

IHS ENGINEERING360 RESEARCH REPORT



2015 PULSE OF ENGINEERING

THE CHANGING WORK ENVIRONMENT FOR ENGINEERS TODAY

IHS Engineering360 Media Solutions

Contents

Pulse of the Engineer Survey 3

About the Survey Respondents 3

Highlights from the Survey Results 4

Conclusions..... 5

Recommendations 6

Survey Results..... 8–30

About IHS (www.ihs.com)..... 31

About IHS Engineering360 Media Solutions 31

Pulse of Engineering Survey

IHS Engineering360 recently conducted new research called “Pulse of Engineering.” The online survey asked engineers and technical professionals in the industrial sector about the pace of engineering, available resources, knowledge management practices, performance measurements and more.

This research report analyzes and presents the results of the survey, and offers recommendations to industrial marketers to help them better understand their target audience, strengthen relationships with customers and position their products to align more closely with customer needs and industry trends.

About the Survey Respondents

Of the 2,162 survey respondents:

- Thirty-four percent work at companies that employ 10 or fewer engineers; 22 percent work for companies with more than 500 engineers.
- Sixteen percent work in engineering/tech design services; 10 percent in aerospace and defense; eight percent in utilities/energy; seven percent in automotive and seven percent in oil and gas.
- Thirty percent are design engineers; 13 percent are in engineering/consulting; 13 percent are process/production engineers.
- Thirty-two percent are team leaders/supervisors and 25 percent are managers/senior managers.
- Thirty-six percent have been in the engineering field for 30 or more years; 27 percent for 20-29 years and 21 percent for 10-19 years.

Highlights from the Survey Results

- Slightly more than half of engineers (52 percent) said the pace of engineering is accelerating, and 57 percent said they are asked to do more with less.
- Forty-seven percent said that knowledge and/or information loss as employees left was very or extremely important. Yet only 43 percent of companies have formal practices in place to identify senior-level and specialized experts to train, transfer, mentor, manage or retain their knowledge among others in the organization.
- Sixty-three percent said the number of designs/projects they work on has increased or stayed the same.
- Forty-six percent of engineers said technology is improving their productivity.
- Respondents agreed that designs are becoming more complex at the same time that design cycles are shrinking and time-to-market pressures are increasing.
- About seven in 10 respondents noted that constraints on resources, specialized knowledge, budgets and time were jeopardizing productivity, product quality and innovation.
- Designing and developing environmentally sustainable products was cited by more than 90 percent of respondents as an important part of their work. The sustainability strategies most often cited as influences on their projects are increasing energy efficiency (60 percent), reducing energy/resource consumption (46 percent), reducing emissions (39 percent) and using less toxic/hazardous parts and materials (39 percent).
- Customer satisfaction (60 percent) and product quality (57 percent) were the performance measures most often cited by engineers, with launch dates (24 percent) considered the single most important performance target they are pressured to meet.
- Seventy-five percent of engineers said they frequently met customer service and satisfaction targets.
- Eighty-three percent of respondents said they considered their company to be at least an average performer relative to their competitors.
- Only 40 percent of engineers said they were very likely to be with their current employer five years from now. Twenty-nine percent said if they were to leave their current role it would be to move to another company, while 23 percent said they would be retiring.

Conclusions

Engineers are under intense pressure to work faster with fewer resources.

Forty-six percent of respondents are working on more projects than they were two years ago, with 69 percent working on at least three projects concurrently. Fifty-seven percent are being required to do more with less. The majority of engineers also said that designs are more complex but design cycles are shrinking because of pressure to get products to market faster.

One reason for the increased pressures may be competition: 55 percent said the number of competitors is growing and 64 percent said the competitive landscape is global and competes 24x7.

Internally, engineers are facing budgetary constraints (60 percent) and time constraints (69 percent) as well as a shortage of resources (68 percent).

These conditions may be cause for concern: 44 percent said the pressure to meet deadlines and cut costs is putting product quality at risk. Unfortunately, only 46 percent said technology is helping with their productivity and just 29 percent said that new hires are being brought on board to help with the additional workload.

At the same time, engineers are finding ways to shoulder the load: 55 percent said they frequently or always meet launch dates and product quality standards, and 74 percent frequently or always meet customer satisfaction goals.

A knowledge drain is occurring, while knowledge management is lacking.

More than one-third of respondents have been in the engineering profession for at least 30 years and 84 percent have been engineers for at least 10 years. Nearly a quarter of respondents said they could retire in the next five years. Thirty-one percent said they were only slightly likely or not at all likely to be employed at the same company five years from now.

The loss of employees will mean the loss of institutional knowledge at these companies. Forty-seven percent of respondents said that knowledge and/or information loss as employees left their companies was very or extremely important. Forty percent said they lose specialized knowledge and expertise faster than they gain it.

Yet only 43 percent of companies have formal practices in place to identify senior-level and specialized experts to train, transfer, mentor, manage or retain their knowledge among others in the organization. Thirty-two percent lack formal knowledge management systems/processes to identify, capture, manage and share critical data, documents and information.

Customer satisfaction is king, even for engineers.

Having satisfied customers was the most often cited objective used to measure a team or department's performance, chosen by 60 percent of respondents. Product quality – a key aspect of customer satisfaction – placed second among performance objectives (57 percent), followed by launch dates (45 percent). It appears that the desire to achieve a high level of customer satisfaction permeates all corners of an organization.

Environmental sustainability is playing an important role.

Half of respondents said it was very or extremely important for their company to design/develop environmentally sustainable products. Another 26 percent said it was moderately important. Fifty-five percent reported that environmental/sustainability pressures on products/designs have increased over the past two years.

In addition, the majority of engineers said that the number of environmental/sustainability regulations, regulatory complexity and frequency of regulatory changes have all increased. The most commonly cited sustainability strategies that are influencing their products/designs are energy efficiency, reducing consumption of energy/resources, reducing emissions, and using less toxic/hazardous parts and materials.

Recommendations

Industrial marketers can use the results of this report in a number of ways to benefit their marketing strategies and to get closer to customers:

Develop buyer personas.

This research provides insights into the values, needs and challenges of engineers and technical professionals. You can use this unique and valuable perspective to help develop buyer personas that describe your various types of customers, their motivations and the problems they face. Match the personas to your product/service offerings in a way that positions your offerings to help engineers overcome their challenges. How do your products/services help customers do more with less, shorten design cycles, or meet performance targets? Messaging based on buyer personas will resonate more deeply with your target audience. For more information on how to use buyer personas in your marketing, go to: <http://bit.ly/UsingPersonas>.

Strengthen your relationships and build new ones.

It's likely that you have a number of solid relationships with long-term customers who are strong advocates for your products, services, brand and company. Some of these engineers may be looking to move into more senior and influential roles in their organizations or with other companies. It's important that you stay in touch with them on a regular basis.

Make sure your company is memorable to them and you are positioned as a leader in your industry as well as a trusted, reliable partner. The same is true with communicating to younger engineers who will increasingly move into decision-making positions as the engineering workforce ages and many professionals look to retirement. Focus on building relationships with the next generation, using their preference for digital channels to communicate with them.

Position your products with key trends in the industry.

One of the key finds of the survey is that creating sustainable products and being environmentally conscious is an important part of an engineer's work. If your products are energy efficient, help reduce energy consumption or are made from safe or recyclable materials, make sure you get that message out to your target audience.

Other trends reveal that engineers are strapped to do more with fewer resources while having to meet aggressive launch dates for products that meet high standards for customer satisfaction. Again, take advantage of these trends in your marketing. How can your products reduce time to market for engineers? Improve productivity? Save time and resources?

Create a technical content strategy to help fill the knowledge management void.

The research shows that many companies lack the strategy or resources to create a knowledge management process that captures and retains technical intelligence and expertise. This situation will only become more urgent as senior engineers retire at a faster rate and take their technical skills and experiences with them. You have a great opportunity to fill this void as well as build customer satisfaction and loyalty by producing trusted, reliable technical content that helps engineers do their jobs more effectively. Your customers will turn to you for authoritative knowledge and you will become an essential resource to these companies.

