Accelerating the intelligent enterprise

Global telecommunications study 2019

EY
Building a better
working world

About this report

The global telecommunications study 2019 has been conducted as part of the EY global telecommunication team's ongoing program of research into the sector worldwide and is aimed at monitoring and evaluating the evolving views of leaders across the global telecommunications industry.

Based on in-depth conversations with industry leaders, the resulting insights help us to assess the current state and future development of this rapidly changing sector. The 2019 survey looks at the overall transformation imperative for telcos, and then drills down into several key issues that emerged prominently in EY's last global telecommunications study in 2017. These key issues were primarily around the opportunities and challenges presented by artificial intelligence (AI), analytics and automation.

While researching to prepare this 2019 report, we conducted 29 in-depth interviews with participants from 27 organizations, supported by insights and analysis from EY global telecommunications sector professionals and secondary research sources. The organizations that took part this year account for a collective annual revenue of US$328b and have an aggregate market capitalization of US$409b.

The methodology

EY teams met with each of the senior industry executives who participated in the study, asking them 14 questions that focused on the industry as a whole, as well as on specific areas and issues within their organizations. With most questions, we asked the participants to provide their top three answers in order to give us more in-depth insights into the opportunities and challenges confronting them now and in the future. We also captured key verbatim comments from the dialogue generated in the interviews, an anonymized selection of these are showcased in this report. If you would like to the see the complete results of the study, please contact the EY global telecommunications team.

Global telecommunications study 2019: participants

29 interviews were conducted with 27 organizations

Participant organizations collectively account for:

US$328b
annual revenue

US$409b
aggregate market capitalization

Taken together, the EY 2015, 2017 and 2019 surveys have involved a total of 111 interviews with 100 organizations, with the aggregate annual revenues of the participating companies standing at over US$1.39t. These interviews have covered 46% of the top 50 global carriers by revenue.

Geographic locations of participating companies in 2015, 2017 and 2019

■ Headquarter locations of the participating entities in 2015, 2017 and 2019

Chapter 1

# The telco transformation imperative

The global telecoms industry landscape has been changing rapidly for many years. But today, the pace of evolution appears to be faster than ever before. Migration to 5G networks, growing use of evolving technologies, such as automation and AI, and the rise of internet of things (IoT) applications, are coinciding with intensifying competitive and regulatory pressures. The result is that operators have no choice but to transform if they're to remain relevant to consumer and enterprise customers. It's clear the major driver for this transformation is digital technologies. The only question now is how to plan and navigate the transition successfully.

Information technology (IT) spending continues to shift to digital ...

As telcos' 5G investments ramp up, the complexion of IT spend is also changing as they overhaul their IT estate to lay down a solid bedrock for digitization. As figure 1 shows, the next few years will see the balance shift decisively from conventional IT to digital, which includes new cloud infrastructure, edge-computing systems, content delivery networks (CDNs) and other elements. This will account for over four-fifths of IT capex by 2024.

Figure 1: Telecoms IT capex spending, conventional versus digital infrastructure[1]

Conventional IT (US$m) ■ Digital infrastructure* (US$m) —●— Digital (% of total)
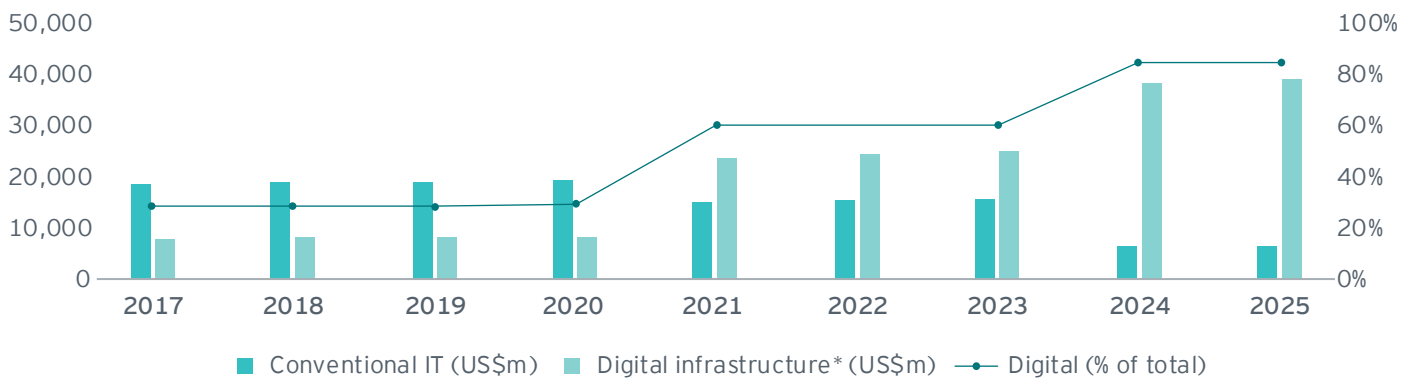
... as emerging technologies power the transformation agenda

At the same time, emerging technologies, such as AI, analytics and automation, are critical to serving customers' rising expectations while delivering greater levels of agility and operational efficiency. EY research on the announcements made by the top 50 telcos worldwide by their revenue shows that adoption of analytics capabilities is in a mature phase, with automation initiatives ramping up from 2018 to play a complementary role.

Figure 2: Emerging technology adoption by top 50 telcos worldwide

■ Automation initiatives ■ Analytics initiatives
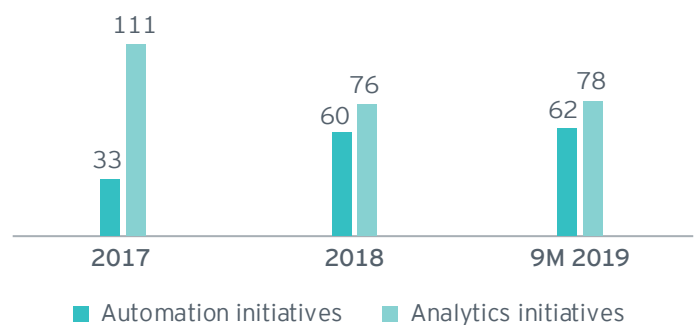
Source: EY analysis of operator announcements

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1. *Analysys Mason*, March 2019; Note: *Digital infrastructure includes new cloud infrastructure, edge computing systems, content delivery networks (CDNs) and other elements.

Despite progress, profitable growth remains challenging

Overall, what's clear across the telecoms industry is that digital transformation is yet to be translated into sustainable financial gains. As figure 3 shows, revenue growth has fluctuated over the last 10 years, while earnings before interest, tax, depreciation and amortization (EBITDA) margins remain low compared to the previous decade.

Over the past three years, operators' aggregate revenue has increased at a compound annual growth rate (CAGR) of 3.7%, while EBITDA margin has risen by just 0.6% over the same time frame. Given that ongoing investment in network expansion is a necessity, the underlying task facing telco leaders today is to find a way to break out of this holding-pattern of continuing profit pressure.

