



Reimagining telco operations in a hyper-digital world

*How can telcos achieve the next efficiency frontier
through digital technologies?*

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Authors:



Bernd Schreiber

Partner, Global Head Operations
Management, Frankfurt
schreiber.bernd@adlittle.com



Vincenzo Basile

Partner, Telecommunication,
Information, Media & Electronics, Rome
basile.vincenzo@adlittle.com



Lokesh Dadhich

Principal, Telecommunication,
Information, Media & Electronics, Dubai
dadhich.lokesh@adlittle.com



Marius Romanescu

Principal, Operations Management,
Frankfurt
romanescu.marius@adlittle.com



Rishi Patil

Manager, Telecommunication,
Information, Media & Electronics, Dubai
patil.rishi@adlittle.com

Executive summary

Organizations in today's digital age are witnessing technology trends that are profoundly reshaping value chains across industries. Digitalization is an all-pervasive trend acting as the disruptor-in-chief of business and operating models across converging industries. The telecom industry, which is at the heart of the digitalization megatrend and a key digitalization enabler, is not immune to this disruption. In this context, a key question facing telecom-industry executives is: is there an opportunity for telcos to reimagine their operations to leverage digital technologies, and if yes, what is the economic value and how can they achieve this?

A vast number of operations digitalization possibilities are constantly evolving with technology advancements, and represent significant potential to propel telcos towards a new efficiency frontier. Yet, digitalization of operational processes is either unaddressed or unexploited in the digital agendas adopted by telco players.

In this report, we present our perspective on the strategic imperative, the available opportunities for telcos, and the approach to pursuing internal digitalization. We also offer our insight on ways of achieving a target blueprint of "future of telecom operations" at the extreme frontier of operational efficiency to compete and win against more agile and digital-centric competitors.

In summary, telcos have an opportunity to reimagine their operations to leverage digital technologies. However, to address the challenges and uncertainties in the hyper-digital era, telcos should:

1. **Digitalize operations:** Do not ignore internal processes digitalization. Ensure that the digital strategy covers all aspects of the business and operational digitalization to achieve a superior efficiency and cost advantage to compete with leaner and more agile competitors.
2. **Look for digital practices beyond the telco industry:** Adoption of digital technologies is evident not only within the telco industry, but also in multiple other adjacent and unrelated industry ecosystems. Telcos must seek inspiration from applications and use cases across industries.
3. **Transform at an optimal scale:** Adopt an iterative, agile and impact-oriented transformation approach, starting with a handful of concepts, taken through various stage gates to achieve tangible business results. Focus on achieving the initial lighthouse successful projects to inspire the organization towards a digital operational blueprint. Opportunities for collaboration with start-ups¹ and partners must be leveraged to bring innovation from the broader ecosystem and bridge capability gaps across the organization.
4. **Adopt a robust governance model:** Address the challenge of scarce capabilities and expertise for leveraging digitalization in operations. The chosen governance should include executive sponsorship, dedicated capabilities, expertise, and accountability to process owners to ensure an organization-wide and sustainable transformation.

¹ Refer Arthur D. Little's viewpoint Telcos and start-ups: Re-think and re-invent: Harness the disruptive power of start

