



TE CONNECTIVITY  
**INDUSTRIAL  
TECHNOLOGY  
INDEX**

Are engineers and executives traveling  
the same path toward innovation?

[TE.com/techindex](https://www.te.com/techindex)

## ABOUT THE SURVEY

The TE Connectivity Industrial Technology Index is a third-party, independent research study commissioned by TE that examines innovation culture within the industries shaping our world. The online survey, taken by engineers and executives in the U.S., China and Germany, was designed to provide insights on how companies can overcome or address critical innovation challenges and what they should consider as they look to build for the future. The survey was conducted between July 27 - August 9, 2022. Subjects were working in one of the following industries:

- Wireless technology & 5G
- Data, cloud computing, and artificial intelligence
- Automotive/commercial transportation
- Industrial machinery
- Energy solutions
- Sensor applications
- Commercial and home appliances
- Aerospace and defense
- Medical devices/technology

## A Global Perspective on the State of Innovation

Technological revolutions are reshaping the world. The rise of e-mobility, renewable energy, artificial intelligence, the Internet of Things, and other emerging technologies deliver creative solutions to address growing economic macro trends and societal challenges. Companies that foster a culture of continual innovation are more likely to develop breakthrough products to help advance these trends and enjoy sustainable, long-term success.

Yet, innovation in these areas can be complex. Developing new products and technologies requires specialized skills as well as a robust design and engineering process, which companies must build intentionally. Internal processes that are not explicitly set up to foster close collaboration and nurture innovation can end up stifling it instead, with disorganization or insufficient resources hampering individuals' best efforts. Additionally, constantly shifting customer needs create challenges for product developers trying to mold their innovation strategies to suit the most attractive market opportunities.

As a global industrial technology leader and a go-to engineering partner for companies advancing technology in many different industries, TE Connectivity has experienced some of these challenges in our innovation efforts. In a rapidly evolving world, it is in our own best interest to take stock of the factors hindering progress for

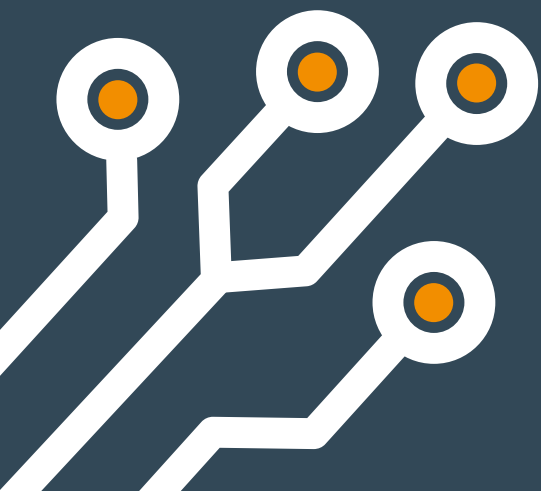
our customers, colleagues, and the engineering community while searching for opportunities that promote future growth.

Knowing that we're not alone among technology companies, we surveyed engineers and executives around the world to explore how they perceive these challenges and foresee areas of opportunity. We also wanted to identify important innovation trends that we can track over time to help technology leaders position their businesses for continued success.

Our inaugural Industrial Technology Index shows that innovation is a top priority for most companies and that they are committed to making the investments necessary to achieve their innovation goals. Yet they face several roadblocks that directly impact innovation progress, including:

- Misaligned perspectives on innovation between engineers and executives.
- Difficulties developing the skills needed to incorporate new technologies into their businesses.
- A lack of structure to support collaboration and knowledge sharing.

**This report highlights key takeaways from the survey to help companies improve their innovation strategies and offers benchmark data to help engineers and executives assess where they stand in relation to their peers.**



1

# Innovation is widely rated as a top priority, and companies generally feel well-prepared to pursue it.

The engineers and executives who participated in the survey agreed on several critical things.

For one, 88% of engineers and 90% of executives see innovation as their organization's top priority. They also agree that their organizations have a solid foundation to enable that innovation.

Specifically, most engineers and executives say their organization has a clearly defined strategy for reaching goals and believe they have the resources needed to improve products, processes or business models.



