

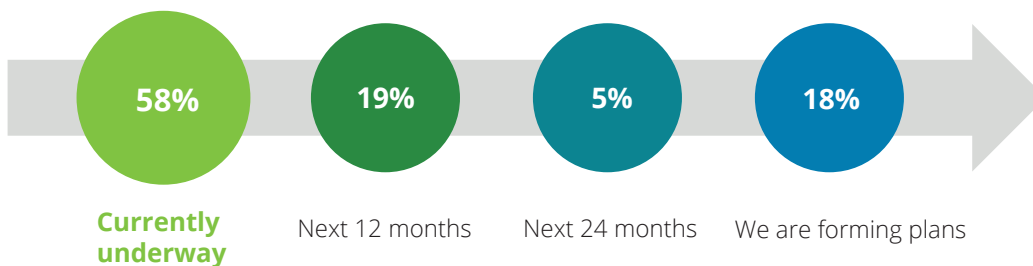
# Semiconductor Transformation Study

Looking beyond pandemics and shortages:  
A view into business transformation in the  
semiconductor ecosystem

# Executive summary

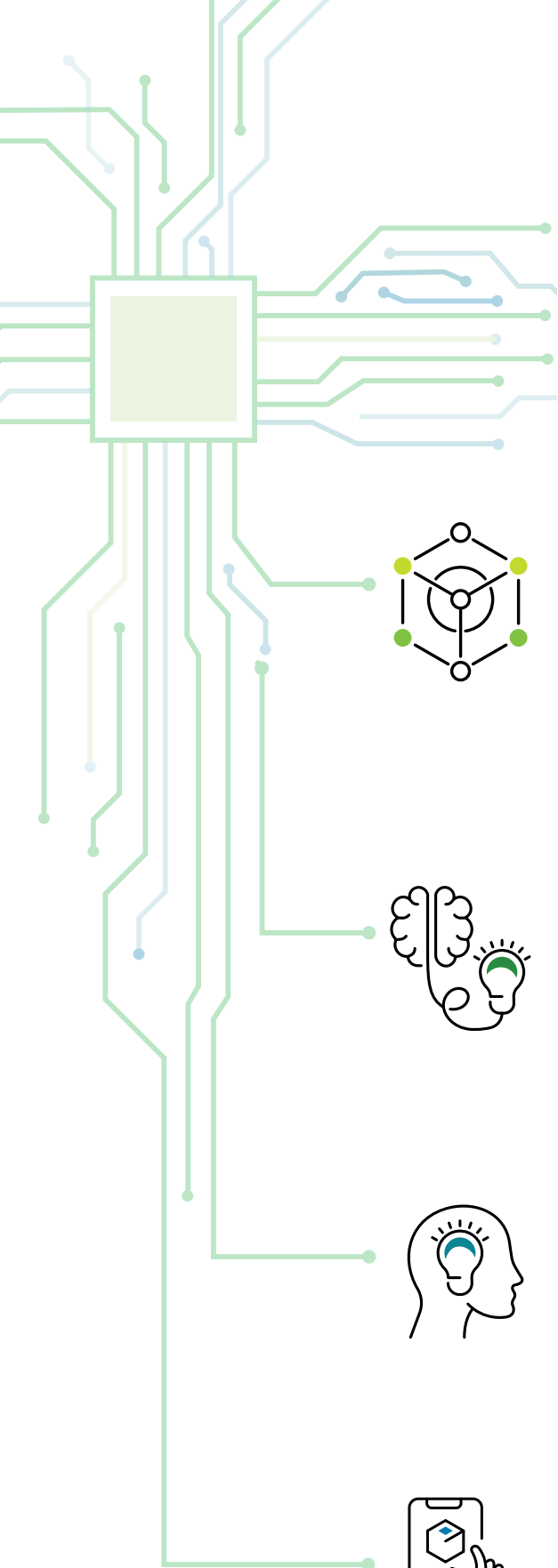
Business transformations in the semiconductor industry were not triggered by the COVID-19 pandemic or resulting supply chain challenges, but instead accelerated by the pandemic. The semiconductor industry has received attention from manufacturers, governments, and even consumers, as many markets are citing a shortage of semiconductors as their main growth and supply constraint. Yet, many semiconductor companies already had transformation underway near the peak of the pandemic and onset of shortages.

**Figure 1. Business transformation launch**



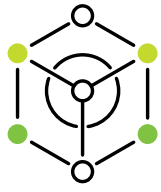
General Q4: When do you plan to undergo your transformation?

To better understand what is driving transformation in the semiconductor industry, Deloitte collaborated with the Global Semiconductor Alliance (GSA) to survey more than 40 top industry executives (See **who we surveyed** at the end of this report).




The survey results were examined in this Semiconductor Transformation Study (STS) and revealed four primary characteristics of transformation in the industry.