1. What is the strategic imperative for telcos to digitalize operations?

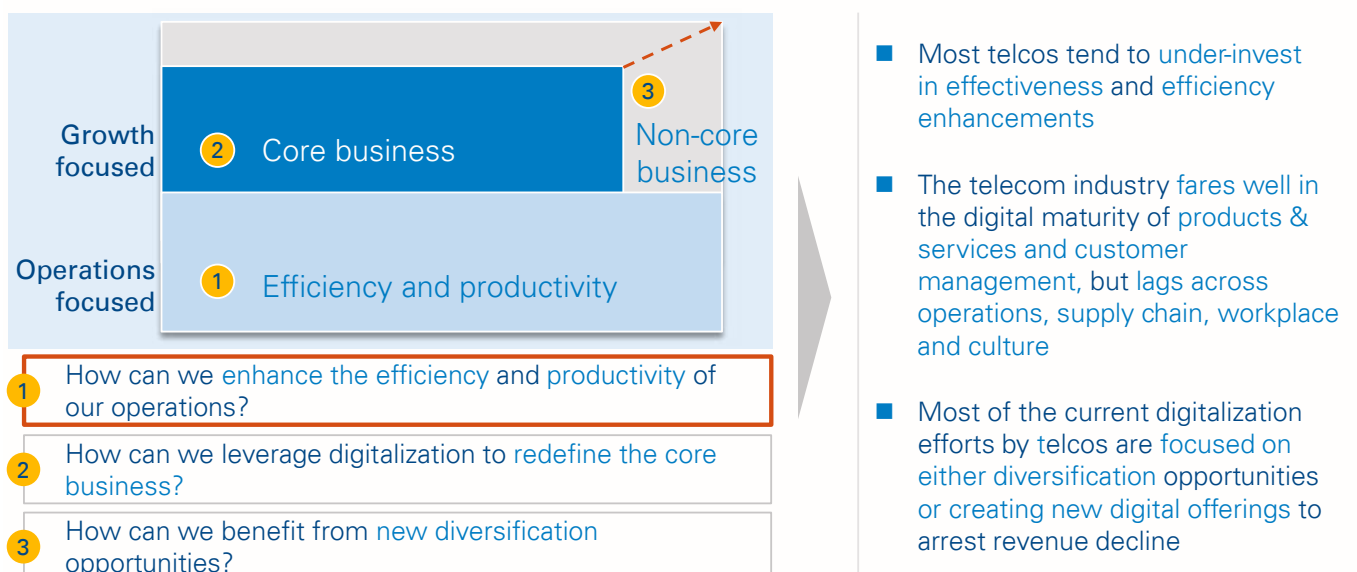
Globally, telecom operators are transforming their business models in an effort to counter the top-line pressure from various market forces, namely digital-native telcos, in-market competition, regulation, etc. The digitalization agenda of leading telecom players reflects the focus on revenue diversification through digital services in a variety of ecosystems. Similar focus, if not more, is necessary to reimagine their operations. Internal digitalization is about the use of latest technologies to simplify business processes and increase quality of service and output, while improving efficiencies.

The operational agility and efficiency imperative for telcos is at its peak, in all facets of operations. To start with, telecom companies can no longer compete with portfolios of standardized products. Customized and contextual services delivered in a personalised manner are increasingly needed to serve different micro-needs of digital-savvy customer segments. Along with evolving product and service requirements is the need to reinvent customer touch-points. Telcos are hard pressed to continuously enhance the experience delivered across touch-points as new customer engagement channels emerge and customers demand seamless experience across channels.

Telcos need to leverage insight from customer and operational data to compete against digital players whose operations are developed on the fundamental principle of data-centricity. These imperatives are increasingly pressurizing telcos' IT and network architecture, leading to greater complexity and costs, while the need of the hour is higher agility and flexibility. As such, telecom players can no longer afford to avoid digitalization of their operations. Telecom executives must seek answers to some key questions to effectively address the efficiency imperative through digitalization:

- Which digital technologies (e.g. blockchain, artificial intelligence, robotics) will bring real value in the short, medium and long term, in the forms of processes agility, cost efficiency, superior quality, and customer and employee experience?
- What is the emerging blueprint of operations across functions (commercial, technology, HR, finance, etc.) due to application of digital technologies?
- What is the economic value of digitalizing operations?
- How to transform operations while balancing short-term, tangible results with long-term, sustainable value creation?

