# Delivering the Digital Dividend

*The EUR 200bn free-cash-flow opportunity for telcos*

2018 report on the telecommunications industry

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**Arthur D Little**

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# Introduction

With the benefit of hindsight, we can see that the foundations of today's ongoing digital revolution were laid in the 1980s, during what can perhaps be considered the first digital revolution. In that decade personal computers proliferated (primarily for business use, but increasingly in the home as well), the first mobile phone came to market (the Motorola DynaTac in 1983), and businesses made a fundamental shift from analog data storage to digital data storage.

Telcos were, for a long time, at the heart of that early digital revolution, leading through their own early digital adoption and transformations, as well as enabling and driving the transformations of other industries as they expanded beyond voice communications and into data and broader ICT services. As early as 1984, BT was promoting itself, in the run up to its initial public offering (IPO), as "The Power Behind the Button", with a clear emphasis on digital capabilities in its advertising. The digital focus helped to contribute to an IPO in which the shares were oversubscribed by more than three times.

However, over the past decade or more, telcos have been increasingly left behind, both in their own right and as the enablers of their customers' digital transformations.

As we move into 2019 the situation is clearer than ever before: telcos need to rapidly up their digital games to avoid the ever-present threat of commoditization of their core connectivity offerings, in both consumer and business areas. The prize, or "Digital Dividend", awaiting those telcos that can rapidly catch up with, or even overtake, their more digital competitors is significant, as this paper highlights.

Our research, global senior executive survey and financial analysis have enabled us to quantify this Digital Dividend – we have calculated that a global pool of more than EUR 200 billion in operating free cash flow (opFCF) is available to telcos that become leaders in this space. The incentive for digital transformation is clear – and the need to embrace change has never been greater.

Our analysis shows that while most, if not all, telcos have embarked on the digital transformation journey, the vast majority of global telcos are still at a relatively early stage of digital maturity. This paper presents the findings of our analyses and proposes means by which telcos can better understand their own digital maturity, as well as identifying and defining ways to improve maturity. We hope this will help those telcos that choose to act to enjoy their share of the Digital Dividend.

## Case study: BT – The Power Behind the Button

In 1984, when British Telecom (later rebranded as the BT we know today) was preparing for privatization, the company needed to communicate that it was an organization worth investing in.

BT's objective was to make people realize that the telephone was only one of the services it could provide. Other services included communications through radio, television broadcasts and computers.

So, BT launched a campaign: "The Power Behind the Button". The company invested £16 million into this initiative, with the object of communicating its technological revolution.

Through this campaign BT demonstrated that it was an innovative and efficient service provider that did not just provide cables, but could lead the early digital revolution.

"The Power Behind the Button" campaign image
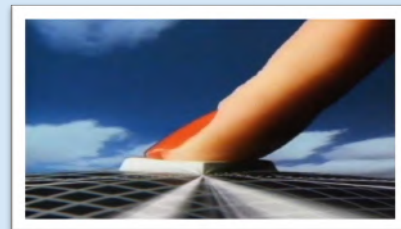


Source: IPA Effectiveness Awards Paper, 1986

This successful campaign demonstrates the innovative digital positioning that BT achieved in the past. However, as new sources of disruptions and digital trends arise, BT, as well as other telecoms operators, needs once again to innovate and embrace the new digital era.

## Digitalization -

*there is no other choice if we want to survive*

*Executive vice president – Major telco operator*

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# 1. Digital transformation: The EUR 200bn opportunity for telcos

To quantify the Digital Dividend awaiting telcos that can digitally transform, Arthur D. Little (ADL) conducted an analysis on the latest available financial results of 190 telecoms operators globally, their historical performances since 2014, and their projected performances until 2022. The main insight from this analysis includes:

- Telco revenues have experienced low-single-digit growth since 2014.

- A very slight uplift in revenue growth is expected in the next five years.

- Despite some revenue growth, higher capex, combined with limited opex reduction, will put pressure on free cash flow.

- Digitalization is key to changing industry economics: broad adoption has the potential to yield a collective uplift of more than EUR 200bn opFCF.

To complement this financial analysis, ADL conducted a global survey of more than 100 telco senior executives on digital transformation. This survey confirms the importance of digital transformation for executives, in terms of both the potential opportunity, or "Digital Dividend' and its resulting position at the top of CxOs' agendas.

**Telecoms revenues have experienced low-single-digit growth since 2014**

Our analysis reveals low-single-digit global revenue growth from 2014 to 2017 (Figure 1). Overall industry growth was mainly driven by North America, while peaking wireless penetration in large, established markets, as well as ARPU erosion in other markets, put pressure on their respective growth.

Operators have struggled to grow wireless revenues in major established markets due to saturation. As the majority of the population in these markets already has a cellular connection,

**Figure 1:    Global telecoms core revenues**

bn EUR
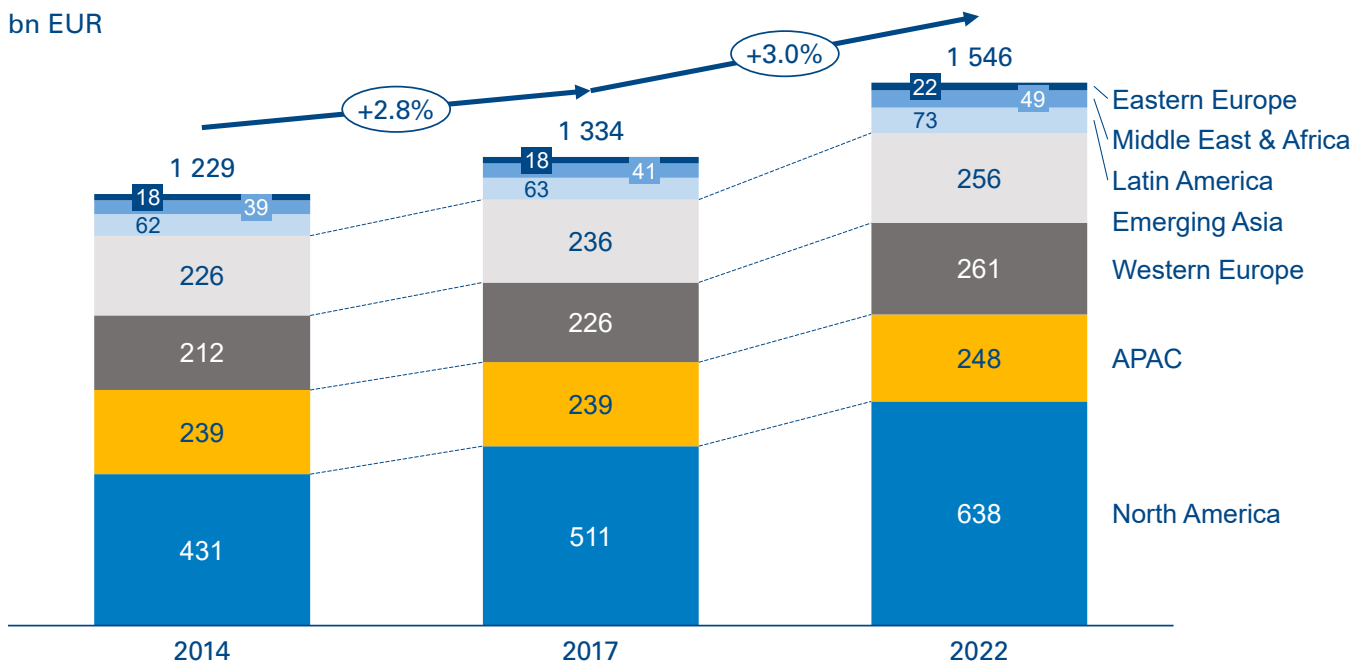


Note: Includes revenues for 190 operators across all global regions, selected based on availability of granular country-level financial data
Source: Operator financials, Arthur D. Little

operators have found that incremental connections are no longer a reliable source of revenue growth. According to the GSMA, in North America wireless subscriber penetration has largely peaked and is expected to grow only 2 percent from 2017 to 2025.

In North America, we observed wireless revenue CAGR of just 1.1 percent from 2014 to 2017. We observed similar trends in Eastern and Western Europe, which experienced wireless revenue CAGRs of 0.9 and 2.4 percent, respectively, from 2014 to 2017.

As telecoms operators face increasing competition from other established operators, OTT players, and new entrants, fixed-revenue growth has also been limited; for example, Eastern and Western Europe experienced fixed-revenue CAGRs of 1.5 and 2.1 percent, respectively. Intense competition between operators has led to aggressive pricing behavior, and thus ARPU erosion.

In Western and Eastern Europe, regulatory pressure has also had considerable impact on top-line figures. The rising number of OTT alternatives to traditional telecoms voice and pay-TV services has resulted in competitive pricing, which has caused further ARPU erosion, as well as subscriber loss.

## A very slight uplift in revenue growth is expected in the next five years

In our baseline forecast of global telecoms revenues, we show acceleration in revenue growth from 2017 to 2022, with an aggregate 3.0 percent CAGR globally. Although only slight, this uplift in revenue growth can be attributed primarily to increased high-speed wireless data coverage in emerging markets, higher revenue from fixed infrastructure required to support aggressive increases in data consumption, and new use cases enabled by 5G deployments in more mature telecoms markets. Indeed, new revenues from 5G are expected to arise from new B2B and B2B2X use cases, as significant incremental revenues are not immediately expected from consumer 5G services.

Increasing wireless coverage and subscriber penetration will be a boom for telecoms revenues in regions with significant room for growth, such as Latin America and the Middle East and Africa (MEA). In those regions, we forecast total revenue CAGRs of 5.2 and 4.9 percent, respectively, from 2017 to 2022.

Acceleration in revenue growth rates will not be limited to higher-growth regions, but will also take place in mature regions, where the latest wireless technology cycle is under way. In North America, for example, several operators are currently engaged in 5G technology build-outs. Sustained deployment

over the next five years will give rise to new use cases and revenue streams, and subsequently drive revenue growth. In North America, we expect total revenue CAGR of 4.6 percent from 2017 to 2022.

## In our baseline case, higher capex combined with limited opex reduction will put pressure on free cash flow

5G deployment and fiber network expansion in mature telecoms markets, as well as continued LTE investments in emerging markets, will require major capital outlays. Our baseline forecast predicts global telecoms capex growing at a CAGR of 7 percent from 2017 to 2022 – a rate that is more than double the historical CAGR and also outpaces the forecast growth in global telecoms revenue for the same period, as seen in Figure 2. We expect capital investments to contribute significantly to the erosion of free cash flows for telecoms operators from 2017 to 2022.

We project growth in telecoms opex to remain stable over the next five years, with no major supplier shocks or changes to expense structure. We expect global opex to increase at a CAGR of 2.7 percent from 2017 to 2022, which is roughly in line with the observed historical growth.

The financial performance of telecoms operators has already been weakening, resulting in significantly lower total returns of telecoms stocks versus other industries, as seen in Figure 3. Top performance of individual telecoms stocks is effectively driven by M&A. The expected pressure that capex and opex will place on free cash flow in the next five years will only continue this trend.

