



EDGE COMPUTING

TREND REPORT

The Future of
Edge Computing
is Here

CFE Media
and Technology

AMERICAS



The edge is where the action is

In the parlance of industrial automation, “the edge” has emerged as a term of considerable currency. The edge is found where the action is, at or near the industrial process.

The introduction of edge computing is the most significant plant-floor advancement in industrial computing since the introduction of supervisory control and data acquisition (SCADA) 30 years ago. While many of the capabilities actualized by edge were possible before, achieving those capabilities was not cost effective for most controlled processes.

To relieve bandwidth constraints or inherent latencies, and to improve system security and reliability, computational resources — from gateways to multi-purpose devices to computers — are being stationed at the edge. These computational resources located at the edge can filter or process data so that only what's needed is transmitted between production control or enterprise systems and the cloud.

Look inside to see the results of the recent CFE Media and Technology survey of its readership regarding opportunities, challenges and attitudes when it comes to edge computing.



SETTING THE STAGE FOR SEISMIC CHANGE

Connectivity, cost-effective acquisition of additional data sets, and continuing growth in computational power culminates in the increasing incorporation of statistical methods, data engineering and data science into the engineering disciplines.



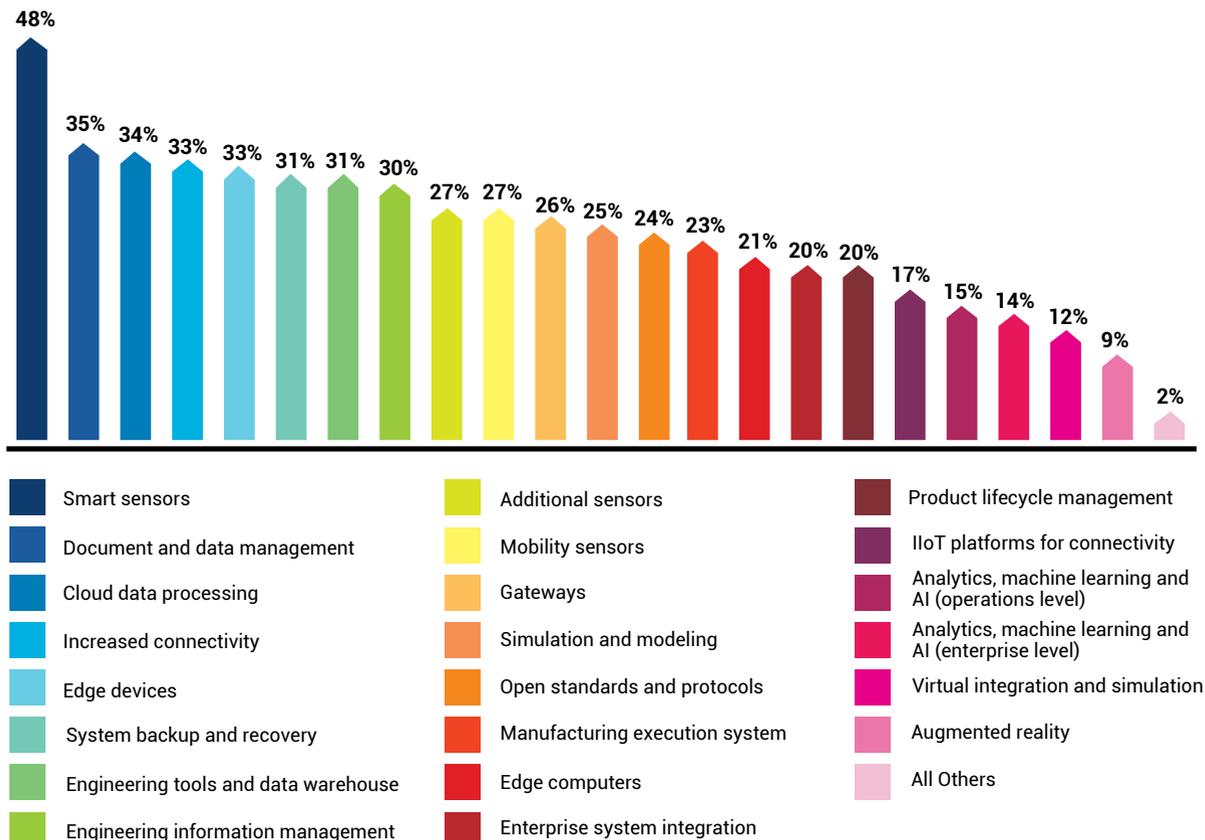
The same disruption is going to happen in the industrial space as happened, for example, in the telco space 25 years ago. It's going to be disrupted by general-purpose computers in the virtual mode, virtual PCs. It's going to happen because the economic value is so compelling that it can't be resisted.

- Dave Laurello,
chief executive officer



Q What technologies are your company incorporating, along with edge computing, to make your engineering, manufacturing and operating systems more productive?

