Enabling Telco to Techco Transformation

The pivotal role of the automation operations platform

OMDIA

Contents

Introduction

Communication service providers (CSPs) have been trying to reinvent themselves for many years. First, they tried to become media companies as video delivery switched from satellite and terrestrial to broadband. Then they tried to become digital service providers (DSPs), expanding beyond the confines of connectivity into adjacent domains such as cloud, finance, and security. Lately, the talk has been of converting from telcos to techcos, with one eye on the heady valuations given to companies that purport to provide technology, even though this may be as simple as a food delivery app.

At the board and CEO level this transition is often thought of as being about modernizing the customer engagement process – the website, the smartphone app, the chatbot. To the chief marketing officer (CMO), digitalization starts at the website and ends at the customer relationship management (CRM) system. But the customer journey does not end here. To deliver great customer experience, operators need to simplify, standardize, and automate the end-to-end process from the initial acquisition of customers to fulfillment, assurance, and monetization.

Focusing solely on "front office" digital transformation (websites and apps) will fail to deliver the required agility. Consider the South American CSP that invested in an industry-leading "customer experience" solution to entice consumers to sign up for its mobile services via online channels. Due to back-office processes such as credit checks that had not been adapted for online use, there was very high shopping cart abandonment and poor order conversion. The company had failed to capitalize on its investment in customer experience because the back-office experience remained a weak link in the chain. A digital, always-on mode of operation means the back office must be highly automated, auto-scaling for surges in demand and maintaining high availability with continuous deployment of software patches and no weekend maintenance windows.

For a successful telco to techco transformation, CSPs must evolve their service and network operations to keep pace with their front-office digitalization initiatives. An evolutionarily fit organism needs a healthy brain (analytics and inventory), muscles (orchestration and activation), and nervous system (service assurance and performance and fault management). All these components must work together seamlessly to deliver the automated operations platform of the techco.

This paper examines why telcos must reinvent themselves, how they are doing this, and what the pitfalls are. We explore how operators are upskilling their workforces, and which approaches they are taking to IT transformation: outsourcing to managed service providers, building their own software stacks, and sourcing technology from best-of-breed and suite suppliers.

The need for reinvention

In a TM Forum podcast last November,[1] Brian Smyth, Accenture's Global Comms & Media Innovation Lead, noted the biggest drivers for change in the telecom sector are lack of revenue growth and disappointing share price performances. To be successful in the 5G era and beyond, CSPs need to become more customer friendly, innovative, and efficient.

Customer friendliness

Internet content providers such as Amazon, Apple, and Netflix have raised consumer expectations. They have mastered the art of personalized customer experiences that remain consistent across different channels (web, TV app, smartphone app, etc.). Consumers now expect the same experience from their mobile and broadband provider. Enterprises that have embraced public cloud services have also had a reset of expectations for ease of use and dynamic operations.

As the TM Forum notes in its recent white paper,[2] "the shift to online channels … [has] caused the telecoms industry … to rapidly accelerate [its] digital transformation plans. This acceleration signifies a broader shift toward a digital economy and society."

It is important that telcos raise their game in customer friendliness. Consumers and enterprises do not have much brand loyalty – they will churn to another provider that can provide a better experience and may even be prepared to pay a premium to do so. Defining what constitutes a better experience is beyond the scope of this paper but could include, in enterprise or wholesale services for example, greater transparency and control of performance, and any usage-based charges associated with superior service quality.

Innovativeness

Digital disruptors are taking an ever-greater share of the internet pie, leaving less for telcos. These disruptors may have advertising-based revenue models (Alphabet/Google, Meta/Facebook), content-subscription models (Netflix, Spotify) or, in the enterprise market, provide cloud services (Alphabet/GCP, Amazon/AWS, Microsoft/Azure, Oracle/OCI, etc.) that simply use internet access as the on-ramp to their walled gardens.

It is extremely difficult for telcos that operate in only a handful of countries to compete with the global companies named above. Scale economies and deep pockets enable them to undercut telcos on price and provide more comprehensive solutions (e.g., a broader catalog of content). Telcos have thus largely abandoned their own efforts in these areas and instead resell the services of the global

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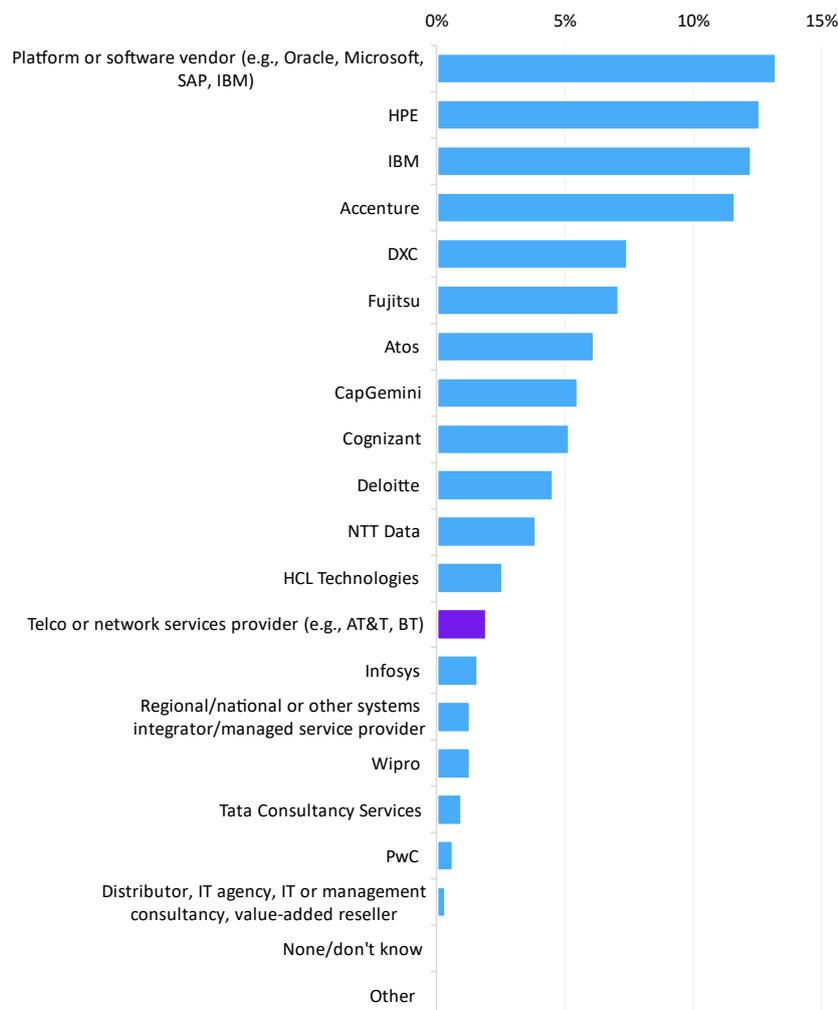[1] TM Forum, *Quick Talk: The tech-driven telco*, November 2021
[2] TM Forum, "The Tech-driven telco: Unlocking growth beyond connectivity through an open digital architecture," September 2021