Figure 2:    Capex to sales ratio
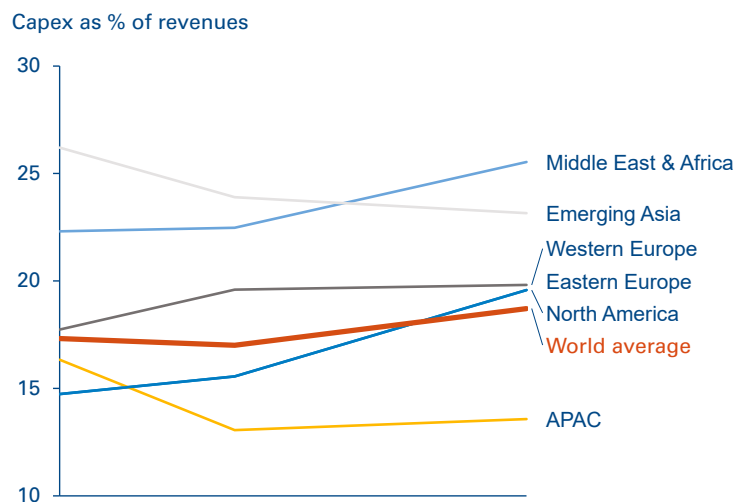
Capex as % of revenues



Note: Includes revenues for 190 operators across all global regions, selected based on availability of granular country-level financial data
Source: Operator financials, Arthur D. Little

Figure 3:   Total return by industry

Annual average in %



- 3 years
- 5 years
- 10 years
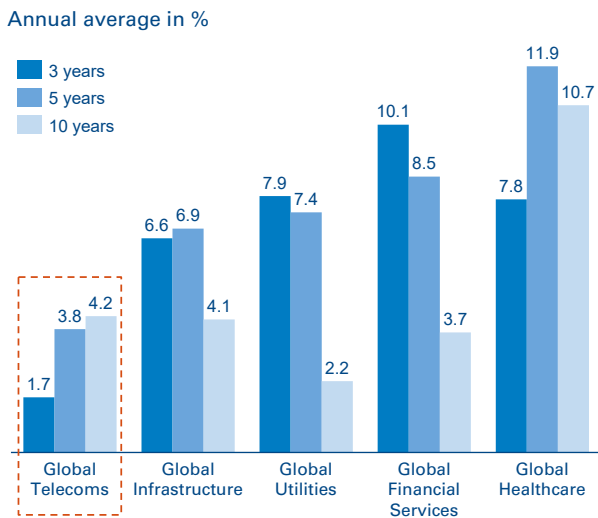
Source: iShares. August 2018

## Broad adoption has the potential to yield a collective uplift of more than EUR 200bn in free cash flow

We define digitalization as the application of digital technologies and interfaces, new ways of working to change an existing business model and create incremental revenue and other value-adding opportunities.

Despite networks being the heart of the digital revolution, digitalization in the telecoms industry is seen as lagging or only on par with a number of other industries. For instance, 65 and 55 percent of senior telco executives we interviewed considered the Financial Services and Retail industries, respectively, to be ahead of the telecoms industry in terms of digitalization. The digital gap between telecoms and other industries puts operator capabilities under pressure and demands increased focus on digital transformation.

At the same time, telecoms operators must act on decreasing cash flows and weak share-price performance. Fortunately, digitalization of the telecoms industry can have a significant positive impact on operator financial performance, but operators have to act now to generate incremental cash flows from digitalization.

Our digitalization forecast for the global telecoms industry projects accelerated revenue growth and reduced opex, with maintained capital investment, when compared to the base case forecast. The result is dramatic – broad adoption of digitalization has the potential to yield a collective uplift of more than EUR 200bn in opFCF for the 190 operators analyzed, compared to our "do nothing" base case, as seen in Figure 4.

Figure 4:   Base-case and digitalization forecast for the global telecoms industry
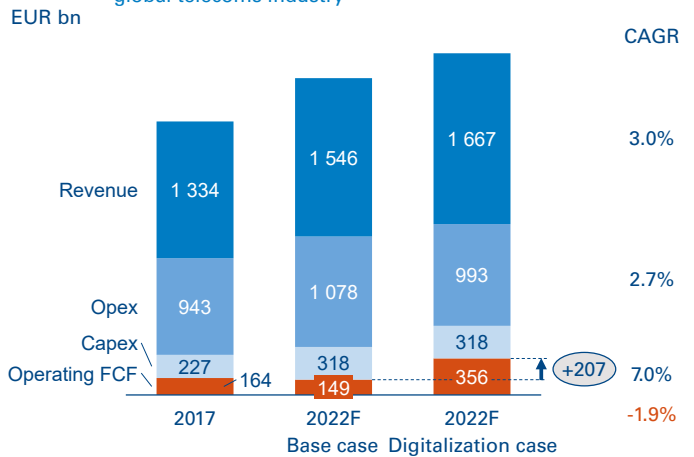
EUR bn



Note: Includes revenues for 190 operators across all global regions, selected based on availability of granular country-level financial data
Source: Operator financials, Arthur D. Little

As well as making core business activities more efficient and reducing time to market for new products, digitalization can open up new revenue streams for telecoms operators. The result of the digitally enabled revenue acceleration and growth opportunities is a 1–2 percentage-point uplift in our revenue-growth forecast over the next five years.

Telecoms operators also stand to realize opex savings across all facets of their businesses thanks to digital transformation, with opex CAGR over the next five years slowing to 1 percent from the base case projection of 2.7 percent.

We recognize that digital transformation does not come without a cost, and that incremental capital investment is required. However, these investments do not significantly impact the total projected capex CAGR, which remains the same as for our baseline case, at approximately 7 percent.

Through digitalization, the telecoms industry can buck the trend of weakened revenue growth and increased cost pressures to return to profit growth.

## The ADL survey confirms the significance of digital transformation for executives, both in terms of expected financial benefits and the resulting place at the top of CxOs' agendas

We conducted a survey of more than 100 senior telecoms executives. We collected views on the telco digital transformation journey with broad global representation from major operators as well as smaller challengers (Figure 5).

Figure 5:    ADL survey participants
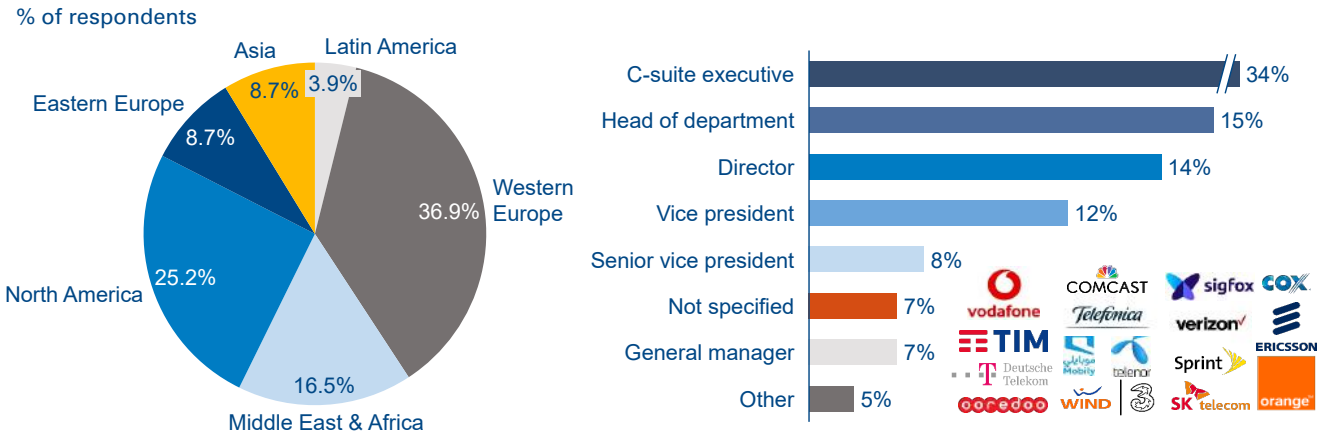
% of respondents



Source: Arthur D. Little TIME digital survey 2018

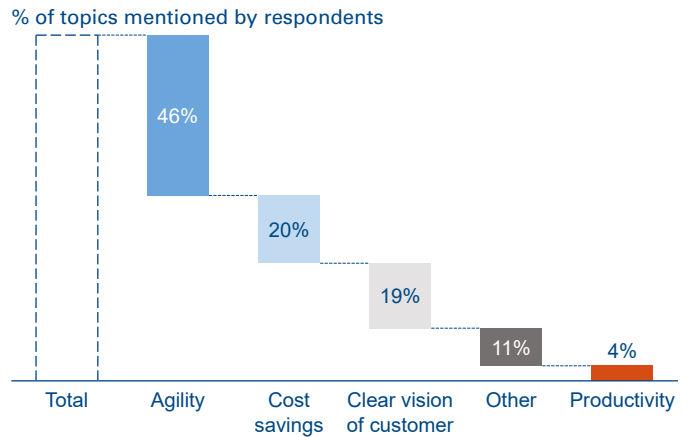The value of digitalization was confirmed by respondents, who saw digital transformation as value contributive (Figure 6). In particular, survey participants expected to grow revenues through subscriber growth, and unlock operational efficiencies such as agility and cost savings (Figures 7 and 8). However, respondents also pointed out some dangers of not engaging in transformation, as highlighted by one comment: *"We have no other choice if we want to survive."*

Figure 6:    The value of digitalization in the future of the telecoms industry

% of respondents



| | | |
|---|---|---|
| | 73% | Value contributive |
| | 11% | Both |
| | 10% | Neither of the two |
| | 6% | Value destructive |

Source: Arthur D. Little TIME digital survey 2018

Figure 7:    Impact of digitalization on organization and processes

% of topics mentioned by respondents



| Total | Agility | Cost savings | Clear vision of customer | Other | Productivity |
|---|---|---|---|---|---|
| | 46% | 20% | 19% | 11% | 4% |

Source: Arthur D. Little TIME digital survey 2018

The survey results show clearly that digital transformation is at the top of CxOs' agendas, in terms of both current and future focus. Aside from Digital Transformation, consolidation and new technologies, such as 5G and the IoT, are also expected to play an important role in shaping the telecoms industry in the coming years (Figure 9).

Figure 8:    Expected impact of digitalization on revenue growth in the next 5 years

% of respondents



| No growth | 2% growth | 5% growth | 10% growth | Greater than 10% |
|---|---|---|---|---|
| 31% | 34% | 20% | 11% | 5% |

Growth expectations

Percentage of respondents
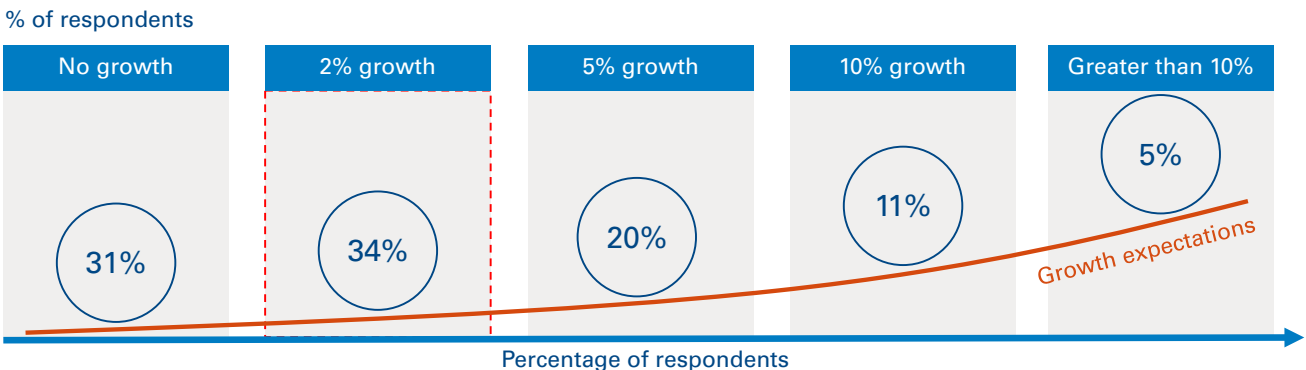
Source: Arthur D. Little TIME digital survey 2018

Figure 9:    Key topics that are shaping the telecoms industry

% of topics mentioned by respondents



Legend: Over the last 12 months / In the next 3 years

Digital transformation: 26% / 32%
5G: 15% / 17%
Consolidation trend: 15% / 6%
Data protection/regulation: 14% / 3%
IoT: 7% / 9%
OTT: 5% / 5%
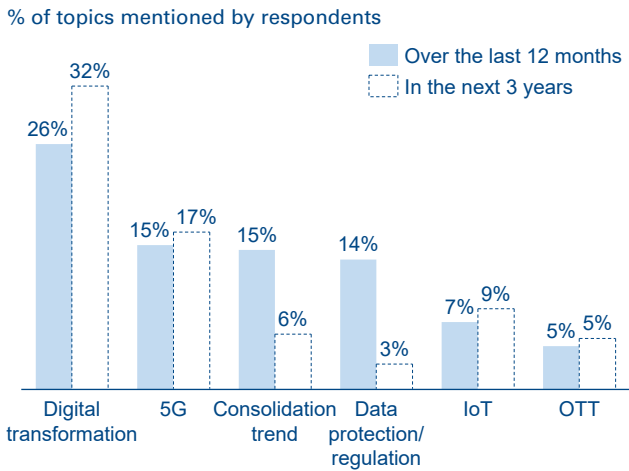
Source: Arthur D. Little TIME digital survey 2018

## Conclusion

Our financial analysis and survey highlight the scale of digital transformation's impact on the telco industry. Despite the fact that most, if not all, telcos have already embarked on the digital transformation journey, the results also highlight that there is still plenty of work to do. Digital transformation is a fundamental requirement not just for success, but also for survival, as it changes the ways telcos operate internally and engage with their customers, and opens up new and incremental revenue streams.

