TATA CONSULTANCY SERVICES

TATA

TCS Global Cloud Study for Utilities

How Cloud Drives Business Innovation

For the past decade, the utilities industry has been on the forefront of the transition toward a clean energy future. This transition is bringing countless new opportunities and business models centered around empowered consumers, renewable energy, decentralized energy generation, grid-scale storage technologies, EV ecosystems, grid management, and information modeling.

To keep pace with this fast-changing ecosystem and capture new opportunities, utilities have been investing heavily in innovation and digital transformation. While initial focus areas included sustainability, reliability, and affordability, there is now a greater emphasis on connectivity, flexibility, and optimization.

The widespread adoption of cloud technology has been a key enabler of digital transformation in the utilities sector and a catalyst for innovation. A global cloud study conducted by TCS reveals that utilities have made strong progress in cloud-enabled innovation. The study indicates that utilities are not only within reach of achieving their goals, but also have significant momentum to close remaining gaps.

These findings are based on a survey of utilities organizations from across all geographical regions, including Europe and UKI, Asia-Pacific, and North America. While there are major differences in how utilities operate across regions and countries, the study's findings provide useful insights into general trends and serve as a benchmark against other industries surveyed.

Putting innovation front and center

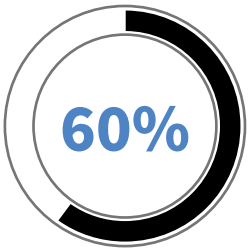
A majority of utilities respondents surveyed in the study confirmed that they have established a culture of innovation within their organizations.

An established culture of innovation is especially critical today, as the utilities industry grapples with the potential of smart grids, battery and storage technologies, distributed energy resource management systems (DERMS), and e-mobility, powered by cloud, artificial intelligence, IOT, blockchain, 5G and metaverse technologies, among others.

66%

Say they have succeeded in embedding innovation across their organization, from leadership to board level to employees, with no issues or only minor ones.

Respondents recognize the crucial role of cloud technology in delivering maximum business value and leveraging the advantages of cloud services. Cloud services provide a unifying digital foundation for a connected future and enable faster innovations and digital transformations with lower costs.



Of the utilities surveyed say cloud is critical to their organization's future as a catalyst for innovation

While cloud adoption has been growing in the utilities industry in recent years, organizations are following different pathways based on their principles and priorities. These pathways are broadly categorized into three horizons, but the horizons are not necessarily followed in a specific sequence.

Horizon 1
Build Digital Core

Enable high-availability, resilient cloud technologies **to leap into the digital era**

Horizon 2
Innovate Business Models

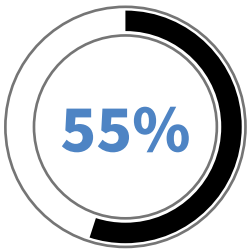
Build a modern cloud architecture **to provide agility and scale**

Horizon 3
Transform and Grow
around purpose-led ecosystems

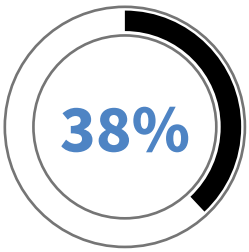
Build industry-driven clouds to create new **business opportunities**

Uncovering top cloud innovation outcomes

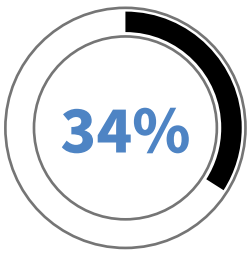
In addition to improved customer experiences, utilities organizations are looking to accelerate innovation through cloud technology by exploring new business models and finding new ways to align purpose with business strategies, such as sustainability efforts.