Figure 3: Global telecoms revenue and EBITDA margin development[2]

Revenue (US$b) — EBITDA margin (%)
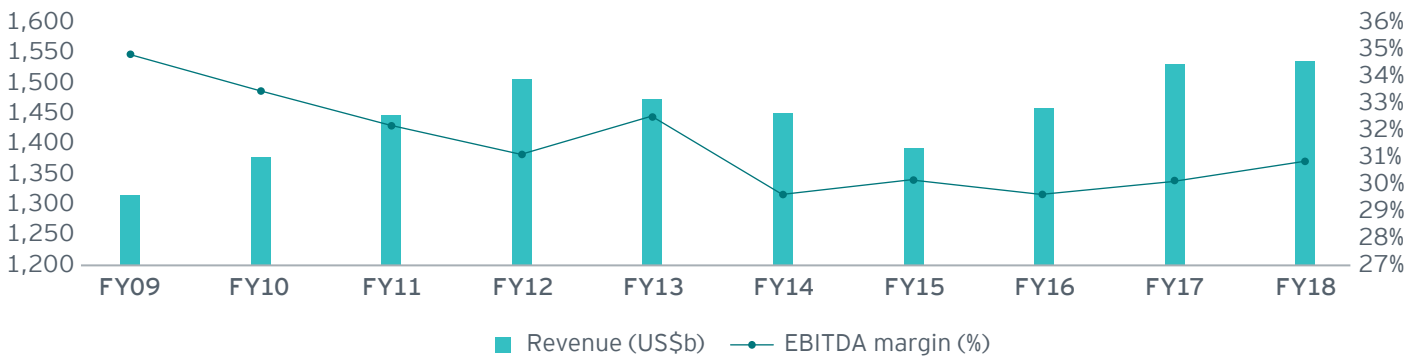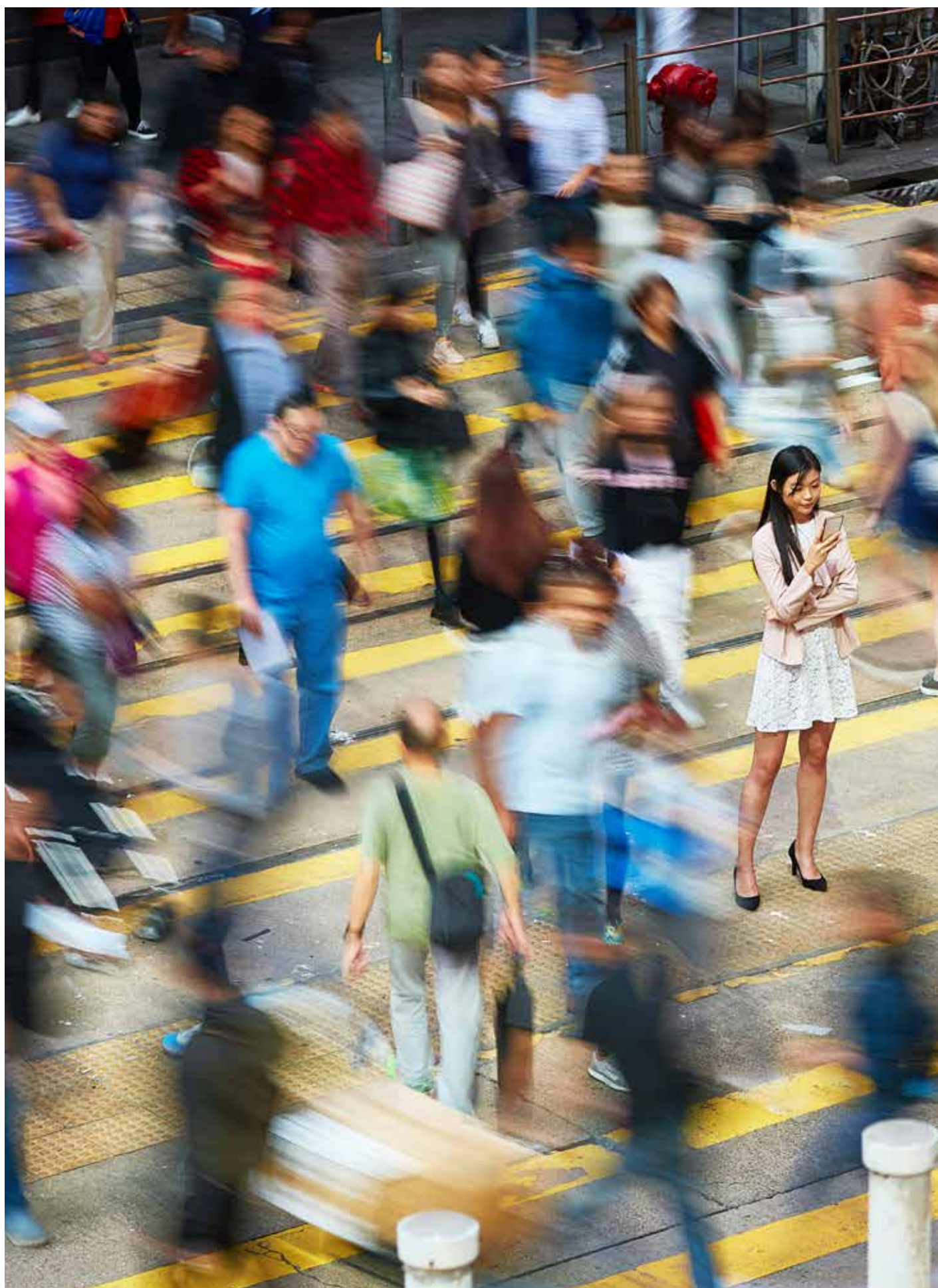
Chapter 2

Key survey findings

Looking across the views of global telecoms industry leaders five key messages around digital transformation and adoption of emerging technologies resonate strongly.

1 AI, 5G and automation are the key technologies driving digital transformation.

2 Customer experience improvements are the top rationale for AI, with agility the key driver of automation adoption.

3 Missing skills, poor data quality and a lack of long-range planning are holding back the transformation agenda.

4 Customer and technology functions are viewed as the prime beneficiaries of AI and automation over the next five years.

5 Operator sentiments on emerging technology pain points diverge according to market maturity.

1 AI, 5G and automation are the key technologies driving digital transformation

IoT or 5G networks, automation and AI are identified as the key drivers of change by the survey respondents when they were asked which emerging technologies and processes would be most important in driving their organization's digital transformation journey over the coming five years. More than half of respondents ranked them one of their top three transformation drivers. It's clear that the transition to 5G is viewed as a fundamental game changer, with AI and automation not far behind in terms of impact.

" Automation will have a fundamental impact on both the customer experience and the back office.