Our financial analysis quantifies the benefit of adopting digitalization; doing so could yield a EUR 200bn uplift in opFCF in the telecoms industry, given accelerated revenue growth and reduced opex with maintained capital investments compared to our baseline case. The imperative to fully engage and Embrace Digital transformation is clear.

To secure a share of the identified Digital Dividend, we suggest a game plan based on:

- Objectively assessing and benchmarking the current state of digital maturity.

- Identifying the gaps and aspects of digital maturity in which improvements will have the highest impact.

- Defining a holistic approach to digital transformation, considering both technology and organizational/cultural changes that may be required.

- Driving rapid progress towards a fully digitally transformed organization, using an agile approach to deliver digital transformation across people, processes and systems.

Each of these steps are considered in detail in the following chapters.

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# Digitalization -

*brings both a need and an opportunity to reengineer processes and reconsider organizations. Agile organizations will stand a better chance to take the benefits*

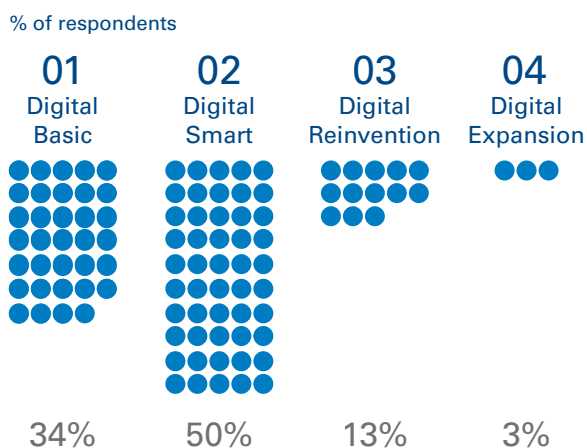*Chief digital officer – Major global telco operator*

"

# 2. How digital are you? Digital maturity defined

Around the world, major fixed and mobile operators have engaged in digital transformation, implementing a number of tangible digital initiatives, with focus on specific parts of their businesses, but how digital are they as businesses overall? To assist in an objective understanding of maturity, we have defined a Digital Maturity Model with four stages of maturity: Digital Basic, Digital Smart, Digital Reinvention and Digital Expansion.

## Telcos have begun the digital transformation journey, but need to accelerate to deliver the 'Digital Dividend'

The results of our survey demonstrate that the journey has at least begun for all operators, with 50 percent of respondents assessing their own businesses as being at just the second level of Digital Smart due to technology implementations. However, for almost all operators there remains a long journey ahead to full digital transformation, with just 16 percent of respondents assessing themselves as being more advanced than Digital Smart (Figure 10) and only 3 percent placing themselves at the digital expansion level.

Figure 10: ADL survey – Perceived digital maturity positioning

% of respondents



| 01 Digital Basic | 02 Digital Smart | 03 Digital Reinvention | 04 Digital Expansion |
|---|---|---|---|
| 34% | 50% | 13% | 3% |

Source: Arthur D. Little TIME digital survey 2018

The survey also highlighted that despite the telecoms industry being a key enabler in the digital industry, most telcos considered themselves either digitally behind, or, at best, on a par with other industries. The majority of respondents viewed both Financial Services and Retail as digitally ahead of telcos (Figure 11).

Figure 11: Digital industry comparison (telco self-assessment)

% of respondents
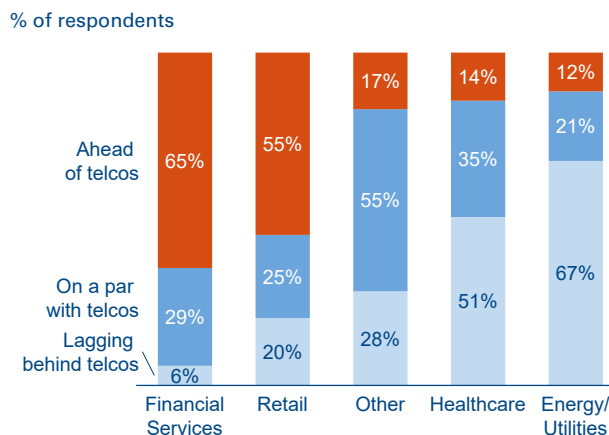


Source: Arthur D. Little TIME digital survey 2018

So, the key question is how fixed and mobile operators can understand digital maturity across their businesses, and then accelerate transformation to achieve Digital Reinvention and Expansion, leapfrogging Financial Services and Retail players to compete head-to-head with the so-called "FANG-like" companies (Facebook, Amazon, Netflix and Google) and secure a share of the EUR 200bn Digital Dividend.

## Key opportunities and enablers exist across the business

Digital transformation opportunities exist in most, if not all, areas of a telco's business, from offering new products and services and improving customer experience to reducing operating costs. Our survey found digitalization could drive significant cost savings across the business, with the greatest impact seen in customer care and sales (Figure 12).

Figure 12: Bottom-line impact

% of respondents



Source: Arthur D. Little TIME digital survey 2018

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The survey also highlighted that there were still significant opportunities available from adopting new digital technologies, enabling operational efficiencies, and offering new products and services. As 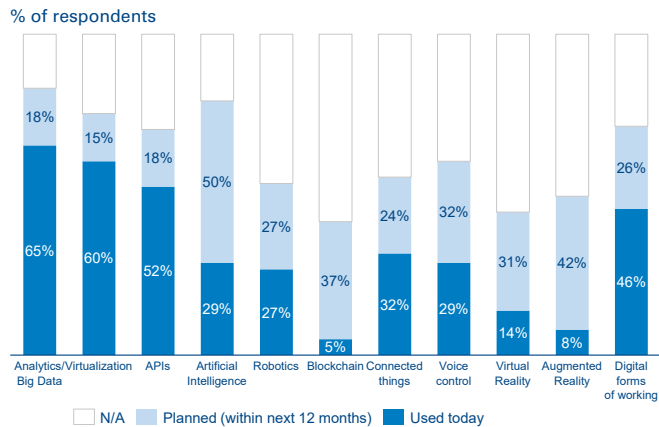Figure 13 illustrates, only analytics/Big Data, virtualization and APIs have reached wide-scale adoption to date. Other digital technologies, such as robotics, blockchain and AR/VR, are still on the horizon, promising future rewards.

Figure 13: Digital technology adoption

% of respondents



N/A   Planned (within next 12 months)   Used today

Source: Arthur D. Little TIME digital survey 2018

Telcos now need to seize these opportunities by adopting new digital enablers operationally and commercially to transform their businesses.

## What does "good" look like?

Telcos are already deploying digital technologies across their businesses, as the UK mobile operator market assessment in Figure 14 below illustrates. However, the challenge that remains is digital adoption and transformation across the whole business, end-to-end, rather than in a set of isolated functional areas.

Figure 14: Digital technology adoption – UK Mobile operators
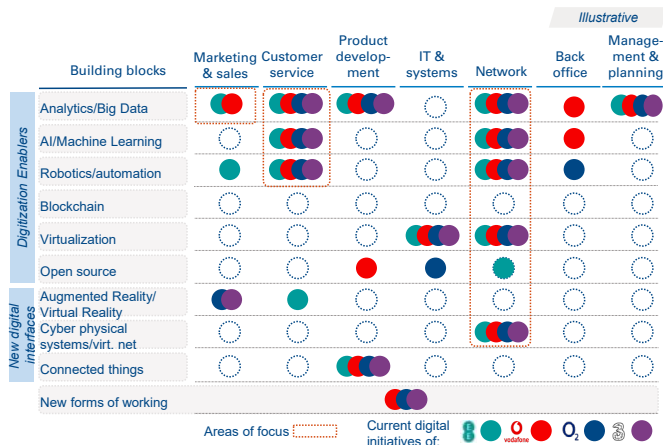


Source: Arthur D. Little market assessment

There are, however, a good number of successful digital transformation initiatives we can all learn from, including Telefónica's Aura AI platform and EE's digitalization of field operations.

### Case study: Telefónica's Aura

Telefónica has invested in creating a number of group-wide platforms to support next-generation digital services, working closely with partners across multiple ecosystems.

As a primary example, in 2017 Telefónica launched the Aura platform, which is focused on the application of cognitive capabilities as the basis for a new customer relationship model.

Aura enables users to manage their digital interactions with the company and control the data generated by using Telefónica's products and services in a transparent and secure manner. The platform supports a wide range of use cases across group markets, from the Movistar Home device for the company's pay-TV service in Spain (including voice control) to customer-care chatbots on Facebook messenger for Telefónica Germany.

Key to the long-term success of Aura will be the ability to partner with retailers, effectively taking on Amazon's Alexa in the process.

Source: Telefónica

### Case study: EE AR field operations

EE is using Augmented Reality to digitalize its field operations and provide remote guidance to subscribers via a mobile app. The new AR-based virtual support app gives users visual instructions on setting up devices such as routers, showing them where various cables go in augmented reality on their smartphones.

EE has also equipped its field forces with AR-powered video apps to enable technicians to help guide each other efficiently, while capturing the knowledge for future use.

Thanks to augmented reality technology, EE is transforming field-service operations, improving customer experience, reducing fix and install times, and driving significant cost reductions.

Source: EE

The case studies illustrate how telcos can digitally transform different elements of their businesses. They don't provide a blueprint for digital transformation, but rather, inspiration and ideas that could become components of a broader digital transformation approach. To truly transform and compete on par with FANG-like companies, a telco needs to understand its digital maturity as an organization, and then map out its digital transformation opportunities and aspirations across the whole business.

## Assessing digital maturity is the necessary first step to plan for the digital transformation journey

The first step to improvement in any field is to understand current positioning. How to do this in the area of digital transformation is a complex and multi-faceted question, but broadly speaking, a telco's digital maturity can be measured by:

- Assessing the level of digital technology maturity in terms of specific capabilities considered in each operational area of the business, benchmarked against best-in-class and FANG-like businesses.
- Assessing and benchmarking organizational and cultural digital maturity.
- Understanding what smaller, more agile competitors (including start-ups) are doing, and what benefits they are deriving from those capabilities.

- Considering emerging/anticipated competitive threats and opportunities, and assessing where digital capabilities are needed to defend against or address them.

Once this review and assessment are completed, an effective, company-specific digital transformation roadmap can be defined, and digital transformation initiatives developed and prioritized.

## Our framework assesses an organization's digital maturity, defining four major maturity stages

The ADL Digital Maturity Model in Figure 15 below allows telcos to assess their digital maturity across two key dimensions: Enabling Digital and Embracing Digital.

**Enabling Digital** assesses the digital technologies a business has implemented, including, for example: Artificial Intelligence (AI), Advanced Analytics, Robotic Process Automation and Augmented Reality. The maturity of each of these technologies as a platform is also considered, from research and pilot through to industrialized application. These technologies, as well as their maturity and applications, are explored further in Chapter 3, Enabling Digital: The new power behind the button.

**Embracing Digital** encompasses the ability of a business to adopt and fully leverage digital technologies/capabilities across four areas: strategy, people & culture, organization and processes. These aspects are considered in detail in Chapter 4, Embracing Digital: Don't just "do" digital, "be" digital.