### Dynamic disruptions:




Semiconductor leaders are navigating an increasingly complex and less predictable market environment, compounded by various new technology catalysts. This creates a phenomenon characterized by continuous and overlapping disruptions, which necessitates alignment around a transformation North Star.

### New frontiers:



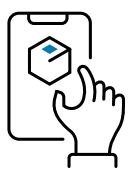
Sales and marketing organizations inside semiconductor companies are often pushing the transformation agenda, which is largely focused on expanding into new technology-driven markets and gaining a competitive edge and market share.

### Innovative models:



Half of the companies surveyed plan to launch an integrated or bundled solution for customers or to offer more “X-as-a-service” instead of the chip industry’s traditional one-time product sales model.

### Digital proliferation:



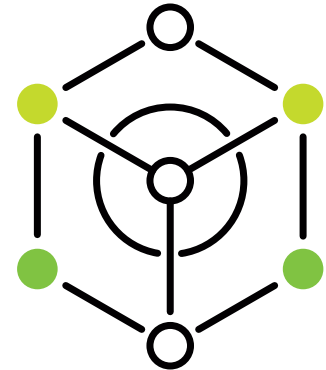
Semiconductor companies seek to substantially change their operating models in their transformation by advancing their digital footprint, skills, and collaboration capabilities to support an expanding portfolio of products, offerings, and markets.

# Dynamic disruptions

Winning in the semiconductor industry used to mean being first to market with new products and quickly scaling production to stay ahead of Moore's Law. That led to a hyper-focus on engineering innovation and operating efficiency. This model was challenged by recent industry disruptors such as new end markets driven by new technologies, the emergence of customers as competitors with in-house

chip design capabilities, and global trade dynamics and investment.

These factors were in play before the pandemic and forced semiconductor companies to rethink their products, their operating models, and their capabilities. The pandemic magnified many of these factors, resulting in an accelerated period of change for the industry.



## Vision and alignment.

Companies may be jumping ahead in their transformation execution without a well-established vision, which can limit the success of the entire endeavor.

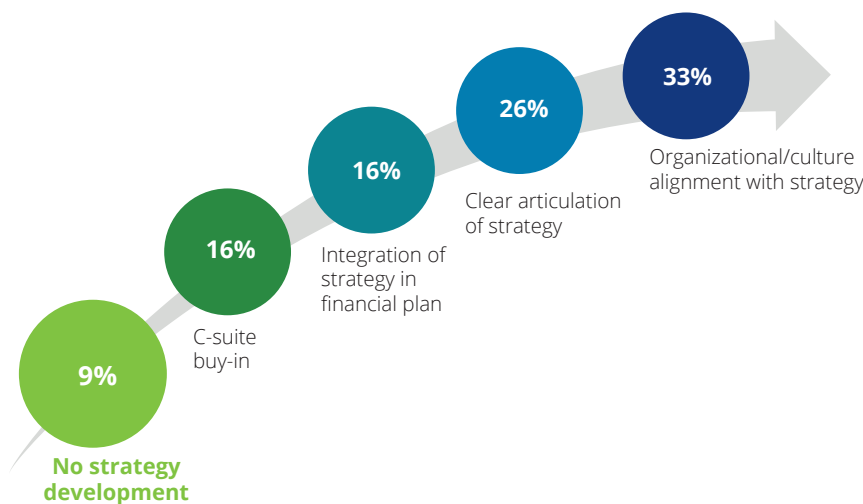
The STS revealed that half of semiconductor companies have had to materially modify their transformation strategy to adapt to changes in the market, strategic objectives, or technology. Further, only a third of companies surveyed said they had full organizational or culture alignment with their transformation

strategy, and 9% did not even define a strategy. It is not surprising that nearly half of transformation plans are experiencing material changes while in flight.

With the ongoing dynamic disruption across the semiconductor industry, companies should establish a clear

end-state vision for their transformation and not try to jump ahead without a complete and aligned plan. This is especially true when the transformation requires changes to operating models, the adoption of new digital capabilities, or new talent capabilities.

**Figure 2. Maturity of the transformation strategy**



Strategy Q8: Which one of the following best describes your current state as to defining your transformation strategy?

# 49%

of transformation strategies materially changed due to market dynamics, shifting objectives, or technology drivers

Strategy Q7: Has your transformation strategy changed materially since inception, and if so, why?