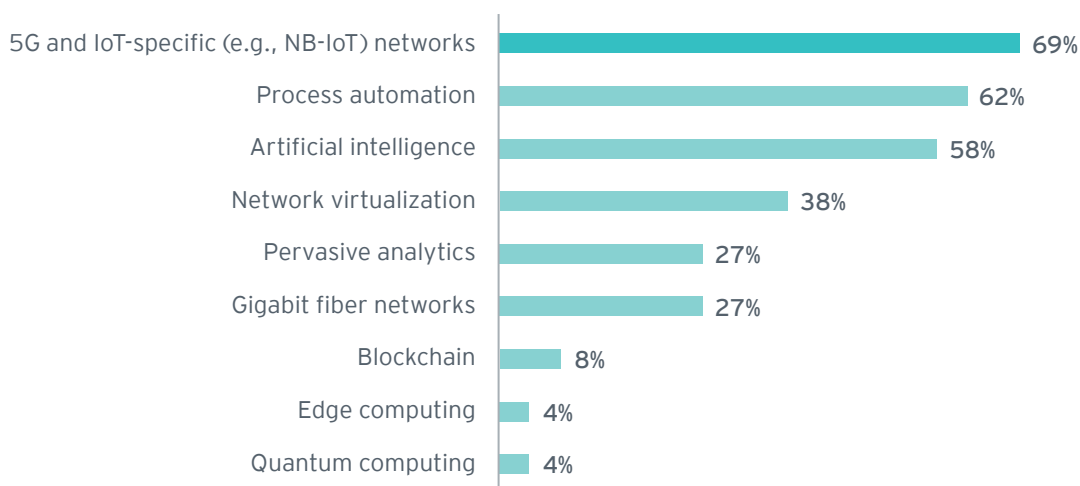**"** Quantum computing is very conceptual — we're at the beginning of the hype cycle there.

" AI and pervasive analytics will change everything.

" 5G moves IoT from being a data network to being a control network. The network becomes more predictable and you can control things, and 5G helps move this control into the cloud. It is vital to resetting the value of the connection.

However, other emerging technologies are at a much more nascent stage, with less than 1 respondent in 10 mentioning blockchain, and less than 1 respondent in 20 citing edge computing or quantum computing. While there are hopes that blockchain may be valuable in helping to overcome issues around data and asset ownership, as telcos form more vertical industry partnerships, the general view was that its applicability in telecoms isn't yet clear. Edge computing's low score may be more cause for concern, given its role to enhance data processing and storage in a 5G world.

Figure 4: Emerging technologies supporting digital transformation

Question: Which emerging technologies and processes will be the most critical driver of your organization's digital transformation journey over the next five years? (Please select three)

Technology	Percentage
5G and IoT-specific (e.g., NB-IoT) networks	69%
Process automation	62%
Artificial intelligence	58%
Network virtualization	38%
Pervasive analytics	27%
Gigabit fiber networks	27%
Blockchain	8%
Edge computing	4%
Quantum computing	4%

2 Customer experience improvements are the top rationale for AI, with agility the key driver of automation adoption

Zeroing in on the importance of AI and analytics to telcos' long-term digital transformation agendas, we asked participants about their most important rationales for building these capabilities. Almost four-fifths of the respondents cited that optimizing the customer experience was the key reason for their adoption of AI. More than half of the respondents also said accelerating business efficiencies was a top-three driver of AI, while four in ten picked out the new business models and services.

"

What we get out of data related to our business has a significant impact on our service quality.

"

Cross-selling and up-selling are also part of our customer support. Problem resolution can actually drive new sales.

"

We are in the second year of a fairly large investment program in analytics. It's had a big impact on net promoter score (NPS).

Figure 5: Rationales for deploying AI and analytics

Question: What are your organization's most important rationales for building analytics and AI capabilities? (Please select three)

Rationale	%
Optimize the customer experience	78%
Accelerate business efficiences	56%
Create new business models and services	41%
Enable more agile decision-making	33%
Enhance network integrity and security	33%
Improve forecasting and planning activities	22%
Reduce exposure to data loss or data being compromised	7%
Improve relationships with partners and suppliers	7%
Improve risk management frameworks	7%
Insulate against disruptive forces	4%
Other	11%

The verbatim comments from the interviewees underline both the rising tide of investment in AI in the telecoms industry, and also its pivotal role in efforts to improve the customer experience.

Looking ahead, respondents see customer experience – including sales and marketing – retaining its prominence as an AI use case over the next five years. This is understandable given the gains operators are achieving in terms of NPS. Network performance management is another important domain for AI, cited by almost half of the respondents.
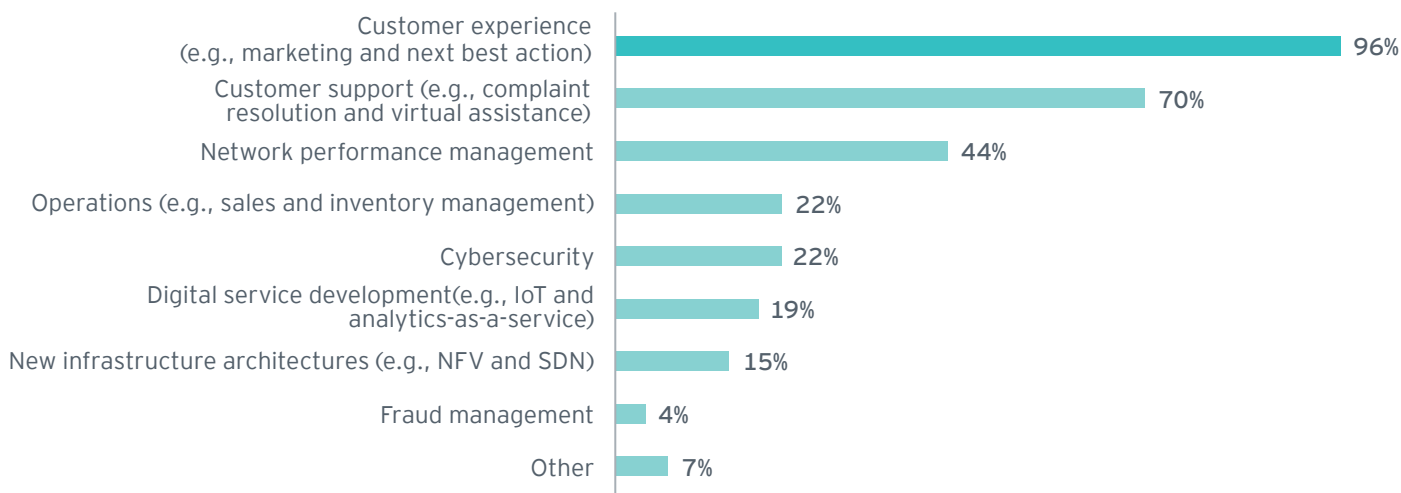
However, operators are less confident in AI's role to improve service-creation activities, with only one in five seeing this as a critical use case in the long term and concerns surrounding customer trust issues acting as a potential inhibitor.

" I'm quite skeptical on the role of analytics in digital service development. Perhaps there is scope to provide analytics as a service (AaaS), but the customer always owns the data. This is a tricky area for the telcos to get into.