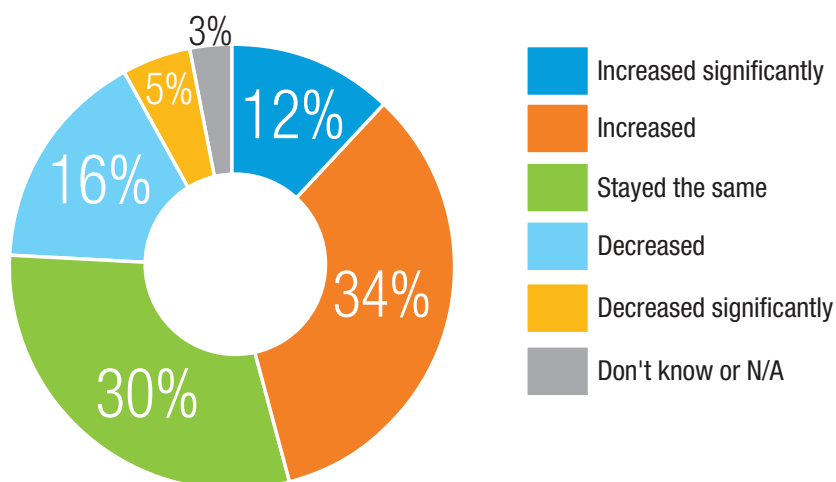
Survey Results

Work Environment

In the past two years, how have your company's design teams and workforce changed?

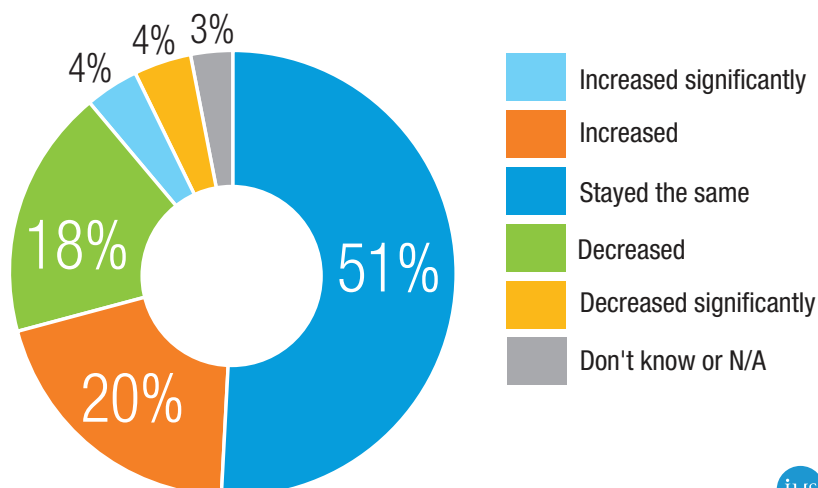
While the average size and makeup of design teams and workforces have remained relatively stable, 46 percent of engineers are working on more projects now than they were two years ago.

Number of designs/projects I work on has



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Average size of the teams I work on has

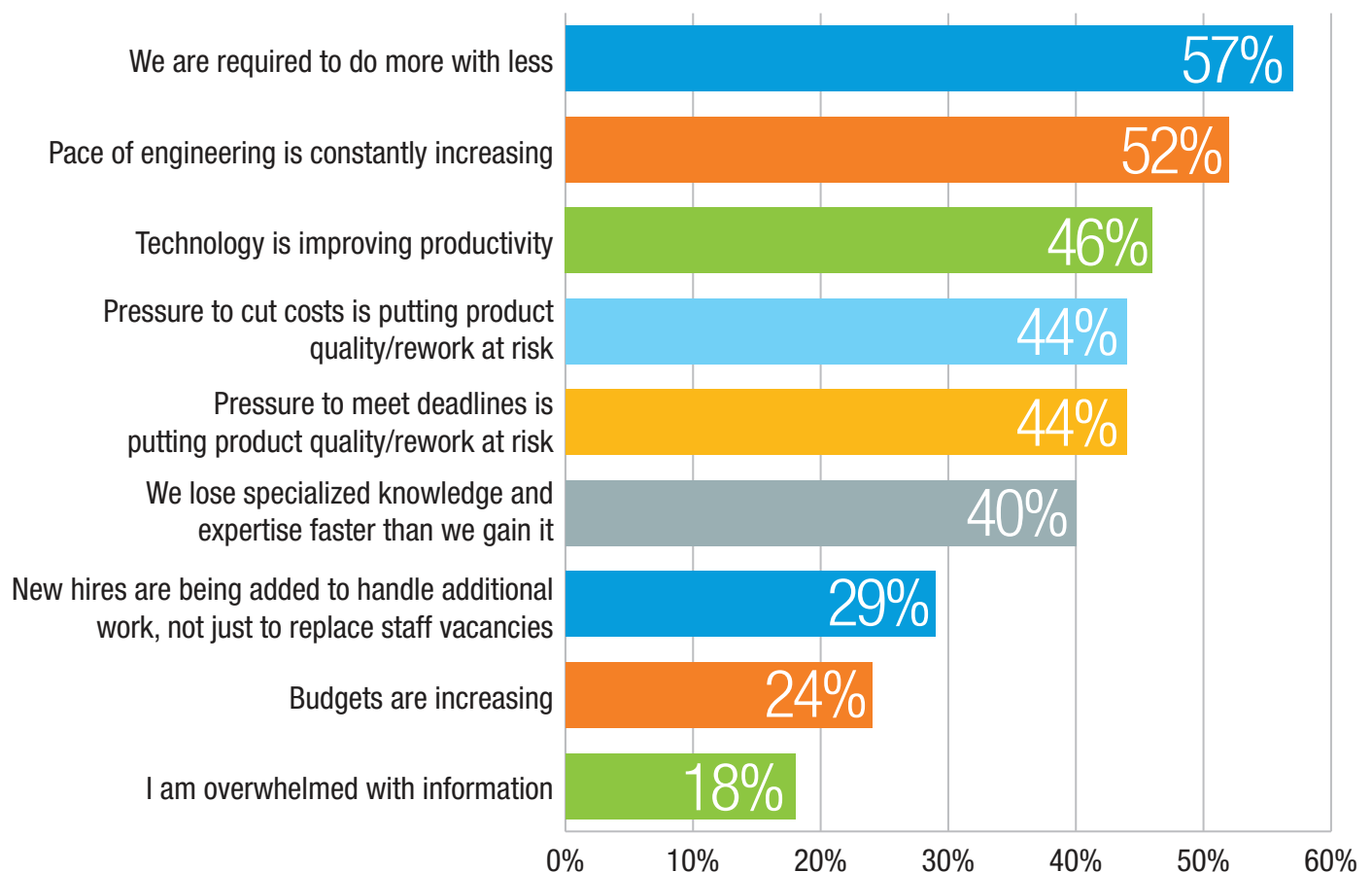


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Which conditions do you believe accurately portray the situation at your company?

Fifty-two percent of respondents said that the pace of engineering is constantly increasing and 57 percent are required to do more with less. Forty-four percent said the pressure to cut costs and meet deadlines are putting product quality/rework at risk. The conclusion: engineers bear a greater burden than ever.

Which conditions do you believe accurately portray the situation at your company?



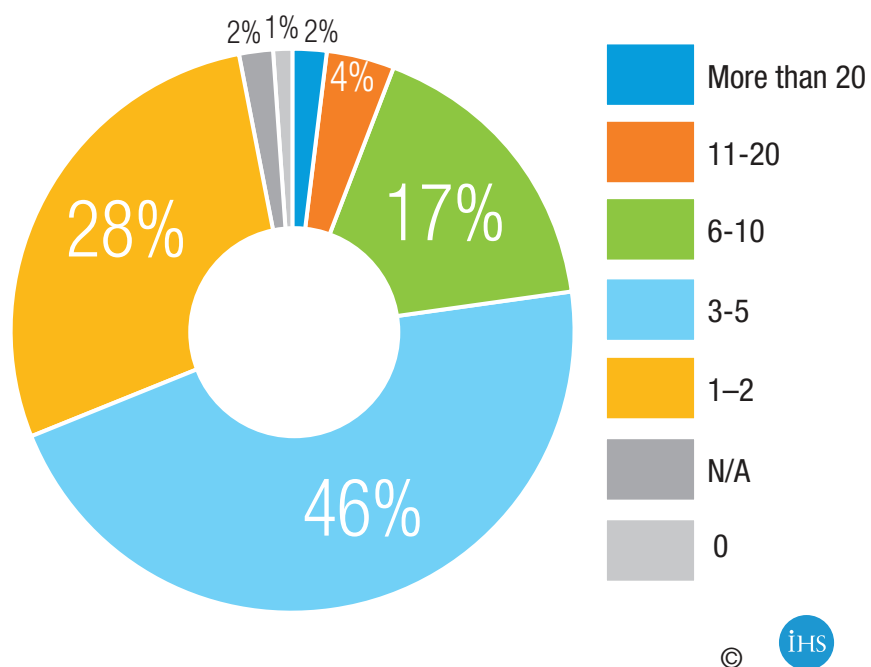
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Typically, how many projects are you working on concurrently?