Figure 15: The ADL Digital Maturity Model



Source: Arthur D. Little

11
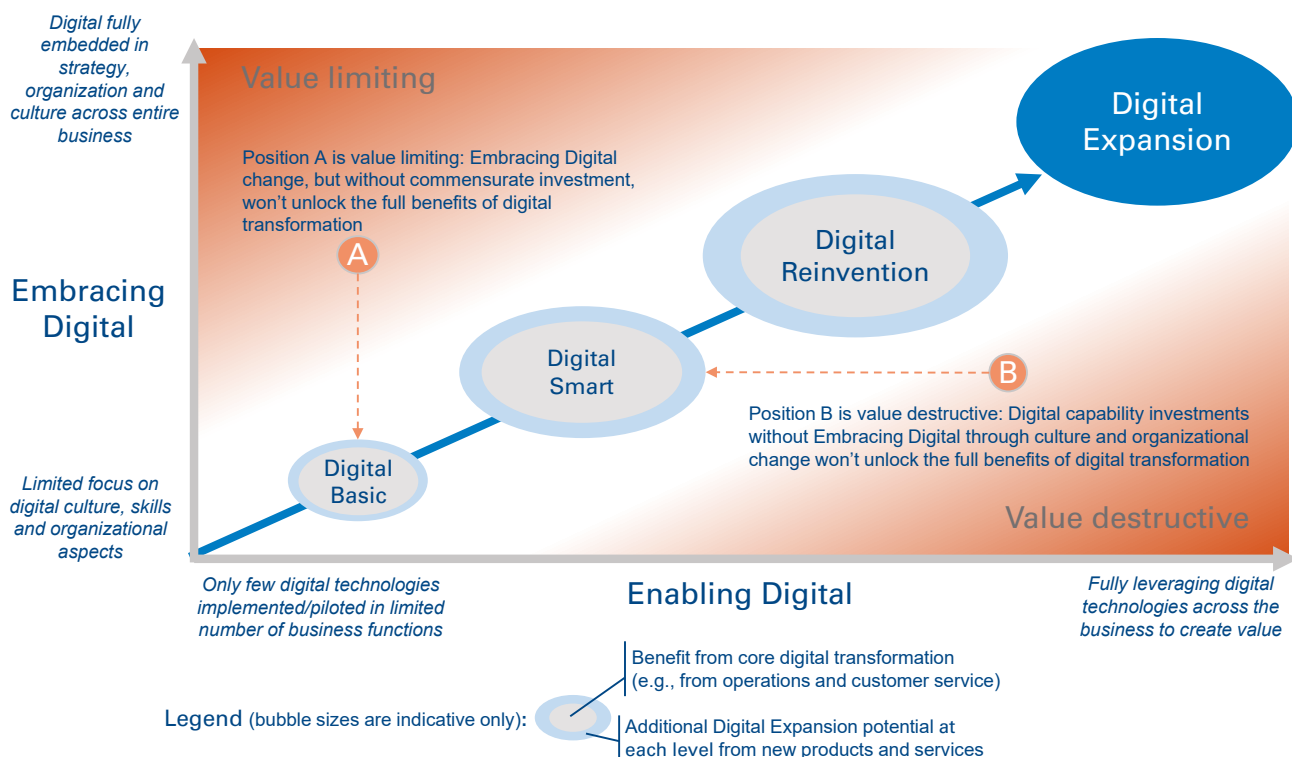
This provides an industry-specific model for assessing digital maturity across the whole organization, enabling benchmarking against others and empowering telcos to optimize their digital transformation roadmaps.

Based on the level of maturity along each of these two axes, a telco can then be classified into one of the four main levels of maturity outlined below: Digital Basic, Digital Smart, Digital Reinvention and Digital Expansion.

**Digital Basic** is the first step towards full digital transformation. At this stage of maturity, telcos start digitalizing individual processes and integrating and updating legacy IT systems (e.g., introducing e-sales, e-care, simple process automation, etc.). However, they continue developing products and services with the "analog customer" in mind. Approximately 33 percent of telecoms operators interviewed for our survey considered themselves to be Digital Basic.

**Digital Smart** is when the organization uses new technology advancements (for example, data analytics and AI) to improve the customer experience and make internal processes smarter and automated. They also develop products and services from the "online" perspective and integrate them into omnichannel customer journeys. This is the maturity level at which approximately 50 percent of survey respondents viewed their businesses.

**Digital Reinvention** is the level at which telcos think and act like large digital players, focusing on customer needs and experience, using agile leadership and organizational principles, joining up digital across their business processes and operating models, and striking a balance between scale and productivity

versus speed and creativity. Only 13 percent of interviewees considered themselves to be at the Digital Reinvention level.

**Digital Expansion** is the most advanced level of digital transformation, as organizations use enablers or new interfaces to venture into new areas and generate new revenue streams, expanding their business operations using digital capabilities. Only the remaining 3 percent of interviewees viewed their organizations as already being at this level.

It should be noted that Digital Expansion is not a final stage that few can achieve. Rather, the benefits coming from Digital Expansion can be partially achieved in earlier stages, while focusing on the core. As a result, companies can consider implementing beyond their cores, even if they have not fully reached the Digital Reinvention maturity level. However, expanding too rapidly before internal transformation is complete should be carefully considered.

## Our estimate quantifies digitalization as a 10ppt + EBIT opportunity

Through detailed analysis of our survey results, assessed against our financial analysis of 190 telcos worldwide, we have estimated the financial impact of digitalization for each maturity level and compared it against a base case (Digital Basic level) over a 10-year period (Figure 16). According to our model estimation, an aggressive move into digitalization can result in a substantial EBIT margin improvement when compared to the baseline of Digital Basic, with:

- Digital Smart resulting in an EBIT margin improvement of 2 percentage points.

Figure 16: Potential improvement in EBIT margin within 10 years
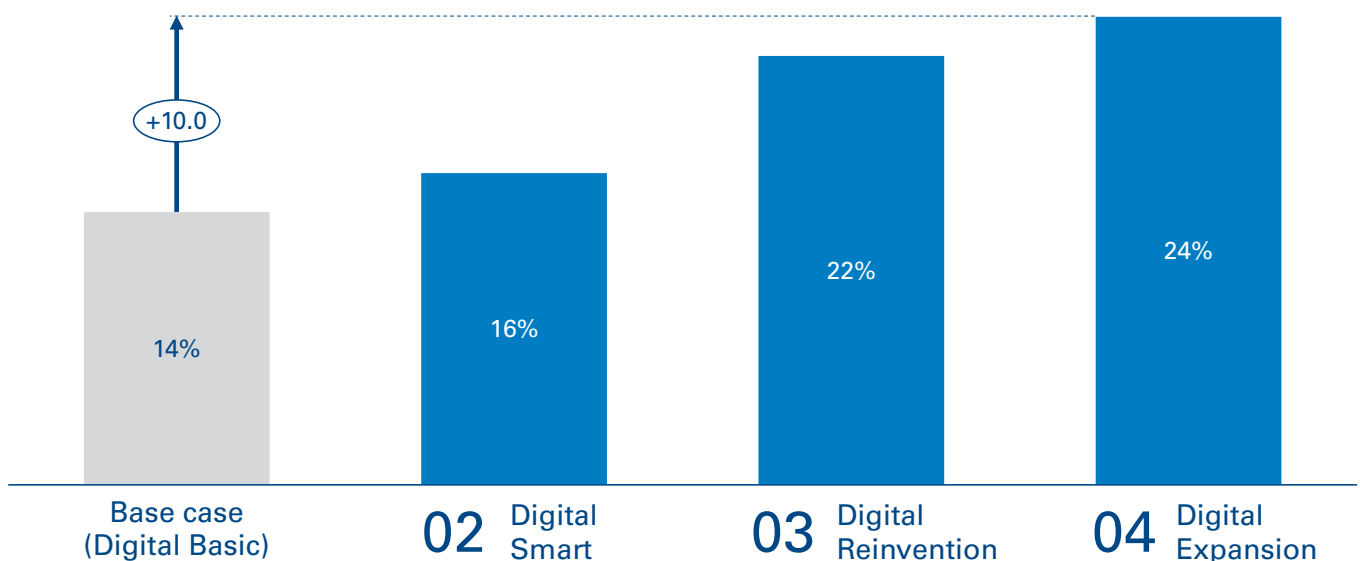


Source: Arthur D. Little

- Digital Reinvention showing an EBIT margin improvement of 8 percentage points.

- Digital Expansion showing an EBIT margin improvement of 10 percentage points.

This tells us that telcos should be targeting Digital Reinvention or Digital Expansion, as these deliver the biggest EBIT margin improvements. It is key to note that while digital expansion is independent of the digitalization of an operator's core business, our economic model (and resulting EBIT improvement) assumes a high degree of internal digitalization, and thereby combines the effects of top-line and bottom-line improvements.

### Focus should not be exclusively placed on "enabling" digital

When setting or refining the digital transformation roadmap, it is key to remember that Enabling Digital and Embracing Digital are equally important and should be developed in tandem. Delivering capabilities to Enable without changing the organization to Embrace will result in sub-optimal returns at best and failure at worst.

As illustrated in Figure 15, at points A and B, if the level of Embracing Digital is ahead of the investment in digital technologies (Point A) the benefit that the enterprise can achieve is limited. Equally, if the technologies are not fully adopted by changing the culture, reviewing the processes and integrating the digital strategy with the traditional part of the business (Point B), the value of investments will not be realized, and ultimately, value will be destroyed. To realize the full benefit potential of digital transformation, Enabling Digital and Embracing Digital must be conducted in careful harmony.

It is also important that telcos focus on all areas of their businesses. The digital technology adoption analysis in Figure 14 illustrates that operators tend to focus their attention on specific business functions (as would be expected with Digital Smart organizations), and are not digitalizing the business end-to-end. To develop beyond Digital Smart, a more holistic assessment (and transformation plan) needs to be considered.

The next two chapters consider Enabling Digital and Embracing Digital in detail, to support an in-depth assessment of digital maturity across all areas of an operator's business.

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## Digitalization -

*will be required to survive, preserve margins, respond to losing customers, and keep control. Telcos are so far behind FANG that when the tipping point comes, I am not sure telcos can respond*

*Executive vice president – Major telecommunications company*

"

# 3. Enabling Digital: The _new_ power behind the button

We have seen that the majority of fixed and mobile operators consider themselves to be Digital Smart, but is that a fair self-assessment? In this chapter we will further explore digital enablement, looking at what digital enabling technologies and capabilities are being adopted today and considering future opportunities and threats.

## Selective adoption of digital enablers is widely visible across all operators

Our survey results confirmed that telcos' widespread adoption of some digital technologies is already commonplace. More than half of respondents used Analytics/Big Data, Virtualization and Open source/APIs (Figure 13). However, a holistic approach to Digital Enabling technologies is rarely seen; instead, a functional (and often siloed) approach tends to be adopted, with varying levels of digital maturity based on the individual business function.

## Digital initiatives focus on network, customer service, product development, and marketing & sales

Our outside-in assessment of UK fixed operators suggests that digital initiatives are currently focused on network, customer service, product development, marketing and sales, as Figure 17 illustrates below.

Figure 17: Digital technology adoption – UK Fixed operators
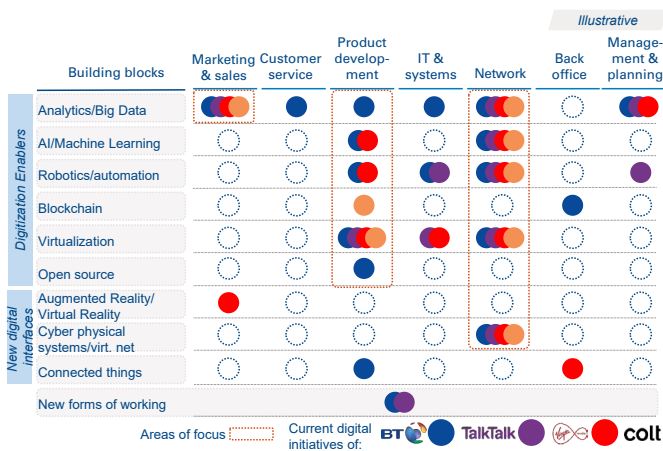


Source: Arthur D. Little market assessment

### Case study: Network virtualization

At the end of 2017, 45 percent of AT&T functions had been virtualized, and the operator was already seeing significant cost savings as a result. The company made the decision to adopt SDN and NFV for its networks in December 2014, establishing a target to transform up to 75 percent of its current network using SDN and NFV technologies by 2020. The roll-out included key functions such as smart APIs that could control services on demand in real time. Similarly, in December 2017, Vodafone announced its group-wide adoption of SDN and NFV technologies to increase the agility, consistency and efficiency of its network.

Source: Telefónica, Vodafone

### Case study: Decommissioning legacy

Telefónica considers its virtual digital platform a key enabler to providing the capabilities required to transform the organization into a digital telco. In 2016, the company accelerated the migration of its customers to this virtual platform. It will turn off 3,000 legacy systems over five years to move towards a virtual architecture. At the end of 2018, the company expects 30 percent of its subscriber base to be migrated (up from 14 percent in 2016). This transformation will allow Telefónica to reduce time to market while increasing customer satisfaction.

Source: Telefonica

### Case study: Self-optimization

Colt has been developing an AI-backed service platform under project Sentio, announced in November 2017. It is a new layer, or set of software capabilities, to provide automated service optimization and network restoration based on AI technology. The platform has capabilities such as automated service management, fault prediction, path optimization and automated capacity management. If implemented successfully, it could be breakthrough technology to help operators meet customer demand for more reliable and agile services while improving business operations.