players. They often do so at cost (zero margin), or even at a loss, to create stickier bundles that reduce the likelihood of customers switching provider.

Even in public cloud services, where operators often announce strategic alliances with all the major providers, it seems that telcos are not the preferred channel through which enterprises buy such services. As **Figure 1** shows, software vendors and systems integrators (SIs) are preferred over telcos according to Omdia's Global Cloud IT Services Survey conducted in 2021 across 310 decision makers.

Figure 1: Software vendors and SIs are preferred over telcos for purchasing cloud services

Q. Please select the top two IT service or channel partners through which your company sources public, hybrid, or private cloud services?

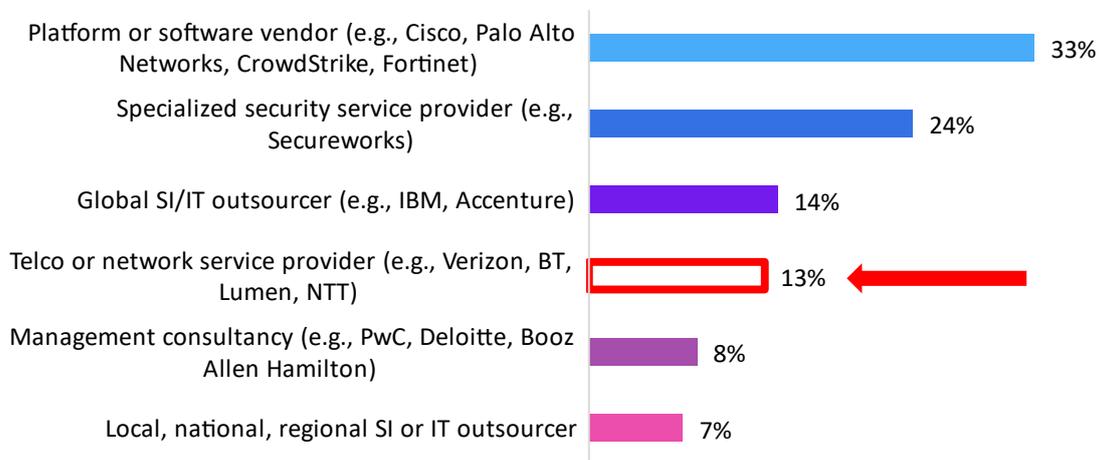Note: Percentage of respondents, global, n=310

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Telcos face a similar challenge when selling security services to enterprises as **Figure 2** shows. Software vendors and specialist security service providers are preferred. Interestingly, SIs rank the same as telcos in this category.

Figure 2: Software vendors and specialists are preferred to SIs and telcos for security services

Please select the top IT partner through which your organization sources security services (across any aspect, including managed security, consulting, advisory, and threat)

Category	Percentage
Platform or software vendor (e.g., Cisco, Palo Alto Networks, CrowdStrike, Fortinet)	33%
Specialized security service provider (e.g., Secureworks)	24%
Global SI/IT outsourcer (e.g., IBM, Accenture)	14%
Telco or network service provider (e.g., Verizon, BT, Lumen, NTT)	13%
Management consultancy (e.g., PwC, Deloitte, Booz Allen Hamilton)	8%
Local, national, regional SI or IT outsourcer	7%

Note: Percentage of respondents, global, n=310

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Source: Omdia

While the charts above suggest telcos face stiff competition when expanding out of their core domain, there is still a potential role for them as a platform that aggregates multiple services across a broad ecosystem. If their platform is easy to work with and sell through, this could provide value to other companies looking to reach telcos' extensive consumer and enterprise customer bases. In particular, we would highlight the attractiveness of telcos for regional content providers (e.g., with local language specialization) that are generally not the prime focus of the global, web-scale players.

"We are building the best connectivity for our customers, but growth will come through opening up our services, partnering, and embarking upon new revenue models."
Colman Deegan, CEO of Vodafone Spain [2]

To innovate successfully, telcos will need to partner with specialist organizations to create industry vertical-specific solutions. This in turn creates a new IT challenge for partner management and onboarding.

"The success of telcos will require that they become one-stop diversified technology service providers … This change will ensure that telcos participate across different market segments and sell a range of technology, professional and managed services … Pursuing growth will, therefore, require a new emphasis on the formation of effective partnerships, investments in people, and in automation — enabling movement up the 'technology stack' and into the ICT space."
Sudipto Moitra, General Manager for ICT at MTN SA Business [9]

Efficiency

Another strategy for telcos is to become leaner and more efficient. This is often associated with concepts such as zero-touch automation, a goal that can only be partially realized within a large and complex business. Many telcos are structuring themselves into two divisions: "netcos," which focus on network efficiency and performance, and "servcos" (sometimes called "digicos"), which leverage the internal network and those of third parties to provide customer services. To enable this efficiency once again requires a modern IT stack that facilitates automation and simplifies change.