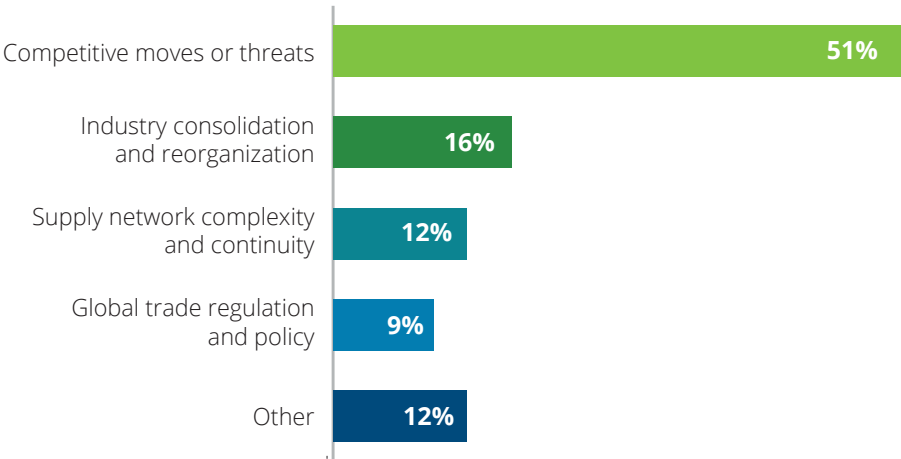
# Competitors and disruptors.

Competitive pressures and industry disruptions are driving most transformations, challenging the industry to balance both expansion and supply chain priorities.

Semiconductor companies are keenly aware of changing industry and competitive landscapes. Nearly 60% of respondents cite competition and industry disruption as the major drivers of their need to change. More than half of organizations expect that their transformation will address

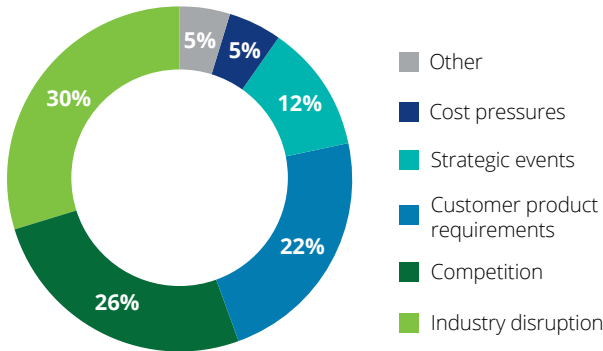
competitive moves or threats. Industry consolidation and supply network issues were ranked a surprisingly distant second and third, supportive of a consistent and strong product-side or demand-side transformation value expectation.

**Figure 3.1. Key risk that organization’s business transformation will address**



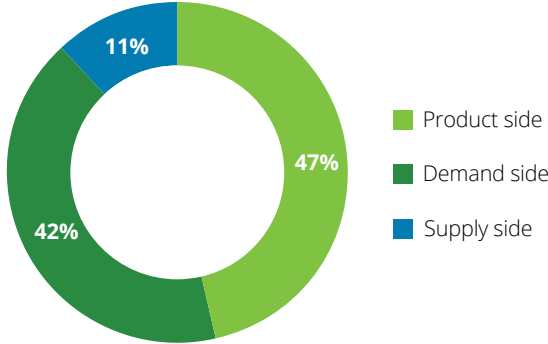
Strategy Q4: What key risk will your business transformation address?

**Figure 3.2. Market dynamics driving organization’s business transformation**



Strategy Q5: Which of these market dynamics is driving your business transformation?

**Figure 3.3. Transformation operating model’s greatest impact**

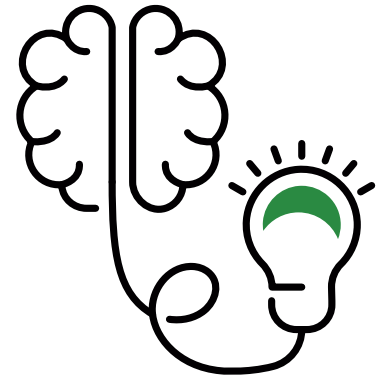


Operating model Q2: Where do you expect to realize the most value from your transformation operating model capabilities?

# New frontiers

## Expand markets and gain share.

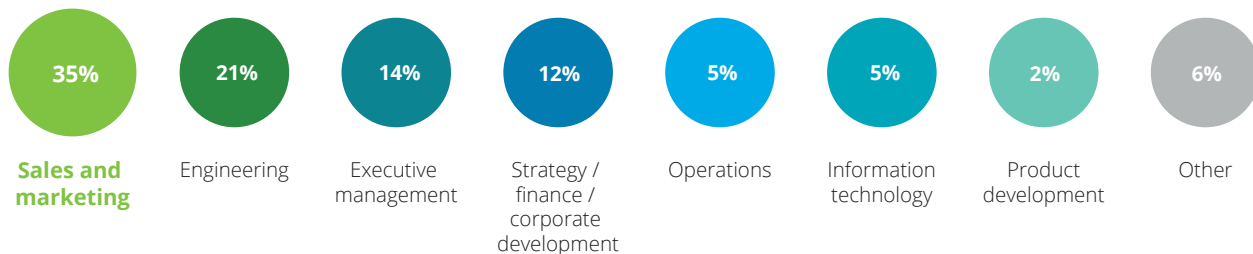
Customer organizations often lead transformation, as there is an intense industry focus on gaining market share and expanding into new markets.