Source: Colt

Network management has been chosen by many operators as a primary business function for digitalization. They are moving away from proprietary hardware and home-grown applications to an era of software-defined systems. The abstraction of the physical layer, replaced by software-defined network (SDN) and network functions virtualization (NFV) capabilities, is changing the ways networks are designed, built, and operated. These innovations are now a reality for many operators (not to mention enterprises) across the world. They allow operators' specific pain points to be addressed, e.g., complexity of vendor footprint and expensive and deeply embedded legacy systems. They also allow significant benefits such as opex reduction, simplification of technology orchestration, flexibility and scalability.

However, switching to a fully integrated telco cloud remains a complicated step for operators: vast existing physical infrastructures and a historical best-of-breed procurement approach that has led to a broad footprint of legacy systems are hindering the migration of networks and systems to the new world. Telefónica, considered a digital pioneer within the telco industry, is still undergoing its digital transformation process, turning off legacy systems and moving towards a virtual architecture solution. Operators such as Colt are trying to go a step further, towards digital Reinvention, with self-optimizing and zero-touch networks.
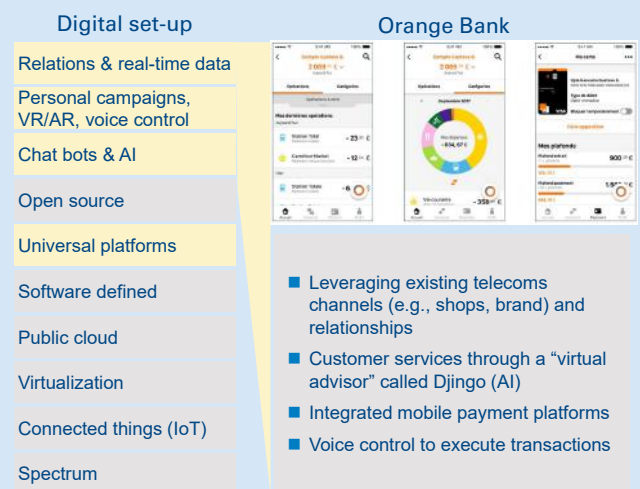
Customer service is a key business function in which digital initiatives have been widely implemented by both fixed and mobile operators. Customer experience at the center of an operator's strategy means digital tools providing improved customer engagement are immediately leveraged. For example, AI-enabled "chatbots" are now common tools used to support customer service (either in direct interactions with customers or as intelligent support tools for human agents). The AI used in these tools can simulate human conversation and respond to queries. More intelligent and collaborative tools are allowing organizations to seamlessly interact with customers across multiple devices and interfaces.

Product development has also been one of the core business functions on which telcos have focused their digital transformations. Telcos are already using AI and Data Analytics to improve the performances of product development processes, which has reduced costs and time to market while ensuring that products exceed customers' expectations. Operators are also leveraging their expertise to sell digital products and services.

## Case study: Digital diversification

In 2017 Orange France used the opportunity to build on its market and product capabilities to move into banking through digital enablement. The company acquired Groupama Bank to become a fully fledged bank – with reduction of churn in the core mobile business as the desired complementary benefit.

**Orange in digital financial services**



Digital set-up:
- Relations & real-time data
- Personal campaigns, VR/AR, voice control
- Chat bots & AI
- Open source
- Universal platforms
- Software defined
- Public cloud
- Virtualization
- Connected things (IoT)
- Spectrum

Orange Bank:
- Leveraging existing telecoms channels (e.g., shops, brand) and relationships
- Customer services through a "virtual advisor" called Djingo (AI)
- Integrated mobile payment platforms
- Voice control to execute transactions

Orange was confident that its knowledge of the mobile business, strong brand and customer relations gave it a competitive advantage to support its move into the banking industry. New, dedicated areas for opening bank accounts have been introduced in 144 Orange stores. The company leverages several digital enablers and interfaces to provide a digital customer experience superior to that of many incumbent banks: voice control and Augmented Reality in the mobile app, BI for overview of spending, AI for chatbots and customer care, etc. By the end of 2017, Orange Bank had 100,000 customers, and customer numbers are predicted to reach up to 2 million within a few years.

Source: Orange

## Case study: Digital analytics

Vodafone uses CleverTap, a digital behavior analytics solution, to improve the performance of its "My Vodafone App" by analyzing app usage data, identifying untapped customer groups and initiating customer engagement. The onboarding campaign improved the click-through rate (CTR) by 15 percent and engagement by almost three times, driving brand loyalty and long-term customer value.

Source: CleverTap

The use of Big Data combined with marketing and sales has opened new possibilities in terms of understanding the preferences and expectations of customers, allowing operators to tailor and personalize marketing engagement.

For example, digital behavior analytics is used to improve performance of apps, while identifying untapped/under-served customer groups and initiating customer engagement.

## The assessment builds a holistic view of the current digital technology

The initial step of the digital transformation journey starts with assessing the current state of the organization's digital technology. The objective of this assessment is to identify and assess the digital initiatives completed, under way and planned across the business. The resulting mapping allows the current state to be better understood and gaps within the vision for the future digital state identified. Initiatives are often spread across business functions, and can be at differing stages of maturity. Nevertheless, this complex landscape needs to be captured and analyzed to fully understand how to drive digitalization across the organization.

There are various alternative approaches to assessing digital capabilities, and no right or wrong way to do it. Assessment can be structured around the different business functions. However, this approach has the accompanying danger of an inward-looking view of the organization's digital capabilities, and may even reinforce capability silos. A more end-to-end approach would be to assess capabilities following a customer view, along the customer journey and across the various touch points with the organization, as shown in Figure 18. In this way the company can focus its efforts on the transformation itself, guided by the evolving digital behavior and needs of its customers. Certain operators have successfully adapted this focus on the customer journey while driving their digital transformations.

## Conclusion

Enabling Digital is normally the first step towards digital transformation, and one that many telcos are already taking. However, Embedding Digital thinking and Embracing Digital ways of working can be more difficult, as these require a significant change in culture, processes and organizational structure across the company. That is why it is also crucial to not just "do" digital, but to also "be" digital, and strike the right balance between Enabling and Embracing Digital, as discussed in the next chapter.

### Case study: Digital and customer first

AT&T has been facing significant challenges in adapting to its evolving needs. This is due in part to hyper data growth and increasing customer needs for global products and experiences that are mobile, virtual, effortless and ultra-fast.

Accordingly, the company launched its Digital First strategy to transform the business with personalized, effortless digital experiences. Its goal was to move 80 percent of customer interactions to digital channels by 2020. In order to achieve this, the strategy consisted of streamlining the customer experience as much as possible, which included driving greater digital awareness among customers, creating engaging and intuitive, customer-controlled platforms to enhance customer interaction and data collection. Thanks to this strategy, AT&T has reported that more than 75 percent of its customer interactions are now digital – on track to meet the 80 percent target in 2020.

The need for a clear vision is also reflected in the successful role that Digital First played in enhancing customer interactions through app utilization. In 2015, 87 percent of AT&T consumers registered to use myAT&T, with 49 percent using it on a monthly basis. As the number of digital interactions increased, AT&T experienced a reduction in calls to contact centers, a reduction in visits to retail stores, and an increase in year-over-year digital transactions, all while providing a preferred customer experience. This has resulted in total cost savings of over 200 million dollars each year.

Source: AT&T

Figure 18: Assessment framework for Enabling Digital across the organization

| | | Inflow | | | Base | | | Retention | | Outflow |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Discover | Engage | Buy | Get | Use | Pay | Support | Retain/ grow | Exit |
| Digital technology | Artificial Intelligence | | | Adopt chatbots to manage customer acquisition | | Fully integrate the IT systems and databases with the AI engine to optimize use | | Fault detection and predictive maintenance | Analyze data about the consumer with AI to determine the best times to contact the user | |
| | Robotic Process Automation | | Automation of target customer selection and engagement | | | | Automation of back-office processes such as invoicing and payment | Sort customer email queries automatically to select the most common queries | Build automated next-best offers to customers | |
| | Advanced analytics | Personalized marketing, based on customer behavior | | | Customer activation and provisioning analytics | Real-time product and service creation and management | | Automated IT security threat detection and resolution | | |
| | Virtualization | Adopting AR and VR to enhance the in-stores experience | | | Software-defined network, network function virtualization to enable rapid provisioning | | | Provide instruction to the customer using AR/VR to solve a technical issue | | |
| | Open source/ APIs | Adoption of APIs (application programming interfaces) across the organization to enable diverse platforms, apps and systems to connect and share data with each other, boosting interconnectivity, and allow developers to access the functionality of other software | | | | | | | | |
| | Cyber security | Adoption of a cybersecurity strategy to protect assets, including reputation, intellectual property (IP), staff and customers | | | | | | | | |

Acceptance
Understanding
Pilot
Adoption
Awareness
Embedded

The level of adoption of digital technologies is assessed across the business & customer journey to define the level of digital enablement

**Enabling Digital**

Source: Arthur D. Little

"

*Full-scale transformation to digital will benefit the most, despite the high risk. The real danger is the challengers with no legacy; they could be very disruptive for the industry*

*Vice president – Major telco operator*

"

# 4. Embracing Digital: Don't just "do" digital, "be" digital!

As we saw in the last chapter, digital transformation requires a number of targeted investments into technology across the organization. However, the benefits of those investments can only be fully realized if the company also invests in and embraces the "softer" aspects of digital transformation. Unless all of the people in the organization fully Embrace Digital transformation, there will be limited impact, so strategy, people & culture, and organization & processes must be at the core of any successful digital transformation (Figure 19).

## A digital strategy provides the structure and oversight necessary to fully Embrace Digital

Telcos are heavily investing in technologies and digital tools to bring digital transformation into their businesses, as we saw in the last chapter. A clear vision is fundamental to incorporating these technologies into the organization and making sure employees embrace the resulting change. Strategy not only serves as a key role in driving technology change, but also lays the foundations for rapid and efficient adoption by the organization as a whole.

Digital strategy should not be developed or managed in isolation from the organization's corporate strategy; it should be an integrated part of the overall corporate strategy. The corporate strategy and the digital strategy should be one and the same to make digital a fully leveraged enabler for the business.

### Case study: Orange Social Hub

The Social Hub was inaugurated with the launch of #Essentiel2020, the new strategic vision for Orange. The Social Hub is a connected common place that can track social media activities in real time. It includes 18 screens monitored by at least six employees round the clock. Thanks to this initiative, Orange can stay connected with its customers 24/7, which, in turn, gives the company better understanding of their needs inside and outside of the digital world. Three fundamental objectives are met thanks to this connected space:

- Collection of customer feedback and opinion, which enables each request to be addressed in a tailored manner and creates more awareness among Orange's staff members about their customers' needs.

- Real-time sharing and tracking of company announcements, which keeps each employee up to date with the strategy and vision of the company, as well as other operational issues.

- Creation of a collaborative workplace that can host different departments across the organization; this allows them to mutually share capabilities and expertise, as well as take advantage of other teams' know-how and data visualization tools.

Source: Orange

Figure 19: Strategy, people & culture, and organization & processes are at the core of digital transformation



| | | Cross-functional questions |
|---|---|---|
| Strategy | Digital-driven strategy | Is there a defined vision for the digital transformation? |
| | Alignment with corporate strategy | To what extent is your digital strategy embedded in your corporate strategy? To what extent is your digital vision supported by senior leaders in your organization? |
| People & Culture | Digital skills | Do you have a clear recruitment strategy to attract and develop digitally skilled talent? |
| | Digital mind-set | Is there a strong internal awareness of digital trends? Does the company culture allow and encourage collaboration between digital and traditional business? |
| Organization & processes | Organizational structure | Are the right organizational structures & processes in place to enable the digital strategy? Is the company driving collaboration with an ecosystem of partners? |
| | Agile and ambidextrous | Is the company operating in an agile way (being an ambidextrous organization)? Is the company embracing new ways of working enabled by digital tools? |

Source: Arthur D. Little

## Digital transformation requires a fundamental cultural and organizational shift

Culture defines the set of unspoken rules and inherent values of an organization. Usually, the longer the company has spent developing and fostering its culture, the stronger the culture becomes. A strong culture engenders a sense of belonging and helps to ensure that the strategic vision and objectives set by the organization are commonly shared and embraced among all employees.