Sixty-nine percent of engineers are working on at least three projects concurrently, with 46 percent working on three to five projects.

Typically, how many projects are you working on concurrently?

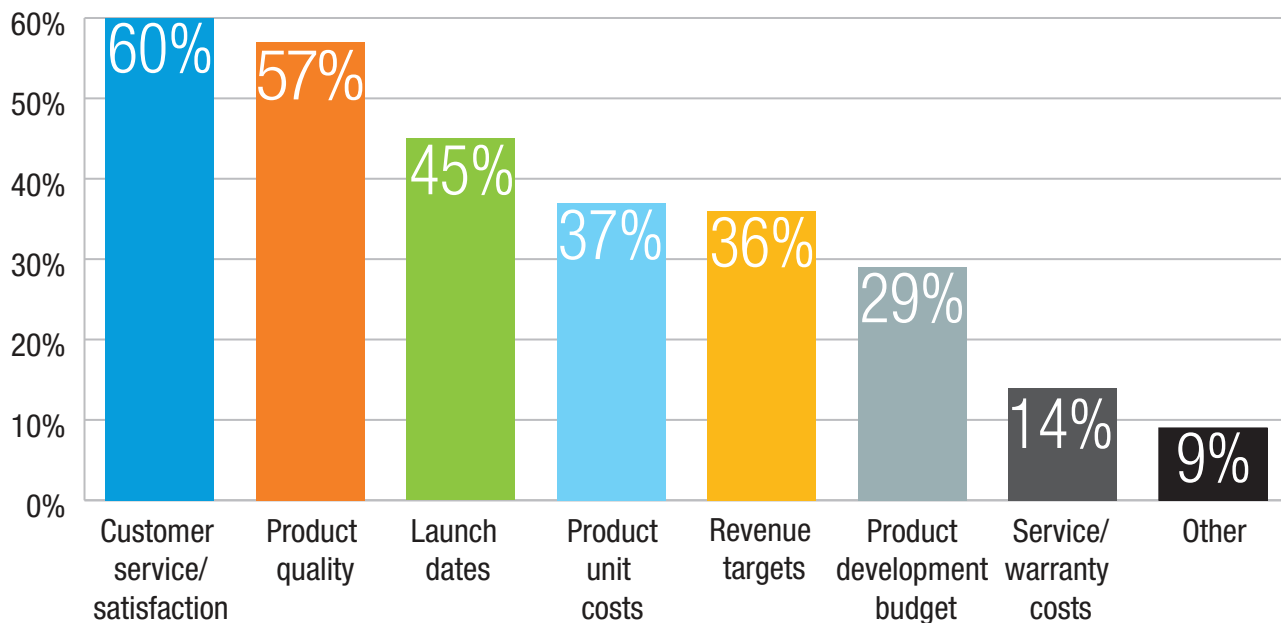


Performance Measurement

Which target goals/objectives are used to measure your team/department performance?

Customer service/satisfaction, product quality and launch dates are the three target goals/objectives most cited for measuring performance.

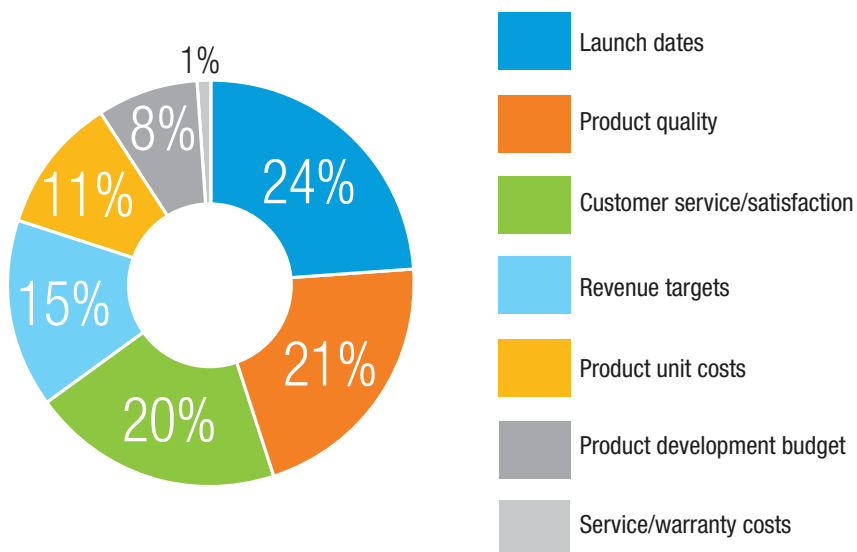
Which target goals/objectives are used to measure your team/department performance?



What is the single most important performance target that you are pressured or incited to meet?

Meeting launch dates is extremely important and the single most important performance target for engineers.

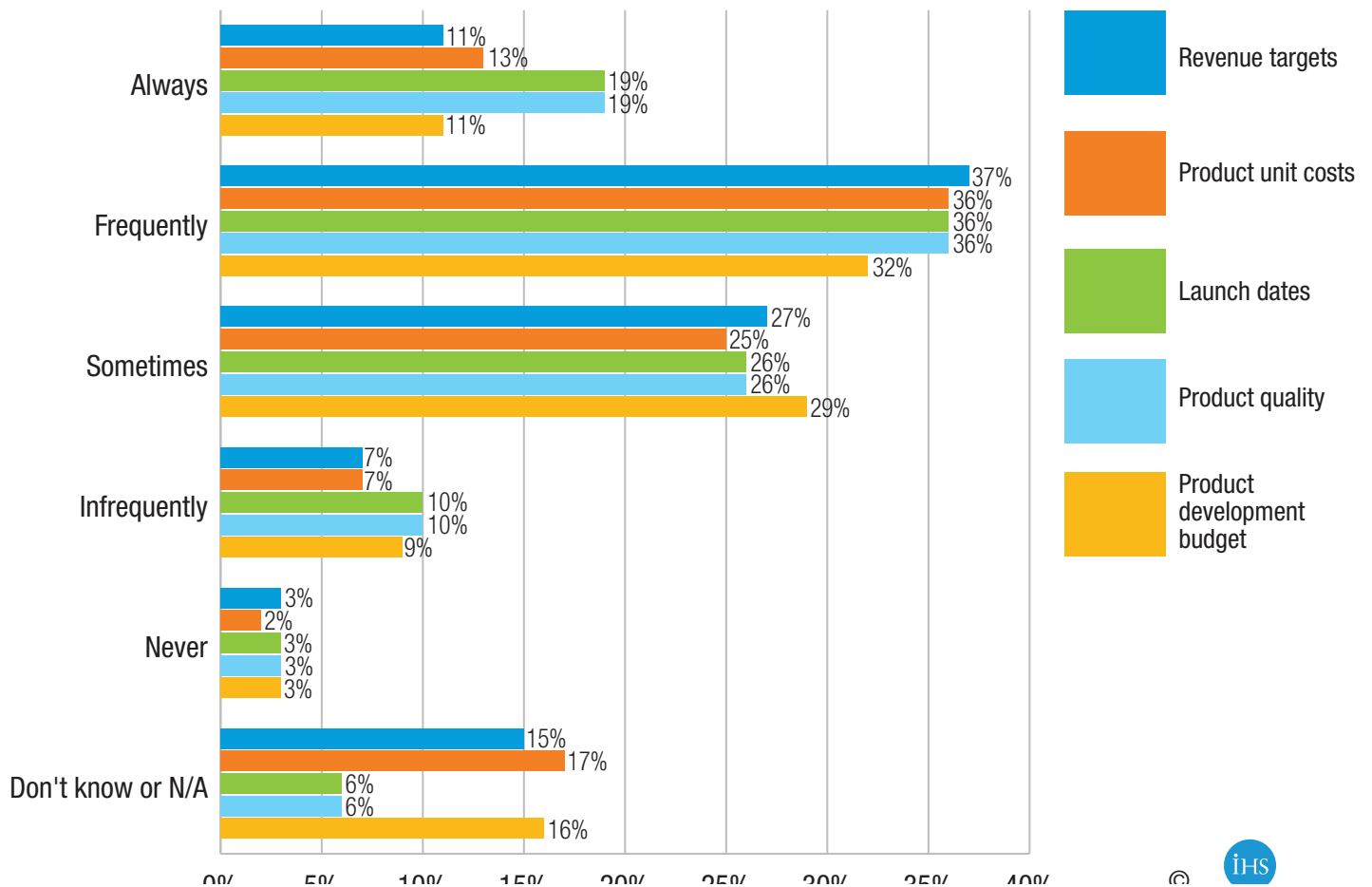
What is the single most important performance target that you are pressured or incited to meet?