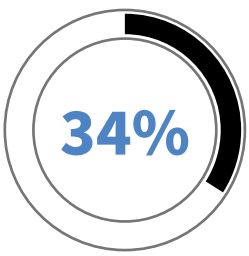
Of utilities respondents say that new business models are a top desired outcome of cloud innovation



Say improved customer experiences are a top desired outcome



Say the ability to participate in digital ecosystems (e.g., customer, partner, supply chain) is a top desired outcomes



New ways of aligning purpose with business strategies (e.g., sustainability efforts) is a top desired outcome

Q. "Pick the top 3 most desired outcomes for cloud-enabled innovation at your enterprise."

Desired outcome: New business models

More than half of utilities respondents (55%) have identified creating new business models as a top desired outcome of cloud innovation, and 39% of respondents say have already made progress in achieving this goal. This includes exploring new operating processes and workflows, which has become a high priority for utilities. For example, utilities retailers are bundling nonenergy products and services, such as telecom products and services, along with their core utility services. Utilities are also leveraging ecosystems to create new offerings as a service, including heat-as-a-service, EV-charging-as-a-service, storage-as-a-service, balancing-as-a-service, and data-as-a-service, among others.

Desired outcome: Customer experience

About 38% of utilities respondents say they are using cloud technology to enhance their customer experience, and this number is expected to grow. As an example, many large utilities are modernizing their Customer Information System (CIS) platform from legacy mainframe systems to modern cloud-based platforms.

In a connected ecosystem, utility customers want convenience and choice, seeking seamless collaboration platform with peers for renewable energy, helping to contribute to a collective societal net zero goal.

1 Convenience

- Usage / outage alerts
- Communications
- Personalized experience
- Home service (water, internet)
- Energy efficiency
- Mobile
- Social
- Automated
- Online receive / pay bill
- Credits / rewards
- Moving services
- Voice assistant

2 Collaboration

- Microgrids
- Smart platfrom
- Net zero energy
- Peer-to-peer trading
- EV chargers
- Energy market place
- VPP
- Community solar
- EV charging exchange
- Asset installation servicing

2 Choice

- Usage optimization
- Time of use rates
- Subscription services
- Product bundling
- Open platforms
- Green attributes
- Dynamic pricing
- Demand supply management
- Start / stop flexibility
- Solar + storage
- Carbon offsets
- Smart home

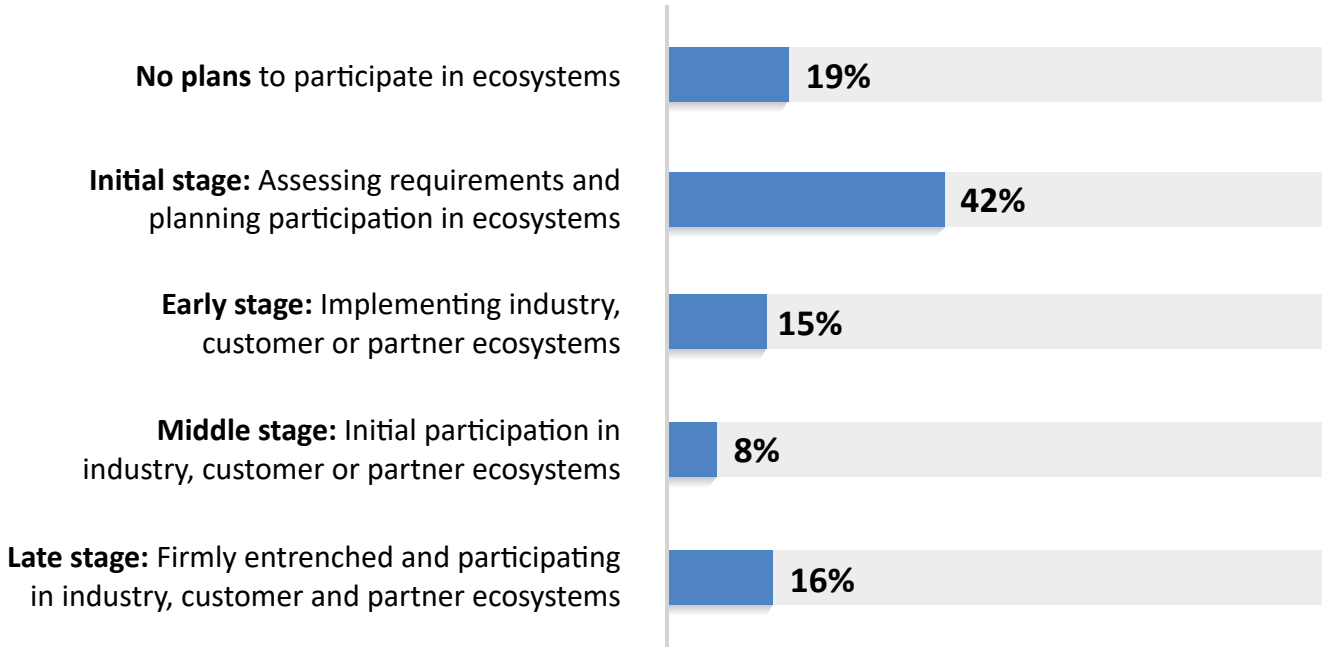
Desired outcome: Aligning purpose to business strategies

