2023 Cloud Complexity Report

The Shifting Demands
of a Multicloud Environment

NetApp

March 2023
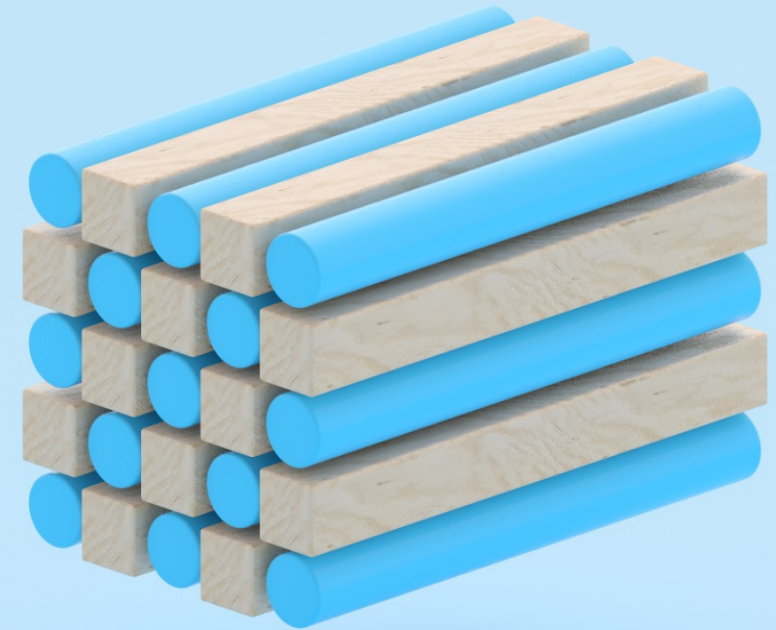
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THE CLOUD COMPLEXITY DILEMMA – AND THE OPPORTUNITY

The cloud is a must-have for digital transformation.

Paradigm shifts are happening in how technology leaders look at and manage their cloud initiatives, and many are considering AI as a possible solution for these deployments. Today, most enterprises are using more than one cloud provider. As cloud adoption accelerates and businesses innovate faster to compete, they will rely on moving workloads across more clouds, creating more complexity in their IT environments.

The inability to manage this complexity can lead to poor IT performance, loss in revenue and create barriers to business growth.

But the upside of cloud is relentless opportunity for innovation.

NetApp explored how technology decision makers around the globe are navigating the complexity of using multiple cloud environments, including the challenges and the best practices that enable businesses to thrive in this new reality.

INDUSTRY ANALYST INSIGHT

"Insights from NetApp's survey underscore cloud technology is more challenging than initially thought. To meet executive expectations for delivering benefits from the cloud, IT continues to look for solutions. Targeted cloud applications, especially in the area of AI, will yield early successes. The survey uncovered many challenges and the intention to make the use of cloud a success, bringing clarity to the current state of cloud across a broad view of IT, worldwide."

– Randy Kerns,
Sr. Strategist & Analyst, Evaluator Group

EXECUTIVE SUMMARY

Technology decision makers are navigating cloud requirements coming from digital transformation and AI initiatives and the complexity of multicloud environments. They are facing a cloud complexity dilemma between the necessity of using the cloud and the complexity it creates. That dilemma has now reached a tipping point with 98% reporting their business has been impacted by increasing complexity of data across cloud from increased cybersecurity risk to lack of visibility into business operations to staff burnout.

That complexity is only being exacerbated by both technical challenges like data mobility between clouds and organizational challenges like cost management, lack of a clear cloud strategy or leadership buy in.

This results in increasing tension between tech executives and leadership over delivering immediate and short-term ROI vs. long term benefit.

Despite these barriers and tensions, key drivers like data sovereignty, sustainability and cost reduction will continue to make cloud essential. Tech executives are searching for new solutions, with AI the tool most broadly cited.

The moment to reduce cloud complexity is now. Organizations that minimize complexity and optimize cloud outcomes put themselves in the best position to lead our next decade of innovation.

RESEARCH METHODOLOGY

NetApp partnered with Wakefield Research to conduct a quantitative research study during November 2022, among 1,300 tech and data executives at businesses in 9 markets: US, EMEA (France, Germany, Spain, the UK), and APAC (India, Japan, Singapore, and Australia/New Zealand).
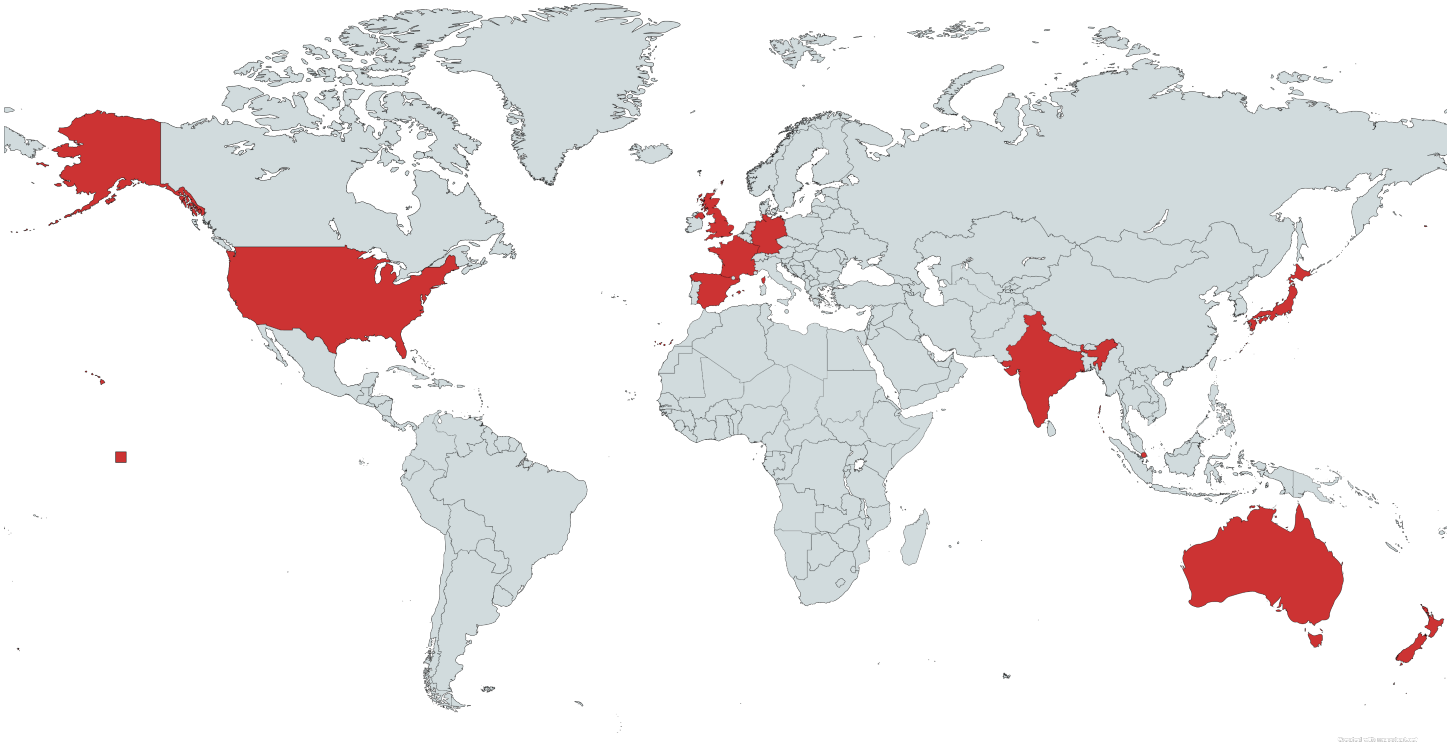
Included roles:
- IT
- IT Infrastructure
- Cloud Infrastructure
- Data Engineering

Included titles:
(Seniority of Director+)

- CIO
- CTO
- SREs
- IT Ops
- Storage Admins
- DevOps

- CloudOps
- Cloud Architects
- Data Scientists
- Data Engineers

CHAPTER 1:

CLOUD COMPLEXITY REACHES A TIPPING POINT

NetApp
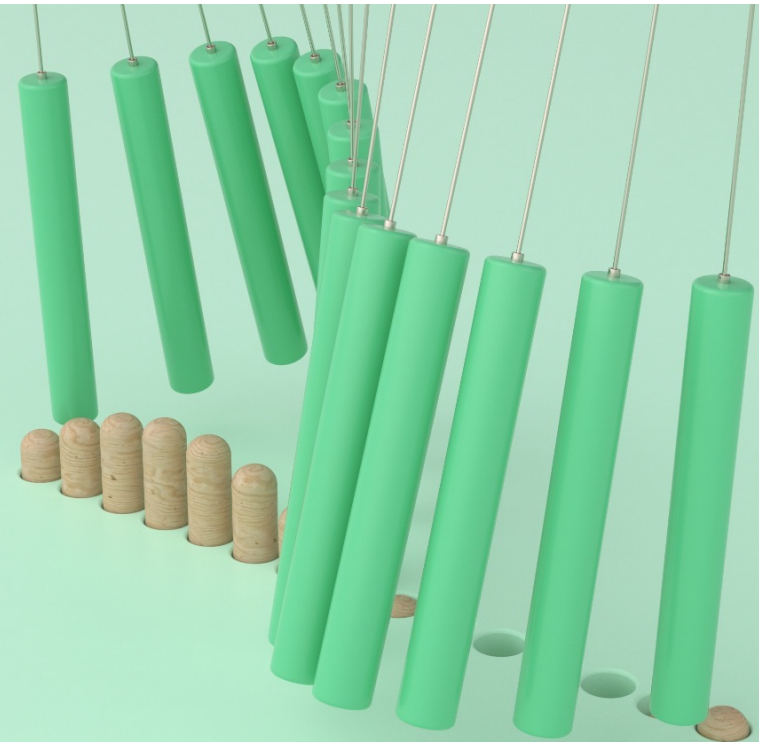
98%

of global tech executives report their business has been impacted by increasing complexity of data across the cloud

THE INCREASING COMPLEXITY OF MULTICLOUD ENVIRONMENTS IS AT A CRITICAL JUNCTURE

Tech executives universally report myriad business impacts due to increasing complexity of data across their cloud environments; this includes both external challenges like cybersecurity as well as internal obstacles like skepticism from leadership and staff not taking full advantage of business applications.

THE BUSINESS IMPACTS ARE MULTIPLE AND DIVERSE IN NATURE

TOP BUSINESS IMPACTS OF MANAGING INCREASING COMPLEXITY OF DATA ACROSS CLOUD OR MULTICLOUD ENVIRONMENTS

45% Increased cybersecurity risk

44% Increased skepticism over cloud from leadership

44% Staff not taking full advantage of business applications

42% Lack of visibility into business operations

37% Going overbudget

31% Burning out staff

BUSINESS IMPACTS VARY MARKET TO MARKET, BUT ALL MARKETS ARE DEALING WITH COMPLEXITY

Top business impacts of increasing complexity of data across cloud
Among those whose cloud journey is not only on-prem
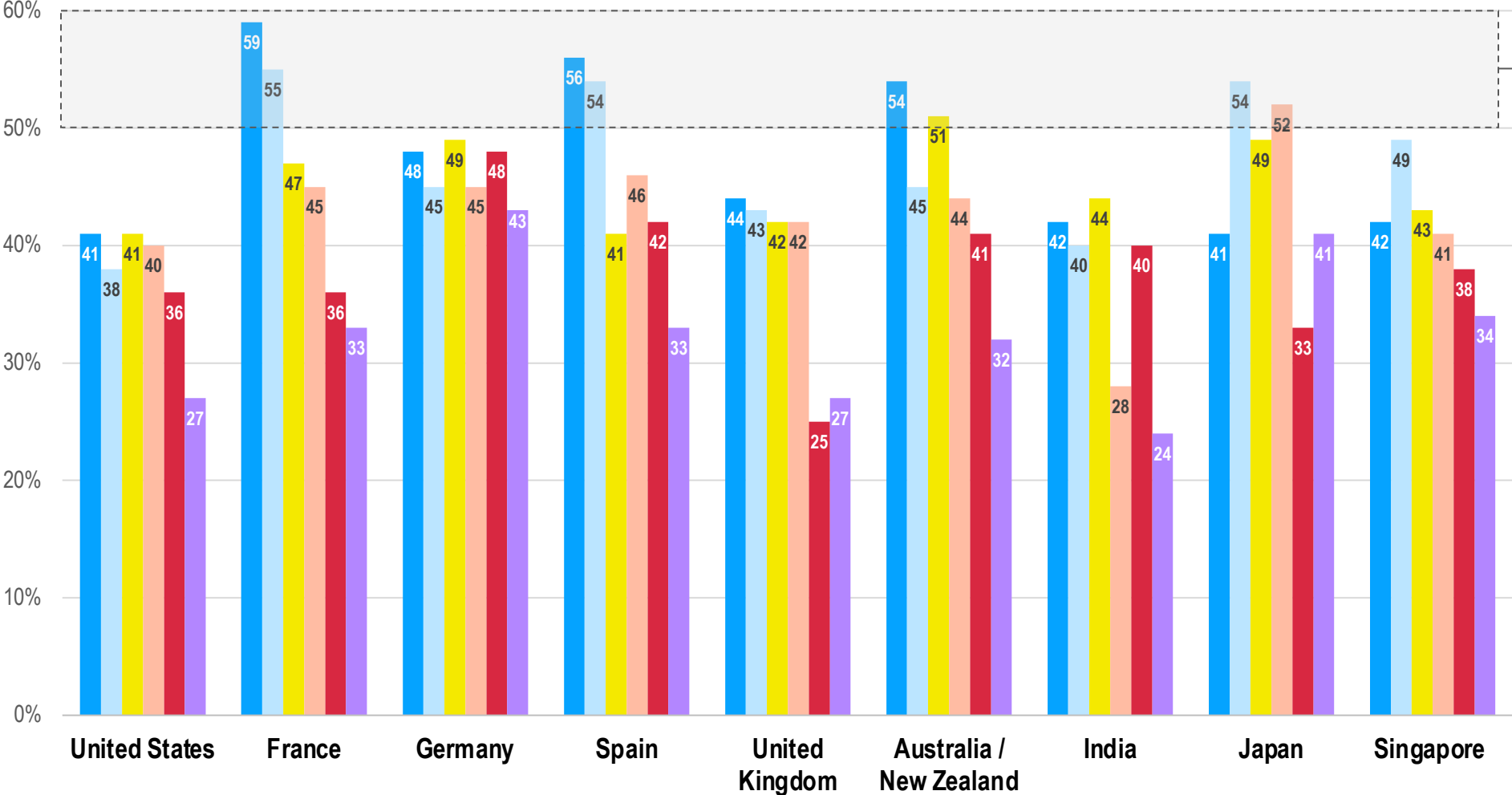
HIGHEST-IMPACT COMPLEXITIES:

■ **Cybersecurity:**
France, Spain and Australia/NZ

■ **Leadership skepticism:**
France, Spain, Japan

■ **Application use inefficiencies:**
Australia/NZ

■ **Lack of Visibility:**
Japan

■ Increased cybersecurity risk

■ Increased skepticism over cloud from leadership

■ Staff not taking full advantage of applications

■ Lack of visibility into business operations

■ Going overbudget

■ Burning out staff

CHAPTER 2:

TECHNICAL AND ORGANIZATIONAL BARRIERS ADD TO THE CLOUD COMPLEXITY DILEMMA
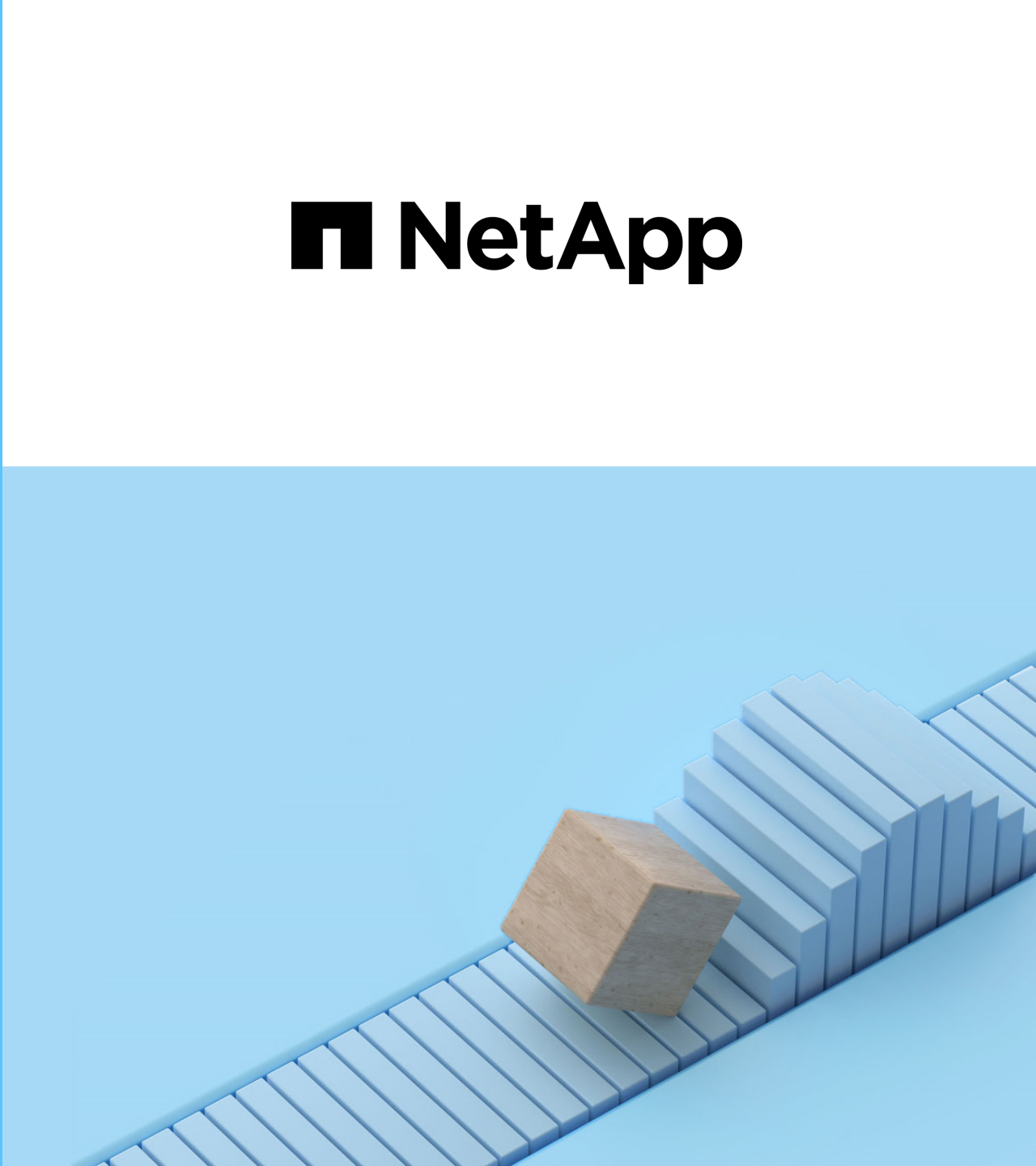
88%

of tech executives report technical challenges

50%

of tech executives report challenges at the leadership level

TECHNICAL AND ORGANIZATIONAL CHALLENGES STAND IN THE WAY OF OPTIMIZING MULTICLOUD ENVIRONMENTS

Most tech executives cite technical challenges of working across cloud environments, like data mobility and interoperability. For half of tech executives, there are also challenges at the leadership level, including not having a clear vision for their cloud strategy and a lack of leadership buy-in.

TOP CHALLENGES IN OPTIMIZING A MULTICLOUD ENVIRONMENT

TECHNICAL CHALLENGES

33% Data mobility between clouds

31% Security & addressing risks

30% Interoperability between cloud services

ORGANIZATIONAL CHALLENGES

32% Having a clear vision for our cloud strategy

31% Establishing the right level of governance

30% Managing costs

CHALLENGES VARY MARKET TO MARKET, BUT ARE LOWER IN US, UK AND INDIA

Top challenges in optimizing a multicloud environment
Among those whose cloud journey is not only on-prem
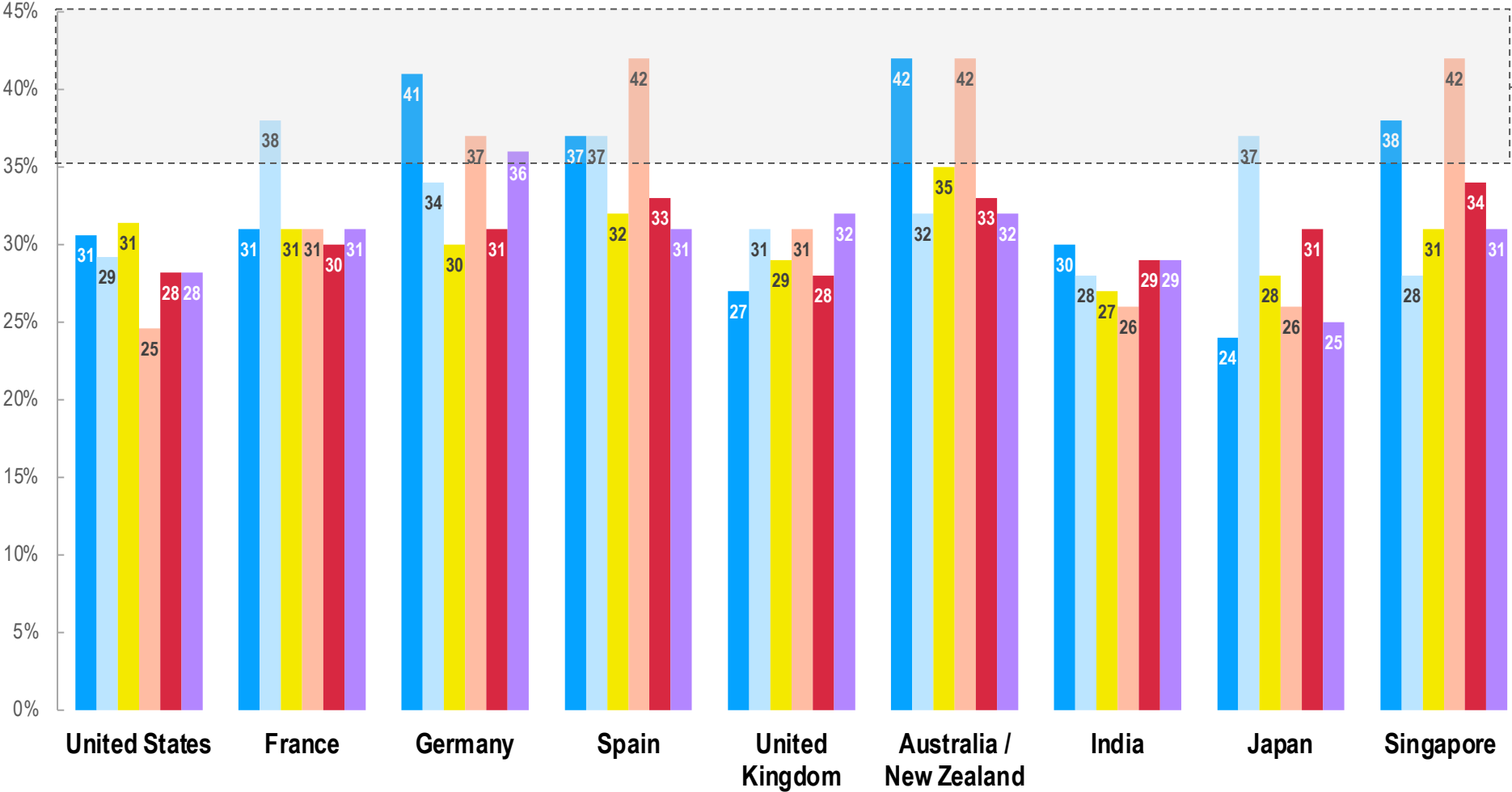
TOP CHALLENGES BY MARKET:

Data Mobility:
Australia / NZ, Germany, Singapore, Spain

Vision for Cloud Strategy:
France, Spain, Japan

Security / Risks:
Australia / NZ, Germany, Singapore, Spain

Cost:
Germany

Data mobility between clouds

Having a clear vision for our cloud strategy

Establishing the right level of governance

Security & addressing risks

Interoperability between cloud services

Managing costs

CHAPTER 3:

TENSION INCREASES BETWEEN TECH EXECUTIVES AND LEADERSHIP AROUND CLOUD ROI

TECH EXECUTIVES REPORT INCREASED PRESSURE AND SKEPTICISM FROM LEADERSHIP AROUND CLOUD ROI

Despite supporting so many business priorities, tech executives are expected to show a return on investment (ROI) on what the company has spent on cloud, either in increased revenue or in saved costs.