How frequently do you meet these specific targets?

Engineers meet revenue targets frequently or always 48 percent of the time; product unit costs 49 percent of the time, launch dates 55 percent of the time, product quality goals 55 percent of the time, product development budget 43 percent of the time and service/warranty costs 39 percent of the time. The goal most frequently met—customer service/satisfaction, at 74 percent of the time—is also the objective most often cited by engineers as a measure of team performance.

How frequently do you meet these specific targets?

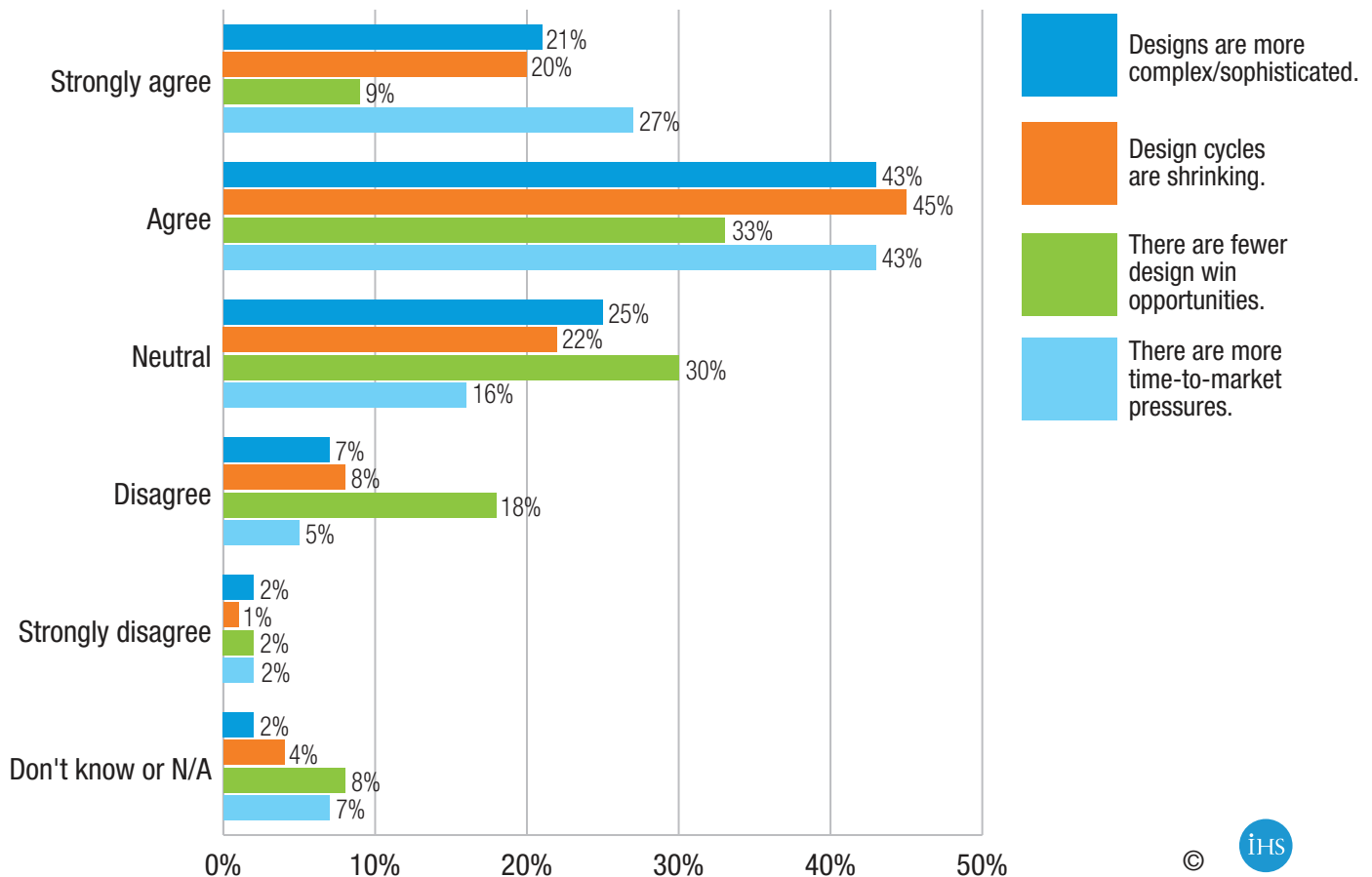


Challenges and Competition

Agree or disagree with the following statements about design projects.

Answers to this question support the conclusion that engineers are increasingly challenged in their chosen profession. Seventy percent agree or strongly agree there are more time-to-market pressures, 65 percent agree or strongly agree design cycles are shrinking and 64 percent agree or strongly agree that designs are more complex/sophisticated. Forty-two percent agree or strongly agree there are fewer design win opportunities.

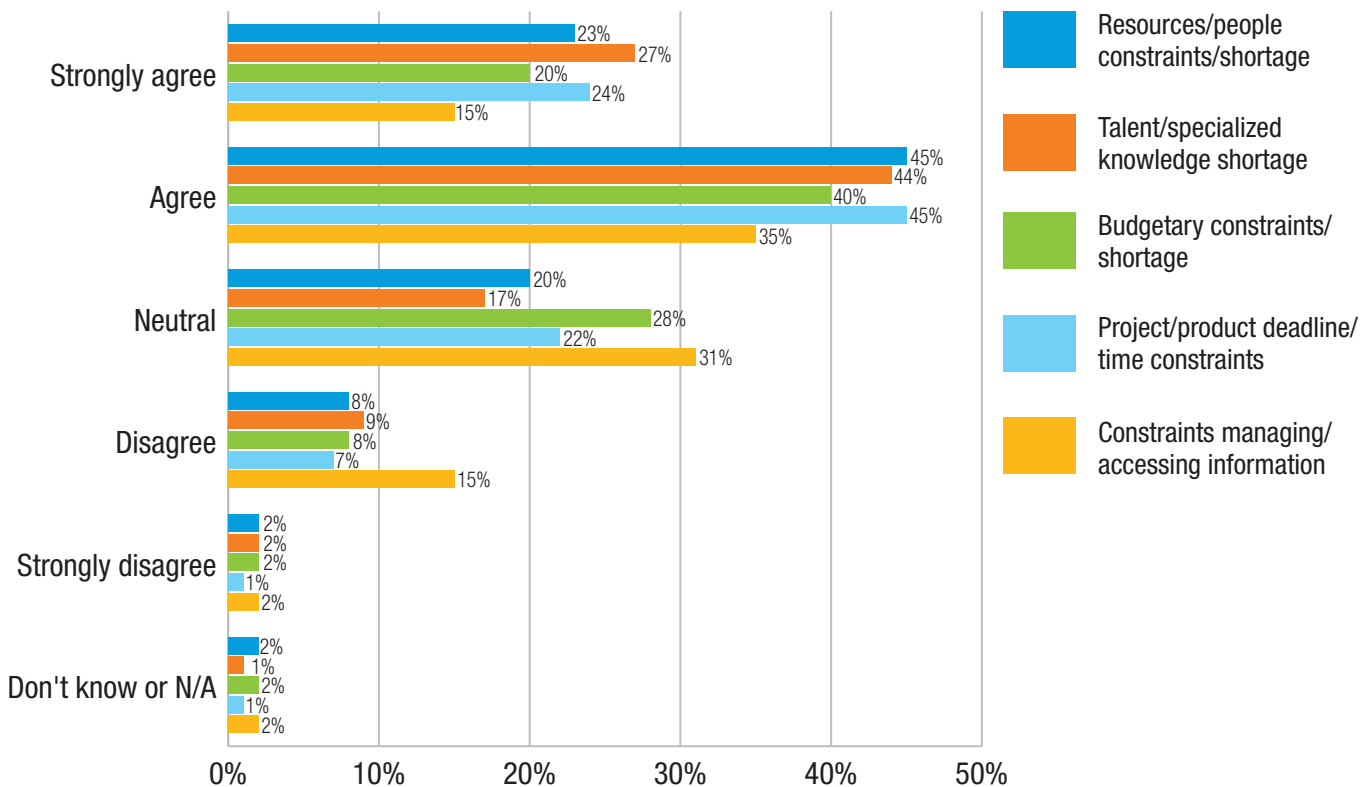
Agree or disagree with the following statements about designs/projects.



Agree or disagree with the following: these constraints are jeopardizing my company's productivity, innovation and/or product quality.

Engineers answered a number of questions about the impact of various constraints on their companies. Seventy-one percent said that talent/specialized knowledge shortage was jeopardizing their company's productivity, innovation and/or product quality; 69 percent cited project/product deadline/time constraints; 68 percent said resources/people constraints/shortage; 60 percent said budgetary constraints/shortage; and 50 percent cited constraints managing/accessing information.