More than one-third of semiconductor transformations are primarily driven by sales and marketing teams. The survey revealed that more than half of respondents said that the key long-term strategic objectives were either expanding sales, products, and markets or increasing competitiveness and gaining share. Given those goals, it is not surprising that sales

and marketing groups are leading the push for transformation. One surprise was that, while growth is a primary goal, customer experience did not rise to the top of the industry's list of priorities. This should be a watch item for the sector, as customer experience is a critical element in acquiring new customers in new markets.

Figure 4.1. Organization driving the business transformation



General Q3: What role/function in your organization is expected to lead a business transformation?

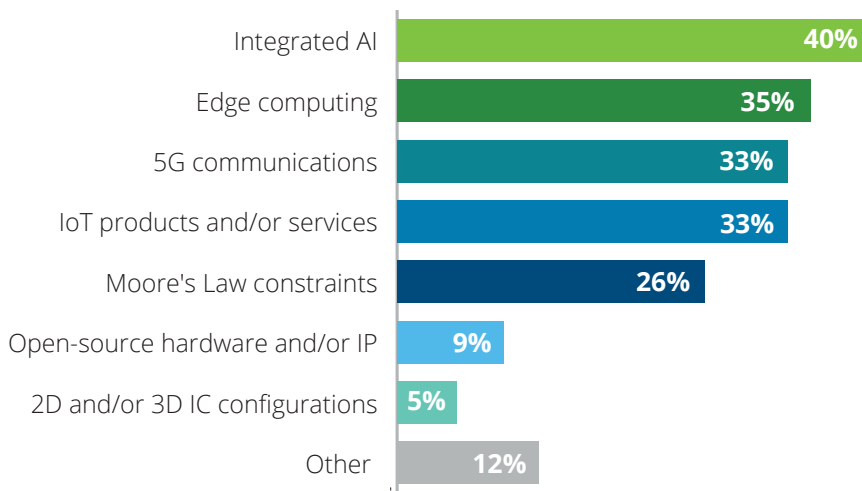


The key technologies driving business transformation include integrated artificial intelligence, edge computing, 5G communications, and IoT products and/or services. These technologies may represent not only the end markets they are expanding into, but also the capabilities that will support their expansion.

The STS also reveals that Moore’s Law constraints are in part driving industry transformation. This is expected throughout the semiconductor ecosystem, as companies still need to invest to retain and improve their core operational competencies, even as they expand into new markets. What is more surprising, however, is that fewer than 10% of respondents viewed internal

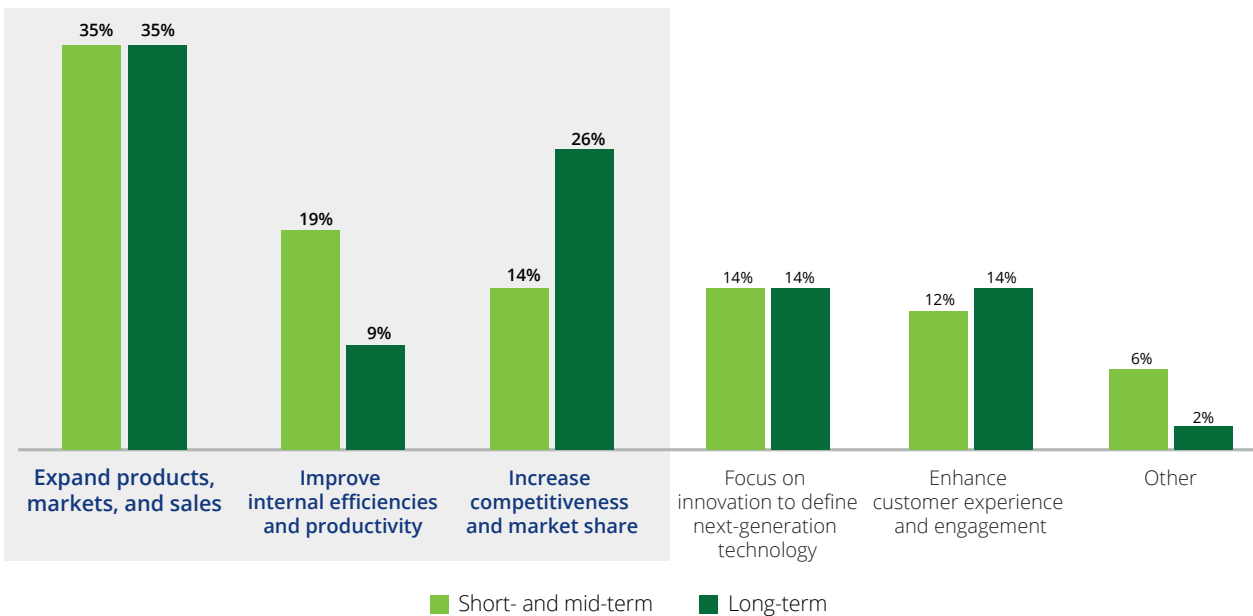
efficiencies and productivity as a long-term strategic objective. This may reflect how semiconductor companies are making a shift in their investment portfolio mix. In the short term, they are continuing to improve the efficiencies of their core competencies. In the long term, they are focused on winning in new target markets before they build the infrastructure to support these new markets.

