optimization will only work for the existing. What if an organization is delving into new business areas and starting to deploy new service offerings?

Many technologies, such as IoT networks, virtualization, edge cloud, and narrowband-IoT, are maturing to become commercially available. However, it is not the technology that is holding up rollouts – it is the complexity of their deployments. This can manifest itself in use cases that need to be translated into service requirements, interoperability with legacy systems, concerns about data & IT security, and the regulatory environment or even uncertainty about business continuity.

There are significant differences in setting up a network with a greenfield approach compared to a brownfield transformation. As new greenfield setups are relatively rare today, we are mainly looking at existing telco setups trying to adopt new ways of working, optimizing existing processes, and creating new ones. We see that there can and should be different processes based on area and function even within an organization.

From an ideation perspective, innovation processes can be designed based on Design Thinking principles (Ideate – Design & Prototype – Engineer – Operate). Such processes should focus on use-cases and be in strong alignment with the commercial part of the organization (e.g. product management). In engineering and operations, a multi-speed model to enable agile/DevOps and waterfall in parallel, as depicted in figure 8, can be adopted to harmonize the two worlds for an existing operator. Traditional physical and legacy components and some cloud infrastructure (incl. monolithic VNFs) can follow a waterfall approach that ensures stability and resilience. On the other hand, innovation services can employ an agile approach featuring DevOps and other leveraging techniques to increase efficiency, speed, and quality.

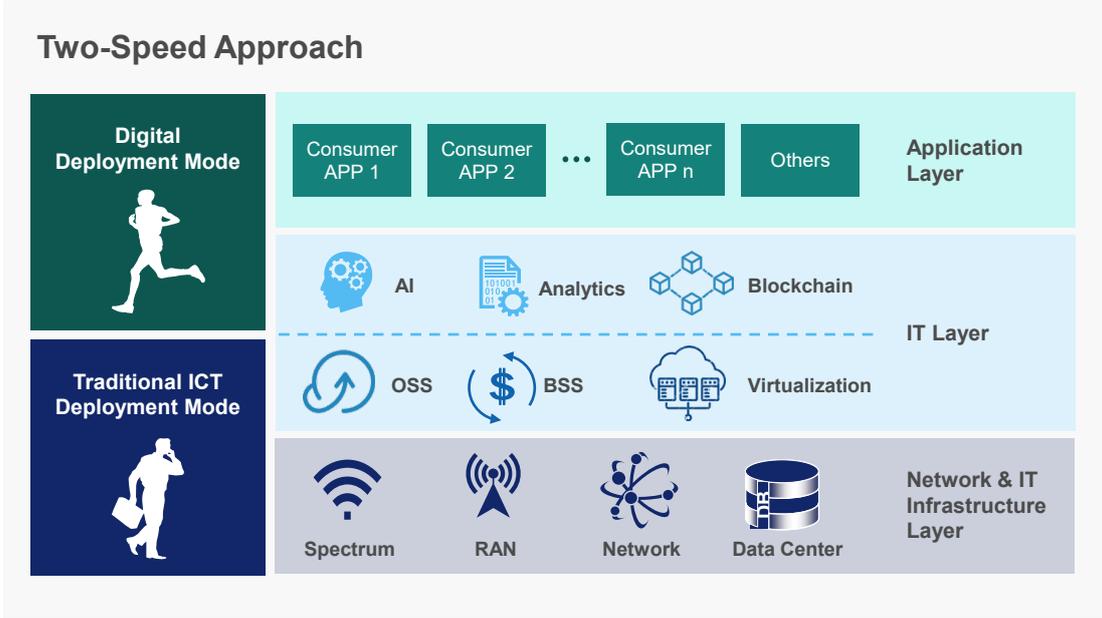


Figure 8 - Multi-speed deployment approach

Telcos can also draw inspiration from hub-oriented pool structures and their underlying processes to foster cross-functional value creation through agile iterations. In these pool organizations, employees are clustered in chapters according to skill groups. A qualification process ensures the best staffing possible while resource management optimizes resource utilization and deployment flexibility.

3.3 People, Skills & Culture

The dimensions of skills & competencies is another challenge that CxOs are facing in their organization. Shifting requirements pose massive challenges for the future workforce's competency setup. What do we need to run an orchestrated and highly automated network? How do we develop new (digital) services and provide focused support for these? How can today's employees solve tomorrow's challenges?