Cloud technology plays a crucial role in helping utilities align their business strategies with sustainability goals. More than half (51%) of utilities respondents cited cloud as an important factor in achieving sustainability goals. Utilities are also using cloud to track air and water quality management (56%), as well as recycling and wastewater management (46%).

Desired outcome: Participating in digital ecosystems

The study findings reveal that the utilities industry – like the other industries – is largely in the initial stages of the full ecosystem participation indicative of later-stage cloud maturity. However, utilities lead all other industries with the highest percentage in late-stage participation. Participating in an ecosystem is paramount in the competitive market and the evolution from new age ecosystem player to new age digital utility delivering reliable, affordable, and clean energy.

Percentage of respondents at each stage of digital ecosystems maturity



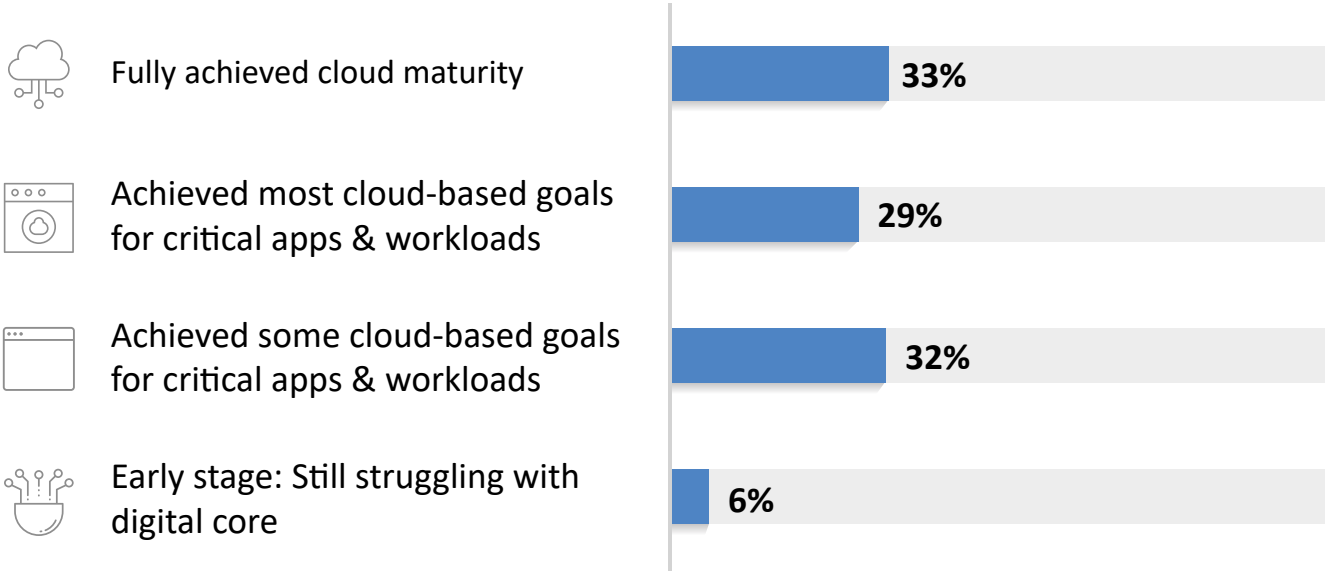
Q. Please rank your digital ecosystem maturity level. In this survey, a digital ecosystem is defined as a complex network of stakeholders that connect online and interact digitally in ways that create value for all.

Tracking cloud maturity and progress

In order to continue making progress, utilities organizations must renew their commitment to cloud technology as a key enabler of business growth.

