Intelligent Telecom:

The Movement Of Enterprise Applications To The Cloud

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Introduction

Telecom companies globally are contending with slower growth in core voice and messaging businesses, lowered margins, increased competition from over-the-top media services, and more demanding customers.

In the U.S., with social media opening up new communications channels, landline and mobile voice access today make up less than a third of the total, having dropped significantly from 55% in 2010 while data revenues contribute 65%.[1]

Further, 5G technologies will soon be a dominant priority across the industry. The need today is for new revenuestreams, innovative offerings aligned with customer expectations, better relationships with stakeholders and hyperefficient operations.

Digital technologies offer telecom firms an opportunity to accomplish all the preceding and more. And cloud computing can accelerate the digital drive. By helping reduce the hardware and software assets in an enterprise, the cloud enables faster scaling, lowered costs and a way to keep pace with the rapidly changing technology landscape.

Simplification of products, reduced pain points across the customer journey (both internal and external) and the creation of 'all-digital' experiences are some of the more lauded aspects of the transition to cloud computing. As one senior partner we interviewed for this research affirmed – "Enhancing the digital experience across our partner ecosystem was a vital driver for cloud adoption. We wanted to give our partners the same customer insights as those derived in our own firm."

As part of the transition to the cloud, enterprise applications come under the spotlight as firms move away from monolithic packages and massive implementation cycles toward shorter agile implementations. In turn, this shift is expected to propel digital transformation.
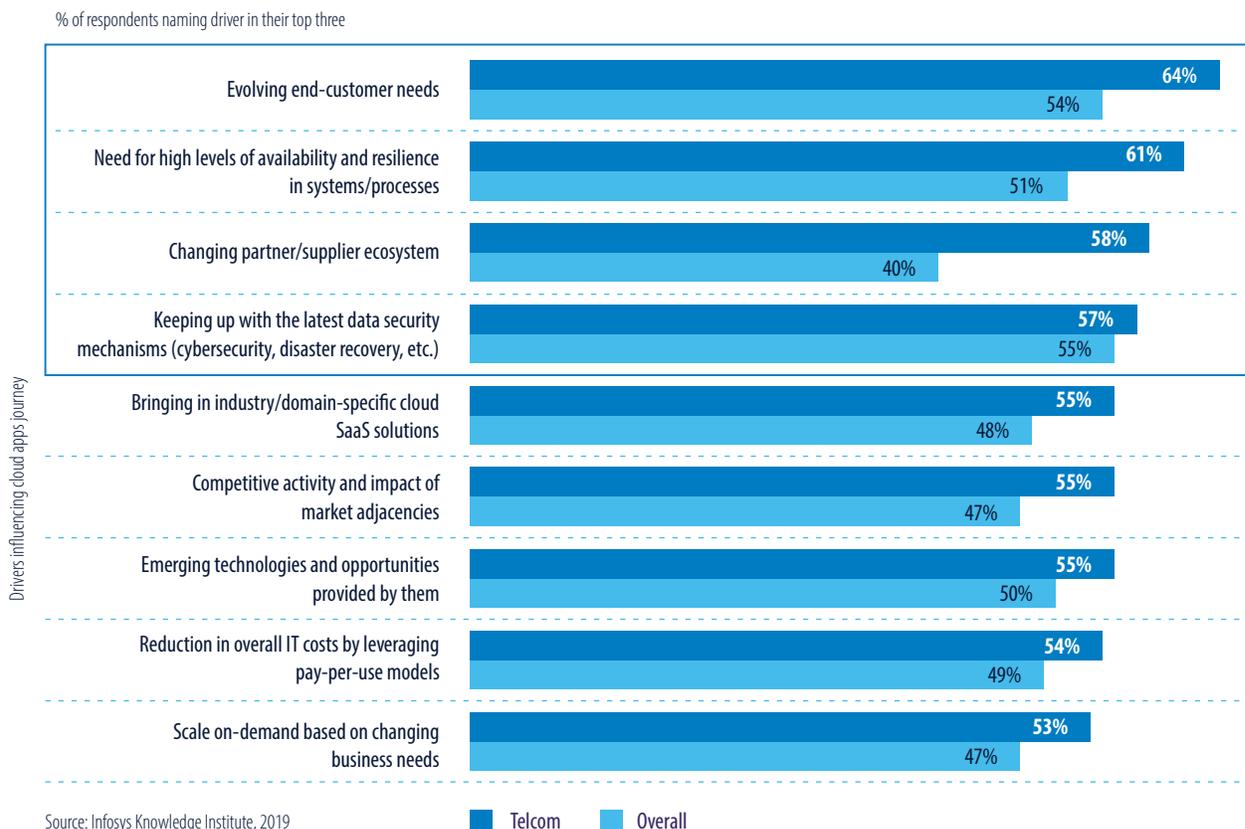
Given the critical role played by enterprise applications in a business, it's essential to get a comprehensive idea of its movement to the cloud. Enterprise applications include those that run the business, such as enterprise resource planning, customer relationship management, supply chain management and human resources management.

Infosys launched a study in the first quarter of this calendar year to understand the experience of application cloud transformation across 81 telecom firms from the United States, Europe, Australia and New Zealand. To understand the pulse of the market moving forward, the survey was further validated by qualitative interviews with senior executives in September and October. Respondents were senior executives involved in digital and cloud initiatives at firms with revenues exceeding $1 billion.

The cloud: a strategic move for enterprise applications

A mix of external and internal drivers trigger the movement of telecom applications to the cloud (Figure 1). The top three include keeping pace with evolving customer needs (64%), ensuring high levels of availability and resilience in systems (61%), and the changing partner ecosystem (58%).