## TE TAKEAWAY



Innovation should be a top priority, not just for a company's products and technologies, but collectively throughout the organization.

Fostering a culture of innovation helps to empower teams to work together to develop the right solutions, whether designing a new product, optimizing a manufacturing process, implementing a new business tool, or solving any problem that arises throughout the organization.

With this type of innovative culture, businesses can continually improve, evolve and succeed in the future.

**Alexandra Spitler**  
Director, Entrepreneurial Engineering, Transportation Solutions

## ALIGNMENT ON INNOVATION



**INNOVATION**  
Innovating is my organization's number one priority above everything else.



**STRATEGY**  
My organization has a clearly defined strategy for reaching our goals.



**RESOURCES**  
We have the resources we need to improve our products, processes, or business model.

2

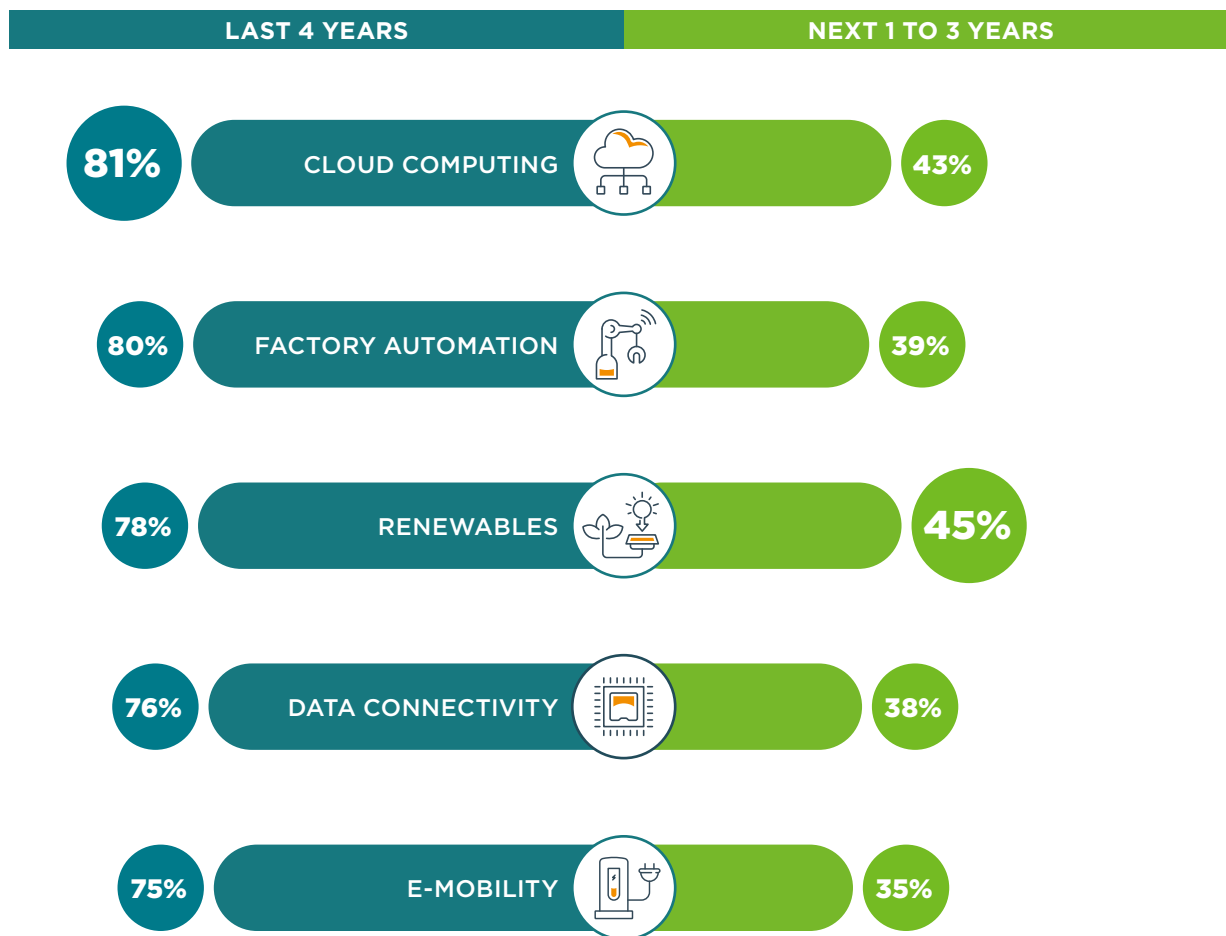
## Companies have identified renewables and cloud computing as key areas for investment.

