

Space for growth

Why every company has a stake in the new space economy



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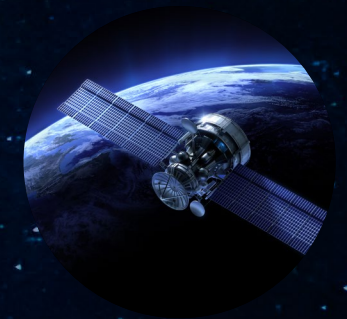
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For millennia, humans have looked to the stars for inspiration and to dream of new possibilities. Today, those possibilities are both real and within reach — for every business. The fast-developing space economy — the activities and resources that create and provide value to human beings exploring, understanding, managing and utilizing space¹ — is the next frontier, creating new levels of insight into global conditions and markets that can change how businesses in all industries operate, boosting their growth and resilience.

Take satellite manufacturing as a proxy for the hyper growth of the space economy. Thousands of satellites are already in orbit and their number is set to rise ten- fold by 2030 profitable. Yet we're only at the start, as the space economy is set for massive growth. Since 2009, space economy equity investments into over 2,100 companies have reached more than \$325 billion and this value is growing every year. By 2035, the space economy is predicted to exceed \$1.8 trillion³.

In many ways, a space-based future is already here. When we check our weather app or plan a trip, we're using space-based technologies. Companies that are integrating space-based technologies (see sidebar) into their businesses today are already transforming operations and opening up exciting possibilities here on Earth. Organizations with a strong digital core can take advantage of advanced space-based capabilities to reinvent operations and achieve faster processes, deeper intelligence and greater sustainability and resilience. These are just the beginning.

Space-based technologies are transforming, and will continue to transform, day-to-day business operations on Earth. Advanced information gathering, speed of data sharing, real-time analytics, seamless global communication — and more — can make processes quicker, more intelligent and more efficient. Many more advanced capabilities are available or coming soon and the opportunities on offer are open for every business, not just those in high tech industries. But to take advantage, they, too, need to take a leap forward.

What are space-based technologies?

We define space-based technologies as products and services that harness signals and data coming from satellites to support areas like telecommunications, maritime navigation, weather forecasting, environmental monitoring and land traffic management. They also include technologies related to space situational awareness, space exploration and the research, development or manufacturing of products and services that use the space environment (especially zero gravity conditions).





The key message? If your company isn't using space-based technologies for growth and competitive advantage, it needs to start now, while the window of opportunity is wide.

Several barriers, however, may be present. In the companies we spoke with, these included concerns about cost, skills gaps and the lack of available infrastructure to integrate space-based technologies. Not attending to these concerns can stall technology implementation in pilot stages and prevent value-creating breakthroughs.

To overcome these barriers and successfully integrate space-based technologies, we recommend three key actions:

- 1. Break free from the endless cycle of pilot projects** by developing a comprehensive vision with concrete actions that include technology proofs and real-life business cases.
- 2. Focus talent development on space technologies** to gain an advantage now versus later.
- 3. Activate an ecosystem of partners** to help with developing and accessing required skills and infrastructure as well as sharing the costs of participating in the space economy.

Closing the intent-to-action gap



“New space-based technologies could contribute to the growth and resilience of industries in multiple ways, depending on the characteristics of each industry.”

Chief Technology Officer, North American space company

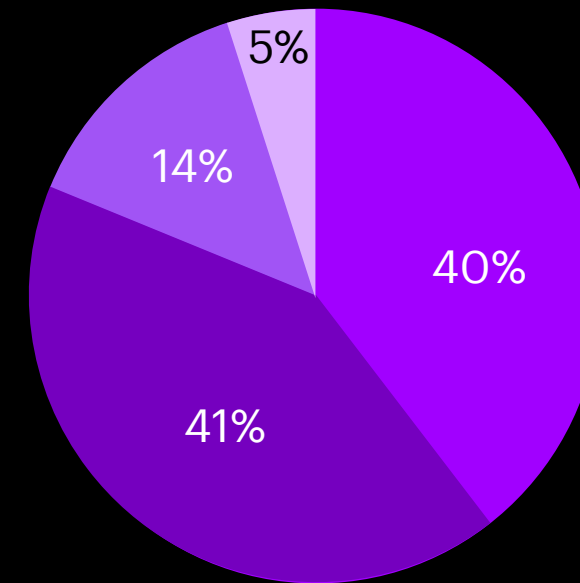
Many business leaders grasp the significance of space to their business’ growth. Our research reveals that more than 80% of executives see space-based technologies as vital drivers of both revenue growth and their ability to differentiate (Figure 1). But only 18% are moving beyond pilots and using these advanced technologies in their daily operations (Figure 2). Those leaders are already realizing the benefits of space technology in functions like IT infrastructure, research and development, customer service and supply chain.