Figure 1. Technology and customer-facing initiatives are the top reasons for movement to the cloud

% of respondents naming driver in their top three

Drivers influencing cloud apps journey	Telcom	Overall
Evolving end-customer needs	64%	54%
Need for high levels of availability and resilience in systems/processes	61%	51%
Changing partner/supplier ecosystem	58%	40%
Keeping up with the latest data security mechanisms (cybersecurity, disaster recovery, etc.)	57%	55%
Bringing in industry/domain-specific cloud SaaS solutions	55%	48%
Competitive activity and impact of market adjacencies	55%	47%
Emerging technologies and opportunities provided by them	55%	50%
Reduction in overall IT costs by leveraging pay-per-use models	54%	49%
Scale on-demand based on changing business needs	53%	47%

Source: Infosys Knowledge Institute, 2019   ■ Telcom   ■ Overall

Globally, customer satisfaction has been typically low in the telecom industry. According to the American Customer Satisfaction Index (ACSI), which provides a national cross-industry measure of customer satisfaction in the United States, the 2018 score for telecommunications and information sector is among the lowest.[2] This score reflects an improvement over the previous two years' decline. Telecom firms have recognized the urgent need to overhaul customer relationships and launched multiple initiatives to correct this downward trend. Introducing integrated voice and data services was perhaps the biggest change,

prompting telecom providers to now be referred to as communication service providers, as their offerings now include entertainment, education and so on.

> *Meeting evolving customer needs is the top driver for cloud apps transformation*

Further, by installing sophisticated technologies to enhance operations and bolster customer-facing functions, these firms have made great strides to provide
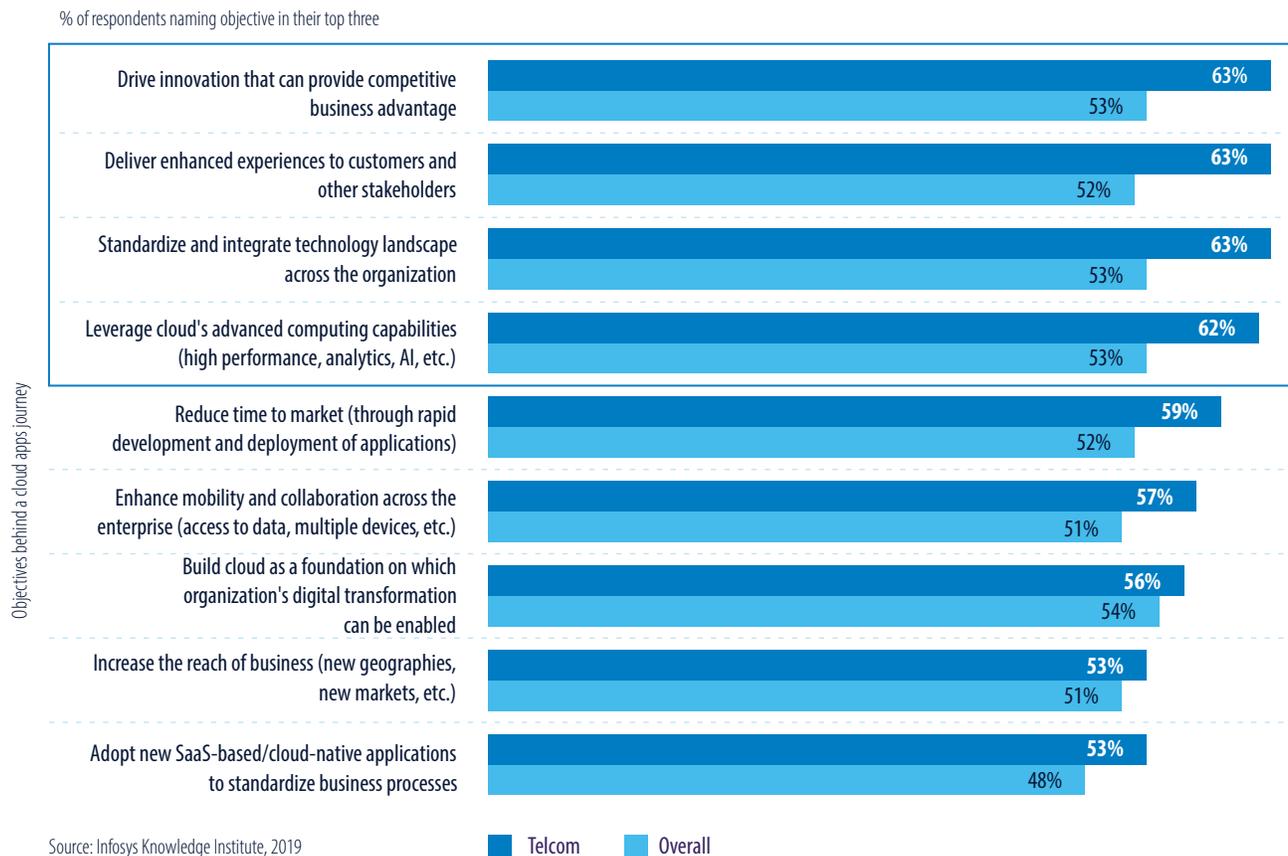
a seamless customer experience. However, more ground should be covered in order for telecom firms to catch up with other sectors. Meeting evolving customer needs as a top driver for cloud apps transformation is warranted.

At the same time, telecom enterprises must also focus on operational performance parameters, such as availability and resilience, to ensure their business functions smoothly. The cloud enables this through smart server switching. As a case in point, Netflix achieves 99.99% availability through prodigious use of cloud services from Amazon.