Figure 1: Strategic imperative for internal digitalization



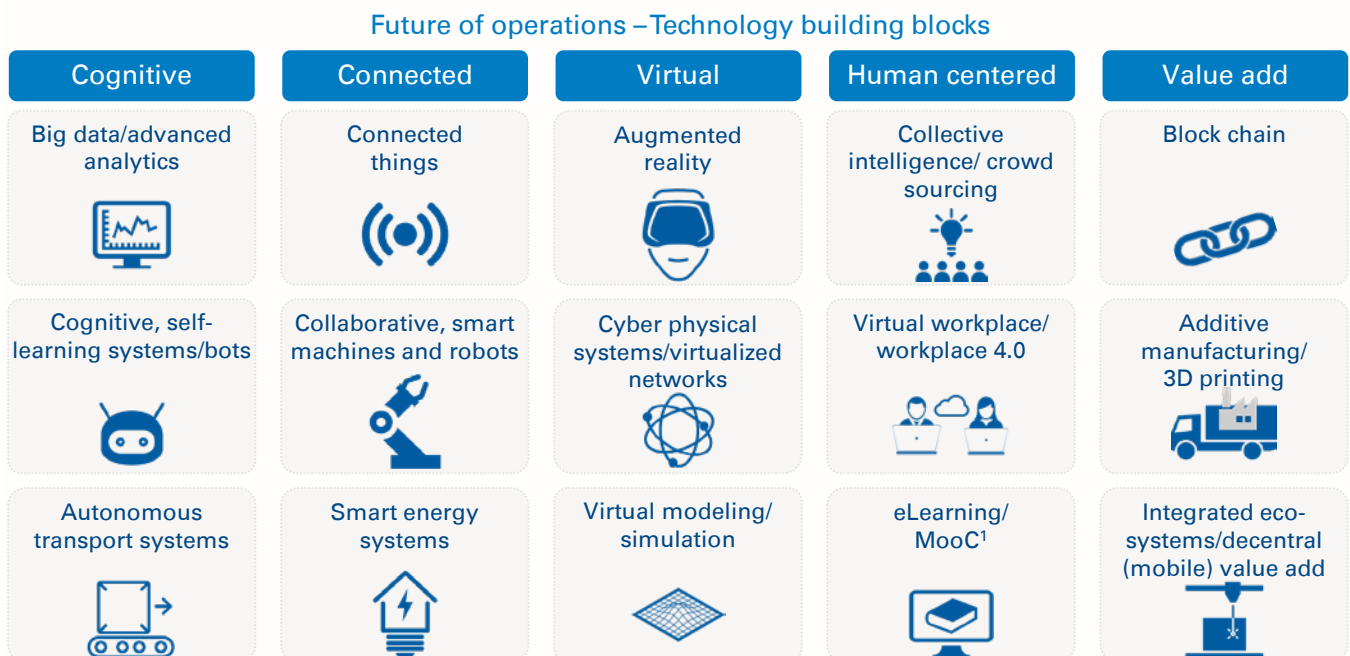
Source: Arthur D. Little

2. Which digital technologies hold potential for telco operations?

A range of technology clusters offer digitalization opportunities and applications. Understanding these underlying technologies and their use cases in a variety of processes is key to digitalization. The resulting picture of telecom operations should be:

- **Cognitive:** Data- and analytics-driven processes enabled by applications of self-learning systems and artificial intelligence.
- **Connected:** Technologies connecting the physical elements to the virtual world via sensors and networks, smart robots, etc.
- **Virtual:** Technologies enabling virtualization of physical assets, services and infrastructure to improve productivity and asset utilization, shorten lead times and reduce costs.
- **Human centered:** Technologies geared towards improving people's productivity, such as virtual workplace technologies and e-learning use cases.
- **Value add:** Technologies aimed at fundamentally redefining various distributed ecosystems (e.g. smart city and blockchain).

Figure 2: Digital-technology building blocks offer significant potential for operational agility and efficiency