One such example is a biodiversity development company that is partnering with space and technology firms to use satellite imagery to support its business. The partnership provides AI-driven satellite image recognition of invasive plant species. This supports environmental conservation efforts by facilitating early detection and efficient management of these species, thus protecting ecosystems under care.

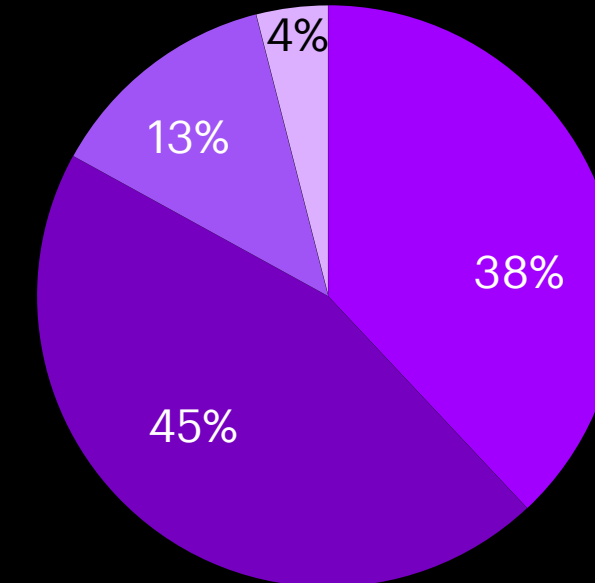
In an increasingly unpredictable and disruptive world, space technologies are uniquely positioned to make organizations more competitive and deliver benefits both today and into the future. Greater resilience, more accurate predictive capabilities, greener operations and more efficient supply chains are just some of the promising opportunities.

Figure 1: Executives see the exciting possibilities in space...

Access to space-based technologies vital to company revenue growth



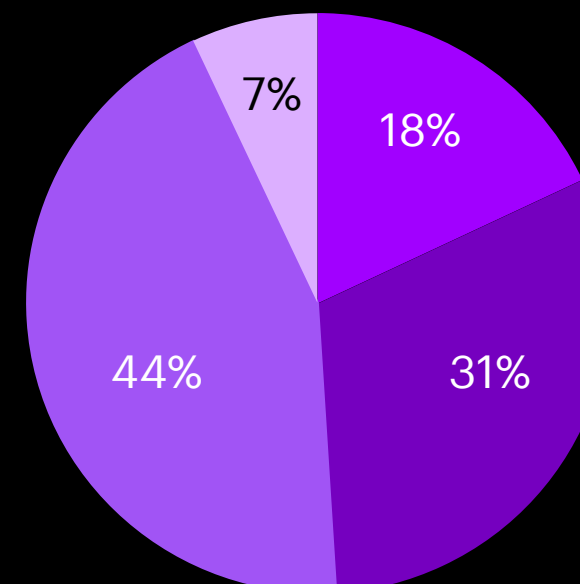
Use of space-based technologies seen as company top differentiator



- Strongly agree
- Agree
- Neither agree or disagree
- Disagree and strongly disagree

Figure 2: ...but only a minority of organizations have fully integrated space-based technologies.

Maturity of space-based technologies



- Widely integrated
- Pilot or implementation at early stage
- Plan to integrate in the future
- No integration or plans to integrate

The long-term promise of space



“New business models will emerge due to the availability of an immense amount of raw data produced by Earth observation. These models will offer processed data or the creation of tools to make the data usable for customers.”

Access Officer, major European space organization

The possibilities from using space-based technologies are nothing short of astounding. One-third of the world’s population, for example, still lacks access to timely and accurate data. Information about changing weather patterns or impending natural disasters can literally be a matter of life or death. Space-based technologies are essential for plugging information gaps to help humans and industries, and it’s no surprise that investments are rising sharply. The finance and insurance industries alone are set to triple spending on space capabilities based on satellite imaging over the next decade⁴.

In the public sector, too, space-based technologies can effect a step-change for agencies charged with public safety. For example, a hazard response portal can combine satellite imaging of real-time weather incidents with on-the-ground data

to provide insights for emergency services to coordinate an immediate response. With the addition of future forms of satellite imaging, along with geospatial analysis, emergency services will be able to allocate and dispatch their vital resources with far greater efficiency, timeliness and accuracy than they can today.