Figure 6: Use cases for AI and analytics

Question: What are the most critical use case domains for analytics and AI at your organization over the next five years? (Please select three)

Use case	%
Customer experience (e.g., marketing and next best action)	96%
Customer support (e.g., complaint resolution and virtual assistance)	70%
Network performance management	44%
Operations (e.g., sales and inventory management)	22%
Cybersecurity	22%
Digital service development(e.g., IoT and analytics-as-a-service)	19%
New infrastructure architectures (e.g., NFV and SDN)	15%
Fraud management	4%
Other	7%

Turning to their reasons for adopting automation technologies, telco leaders view increasing agility and scalability as their leading driver. Greater workforce productivity and improved customer support rank second and third respectively.

Automation's role as a catalyst for incremental digital transformation is a little more muted, with less than one-third citing this as a reason for adoption.

Across all rationales, OPEX and CAPEX gains are important considerations – a point underlined by the respondents' verbatim comments. Yet, respondents' focus on productivity and customer experience gains also show that the human outcomes of automation, be it for the customer or the employee, are also one of their major concerns.
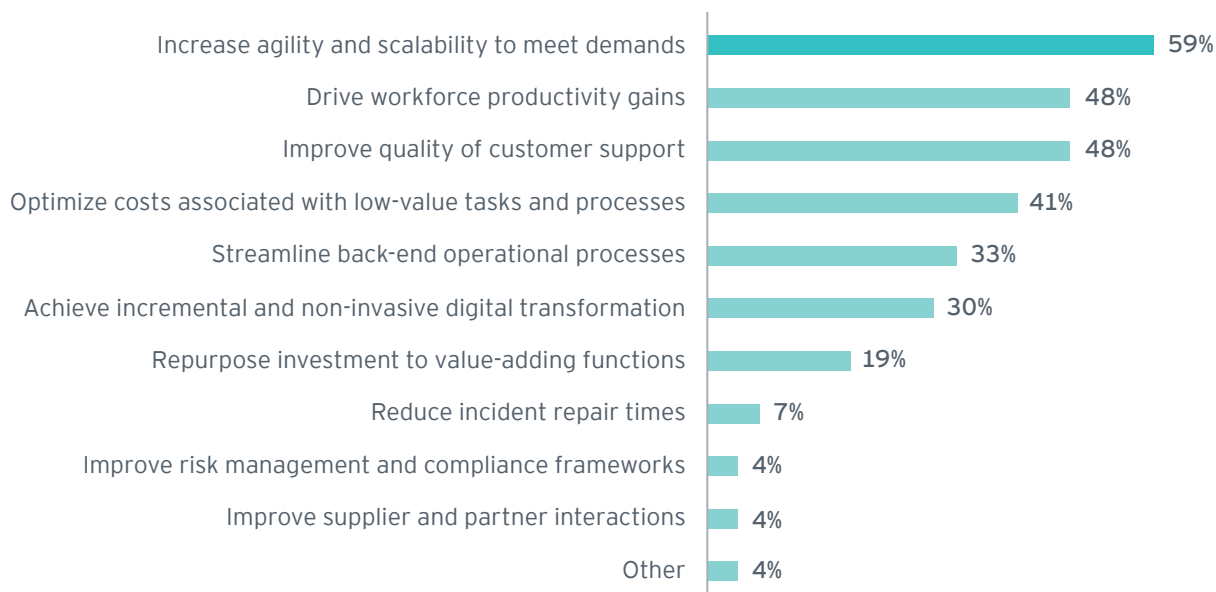
> ❝ Eliminating repairs is important for us — it's about optimizing our capital investment in the supply chain.

> ❝ It does not matter how well you train people, humans will eventually make some mistakes, but machines will not.

Figure 7: Drivers of automation adoption

Question: What are the most important drivers of automation adoption at your organization? (Please select three)

Driver	Percentage
Increase agility and scalability to meet demands	59%
Drive workforce productivity gains	48%
Improve quality of customer support	48%
Optimize costs associated with low-value tasks and processes	41%
Streamline back-end operational processes	33%
Achieve incremental and non-invasive digital transformation	30%
Repurpose investment to value-adding functions	19%
Reduce incident repair times	7%
Improve risk management and compliance frameworks	4%
Improve supplier and partner interactions	4%
Other	4%

> ❝ We're a bit late to process automation and need to play catch up. For us, it's about fixing the basics.

3 Missing skills, poor data quality and a lack of long-range planning are holding back the transformation agenda

While telco leaders are energized by the potential of AI and automation in areas such as customer experience, they also acknowledge that they face significant barriers, both strategic and operational, that prevent them from realizing the full potential of these technologies.

As cited by 67% of respondents, inadequate talent and skills are overwhelmingly the leading pain points affecting the deployment of analytics and AI. Beyond this, lack of alignment between analytics or AI initiatives and business strategy, low-quality data and metadata, and poor interdepartmental collaboration all feature as significant hindrances.

All of these barriers are reflected in the respondents' verbatim comments, with a surprisingly heavy focus on the problems posed by the "silo mind-set," an age-old issue for many operators.
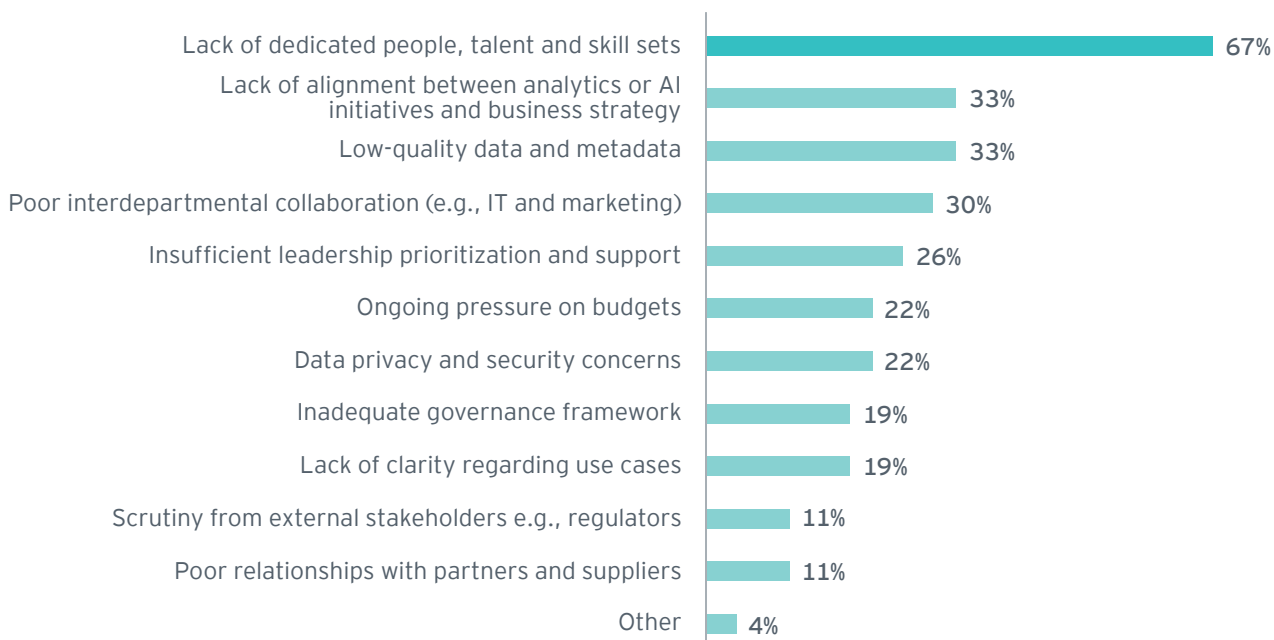
> " We don't struggle to attract data scientists at the moment, but we do struggle when it comes to big data architects, more on the engineering side.