While cloud environments are serving all sorts of business needs and priorities, tech executives also report fending off skepticism from their CFO. This pressure will continue to hang over tech executives in 2023 as they battle increasing cost complexity.

Left chart legend:
- Expecting to already show a return
- Expecting a short-term return
- Expecting a long-term return

GLOBAL: 38%, 46%, 16%

84%
of tech executives are already expected to show returns on their cloud investments or are under pressure to show short-term progress

Right chart legend:
- Extremely skeptical
- Very skeptical
- Somewhat skeptical
- Not too skeptical
- Not skeptical at all

GLOBAL: 10%, 33%, 33%, 16%, 8%
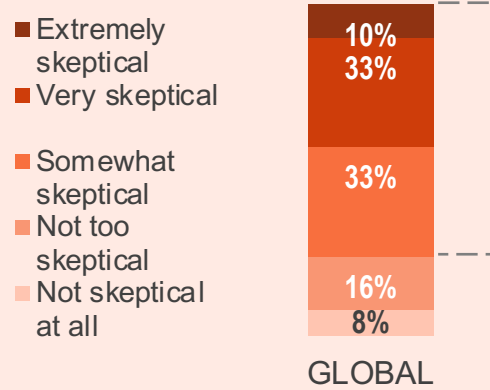
76%
of tech executives report their CFO or other business leaders are somewhat to extremely skeptical of seeing cost savings

SKEPTICISM FROM LEADERSHIP IS PERVASIVE ACROSS MARKETS

Tech executives from every market report significant levels of skepticism from leaders, with India, Australia/NZ, UK and Germany showing the most skepticism, and France, US, Japan and Spain showing the least.

Skepticism of CFO/Business Leaders about realizing cost savings from moving to the cloud
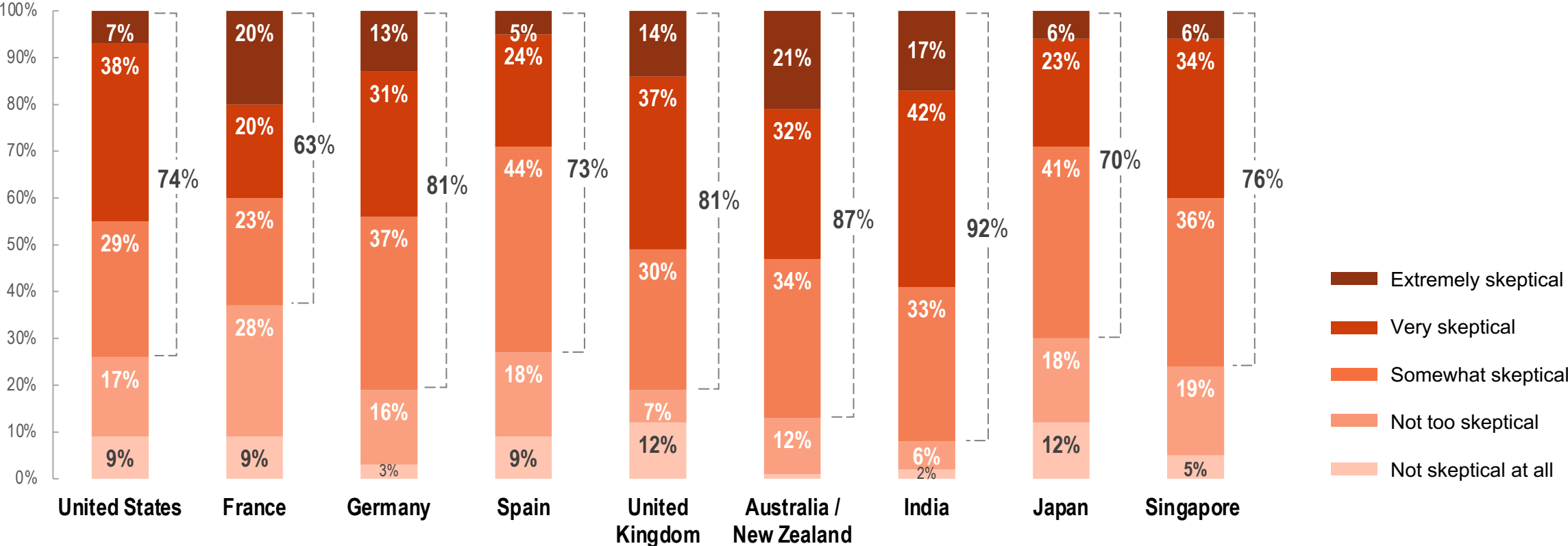
AS A RESULT, CLOUD COST CONCERNS ARE EVER-PRESENT…

Nearly half of tech executives (49%) report that when cloud strategy discussions happen, cost concerns come up often or all the time. This is highest in EMEA, where 56% report this. Another 37% of executives report it happens sometimes, leaving just 13% of companies where cost concerns are rarely or never raised.

Frequency that cost concerns come up during cloud strategy discussion

Global (n=1300)

- All the time / Often (net) — 49%
- Sometimes — 37%
- Rarely / Never (net) — 13%

US (n=500): All the time 11%, Often 33%, Sometimes 41%, Rarely 12%, Never 3% — 44%

EMEA (n=400): All the time 19%, Often 37%, Sometimes 32%, Rarely 11% — 56%

APAC (n=400): All the time 16%, Often 34%, Sometimes 37%, Rarely 12% — 50%

Legend:
- All the time
- Often
- Sometimes
- Rarely
- Never
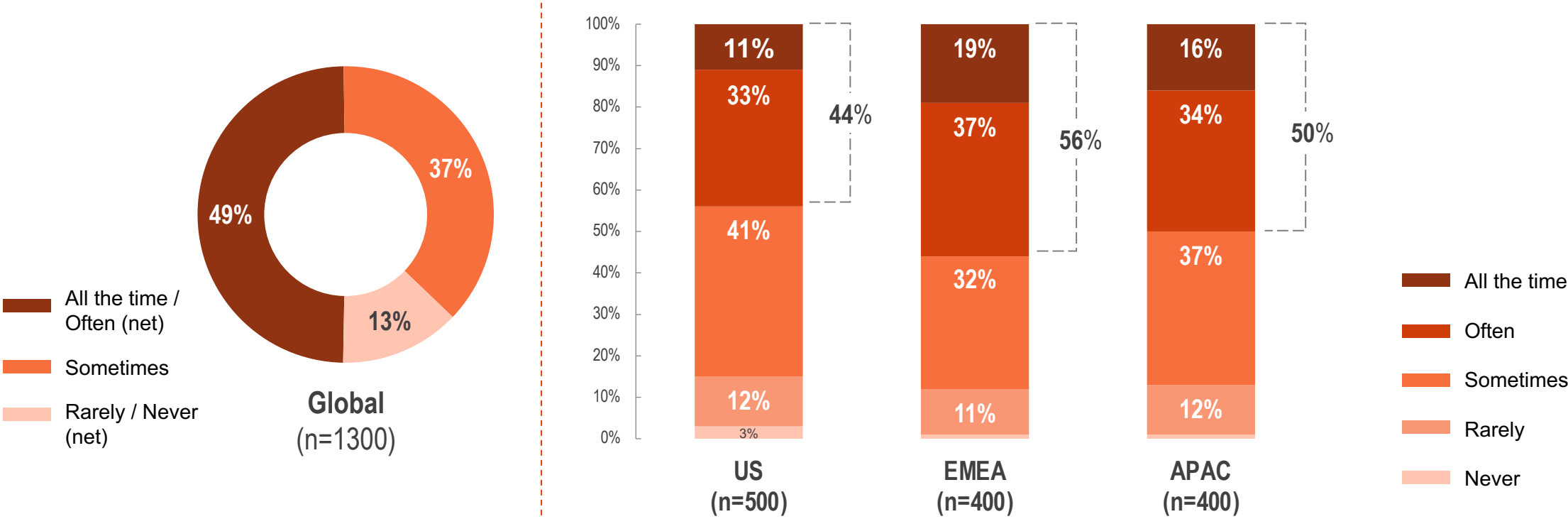
…AND PREVALENT IN EVERY COUNTRY

Cost concerns are prevalent in cloud strategy discussions in every country, and are most prevalent in France, UK, Germany and Australia/NZ, and least prevalent in Japan, US and Spain.