Most utilities have already invested in a strong digital core with cloud as the unifying fabric. With modernization efforts underway, utilities can unlock innovation by optimizing their business processes and models for enhanced insights and customer experiences. Over time, they can mature into a cloud-native environment and participate in transformative partner ecosystems that maximize the value of cloud technology.

Despite the rapid pace of investment and adoption in recent years, only a third of utilities respondents reported that they were fully cloud mature, with an additional 29% reporting that they were well on their way. Therefore, utilities must remain committed to cloud technology in order to achieve their innovation and digital transformation goals.



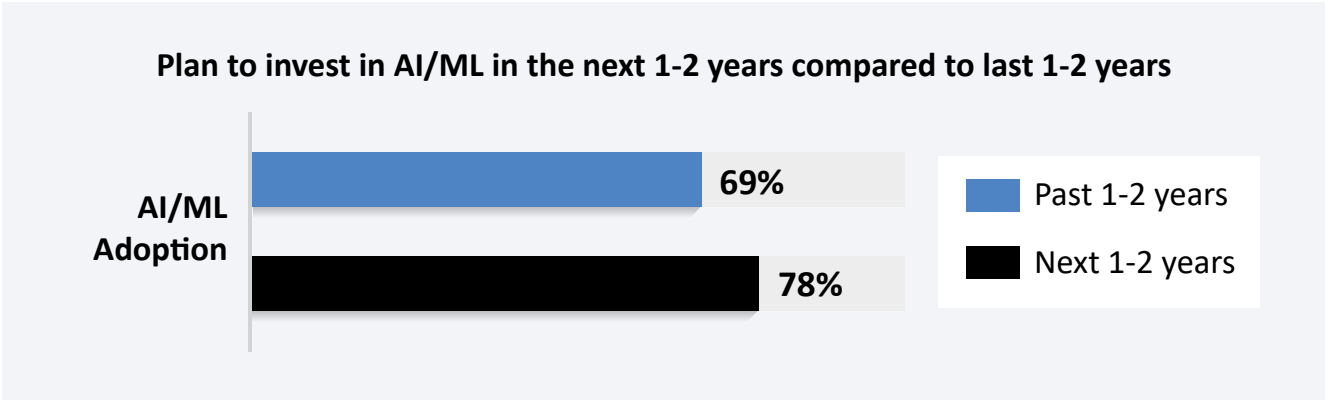
Utilities respondents surveyed in the TCS global cloud study reported a lower percentage of utilizing large third-party public cloud service providers, such as Microsoft Azure, Amazon Web Services, and Google Cloud, compared to the overall aggregate. Instead, utilities organizations tended to deploy a hybrid cloud model, which is a mix of public and private cloud services.

Cloud deployment model	Utilities respondents	Total respondents
Hybrid cloud (a mix of public and private)	**82%**	**72%**
Public cloud only	**18%**	**26%**
Private cloud only	**0%**	**2%**

Q. What best describes your cloud deployment model? Choose the one that most closely resembles your current scenario.

Fueling the next wave of data-intensive technologies

Study findings show that utilities organizations are eager to invest in data-intensive technologies. This is not surprising in an industry that must harness large amounts of data, including sensitive customer demographic data, as well as critical national infrastructure data, including utility asset data, GIS data, smart city data, etc.

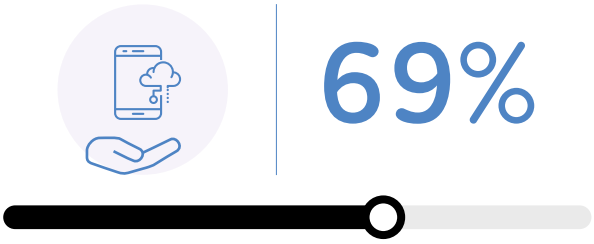


Utilities organizations recognize that this huge volume of data cannot be easily handled without a cloud-based sustainable infrastructure and technologies like artificial intelligence for better and faster decision-making. To make the most of their data, utilities must have robust mechanisms in place to share, discover, and access it. This requires a strong commitment to data governance as part of an overall strategy to secure more value from data, especially as organizations accelerate the adoption of emerging AI technologies.