Weather forecasting and environmental monitoring are already some of the most important applications of satellite imagery. But future applications, particularly in agriculture, will be profound. Imagine this near-term future scenario:

Reina is the head of the space data processing department in a company that supports farmers by applying real-time satellite data to their operations. She uses imaging from several ranges of the electromagnetic spectrum, including optical, microwave, multi- and hyper-spectral imaging, to monitor critical factors such as soil moisture, weather patterns and diseases that may affect crops. Combining a constant stream of images and using AI-driven predictive models allows Reina to help farmers significantly improve crop yields, reduce land mismanagement and prepare for extreme weather events. What’s more, access to robust space-based data drastically increases farmers’ chances of making successful insurance claims for adverse events.

Agriculture is just one sector that stands to reap major benefits from the unique insights and situational awareness space-based technologies can provide. Others include transportation and energy. The European Space Agency (ESA), for example, has successfully completed a feasibility study for a project to use satellite imagery and tracking to monitor the transport of hazardous materials. This will not only offer enhanced safety to companies in the chemicals and resources industries, but it will also provide intelligence that could help improve supply chain efficiency⁵.

Space at work today



“Much of today’s economy is based on satellite navigation... there are many aspects of it that are extremely useful, beyond navigation itself.”

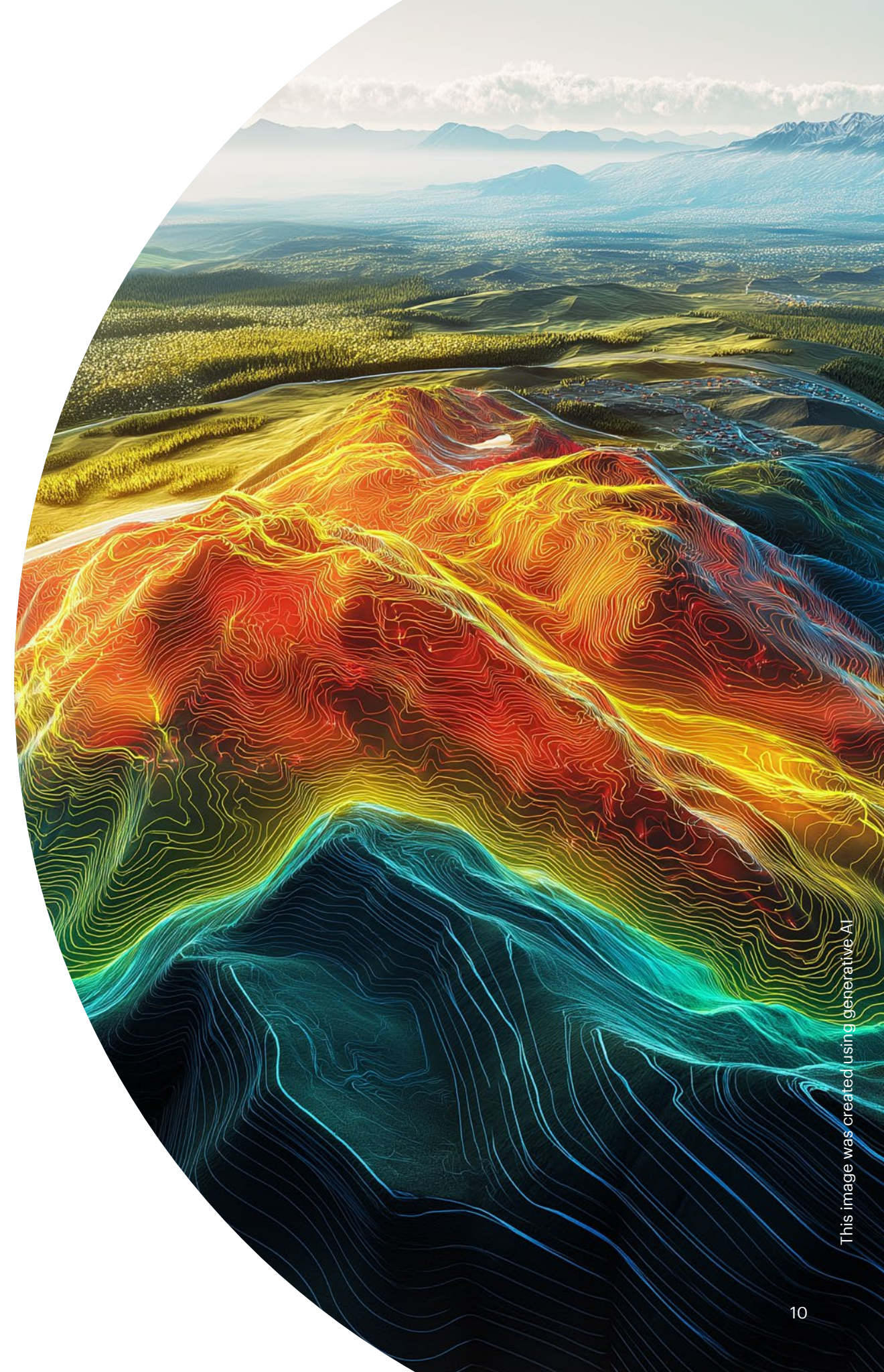
Business Application Officer, major European space organization