**Figure 4.2. Technology trends driving business transformation (percent ranking each in the top two)**



Strategy Q6: Which of these technology trends is driving your business transformation? (select top 1-2)

**Figure 4.3 Strategic objective of business transformation**



Strategy Q2: What is the key short- to mid-term strategic objective of your business transformation?

Strategy Q3: What is the key long-term strategic objective of your business transformation?

# Innovative models

## New models and solutions.

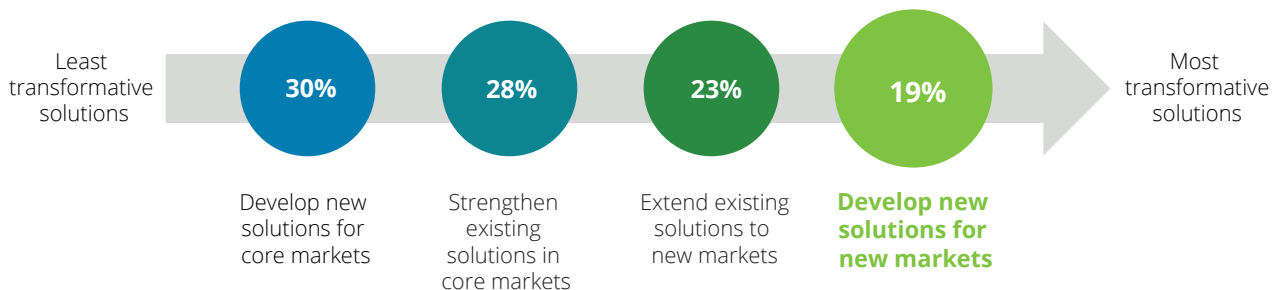
Many chip and hardware companies are developing solutions and moving to nontraditional revenue and transaction models like as-a-service, indicating a major shift in the relationships that semiconductor companies expect to have with their customers.



STS revealed that 42% of semiconductor companies are focused on new markets and experimenting with new go-to-market strategies, such as selling integrated solutions and experimenting with new

business models. The implications of these shifts are profound, given how these new offerings change the way companies go to market, engineer products, and generate revenue.

**Figure 5.1. Product go-to-market strategy**



Business model Q1: Which approach best describes how you will address the strategic target market(s) associated with your transformation strategy?

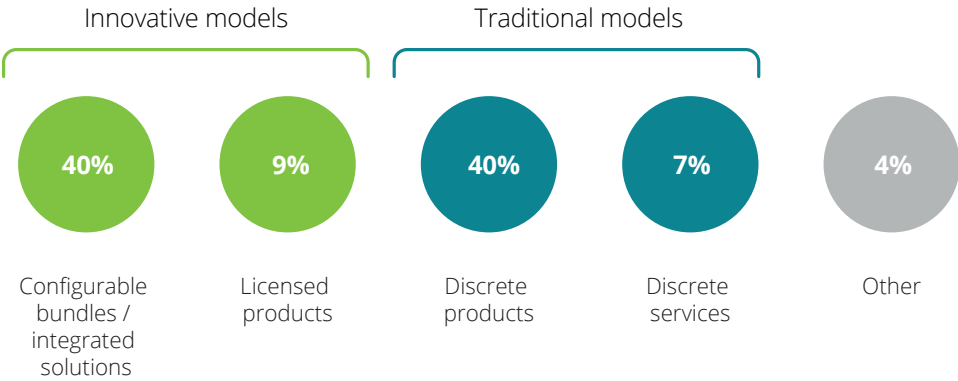




Many semiconductor companies are offering solutions that broaden their product offerings beyond their core products to cater to a diverse array of customers and needs, with 19% of semiconductor companies surveyed developing innovative solutions to enter

new markets and seven out of every 10 companies aware of the need for new offerings, including configurable bundles, integrated solutions, and licensing options. For the represented transformations, these new offerings have reached parity with traditional, discrete products and services.