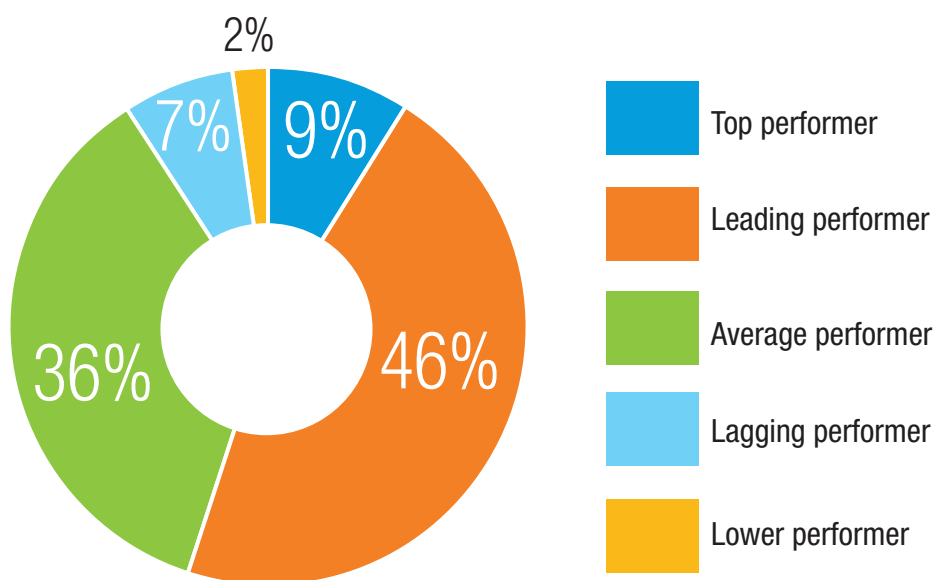
Agree or disagree with the following: these constraints are jeopardizing my company's productivity, innovation, and/or product quality



Relative to its competitors or a peer group, how does your company perform?

Only nine percent believe their company is a lower or lagging performer, while the majority (55 percent) believe their company is a leading or top performer when compared to competitors.

Relative to its competitors or a peer group, you believe that your company is generally the:



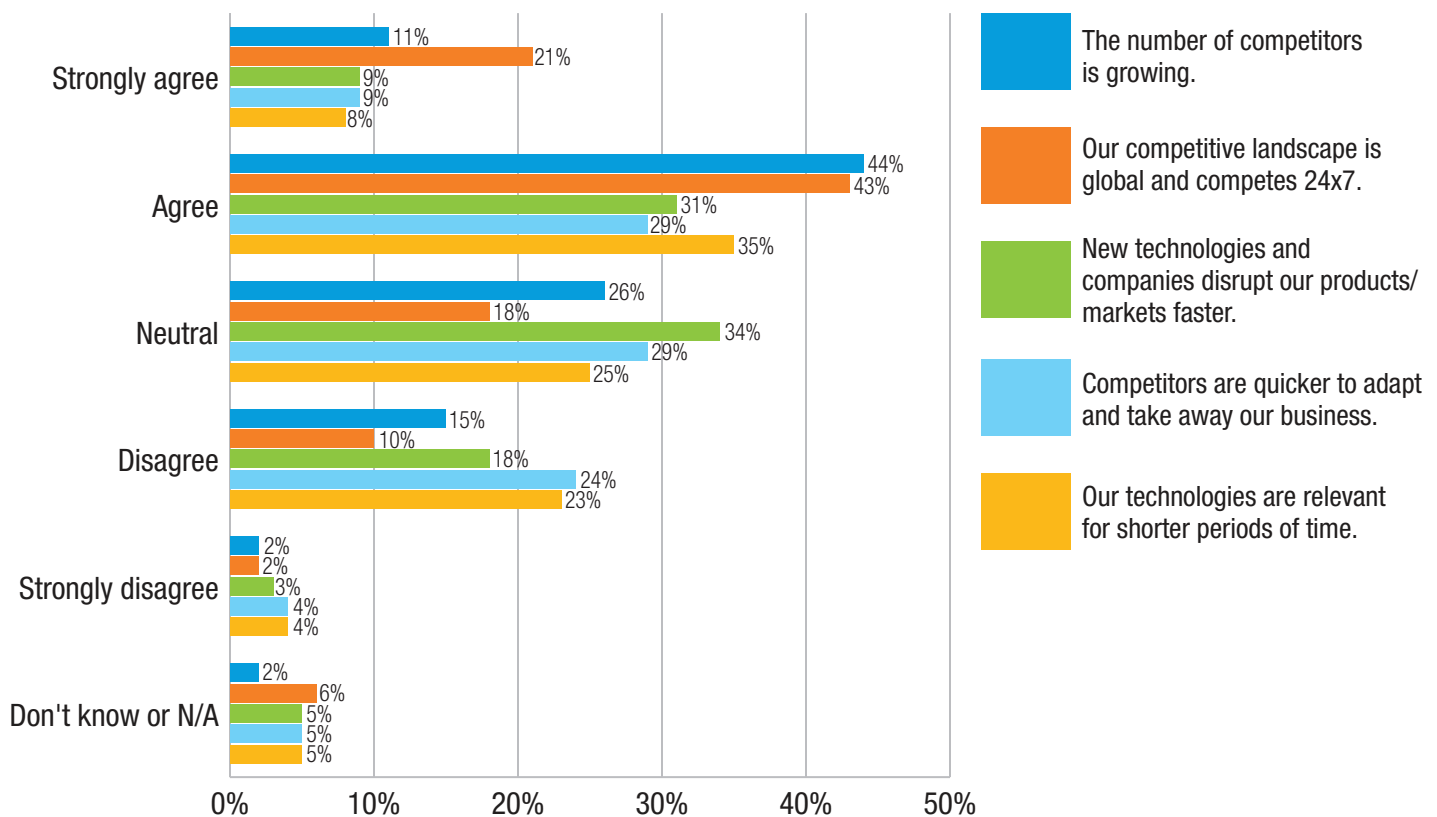
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Agree or disagree with the following statements about how the competitive landscape for your product/market is evolving.

Engineers are highly aware of the competitive market they work in. The majority (55 percent) believe the number of competitors is growing and 64 percent agree the competitive landscape is global and competes 24x7. Forty-three percent said their technologies are relevant for shorter periods of time, 40 percent said new technologies and companies are faster to disrupt their products/market, and 38 percent said competitors are quicker to adapt and take away their business.

Agree or disagree with the following statements about how the competitive landscape for your product/market is evolving.

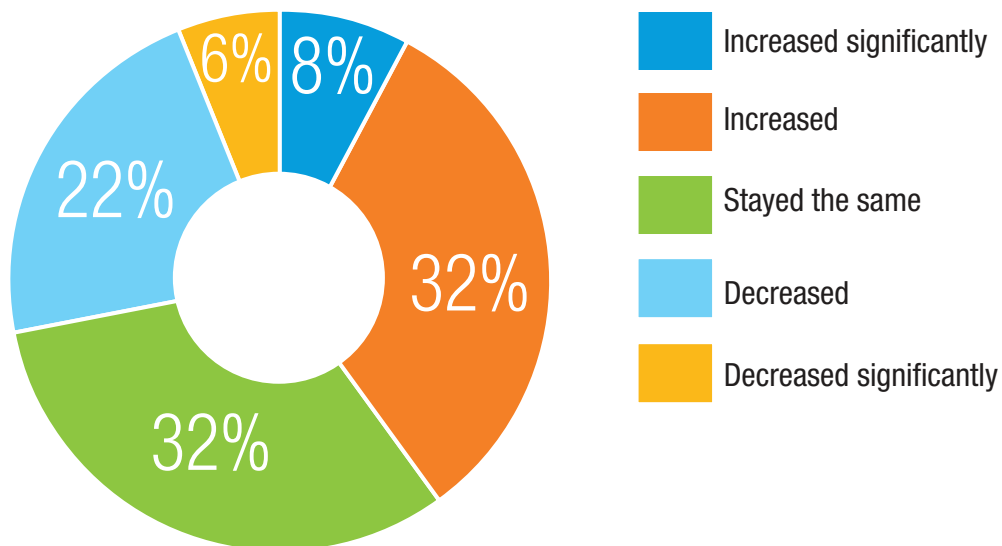


Workforce Changes and Knowledge Management

In the past two years, how has the size of your company's engineering workforce changed?

Forty percent said their company's engineering workforce has increased, while 28 percent said it decreased.