Of course, the three strategies outlined above (customer friendliness, innovation, and efficiency) are not mutually exclusive. Operators should pursue all three simultaneously to drive differentiation and/or remain competitive.

Front and backend transformation

There is often a lot of discussion about digitization in telecoms, and other industries. In the strict meaning of the word, most operations were digitized years ago – there are very few pen and paper processes – and, of course, the network switching systems have been digital for over 50 years.

Often, when people refer to digitalization, they mean using websites and smartphone apps to interact with the customer as opposed to call center agents and retail store staff. While these digital channels are not new, they were not always implemented efficiently, as discussed below. And, while frontend digitalization is important, without backend digitalization, an operator's transformation will not be complete.

Vodafone UK's digital frontend transformation

Late in 2021 we spoke with Ahmed Sayed, CIO of Vodafone UK and Group Global Engineering Director, about his company's plans to increase developer headcount from 8,000 to 16,000 with a goal of becoming the biggest software house in Europe. These developers will work on new digital frontends – applications such as chatbots and mobile apps that directly interface with the customer. The aim is to develop a culture of minimum viable products and fail fast that allows Vodafone to enter adjacent markets through a process of trial and error. These potential new markets include e-commerce, fintech, and insurance.

Ben Connolly, Head of Digital Engineering, gave a presentation[3] in 2020 explaining Vodafone UK's transition "from telco to techco." Connolly is responsible for Vodafone UK's digital interaction channels, including websites, mobile apps, and voice assistants. He explained that, historically, Vodafone was a very network-centric organization. IT was regarded as non-core and hence was largely outsourced with Vodafone's limited in-house IT staff focused mainly on managing the outsourced partner relations. To become a techco, in Connolly's words, Vodafone UK needed to develop more in-house IT capabilities and be less reliant on outsourcing. It also needed to simplify the organization and become less sluggish, in part by recruiting people with the right mindset.

The objectives of the transformation program that Connolly led were to:

- Improve net promoter score (NPS) by increasing simplicity and convenience while creating a "wow" customer experience

- Drive revenue growth by revitalizing the core business and enabling new revenue streams

- Improve profitability by adopting a leaner, more efficient cost structure.

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[3] YouTube, *From Telco to Techco: How Vodafone Made it Happen*, March 2020

When he started in the role in 2017, Connolly's team consisted of eight software engineers. This had grown to over 150 by March 2020 and the plan was to expand further. To build the team, Connolly hired externally but also found talent within other parts of Vodafone, including retail stores, network engineering, and areas of IT such as release management.

Conway's law

Connolly noted that Conway's law[4] was evident when he started in his role with Vodafone. Conway observed that companies design computer systems that mirror their own organizational structure. In Vodafone UK's case they had a shop website (for selling plans, phones, content, etc.) and a separate care website (for looking at bills, voice minutes, and data allowances, etc.). These were built by different teams using different architectures, technologies, and working practices. These differences were evident to the end customer who would go from one page to another in a customer journey that felt jarring. Moreover, there was very little reuse or interchangeability of the website components each team had built. Extrapolating this across the whole of Vodafone UK's IT estate (and indeed Vodafone Group), it is clear how inefficient this fragmented approach was.

Another example of Conway's law at work is the split between the consumer and enterprise sides of the organization, which historically operated with completely different IT systems. Now they have adopted common practices, tools, and platforms across the digital engineering practice and, increasingly, across the broader Vodafone IT estate.

Cultural change – engagement, ownership, and DevOps

Connolly also observes the importance of software engineers feeling connected with the outcome of their work. In the past it might take six months for a new piece of code to move into production and in the intervening period other engineers may have altered the code. This disconnect meant that developers were not always fully engaged and committed to their work.

Connolly notes that post transformation there was a much greater adoption of DevOps culture internally with developers encouraged to build high-quality software quickly without relying on the safety net of a separate team (testing, release, operations, performance, etc.) and to take ownership should potential improvements become apparent once in production. Connolly summarizes his philosophy as "build it, ship it, love it."

Historically, the website team would build new software, pass it to a release team that would prepare it, and ship it to production once each quarter. This was done at night with a team of over 30 people meticulously moving bits of software from one piece of infrastructure to another and fixing it when things went wrong. Now the developers ship new software directly to production multiple times each day.

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[4] Conway's law, Wikipedia

Backend transformation

As discussed in the introduction, digital transformation does not begin at the website and end at CRM. There are multiple backend processes beneath the CRM that must function smoothly to enable a great customer experience. **Figure 3** shows a simplified technology stack for a telco split into front and backend IT and the underlying network.

The engineers that are responsible for backend, operational support systems (OSS), would like to have greater control over the technology rather than rely on managed services. Some would even like to build their own software applications. However, in Vodafone's case, according to Sayed, they will continue to rely on vendors for key back-office applications like billing. The new developers that Vodafone hires will focus on the systems of engagement on top, not the underlying systems of record.