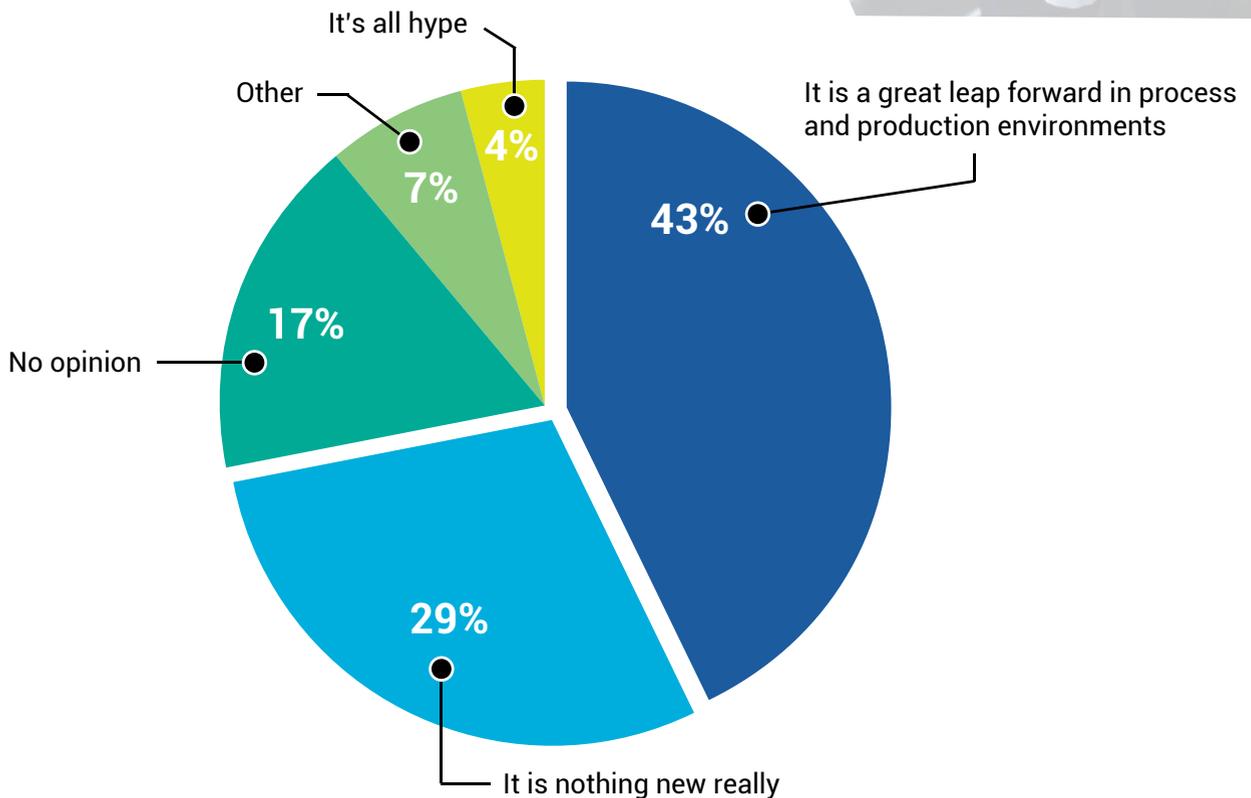
A The adoption of edge computing is impacting the entire operation.



43% SEE EDGE AS A GREAT LEAP FORWARD

Q What is your personal professional opinion when it comes to the introduction of edge computing?

A Whether you are a believer or see the edge as nothing new, there is excitement around the potential of edge computing to reinvent production environments.



TRUST, BUT VERIFY

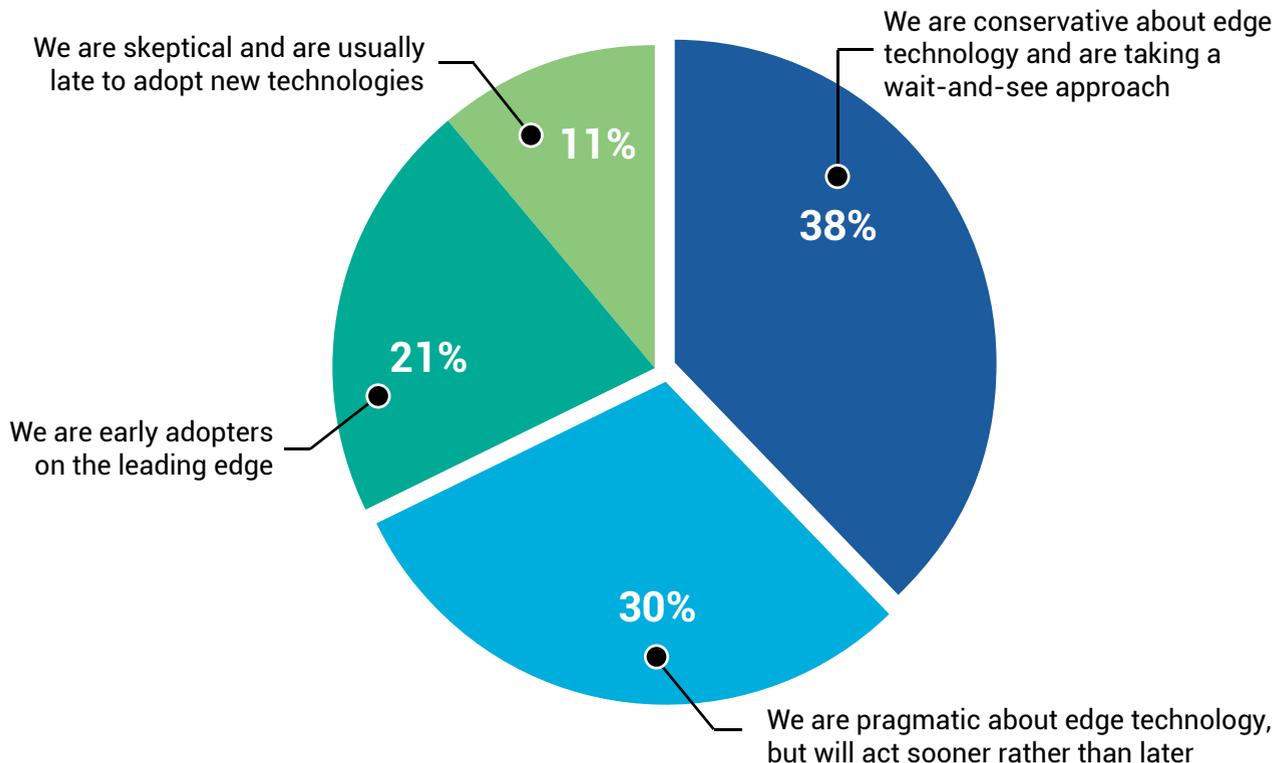
When it was first said that you would run your business on the Internet, people thought it was some kind of a joke. With edge computing there are just as many initial doubts. The plant floor can be seen as the last mile for IT proliferation.