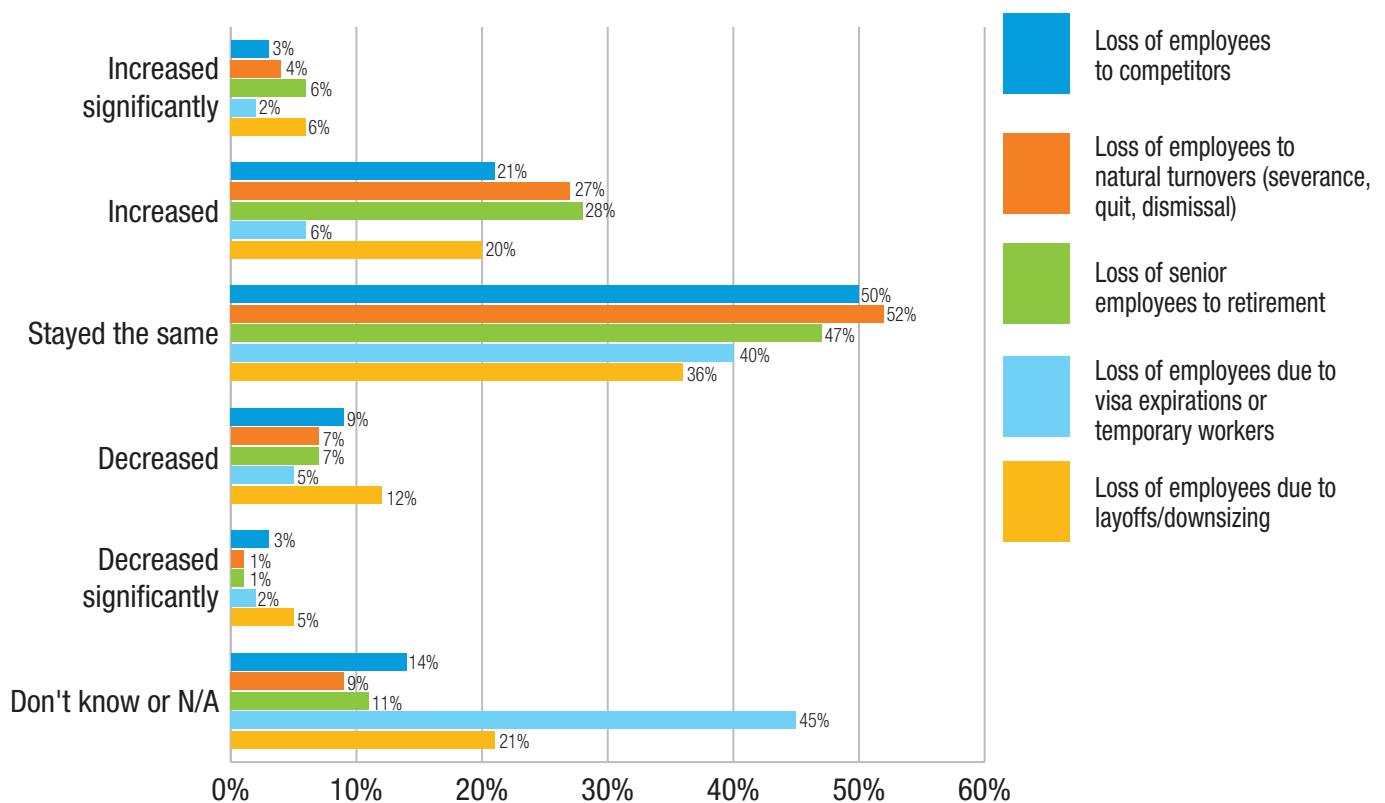
In the past two years, how has the size of your company's engineering workforce changed?



In the past two years, how have employee losses in your company's workforce changed?

Loss of employees is an issue for many companies with engineering workforces. Thirty-four percent are experiencing increased losses of senior employees to retirement, while 31 percent are seeing increases in employee loss due to natural turnover.

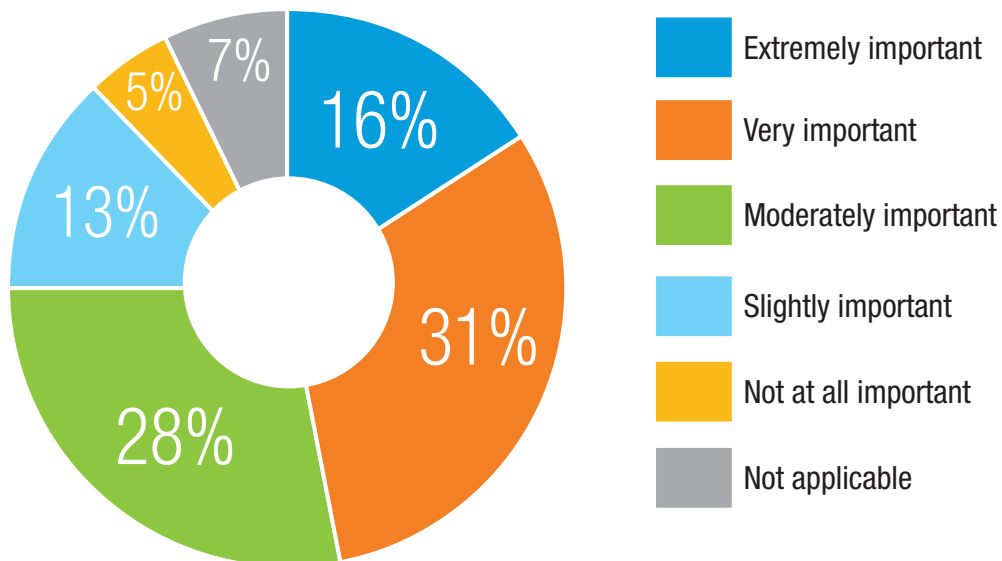
In the past two years, how have employee losses in your company's workforce changed?



How important was knowledge/information loss as employees left the company?

As evidence of a knowledge drain, forty-seven percent of engineers said that knowledge/information loss was very important or extremely important as employees left the company.

How important was knowledge and/or information loss as employees left the company?



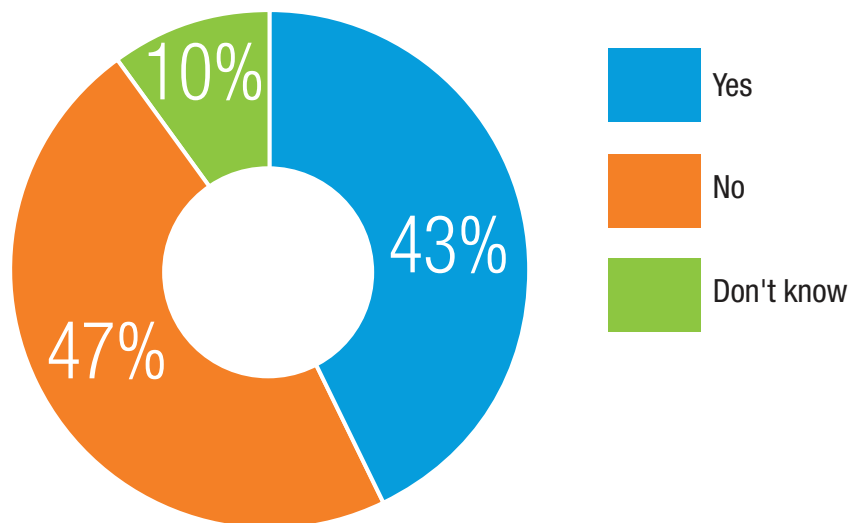
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Does your company have formal practices in place to identify senior-level and specialized experts to train, transfer, mentor, manage or retain their knowledge among others in the organization?

Only 43 percent of companies have formal practices in place to preserve knowledge by leveraging senior-level and specialized experts.

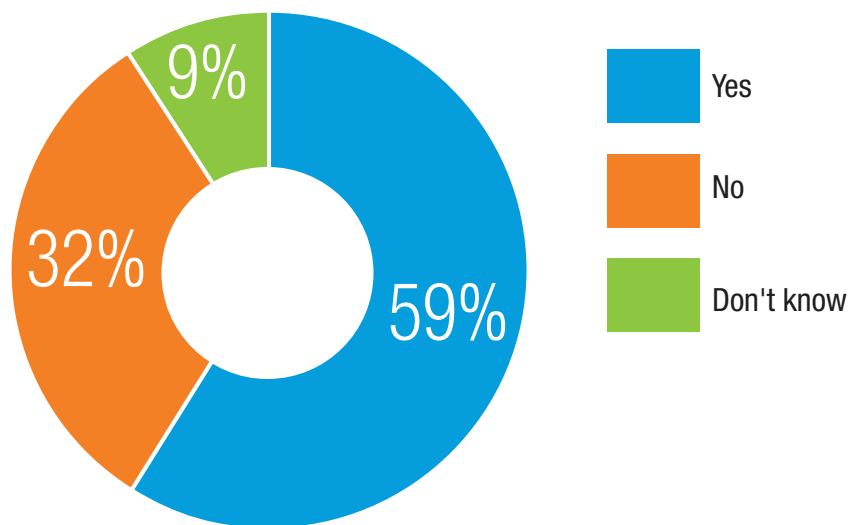
Does your company have formal practices in place to identify senior-level and specialized experts to train, transfer, mentor, manage or retain their knowledge among others in the organization?