> " Poor-quality data is the key thing we need to fix — we need to have the right infrastructure in place.

Figure 8: Barriers to maximizing the use of analytics and AI

Question: What are your organization's most significant barriers to maximizing the use of analytics and AI? (Please select three)

Barrier	%
Lack of dedicated people, talent and skill sets	67%
Lack of alignment between analytics or AI initiatives and business strategy	33%
Low-quality data and metadata	33%
Poor interdepartmental collaboration (e.g., IT and marketing)	30%
Insufficient leadership prioritization and support	26%
Ongoing pressure on budgets	22%
Data privacy and security concerns	22%
Inadequate governance framework	19%
Lack of clarity regarding use cases	19%
Scrutiny from external stakeholders e.g., regulators	11%
Poor relationships with partners and suppliers	11%
Other	4%

> " Internally, we struggle with people who don't want to give you the data that you need. It's the old reflexes on the IT side.

Looking at the barriers to successful automation, telco leaders mention a range of issues, with no single factor alone being cited by more than half of the respondents (see figure 9). Out of the many cited issues, the most frequently mentioned one is a lack of long-term planning, followed by poor linkage between the automation and people agendas. What shines through is that many telcos lack an overarching approach to automation and that the organizations must bring their people with them on the automation journey. Both of these factors are underlined by our respondents' verbatim comments.
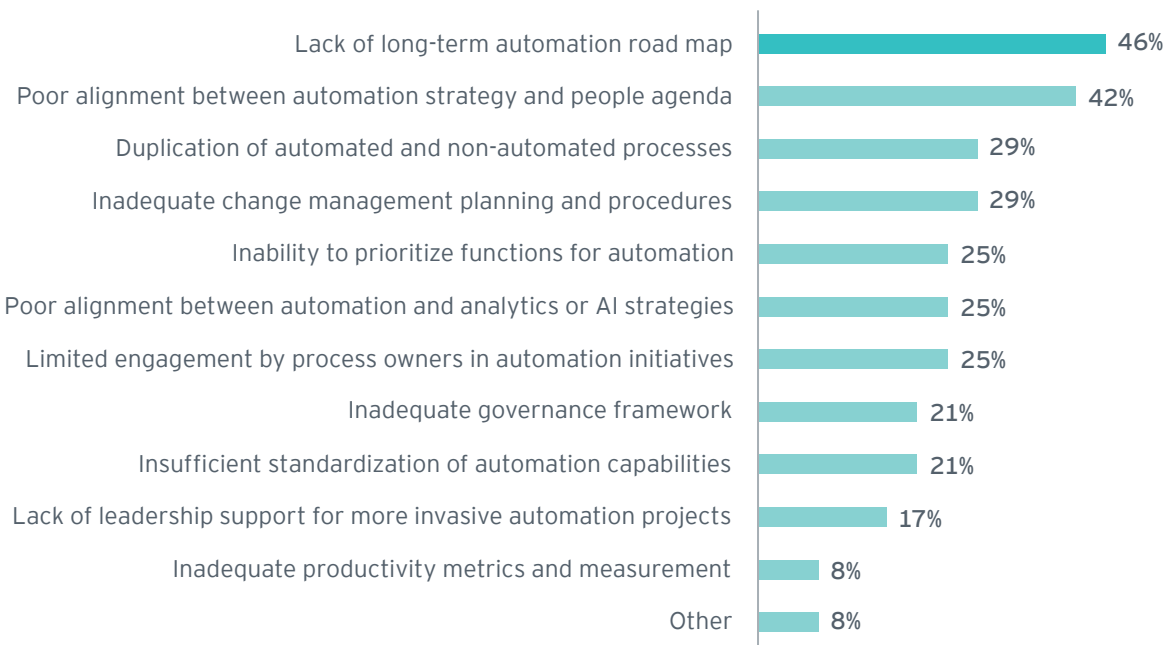
> " If you don't know where you are going in terms of your automation journey, that's a big problem.

> " There are many functions to automate, making it difficult to establish an automation road map.

Figure 9: Barriers to maximizing the use of automation

Question: What are your organization's most significant barriers to maximizing the use of automation? (Please select three)

Barrier	Percentage
Lack of long-term automation road map	46%
Poor alignment between automation strategy and people agenda	42%
Duplication of automated and non-automated processes	29%
Inadequate change management planning and procedures	29%
Inability to prioritize functions for automation	25%
Poor alignment between automation and analytics or AI strategies	25%
Limited engagement by process owners in automation initiatives	25%
Inadequate governance framework	21%
Insufficient standardization of automation capabilities	21%
Lack of leadership support for more invasive automation projects	17%
Inadequate productivity metrics and measurement	8%
Other	8%

> " People only come up with the use cases for automation when there is a people strategy in place to deal with the implications. It's a very human-centered issue — it's about way more than robots.

4 Customer and technology functions are viewed as the prime beneficiaries of AI and automation over the next five years

Customer and technology functions lead the way as the parts of telco organizations most likely to benefit from AI and automation over the next five years. Although marketing is seen benefiting more from AI than from automation, the balance with other functions such as finance and human resources (HR) is the other way round – with automation expected to have a greater impact.

Together with the verbatim comments from participants, these findings suggest that there's still plenty of impact yet to come from AI in sales and marketing, and that network teams are also in pole position to take advantage of both automation and AI. Interestingly, while three-quarters of respondents see IT and networks team as primary beneficiaries of AI over the next five years, under half of the respondents see network-related use cases as critical over a similar time frame (see figure 10).
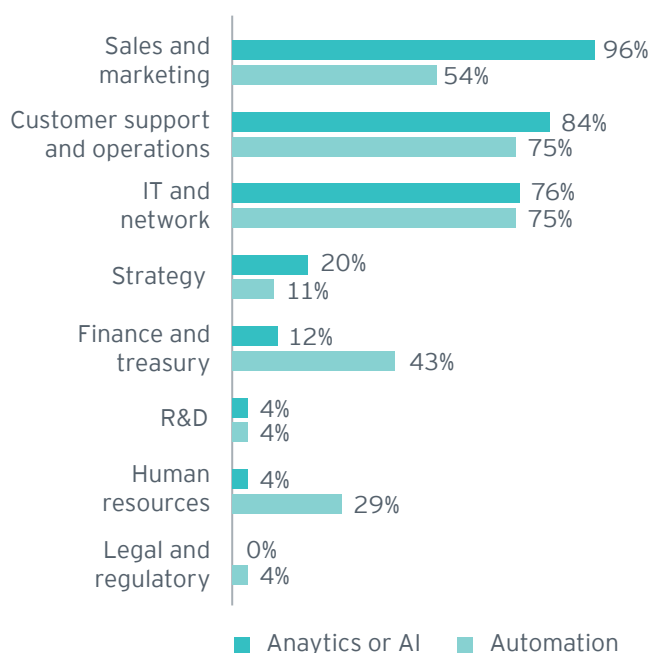
> " Earlier, you optimized network capacity based on assumptions. But today, we have real-time data on utilization levels.

