As Clouds Form, Will Lightning Strike for Telcos?
TeBIT 2022 Executive Report

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For telecom operators, the cloud does double duty, sparking both efficiencies and opportunities for growth. But will it also be a double-edged sword? By shifting their data and processes to the cloud, telcos open the door to faster, more flexible ways of working. By developing cloud-based products, they can pursue—and seize—new revenue streams. But as the cloud’s role grows, cloud providers become better positioned to get in on the action. How can telcos unleash rewards, not rivals?

This year’s telco IT benchmarking (TeBIT) study, jointly developed by ETIS—The Community for Telecom Professionals—and Boston Consulting Group, looks at the path telcos are taking as they embrace the cloud and deepen relationships with cloud providers. It finds telcos in wide agreement that they have landed on an enabler for growth. What they haven’t landed on—yet—is the optimal strategy: both to speed their cloud journey and to ensure that today’s partners aren’t tomorrow’s competitors. (See “About the TeBIT Benchmark”)

Accelerating Transformation
Telcos played a crucial role in helping the world adapt—and stay connected—during the pandemic. Video conferencing, online transactions, digital ecosystems: they kept businesses and society resilient. And as new ways of interacting have grown into standard ways, telecom services have grown, too. On average, ETIS members saw a 2.6% increase in revenues in 2021, a turn north from the 0.8% drop the group recorded in 2020. Yet EBITDA
cloud providers. It finds telcos in wide agreement that they have landed on an enabler for growth.

What they haven’t landed on—yet—is the optimal strategy: both to speed their cloud journey and to ensure that today’s partners aren’t tomorrow’s competitors. (See “About the TeBIT Benchmark”)

**Accelerating Transformation**

Telcos played a crucial role in helping the world adapt—and stay connected—during the pandemic. Video conferencing, online transactions, digital ecosystems: they kept businesses and society resilient. And as new ways of interacting have grown into standard ways, telecom services have grown, too. On average, ETIS members saw a 2.6% increase in revenues in 2021, a turn north from the 0.8% drop the group recorded in 2020. Yet EBITDA margin—an indicator of how well telcos are managing costs and efficiency—has not grown in step. A prime culprit: legacy technology.

For telcos, this isn’t a news flash. One of the key motivators for transformation has been to shift to more flexible, scalable, and efficient ways of working. By modernizing their IT, telcos can accelerate process automation, better leverage data and analytics, and take advantage of emerging technologies and business models. And they’re well on their way: 78% of TeBIT participants are in the middle of a digital transformation, business support system transformation, or operations support system transformation. Another 11% are even further along, nearing the end of their transformations. If these efforts pay off, telcos can hit the trifecta of boosting revenues, lowering costs, and improving efficiency.

Increasingly, telcos see the cloud as the special sauce that makes their transformations come together. ETIS members’ annual reports spotlight an array of cloud initiatives and goals: new cloud products, cloud-based customer- and network-service platforms, cloud-first strategies—the list goes on. The cloud lets telcos more easily access their data, scale the services they use (or sell), and put advanced analytics and automation to use—for example, to predict and prevent service incidents and to support customers as they choose from, and use, the telco’s offerings.

One surprise is where telcos are in their cloud journey. While 75% of TeBIT participants have initiated a shift to the cloud since 2019, most are still, in practical terms, in the early stages. On average, telcos migrated just 26% of their applications by the end of 2021, and no participant crossed the 50% mark. Why the holdup? One explanation is—again—telcos’ legacy IT landscape. With a broad variety of interdependencies and often layers of customization added over the years, it’s a natural bottleneck. Moving applications from a legacy environment to a cloud platform is taking time.
With success stories spanning industries, there is no question about the efficiency and effectiveness of the cloud. The question is how efficiently and effectively telcos are embracing it. This year’s TeBIT analysis uncovered some surprises, some potential pitfalls, and some ways, perhaps, to smooth the journey.