Does your company have formal knowledge management/systems processes in place to identify, capture, manage and share critical data, documents and information?

The majority of companies (59 percent) have formal knowledge management/systems processes in place.

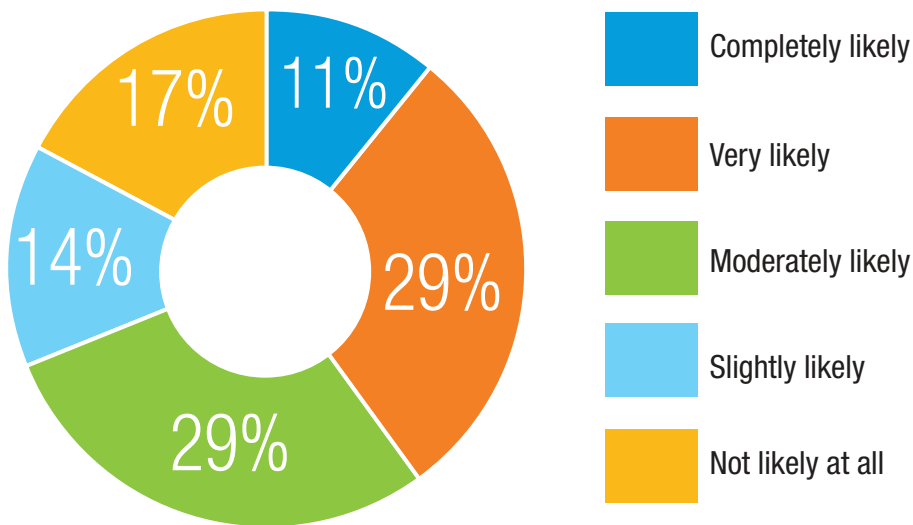
Does your company have formal knowledge management systems/processes in place to identify, capture, manage, and share critical data, documents and information?



Estimate how likely you are to be employed by the same company five years from now.

Twenty-nine percent of engineers said they are very likely to be employed at the same company five years from now. Thirty-one percent said they were only slightly or not at all likely.

Estimate how likely you are to be employed at the same company five years from now.



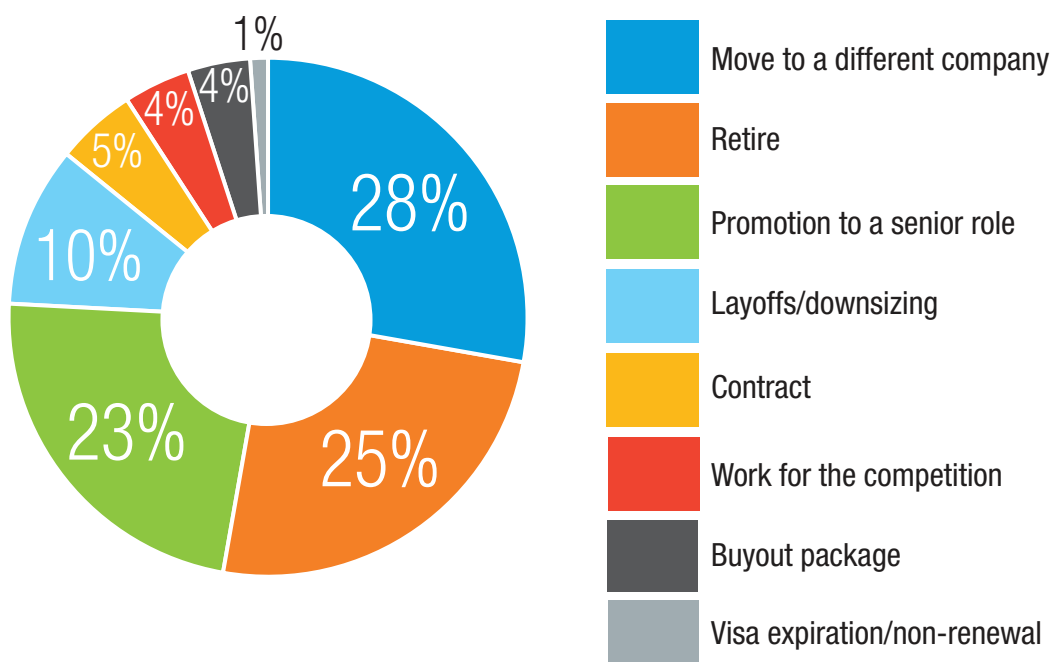
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If you were to leave your current role, what do you anticipate would be the primary reason?

The top three reasons cited for an engineer to leave their current role would be to move to a different company (28 percent), retire (25 percent) or for a promotion to a senior role (23 percent).

If you were to leave your current role, what do you anticipate would be the primary reason?



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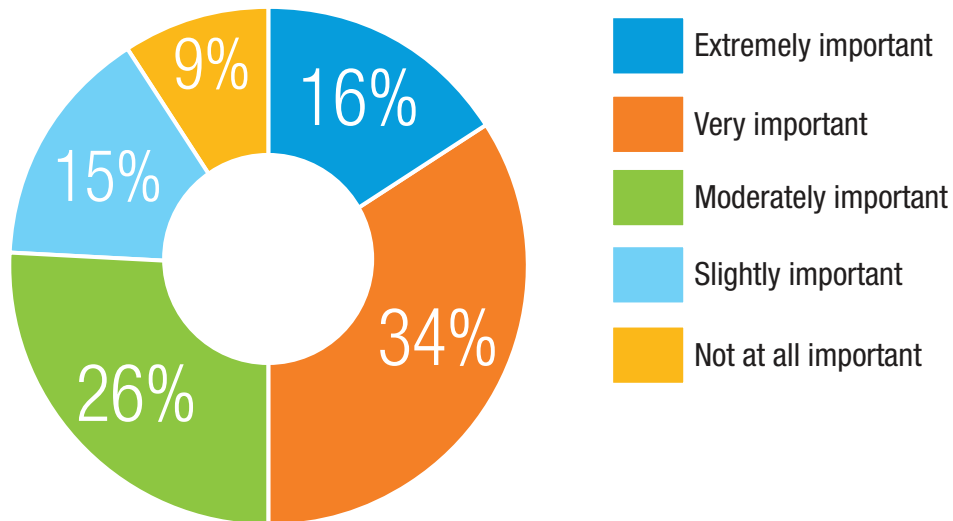


Environmental Sustainability

How important is it for your company to design/develop environmentally sustainable products?

Fifty percent of engineers said it was very or extremely important for their companies to design/develop environmentally stable products.