**Figure 5.2. Primary offering delivered to strategic target market(s)**

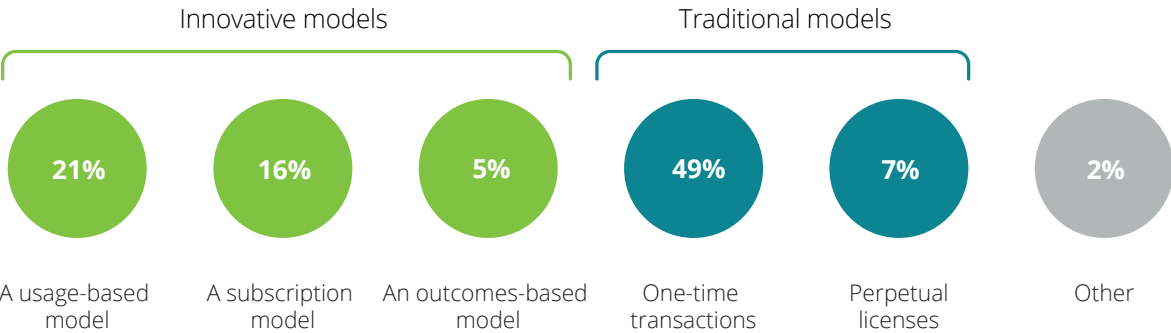


Business model Q2: What will be the primary offering delivered to your strategic target market(s)?

Nearly half of respondents plan to introduce usage-, subscription-, or outcomes-based revenue models. Even “hardware” companies, including those producing chips and equipment, are forging paths toward nontraditional models. The software industry began using these approaches some 10 to 15

years ago. This has worked well for many software companies over the past two decades, leading to growth, profits, and high valuations supported in part by these recurring revenue models. It has been the software industry’s biggest shift during that time. The same could be true for the semiconductor industry.

**Figure 5.3. Monetization strategy for primary product offering**

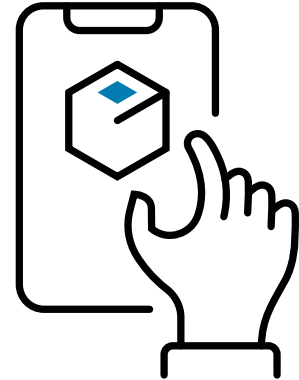


Business model Q4: How will you monetize the primary offering in your transformation business model?

# Digital proliferation

## Digital DNA and data.

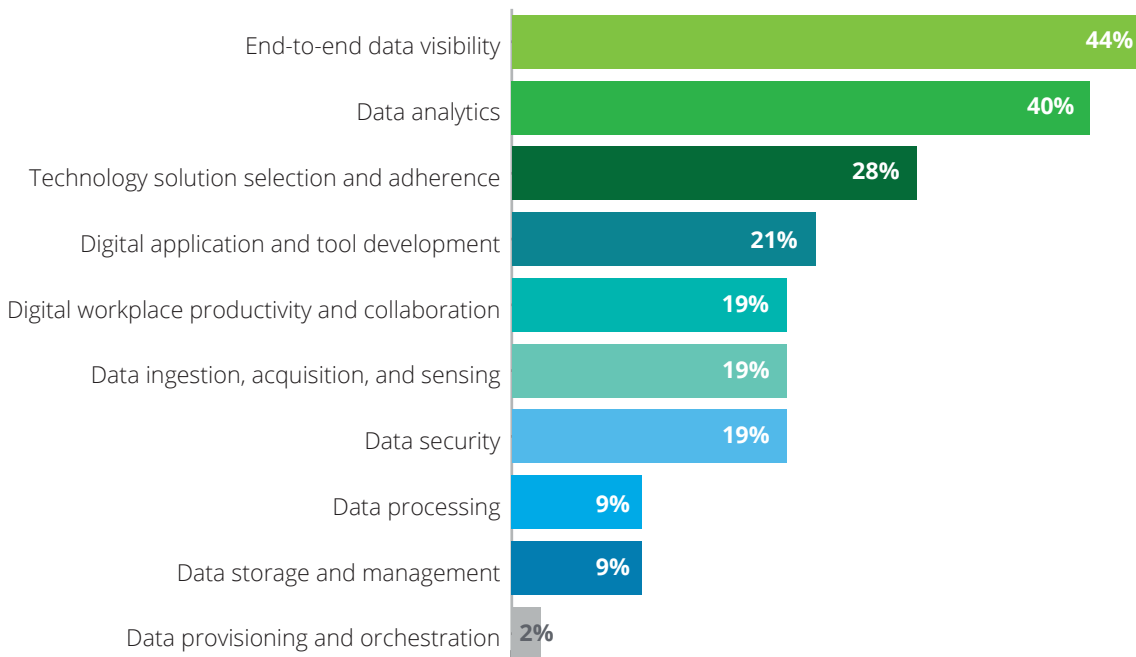
Advancing digital adoption in the industry is vital for deriving actionable insights from the increasingly vast amounts of product and customer data curated from expanding markets.