In an increasingly connected world, customers expect a one-stop shop to service their needs. Today, telecom firms partner with media companies, payment gateways, education service providers and the like to be a one-point solution for their customers. Staying on top of a changing partner ecosystem is clearly important and essential.

The prime objectives, rather than drivers, that telecom firms expect to accomplish from the cloud apps transformation are innovating to gain competitive advantage (63%), enhancing customer experience (63%), and standardizing and integrating the technology landscape (63%).

Figure 2. Innovation, enhanced experiences and technology integration are the top expected end points of cloud app transformation

% of respondents naming objective in their top three

Objective	Telcom	Overall
Drive innovation that can provide competitive business advantage	63%	53%
Deliver enhanced experiences to customers and other stakeholders	63%	52%
Standardize and integrate technology landscape across the organization	63%	53%
Leverage cloud's advanced computing capabilities (high performance, analytics, AI, etc.)	62%	53%
Reduce time to market (through rapid development and deployment of applications)	59%	52%
Enhance mobility and collaboration across the enterprise (access to data, multiple devices, etc.)	57%	51%
Build cloud as a foundation on which organization's digital transformation can be enabled	56%	54%
Increase the reach of business (new geographies, new markets, etc.)	53%	51%
Adopt new SaaS-based/cloud-native applications to standardize business processes	53%	48%

Objectives behind a cloud apps journey

Source: Infosys Knowledge Institute, 2019

■ Telcom   ■ Overall

Competition has flared up significantly in the telecom industry from unconventional parties, including social media, OTT service providers and internet-based players. Revenues are being squeezed, which is compelling telecom enterprises to discover new ways to leapfrog the competition. The utility-style business model, with its old ways of looking at customers and generating revenues, will no longer work in today's customer-centric world. By moving to the cloud, enterprises can access a wider ecosystem that they can tap into to quickly adapt to the new demands and survive an intensely competitive environment. This, then, will give telcos the necessary fuel to fight off the threats from the tech giants and chip providers which are moving up the value chain.

The four types of enterprises

The study evaluated the maturity and direction of the application cloud program across the telecom companies surveyed. Maturity was determined by asking the following questions:

- Are the business objectives of telecom firms strategic or operational in nature?

- Do business or IT-led reasons drive telecom enterprises to the cloud?

- Are enterprises occupied with quick wins today, or are they thinking and planning ahead?

- Have telecom enterprises expanded to include the external ecosystem, or are they internally focused?

This examination led to four distinct clusters in the telecom industry:

Business-focused (57%):

Visionary enterprises looking at long-term business impact. Competition, enhanced stakeholder experiences, increased innovation, market reach and keeping up with the changing ecosystem drive these firms.

IT-focused (26%):

Enterprises absorbed in technology-led operational outcomes and that are not fundamentally changing their business model in response. Typically, these firms look for short-term outcomes, including reduced costs, high availability, data security and advanced compute capabilities such as analytics and AI.

Agility-focused (7%):

Progressive enterprises focused on improving organizational agility. These firms rely heavily on operational transformation to deliver business outcomes.

Ad hoc (10%):

Enterprises lacking a clear vision and plan for IT or business transformation. They respond to triggers in an ad hoc fashion.

Figure 3. Business-focused enterprises (57%), IT-focused enterprises (26%) and agility-focused enterprises (7%) comprise the key clusters

Base : 81

- Business-focused
- IT-focused
- Agility-focused
- Ad hoc
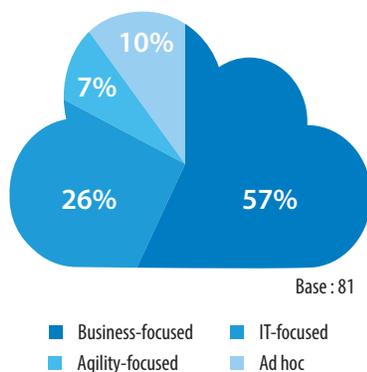
Source: Infosys Knowledge Institute, 2019

> *Using DevOps and cloud platforms such as Salesforce and SAP can ignite a telco's journey to visionary status*

The telecom sector is ahead of other industries in the size of its business-focused cluster (57%), indicating that this is a mature industry that has recognized the value of the cloud platform to innovate with an external-facing view. That telecom enterprises look to exploit the cloud's advanced capabilities and fuel their digital transformation is confirmed by the size of the IT-focused group (26%), which forms a larger portion of the cluster pie. The small size of the agility-focused cluster (just 7%, compared to