Figure 3: Simple telecom technology "stack" of frontend IT, backend IT, and underlying network
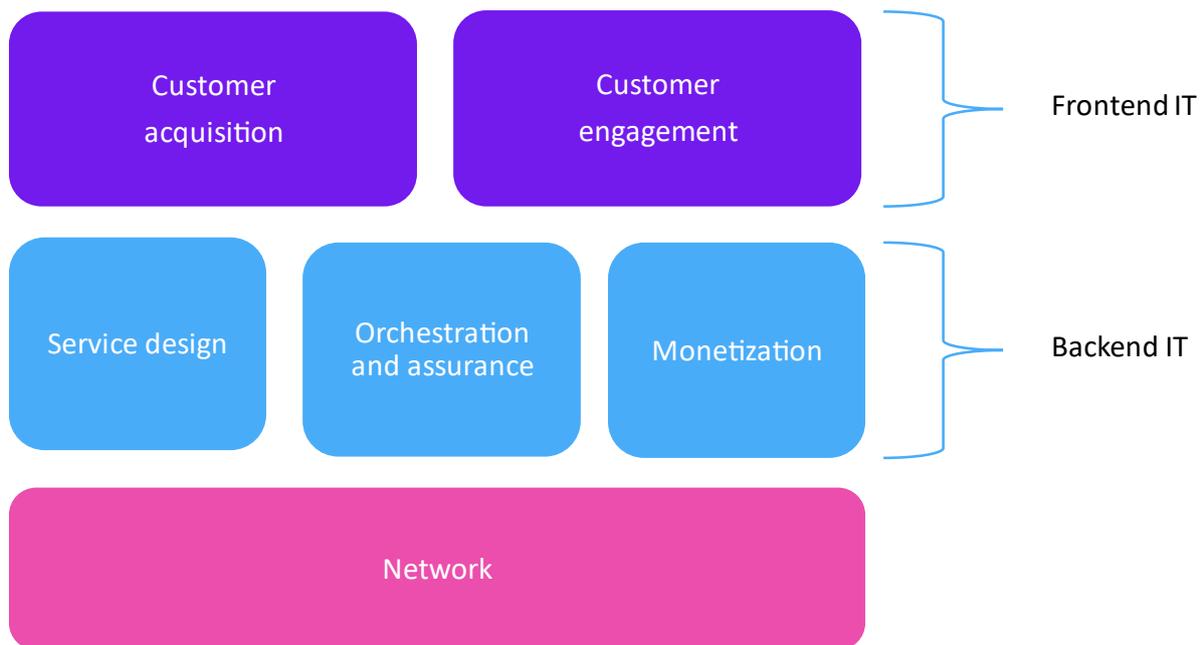
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Source: Omdia

The importance of backend systems of record

Systems of record are not customer facing and are not obviously a source of differentiation. Hence, they tend to be purchased from software vendors rather than developed in house. It is imperative that these systems of record are flexible and open, aligning with open architectural principles so that

the highly automated front-end experience cascades all the way down to the network rather than being disjointed, manual, and error prone.

Inventory (service and network) is a key system of record; it must be accurate, complete, and active. Systems of enablement, which span the entire service lifecycle from design to configuration and ongoing assurance, are reliant on these systems of record.

The importance of backend systems of enablement

Systems of enablement such as order management and service orchestration can increase the agility of the network to support techco innovation. These systems should be highly automated and intent based.[5] They should also be flexible. For example, order requests range from very simple but high-volume orders, such as mobile subscriptions, to highly complex but low volume orders, such as enterprise connectivity. These complex orders may require the procurement of equipment (e.g., a gateway router) and additional network build-out (e.g., a fiber tail). It also entails more sophisticated requirements, such as multiphase billing and automated handling of order revisions.

With the transformation of the underlying network, such systems are key in managing that complexity through the automation of a software defined network (SDN), network function virtualization (NFV), and multi-cloud telco networks. A good example of this is a recent announcement by Vodafone[6] that it plans to hire 7,000 new software engineers who will, among other things, develop: "new adjacent platforms beyond core fixed and mobile connectivity. Called Network as a Platform (NaaP), it will spur many new personalized services, including providing consumers with a broadband speed boost."

# The importance of conscious uncoupling

The systems of record and enablement should be decoupled from the systems of experience. Similarly, to increase agility, operators need loose coupling between the systems of record and enablement and the underlying network infrastructure. Operators should take a declarative, model-driven approach that allows new products to be designed at a high level, without having to know the details of the network equipment. These products can then be exposed in abstract form to the front-office business support systems (BSS) for bundling into new commercial offers. The key is to decouple what is sold from how it is delivered by using abstraction layers. This has the added benefit of isolating any updates, which in turn enables localized testing for faster service introduction.

As **Figure 4** shows, the network resource view (resource-facing services, RFS) is abstracted from the vendor-specific details of the underlying resources. Similarly, the service fulfillment view (customer-facing services, CFS) is abstracted from the network resource view. Open application programming interfaces (APIs) enable each element of the architecture to be loosely coupled such that changes are relatively simple to implement.

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[5] Heavy Reading, *Intent-Based Networking: Automating Next-Generation Networks*, August 2017
[6] https://www.vodafone.com/news/technology-news/7000-new-software-engineers

Figure 4: Abstraction between services and resources using open APIs
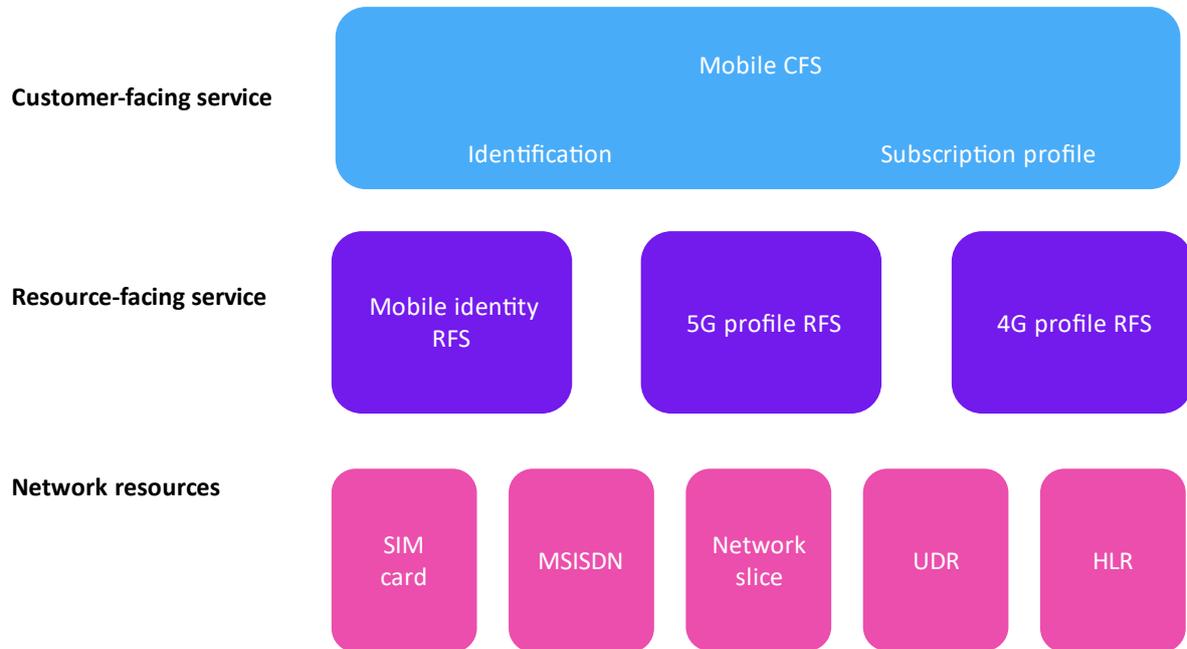
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Source: Omdia, based on Oracle graphic