Looking back on the last four years, survey results show that over 75% of companies have already increased investments in five key areas of innovation: cloud computing, factory automation, renewables, data connectivity, and e-mobility.

However, looking ahead to future innovation, the most common priorities for investment over the next one to three years are renewable energy and cloud computing, with 45% of companies prioritizing renewables.



### IN WHAT TECHNOLOGIES ARE COMPANIES INVESTING?



#### TE TAKEAWAY



Customers, employees and shareholders alike are pushing companies across industries to embrace sustainability, so it's no surprise to see renewable energy as an area of focus.

With continued government policy support and improving competitiveness of wind and solar photovoltaic, renewable generation capacity is expected to grow at 15% CAGR over next 10 years, with 50%+ of the renewables growth coming from solar PV and 30% of the growth coming from onshore and offshore wind.

TE's global presence and breadth of customer base give us unique insights into renewable adoption and connectivity problems that need to be solved. We are enabling this transition to renewables with innovative solutions that make it simpler and faster to connect renewables and reduce total cost of ownership.

**Arvind Kaushal**  
Senior Vice President and Chief Strategy Officer

### 3 Companies recognize the need to continue building their capacity for innovation.

As companies prioritize breakthrough technologies over the next three years, their investment priorities reflect their intentions to create an overall environment that supports future innovation.

More than 80% of respondents expect to increase investments in new design processes, upgrade existing labs, improve employee training, and hire new talent. Three-quarters or more also expect additional investments to build new labs, foster cross-collaboration within their organization and encourage external partnerships.



#### TE TAKEAWAY



In order to attract the best talent, a company must create a very inclusive culture for innovation.

We believe that the right professional tools and access to continued learning are key in creating a workplace that fosters innovation. TE's engineers are encouraged to think differently and perform experiments to discover new ideas and new solutions for our customers.