the 15% median value) indicates that reduced time to market, enhanced collaboration and the ability to scale on demand are not yet prime motives for telco cloud journeys. By introducing DevOps into cloud programs (Infosys is a world leader in this aspect), and using cloud
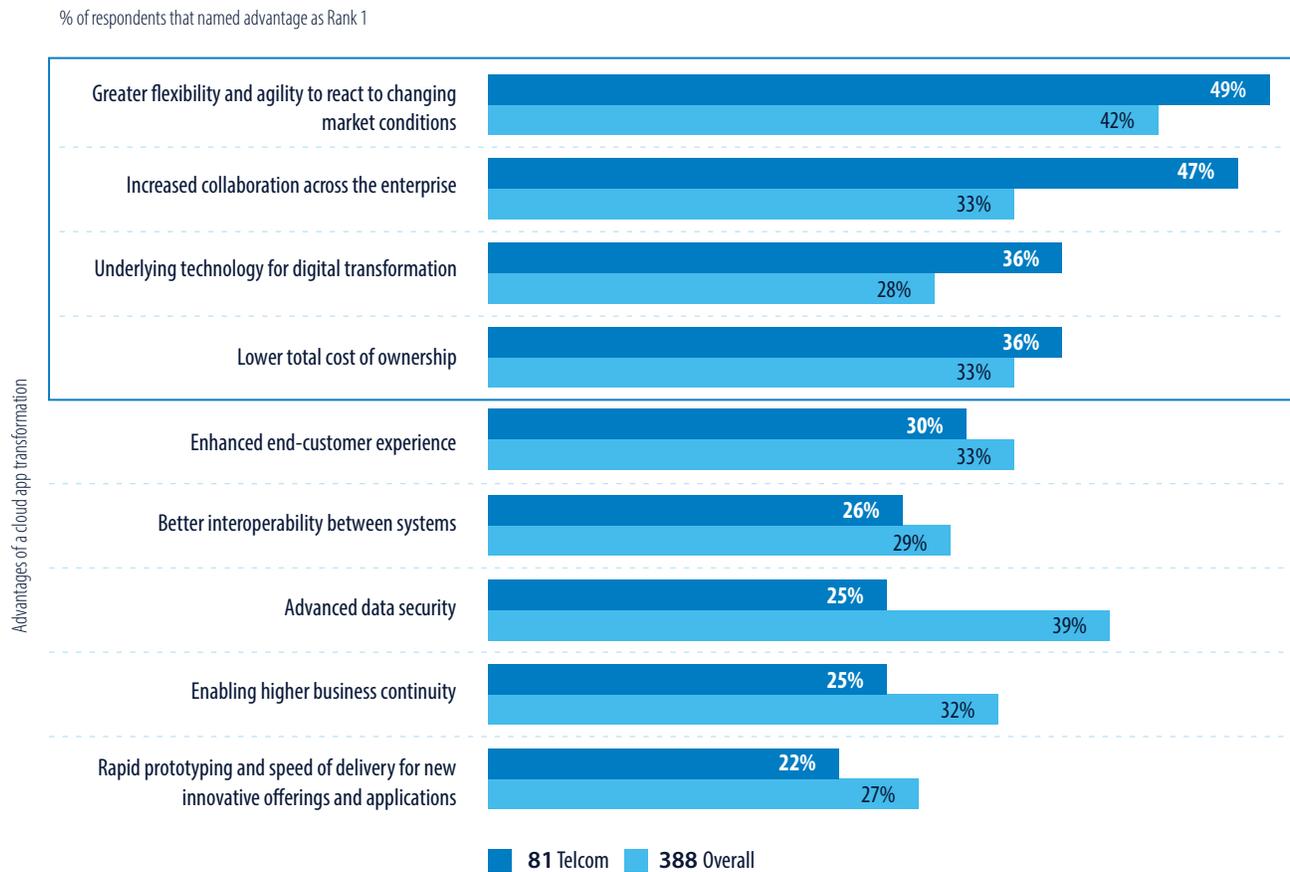
platforms such as Salesforce and SAP, telcos can ignite their journey to visionary status.

Read our master report titled "Behind the scenes of an intelligent enterprise: moving enterprise applications to the cloud" for more insight into each cluster.

Enterprise clusters expect both strategic and operational benefits

Though satisfying evolving customer needs was a top driver for cloud apps transformation, it did not feature in the top advantages that the cloud was expected to deliver. Instead, telecom enterprises expect greater flexibility to respond to market changes (49%), increased collaboration across the enterprise (47%), cloud as a foundational technology for digital transformation (36%) and lowered total cost of ownership from cloud apps (Figure 4).

Figure 4. Aspirations include market flexibility, increased collaboration and cloud as a dominant technology on which to transform

% of respondents that named advantage as Rank 1

Advantages of a cloud app transformation

	Telcom (81)	Overall (388)
Greater flexibility and agility to react to changing market conditions	49%	42%
Increased collaboration across the enterprise	47%	33%
Underlying technology for digital transformation	36%	28%
Lower total cost of ownership	36%	33%
Enhanced end-customer experience	30%	33%
Better interoperability between systems	26%	29%
Advanced data security	25%	39%
Enabling higher business continuity	25%	32%
Rapid prototyping and speed of delivery for new innovative offerings and applications	22%	27%

81 Telcom   **388** Overall

Advantages of cloud transformation (%)	Overall telecom	Geo		
		Australia and New Zealand	EU	U.S.
Base	81	17	26	38
Greater flexibility and agility to react to changing market conditions	49	67	50	42
Increased collaboration across the enterprise	47	50	33	63
Underlying technology for digital transformation	36	50	40	27
Lower total cost of ownership	36	33	40	33
Enhanced end customer experience (CX)	30	17	36	31
Better interoperability between systems	26	-	17	40
Advanced data security	25	33	22	23
Enabling higher business continuity	25	25	-	33
Rapid prototype and speed of delivery for new innovative offerings and applications	22	25	20	20

Source: Infosys Knowledge Institute, 2019

For some executives we interviewed, increased collaboration across the enterprise can be found by procuring a cloud platform, ensuring the enterprise has "a single face across the ecosystem". Cloud then acts as the foundation for knowledge sharing and data dissemination, with employees working on 'live' projects at a global scale.

Given the state of flux in the telecom industry, as it battles diverse market forces it must equally prioritize increasing internal and external performance.