In the context of digital transformation, however, an organizational culture that drove success in the past can potentially hinder progress and take significant time and effort to change.

This can be particularly true for incumbent telcos, many of which can trace their roots back for 100 years or more and have developed cultures around organizational hierarchies and structures that have allowed them to scale over decades. However, these may have outdated processes in place. Such rigid structures and embedded cultures can become barriers when embarking on digital transformation.

One way to decrease cultural barriers and create more open and agile cultures within organizations is through flexible and/or remote working. The relationship between flexible working and digital transformation revolves around three key points:

- Innovation: Flexible working helps foster flexible thinking – employees are more creative and agile, which results in an organization that can adapt and react faster to changes.

- Technology use: Remote working requires greater reliance on and use of digital technologies, which can encourage embracing of digital transformation initiatives more quickly.

- Digital natives: Flexible- and remote-working initiatives can make it easier to attract digital natives, and digital natives both demand and help foster cultures of innovation, embracing change, and increasing focus on the new skills and capabilities required for successful digital transformation.

Telcos should also align their corporate cultures and digital transformations through their offices and working environments. Office redesign is a powerful tool that, when used in tandem with redesign of organization structures, can help to accelerate cultural change. A more open-plan office layout, if properly equipped with innovative tools and using digital collaboration tools, can help employees to become more accustomed to digital initiatives and ultimately foster a more digitally aligned culture.

### Case study: Tele2

A good example of digital ways of working is Tele2's ambitious agile (re)organization, although a number of other leading telecoms operator groups are working on implementing similar organizational models.

Tele2 wanted to increase speed and effectiveness, and after considering various options, the business decided to adopt an agile methodology that would define governing principles to guide everyday work.

Tele2's agile principles
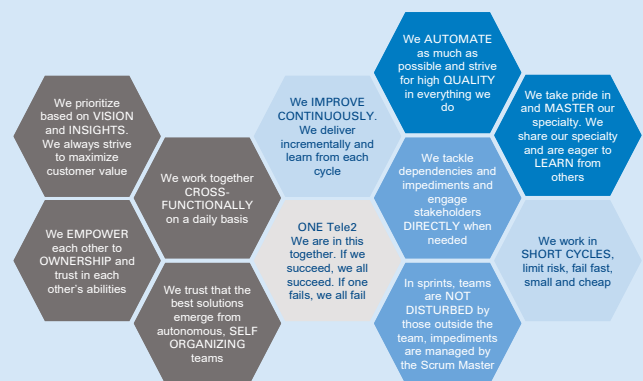


Similar to the organizational model of Spotify, Tele2 introduced "tribes", "squads", "chapters" and "guilds". This set-up enables fixed, cross-functional teams and increases the collaborative culture and overall level of innovation.

Source: Tele 2, Arthur D. Little

Tele2's cross-functional collaborative operating model
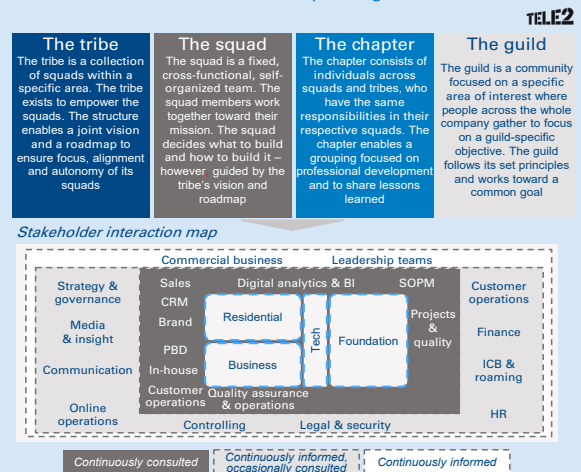


Source: Arthur D. Little analysis

Tele2 revolutionized the digital customer experience through focused, autonomous teams and structures, and is currently aiming for higher customer satisfaction, faster deliveries, less defects and improved employee satisfaction.

Source: Tele2

The Orange Social Hub case study shows how telcos are beginning to increase their focus on Embracing Digital in the workplace. Retraining existing employees with more digitally aligned skills and ensuring new hires bring digital skills are also key to Embracing Digital transformation.

Technologies, digital tools and software present both challenges and opportunities for telcos. One of the differentiating factors between successful and unsuccessful digital transformation initiatives is people. For example, customer insight, interactions and data generation enabled via digital transformation will ultimately need to be driven, understood and managed by people.

In this area of development, telcos should focus on two aspects with respect to digital transformation:

- Employees need to be either hired or retrained with digital skills.

- Digital innovation allows more effective training.

Vodafone's employee-training mobile app illustrates the importance of digital in training, demonstrating how operators can Embrace Digital transformation to improve training in digital skills and so drive improved productivity. The app allows employees to easily and quickly access training materials to do their increasingly digitally enabled jobs. As a result of the app's deployment, learner engagement has grown rapidly and sharply compared to previous approaches, eventually topping 10,000 items viewed per day.

Similarly, collaboration between Deutsche Telekom and Duke Business School to create the "levelUP!" program shows how executives can globally engage in digital transformation online. These tailored online programs can play a significant role in driving the organization to "'think digital", and so help to nurture a more digitally aligned and digital-embracing culture.

Despite its importance, cultural change alone is not enough. Organizations need to be reconsidered for the digitally transformed world, and significant change may be necessary. As well as needing new skills, organizations must reassess their structure and staffing levels end-to-end and make sure the they are equipped to benefit from digital transformation. The key to successful digital transformation is to let machines do what machines do best, and people do what people do best – if that balance can be accurately struck, the synergies to be derived from human/machine interactions are significant.

The complexities of this level of change for large telcos – both cultural and organizational – are not to be underestimated, and may in part explain the delays in delivering digital transformation,

and why telcos lag so far behind FANG-like organizations, which have no such legacies or heritage to manage. The heritage of telcos brings with it social responsibilities to employees who may have worked for an organization for 40 years or more – driving change under those circumstances is not a trivial task.

## Embracing Digital requires a focused agile approach

When looking across operators' business functions, we can see opportunities at almost all levels to benefit from digital transformation, as illustrated in Figure 20.

However, choosing where to start first requires assessment and prioritization, based on a mix of ease of implementation, potential value, fit with digital strategy, and alignment with strategic priorities.

Figure 20: Opportunities & maturity for digital technology
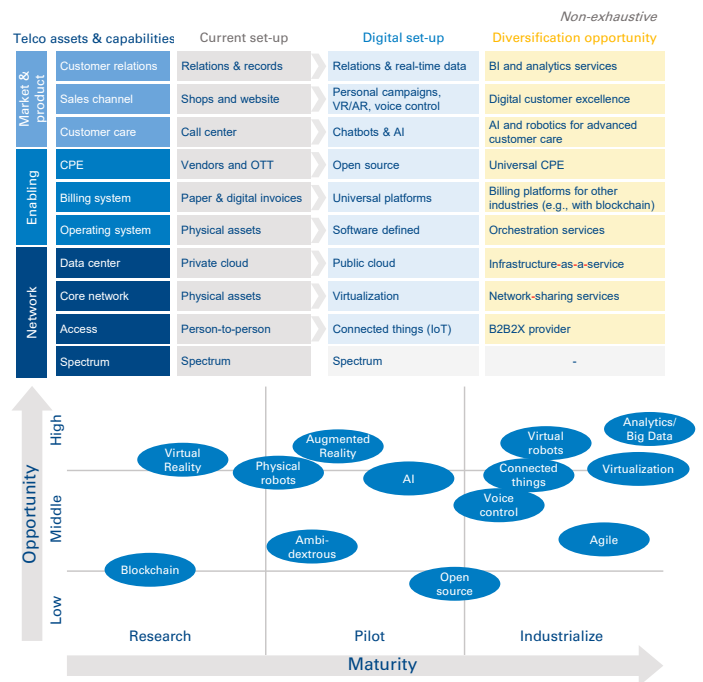


Source: Arthur D. Little

Inspired by agile methodologies, one of the best-practice approaches observed within digitally advanced companies is an agile approach known as "test and run". This is based on four values:

1. A strong focus on individuals and interactions over processes and tools.

2. Delivery of working software over comprehensive documentation.

3. Relentless focus on customer collaboration over contract negotiation.

4. Responding to change prioritized over following a plan.

While this approach was designed for software development, these values can and should be used when seeking to Embrace Digital transformation. Supporting these four values, the 12 Agile Manifesto principles shown in Figure 21 can serve as an additional reference point to help organizations to deliver rapid change, with a focus on the value to the business and its customers.

Figure 21: 12 principles from the Agile Manifesto

| #1 Deliver early & often | #2 Embrace change | #3 Deliver regularly | #4 Work with the business | #5 Trust your team | #6 Meet face to face |
|---|---|---|---|---|---|
| #7 Software is progress | #8 Keep progress constant | #9 Be vigilant | #10 Keep it simple | #11 Teamwork | #12 Take time to reflect |

Source: Agile Manifesto

## Achieving strategic agility in the telecoms industry through organizational change and agile

Embracing Digital throughout the organization has significant implications for the way the company is organized in terms of both structure and processes. New skill sets need to find places within the organization where they can grow and drive improved collaboration with more traditional business functions and areas. One illustration of the need to adapt the organization structure is the convergence between the IT and network functions.

Telcos, like companies in many other sectors, face the challenge of integrating new ways of working on the one hand, and continuing to deliver efficiency and scale on the other. At the organizational level, the concept of the ambidextrous organization offers tangible and balanced answers to this most pressing management dilemma. Companies can be defined as "ambidextrous" when they continuously solve the trade-off between speed and creativity and scale and productivity, as illustrated in Figure 22.

Figure 22: Ambidextrous organization framework
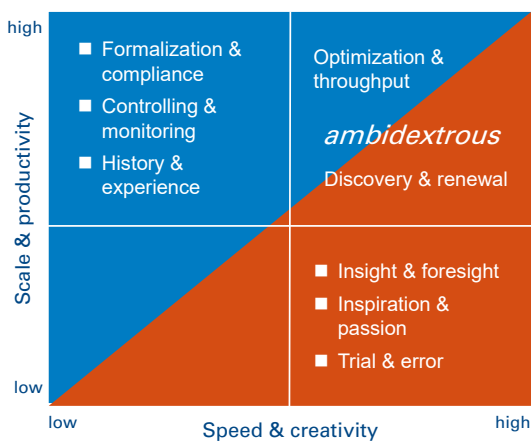
Source: Arthur D. Little

### Case study: AT&T Foundry

In the spring of 2018, AT&T opened its latest innovation center in Mexico City. This built on the three existing innovation centers in:

- Silicon Valley: talent hub for customer software
- Israel: talent hub for network infrastructure
- Dallas: talent hub for enterprise software

These centers are designed to bring innovation in from outside AT&T. Start-ups are attracted to them due to a unique resource mix and the 360-degree interactions among internal and external teams facilitated by an adaptable space.

This organizational structure and office environment is well suited for fast-paced innovation, where proactive change is constantly endorsed and teams can focus on creating better ideas.

Intucell, a start-up networking technology company, was attracted to AT&T Foundry's unique offering. This led AT&T to take advantage of Intucell's capabilities, which resulted in a 10 percent increase in call retention and throughput speeds, alongside a 15 percent decrease in network overloading where the system was deployed.

Source: AT&T

Businesses with emphasis on the speed and creativity dimension possess strong capabilities that enable anticipation, innovation and adaptation. These translate into corporate attributes such as insight and foresight, inspiration and passion, and trial and error.

Conversely, companies that excel in the scale and productivity dimension demonstrate strong capabilities when it comes to planning, as well as optimization and control. This results in attributes such as formalization and compliance, controlling and monitoring, and history and experience.

Ambidextrous organizations – those that manage to balance these two potentially conflicting dimensions – establish an equilibrium characterized by strong emphasis on both dimensions. We have supported numerous clients in achieving tailored organizational equilibrium that delivers both speed and creativity _and_ scale and productivity.

As shown in our viewpoint on this topic, _Ambidextrous organizations – Building sustainable organizational advantage_, the vast majority of companies tend to focus on one of the two dimensions at the expense of the other. Organizations that do manage to excel in both dimensions are rare – but reaping the benefits of their ambidexterity.

In terms of new ways of working, the agile model has proven that it helps organizations to improve on the speed and creativity dimension. For operators, this is especially relevant not only to embracing the new digital capabilities that are being deployed, but also to achieving higher operational performance across the organization – for example, with fast, well-informed and objective decision-making.