What we can do with today with space-based technology is already impressive. In fact, the burgeoning space economy has a significant impact on current economic growth and development. For example, 10% of the EU’s GDP now depends on space-based navigation systems⁶. In industries such as agriculture, resources, retail and financial services, information that is uniquely made available by satellites, such as unhindered broadband communication, real-time asset tracking and emissions observation is helping organizations to build stronger supply chains and reduce inventory.

Take ESP Logistics. The logistics management provider specializing in the oil and gas sector works with Spire, a space technology business, to give its customers data that allows them to track and predict the journey times of cargo ships⁷. This is vital in an industry where even the smallest deviation from course can cost serious time and money.

Taken one step further, imagine this scenario: With the technology available today, Joshua, a supply chain executive for an electric vehicle battery manufacturer, could use satellite navigation and AI-enabled predictive analytics to embed resiliency into his company’s operations. Satellite-based real-time navigation could improve on-time delivery, dynamically rerouting based on traffic, weather and infrastructure. IoT sensors connected to low Earth orbit (LEO) satellites could monitor shipment conditions (temperature, vibration, humidity), which would lead to reduced battery degradation, cutting goods lost by a measurable percentage. Space-based data simulations could also optimize the company’s logistic networks, reducing resource waste and CO₂ emissions.

Some companies are creatively using products and services based on pioneering space-based technologies. Mining company Rio Tinto, for example, is using laser-induced breakdown spectroscopy method (LIBS) developed by NASA to analyze rocks on Mars. It’s a game changer for Rio Tinto. Instead of teams of geologists spending thousands of hours collecting and analyzing data from rock samples, LIBS reduces sample analysis time from days to just over an hour with unparalleled accuracy. It can detect even the lightest elements in the periodic table, including lithium, which is critical for the energy transition⁸.



Others are learning from innovation being carried out by scientists and engineers on the International Space Station (ISS) and creating commercial applications that will drive their own competitiveness. Airbus, for example, recently announced tests on the ISS of the first 3D metal printer for use in additive manufacturing in space⁹, technology that will be vital for building space infrastructure at scale.

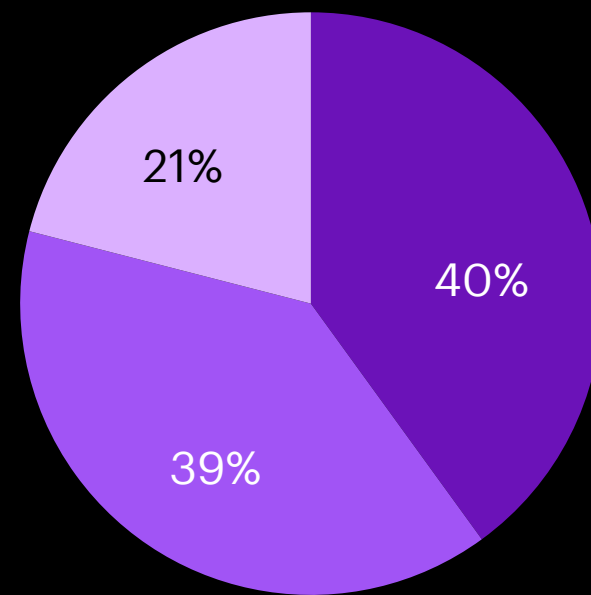
Breakthroughs are possible thanks to satellite imaging constellations such as Landsat, Sentinel-2, Planet, Pleiades, Spire or BlackSky, which make every place on Earth visible through optical, multi- and hyperspectral imaging. More companies are joining the race and launching imaging constellations, such as Pixxel and Open Cosmos. In navigation, systems like GPS and Galileo make nearly the entire planet navigable.