Cloud applications such as Salesforce's Force.com (a development platform) can be used to scale quickly and de-risk digital transformation, while increasing the number of citizen analysts who don't need specialist data science training.
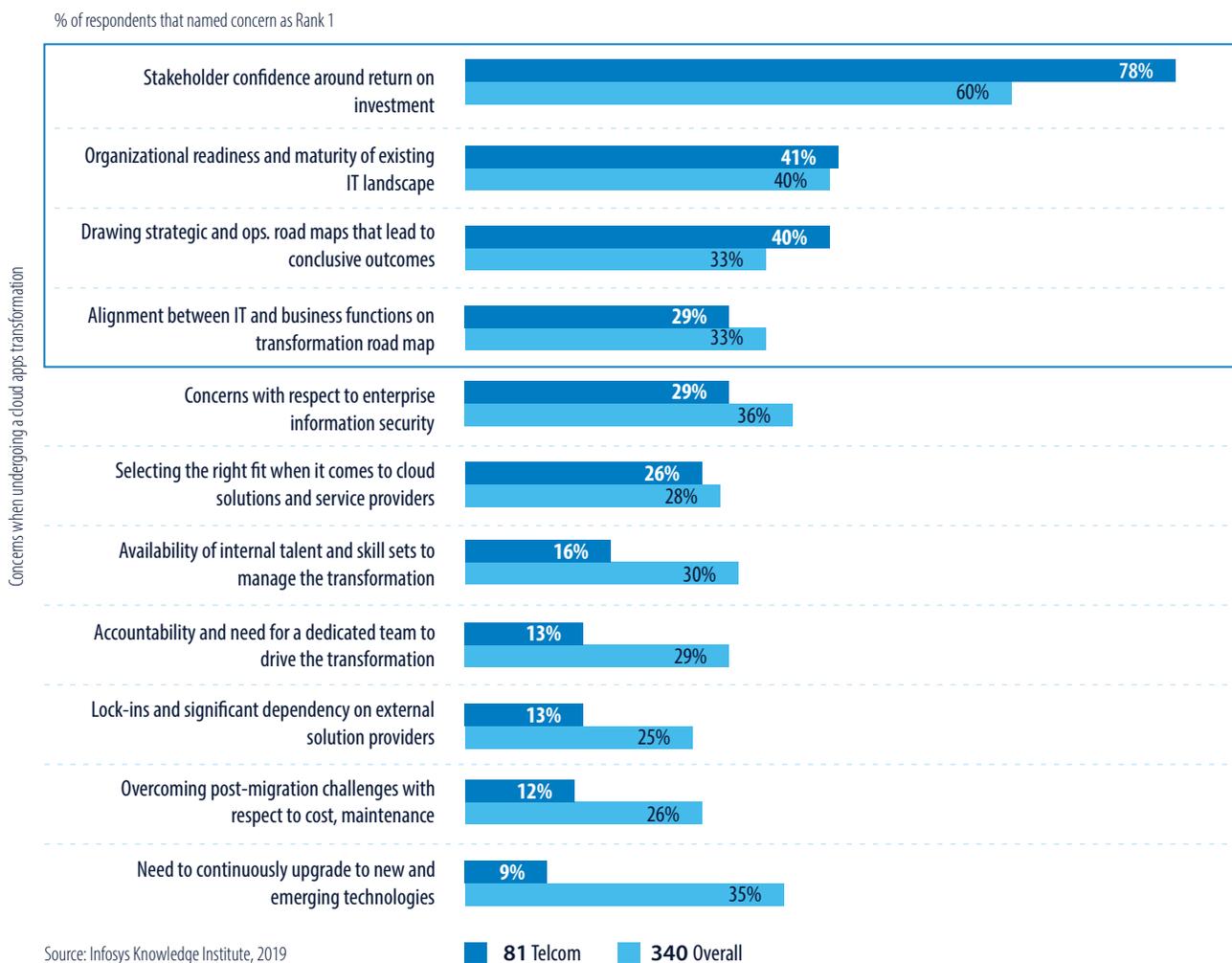
The U.S. considered increased collaboration (63%) as an important advantage, while greater flexibility to address market changes (50%) was more prevalent in Europe. Australia and New Zealand respondents considered the top three advantages as vital.

Cloud concerns persist, characterizing large-scale programs

Building stakeholder confidence (78%) was the most significant concern for the telecom industry and attracted significantly more responses than other concerns (Figure 5). Cloud transformation programs mandate high investments and consequently garner significant visibility, especially among senior-level leaders. Large-scale programs of this nature require ownership and direction from top management to succeed, and so delivering significant ROI deservedly becomes a key concern across business and IT groups, and across industries and regions.

Figure 5. Telcos are apprehensive about building stakeholder confidence, organizational readiness, and drawing effective strategic and operational road maps

% of respondents that named concern as Rank 1

Concerns when undergoing a cloud apps transformation

Concern	81 Telcom	340 Overall
Stakeholder confidence around return on investment	78%	60%
Organizational readiness and maturity of existing IT landscape	41%	40%
Drawing strategic and ops. road maps that lead to conclusive outcomes	40%	33%
Alignment between IT and business functions on transformation road map	29%	33%
Concerns with respect to enterprise information security	29%	36%
Selecting the right fit when it comes to cloud solutions and service providers	26%	28%
Availability of internal talent and skill sets to manage the transformation	16%	30%
Accountability and need for a dedicated team to drive the transformation	13%	29%
Lock-ins and significant dependency on external solution providers	13%	25%
Overcoming post-migration challenges with respect to cost, maintenance	12%	26%
Need to continuously upgrade to new and emerging technologies	9%	35%

Source: Infosys Knowledge Institute, 2019   **81** Telcom   **340** Overall

Respondents also expressed concern over organizational readiness for the cloud apps journey (41%) and drawing effective strategic and operational road maps (40%).

Legacy systems must first be modernized before cloud initiatives achieve their stated vision. To do this, telcos must think carefully about technologies such as APIs and business process management before shifting applications to the cloud. They must also bring teams together end to end in proximity to ensure knowledge is shared regarding successful cloud implementations. Investment in infrastructure and systems to minimize

the impact of distance is essential for global telco firms such as Spain's Telefonica and America's AT&T.