Source: Arthur D. Little

1) Massive open online Course

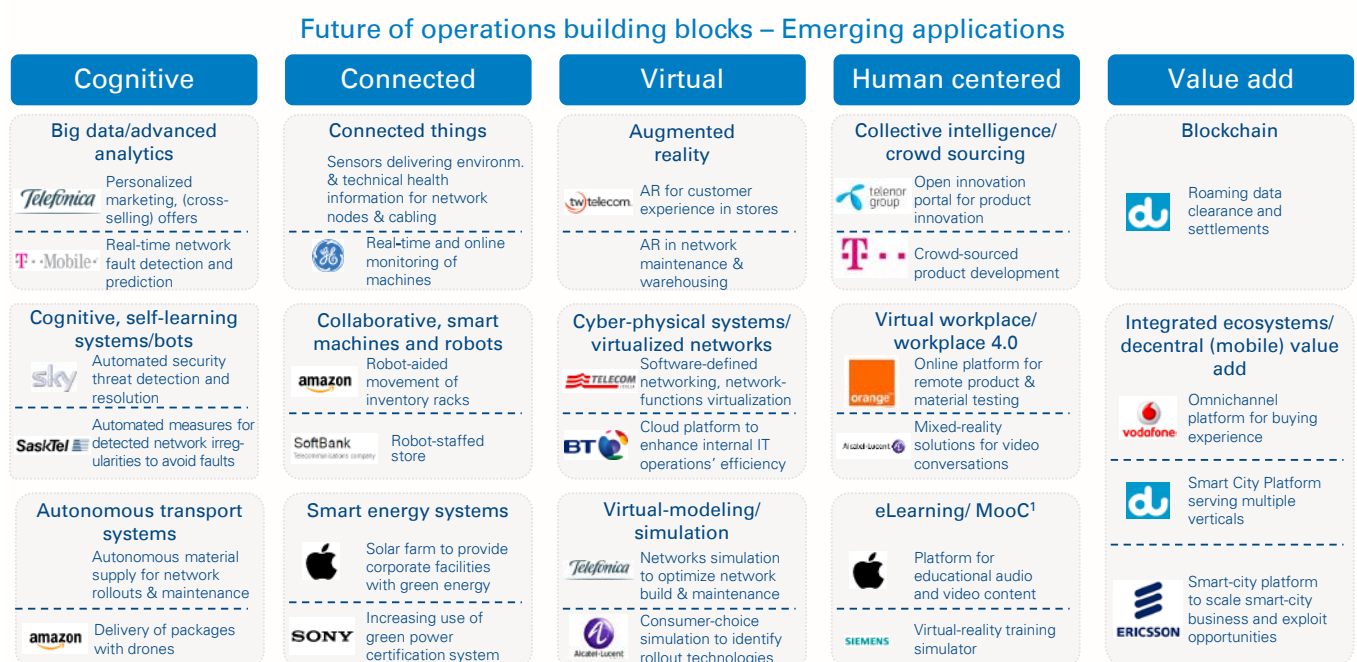
3. What is the emerging blueprint of operations enabled by digital technologies?

Applications of these technology building blocks have significant potential to disrupt legacy processes across telecom functions (from commercial to technology to corporate functions, such as HR, finance, procurement and supply-chain management). Evidence of such applications’ potential is available not only within telecom, but also in adjacent and unrelated industries. Our research highlights 500+ use cases of digital technologies which can be applied in telecom operations to reimagine legacy processes and attain multifold agility and quality improvements.

Marketing and sales: Cognitive-technology applications are helping operators improve marketing and sales efficiency. Optus, Australia, is using artificial intelligence and predictive analytics to generate recommendations for next-enterprise sales. Artificial-intelligence tools analyze customer data, such as customer messages and e-mails, entries in calendars, contributions to social networks, and stored pictures or tweets for up- and cross-sell recommendations.

Customer care: Operators have adopted cognitive- and connected-technology applications to improve customer experience and support. For instance, Vodafone has implemented virtual assistants that use intelligent chatbot technology to better enable and enhance digital self-service for consumers. The chatbot solution uses natural language processing (NLP) to understand a consumer’s intent and map the query/complaint to the solution, regardless of how the question is phrased. Deutsche Telekom has launched an AI program to develop virtual assistants and launched different assistants, such as Tinka, a search engine-like chatbot; Sophie, a chatbot for Facebook messenger; and Vanda, a learning chatbot for corporate customers. Other operators, such as Vodafone, 3 and O2, have applied integrated ecosystems to offer seamless customer services. This has been achieved by implementing pace-layered omnichannel architectures that rely on single master data management platforms which enable operators with a singular view of customers, integrating insight from

Figure 3: Applications and use cases of digital technologies are being adopted in telcos and related industries



Source: Arthur D. Little

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different channels and enabling better targeting and take-up of products, services and promotional campaigns.

