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The State of Digital Transformation in Telecommunications

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INTRODUCTION

Digital transformation and digitalization are overused terms that mean everything and nothing at the same time. The "true" meaning of digitalization is the simulation of the real, analog world in a computer-compatible digital (i.e., number-based) format. Telephony switching started to be digitalized in the 1960s, and mobile has been digital since 2G. So why are we talking about digitalization in the telecom industry in 2017?

Digital transformation is perhaps a more valid topic for discussion, but what does it mean? Is it simply the use of computers instead of paper and pen? Does it mean greater use of the Internet in business processes, such as selling stuff? Does it mean making better use of data that is more easily captured and stored, thanks to digital technology? Or is it just an umbrella term for the ongoing process of change in businesses, industries and society at large?

For many telcos, digital transformation is synonymous with modernization of business processes to better compete with over-the-top (OTT) digital disruptors, such as Skype, Netflix and WhatsApp. Not only are these "new" entrants* eating telcos' lunch, they and other 21st century businesses, such as AWS, Airbnb and Uber, have changed enterprise and consumer expectations about how services are ordered (with one click) and delivered (seamlessly).

The greatest irony of the smartphone age is that the companies that enable the connectivity of mobile computing still have a high level of manual processes in their operations and are generally regarded by consumers as a pain when it comes to ordering services or resolving problems (which, in turn, often arise due to human error in manual processes). The good news is that telcos are no worse than most established industries when it comes to embracing automation and digitalization. Rather than compare a telco with an advertising business (Google, Facebook, etc.) it would be fairer to compare them with your local electric utility, airline, bank or supermarket chain. In that context, telcos are actually fairly digitally savvy. In fact, a 2016 study of digital transformation across different industries found that telecom was the most advanced sector, ahead of financial services and public sector, while utilities and manufacturing were the worst performing.

What holds the telecom sector back from taking greater advantage of digital transformation? Three key things: 1) the strict regulatory framework in which telecom operates; 2) the multitude of technology stacks that have accumulated due to the rapid pace of innovation in the industry over the last 20 years; and 3) a multiplicity of IT systems inherited after years of consolidation across the sector. New, asset-light companies, such as Netflix, clearly do not suffer as much of a legacy infrastructure problem while digital upstarts, such as Uber, seem to delight in flouting regulations (*viz.* Greyball), rather than struggling to comply with them. Nonetheless, there is still plenty of opportunity for communications service providers (CSPs) to become more cost-efficient and customer-friendly by modernizing their operations.

We conducted a survey of telecom operator personnel to better understand which aspects of digital transformation are most important to them and where they are placing their investment "bets." We asked them about the degree to which their organizations had already adopted technology and practices, such as DevOps, cloud and network functions virtualization (NFV). And we asked how they planned to address the OTT threat, including user data monetization (taking a leaf out of Facebook and Google's book). Below we present the results.

^{*} Skype was released in 2003, Netflix started streaming movies in 2007 and WhatsApp launched on the App store in 2009.



ONLINE SURVEY ANALYSIS

Research Methodology

The research for this report was carried out in April 2017 and consisted of a Web survey based on the questionnaire composed in conjunction with the sponsor. Email invitations were sent to contacts in the Heavy Reading database. After culling disqualified and incomplete entries, we were left with 119 valid service provider responses from 83 discrete companies worldwide. This section provides detailed analysis of the data from this survey.

Online Survey Demographics

Figure 1 shows that converged operators, those running both fixed and mobile networks, make up a majority of respondents, representing 48% of the total. Mobile network operators made up the next largest portion, with 24%. The portion for fixed-line network operators was 11% and cable operators comprised 8%. The remaining respondents came from mobile virtual network operators (MVNOs), OTT service providers and other CSPs.

Example companies participating in this survey include: AT&T, Bell Canada, British Telecom, CenturyLink, Colt, Comcast, Cox, Etisalat, MTS, MTN, Orange, Proximus, Sprint, T-Mobile, Telecom Italia, Telefónica, Telenor, TELUS, Verizon and Vodafone.



Figure 1: Type of Telecom Service Provider

The majority of survey respondents work in technically-oriented roles, although customeroriented roles were also well represented. Corporate management represented 21% of respondents. R&D technical strategy made up the next largest portion at 17%. The next largest were network operations (16%), network planning (13%), and IT, data center and cloud domain workers (8%). Other respondents held roles in sales/marketing, product management, software design and product marketing.