> " Sales and marketing will remain as the top priority because of how much it influences the bottom line.

Figure 10: Long-term impact of emerging technologies on business functions

Question: Which parts of your organization are most likely to benefit from improved analytics or AI capabilities over the next five years? (Please select three)
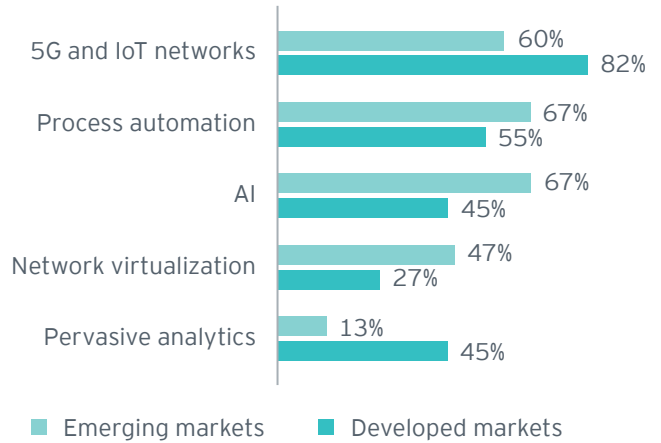
Business function	Analytics or AI	Automation
Sales and marketing	96%	54%
Customer support and operations	84%	75%
IT and network	76%	75%
Strategy	20%	11%
Finance and treasury	12%	43%
R&D	4%	4%
Human resources	4%	29%
Legal and regulatory	0%	4%

■ Anaytics or AI   ■ Automation

5 Operator sentiments on emerging technology pain points diverge according to market maturity

An analysis by geography of telcos' responses regarding technology drivers and AI and automation pain points shows their sentiments vary significantly. When asked which emerging technologies will drive transformation, emerging market operators more likely to put AI, automation and 5G on an equal footing as transformation drivers. Developed market operators have a more singular focus on 5G and IoT networks as a catalyst for transformation.

Also, as figure 12 shows, the perceived pain points regarding AI and analytics vary between regions. Low-quality data and metadata are the leading concern alongside missing skills in developed markets, underlining that elemental challenges persist even while use of analytics is in a mature phase. Meanwhile, lack of skills, leadership buy-in and collaboration all rank higher as barriers in emerging markets, underlining the need for better organizational alignment.
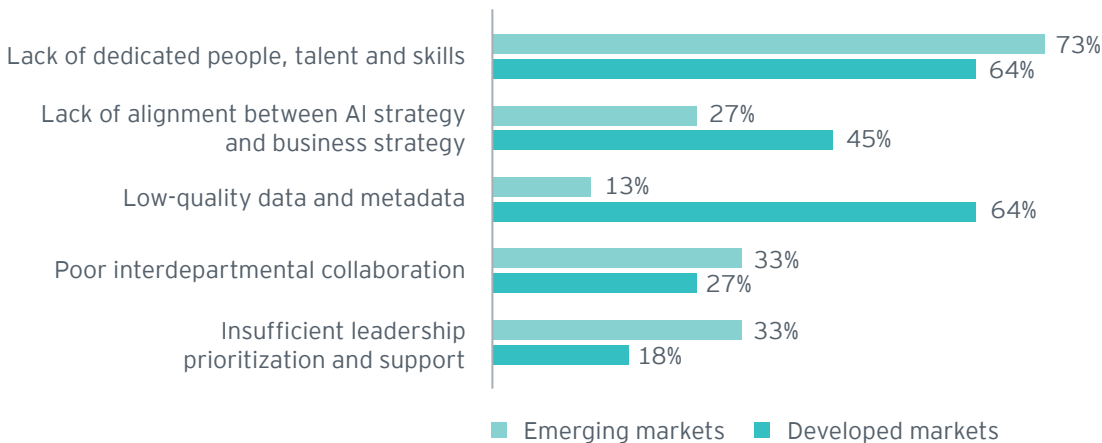
Figure 11: Digital transformation drivers according to market maturity

Question: Which emerging technologies and processes will be the most critical driver of your organization's digital transformation journey over the next five years? (Please select three)