Frequency that cost concerns come up during cloud strategy discussions

	All the time	Often	Sometimes	Rarely	Never
United States	11%	33%	41%	12%	3%
France	23%	39%	24%	10%	4%
Germany	25%	32%	34%	9%	
Spain	9%	37%	36%	18%	
United Kingdom	20%	38%	35%	7%	
Australia / New Zealand	20%	37%	31%	11%	
India	18%	35%	31%	16%	
Japan	14%	27%	44%	12%	3%
Singapore	10%	37%	43%	9%	

Callout percentages: United States 44%, France 62%, Germany 57%, Spain 46%, United Kingdom 58%, Australia/New Zealand 57%, India 53%, Japan 41%, Singapore 47%
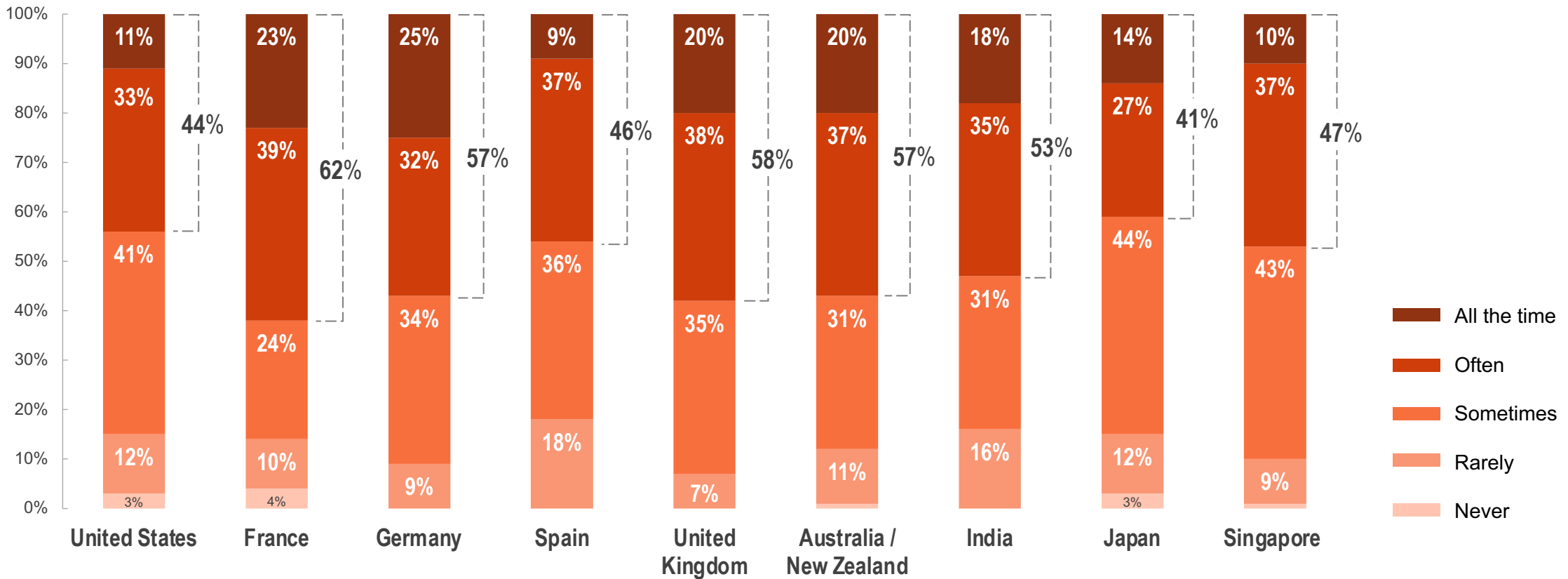
CLOUD COST CONCERNS ARE HIGHEST AT LARGER AND LEGACY COMPANIES

Cost concerns are raised more frequently at larger companies (54%) compared to smaller companies (45%) and older companies (53%) compared to newer companies (41%). There is also higher incidence at companies where business leaders are extremely or very skeptical about savings from moving to the cloud, where 60% say it occurs often or all the time.

Frequency that cost concerns come up during cloud strategy discussions

By company size

By years company has been in business

By leaders' skepticism of cost savings moving to cloud

Legend:
- All the time
- Often
- Sometimes
- Rarely
- Never

By company size:
- Under 250 (n=676): 2%, 12%, 41%, 31%, 14% — 45%
- 250 or more (n=624): 2%, 11%, 33%, 38%, 16% — 54%

By years company has been in business:
- Under 10 years (n=383): 3%, 10%, 46%, 31%, 10% — 41%
- 10 years or more (n=917): 1%, 12%, 34%, 36%, 17% — 53%

By leaders' skepticism of cost savings moving to cloud:
- Extremely or very skeptical (n=567): 1%, 8%, 31%, 38%, 22% — 60%
- Somewhat skeptical or less (n=733): 3%, 14%, 42%, 31%, 10% — 41%

PRESSURE TO SHOW ROI IS HIGH REGARDLESS OF COMPANY SIZE, BUT IS HIGHER WHERE BUSINESS LEADERS ARE SKEPTICAL

Tech executives who report extreme or very skeptical leadership over cost savings (44%) report pressure to already be showing ROI vs executives who report less skepticism (33%). The expectation of pressure may also depend on who is feeling it: C-suite executives are less likely to report pressure to already be showing returns than Directors, who are closer to day-to-day operations.

Expectation to show a return on investment regarding cloud
Among those whose cloud journey is not only on-prem, *n=1,297*

By company size
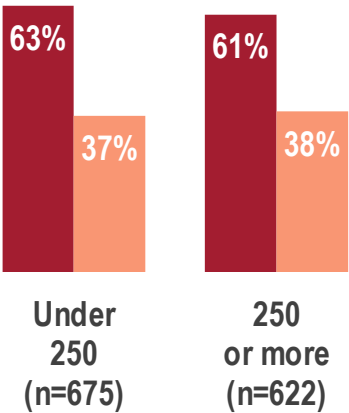
By job level

By leaders' skepticism of cost savings moving to cloud

Under 250 (n=675)	250 or more (n=622)	C-Level or senior executive (n=328)	Director (n=969)	Extremely or very skeptical (n=567)	Somewhat skeptical or less (n=730)
63% / 37%	61% / 38%	63% / 36%	62% / 38%	56% / 44%	67% / 33%
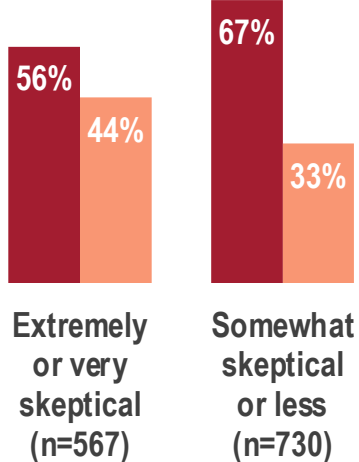
■ Expected long-term return

■ Expected already to show return

PRESSURE TO ALREADY SHOW ROI IS HIGH IN EVERY COUNTRY

The pressure to already show ROI on cloud investment is highest in UK, Spain, India, and Singapore, where 9 out of 10 tech executives feel it. But even where there is less pressure, 8 or more out of 10 feel it.