**Dr. Emily Zhang**

Fellow & Director, Automation Manufacturing Technology

#### HOW BUSINESSES EXPECT TO INCREASE INVESTMENTS IN THE NEXT 1 TO 3 YEARS

##### CREATING

new design processes



84%

##### UPGRADING

existing labs



83%

##### IMPROVING

trainings for existing employees



82%

##### HIRING

new talent



82%

##### BUILDING

new labs



79%

##### FOSTERING

cross-collaboration within the organization



79%

##### FORGING

external collaborations

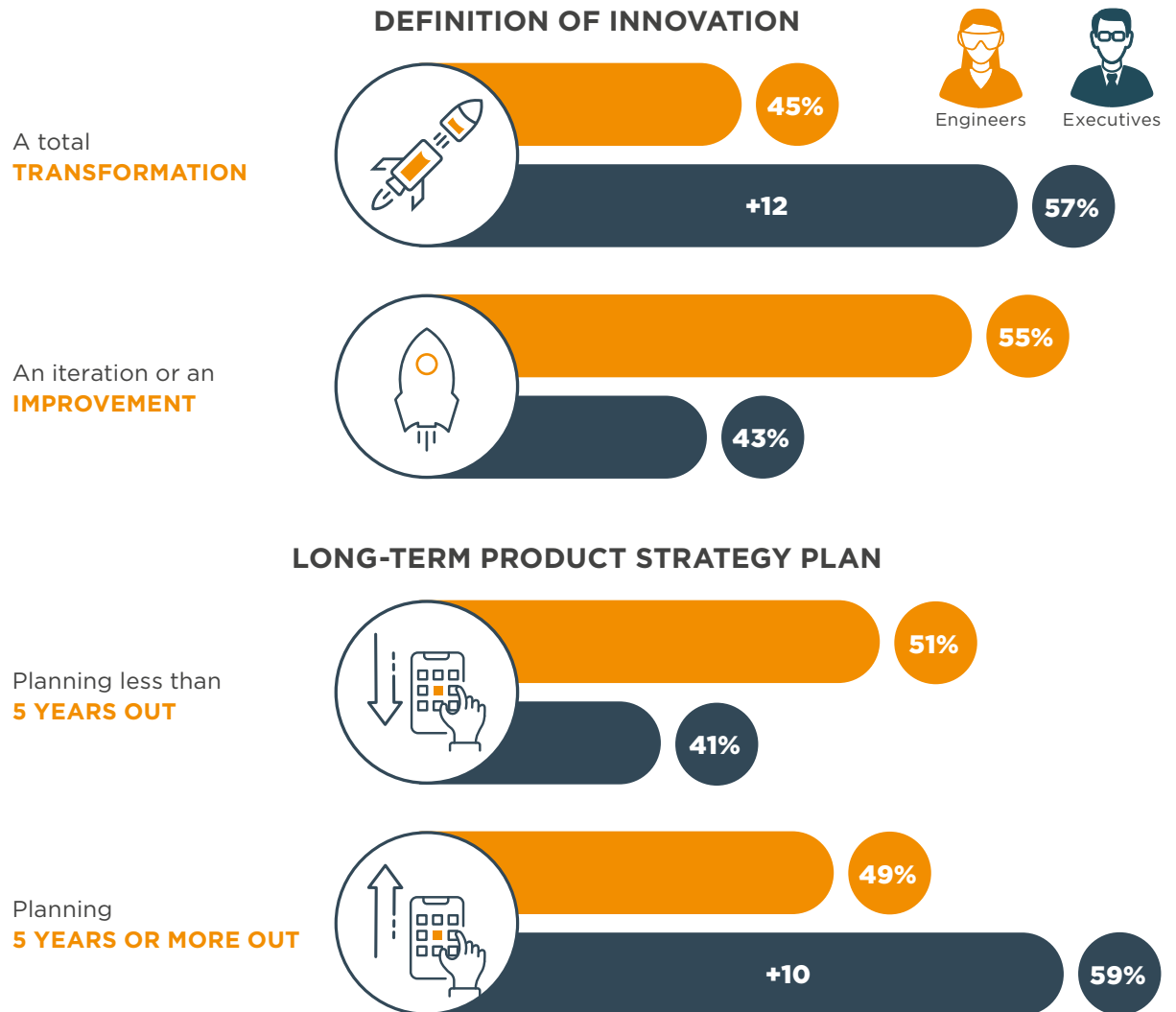


75%

## 4 Engineers and executives have differing views on the pace at which innovation is achieved – and ultimately, the definition of innovation.

While executives and engineers see eye-to-eye on the importance of and potential for innovation, they have some key disagreements regarding how they define it and how fast they expect it to happen. For example, executives are far more likely to view innovation as a total transformation instead of an iteration or improvement, which is the opposite view held by most engineers. Executives are also more likely to view innovation as a long-term strategy, while most engineers think in a shorter-term context (less than five years ahead).

This opposing perspective on revolutionary vs. evolutionary innovation impacts the entire innovation process, from research and discovery through final output. Without alignment on how an organization defines innovation, there is a risk of misunderstanding between the two groups. As the results of the survey reflect, **discrepancies around key drivers and areas of investment have created an uneven foundation for organizations to innovate upon.**



### TE TAKEAWAY



There is a common misconception that innovation is limited to large technical breakthroughs that go on to launch a new product.

But innovation is required everywhere to respond to the ever-changing needs in the market. Innovation can be revolutionary or evolutionary, large or small, transformative or incremental, but in all cases, exists to solve our customers' unmet needs. When business leaders and engineers jointly maintain their focus on this end goal, innovation of all types will thrive and technology will advance.

**Davy Brown**

Vice President and CTO, Industrial Solutions

5

## Engineers prioritize sustainable practices more than executives.

Organizations have spent significantly on innovation in areas related to sustainability and plan to continue prioritizing sustainable technologies such as renewables. However, engineers and executives are not as aligned on the importance of implementing sustainable practices within their organizations.