A Slow Migration
One surprise is where telcos are in their cloud journey. While 75% of TeBIT participants have initiated a shift to the cloud since 2019, most are still, in practical terms, in the early stages. On average, telcos migrated just 26% of their applications by the end of 2021, and no participant crossed the 50% mark. Why the holdup? One explanation is—again—telcos’ legacy IT landscape. With a broad variety of interdependencies and often layers of customization added over the years, it’s a natural bottleneck. Moving applications from a legacy environment to a cloud platform is taking time.
Their visions vary, but ETIS members have big plans for the cloud

ETIS members highlighted an array of cloud initiatives and goals in their annual reports:

- Cloud-based products for the modern workplace
- Evolve core network towards a common cloud-based solution
- Cloud-first strategy
- Launch market-leading products faster through cloud solutions
- Cloud solutions with highest security standards
- 5G Cloud VR project
- 5G, IoT, cloud, cybersecurity, and data analysis as future growth opportunities
- Development of next-generation cloud solution
- Cloud-based customer- and network-service platforms
- Telcos as platforms for digital services
- Uniform data model to enhance data analysis using cloud-based deployment
- New cloud space offering

Sources: ETIS members’ annual reports, 2021; BCG analysis.
TeBIT telcos are in the midst of a broad digital and IT modernization...

Transformation efforts are enabling telcos to accelerate process automation, leverage advanced analytics, and extend their fixed and mobile offerings.

- 78% are in the middle of a transformation
- 11% are nearing the end of a transformation

Sources: TeBIT 2022; BCG analysis.

*BSS = business support system; OSS = operations support system.
...and cloud migrations are a key element of their transformations

Telcos are embracing the cloud—but so far, they haven’t pulled the plug on on-premises infrastructure

<table>
<thead>
<tr>
<th>Infrastructure typologies</th>
<th>On premises, noncloud only</th>
<th>Hybrid cloud</th>
<th>Cloud only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure (such as a data center) is deployed onsite at the telco (or at its vendor’s location)</td>
<td>The telco uses a combination of cloud and on-premises infrastructure</td>
<td>Private or public cloud environments provide all IT resources for the telco</td>
<td></td>
</tr>
</tbody>
</table>

Sources: TeBIT 2022; BCG analysis.

- **0%** of TeBIT participants have yet to initiate a shift to cloud
- **67%** have launched a dedicated shift-to-the-cloud program
- **33%** are shifting to the cloud gradually (through individual initiatives rather than a dedicated program)
- **0%** are mainly or fully on cloud

- **Future**
On average, telcos migrated just over a quarter of their apps by the end of 2021. But there’s still a long way to go until full cloudification. No TeBIT telco has shifted more than half of its applications to the cloud—and for most participants, the figure is much lower.

TeBIT participants hold hybrid cloud estates, comprising complex on-premises legacy systems and newer public and private cloud environments.

Sources: TeBIT 2022; BCG analysis.
Telcos are trying different approaches as they move applications to the cloud, and each has its pros and cons.

## The five methodologies

<table>
<thead>
<tr>
<th>What telcos do</th>
<th>REHOST</th>
<th>REFACTOR</th>
<th>REWORK</th>
<th>DEVELOP</th>
<th>SERVICE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lift and shift</strong></td>
<td>Move existing applications as-is to cloud-based infrastructure as a service (IaaS)</td>
<td>Shift to platform as a service (PaaS) using containerization</td>
<td>Redevelop applications with cloud-native code—and then rehost or refactor them</td>
<td>Develop cloud-native applications from scratch</td>
<td>Replace applications with software as a service (SaaS)</td>
</tr>
<tr>
<td><strong>Advantages and disadvantages</strong></td>
<td>Allows for a fast migration, but doesn’t take full advantage of the cloud’s potential</td>
<td>Uses the code base, frameworks, and other elements of the original application, but gives you limited optimization options</td>
<td>Cloud-optimized code lets you better leverage the cloud’s benefits, but the process requires more time and effort than telcos might like</td>
<td>Puts you in position to take full advantage of the cloud, but it’s a significant undertaking (more so than any other approach)</td>
<td>Shifts the burden of maintenance and updates to the vendor, but requires you to redesign your business processes</td>
</tr>
</tbody>
</table>

**Sources:** TeBiT 2022; BCG analysis.
So far, telcos don’t have a clear preference for any one methodology

As they shift applications to the cloud, most TeBIT participants are focusing their efforts around two or three approaches

DISTRIBUTION OF METHODOLOGIES USED BY TEBIT PARTICIPANTS\(^1\) (%)

Sources: TeBIT 2022, BCG analysis.