The above example is relatively simple hence the importance of standardized APIs may not be apparent since there are few integrations. However, more complex services such as consumer multiplay or enterprise-wide area networking (WAN) involve many more CFS and RFS. The complexity of services will increase as operators create new offers in partnership with industry specialists. Orchestrating such orders manually is likely to have a high error rate with order fallout leading to poor customer satisfaction and potential revenue leakage if billing systems are not in synch with provisioning. What is ordered is likely to differ from what is delivered and what is charged. It is important to automate the change requests and the resolution of order fallout (e.g., an incorrectly provisioned service), as well as the correct order flows.

Open APIs

Since 2016, TM Forum has developed a suite of REST-based APIs for service provider IT.[7] Over 60 open API specifications have been published to date. TM Forum's open APIs enable interoperability between different vendors' solutions and even between the solutions of the same vendor.

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[7] TM Forum, *Open APIs*: https://www.tmforum.org/open-apis/

Adherence with the open APIs is now mandated in the IT requests for proposal (RFPs) of Orange and several other operators. The APIs were recently demonstrated in a TM Forum catalyst[8] (proof of concept) for zero-touch partnering, which showed:

- Rapid onboarding of offerings from new partners
- Assembly and curation of blended offers
- Consistent orchestration of customer orders across multiple external and internal fulfilment systems.

Network as a service – a new hope

The evolution of networks and the business models that telcos wish to embrace (e.g., B2B2X) require a makeover for their OSS. CSPs need to adopt a network-as-a-service (NaaS; sometimes known as network-as-a-platform) approach that abstracts the complexities of the network. NaaS provides clean northbound interfaces. These may be exposed to internal stakeholders such as BSSs like CRM that enable rapid composition of services, or to external stakeholders such as enterprise customers and wholesale partners. Such a NaaS approach could enable traditional network connectivity services or new "digital" services where connectivity is one of several components (e.g., IoT, managed security, etc.).

A key building block for this NaaS architecture is a highly automated operations platform that combines service and network orchestration, inventory, and topology with assurance. In the past, it was not possible to create such a NaaS architecture because of the technological limitations of the network infrastructure. However, with SDN, NFV, and standardized open APIs, the NaaS paradigm is increasingly feasible.

[8] TM Forum, *Zero Touch Partnering*: www.tmforum.org/collaboration/catalyst-program/zero-touch-marketplace-integration/

Why IT transformations fail

Telcos have made significant investments in network infrastructure (FTTH, 5G, etc.) and have revamped their digital frontends (websites and apps). However, their transformation projects often fall short in delivering the hoped-for automation and on-demand experience. Sudipto Moitra, General Manager for ICT at MTN SA Business, notes that many initiatives fail, as the following quote[9] explains:

"Transformation was attempted before backend integration had been fully accomplished. In their efforts to satisfy their clients' expectations, they underestimated the complexities of the change. They ended up incurring high costs and unfortunately failed not only themselves but disappointed their customers too."
Sudipto Moitra, General Manager for ICT at MTN SA Business

Common causes of failure in company IT transformations include:

- **Lack of clear corporate goals.** The transformation strategy is often not clearly articulated at the CXO level and understood throughout the business

- **Lack of support from middle management and risk aversion.** Even when the CXO level does articulate a clear strategy, middle management (that often sees its role as maintaining business as usual) can block change. A fear of making mistakes and a blame culture can lead to excessive risk aversion. Organizations should consider their IT project risk as a portfolio where the combined risk is less than the sum of each individual project (as project risk is idiosyncratic). Not being willing to learn, to experiment, and make mistakes are impediments to growth

- **Lack of skills and budget.** Lack of budget, lack of IT skills, and lack of motivated staff often go hand in hand. Operators are competing for talent with organizations that pay more and are perceived to be more innovative and interesting places to work. A history of outsourcing IT has left telcos with very shallow IT departments that are more used to managing vendor relationships than developing and deploying software

- **Inflexible legacy IT.** Most large telcos, which have grown via acquisition and now offer a combination of mobile, fixed, and enterprise services, have siloed IT stacks. Applications are duplicated across lines of business and across each country they operate in. These legacy systems are expensive to maintain and prohibitively expensive to change

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[9] Moitra, S., *Telco vs TechCo – The New Battlefield for the Future of ICT*, ITWeb, 2021

- **Excessive complexity.** Related to the last point, telcos that have grown via acquisition often have highly convoluted processes and a multiplicity of products that are hard to manage and monetize

- **Cultural and organizational challenges.** Culture change is hard. Operators have tried setting up offices in Silicon Valley and buying startups but, generally, these initiatives have not yielded significant results. In addition to siloed thinking, many organizations are still structured for waterfall processes. Senior management wants to understand an IT project from beginning to end to decide if spending should be approved. They are not prepared for agile methodologies where software development is more ad hoc and organic. Similarly, it is hard to implement DevOps in large organizations where the developers are separated from operations by multiple intermediaries (testing, release management, etc.).