The study found that 39% of utilities organizations excel in data governance and experience no issues, compared to 34% for the total industries surveyed. This suggests that utilities organizations are well-positioned to make the most of the data-intensive technologies that will fuel their innovation and digital transformation in the future.

Identifying and overcoming barriers to innovation

Most utilities respondents surveyed show a strong commitment to an innovation-led transformation rooted in cloud. Nearly two-thirds of respondents say they take the long view of cloud investments.



69%

Percentage of respondents selecting "agree" or "significantly agree" that "our leadership recognizes that cloud is a long-term investment and intends to stay the course"

However, as a regulated industry, utilities face unique challenges that can impede their ability to adopt cloud technology at a fast pace.

Obstacle: CapEx/OpEx model

One of the main challenges some utilities face is around CapEx vs OpEx models, which can prevent utilities from capitalizing on cloud spend and realizing return on investment. Current regulations (cloud computing agreements) mostly treat cloud expenditures as operation and maintenance (O&M) expenses rather than capital investments. This accounting can deter utilities – particularly those in North America – from adopting cloud-based advanced technologies on a mass scale.

Obstacle: Critical Infrastructure

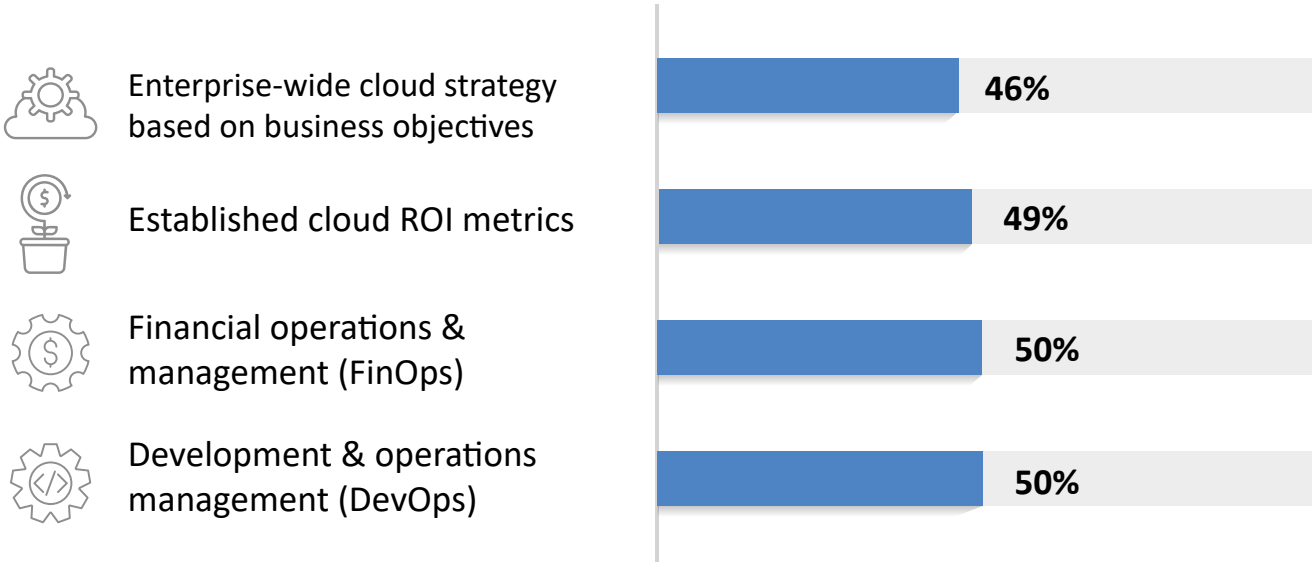
Utilities manage critical infrastructure and provide essential emergency services to society, so many of their applications (especially OT systems) are highly critical and demand high availability, reliability, performance, and security. Although cloud providers are improving their services to meet the stringent demands of non-functional requirements, many utilities organizations are still reluctant to risk disruption or abandon tried-and-true systems that, even if overly complex or rigid, are at least known and optimized.