Many telcos have track records of letting large-scale or prestigious projects drag on due to vested interests of key people in the organizations, or as a result of significant sunk costs. In our survey, 51 percent of respondents said that in their organizations, decisions were mainly based on experience or ambition, albeit complemented by operational and financial analysis. While only 41 percent stated that within some business areas of their organizations, real-time information was accessible and used to support decision-making. Embracing the new digital ways of working will achieve fast decision-making, which will enable operators to fail fast where necessary but, as a result, succeed at an accelerated pace.

Despite the benefits, wholesale adoption of the new ways of working described in this chapter can be challenging for large organizations. For this reason, a pilot and phased roll-out approach can demonstrate the benefits of Embracing Digital on a manageable scale in the first instance, while delivering demonstrable business value. An excellent example of how to demonstrate the benefits of Embracing Digital on a pilot basis while delivering tangible business benefits is the AT&T Foundry program, which established multiple digital innovation centers that now deliver real business benefits.

### Conclusion

Defining a digital strategy, identifying and promoting new skills and digital culture, and adapting your organization and processes are necessary to enable and scale digital transformation. They should be driven together in order to fully Embrace Digital. A new, "Google-like" office environment will not be enough to push staff to Embrace Digital. Processes, organization structure, training, recruitment and strategy all need to push together to create the right culture and environment to Embrace Digital and so realize the full potential of digital transformation.

*There is currently a huge mismatch between culture, objectives and action. The pace of digitalization is increasing and requires a mind-set change*

*President – Major networking company*

# 5. Delivering digital: Driving real change and adding real value

Once a telco's digital maturity and current positioning have been assessed and considered, the next steps are to refine the digital strategy, define the finance and investment plan, and implement these to deliver the Digital Dividend.

## From maturity to delivery: How to align strategy, investment and delivery

The output from the maturity assessment will provide a comprehensive understanding of current capabilities and gaps, enabling rapid review and optimization of the overarching digital and corporate strategy. This, in turn, will allow investment plans to be developed, considered in the context of overall capital allocation priorities and optimized as far as possible to drive digital delivery, as illustrated in Figure 23 below.

Figure 23: Strategy and finance review to digital delivery
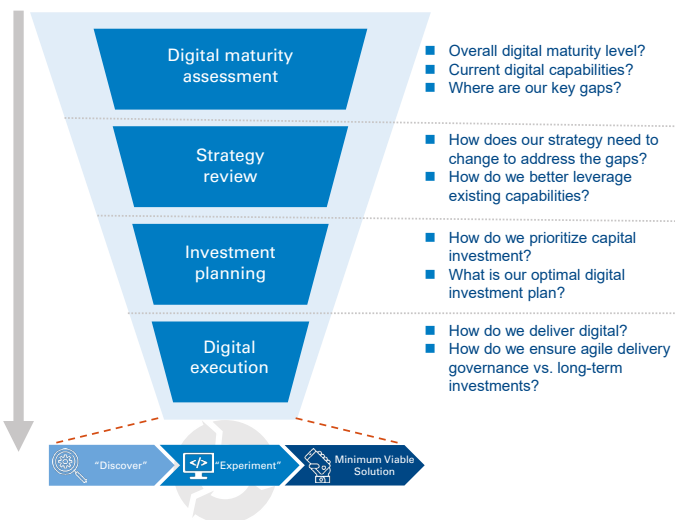


Source: Arthur D. Little

Through this strategy review, telcos can ensure they have the right focus to efficiently drive up digital maturity levels, by closing key gaps and better leveraging existing capabilities. This strategy is then realized through an optimized finance and investment plan, and an effective digital delivery framework.

## Traditional capex planning cannot be applied to digital transformation

When resetting the digital strategy, a key consideration is the capex investment plan. Telcos typically invest 12–20 percent of their total revenues as capex, which equates to some 230 billion

**Case study: Obsess over the customer and reduce friction**

Truly digital companies aim at minimizing the friction involved in using their services. The easier it is to use a digital service, the better.

Amazon follows the motto, "Obsess over customer", and this results in a best-practice ability to eliminate friction at its customer touch points. As early as 1997, the company introduced "one-click" shopping on its website.

The launch of Amazon Prime in 2004, with free shipping as key feature, was the next major step towards frictionless online shopping.

Today, more than 100 million Prime customers can buy most items from the vast Amazon catalog without thinking about shipping costs, and receive their purchases within typically 24 hours.

For grocery shopping at Whole Foods Market, Amazon even guarantees a two-hour delivery window in certain cities.

In 2017, Amazon's shipping costs accounted for a staggering 21.7 billion USD, which made it one of the largest cost lines of Amazon's P&L, only partly offset by shipping revenues. Nevertheless, in keeping with the company's motto, this friction-reducing approach, underpinned as it is by Prime subscriptions, adds huge value to the business.

Source: Amazon

EUR annual capex spend by the 190 companies analyzed across the global telecoms industry.

In contrast, FANG companies typically commit to small numbers of large-scale investment projects in tangible assets that create structural competitive advantage (e.g., Tesla's giga-factory, Apple's retail network, Google's global data center infrastructure and Amazon's fulfillment centers). These are nearly impossible for a direct competitor to match.

The purpose of these large-scale investments is typically to achieve substantial improvements in customer experience (e.g., the global Netflix Content Delivery Network and low-latency search results by Google) or production efficiencies through the control of key steps in the value chain.

Figure 24: CAPEX Investments in digitalization

% of participants

% of capex invested in digitalization
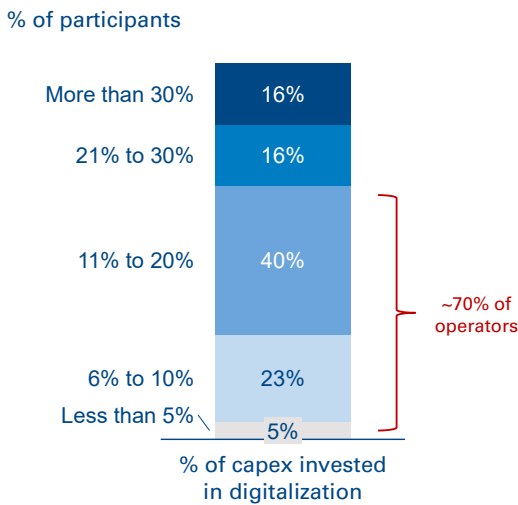
Source: Arthur D. Little

In addition, digital players allocate the remainder of their capex spending to many comparatively small initiatives with high rates of return. While digital players would commit to projects with 100-times return and likelihood of 10 percent, most telco decision-makers would not commit to any project with almost-guaranteed likelihood of success, albeit that the potential returns are commensurately more modest.

So, while telcos are willing to invest in large-scale projects to roll out 5G, replace BSS/OSS stacks, virtualize networks, etc., they do not tend to make smaller investments in higher-risk projects with potentially high rates of return. To truly transform into digital telcos, operators will need to adapt this investment strategy and approach to a digital environment with digital risk/reward profiles.

The second investment challenge for telecoms operators is the digital share of funding, as our survey found that nearly 70 percent of interviewed telecoms operators committed 20 percent or less of their overall capex envelopes to digitalization initiatives. For telcos to truly reinvent themselves as digital companies, they need to increase this capex allocation to digital initiatives and modify their investment strategies accordingly.

## Strategy and implementation are intertwined – Our delivery framework allows an agile and iterative approach

In an agile digital world, strategy, capital allocation and implementation are intertwined and iterative. Strategy can no longer be a process conducted once a year (or even worse, once every three or five years, as has been the case with some telcos). Capital allocations should be more dynamic and flexible. An understanding of overarching objectives and associated

investment planning is, of course, necessary, but the strategy and planning process should not be considered done once the implementation begins. Instead, it should be continually reassessed and reprioritized.

Based on our experience and the results of the survey, there are common issues telcos face in this critical phase, primarily with legacy systems and lack of the necessary talent and skills (Figure 25).

Figure 25: Most frustrating issues encountered in digitalization

% of topics mentioned by respondents
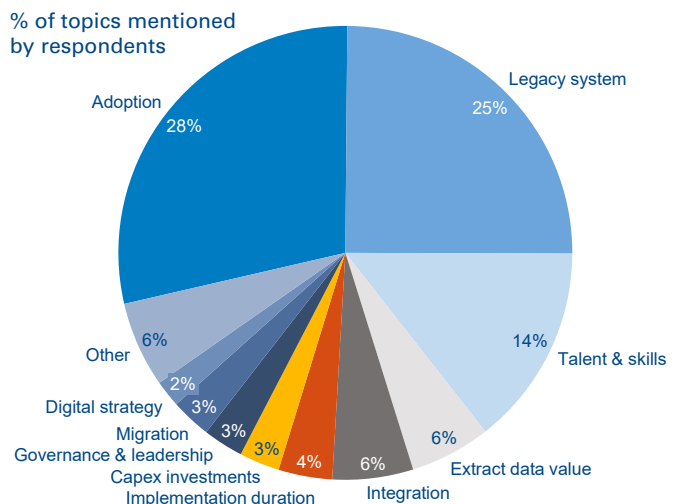


Source: Arthur D. Little

Companies often struggle to integrate legacy systems with new systems, and tend to buy monolithic stacks that involve huge capex investment and long implementation timelines.

Telcos also struggle with acquiring and developing talent and skills to support their digital transformations. The supply of digital skills is relatively low and the demand high, which makes it hard to recruit and retain people with the required skills. However, there are more and more programs being developed by telcos to build digital skills, as the BT and University of Alcalá digital transformation MA example demonstrates.

To support the delivery of digital initiatives and help address these challenges, ADL's Digital Problem Solving practice has developed an approach which is rigorously creative, combining traditional management consulting techniques with design-led thinking and FANG-style patterns and methodologies.

This digital delivery approach has been tailored to the telecoms sector, providing the benefits of deep-sector skills and knowledge as well as broad, cross-sector digital transformation skills and experience. At its core, the approach has three phases: Discover, Experiment and Minimum Viable Solution, as illustrated in Figure 26.

Figure 26:  ADL delivery framework



| "Discover" | "Experiment" | Minimum Viable Solution | n+ |
|---|---|---|---|
| ■ Understand holistic view of problem and root cause, linking people, process and technology<br>■ Determine desired outcomes<br>■ Divergent ideation process (telco and adjacent domains)<br>■ Develop business case | ■ Create solution hypotheses (building on desired outcomes)<br>■ Design (process or prototype technology)<br>■ Experiment – seeking user/behavioral feedback<br>■ Validate/revalidate learning<br>■ Invest, pivot and/or stop decision point(s) | ■ Actions to deliver desired outcome<br>■ Scaled delivery<br>■ Benefits tracked and measured once delivered<br>■ Constant reframing of question to ensure on track | ■ Iterate as needed |

Source: Arthur D. Little

The approach starts with the **Discover Phase**. The focus of this phase is on bridging the gap between what is needed to be known and what is actually known at the outset. To this end, a holistic approach is taken, which assesses the objectives and issues that the digital initiatives are designed to address. Through this process a carefully crafted solution hypothesis can be developed, combining industry expertise with insight and learnings from digital leaders. This allows the initiatives and solutions to be tested, and thereby, falling into the trap of applying a previously used (and often sub-optimal) solution to a new problem is avoided.

The **Discover** approach:

■ Develops a holistic view of the problem (and root causes), linking people, processes and technology across conventional organizational boundaries and business units – while considering both enabling and embracing aspects equally.

■ Articulates desired outcomes in the voice of the customer (whether internal or external customers).

■  Uses divergent thinking to generate innovative solution hypotheses.

■ Defines business case(s) to help focus, quantify and prioritize ideas.

Examples of tools that may be used during the Discover Phase are illustrated in Figure 27.