U.S. respondents (87%) were most concerned about building stakeholder confidence while Australia and New Zealand respondents also worried about organizational readiness (67%). All

European respondents expressed worries over information security.

The IT-focused cluster (86%) stood out in expressing concern about building stakeholder confidence. Only the business-focused cluster (31%) was apprehensive about information security, and it did not feature in the agility-focused or IT-focused clusters.

The importance of a clear strategy and road map

Game-changing initiatives such as the cloud cannot succeed without the support of multiple stakeholders across the organization. To garner support, stakeholders must have clarity on the initiatives and what to expect from them. Almost half the respondents said they had clarity on the digital path, and only 20% said they were unclear (Figure 6). The segment with less clarity was four percentage points lower than the median number across industries.

Figure 6. Almost half the telecom firms had clarity on digital initiatives, with only 20% unclear, less than the industry average
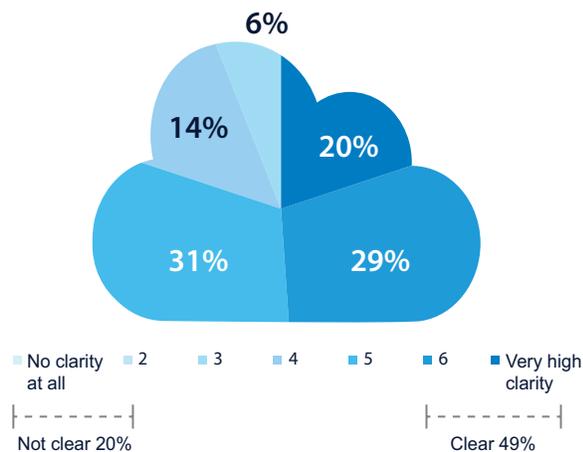
Source: Infosys Knowledge Institute, 2019

The respondents with clarity look to innovate to gain competitive advantage (63%), exploit the cloud's advanced capabilities (62%) and reduce time to market (59%).

Breaking down the cluster data, the business-focused group (70%) had the highest levels of clarity. Experience breeds clarity — the more mature a firm is on its

digital transformation journey, the more challenges arise to impede progress. However, as firms garner more experience in one digital technology, the more confident they are of succeeding on other initiatives. They can think about standardizing software as processes become more transparent and create new efficiencies with automation.

Enterprise cloud applications adoption is well underway

According to the study, 53% of the respondent firms had moved all or some of their major applications to the cloud (Figure 7). Adoption in the telecom arena is higher than other industries, signaling a more mature industry. That's because the industry has embraced digital transformation enthusiastically. The advent of the mobile phone and the indispensable entertainment it provides has provided the impetus to ensure that cloud technology is firmly entrenched in the technology landscape. The advantages that cloud transformation promises, such as higher operational efficiencies, lowered TCO, faster launching of new offerings, flexibility

and scalability gains, are other reasons why telecom firms are early adopters of the cloud. Many have moved key enterprise applications, including mission-critical business support systems and operations support systems, to the cloud.

> *The promise of greater operational efficiencies, lower TCO, faster product launches and improved flexibility have driven telecom firms to the cloud*

Figure 7. Fifty-three percent of respondents have moved all or some of their enterprise applications to the cloud, with 26% still entirely on-premises
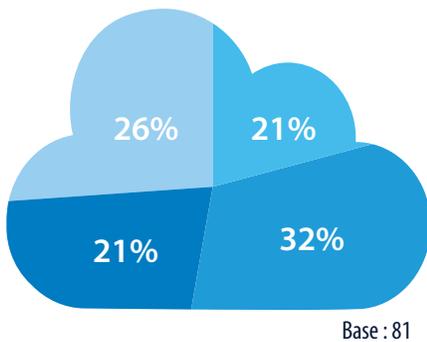
Base : 81

	Current state of cloud transformation (%)	Overall	Telecom	USA	EU	ANZ
	Base	853	81	38	26	17
1	Some pilots and POCs for cloud adoption are underway, but currently, all enterprise applications are still on-premises	24	26	32	19	24
2	Cloud adoption is underway for some applications and functions, but none have been completed	26	21	16	38	6
3	Cloud adoption is already complete for some enterprise applications and functions	34	32	32	23	47
4	All major enterprise applications have moved to cloud	16	21	21	19	24

Source: Infosys Knowledge Institute, 2019

Respondents from Australia and New Zealand (71%) are ahead in moving applications to the cloud. European firms trail in this area (42%). However, 32% of U.S. firms stated they had all applications on-premises despite 53% having moved some or all the major applications to the cloud. American telcos, entrenched in decades-old utility services, may be less nimble and daring than their global counterparts. The inability of these large firms to experiment quickly and a dearth of agile ways of working may also shine a light on this weaker adoption.

Three choices for migration to the cloud: LOB, enterprise or both

Telecom enterprises must carefully examine the objectives and expected outcomes before deciding on which cloud approach to take.

The line-of-business approach allows a business unit to independently activate a new cloud service with less involvement from the enterprise IT team. Such an approach is best suited for situations that require quick deployments and minimal disruption. Moreover, telecom enterprises can select best-in-class software such as SAP SuccessFactors or NetSuite by adopting a LOB approach.

In contrast, enterprise-level cloud approaches are complex, requiring immense efforts and being ideal for long-term projects that integrate applications on a single homogeneous platform. Such efforts cause significant disruption and take a long time to complete.

The combination option presents the best of both approaches.

Telcos chose to use the enterprise (36%) approach more often. The LOB (31%) and combination (33%) approaches were not far behind, an approach that mirrors the views of other industries (Figure 8).