Expectation for a ROI on cloud
Among those whose cloud journey is not only on-prem

Legend:
- Expected long-term return with no expectations for short-term return
- Expected already to show return or under pressure for short-term return

Data by region:
- US (n=499): 22% / 78%
- EMEA (n=399): 12% / 88%
- APAC (n=399): 14% / 86%

Data by country:
- United States (n=499): 22% / 78%
- France (n=100): 12% / 87%
- Germany (n=100): 15% / 85%
- Spain (n=100): 11% / 89%
- United Kingdom (n=99)*: 8% / 91%
- Australia / New Zealand (n=99)*: 14% / 86%
- India (n=100): 10% / 90%
- Japan (n=100): 21% / 79%
- Singapore (n=100): 10% / 90%

*sample size under 100

CHAPTER 4:

BUT THERE ARE KEY DRIVERS THAT CONTINUE TO MAKE CLOUD ESSENTIAL

Most or some (net)

74%

26%
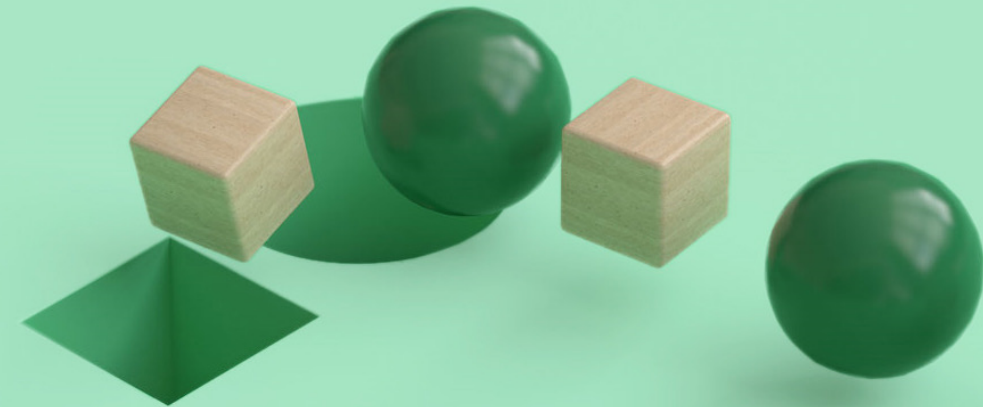
Very little, none, or does not apply (net)
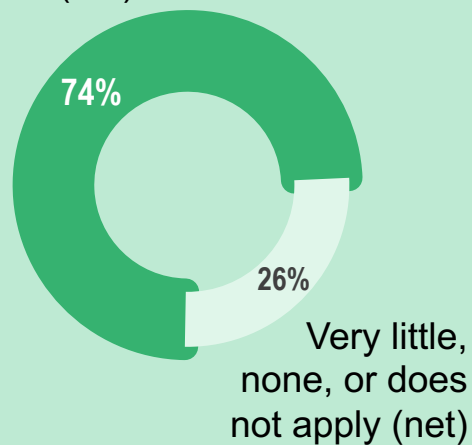
74%

say their multi-cloud strategy is driven by data sovereignty requirements

Extremely or very important (net)

79%

21%

Somewhat important or less (net)
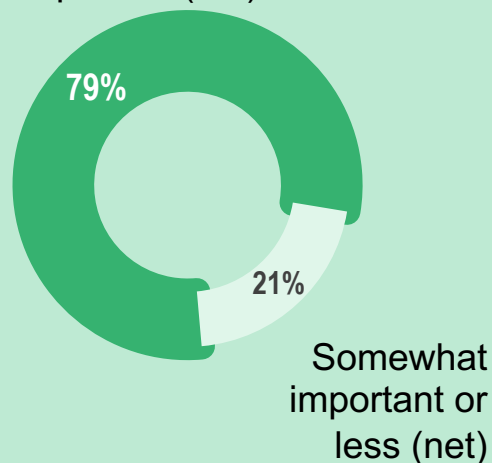
79%

say cloud strategy is very or extremely important to ESG outcomes

CLOUD STRATEGY IS DRIVEN BY DATA SOVEREIGNTY REQUIREMENTS AND ESG OUTCOMES

Nearly 3 out of 4 tech executives say their multi-cloud strategy is driven by data sovereignty requirements, adding the various local regulations where data is collected and stored to the list of demands alongside sustainability and business demands.

Nearly 8 out of 10 tech executives say cloud systems are developed with sustainability goals specifically in mind.

DATA SOVEREIGNTY DRIVES MULTICLOUD STRATEGY IN ALL MARKETS

A majority of tech executives in every market report that staying compliant with various local regulations drives their multicloud strategy most or some of the time. This number is lowest in France (59%) and highest in the UK (89%).

Multicloud strategy is driven by data sovereignty requirements

	Most	Some	Very little	None	N/A
US (n=500)	30%	48%	21%	1%	
EMEA (n=400)	25%	45%	26%	5%	
APAC (n=400)	26%	49%	22%	2%	1%
United States (n=500)	30%	48%	21%	1%	
France (n=100)	25%	34%	35%	6%	
Germany (n=100)	20%	42%	30%	8%	
Spain (n=100)	23%	44%	29%	4%	
United Kingdom (n=100)	31%	58%	10%	1%	
Australia / New Zealand (n=100)	29%	51%	16%	1%	3%
India (n=100)	30%	44%	26%		
Japan (n=100)	23%	44%	27%	6%	
Singapore (n=100)	22%	57%	20%	1%	
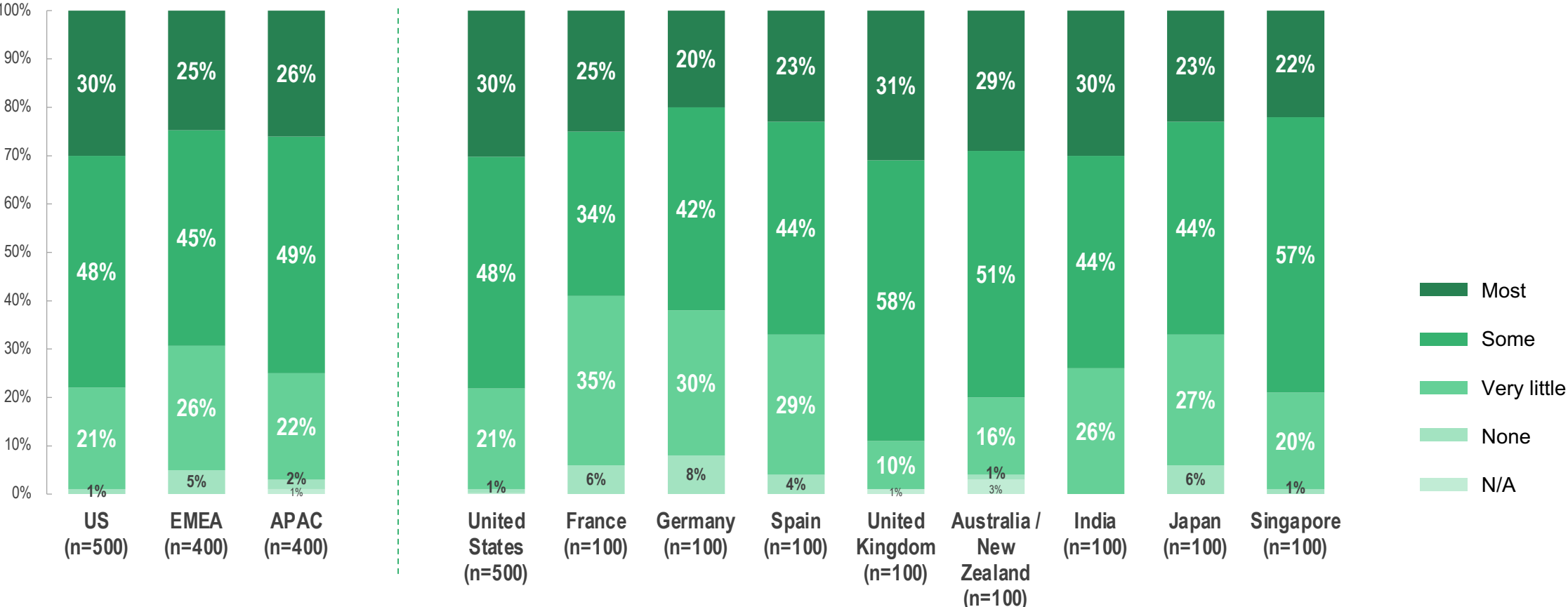
ESG AND SUSTAINABILITY ARE ALSO DRIVING FORCES IN CLOUD STRATEGY

When developing initiatives to reduce their company carbon footprint, companies feature cloud prominently in their strategy. This is true across all regions, though slightly lower in APAC at 64%. This adds another disparate demand to the role of cloud inside companies.

Role cloud plays in reducing carbon footprint

Legend:
- Cloud overlooked in sustainability strategy
- Cloud prominent in sustainability strategy

Region	Cloud overlooked	Cloud prominent
US (n=500)	25%	75%
EMEA (n=400)	26%	74%
APAC (n=400)	37%	64%
United States (n=500)	25%	75%
France (n=100)	26%	74%
Germany (n=100)	22%	78%
Spain (n=100)	24%	76%
United Kingdom (n=100)	32%	68%
Australia / New Zealand (n=100)	38%	62%
India (n=100)	49%	51%
Japan (n=100)	31%	69%
Singapore (n=100)	28%	72%

AND TIERED WORKLOADS REMAIN CRITICAL TO ACHIEVE EFFICIENCIES

Nearly three-fourths of executives say that tiered workloads are very to extremely important and there is no significant variance by market.