Failed IT transformations are not just a waste of money. They can increase the risk aversion within an organization, making it harder to bring about future change. At their worst, they can damage a CSP's brand and increase churn if IT problems negatively impact the customer experience. This is why it is critical to take the right approach to IT transformation, as we explore in the following section.

Comparing transformation approaches

In *Telecom Extreme Transformation*,[10] the authors share the three key learnings from transformation programs they led at AT&T and other telcos, which we paraphrase as follows:

- Leverage the existing, best-in-class practices and processes rather than reinventing the wheel

- If your existing practices and processes are not best-in-class you must optimize these first before embarking on a transformation program

- Never attempt to build custom solutions for the transformation to digital service provider. Instead, use off-the-shelf solutions built upon your own architectural design.

The last point is worth reiterating. Their advice is that operators should seek differentiation through their own IT architecture but not by trying to build the software components themselves. Given that even large operators like AT&T represent a very small percentage of the entire telecom industry, it is better to leave technology solution development to third parties that can achieve greater economies of scale by selling the same solution to multiple operators around the world. These other customers are generally not in direct competition. Most mobile and fixed access operators are only present in one or two countries. In enterprise telecoms there is more global competition, but even here it probably makes more sense for operators to focus on IT architecture as a differentiator rather than the underlying software systems.

Build, buy, or outsource?

As discussed earlier, Connolly found that outsourcing digital frontend development had left Vodafone UK not in control of a key asset. Should telcos take a similar approach to backend development? Building proprietary solutions based on open source software certainly brings greater control but is a huge undertaking for operators that are already struggling to attract top developer talent. It also creates a significant software maintenance challenge. Instead, we argue that scarce developer talent should be focused on systems of engagement (customer facing) while off-the-shelf solutions are used for systems of record (e.g., CRM and inventory) and enablement (orchestration and assurance). Differentiation can still be achieved through the unique combination of software solutions an operator chooses and how they configure them. As one IT chief architect of a tier-one operator in North America summarized it: "buy for efficiency, configure for differentiation."

These solutions must be open and highly configurable with a credible roadmap and vibrant user community. Another recommendation from Hushyar, *et al.* is to not bet on startups and small vendors given their challenges in scaling up. If there are no other options, then make sure a major
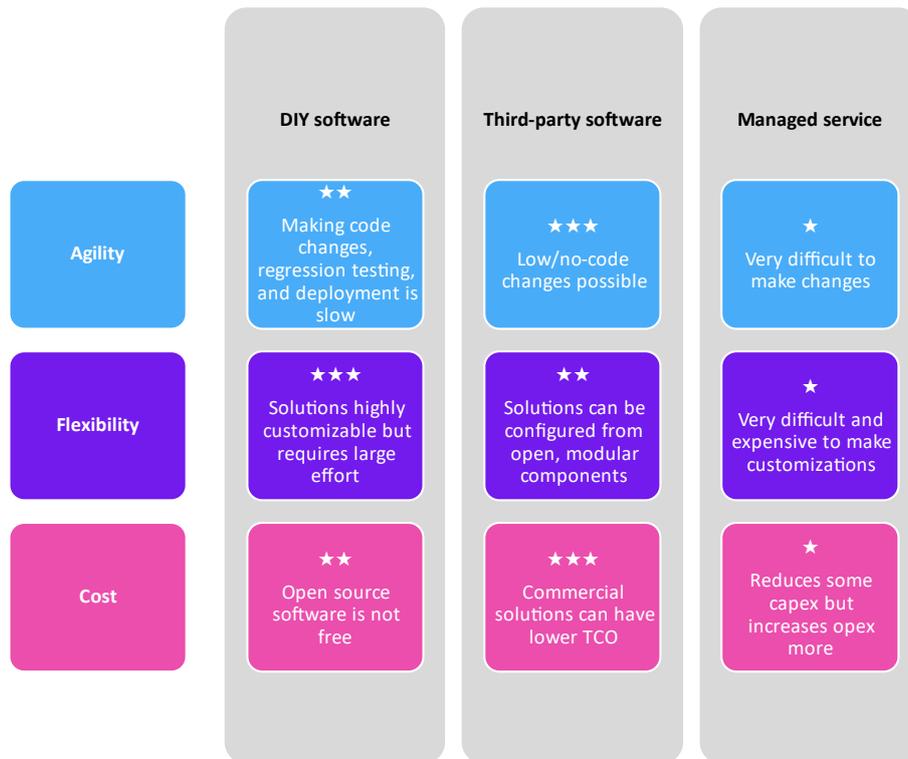
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[10] K. Hushyar, H. Braun, Dr. H. Eslambolchi, *Telecom Extreme Transformation,* 2021, CRC Press

vendor provides the supervision and accountability for the commitments of the startup. Even then, it is difficult for the major/prime vendor to guarantee support and maintenance of the small vendor's product throughout the lifecycle of the solution.

While buying rather than building is the right approach for back-office systems, the management of such operational systems should not be outsourced. To do so reduces agility and risks lock-in as key operational knowledge is lost from the organization. For example, we note one CSP that outsourced its OSS estate to a managed service provider under a multiyear agreement. At the end of the contract, the IT systems were handed back to the CSP in a precarious state. Software versions were several iterations old, and some systems had even been discontinued. With no operational experience left inside the telco it was in a very vulnerable position to try to bring the management back in house.

Figure 5 summarizes the comparison of the three approaches: DIY software, commercial off-the-shelf solutions, and managed services.