The study found that 45% of utilities respondents cited "Potential for disruptions and unplanned downtime" as a top obstacle to cloud-enabled innovation, compared to only 40% of respondents from other industries.

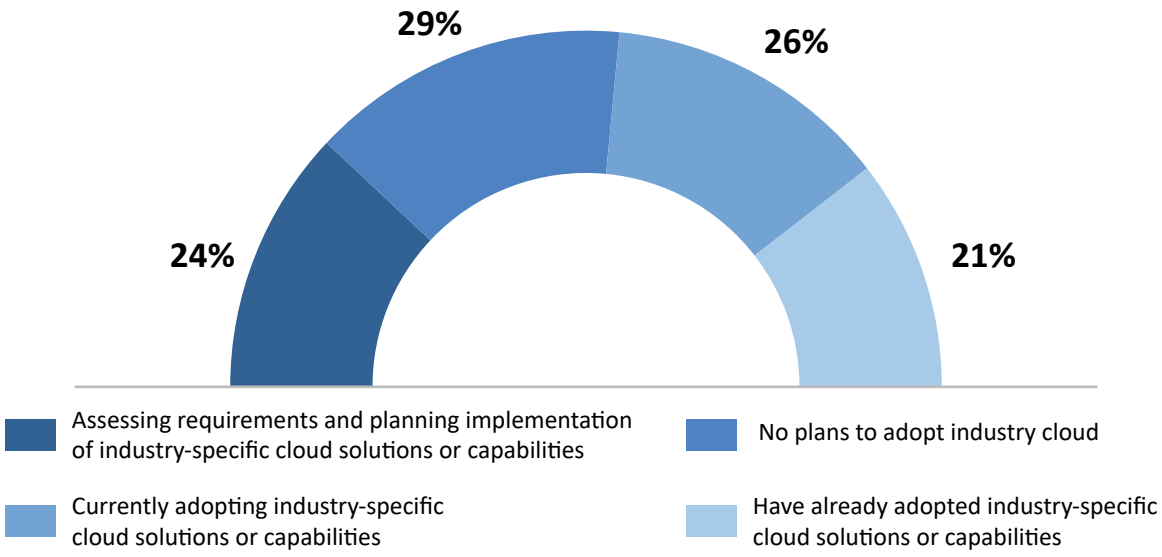
Obstacle: Unavailability of cloud expertise

Utilities organizations also struggle to find or develop critical cloud skillsets and capabilities. Many utilities organizations surveyed say they lack full proficiency in areas such as DevOps, FinOps, agile practices, and cloud metrics.

Proportion of respondents who report proficiency challanges with skills and experience in the following areas



One way utilities organizations are addressing the gap in critical skills is through the adoption of industry clouds. Industry clouds are quickly emerging as a fast path to acquiring expertise and capabilities, and utilities lead all other industries surveyed in their adoption. Study findings show that almost half of utilities organizations surveyed are either currently adopting industry clouds or have already done so – which is the highest percentage of any industry.

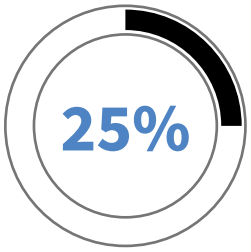


What are industry clouds?

Industry clouds are cloud-based platforms that are designed to meet the specific needs of a particular industry, such as utilities. They provide pre-built applications, workflows, and data models that are tailored to the industry's unique requirements. For example, Salesforce Energy and Utilities Cloud, S/4HANA Utilities and Microsoft Sustainability Cloud all offer out-of-the-box capabilities that can help utilities organizations overcome the challenges of finding or developing critical cloud skillsets and capabilities.