Executives are five times more likely than engineers to feel that focusing on sustainability is unimportant for the organization. And one in five engineers report that their organization doesn't have a clear strategy for implementing sustainable practices.



### TAKING ACTION ON SUSTAINABILITY

#### IMPORTANCE STRATEGY



Executives are **5X more** likely to think **sustainability is unimportant to their organization.**  
(11% vs. 2% engineers)



**1 in 5** engineers says there is **no clear internal strategy** for implementing sustainable practices.  
(21% vs. 13% executives)

#### TE TAKEAWAY



Sustainability is core to TE's company purpose, with strategic goals for 2030 and beyond to enable a more sustainable future.

Our products are enabling our customers to bring more sustainable solutions to the world like electric vehicles, more efficient data centers and renewable energy products. In our operations, we are focused on reducing greenhouse gas emissions in our value chain, water use and the amount of waste produced.

To achieve our goals, we prioritize sustainability in our design process, operate efficiently in our plants and source renewable energy for our facilities.

**Holly Webdale**  
Vice President, Environmental Sustainability, Global Facilities and Construction

Although executives and engineers agree that their organizations have done well to serve end consumer needs, they don't agree that consumers are the primary motivation to innovate.

Even though organizations are mostly aligned on their priority areas for innovation, executives and engineers differ in terms of the factors that drive specific projects. For example, executives are more likely to say that addressing unmet consumer needs is one of the top motivators for innovation. Executives also cite an improved customer experience as the top indicator in measuring innovation success.

On the other hand, engineers feel that adapting to external global factors is a top motivator for innovation. In addition, they cite improved market share as the principal measure of innovation success. These results reveal that executives are likelier to support innovation with the end consumer in mind, while engineers approach innovation more tactically.

We saw a similar difference when we asked survey respondents to reflect on the top factors most important for successful innovation. Executives identified "a clear end consumer challenge to solve" as second-most vital, while engineers placed it last. These findings indicate a critical gap that impacts the approach, methodology and innovation output. **There is a clear need for better alignment between engineering and executive teams on success metrics for innovation.**

## WHAT IS DRIVING INNOVATION?



# 37%

of executives rank **addressing unmet consumer needs** within the top two strongest motivators driving their organizations innovation.



# 30%

of engineers rank **adapting to external global factors** within the top two strongest motivators driving their organization's innovation.



# 63%

executives agree **an improved experience for the end consumer** is the most important measurement of success (vs. 45% engineers).

### TE TAKEAWAY



End consumers certainly are a driver of innovation within our Appliances business.

However, most consumers don't think about the electrical connectors that enable the features and performance they desire. As a B2B manufacturer, most of our new products result from collaborating with the appliance manufacturers to support their developments.

Together we translate their customers' wants and solve how best to deliver reliable products that offer improved features. When our innovations perform well, TE is an afterthought in the consumer experience, even though it's our products that are enabling a user experience that is meeting their expectations.

**Joe Zekoski**

Vice President, Product Management, Appliances



**7 Engineers are more likely to say their organizations must do more to achieve their innovation goals—and almost half of engineers believe that those goals are unrealistic.**

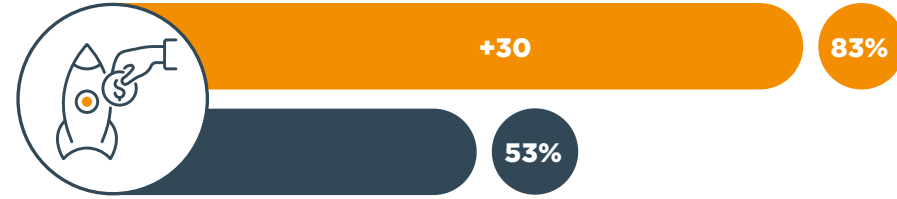
The general agreement between executives and engineers on investment priorities to promote innovation broke down when we asked each group whether their organizations are investing enough - and whether their company's innovation goals are realistic and achievable.

Specifically, 83% of engineers think their organization needs to invest more to meet goals, while only 53% of executives agree with that statement. Similarly, 48% of engineers say that their organization's goals for innovation are unrealistic and the company may struggle to meet them, while only 34% of executives believe that.