There is an ongoing effort on harmonizing telco network and IT departments globally, albeit with mixed success – there are apparent difficulties in translating a network department into an IT department. But this is also true the other way around as skills, competencies, and culture and mindset are fundamentally different. Fixing hardware issues is different from fixing bugs.

While a classic network organization with its simplicity, well-understood, defined processes, and clear responsibilities could react in time and fix issues, new use cases may require a different setup. As pointed out in a multi-speed model, employing traditional and 'new-world' ways of working within the same organization may prove cumbersome. This is especially true when it comes to the mindset and culture of the workforce. These are not to be left out of the equation.

Thinking about the evolution of carriers from infrastructure via digital networks to digital service providers, we will experience an (r)evolution in skills and roles (figure 9). Especially in the later stages of the evolution, increased automation and softwarization will leave its marks. A revamped organizational structure and operating model will emphasize business intelligence, API design, partner integration, cybersecurity, analytics, automation, and front- and back-end development. This will inevitably lead to new requirements for the workforce of a carrier. Technical expertise in software-defined networking will gain traction. Network engineers, architects, and business roles will likely transition into product owners, cloud infrastructure specialists, network automation specialists, or application and process specialists.

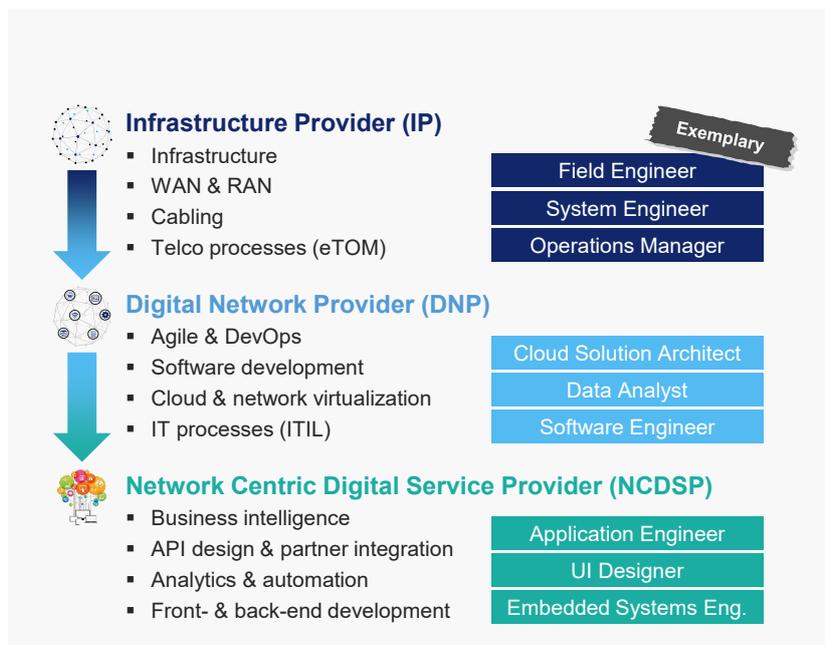


Figure 9 - Skills & Roles along the Carrier Evolution

New competency frameworks, skill trees, and job descriptions will be relevant for the telco of the future. Sophisticated and well-structured requalification & training plans and active coaching will need to enable the workforce. And on top of that, some positions will have to be newly created and recruited as they cannot be filled from within and some functions will disappear. Ongoing change and optimization of existing resources is not something new we see in the industry. However, to support unique requirements such as service orientation, efficient design, automation, etc. more extensive than incremental changes will need to occur. Telcos should also not forget that they will get into direct competition for talent with hyperscalers. They will need to strengthen their position as appealing employers by offering a clear strategic vision, development, personal growth opportunities, and attractive remuneration packages.

Any transformation is inherently characterized by resistance to change, pushbacks, and uncertainty. Nevertheless, a pro-active rather than a reactive attitude within the workforce can have a massive impact on the entire organization's success. Collaboration, cooperation, co-creation are vital enablers to an end-to-end approach and the transition towards a customer-focused organization. Decision-makers are already looking at how to transition their way of working towards a more agile setup and lean implementation and operations. Transparency, clear guidelines, and shared goals can help in avoiding pitfalls during any transformation endeavors.