\(^1\)To gain insight on which approaches telcos are using to shift their applications to the cloud, we asked TeBIT participants to allocate 100% across the different methodologies shown. The “max” percentage for each methodology represents the highest percentage allocated by a telco for that approach; the minimum allocation for each was 0, indicating that at least one telco said it does not use that approach at all.
But maybe telcos could pick up the pace. Typically, there are five ways to shift a legacy application to the cloud: rehosting (lifting an application “as is” and deploying it on the cloud); refactoring (adjusting and then moving the application); reworking (redeveloping the application with cloud-native code and then rehosting or refactoring); developing cloud-native applications from scratch; and replacing a legacy application entirely with a software-as-a-service (SaaS) solution. Each of these approaches has its pros and cons. Rehosting, for example, means a fast migration, but it typically leaves you with software that doesn’t take full advantage of the cloud’s potential. Developing from scratch, by contrast, can realize that potential but it’s a significant undertaking.

Overall, telcos don’t seem to have a clear preference for any one method. Yet we did see some patterns. The participants that are most advanced in their cloud migrations tend to rework their existing applications or develop all-new ones. Telcos that are just beginning their migrations, meanwhile, typically employ the full range of methodologies—in effect, trying them all. This suggests that telcos just starting their migrations might want to follow a more focused playbook—centered around the methodologies favored by the early adopters.

A Shift but Not a Strategy
App migration is important, but telcos also need to think about where, and how, the cloud can trigger growth. That means applying a strategic mindset to
the cloud. Throughout the study, we saw evidence of participants taking more of an ad hoc approach rather than looking at the big picture. Case in point: while 44% of cloud migrations have been led by telco IT departments, just 33% percent have been spearheaded jointly by IT and the business side. One could argue that it makes sense that IT is leading the charge: the cloud can simplify the IT landscape and trigger greater efficiency in operations. But those benefits are just part of what the cloud offers.

Similarly, telcos appear to be taking an opportunistic approach in how they leverage their cloud partners. On average, TeBIT participants use 2.6 cloud providers (not including SaaS vendors). The most common platforms are Amazon Web Services, Google Cloud, and Microsoft Azure. When selecting a provider, the two main drivers are the product offering (say, the ability to store data, perform analytics, and add other functionality right away) and the provider’s broader capabilities (such as helping with migration, data cleansing, or streamlining processes to boost efficiency).
IT—not the business side—is spearheading the shift to the cloud

Yet the cloud’s benefits can reach far beyond the tech department

- **Simplification**: migrating to the cloud unifies and simplifies the IT portfolio
- **Insights and opportunities**: a common data architecture helps telcos leverage advanced analytics
- **Automation and efficiency**: cloud solutions help telcos operate in faster, more flexible ways
- **Scalability**: the “on demand” nature of cloud services enables telcos to adjust capacity and resources as needed
- **Predictability of costs**: a subscription pricing model means no surprises—and often, a lower total cost of ownership
- **New business opportunities**: Cloud-based platforms and services open the door to new telco offerings—and revenue streams

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**BUSINESS UNITS LEADING CLOUD MIGRATIONS; SHARE OF TOTAL (%)**

- IT function or department: 44%
- Joint effort (IT and business): 33%
- Transformation office: 11%
- Network function or department: 11%
- Business: 0%
- External third party: 0%

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**Sources**: TeBiT 2022; BCG analysis.

*Because of rounding, percentages do not add up to 100.*
On average, TeBIT telcos have 4.8 cloud environments...

Each cloud environment serves a specific purpose and stands on its own; examples include an IT cloud, a B2B cloud, and a telco cloud that delivers and manages network functions and services.

4.8
average

3 min
5 median
7 max

All participants hold hybrid multicloud estates, which combine legacy on-premises environments with public and/or private clouds.

Public cloud
IT resources (such as storage and compute) provided via a cloud infrastructure that is shared by multiple customers. Examples include Amazon Web Services and Google Cloud.

Private cloud
A dedicated cloud environment—based on platforms such as OpenShift—for use by a single customer. Can be located in-house or hosted by a vendor.