Products and services: Operators are adopting various use cases to create new services for adjacent industries. For instance, du is piloting a blockchain-based pilot system in roaming data clearance and settlements. The pilot aims to harness the advanced security offered by the blockchain technology to manage electronic records. Others, such as Taiwan Mobile, are implementing cognitive technology-based applications for product-renewal management for better targeting of promotions.

Technology (network and IT): Applications based on multiple technology building blocks are being implemented to improve operational efficiency in network and IT operations. Players such as AT&T and Verizon have started using autonomous drones to gather data from cell towers and other structures to eliminate the costs of human inspection. Drones are being used for line-of-site testing between radio towers to identify obstructions and power needs for antenna sites placement as a key part of infrastructure buildout. They are also being used for network planning. Other companies, such as Telus and Comcast, have replaced existing proprietary CPE with virtualized multitenant platforms that can be configured from central console and dynamically add and run new services (software

updates and downloads). Artificial intelligence and machine-learning use cases in predictive maintenance and technical operations optimization are increasingly being adopted. DevOps models, investment in continuous integration and consolidation, implementation of software-defined configurations, and development of end-to-end application monitoring are the key drivers of digitalization for network and IT. Apart from offering enhanced customer experience, these applications represent significant cost optimization potential in technology.

Steering and support: Technology use cases supporting management decision-making and workforce management are being adopted. Pilots of immersive-communication solutions are evident as part of integrated workplace 4.0 services, which replicate in-person interaction, giving users an impression of natural, “face-to-face” communications. The technology differs from existing video communication services, as it leverages “mixed reality” – i.e., feeds (video as well as other content) from multiple physical and digital sources integrated in customizable artificial environments for greater collaboration. The solutions aim at fostering cross-geography collaboration and reducing the inefficiencies of business traveling. In another instance, artificial-intelligence applications are being leveraged in recruitment to screen prospective candidates’ profiles to improve the efficacy of recruitment.

Figure 4: Big data/advanced analytics applications across telco functions

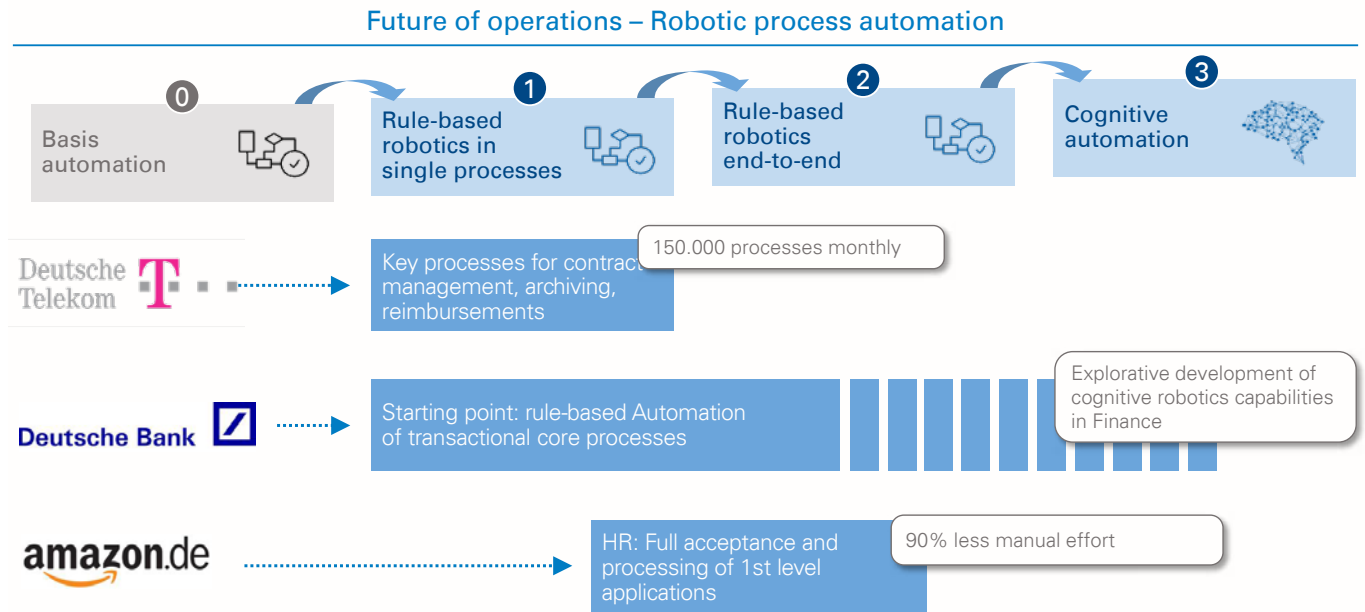
Future of operations applications – Focus big data/advanced analytics building block