Importance of tiered workloads to organization's cloud strategy

	Extremely important	Very important	Somewhat Important	Not Important (net)
GLOBAL (n=1300)	26%	48%	22%	4%
US (n=500)	28%	48%	22%	2%
EMEA (n=400)	25%	48%	22%	5%
APAC (n=400)	26%	47%	23%	6%
United States (n=500)	28%	48%	22%	2%
France (n=100)	39%	41%	15%	5%
Germany (n=100)	14%	47%	34%	5%
Spain (n=100)	19%	56%	19%	6%
United Kingdom (n=100)	27%	49%	21%	3%
Australia / New Zealand (n=100)	31%	50%	16%	3%
India (n=100)	31%	49%	20%	—
Japan (n=100)	15%	33%	34%	18%
Singapore (n=100)	25%	54%	20%	1%
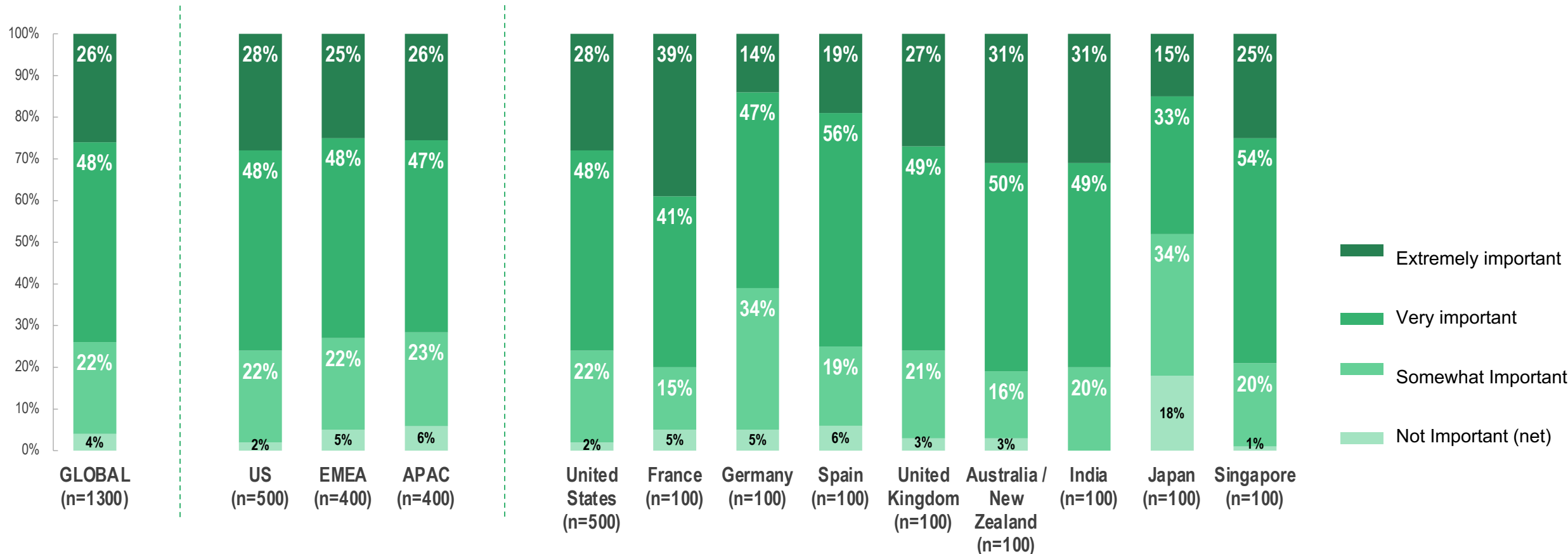
CHAPTER 5:

TECH EXECUTIVES LOOK TO AI AS A POSSIBLE SOLUTION
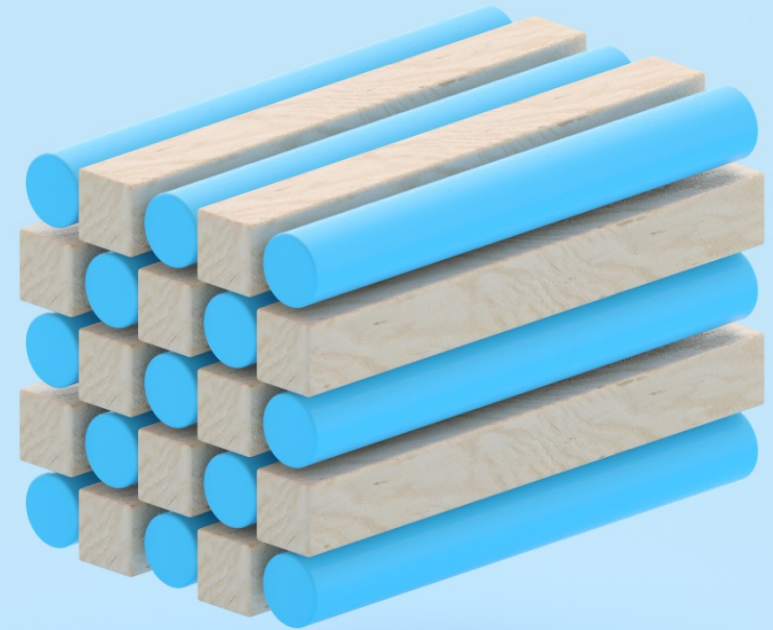
By 2023

37%

of executives reported half or more cloud supported AI applications will be supported

By 2030

59%

of executives reported half or more cloud supported AI applications will be supported

AI IS SUPPORTING CLOUD DEPLOYMENTS, AND THIS TREND CONTINUES TO INCREASE

In the next year, over a third of tech executives report that half or more of their cloud deployments will be supported by AI-driven applications. That number will only continue to grow, as most executives report that half or more will be supported by AI come 2030.

AI IS SEEN AS CRITICAL TO DRIVING MULTIPLE BUSINESS BENEFITS

TOP BENEFITS OF USING ARTIFICIAL INTELLIGENCE IN YOUR ORGANIZATION

40% Greater security & risk assessment

37% Increase production rate

38% Improved customer experience

30% Outcome prediction

33% Closing the skills gap

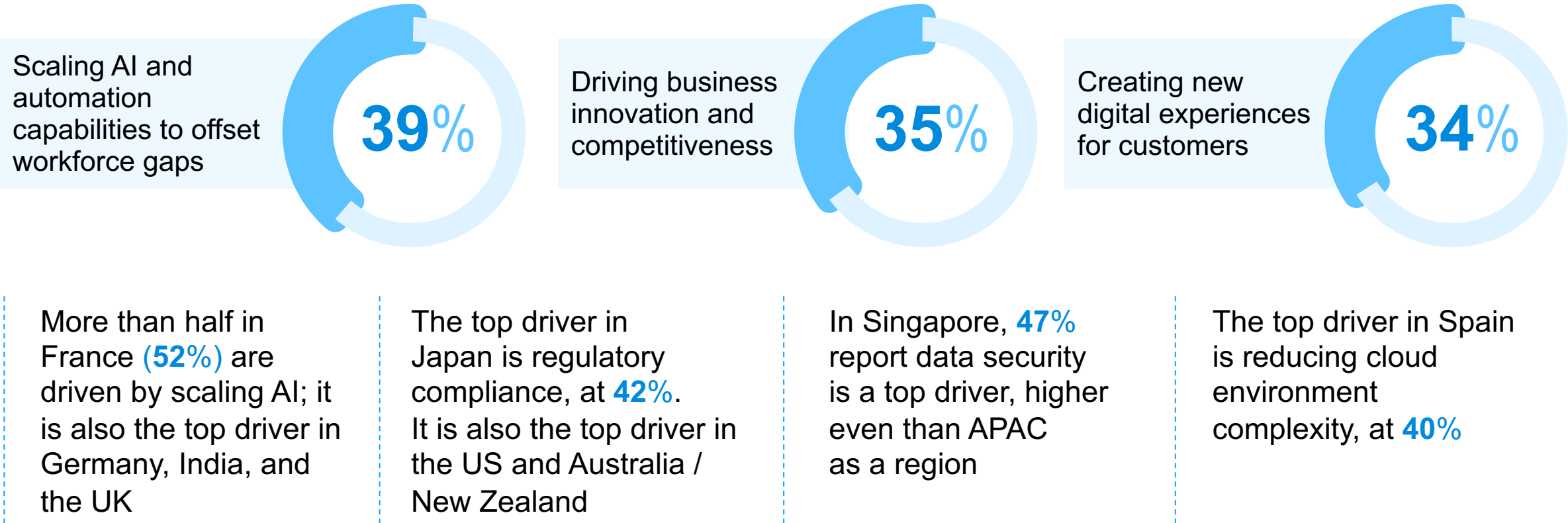**38%** Boost database query accuracy

38% Product development

36% Automation of routine activities

SCALING AI AND BUSINESS INNOVATION ARE DRIVING CLOUD INVESTMENT NOW

Scaling AI and automation is ranked by 39% as a top 3 business need to drive cloud investment to offset workforce gaps; another 35% report driving business innovation as a top 3 driver for cloud investment. These business needs underscore the pressure that cloud is under to perform.