We asked in which markets the respondents' company offers communication services. **Figure 2** shows that the most widely covered market among our respondents was the U.S. (71%),



followed by the U.K., Canada, Germany, Russia and Brazil. Clearly, the numbers in this chart add up to more than 100%, as many of the CSPs surveyed operate in multiple markets.





Around half of respondents work for Tier 1 operators with more than \$1 billion in revenue, with a majority of these having revenue greater than \$5 billion. Midsized operators (with revenue of \$200 million to \$1 billion) made up 17% of the sample. Tier 3 operators (with less than \$200 million in revenue) made up 35% of the total.



Figure 3: Company Size

Digital Transformation

We asked the survey participants what are the three most important aspects of digital transformation for their company. Process automation was the highest-ranking option,



closely followed by network virtualization; big data analytics was the third most popular response, also followed closely by self-service apps and omni-channel. Personalized offers were less of a priority, and DevOps was the lowest ranking aspect of digital transformation.



Figure 4: Most Important Aspects of Digital Transformation

We asked the survey participants in what three areas will their company invest the most over the next 12 months as part of its digital transformation strategy? Business intelligence and analytics was the most popular response, closely followed by customer-facing applications (e.g., self-service portals), customer experience management (CEM) and operations support system (OSS). Customer relationship management (CRM) was a slightly lower priority, followed by cybersecurity and applications programming interface (API) development. Workforce collaboration tools and identity/access management scored poorly.

Figure 5: Digital Transformation Investment Priorities



Note: Score is a weighted calculation.



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We asked the survey participants to what extent their company had adopted various technologies and practices for digital transformation (aggressive, moderate, early-stage or not at all). We then calculated a weighted score, assigning 4 points to aggressive adoption, 2 points to moderate and 1 point to early stage. Service agility and NFV/software-defined networking (SDN) scored highest for adoption, with more than 60% of respondents saying their company had adopted these two aspects aggressively or moderately. Self-organizing networks scored lowest, with 28% having no adoption of SON and 27% being at an early stage.

	Aggressive	Moderate	Early-Stage	None	Weighted Score
Service agility	25%	36%	28%	11%	2.0
DevOps	16%	36%	37%	11%	1.7
API management	14%	43%	34%	9%	1.7
Identity-centric security	15%	39%	33%	14%	1.7
NFV/SDN	24%	38%	26%	11%	2.0
SON (self-organizing networks)	12%	33%	27%	28%	1.4

Figure 6: Technology & Practice Adoption Levels

Source: Heavy Reading

We were surprised that 11% of respondents indicated their company had not adopted DevOps at all. In a separate question, we asked which statement (see below) best matched their company's adoption of DevOps. The most popular response (39%) was partial adoption (with some resistance), but a significant proportion (31%) indicated their company had no plans to deploy DevOps and a small minority (6%) said they saw no value in DevOps. Conversely, 24% indicated their organizations were fully committed to implementing DevOps under their own steam.

Figure 7: DevOps Adoption



Responding to the OTT Threat

The reason that digital transformation is such an important topic in the telecom industry is due to the threat from OTT players such as Netflix and WhatsApp, rather than competitive threats from other telecom operators. We asked our participants how they would describe



their company's strategy regarding OTT providers. The most popular response (42%) by a wide margin was partnership: to offer bundled services together with OTTs. A brave 24% said their company sought to compete head on with the OTTs by developing their own applications. A more pragmatic 18% said they would become a platform provider for multiple OTTs, while 14% said they would focus on quality of service (QoS) to maintain their competitive position at the network layer vis-à-vis other network operators.



In a similar vein, we asked participants how their company planned to monetize big (user) data. Direct marketing and advertising (28%) was the most popular response. However, this was closely followed (26%) by those who had no plans to monetize user data and instead hoped to simply understand their customers better through analytics. Location based services (20%) proved popular, as did selling the data to third parties (anonymized or otherwise).







We asked participants the three most important ways their company expects to use the knowledge of customer needs that it gets from analytics tools. The most popular response was to create personalized offers, closely followed by self-service apps. Omni-channel was the next most popular response, while social media related applications scored lowest.



Figure 10: Benefits of Greater Customer Understanding

Note, score is a weighted calculation

Network Evolution

Although network evolution and digital transformation are independent themes there is some overlap in that innovations, such as virtualization, are seen as potential enablers of greater agility for telecom operators. We asked our participants when they thought their company would have at least 50% of its operations/services moved to the cloud. A third said it would take place within the next three years, and a further 37% said between 3 and 5 years. A quarter said it would take 5 to 10 years, while a small minority (5%) thought it would take more than 10 years.