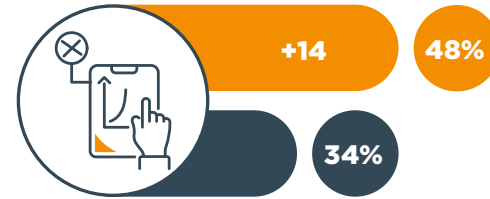


**ACHIEVING INNOVATION GOALS**

My organization needs to financially invest more to meet our innovation goals.



My organization's innovation goals are unrealistic, and we struggle to meet them.



**TE TAKEAWAY**



Innovation is core to TE's culture, and our innovation goals are designed to allow employees to dream of what they want their businesses to become in the future. The business goals are the key source of guidance to determine our priorities and enable innovation to generate value to shareholders, customers and employees. While defining our objectives, we must keep the investment of time and resources in mind, but not in a way that limits the endless imagination of our engineers.

**Khurram Abbas**  
Director of Engineering, Industrial

## Companies are focused on driving innovation in-house but are also looking outside for strategic opportunities.

Companies can take two key approaches to drive innovation: developing ideas in-house or acquiring them from outside. Fostering innovation in-house means building advanced design and engineering capabilities across the organization or creating dedicated tech incubators. Looking outside the organization means acquiring other companies and licensing new technologies.

The survey shows that most companies are pursuing a hybrid approach that relies primarily on in-house innovation. Collectively, executives and engineers say their innovation strategy follows a 60% “build it within” and a 40% “buy from outside” approach.

Organizations prioritizing the in-house approach say it is a cost-effective way to capitalize on the company’s unique expertise and ensure innovation matches their existing product infrastructure—while retaining the flexibility to look outside when special expertise or skills are needed. This attitude suggests that companies are likely to prioritize investments that support in-house innovation, but as we see in the next takeaway, engineers are interested in seeking external consultation to increase innovation capacity.

### APPROACH TO INNOVATION

**60%** Build it within

**40%** Buy from outside

Averaged together, engineers and executives believe their **approach to innovation follows a 60% “build it within” and a 40% “buy from outside” approach**, showing slight preferences to building core capabilities internally.



Engineers



Executives

### REASONS FOR FOLLOWING THE “BUILD IT WITHIN” APPROACH

Building our own solutions ensures it will operate within our existing **ECOSYSTEM**.



We need to use our specialized **COMPETENCIES** or proprietary technology that no one else can offer.



It’s more **COST-EFFECTIVE** and efficient to keep it within the organization.



We prefer to have **FULL CONTROL** over the process.



### TE TAKEAWAY



We live in exciting times, when significant advances in technology are enabling people all over the globe to live healthier, longer lives. TE Medical constantly monitors the industry with our customers to identify critical gaps in patient care.

We examine each unique opportunity that we discover to determine if it makes sense to innovate from within or acquire an existing company to deliver medical technology through our global network that could transform patient care for the better. We have found success by investing in both of these paths to innovation.

**Pat Duane**

Senior Vice President and GM, Medical

# 9 Improving engineers' capabilities is key to ensuring future innovation, and they are looking for more support from executives.

Our survey found that 47% of engineers think fear is a factor in slowing down innovation. Such feelings are even more pronounced in the automobile/commercial transportation industry, where 86% of engineers report fear around innovation, likely due to the rapid pace of change and high stakes related to vehicle electrification.

In general, though, fear of innovation is related to the sentiment among engineers that they lack the skills or experience to meet innovation challenges. Both engineers and executives recognize the importance of addressing skills gaps—85% agree that more training, learning, and development opportunities would help accelerate innovation. However, engineers are more willing than executives to say their organizations should consider other ways to increase innovation capacity, such as bringing in external teams or consultants and promoting internal collaboration.

Specifically, 82% of engineers say bringing in external consultants would accelerate innovation, while only 69% of executives agree with that sentiment. Just over half of engineers (51%) prioritize investing in internal collaboration across the organization, while only 41% of executives see this as a priority.