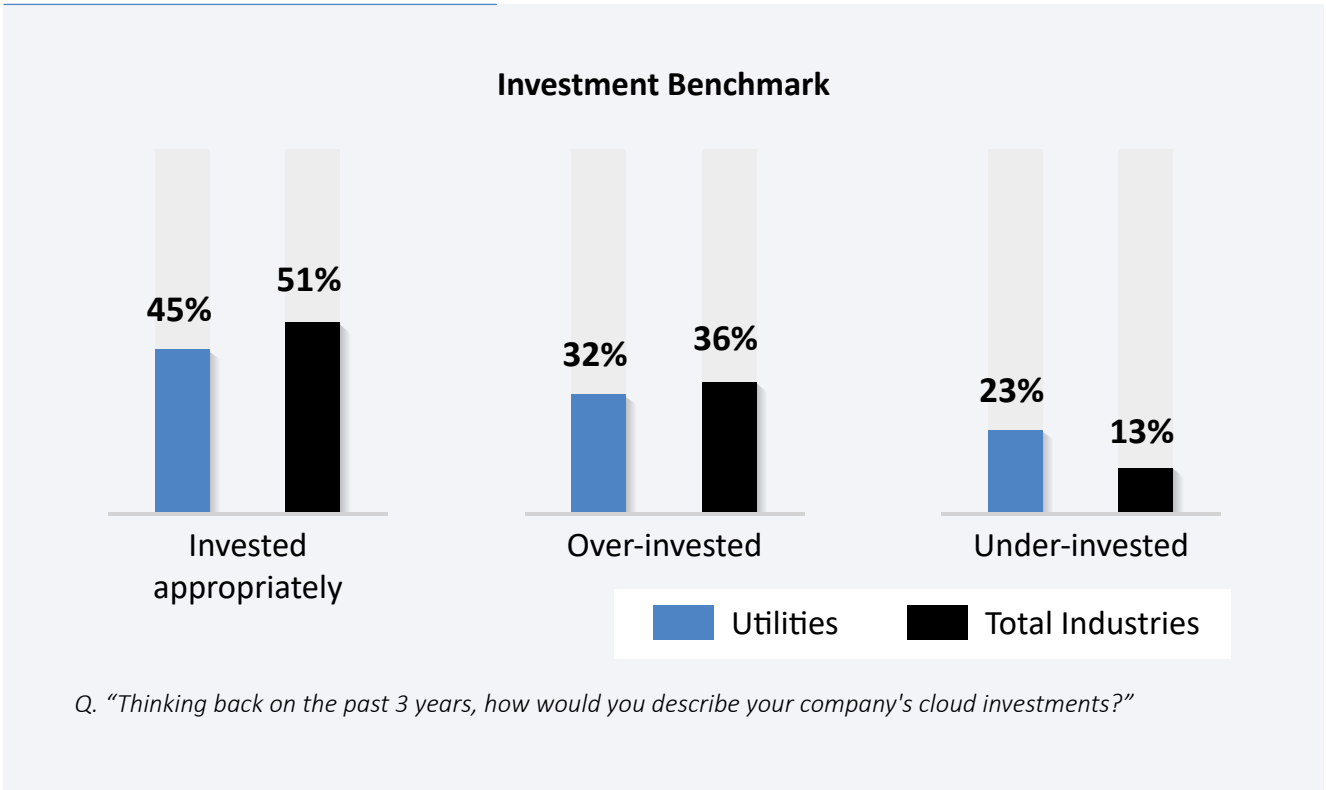
Obstacle: Investment alignment

The study also found that a significant number of respondents see room for improvement in aligning their cloud investments with their requirements.



A quarter of utilities respondents said they have changed or are changing their cloud strategy due to insufficient ROI, which points to a larger challenge

While nearly half of utilities organizations surveyed say they have invested appropriately in cloud in the past three years, one-third say they over-invested over that same time period.



Q. "Thinking back on the past 3 years, how would you describe your company's cloud investments?"

Additionally, another 23% of utilities respondents say they under-invested in cloud, which is the highest percentage of all industries surveyed. This suggests that utilities organizations may have been too cautious in their cloud investments and may need to reassess their cloud strategy to ensure they are investing appropriately to achieve their innovation and digital transformation goals.

Obstacle: Legacy barriers

Many utilities companies still rely on legacy systems to support their core business processes, applications, and data. These legacy systems are often inflexible and cost-intensive, and they can hamper the ability to innovate and meet new business requirements. However, study findings show that nearly half (46%) of utilities organizations have plans to increase investments in cloud-native ERP in the next 1-2 years, indicating a shift towards cloud-based modernization and digital transformation.