While semiconductor companies are focused on winning and providing solutions to enable advanced digital technologies like artificial intelligence and edge computing, they should deploy related technologies internally to provide capabilities (data visibility, advanced analytics, and process automation) essential to executing their transformation. End-to-end data visibility and analytics can facilitate responsive

sensing of new demand and market shifts, collaborative engineering of new products, and efficient manufacturing and delivery of those products. A data-driven digital architecture or “DNA” also advances automation to support expansion and scalability. These tech-enabled capabilities will be the foundation of a digital end-to-end value chain across expanding markets and portfolios.

**Figure 6. Core technologies most important to the organization’s transformation (percent ranking each in the top two)**



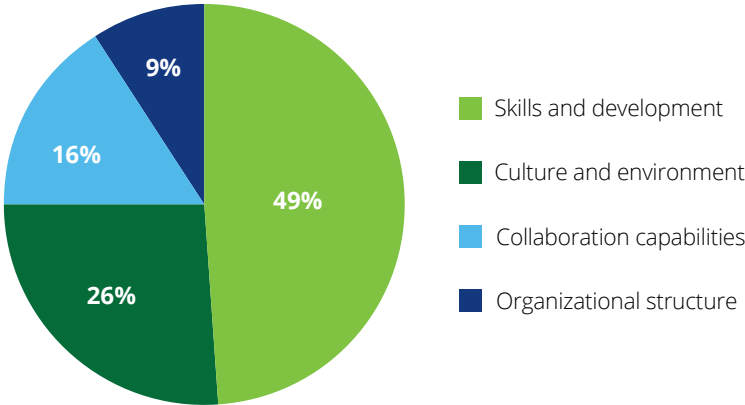
People, Process, and Technology Q2: What core technologies are most important to your transformation? (Select top 1-2)

## Talent and skill development.

Operating models are expected to be significantly different by the end of the transformation, with talent and skill development playing a critical role.

Although almost half of respondents see skill development as a major driver of successful transformation, they also realize the importance that collaboration capabilities and company environment play.

Figure 7.1. People and talent organization’s critical role in transformation

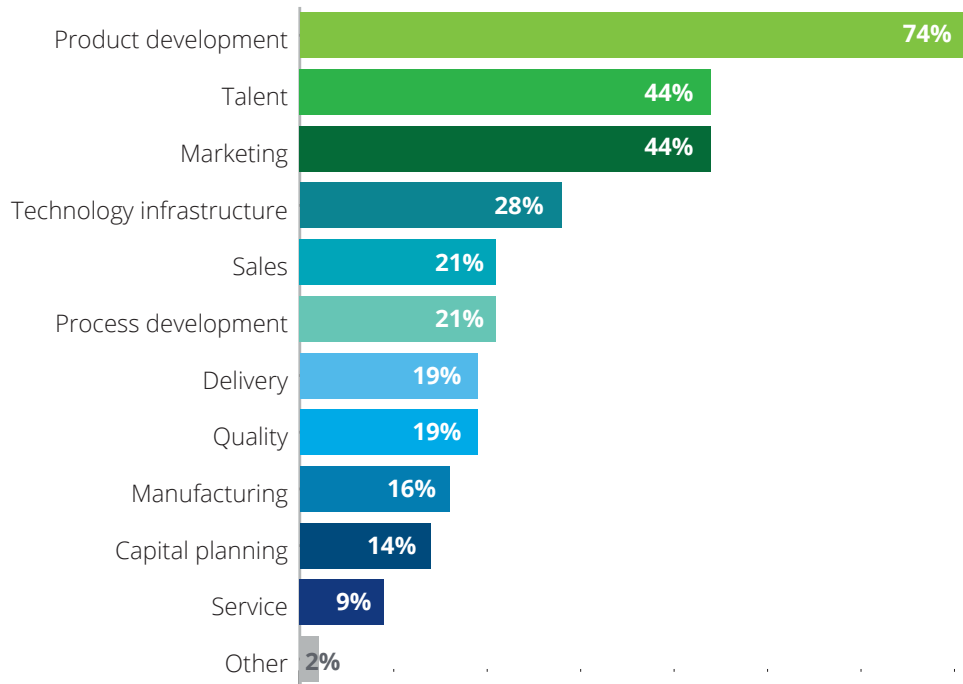


People, Process, and Technology Q1: What aspect of your people/talent is most critical to your transformation?



For the semiconductor industry, product development stands out as the most critical capability. Given that sales and marketing are often leading the charge, the goal may be more focused on making product development more responsive to changes in the market, getting the right products to the market at the right time.