Hybrid cloud
A combination of public and private cloud environments.

Hybrid multicloud
A combination of legacy on-premises environments and multiple private/public clouds.

Sources: TeBIT 2022; BCG analysis.
...but they use just 2.6 cloud service providers

Average number of cloud service providers per telco

- **2.6** average
- **2** min
- **3** median
- **4** max

Most TeBIT telcos have focused their efforts—and contracts—around the public cloud’s three leading players

- **~80%** use Microsoft Azure
- **~60%** use Google Cloud
- **~60%** use Amazon Web Services

Other cloud providers mentioned by participants include Oracle, Exoscale, and Red Hat OpenShift

Sources: TeBIT 2022, BCG analysis.

1Cloud service providers offer infrastructure as a service (for storage, compute, and other resources) and platforms as a service (for building and deploying cloud-based applications). For purposes of this question, we excluded software as a service (SaaS) vendors.

2Not all TeBIT participants answered this question; percentages were calculated from the total number of responding telcos.
When selecting cloud providers, telcos look primarily at the product offering and the vendor’s broader capabilities.

**TOP DRIVERS FOR SELECTING A CLOUD SERVICE PROVIDER (% OF TOTAL RESPONSES)**

<table>
<thead>
<tr>
<th>Driver</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product offering</td>
<td>28</td>
</tr>
<tr>
<td>Provider’s broader capabilities</td>
<td>22</td>
</tr>
<tr>
<td>Reputation</td>
<td>11</td>
</tr>
<tr>
<td>Price</td>
<td>11</td>
</tr>
<tr>
<td>Provider’s transformation capabilities</td>
<td>11</td>
</tr>
<tr>
<td>Existing installation</td>
<td>6</td>
</tr>
<tr>
<td>Past experience</td>
<td>0</td>
</tr>
<tr>
<td>Data center location</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>11</td>
</tr>
</tbody>
</table>

*Sources: TeBIT 2022; BCG analysis.

TeBIT participants were asked to select their top two drivers when selecting a cloud service provider.
Participants largely leverage the public cloud, but they also look to their providers for integrated services and virtual private clouds.

Integrated services (such as analytics tools) are often sought-after components of a cloud solution. But they can lead to vendor lock-in.

A virtual private cloud (VPC) is an isolated environment within a public cloud. It can provide a higher degree of data privacy and lower latency.

**OFFERINGS TELCOS UTILIZE FROM THEIR TOP TWO CLOUD PROVIDERS (% OF TOTAL RESPONSES)**

- **Public cloud**: 33%
- **Integrated services**: 19%
- **VPC**: 19%
- **Private cloud**: 14%
- **Data center**: 10%
- **Other ICT services**: 5%

**Sources**: TeBiT 2022; BCG analysis.

**Note**: VPC = virtual private cloud; ICT = information and communications technology.
This aligns with the mixed use telcos tend to make of their platforms: on average, participants leverage each of their cloud providers in five ways. But we didn’t see a clear pattern, no “must have” capabilities that everyone is embracing. Instead, the uses—which include infrastructure services (such as compute, storage, and backup), business support systems, data and analytics, and reselling—vary from one telco to another.

All of this supports the notion that telcos are still looking for the optimal way to move to the cloud. There’s no magic bullet, no consensus on what works best. Everyone is taking their own approach. And those approaches—for now, at least—focus more on individual waypoints than the overall journey. This, too, is a familiar theme. In last year’s TeBIT report, we saw that participants were prioritizing and investing in digital transformations but missing an end-to-end view of how to optimize the tools—and the results. Telcos need that holistic perspective when it comes to the cloud as well.

**Sparking Growth—or Competition?**
While telcos work with a small number of global cloud service providers, they use a wider array of SaaS vendors: 12.6 on average (though the number ranged widely, from 3 to 50, across TeBIT participants). This finding wasn’t unexpected, as SaaS solutions offer specific functionality and fast migration paths. But two SaaS solutions stand out: 100% of participants use both Salesforce (for customer relationship management as well as marketing and sales) and ServiceNow (for service management).
Overall, telcos expressed satisfaction with their cloud providers: 67% said they were happy with the majority of their vendors, while the rest said the picture was mixed, closer to a 50-50 split. Tellingly, no participants said they were happy with just a minority—or none—of their vendors. That’s significant, as one lesson from transformations is that satisfaction tends to rise as you get closer to the goal line. By then, you’ve worked out many issues and are starting to see a payoff. So it bodes well that telcos are generally happy now, when there is still a way to go.
While telcos have a more diverse set of SaaS relationships, a few vendors still dominate the field.