While the technology is already above our heads, not all companies are strategically using it. Only a minority of companies have fully included space in their innovation roadmaps both in improving operations and developing new products and services (Figure 3). So, what are the rest missing?

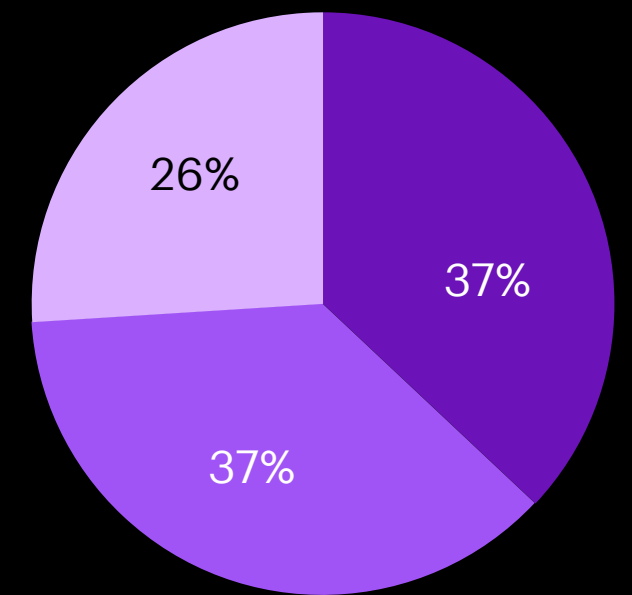
A simple realization that any company can be — or perhaps already is — a space company moves the opportunities with space-based technologies from promise to reality.

Figure 3: Most organizations have yet to realize space tech’s innovation promise

Use of space-based technology in innovation model to improve operation



Use of space-based technology in innovation model to develop new products and services



- Extensive use
- Limited use
- Very limited use

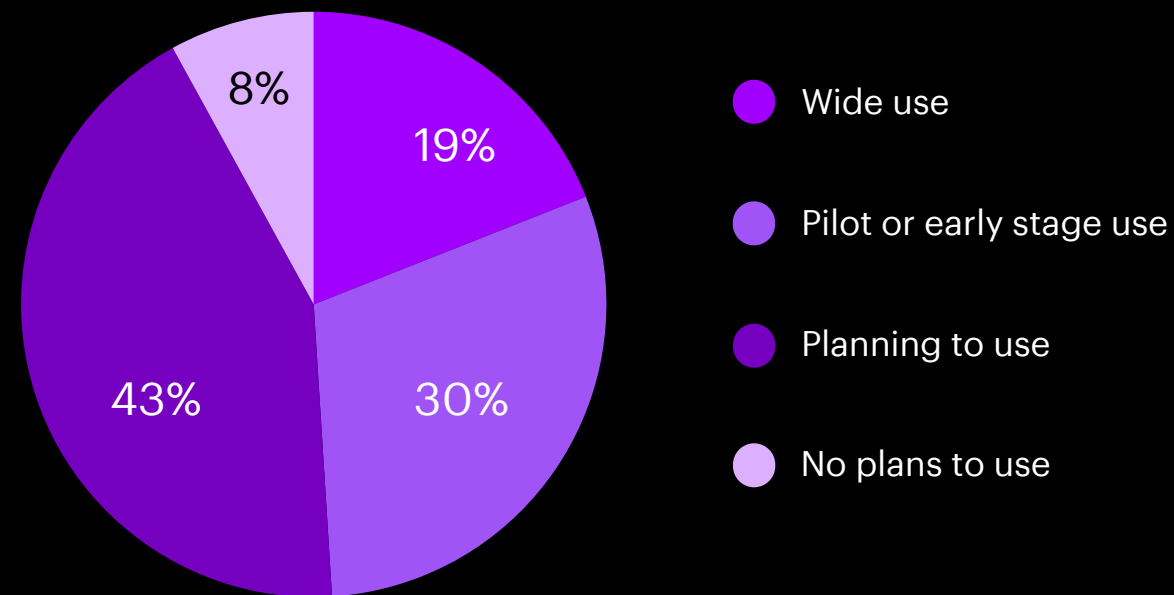


Three steps to space



It's time for existing technologies and exciting applications to combine for every company's benefit. Most organizations, for instance, are facing increased weather volatility that negatively impacts operations, yet only 19% of executives say that their companies are widely using space imaging for weather monitoring to augment their operations (Figure 4). Those yet to harness the promise of space — in this and other ways — are already missing out.