European telcos strongly voted for the enterprise (40%) and combination (40%) approaches, while U.S. telcos preferred the LOB approach (39%).

A cluster view showed that the business-focused firms were confident of using any of the three approaches based on the requirement, indicating their maturity and experience in the cloud apps journey. Half of the respondents from the agility-focused cluster opted for the enterprise cloud so that they can ensure the benefits percolate throughout the organization.

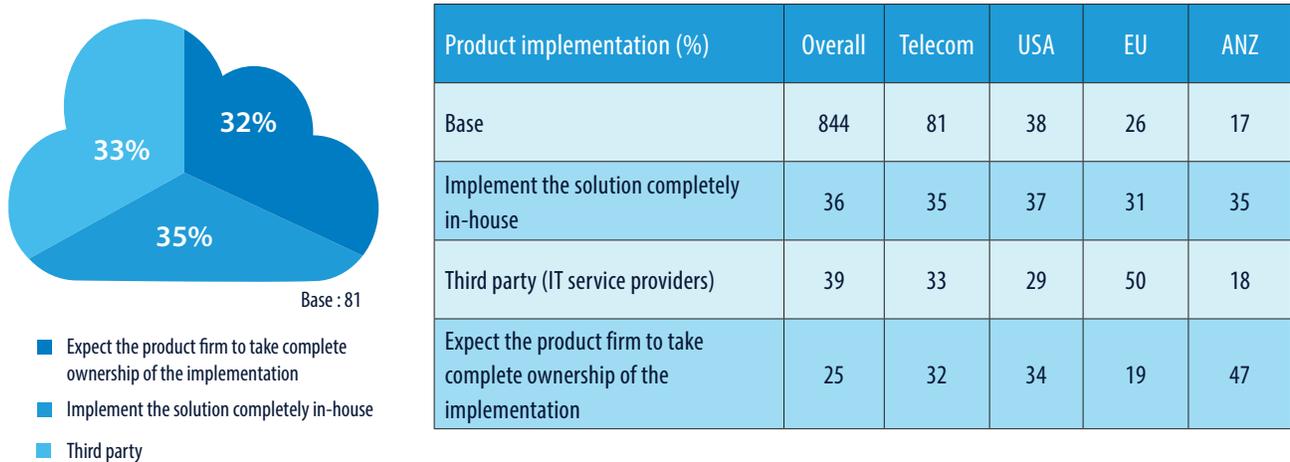**Figure 8. Enterprise cloud is the way forward for 36% of telecom firms**

Base : 77

■ Enterprise cloud ■ Combination
■ LOB cloud
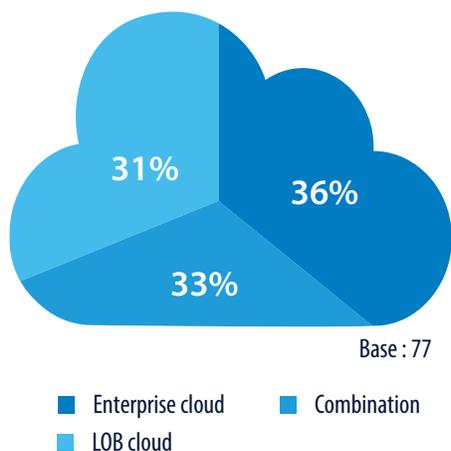
Approach adopted	Overall	Telecom	U.S.	EU	ANZ
Base	814	77	36	25	16
LOB cloud	31	31	39	20	31
Enterprise cloud	39	36	33	40	38
Combination	30	33	28	40	31

Source: Infosys Knowledge Institute, 2019

The implementation process

Once the right cloud approach has been identified, and the cloud solution identified (SAP, Oracle, Salesforce, and so on), how do telecom firms go about actually implementing these solutions? Is the help of a third-party provider necessary, or can firms go it alone? Alternatively, do they expect the product owner to take charge of cloud implementation?

Figure 9. Telecom firms were equally comfortable working with a third-party provider, the product firm or implementing it in-house

32%

33%

35%

Base : 81

■ Expect the product firm to take complete ownership of the implementation

■ Implement the solution completely in-house

■ Third party

Product implementation (%)	Overall	Telecom	USA	EU	ANZ
Base	844	81	38	26	17
Implement the solution completely in-house	36	35	37	31	35
Third party (IT service providers)	39	33	29	50	18
Expect the product firm to take complete ownership of the implementation	25	32	34	19	47

Source: Infosys Knowledge Institute, 2019

Whereas the consumer, retail and logistics industry largely favored in-house employment, telcos were open to using all three options almost equally. This implies that this more mature industry is at a stage where it can select the option best suited for its needs (Figure 9). If telcos require faster results and higher skill levels, they can work with third-party firms. However, if they are looking at implementing mission-critical solutions, they can consider doing it in-house and retain control and reduce costs.

Telecom firms from Europe were most inclined to work with third-party providers (50%), while Australia and New Zealand preferred the product firm to anchor the implementation (46%).

Preparing for the cloud challenge

The primary implementation challenges faced by respondent firms were the pace of execution (58%), promoting internal cultural change (58%), collaborating with external stakeholders (56%) and absence of a dedicated internal team to drive the initiative (56%) (Figure 10). The articulated challenges are indicative of enterprises that are eager to advance on their cloud initiative.

The business-focused cluster was challenged by refactoring applications to suit cloud architectures (80%), lack of sufficient clarity on the execution road map (78%) and pace of execution (76%). Overall, this cluster is ahead with its cloud program and is also at ease using any of the three cloud approaches. This explains why more business-focused firms expressed strong views on the challenges faced. According to our report titled Infosys Digital Radar 2019: Barriers and Accelerators for Digital Transformation in the Telecommunications Industry, these visionary telcos become more confident as they roll out repeated successes. Though they may cite more barriers, they are also far more confident in overcoming them in the future.