Marketing & sales	Customer service	Product	Enabling	Network	Steering & support
Personalized marketing, (cross-selling) based on customer behavior	Customer activation and provisioning analytics	Automated tariff optimization/“below-the-line” pricing	Automated IT security threat detection and resolution	Predictive maintenance of network services	Workforce/Talent analytics
Real-time sales-process monitoring	Real-time field-force scheduling based on best-cost decisions	Real-time product and service creation and management	Real-time IT fault detection and prediction to improve service availability	Real-time network-fault detection and prediction	Field Force analytics
Real-time media (e.g., video) performance tracking to improve content promotions	Boosted failure analysis for customer complaints	Product-renewal enhancement	IT development quality Assurance	End-to-end service-quality monitoring	Smart procurement
Real-time ARPU visibility by correlating operations data (CDRs) with business systems	Real-time analytics of customer journey and satisfaction	Advanced analytics-based product design	Application performance monitoring	Network-rollout optimization	Inventory optimization
Heavy roaming-abuse detection and automatic user-account deactivation	Real-time B2B solution-delivery monitoring	Smart targeting products – Micro targeted campaigns	Service activation optimization	Network monetization (real-time offers to match demand and capacity)	Receivables optimization
Account-targeting engine for B2B clients	Contact-center productivity	Outdoor advertising optimization	IPTV service assurance	Real-time network-fraud management	Revenue assurance

■ Customer experience – Cross-functional application
 ■ B2B service delivery – cross-functional application
 ■ Network operations – cross-functional use case
■ Workforce performance management – cross-functional use case
 ■ Other – function-specific use cases

Source: Arthur D. Little

Figure 5: Robotic process automation (RPA) use cases



Source: Arthur D. Little

Furthermore, robotic processes automation (RPA) is set to transform classical finance and human resources as well as Network and IT Operations processes to unprecedented levels of automation. While the current use cases of RPA focus

on automation of single processes, realization of use cases of cognitive automation is not too far in the future. Several companies have started implementing RPA in processes to realize significant efficiency gains.