4 Outlook & Recommendations

Telecommunications operators need to ask themselves where they see themselves in the future and what steps they will take to get there. They must rethink their business and operating models to address emerging customer needs and deliver on expectations. Alongside that, they need to prepare their networks, make them scalable, flexible, resilient, and able to master tomorrow's challenges. Telcos need to embark on a transformational journey that will enable them to fix internal challenges and provide excellent services to their customers.

From an operating model perspective, telcos can and should be proactive. They can start developing structures and processes based on their ambitions across the carrier evolution spectrum. Depending on their envisioned strategic trajectory, they can look at linking classical plan-build-run structures with agile organizational structures across various domains. They can explore multi-speed approaches, learn from design thinking principles while aligning with the commercial sectors of the organization and even think about pool organizations. They can start defining tomorrow's skill sets, develop according training plans and start their transformation journeys today.

For most telcos, it is not about whether they need to change, but when. Market consolidation is taking place worldwide and in various industries - in telecommunications, automotive, transport, logistics, etc. **Telcos are still the top dogs in the connectivity sphere**, but they are losing ground fast. Many telcos' current position and size may inhibit a rational view of the topic in many aspects. In the not-so-far future, customers and associated with its revenues and EBIT are expected to migrate towards OTTs and carrier-neutral providers. At the same time, telcos are being held back by legacy and budget pressure, with execution delay increasing OPEX starting a downward spiral on EBIT. Margins are flat or decreasing and become worrying to investors. And once profit becomes loss, will recovery still be possible? Profiting from consumer service revenue in direct competition with OTT providers already benefitting from high brand awareness, good reviews and increasing business acumen, short development cycles, and low times-to-market will be difficult. This may seem like a grim outlook for telcos today, but it may just turn into a nightmare tomorrow without foresight and action.

Despite all the challenges, however, telcos are unique to reap the benefits of their assets and provide top-notch services to customers while tapping into new revenue streams and business endeavors. They can leverage their often decades-long experience of building and operating networks, their strong partnerships with businesses and end-customers, as well as their physical and non-physical assets. The question is whether and when telcos will start building tomorrow's organization that they already should have in place today.

5 The Author



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5.1 Contributors



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Jürgen Jägersberger is Managing Consultant at Detecon with more than 20 years of experience in technical and management functions in the telco industry. He has designed, built and operated networks and services as vendor, operator and consultant and been leading transition and transformation of organizations and technologies over their lifecycle.

6 The Company

Detecon is the leading, globally operating technology management consulting company with headquarters in Germany, which has been combining classic management consulting with high technological competence for over 40 years. The focus of its activities is on digital transformation: Detecon supports companies from all areas of business to adapt their business models and operational processes to the competitive conditions and customer requirements of the digitalized, globalized economy with state-of-the-art communication and information technology. Detecon's expertise bundles the knowledge from the successful conclusion of management and ICT consulting projects in over 160 countries.

Detecon is a subsidiary of T-Systems International, one of the world's leading vendor independent providers of digital services and subsidiary of Deutsche Telekom. Together with T-Systems Multimedia Solutions GmbH (MMS) and the digital areas of T-Systems Global Systems Integration (SI) the Detecon International GmbH forms one of the largest integrated digital providers in Germany as the portfolio unit "Digital Solutions".

As a member of this new alliance, Detecon is driving forward its consulting approach Beyond Consulting, a significant evolutionary step forward in traditional consulting methods adapted to meet the demands of digitalization today and in the future. The concept features top consulting that covers the entire spectrum from innovation to implementation. Groundbreaking digital consulting demands ever greater technology expertise and a high degree of agility that incorporates flexible, but precisely fitting networking of experts for complex, digital ecosystems in particular. At the same time, it is more and more important in digital consulting to accompany clients from innovation to prototyping to implementation.

This factor prompted Detecon to found the Digital Engineering Centers for Cyber Security, Analytical Intelligence, Co-Innovation, and Industrial IoT in Berlin in 2017 as facilities that extend the added-value chain of consulting and accelerate the realization of digital strategies and solutions by means of prototypes and proofs of concept.

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