Figure 5: A comparison of approaches to telco IT transformation

	DIY software	Third-party software	Managed service
Agility	★★ Making code changes, regression testing, and deployment is slow	★★★ Low/no-code changes possible	★ Very difficult to make changes
Flexibility	★★★ Solutions highly customizable but requires large effort	★★ Solutions can be configured from open, modular components	★ Very difficult and expensive to make customizations
Cost	★★ Open source software is not free	★★★ Commercial solutions can have lower TCO	★ Reduces some capex but increases opex more

Note: The number of stars reflects which option is the best for each category.
More stars is better and in the case of cost means the cheapest.

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Source: Omdia

The war for talent

Recruiting technology talent and upskilling the existing workforce is key to transformation. This can help to reduce vendor dependency and provide scope for differentiation from competitors. Schalk Visser, Cell C's CTO says:[11] "We've been a telco for 20 years, so we think like a telco. This is why we need to reskill our existing employees so that they understand what the future business will look like. In addition, we need to acknowledge that we won't always have the expertise on the inside, so you have to bring new skills onboard."

However, there is a limited supply of high-tech talent in most countries and CSPs are competing against more attractive and better-funded internet companies. The competitive recruitment landscape is not new. The term "war for talent" was coined in 1997 and a book with this title was published four years later.[12]

Telcos need to create the perception among graduates and industry practitioners that they are innovative and fun places to work. Telco IT should not be about program and vendor management. Instead, it should be about product and platform development.

Engineering versus IT

The received wisdom is that telcos are engineering-centric while internet tech companies are full of computer scientists. However, our analysis of LinkedIn data suggests the reverse is true. Our sample of tech companies (Alibaba, Apple, AWS, Meta, and Tencent) have a higher proportion of staff in engineering roles than telcos, as **Figure 6** shows. Conversely, our sample of telcos have more staff in IT than engineering. Rakuten Mobile and Reliance Jio are the exceptions to the rule, which perhaps reflects their relative youth (Reliance Jio launched in 2016 and Rakuten Mobile in 2018) and different mindset. They have around twice as many staff in engineering than IT (like the techcos) whereas, for the rest of our telco sample (AT&T, BT, DT, Orange, Telefonica, Verizon, and Vodafone), engineering headcount is around 30% less than IT.

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[11] Carew, J., *From Telco to Techco*, *Brainstorm Magazine*, September 2021
[12] E. Michaels, H. Handfield-Jones, and B. Axelros, *The War for Talent*, Harvard Business Press, 2001

Figure 6: Percentage of employees in engineering and IT roles – telcos and techcos

■ Engineering   ■ IT
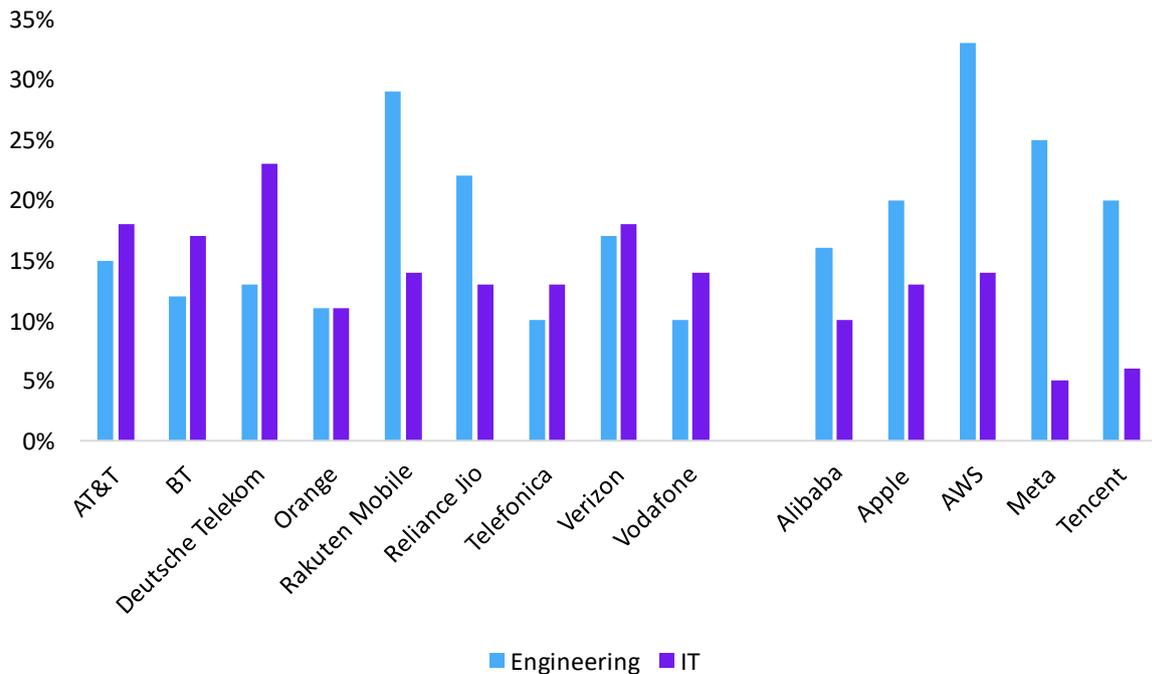
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Source: Omdia, based on LinkedIn data

Diversity and inclusion

Countless studies (e.g., Harvard Business Review[13], McKinsey[14], and World Economic Forum[15]) demonstrate that a diverse and inclusive workforce can be a competitive advantage. It may be a surprise that independent studies suggest diversity in telecoms on a global level is not much below average.