Figure 10. Issues across people, process and technology were top of mind for telecom firms undergoing a cloud apps transformation

Challenges (% Top2 box)	Overall	Telecom	USA	EU	ANZ
Base	840	81	38	26	17
Pace of execution and implementation of the initiative	48	58	59	58	53
Promoting a culture change within the organization	48	58	59	58	53
Collaboration and integration with external service providers and stakeholders	47	56	55	56	59
Absence of an internal dedicated cloud team to drive the initiative	45	56	58	54	53
Application refactoring and tweaking to suit cloud architectures	46	54	61	50	47
Tracking and monitoring systems and processes on cloud	51	54	63	46	47
Aligning existing legacy systems and architectures and technology environments	49	54	55	54	53
Lack of high levels of clarity in the execution road map	45	54	61	40	59
Accurate estimation of time and financial costs involved	51	49	47	50	53
Deciding on choice of tools and technologies to pick from	48	49	50	50	47

Source: Infosys Knowledge Institute, 2019

Conclusion

The telecom industry is in the midst of a paradigm shift. Its members are adopting new business models as OTT tech companies compete for customer bandwidth. No longer just "dumb pipe companies," they are identifying new revenue streams by harnessing new technologies such as 5G and artificial intelligence while keeping demanding customers satisfied. This calls for an agile and flexible organization to support the massive changes. Cloud is the sure-shot enabler for this transformation, with the multitude of benefits it promises.

> *Telcos are progressive in adopting new technologies to enhance business operations and performance, validated by the size of the business-focused cluster in this research*

Telecom firms have always been progressive in adopting new technologies to enhance business operations and performance. This was validated by the survey findings, which showed that the telecom industry had the highest number of firms (57%) in the advanced business-focused cluster across industries. Such firms

are further along the cloud apps journey and have a market-oriented perspective, which is essential for navigating the current complex business environment.
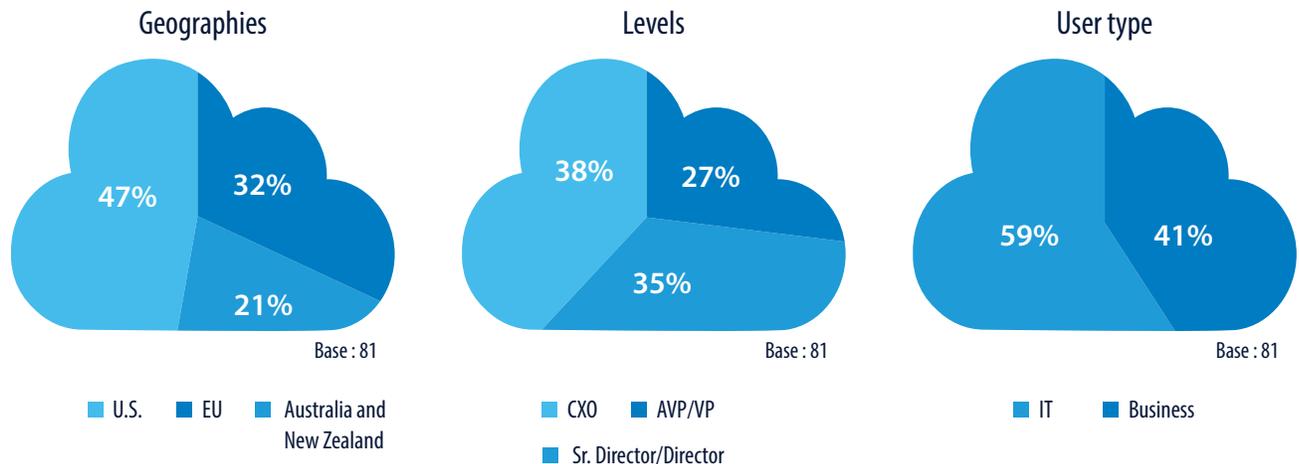
Almost half the respondents to the survey stated they had clarity on the digital path, and over half the telecom firms studied said they had shifted all or some major applications to the cloud. One more sign of their maturity was their comfort with using any of the three cloud approaches to address their requirements. They can choose the LOB approach if they are looking for quick wins, or they can opt for the enterprise cloud approach if the objective is to have an organizationwide impact. Respondents were willing to work with third-party providers, product firms or in-house teams for the cloud solution deployment, again emphasizing this industry's relative maturity.

As telcos continue the cloud apps journey at a brisk pace, they will encounter a host of people-, process- and technology-related challenges. The study revealed that pace of execution, promoting a culture change and collaborating with external stakeholders posed challenges to respondent firms. However, telecom firms must determine ways to overcome the challenges as the promise of the cloud is too substantial to ignore.

Survey methodology

A total of 81 telecom senior executives and leaders involved in digital and cloud initiatives responded to this research, which took place in the first quarter of this calendar year. To understand the pulse of the market moving forward, the survey was further validated by qualitative interviews with senior executives in September and October. Only companies with revenues exceeding $1 billion were invited to participate. Respondents hailed from the United States, Europe, Australia and New Zealand.

Geographies

47%
32%
21%

Base : 81

■ U.S.   ■ EU   ■ Australia and New Zealand

Levels

38%
27%
35%

Base : 81

■ CXO   ■ AVP/VP
■ Sr. Director/Director

User type

59%
41%

Base : 81

■ IT   ■ Business

Source: Infosys Knowledge Institute, 2019

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Author

Harry Keir Hughes

Senior Consultant – Infosys Knowledge Institute
harrykeir.hughes@infosys.com

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