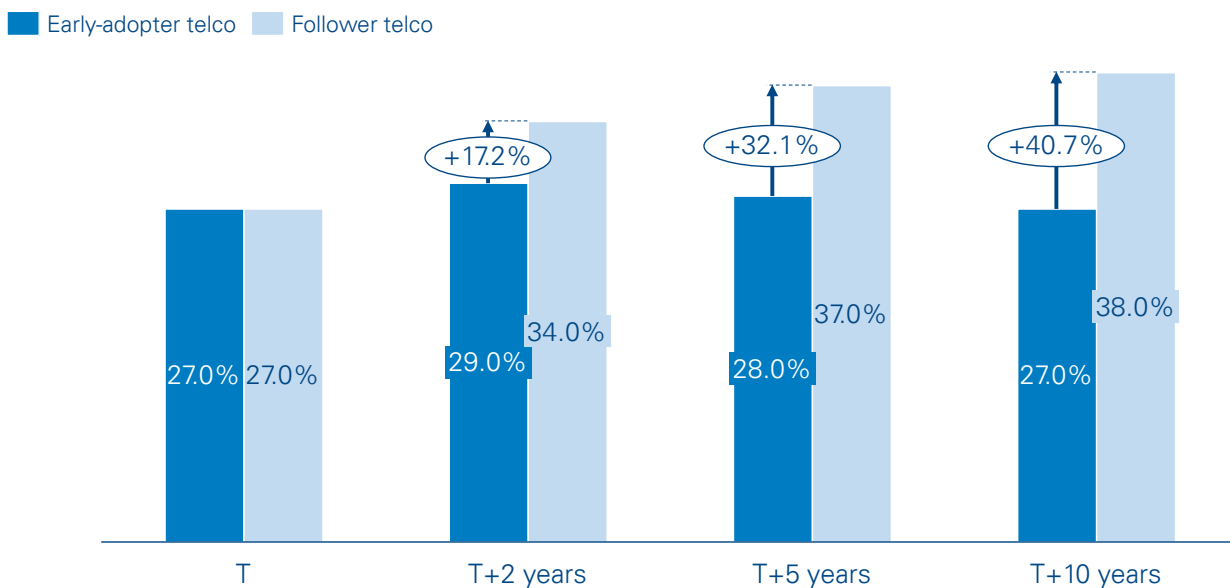
4. What is the economic value of digitalizing operations?

Early adopters have started realizing the benefits of digitalization. We have identified a number of applications specifically for telecom operators and assessed the benefits to a typical incumbent telecom operator’s cost structure. An early

adopter of digital technologies can achieve an EBIT advantage of approximately 5 bps within two years and approximately 10 bps over 10 years compared to a follower operator that misses out on the internal digitalization opportunity.

Figure 6: Early adopters will have a tangible and significant efficiency advantage

EBIT advantages of early adopters



Source: Arthur D. Little

5. How to transform operations while balancing results and value creation?

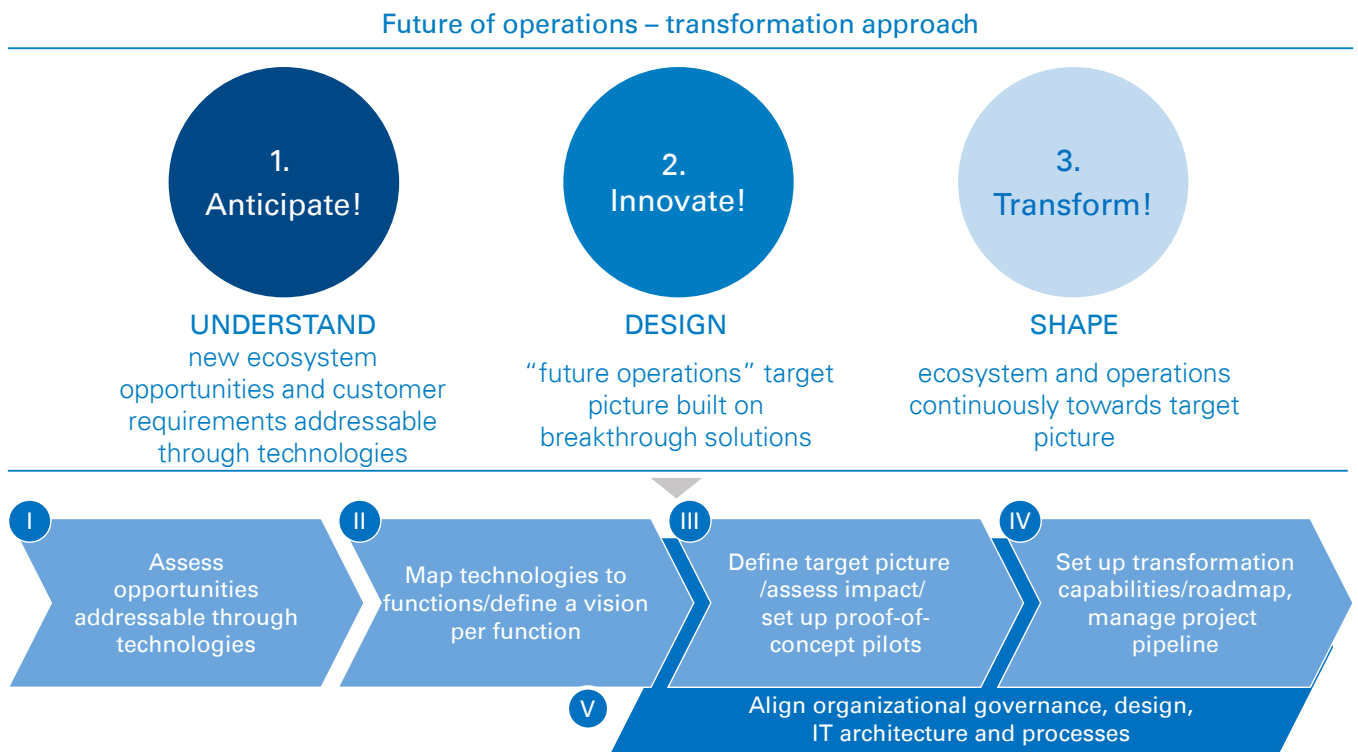
Despite the potential impact and opportunity to create a competitive cost and agility position through digital technologies, telecom executives grapple with challenges and uncertainties, which inhibit the momentum of internal digitalization:

1. **Uncertainty regarding the potential** and possible impact of “digital” technologies.
2. **Sunk investments** due to failed “experiment-and-learn” approaches.
3. **Misplaced perception** that new technologies are “lab projects” without measurable effect.
4. **Potential confusion in the organization** on account of the complexity of digital technologies.
5. Lack of or **unidentified technology partners** for specific technological applications.
6. **Resistance to changing** the way of working in the organization.

Successfully addressing these challenges requires a coherent, consistent and holistic digitalization vision and target blueprint setting, as well as a measured approach towards implementation, balancing the transformation scale between early impact and sustainable, long-term momentum.

Arthur D. Little recommends a five-step approach to internalize the digital disruptions occurring across industries.

Figure 7: Arthur D. Little’s internal digitalization approach for telcos



Source: Arthur D. Little

Contacts

If you would like more information or to arrange an informal discussion on the issues raised here and how they affect your business, please contact:

Austria

Karim Taga
taga.karim@adlittle.com

Italy

Giancarlo Agresti
agresti.giancarlo@adlittle.com

Singapore

Yuma Ito
ito.yuma@adlittle.com

Belgium

Gregory Pankert
pankert.gregory@adlittle.com

Japan

Shinichi Akayama
akayama.shinichi@adlittle.com

Spain

Jesus Portal
portal.jesus@adlittle.com

China

Russell Pell
pell.russell@adlittle.com

Korea

Hoonjin Hwang
hwang.hoonjin@adlittle.com

Sweden

Bo Lenerius
lenerius.bo@adlittle.com

Czech Republic

Dean Brabec
brabec.dean@adlittle.com

Latin America

Guillem Casahuga
casahuga.guillem@adlittle.com

Switzerland

Clemens Schwaiger
schwaiger.clemens@adlittle.com

France

Didier Levy
levy.didier@adlittle.com

Middle East

Lokesh Dadhich
dadhich.lokesh@adlittle.com

Turkey

Coskun Baban
baban.coskun@adlittle.com

Germany

Michael Opitz
opitz.michael@adlittle.com

The Netherlands

Martijn Eikelenboom
eikelenboom.martijn@adlittle.com

UK

Jonathan Rowan
rowan.jonathan@adlittle.com

India

Srini Srinivasan
srinivasan.srini@adlittle.com

Norway

Diego MacKee
mackee.diego@adlittle.com

USA

Sean McDevitt
mcdevitt.sean@adlittle.com



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Arthur D. Little

Arthur D. Little has been at the forefront of innovation since 1886. We are an acknowledged thought leader in linking strategy, innovation and transformation in technology-intensive and converging industries. We navigate our clients through changing business ecosystems to uncover new growth opportunities. We enable our clients to build innovation capabilities and transform their organizations.

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