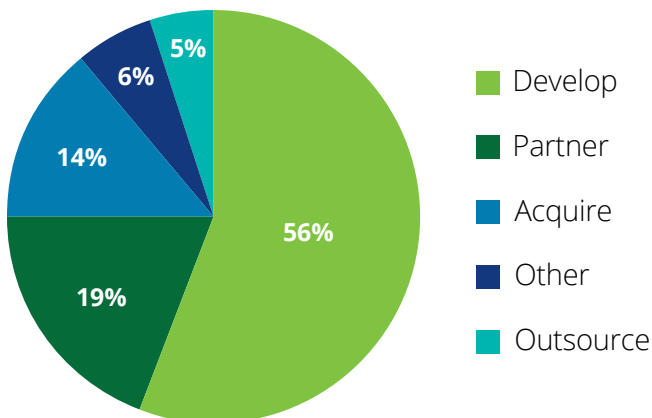
**Figure 7.2. Critical capabilities for organization’s transformation strategy**



Capabilities Q1: What high-level capability areas are critical to your transformation strategy? (Select top 1-3)

More than half of respondents say that their organizations plan to develop needed capabilities internally. A third plan to fortify their capabilities through partnerships or acquisitions. As the chip market becomes increasingly complex, with a diverse set of capabilities needed, some semiconductor companies believe they will need outside help to fill capability and talent gaps to achieve their ambitions for growth.

**Figure 7.3. Strategies to obtain capabilities to support the transformation**



Capabilities Q3: How do you plan (or prefer) to obtain the capabilities to support your transformation?

# For transformation leaders

By exploring unprecedented changes in the semiconductor industry, the STS shows that semiconductor transformation touches and disrupts all parts of a business. With almost half of semiconductor transformations incurring material changes along the transformation journey, there are opportunities to improve how companies are executing their changes. A successful transformation approaches the journey holistically, led by a clearly articulated strategy that sets out guiding principles and objectives for all aspects of the transformation.

Leaders should consider the following questions as they develop and evolve their strategy.



**What is the transformation ambition?**



**What is the scope, size, and speed of the transformation?**



**How does the transformation ambition align to or change the current enterprise strategy?**



**What are the business models needed to achieve the transformation ambition?**



Once leaders have established a transformation strategy, they should assess their readiness to launch a transformation effort with these questions.

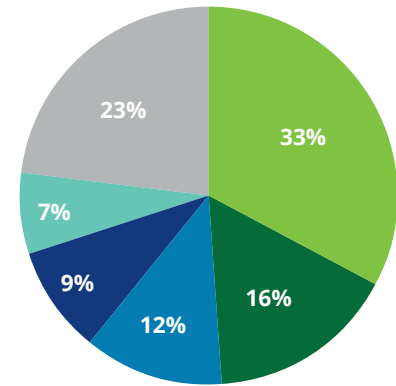
- Are multiple C-suite members invested in the transformation?**
- Is there a commitment to significant investments in technology and the business?**
- Is there a desire to develop innovative business models, operating models, and capabilities?**
- Is there enough lead time to shape the transformation's ambition and business case?**

After answering these questions, leaders should be well-positioned for a successful and impactful transformation.

# Who we surveyed

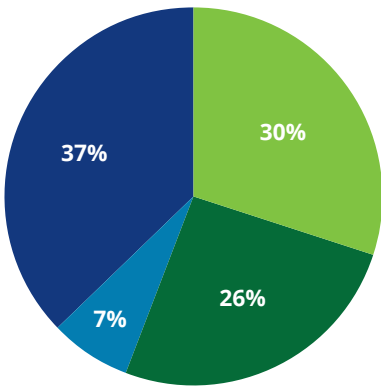
This Semiconductor Transformation Study is primarily based on a survey conducted by Deloitte and the GSA in spring 2021. The survey was designed to gauge how company leaders across the semiconductor ecosystem viewed their own transformation and the broader transformation landscape. Survey respondents comprised strong C-suite and senior leadership representation from fabless companies, integrated device manufacturers (IDMs), equipment suppliers, foundries, and materials suppliers. While slightly more than half of respondents were from companies headquartered in North America, all key regions were represented.

Figure 8.1. Type of organization



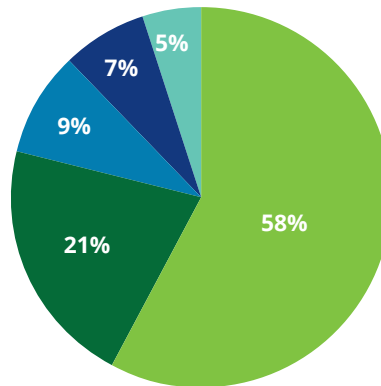
- Fabless company
- Equipment supplier
- Materials suppliers
- IDM
- Foundry
- Other

Figure 8.2. Respondent's level



- C-suite or GM
- Sr. VP, VP, or business unit leader
- Director
- Other or unspecified

Figure 8.3. Respondent location



- North America
- EMEA
- Japan
- Korea
- APAC

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# Acknowledgments

The authors would like to acknowledge and thank the Global Semiconductor Alliance (GSA) for helping field this study, and to Lara Warthen and Anisha Sharma for their ongoing efforts to publish and promote this work to the global marketplace.





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