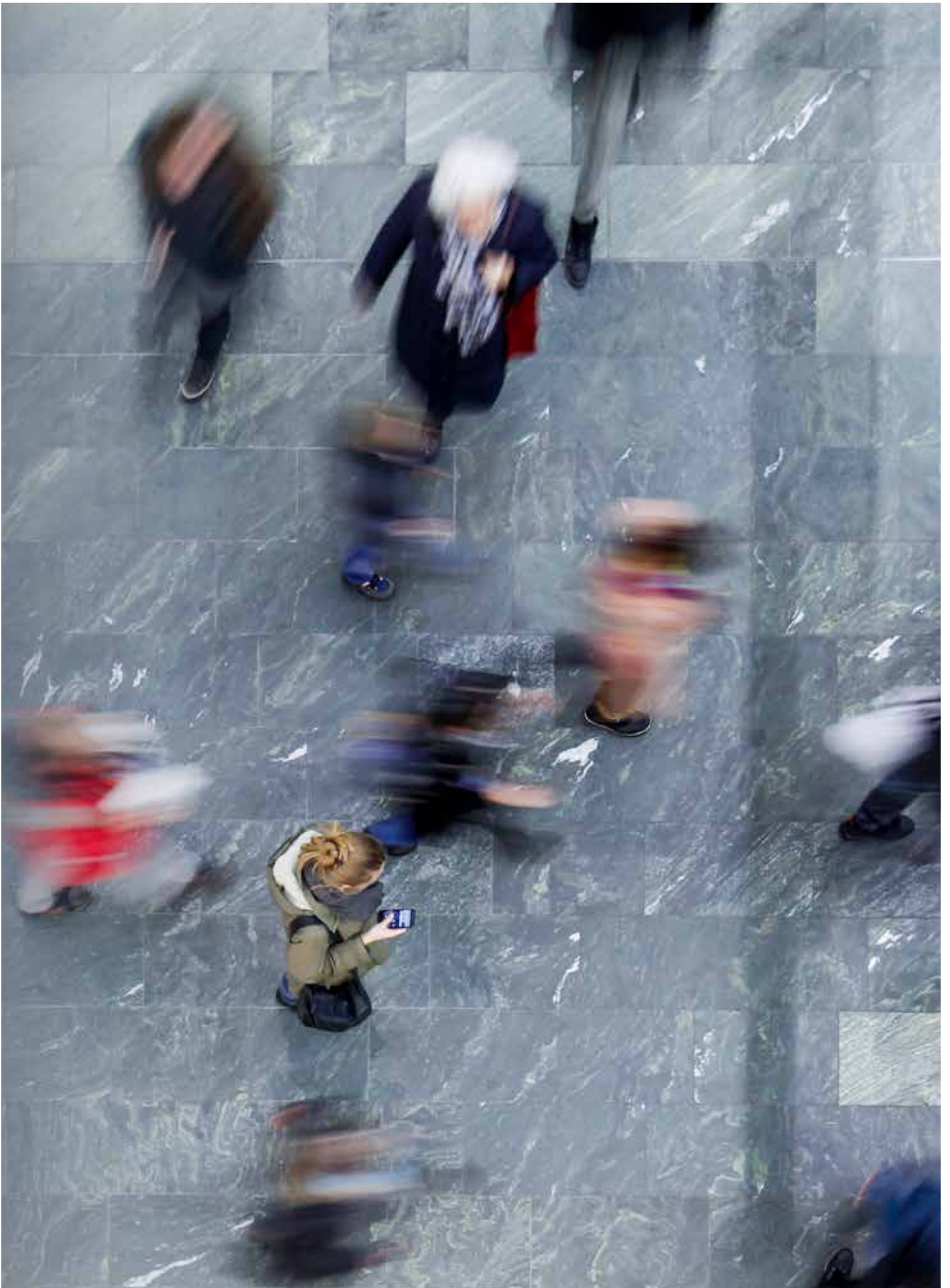|	Emerging markets	Developed markets
5G and IoT networks	60%	82%
Process automation	67%	55%
AI	67%	45%
Network virtualization	47%	27%
Pervasive analytics	13%	45%

Figure 12: AI and analytics barriers according to market maturity

Question: What are your organization's most significant barriers to maximizing the use of analytics and AI? (Please select three)

	Emerging markets	Developed markets
Lack of dedicated people, talent and skills	73%	64%
Lack of alignment between AI strategy and business strategy	27%	45%
Low-quality data and metadata	13%	64%
Poor interdepartmental collaboration	33%	27%
Insufficient leadership prioritization and support	33%	18%

Chapter 3

Accelerating the intelligent enterprise: next steps for telcos

EY analysis of the survey findings points to four "next steps" for the industry. We believe that these are the key actions telcos should take to maximize the value of AI and automation initiatives across their operations.

Step 1 **Prioritize the mutually reinforcing impact of emerging technologies**

Step 2 **Engage and empower the workforce as agents of change**

Step 3 **Extend AI and automation efforts well beyond the customer**

Step 4 **Revisit and refresh your digital transformation fundamentals**

Step 1

Prioritize the mutually reinforcing impact of emerging technologies with an informed and holistic mindset.

The impact of emerging technologies is not limited to IT, but is pervasive across the organization. They're also mutually reinforcing, amplifying and enhancing each other's ability to create value. Given these factors, it's vital to take a holistic approach to deployments that defines the optimal interplay and phasing of different technologies, balancing growth and efficiency goals in the process (see figure 13). It's also important to take a long-term view of emerging technology deployments – while automation is already delivering plenty of benefits, long-range planning is often lacking.

Figure 13: Assessment of emerging technologies and processes
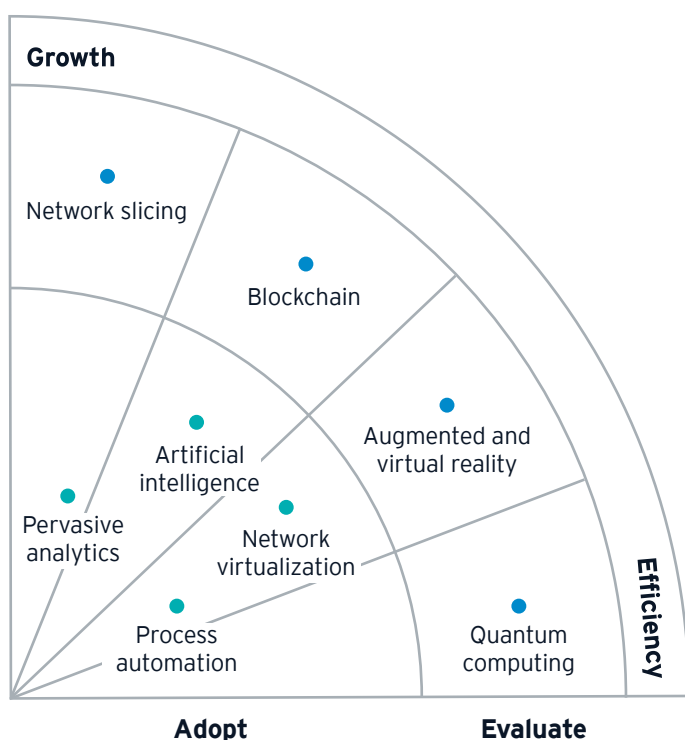
Source: EY analysis

> **"**
> Analytics and automation go hand in hand, but in the short term, they are distinct.

> **"**
> AI and automation are intrinsically linked.

As the choice of emerging technologies and processes continues to widen, it's essential to take action in order to increase internal knowledge and education, particularly given the potential interplay between them. As figure 14 shows, the vast majority of telcos agree that they need to do more in this area.

Figure 14: Organizational understanding of transformation concepts

Statement: "Our organization requires greater understanding of interrelated digital transformation concepts." (Please select one option)

- Strongly agree
- Slightly agree
- Neither agree nor disagree
- Slightly disagree
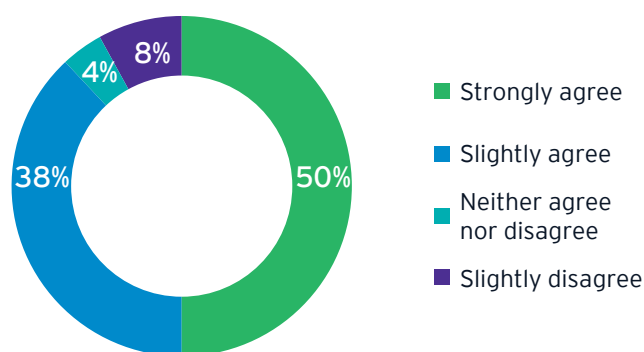
> **"**
> Too many people don't understand things beyond their own functional domain.

Step 2   Engage and empower the workforce as agents of change

To transform successfully, telcos need to leverage the most powerful change lever at their disposal – their own workforce. This means ensuring they take their people with them on the journey and taking action to create a more cohesive workforce that collaborates across age-old organizational barriers – including those between IT and the business.