Scaling AI and automation capabilities to offset workforce gaps — **39%**

Driving business innovation and competitiveness — **35%**

Creating new digital experiences for customers — **34%**

More than half in France (**52%**) are driven by scaling AI; it is also the top driver in Germany, India, and the UK

The top driver in Japan is regulatory compliance, at **42%**. It is also the top driver in the US and Australia / New Zealand

In Singapore, **47%** report data security is a top driver, higher even than APAC as a region

The top driver in Spain is reducing cloud environment complexity, at **40%**

SCALING AI IS THE TOP PRIORITY GLOBALLY

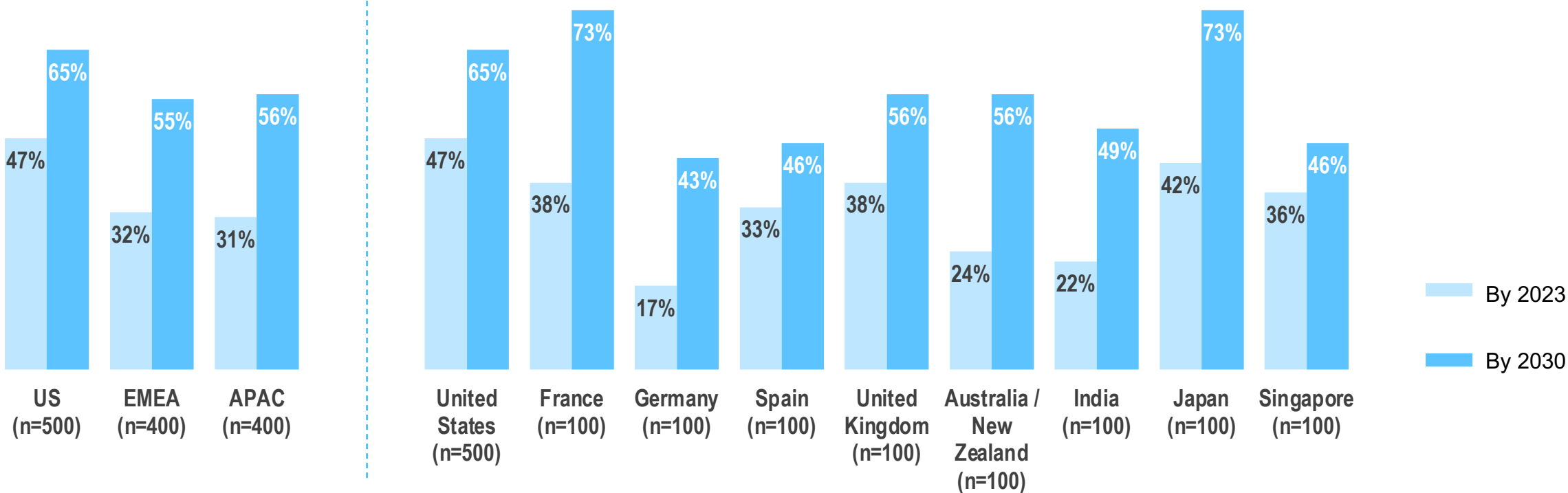Scaling AI is the top priority in EMEA and APAC, second only to meeting regulatory compliance in the US.

Top 3 ranked business needs most likely to drive cloud investment decisions in 2023

	Global	United States (n=500)	EMEA (n=400)	APAC (n=400)
Scaling AI and automation capabilities to offset workforce gaps	**39%**	**36%**	**43%**	**38%**
Driving business innovation and competitiveness	35%	34%	37%	35%
Creating new digital experiences for customers	34%	35%	33%	34%
Meeting regulatory compliance	33%	37%	28%	34%
Increasing data security	33%	29%	36%	37%
Achieving ESG outcomes	33%	33%	30%	35%
Shifting operational budget needs	32%	34%	33%	30%
Reducing cloud environment complexity	31%	30%	33%	31%
Supporting hybrid work environments	30%	32%	29%	29%

THE TREND TOWARDS AI SUPPORT FOR CLOUD IS DRIVEN BY THE US, FRANCE AND JAPAN

Nearly 1 out of 2 US-based tech executives (47%) report half or more of their cloud deployments will be supported by AI-driven applications in the next year, with nearly two-thirds (65%) saying they'll reach half or more by 2030. This far outpaces EMEA and APAC, where fewer than a third expect to reach that mark in the next year. The exceptions in EMEA and APAC are France and Japan, where 73% expect to reach that mark.

Likely when <u>half or more cloud</u> deployments will be supported by AI-driven applications

Bar chart showing percentages By 2023 and By 2030:

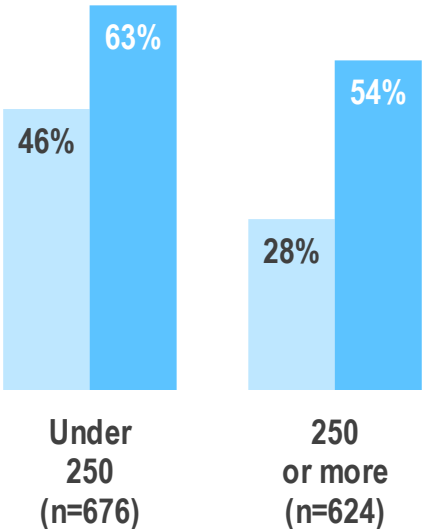| Region/Country	By 2023	By 2030
US (n=500)	47%	65%
EMEA (n=400)	32%	55%
APAC (n=400)	31%	56%
United States (n=500)	47%	65%
France (n=100)	38%	73%
Germany (n=100)	17%	43%
Spain (n=100)	33%	46%
United Kingdom (n=100)	38%	56%
Australia / New Zealand (n=100)	24%	56%
India (n=100)	22%	49%
Japan (n=100)	42%	73%
Singapore (n=100)	36%	46%

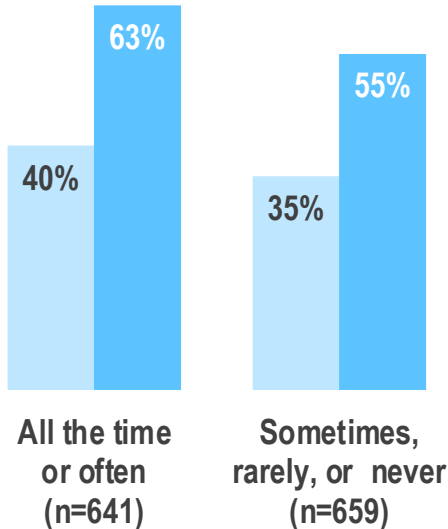# SMALLER COMPANIES ARE FIRST MOVERS IN AI ADOPTION

Nearly half of tech executives at smaller companies – those with fewer than 250 employees – expect to reach the 50% mark in the next year, and 63% by 2030, while larger companies lag behind. Interestingly, the companies with the highest AI expectations are those where cost concerns are raised more frequently – but where they face less skepticism from business leaders.

Likely when <u>half or more</u> cloud deployments will be supported by AI-driven applications

Company size

- Under 250 (n=676): 46% By 2023, 63% By 2030
- 250 or more (n=624): 28% By 2023, 54% By 2030

Cost concern frequency during cloud discussions

- All the time or often (n=641): 40% By 2023, 63% By 2030
- Sometimes, rarely, or never (n=659): 35% By 2023, 55% By 2030

Leaders' skepticism of cost savings moving to cloud

- Extremely or very skeptical (n=567): 31% By 2023, 55% By 2030
- Somewhat skeptical or less (n=733): 43% By 2023, 62% By 2030

Legend: By 2023, By 2030