Case study: BT and University of Alcalá digital transformation master's degree

Development programs and university degrees are useful approaches that companies should adopt to organically address the high demand for digital skills through retraining. BT is implementing these initiatives through its digital transformation master's degree, in partnership with Universidad de Alcalà in Spain.
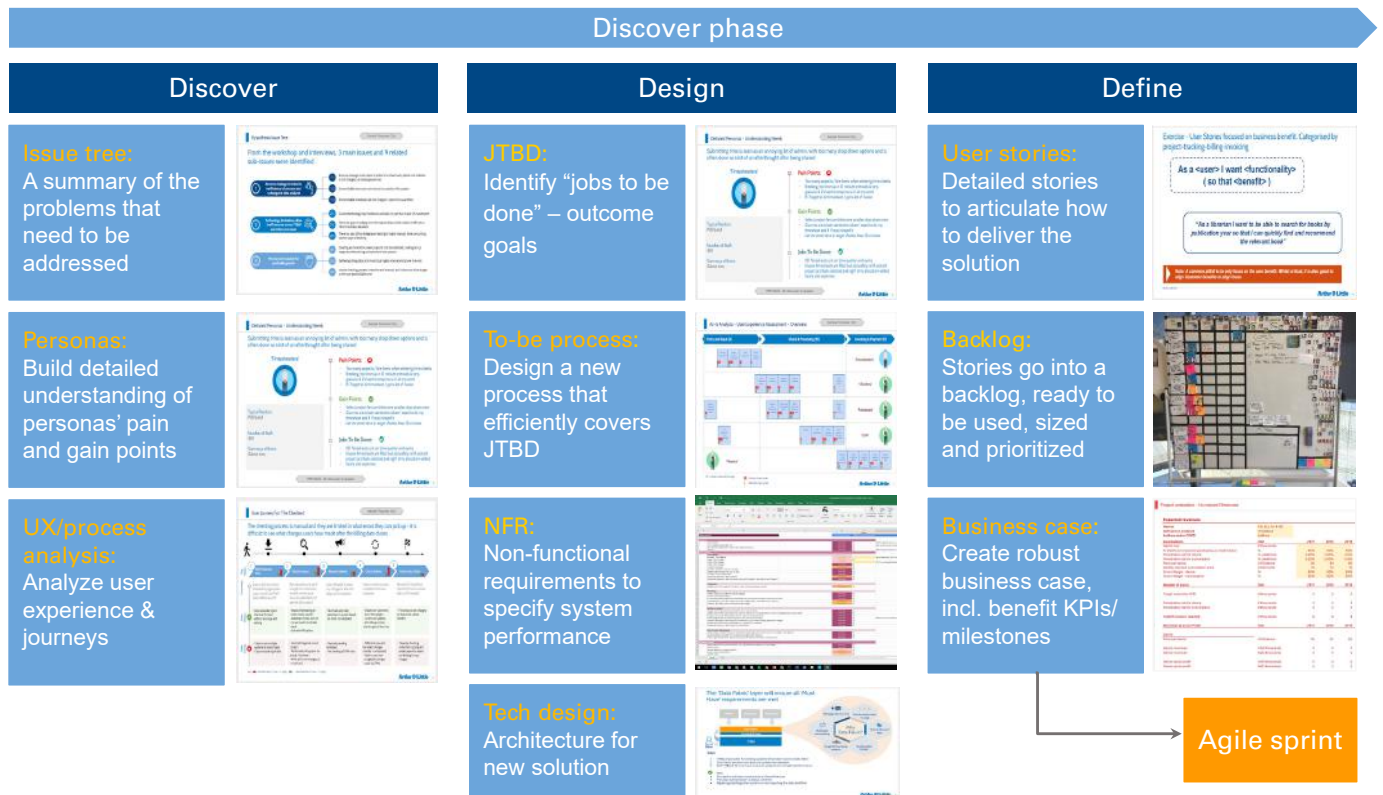
This two-year differentiated training program aims to bring brilliant candidates up to speed with the latest technological trends and digital transformation issues in the telecoms industry.

Twenty-eight BT executives recently received their digital transformation master's degrees from the Universidad de Alcala. The program's curriculum included modules on digital business, Big Data, the Internet of Things, application performance management, collaboration, mobility, security, cloud computing and virtualization. This makes it a very broad and all-encompassing, 360-degree digital transformation course.

Source: Amazon

The Discover stage rapidly translates desired outcomes into solution hypotheses, which can be quickly tested with users to identify and validated learnings. This part of the approach is called the **Experiment Phase**, and helps to bridge the difference between designed/desired/anticipated outcomes and actual outcomes.

Figure 27:  Examples of tools used during the "discover" phase



| Discover phase | | |
| --- | --- | --- |
| **Discover** | **Design** | **Define** |
| **Issue tree:** A summary of the problems that need to be addressed | **JTBD:** Identify "jobs to be done" – outcome goals | **User stories:** Detailed stories to articulate how to deliver the solution |
| **Personas:** Build detailed understanding of personas' pain and gain points | **To-be process:** Design a new process that efficiently covers JTBD | **Backlog:** Stories go into a backlog, ready to be used, sized and prioritized |
| **UX/process analysis:** Analyze user experience & journeys | **NFR:** Non-functional requirements to specify system performance | **Business case:** Create robust business case, incl. benefit KPIs/ milestones |
| | **Tech design:** Architecture for new solution | **Agile sprint** |

Source: Arthur D. Little

The **Experiment** approach:

- Translates desired outcomes into solution hypotheses to be tested.

- Designs a new process, organizational capability, or technology prototype.

- Allows experimentation of the prototype with users to seek feedback.

- Provides feedback to validated learning opportunities to help optimize the process capability/technology prototype before scaling out.

- Helps inform the "invest, pivot or stop" decision, which helps companies invest money efficiently and validates key assumptions used in business cases.

Following successful design of the intended solution, the next step is to create a set of actions to deliver. We call this phase the **Minimal Viable Solution**; and it is designed to deliver just that – a minimum viable solution that has been tested and validated and is ready to be embedded in the business. Adoption engineering and behavioral change management are key to this process to ensure scaled delivery and user/customer

acceptance. Equally important are tracking and measuring benefits once they have been delivered.

The **Minimal Viable Solution** approach leads to:

- Pragmatic and focused actions to deliver the desired outcome.

- Preparation for at-scale delivery and change embedded within the organization.

- Fully tracked benefits, both potential and realized.

### Conclusion

In summary, developing and optimizing your digital strategy based on a maturity and positioning analysis will enable you to drive your digital transformation forwards. However, it doesn't stop there. The approach to deliver this strategy is as important as the strategy itself, as you need to:

- Build a balanced approach, designed to deliver your digital transformation across your business through technology and people – Enabling and Embracing Digital.

- Ensure you have the right investment strategy, and don't exclude smaller, higher-risk initiatives which could provide significant returns – investing with a digital mind-set.

- Deliver your initiatives in a digital way, following the three-phased approach of: Discover, Experiment and Minimum Viable Solution – delivering digital.

Also, remember this isn't a one-off process. Rather, you need to constantly review and optimize your digital strategy and delivery plans to be agile and both Enable and Embrace digital transformation.

"

*Implementation requires time and resources. Everything has to be reworked and involves: eliminate, simplify, standardize and digitalize*

*Director – Leading networking company*

"

**Arthur D Little**

# 6.  Eyes on the prize: Conclusions and key take-aways

## Conclusions

Life has not been easy for telcos over the past decade. New OTT technologies have eaten away at core business revenues, and rapid developments in core fixed and wireless technologies have been a continuous drain on scarce capital, while returns on investments have fallen. Customer expectations have never been higher, while the cost of meeting those expectations has not been reduced. Our analysis shows that over this period, revenue globally in the telecoms sector has slowed to very low-single-digit CAGR growth, while core communications revenues have actually shrunk in some developed markets.

Against this backdrop, telcos have been seeking the means to regain customer loyalty and build more profitable and sustainable revenue streams in the face of ever-greater competition. As we have seen in this paper, the broad adoption of digitalization would seem to be the answer, providing, as it does, the opportunity to dramatically improve financial performance for telcos. This opportunity, or Digital Dividend, represents an incremental EUR 200 bn opFCF opportunity globally.

Given the size of the prize, and, according to our survey, the fact that telco executives are already aware of the importance of digital, it is surprising that more is not being done. Seventy-three percent of our survey respondents agreed that digital was value contributive (and a further 11 percent thought it could both add and destroy value), but the level of digital transformation remains immature compared to other industries, and there is certainly plenty to do.

Investors and shareholders are increasingly waking up to the opportunities that digital transformation represents, and are also beginning to place pressure on leadership teams to move faster along the digital maturity scale.

However, the path to delivering this Digital Dividend is far from straightforward, and the risk of commoditization and/or disintermediation from customers remains ever present for telcos. To improve digital maturity and access the Digital Dividend, telcos must first better understand their current state of digital maturity.

In this paper, we have proposed a Digital Maturity Model to allow telcos to assess their current capabilities and statuses on an objective and holistic basis. We have also proposed approaches to help prioritize and sequence digital transformation initiatives and deliver transformational improvements. We have seen that these improvements will only result in genuinely transformational improvements in performance if they are considered end to end across a telco's business model (and not just by looking at siloed activities in isolation).

The maturity assessment is based on two dimensions, both of which are critical to success: one is focused on embedding digital technologies in the business (called Enabling Digital), and the other is focused on embedding digital thinking and behaviors into the organization's culture, strategy and processes (called Embracing Digital).

Building on this baseline view, telcos can refine and optimize their digital strategies, prioritize their portfolios of digital initiatives, and use our delivery approach to progress through the four maturity stages of Digital Basic, Digital Smart, Digital Reinvention, and Digital Expansion to realize the opportunity presented by the Digital Dividend.

Once upon a time, telcos were at the forefront of the digital revolution. The industry now has the opportunity – as well as a clear incentive in the form of the awaiting Digital Dividend – to catch up with more progressive digital businesses that have, quite simply, left telcos behind.

Catching up will enable telcos to improve operational efficiency, deepen engagement with customers (and employees) at all levels, and dramatically improve decision-making across their organizations. The prize is well worth the effort, but a fundamental shift in focus and significant effort (not to mention continued investment), as well as substantial stakeholder engagement, both within and outside the organization, are required to reposition telcos at the forefront of digital transformation.

## What next?

With the financial analysis, survey results and case examples all demonstrating the value of the Digital Dividend, the key challenge for telcos is now to deliver digital transformation. With the threat of commoditization of core connectivity offerings, it is imperative that telcos rapidly up their digital games by following the five steps outlined in this paper and summarized below:

1. **Assess current digital maturity** – Assess the digital maturity of the organization end-to-end, through the separate lenses of Enabling Digital and Embracing Digital. The technology and cultural/organizational changes need to be delivered in tandem and holistically across the organization to maximize returns on investment and, ultimately, increase digital maturity.

2. **Redefine and optimize digital strategy** – The process of redefining and optimizing the strategy will enable the organization to focus on the key objectives of achieving digital transformation – always bearing in mind that digital strategy and corporate strategy should be completely interlinked.

3. **Develop and prioritize the digital transformation initiative portfolio** – Using their updated digital strategies, telcos need to assess, develop and prioritize their digital initiatives to optimize returns and ensure digital maturity is delivered at pace.

4. **Deliver digital** – Digital is as much about the organization as about the technology, so how it is delivered is as important as what is delivered. Telcos need to adopt new agile ways of working to deliver and harness their new digital capabilities. Significant stakeholder engagement will be required to drive change and rethink established wisdoms such as traditional capex allocation policies – but the results will more than justify the efforts.

5. **Repeat** – Remember that digital transformation is not a one-off process, and the digital world is not standing still waiting for telcos to catch up. A continuous refresh of strategic objectives and priorities, as well as continuous monitoring of competitor activities and capabilities, is vital. Implementation priorities, as well as overarching strategic objectives and capital allocation planning, should be continuously reassessed and reprioritized. Equal weight should be given to doing the right things and doing things right. Digital strategy and initiatives should be regularly, if not constantly, reviewed, assessed and reprioritized to ensure that the business remains agile and focused, and can both Enable and Embrace digitalization.

Delivering the Digital Dividend is not a short-term activity, and many iterations of the above steps will be needed to reach more advanced (and therefore more profitable) levels of digital maturity. However, the time for action is here and now – too many telcos are approaching digital on a piecemeal basis and reacting only to short-term challenges. A more strategic and holistic approach is vital to ensure the long-term sustainable and profitable success of telcos in an ever-more digital world. Through successful digital transformation, telcos can once again become the power behind the button.

"

*The ones that will benefit the most from digitalization are the ones that will successfully digitalize through the whole organization, and not only parts of it*

*Chief executive officer – Major telco operator*

"

# Notes

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**Delivering the Digital Dividend**

The EUR 200bn free-cash-flow opportunity for telcos

2018 report on the telecommunications industry

## Arthur D. Little

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