Figure 4: Only 19% of executives say they're using space-based weather monitoring to augment their operations



So, how can executives pick up the pace and start to embrace the possibilities that space-based technologies offer? Three key actions provide a practical roadmap: develop a comprehensive vision to scale projects beyond pilots, create a focused talent strategy and assemble and activate the right ecosystem. Below, we look in more detail at each of these.

1. Develop a comprehensive vision to break out of the endless pilot project cycle

A holistic, enterprise-wide approach to exploring the possibilities of space is essential. Yet fewer than 20% of companies we surveyed have a plan for using space-based technologies that comprehensively spans their organization. Space-based technology can and should be a part of an organization's digital core strategy.

Executives don't have to reinvent the wheel to develop an integrated approach to embracing space-based technologies. One major European distributor of gas and electricity, for example, worked with Accenture to gain a better understanding of new trends and business models in the space economy. The resulting analysis feeds into the wider company strategy on how it can cross-functionally use space-based technologies to grow its business.

Using data and insights from space-based technologies is also important for a successful enterprise-wide strategy. One company that's making it easier for organizations to deploy satellite-based insights across various functions is e-GEOS. Its Cloud Earth Observation Services (CLEOS) solution provides an AI-powered satellite data and information platform, which offers a source of actionable geoinformation reports. These have significant implications across a range of applications, including emergency and natural disaster management.



Earth observation also facilitates new smart operations in many areas, including energy and manufacturing. EO data can, for instance, support better forecasting of the energy potential for new solar, wind and hydropower sites. Customers can use the insights from CLEOS to make operational improvements across multiple areas of their businesses, including supply chain and customer service. For example, CLEOS is supporting development of innovative traffic management applications, as well as urban and last-mile logistics services¹⁰.

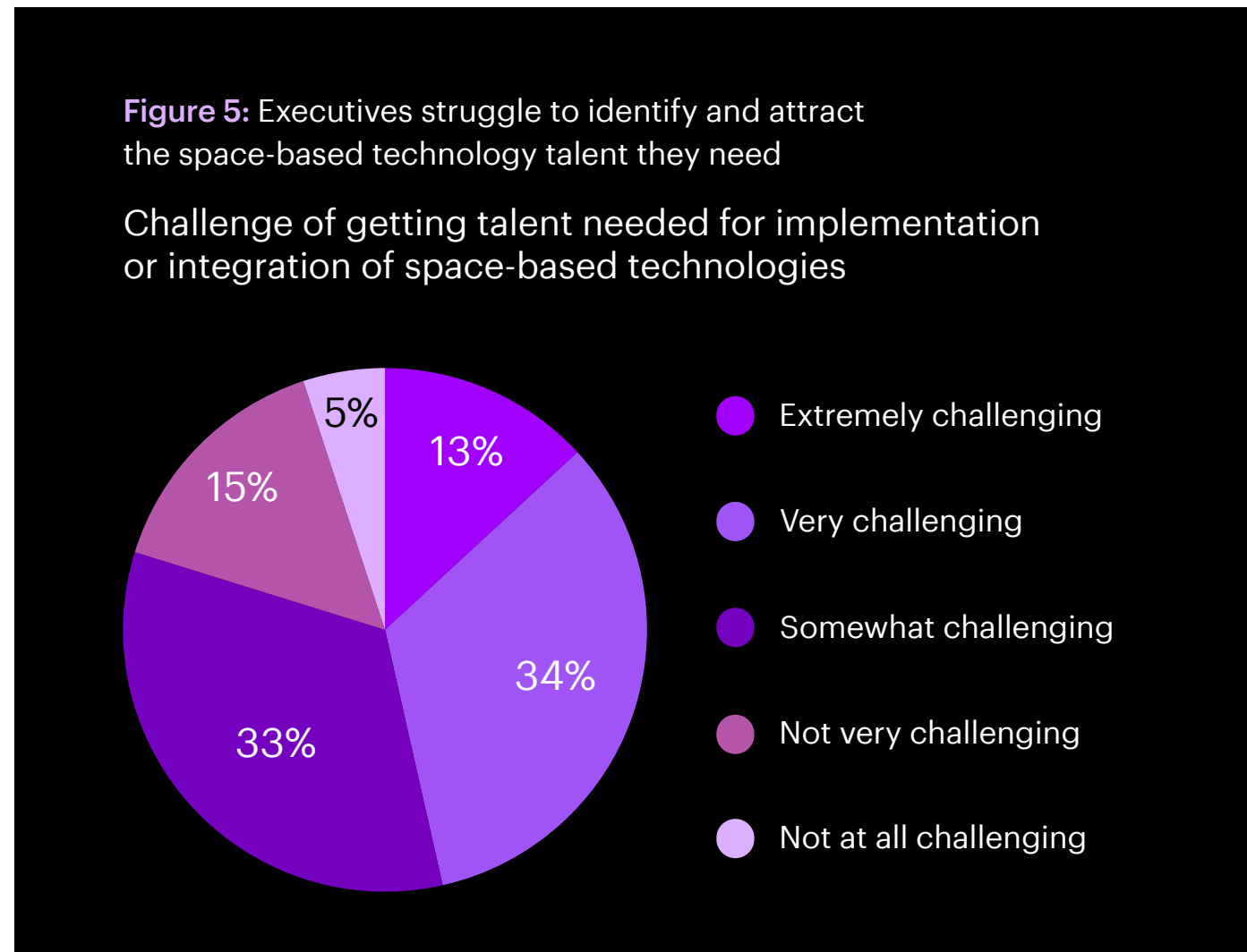
Our survey revealed that only 17% of executives are expecting to scale-up deployment of space technologies to the level of widespread use in their enterprise over the next three years. To avoid creating siloed individual use cases or an endless churn of pilots, scaling-up space-based technologies needs to be a key element of every company's digital plan.