## FINDING AND REFINING INNOVATIVE TALENT

### WHAT WOULD ACCELERATE INNOVATION?

#### External Consultants



#### Internal Collaboration



Engineers



Executives

# 85%

**agree** more opportunities for **training, learning and development** would enable their organization to accelerate its innovations starting tomorrow.

# 82%

**expect** their organization to **increase** investments in **improving training for existing employees** to support future breakthrough solutions.

## TE TAKEAWAY



Technological innovation is accelerating faster than ever, and it's often difficult to stay on top of all the potential partners who can help TE make a difference.

Open innovation, with increased information sharing and collaboration of internal and external sources, is a great way for us to expand our partner system, be exposed to new ideas and unconventional approaches, interact with new talent, foster collaboration and engage in an intellectually stimulating exchange of ideas.

**Dominique Freckmann**

Director, Innovation & Technology, Transportation Solutions

### Lack of internal skills and collaboration across silos are hurdles to achieving innovation goals.

Ultimately, a perceived gap in engineering skills and difficulties related to collaboration are two of the biggest threats to a company’s ability to meet its innovation goals. Specifically, 42% of all respondents say that their organizations lack the internal knowledge or experience to implement new technologies.

Additionally, 39% of all respondents say that silos present challenges to implementing new technologies across the organization. These silos may exist because innovation is often confined to an internal innovation center or lab (53% of organizations). Only 24% of organizations report regular collaboration with other internal teams to drive breakthrough solutions.

Based on the findings, there is likely a direct correlation between organizational silos and a missing culture of innovation across an entire organization. Almost half (47%) of engineers say that one reason their organization has an aligned engineering function is a lack of silos.

Without silos, there is a shared understanding of strategic objectives for innovation. Additionally, 90% report that fostering a broadly shared culture of innovation is a significant factor that makes innovation happen.



### WORKING IN UNALIGNED SILOS

# 39%

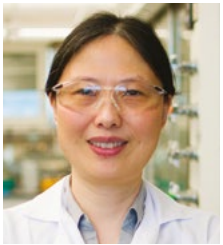
**AGREE**  
silos will pose a challenge in implementing new technologies across the organization

# 1 in 4

point to a **lack of internal alignment** as a roadblock to innovation



### TE TAKEAWAY



With more than 85,000 employees all over the world, one of TE’s strengths is the huge amount of knowledge that exists in our organization.

While it can be a challenge to find the right collaborator in such a large pool, we have created centralized digital tools and other channels to help our technical community collaborate.

The knowledge and experience of our coworkers – regardless of what part of the business they are in – can be our most valuable resource. The best innovators are open minded, are willing to share what they know and proactively reach out for help when needed.

**Ting Gao**  
Senior Director, Materials Engineering

## How to foster greater alignment between engineers and executives on the path to innovation success.

Our inaugural **Industrial Technology Index** found that most companies have a relatively strong foundation for innovation and general alignment between engineers and executives in several key areas. However, the disconnects that remain between those two groups – particularly around what needs to be done to reach innovation goals and how to measure success – can weaken that foundation. Organizations that work to align engineers and executives in areas where their views and priorities diverge will be in a better position to achieve and sustain long-term success.

Throughout this report, we've highlighted several key differences to help organizations assess their approach to innovation. However, each challenge is also an opportunity to develop solutions that can help accelerate innovation and drive future success. These solutions include:



### **AGREEING**

on a shared definition for innovation and metrics for measuring success.



### **ALIGNING**

priority areas and committing to an appropriate level of investment to support innovation goals.



### **STRIKING**

the right balance between internal training/skills development and targeted hiring to enhance innovation capabilities.



### **FOSTERING**

broader collaboration inside an organization and with outside partners to drive creative thinking.



### **RECOGNIZING**

the importance of sustainability both inside the organization and within the products or solutions developed for customers.

**Strengthening alignment between engineers and executives across these areas** can be the difference between maintaining a competitive advantage or falling behind amid the rapid pace of technological change.

## Interested in learning more about TE Connectivity?

Visit [TE Perspectives](#) for new articles on the future of industrial technology.





© 2023 TE Connectivity. All rights reserved. TE, TE Connectivity, and TE connectivity (logo) are trademarks owned or licensed by the TE Connectivity Ltd. family of companies.