According to financial data provider Refinitiv's diversity and inclusion index,[16] the top 100 most diverse and inclusive companies globally include seven telcos: TIM Brazil, INWIT, Telecom Italia, Zain, Verizon, Telenor, and Digi.Com Berhad. These companies had an average score of 72% for diversity and inclusion, just under the average score of 73% for the top 100. Industries that outperform the

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[13] Hewlett, S. A., Marshall, M., and Sherbin, L., *How Diversity Can Drive Innovation*, *Harvard Business Review*, December 2013

[14] Dixon-Fyle, S., Dolan, K., Hunt, V., and Prince, S., *Diversity wins: How inclusion matters*, McKinsey, May 2020

[15] Eswaran, V., "The business case for diversity in the workplace is now overwhelming," World Economic Forum, April 2019

[16] Refinitiv, 2021: https://www.refinitiv.com/en/sustainable-finance/diversity-and-inclusion-top-100

average include banking (with nine companies in the top 100 and an average score of 74%) and specialty retail (eight companies in the top 100 with an average score of 75%).

We note with interest that the TM Forum is working on its own Inclusion and Diversity Score to measure how diverse, equal, and inclusive telcos are. Keri Gilder, CEO of Colt & Chair of TM Forum's Diversity & Inclusion (D&I) Council says: "If we're going to build the foundation for the digital economy and drive Industry 4.0, the only way to do this … is to put D&I at the center of our strategy." The benchmark is currently in trials, with full launch expected later in 2022. We applaud this initiative and look forward to seeing not just the reports but also the impact it has on organizational diversity.

Conclusions and recommendations

Hushyar, *et al*. argue that the traditional CSP business model with its focus on triple-play connectivity (fixed and mobile voice and data) is not sustainable. It is capital intensive and has shrinking margins given the commodity-like nature of such services. They also warn that hyperscalers (Amazon, Facebook, Google, etc.) are aggressively expanding the scope of their offerings to include connectivity (AWS Private 5G, Google Contact Center AI, etc.) and that this is "the kiss of death for traditional CSPs." The renaissance of low earth orbit satellite constellations such as SpaceX is another threat to traditional connectivity services, particularly in rural areas.

CSPs have a choice – they can either focus on being best-in-class at delivering NaaS connectivity or aspire to deliver compelling digital propositions potentially tailored to select vertical industries. For the latter, they must transform to become digital service providers. This transformation is not simply about improving network and service performance. That is a prerequisite. Instead, the transformation concerns reducing the time and cost to introduce new services and the ability to scale these up quickly should they prove popular.

The caveat is that what these new services will be is unclear. Deutsche Telekom's recent decision to withdraw its cloud gaming service[17] and the closure of T-Mobile US's IPTV service at the end of 2020 are just two examples of new services launched by telcos that failed to gain traction in hotly contested markets. The hyperscalers themselves are no strangers to failure with Google's cloud gaming service Stadia having underwhelmed[18] and Facebook's cryptocurrency project being wound down[19]. However, these companies' willingness to take risk and accept failure ("move fast and break things") is what sets them apart from traditional telcos.

Many telco transformations have focused on the "digital" frontend. This is the equivalent to performing cosmetic surgery on an athlete. It may look nicer but telcos are not in a beauty contest. Rather, they are in an Olympic distance triathlon that requires a highly performant:

- **Brain:** analytics (thinking) and inventory (memory)
- **Muscles:** service and network orchestration
- **Nervous system:** service assurance (performance and fault management).

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[17] "Deutsche Telekom pulls the plug on its cloud gaming service," Telecoms.com, January 27, 2022
[18] "Stadia year in review 2021: Lives to see 2022, but limps into the future," Android Central, December 29, 2021
[19] "Facebook's libra cryptocurrency project ends in failure", Business Matters, January 28, 2022

To get their second wind in this corporate triathlon telcos need to:

- **Rearchitect their back office** by considering end-to-end processes and leveraging open, standards-based, model-driven solutions
- **Adopt intelligent orchestration** that supports automation, continuous availability, and near real-time response times
- **Modernize their core OSS** – only by transforming their inventory, orchestration, and assurance systems will the investments in digital frontend pay off.

The operational systems that operators select should be:

- **Open and standards based** – using frameworks like TM Forum's Open Digital Architecture20 and open APIs that enable a loose coupling between the OSS and the underlying network. This increases organizational agility so that experimental services can be launched more quickly and easily
- **Modular** – systems should be easily integrated with an operator's existing estate; the CSP should be able to differentiate its service through configuration of the application without the need for expensive customizations
- **Cloud native** – microservices based, container packaged, dynamically managed, easily hosted in public cloud, and consumable as a service (SaaS). Systems must support 24/7 operations, accommodate sudden spikes in demand, and enable rolling upgrades of functionality.

These systems should, for the most part, be commercial rather than home grown. Unlike the hyperscalers, which have global reach, the telecom industry is too fragmented for individual telcos to cost-effectively develop much of their own software. They should focus their limited resources on the customer-facing frontend (websites and apps).

Systems of record should be sourced from high-quality suppliers that benefit from scale economies by selling the same solution to multiple operators across the world. Differentiation for operators comes from their frontend systems of experience, not by trying to build their own backend systems of record.

Operators should work together and with the vendor community through organizations like TM Forum that can coordinate efforts and agree standard approaches. By doing so, the telecom industry can consolidate its efforts to implement disruptive change and launch appealing new services.

Finally, the telecom industry must adopt a growth mindset. It must move away from the asset-heavy, hardware-based engineering ethos of old and embrace an asset-light and software-driven approach that encourages experimentation and innovation. To do so will require the hiring of new talent and the retraining of existing staff. The challenges that the telecom sector faces are not unique. Industries such as banking and retail also face digital disruption. The best-in-class companies in those industries are adapting to change, evolving their IT to enable customer friendliness, innovation, and efficiency. Telcos can do it too by focusing on end-to-end digital transformation and not just the tip of the iceberg (from website to CRM).

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[20] *TM Forum Open Digital Architecture: Tackling the Telco IT Integration Tax*, Omdia, December 2020

Appendix

Methodology

This report is based on Omdia's ongoing research and briefings with telecom operators and technology suppliers.

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Get in touch

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