To achieve all this, and drive transformation at the necessary scale, engaging process owners is critical. Instilling a greater sense of ownership of change among them by more clearly articulating roles and responsibilities around digitization is important. A renewed sense of purpose among process owners will also support relatively new leadership roles, such as that of a chief digital officer, that are designed to broaden organizational commitment to transformation.

At the same time, telcos need to do more to break down silos. Trust between business units is often lacking, and sustaining collaboration between product development, marketing and IT remains challenging. Also, centralization strategies remain in flux, making it more complicated to create and apply a consistent transformation agenda across geographies. All of these internal barriers need to be tackled through a new mindset, roles and ways of working.

> **"**
>
> The overarching barrier for us is our organizational structure and the degree of complexity driven by this.

> **"**
>
> The first things we need to address are the process owners — half our processes have owners, the other half don't. If you speak to people in our organization, most won't understand what we mean when we talk about owning processes.

> **"**
>
> Some organizations are starting to appoint chief data officers, people who have a genuine end-to-end view. It's a different role. Data and digital pervades it, but the role is actually about acting as the glue.

Figure 15: Telco organizational design considerations[3]

Structure	Resources	Roles	Capability
Streamlined and responsive structure with appropriate spans of control and management layers	FTE and head count requirements defined to deliver superior performance	Clear roles, responsibilities, accountabilities and incentives	Capability requirements matched to the right roles and appropriate reskilling, learning and development

Defined governance and processes › Talent and culture management › Performance measurement
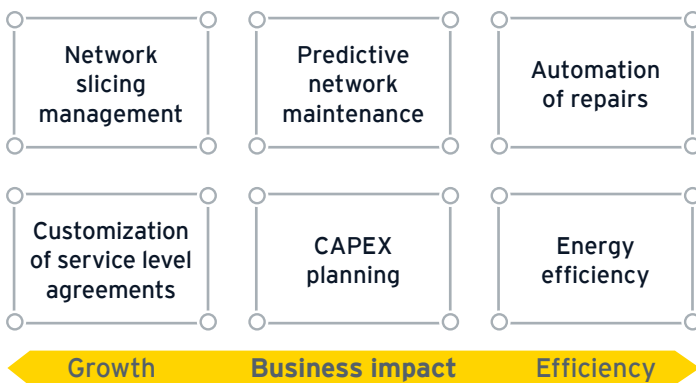
3. Source: EY analysis

Step 3 — Extend AI and automation efforts well beyond the customer

Telcos' current use of AI or analytics and automation is weighted heavily toward optimizing the customer experience. However, use cases for AI in areas such as networks and security, where they're currently less advanced, would benefit from greater focus going forward.

This will require a shift in investment priorities and telcos should also take into account that AI and machine learning have an important role to play in supporting new business models, through capabilities such as network slicing for enterprise customers. Figure 16 shows a number of AI use cases in the network area that can deliver both growth- and efficiency-led gains.

" There is more you can do on the revenue side to create offers providing analytics and AI using the network.

" We have only 'scratched the surface' from an analytics point of view.

Figure 16: Indicative network AI use cases for telcos

| Network slicing management | Predictive network maintenance | Automation of repairs |
| Customization of service level agreements | CAPEX planning | Energy efficiency |

Growth — Business impact — Efficiency

Source: EY analysis

Step 4 — Revisit and refresh your digital transformation fundamentals

If telcos are to maximize long-term value creation in the evolving landscape that we've described, it will be essential for them to have an agile transformation road map – one based on fundamentals that they would need to revisit and refresh continually to stay abreast of developments and ahead of competitors. As figure 17 shows, nearly all operators in our study agree that they require a step-change in agility levels in order to maximize their digital transformation journey.

Figure 17: The need for greater agility among telcos

Statement: "Our organization requires a step-change in agility levels to maximize our digital transformation journey". (Please select one option)

4% 4%
31%
61%

■ Strongly agree
■ Slightly agree
■ Neither agree nor disagree
■ Slightly disagree
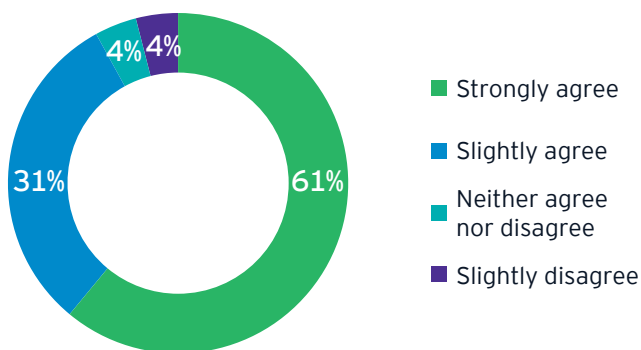
This will involve applying four specific principles. One is prizing innovation as well as efficiency gains. Compared with the previous surveys of industry leaders, our 2019 survey underlines growing fears around telco rates of innovation. AI, analytics and automation have a substantial role to play in overcoming this challenge by providing greater levels of customer- and product-level insights that can aid new service creation.

The second principle is to achieve a better balance between experimentation and execution. Experimentation remains a critical route to new learnings and new competencies. As figure 18 illustrates, the overwhelming majority of telcos in the study agree that their organization needs a more experimental mindset to get the greatest possible value from analytics and automation.

Figure 18: Attitudes to automation and analytics initiatives

Statement: "My organization requires a more experimental mindset to maximize the success of analytics and automation initiatives." (Please select one option)

11%
8%
31%
50%

■ Strongly agree
■ Slightly agree
■ Neither agree nor disagree
■ Slightly disagree
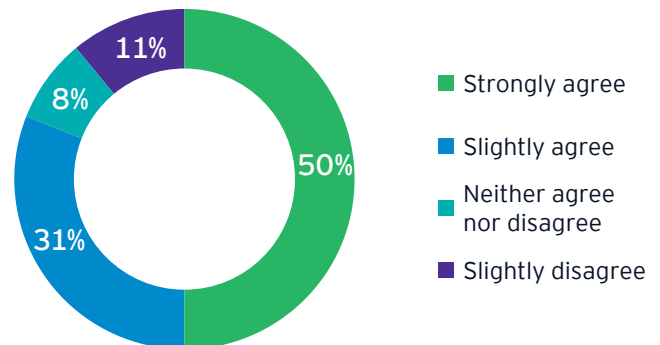
The third principle for maximizing value from AI or analytics and automation is applying improved governance and metrics. As digitization matures within telcos, new forms of measurement and oversight will be essential to maintain visibility, control and alignment with the strategy.

Last but not least, it will be vital for telcos to recognize not just the potential of digitization, but also its limits. Transformation is a human-centered process, and while AI and automation have a major role to play, it's imperative for organizations not to lose sight of the human aspects and also to ensure they take their people with them on the journey.

❝

We have automation use cases that impact a low number of people and a large part of their activities. But as you progress, more people are affected but to a lesser extent. How do you quantify those kind of savings?

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