On average, TeBIT participants use 12.6 SaaS vendors...

- **Average**: 12.6
- **Min**: 3
- **Median**: 26.5
- **Max**: 50

...but there are three major players:

- **100%** use Salesforce
- **100%** use ServiceNow
- **~66%** use Oracle

Other SaaS solutions mentioned by participants include CloudSense, Vlocity, Connective, Qualtrix, IBM Watson, Azure AD, Teradata, and Elastic Cloud.

Sources: TeBIT 2022, BCG analysis.

1 Not all TeBIT participants answered this question; percentages were calculated from the total number of responding telcos.
Overall, TeBIT participants are satisfied with their cloud providers

- Happy with all of their cloud providers: 67%
- Happy with the majority of their cloud providers: 33%
- A mixed (50-50) picture: 4%
- Happy only with some vendors: 1%
- Unhappy: 0%

Sources: TeBIT 2022; BCG analysis.

In transformations, ratings tend to rise as you get closer to the finish line. But even in the early stages, telcos are generally happy with their cloud vendors.
Telcos see cloud service providers as partners and enablers, not competitors—but will that change?

Participants view their vendor relationships as symbiotic, with some telcos and providers even engaging in joint development. Yet as telcos move deeper into the cloud, offerings may converge—and rivalries emerge.

Sources: TeBiT 2022; BCG analysis.
The bigger question is what the future holds for the relationship between telcos and vendors—especially the large global cloud service providers. Right now, telcos tend to view that relationship as symbiotic: 62% of TeBIT participants perceived cloud service providers as partners and allies (involved in decision making, in some cases even jointly developing cloud-based services); the rest saw them as enablers (providing the capabilities and functionality that let telcos harness the power of the cloud). Notably, none viewed their vendors as competitors.

But is this a marriage for the ages, or one of convenience? As telcos simultaneously embrace the cloud and diversify their portfolios, the lines may blur between their offerings and those from cloud providers. (Indeed, some telcos are already reselling products such as cloud storage.) This has the potential to spark competition between telcos and their cloud partners, particularly in emerging areas such as edge computing and the Internet of Things.

A face-off wouldn’t be unprecedented. Cloud providers now dominate data-center services—an area where telcos had made the early inroads. And they’re not likely to cede promising new markets. Cloud providers are agile and, as they’ve proven time and again, can respond quickly to evolving needs and opportunities.

There’s the potential, too, for competition even in telcos’ traditional business. Increasingly, core
network capabilities (such as traffic management) and value-added services (such as industry-specific 5G solutions) can be handled through software instead of dedicated hardware installed across the telco’s network. This lowers the entry barriers for cloud providers looking to offer similar—or identical—services.

Telcos need to consider these vulnerabilities and take steps to minimize the risk. This starts by making the most of their own strengths: infrastructure ownership and control over the network; end-customer access; and the ability to provide customization and individualized service. Utilizing these advantages, telcos can develop unique capabilities and differentiators. And they can strike the right balance in their cloud partnerships—one that brings growth, not competition.
About the TeBIT Benchmark

TeBIT, a survey of European operators’ IT spending and performance, was completed in December 2022. Participating telcos shared financial data, but, critically, they also provided information about their technology initiatives and priorities. The TeBIT analysis sheds light on how participants are adapting to new trends, circumstances, and challenges—and zeros in on where telcos may want to focus their efforts. Each year, TeBIT takes a deep dive into a topic of particular interest to telcos. In previous reports, we’ve looked at digital maturity and adapting during the COVID-19 crisis, among other areas.

Collaboration is a key component of TeBIT; the goal—as it is with ETIS working groups and community gatherings—is to identify, and even shape, the best practices that can help telcos better serve customers in a rapidly changing world. In return for allowing themselves to be compared with other telcos, participants can access a full set of benchmark results, along with further trend analysis.
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