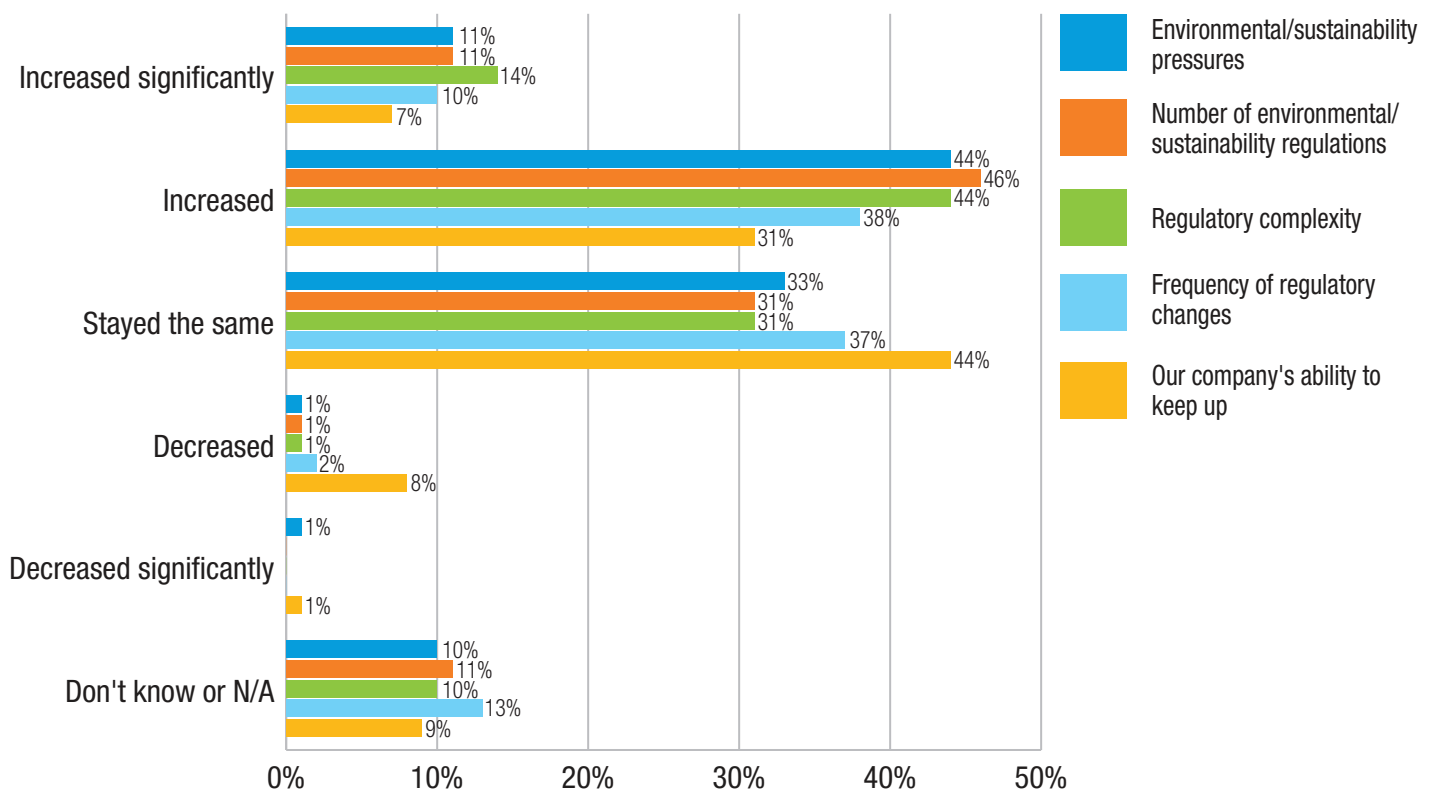
How important is it for your company to design/develop products that are environmentally sustainable?



In the past two years, have regulatory/sustainability pressures on your products/designs changed?

The majority of companies are experiencing increases in environmental/sustainability pressures (55 percent), the number of environmental/sustainability regulations (57 percent) and regulatory complexity (58 percent). Forty-eight percent report an increase in the frequency in regulatory changes and 38 percent said it was harder for their company to keep up.

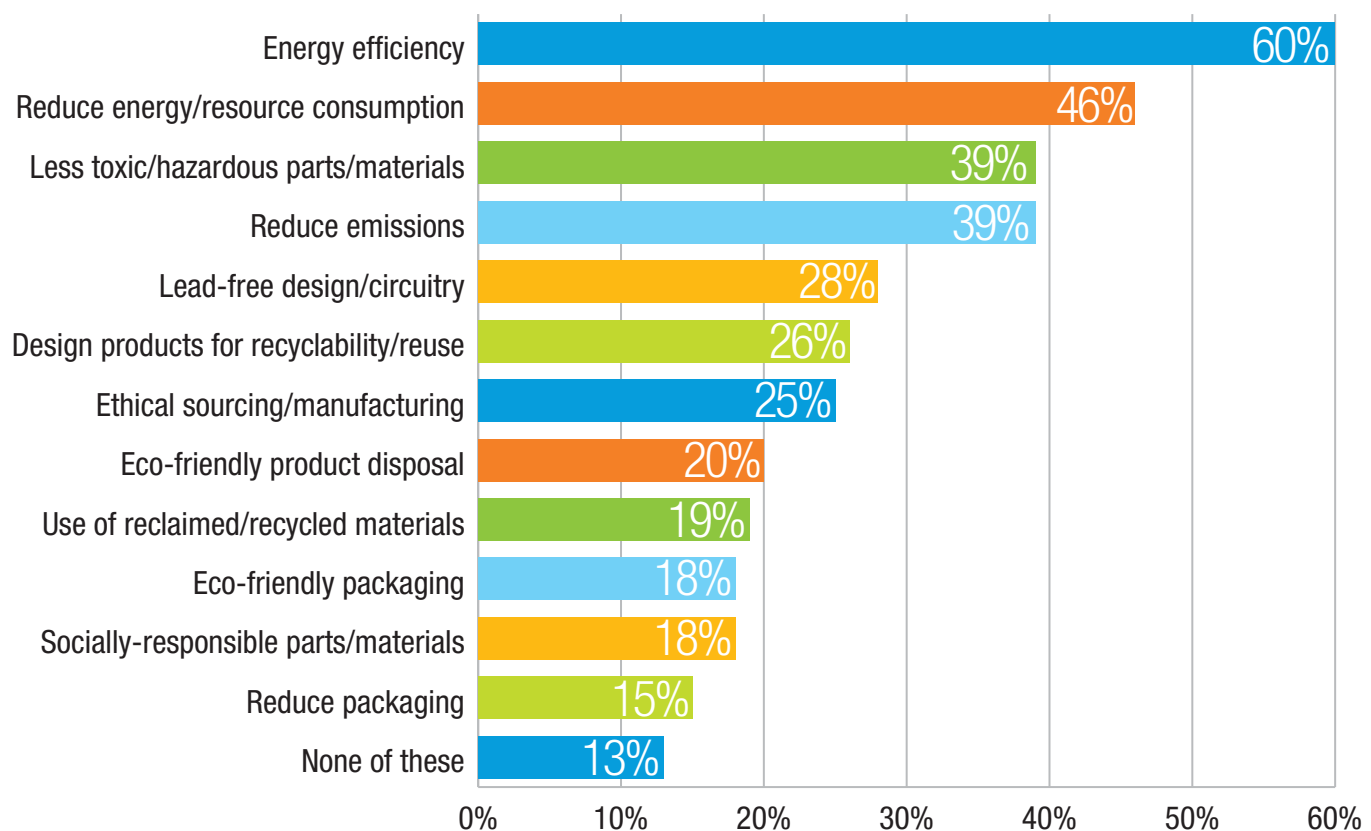
In the past two years, have regulatory/sustainability pressures on your products/designs changed?



Which of the following sustainability strategies are influencing your work product/design(s)?

The top sustainability strategies that are influencing engineers' work/product designs are energy efficiency (60 percent), reducing energy/resource consumption (46 percent), reducing emissions (39 percent) and using less toxic/hazardous parts and materials (39 percent).

Which of the following sustainability strategies are influencing your work product/design(s)?



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In Their Own Words

For the Pulse of Engineering survey, we asked a number of open-ended questions about design team challenges, obstacles to meeting their goals, design pressures and risks to company productivity. Responses were grouped into word clouds, which are images composed of words and phrases used in the response to each question. The size of each word or phrase in the image is reflective of its frequency (the larger the word or phrase, the more often it was used in responses).

When it comes to design teams and the workforce, what's the biggest challenge/obstacle you face (for example: skills, expertise, communication, etc.)?



What are the most significant challenges/obstacles you face that limit your ability to meet targets?



Overall, what is the most significant design pressure you face today?



What do you believe is the biggest issue that limits or poses risk to your company's productivity, innovation, problem-solving, and/or product quality?



About IHS (www.ihs.com)

IHS (NYSE: IHS) is the leading source of insight, analytics and expertise in critical areas that shape today's business landscape. Businesses and governments in more than 150 countries around the globe rely on the comprehensive content, expert independent analysis and flexible delivery methods of IHS to make high-impact decisions and develop strategies with speed and confidence. IHS has been in business since 1959 and became a publicly traded company on the New York Stock Exchange in 2005. Headquartered in Englewood, Colorado, USA, IHS is committed to sustainable, profitable growth and employs about 8,800 people in 32 countries around the world.

About IHS Engineering360 Media Solutions

IHS Engineering360 is the world's largest online destination for engineers, delivering the single source for trusted, expert engineering content, information, insight, tools and community for engineers and technical professionals across multiple industries and disciplines. An engaged community of more than 7.5 million industry professionals – half the world's engineers – rely on IHS Engineering360 as a trusted resource at every stage of the research, product design and purchasing process. For industrial marketers, our mission is to provide comprehensive digital media solutions that connect companies with their target audience and generate unparalleled results – delivering measurable and actionable awareness, demand and engagement opportunities at all stages of the buy cycle.



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