“Integration of satellite communication into IT infrastructure opens up new possibilities for redesigning your enterprise, data management, application deployment and operational optimization.”

Head of Products & Business Development, North American space company

2. Focus your talent on space technology to gain an advantage in the talent race

Finding and developing the right talent for space-based technologies is especially competitive. Four out of five companies report they find it a challenge to fulfill their talent needs to implement space-based technologies. Nearly half describe the search for suitably skilled talent as very or extremely challenging (Figure 5).



But it's not just space-specific know-how that companies need. At least two-thirds of executives indicate that skill gaps in data, management, analytics and AI are hindering their broader implementation of space-based technologies.

“In my experience, it is easier to educate a person who is not familiar with space about its technologies than it is to teach a space professional about a different field.”

Managing Director, US space consulting company

In other words, the same skill sets required for developing an organization's digital core are just as in-demand for space-based technologies. Given the scarcity of digital talent, companies will need to think creatively about how to address their need for appropriately skilled people. Here, too, partnerships can be valuable. For example, QuSecure, a leader in post-quantum cybersecurity, teamed with Accenture to deploy a joint cyber security team providing highly agile and secure transmission using post-quantum cryptography (PQC) of data from Earth to Low Earth Orbit (LEO) satellites to Geosynchronous Earth Orbit (GEO) satellites and back to Earth¹¹. This innovation enhances trust and reliability in communication to/from satellite communication networks and demonstrates that crypto agility can be deployed in the most complicated of enterprise environments.

Companies must also consider the implications of space-related work, specifically about the new skills sets and collaborative ways of working required for success. Reskilling strategies to integrate people and new technology are also key. And in such a dynamic and rapidly evolving technology environment, it will be essential to foster a culture of continuous learning. Some companies, for example, are using a UK Space Agency Training Programme to support upskilling employees in software, data and AI¹². Advances in AI can help augment people's skills, too, enabling the more efficient data analysis and faster decision making that space technology can achieve.

Given space talent scarcity, creating clear pathways for career growth in new technologies and cultivating a supportive work environment as part of a compelling employee value proposition will be essential for employee retention and satisfaction.

3. Activate your ecosystem

The space ecosystem is both complex and constantly changing. Like space itself, it's not easy to navigate. There are already more than 3,000 companies driving the space economy¹³, which is projected to grow to \$1.8T in 10 years.

“The biggest obstacle to partnerships remains the lack of knowledge exchange. There might be technologies that can be used by non-space industries, but to understand how a business case can work for them, space companies must understand how their business case works.”

Head of Department, major European space agency

More than eight out of ten (83%) executives told us that navigating through the thousands of companies in the space ecosystem is crucial for their company's success. Partnerships with space-based technology application developers, space agencies and satellite manufacturers topped executives' lists of the ecosystem players they say are the most important to work with now to accelerate progress. Partnering with space-based technology application developers,

for example, can lead to better tailored solutions for companies, while working with space agencies can provide access to experiments in the space that can support the R&D of new products. The list of partners will inevitably lengthen as emerging possibilities like space-based manufacturing or even in-orbit cloud computing platforms become reality.