Despite the challenges of cloud adoption, utilities organizations are committed to their digital transformation journey. In recent years, there have been visible changes in utilities' adoption of cloud technology. For example, a sizable portion of larger-scale utilities are moving toward SaaS-based Customer Information Systems, while modernizing and migrating core asset management and GIS systems to the public cloud. Real-time IT-OT systems like SCADA, Census, and Headend are also migrating to the cloud.

Realizing the true promise of cloud-enabled innovation

To continue moving forward, utilities organizations must prioritize several key areas that include:

Addressing the CapEx vs OpEx challenge. Utilities regulators are increasingly relaxing restrictions so that utilities can show their cloud-based expenses as CapEx and realize the ROI on their investment. This adjustment could help utilities adopt advanced cloud-based technologies on a larger scale and drive innovation and digital transformation forward.

Transforming OT deployment. There is a prevailing assumption that operational technology (OT) systems can only be deployed on-premises. Instead, utilities should work towards leveraging cloud computing while transforming OT systems, taking into consideration the constraints of meeting compliance regulations for critical infrastructure.

Investing in cloud-intensive data technologies. Cloud technology can fuel the next level of AI, IOT, 5G, AR-VR for business innovation, bringing reliable, affordable, and cost-efficient energy and utility services to consumers.

Achieving and maintaining critical skills. Utilities organizations must identify and overcome shortfalls in capabilities that could impact growth and transformation. Multi-cloud approaches will likely enhance the need for broader skills requirements. In addition, gaps in data governance could prove serious impediments to newer AI technologies.

Evolving cloud-enabled sustainability. Utilities must look for new ways to assess the maturity of green IT ecosystems across cloud and on-premises infrastructures. As a major contributor toward sustainable solution implementation, there is considerable focus around cloud-enabled ESG reporting for emissions, benchmarking, forecasting, and simulations. Utilities are also actively building environmental solutions for physical, transition, and reputational risk management, and planning environmental actions for air, water, waste, and land.

By prioritizing these areas, utilities organizations can continue to make progress toward cloud-enabled innovation, driving new business models, and enabling sustainability. This will help them stay competitive in a rapidly evolving utilities landscape and meet the changing needs of their customers.

Authors

Uttam Kundu
Enterprise Architect, Utilities, TCS

Tapas Laha
Enterprise Architect, Utilities, TCS

About the study

Tata Consultancy Services (TCS) conducted a global cloud study from 6 January to 14 February 2023 on the theme of cloud-enabled innovation. TCS surveyed 972 C-suite and IT senior executives and decision makers from companies with +$1 billion in annual revenue, across UK & Ireland, Continental Europe, North America, and APAC (India, Japan, Australia, NZ). The C-suite and IT senior executives and decision makers included 80 respondents in the Utilities sector.

About the Thought Leadership Institute

Since 2009, the TCS Thought Leadership Institute has initiated conversations by and for executives to advance the purpose-driven enterprise. Through primary research, we deliver forward-looking and practical insights around key business issues to help organizations achieve long-term, sustainable growth. For more information, visit tcs.com/insights/globalstudies

For the most up-to-date content and news, download the 'TCS Perspectives' app for your iOS and Android device.

Get more insights

If you would like to have more information on the TCS Global Cloud Study, please visit on.tcs.com/2023-global-cloud-study

For more information or any feedback, email the TCS Thought Leadership Institute at TL.Institute@tcs.com

About Tata Consultancy Services

Tata Consultancy Services is an IT services, consulting and business solutions organization that has been partnering with many of the world's largest businesses in their transformation journeys for over 56 years. Its consulting-led, cognitive powered, portfolio of business, technology and engineering services and solutions is delivered through its unique Location Independent Agile™ delivery model, recognized as a benchmark of excellence in software development.

A part of the Tata group, India's largest multinational business group, TCS has over 601,000 of the world's best-trained consultants in 55 countries. The company generated consolidated revenues of US $29 billion in the fiscal year ended March 31, 2024, and is listed on the BSE and the NSE in India. TCS' proactive stance on climate change and award winning work with communities across the world have earned it a place in leading sustainability indices such as the MSCI Global Sustainability Index and the FTSE4Good Emerging Index. For more information, visit www.tcs.com