We asked our participants what is the biggest challenge that their company faces in implementing NFV/SDN. Integration with legacy tools was the most commonly cited challenge (35%), followed by culture (23%); network engineering, operations and suppliers have to redesign and rethink deployment for cloud. The lack of a compelling business case and a failure to deliver on cost and time to market savings were each cited by a fifth of respondents.



Figure 12: NFV/SDN Challenge

Finally, we asked respondents which of the statements below best matches their company's view of commercial off-the-shelf (COTS) self-organizing networks (SON) solutions. The most popular response (65%) was that integration with legacy systems was a requirement. Just under a fifth said they were happy with existing SON solution operating independently of legacy systems, while a similar number said they had no interest in COTS solutions.







CONCLUSIONS

Our survey found that the most important aspects of digital transformation for telecom operators were process automation and network virtualization. The highly automated nature of Webscale data center operations provides a benchmark for telcos. The opportunity to reduce human intervention in simple business processes and repurpose this talent for more valueadded activities is immense. Virtualization promises better capacity utilization and, hence, a greater return on capital for operators by reducing the capital intensity of their businesses. At the same time, the "softwarization" of telecom should increase business agility and unleash greater creativity.

Telcos top priorities for digital transformation investment include business intelligence (BI), analytics, CEM and CRM. CSPs are sitting on a mountain of data and through the use of BI and analytics there should be significant opportunities to both reduce cost and increase revenues. Customer experience will always be a key priority, as the barriers to switching service provider are low and the cost of churn is high. And while CRM is hardly a new concept, few operators can be said to have a strong relationship with their customers today.

Given all the hype in telco and IT circles regarding DevOps, we were surprised to find adoption was minimal or partial among our survey respondents. This matches <u>anecdotal evidence</u> that while frequent code changes and rollbacks are quite common in an enterprise IT environment and among Webscale OTT players, in a telco environment the blood-brain barrier between engineering and operations remains impermeable.

The two key strategies for dealing with the OTT threat are to partner (if you can't beat 'em) or become a platform provider (à la the App Store). However, some brave souls are still trying to compete head on with OTT players. Other CSPs are giving up on the application layer and focusing on network quality (fast but dumb pipes) instead.

Operators are keen to exploit customer data for marketing purposes or to sell advertising. Some are planning to sell the data to third parties, something the U.S. regulator's new chairman has facilitated by <u>rolling back privacy rules</u>. He has also given the green light to zero-rating, which should help operators partner with, or potentially stifle, OTT players. However, the regulatory landscape is quite different in other countries. In the EU, for example, new legislation – the <u>General Data Protection Regulation</u> – will require companies, including CSPs, to put users in control of their own personal data. GDPR is not just for EU companies, but will apply to any company that has EU customers or collects data from EU citizens. And while <u>courts in the Netherlands have ruled</u> against a regulator and found in favor of T-Mobile regarding zero-rated music, in Canada the telecom regulator recently ordered Videotron to cease its zero-rating of streamed music. Regulation remains, as ever, a minefield.

Cloud and NFV are some of the hottest issues in telecom today. Our survey found that the vast majority of telcos expect over half of their services will be cloud based within five years. However, progress on the NFV front is slow with legacy integration, culture change and lack of a compelling business case cited as the key challenges to its implementation.

Usage of telecom networks is set to rise inexorably as consumers increasingly depend on connected smartphones and wearables in addition to the industrial demands of the Internet of Things (IoT). This should put telcos in a strong position to have a key relationship with consumers and enterprises as their conduit to the public and private cloud. Telcos have a wealth of information on their customers' location, shopping habits and other behaviors and



demographics, which should place them in a strong position to upsell value-added services beyond minutes and megabytes. To tap this potential (within the bounds of privacy laws) requires a refresh of telco business processes and the implementation of new IT tools, which we might collectively call digital transformation.

The key aspects of this transformation include:

- Agility of network operations increased automation and ability to rapidly respond to new customer requirements (internal and external).
- Improved customer engagement meet customer expectations for ease of ordering, delivery and problem resolution; make customized, relevant new offerings based on data analytics.
- New service offerings turn operators into service aggregators for third parties (e.g., Netflix, Spotify, Deezer, financial services, utilities), similar to the app store concept for smartphones.
- Enabling internal innovation adoption of DevOps and fast-fail mentality to unleash creative potential within a telco's own workforce and provide an attractive environment for recruitment.