One example of a business using a partnership strategy to explore the art of the possible is Duke Energy. The company has worked with Accenture to create a comprehensive Azure-based cloud platform that ingests highly precise methane detection data from space ecosystem technology partners and uses analytics and artificial intelligence to identify methane emissions from natural gas distribution assets, such as pipelines and gas meters. Near real-time leak detection and remediation enables Duke Energy to lower methane emissions while enhancing the resilience of its operational systems. Now workers can detect leaks within minutes rather than relying on manual pipeline inspections, allowing for faster repairs. Duke Energy's new approach means it can not only spot and repair leaks earlier, but can now detect even trace-level emissions. The result is more efficient, accurate and timely repairs, along with reduced methane emissions in line with the company's 2030 net-zero goals¹⁴.



Unlocking space for industry transformation



In a world of relentless upheaval and disruption, space-based technologies, along with the rich data accessibility they offer, provide organizations with game-changing possibilities for growth and market differentiation. And they're near-infinite in scope.

Integrating with the large and growing space economy can provide companies the edge required to outmaneuver the competition both now and for years to come. Of course, there are challenges. The technology and its applications are developing at light speed and demand an AI-enabled, secure digital core to support them.

But with a clear strategic vision, access to the right talent and an ecosystem of relevant partners, every company in every industry can use space-based assets and insights to transform their operations for greater growth, resilience and value.



How Accenture can help

At Accenture, we're embracing innovation and space technology and turning those possibilities into realities for reinvention. We're connecting satellite constellations for easy and secure communications, using satellites to help farmers prevent disease and improve crop yields, combining Earth observation with AI to protect delicate ecosystems and help keep our planet thriving.

If you're already working in space, we'll help you do more. If you're still on the ground, we'll light the way. We'll be pushing the boundaries of exploration, enabling new structures and ecosystems, creating new areas of growth. It's an epic journey of discovery, and there's room for all. So, when you look up at the marvel of space, remember, we can help you launch your company to its next great adventure. Your next steps in space. Start with Accenture.

How you can work with Accenture to use space to change your business

Develop an overarching space strategy:

Accenture can help you develop a space strategy to boost your understanding of the possibilities, define a comprehensive vision, develop and test an actional approach and bring new products and services to market.

Unlock the power of Earth observation and geospatial intelligence:

Through AI and machine learning, Accenture can transform satellite data of the Earth's land, water and atmosphere into valuable intelligence for our clients: Environmental Monitoring, Emissions Detection, Natural Disaster Response.

Tap into vast potential of satellite connectivity:

Accenture can help together with its ecosystem partners to architect and implement satellite connectivity solutions to help your business eliminate connectivity gaps and unlock real-time insights across the globe: Off Grid & Field Connectivity, Connected Transportation, IoT Sensor Data Retrieval.

Made in Space for Earth:

Leverage the unique environment of space to reinvent the way you design and manufacture products and services: Microgravity R&D, Manufacturing in LEO, Space Enhanced Consumer Goods.

Connect industries:

Connecting industries to the space ecosystem is crucial for fostering innovation and growth. By providing clear guidance and support, we help both existing and future space businesses navigate the complex path to commercialization, ensuring they can thrive in the expanding space market.



About the Space for Growth report

The Accenture Space for Growth report combines analysis of primary and secondary research on the use of commercial space-based technologies across industries, focusing on satellite communication, navigation, Earth observation, space security, research and product innovation. Primary research covers interviews with experts, including current and former public officials working in space organizations and space industry executives.

We also conducted a survey with 1300 executives at major companies from 17 industries in North America, Europe and APAC. The research provides a unique perspective on current and planned use of space-based technologies, covering a wide range of areas from sentiment on having access to space-based technologies to challenges in collaboration with space ecosystem organizations. We conducted interviews and the executive survey in 2024.



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About Accenture

Accenture is a leading global professional services company that helps the world’s leading businesses, governments and other organizations build their digital core, optimize their operations, accelerate revenue growth and enhance citizen services—creating tangible value at speed and scale. We are a talent- and innovation-led company with approximately 801,000 people serving clients in more than 120 countries. Technology is at the core of change today, and we are one of the world’s leaders in helping drive that change, with strong ecosystem relationships. We combine our strength in technology and leadership in cloud, data and AI with unmatched industry experience, functional expertise and global delivery capability. Our broad range of services, solutions and assets across Strategy & Consulting, Technology, Operations, Industry X and Song, together with our culture of shared success and commitment to creating 360° value, enable us to help our clients reinvent and build trusted, lasting relationships. We measure our success by the 360°value we create for our clients, each other, our shareholders, partners and communities.

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