- John Vicente,
chief technology officer



Q Which best describes your organization's stance on the adoption of edge technology?

A More than half of survey respondents are leaning forward indicating that we may be nearing the tipping point for adoption.



THE TOUGHER ROWS TO HOE



The challenge is how to deliver complex enterprise services at the edge. The solution is to establish best practices within the organization and consolidate digital services.

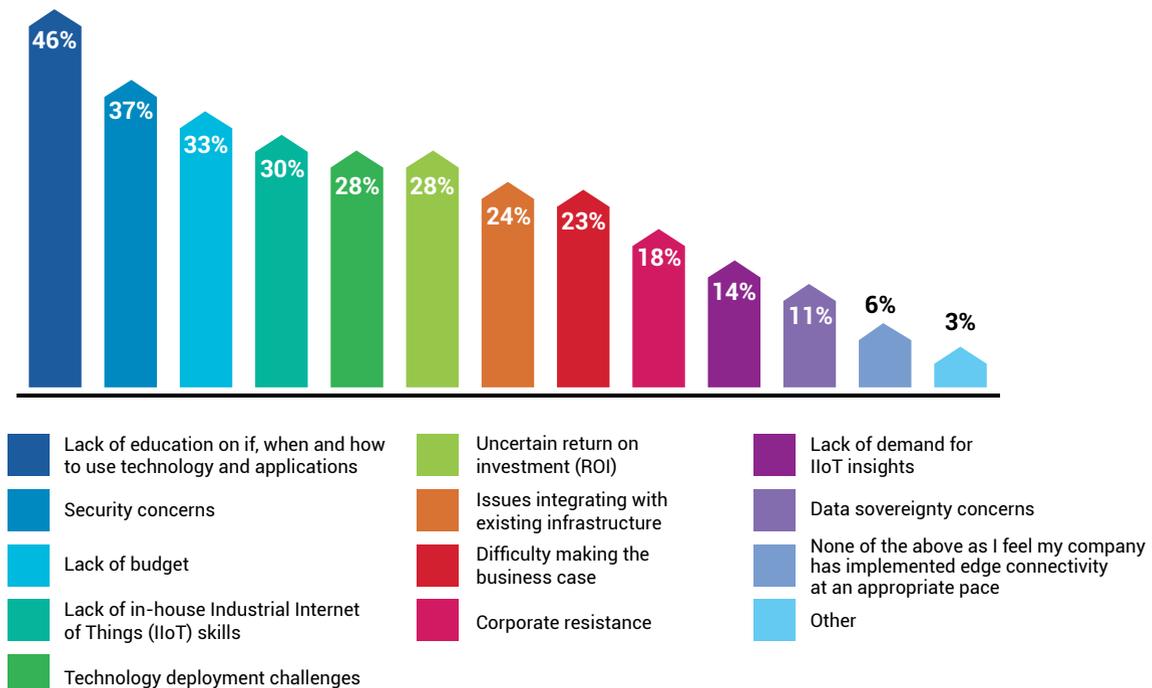
- Jason Andersen,
vice president, strategy
and business line management



Q
A

What are the barriers to edge computing deployments in your organization?

Survey respondents say lack of education on if, when and how to use the technology and applications is the foremost barrier to edge computing deployment in their organizations. Respondents' lack of know-how and security concerns are slowing the achievement of the full benefits of edge computing.



HELP WANTED



People are being hired as data scientists but they're too often employed as data janitors.

- Dave Vasko,
director of advanced technology

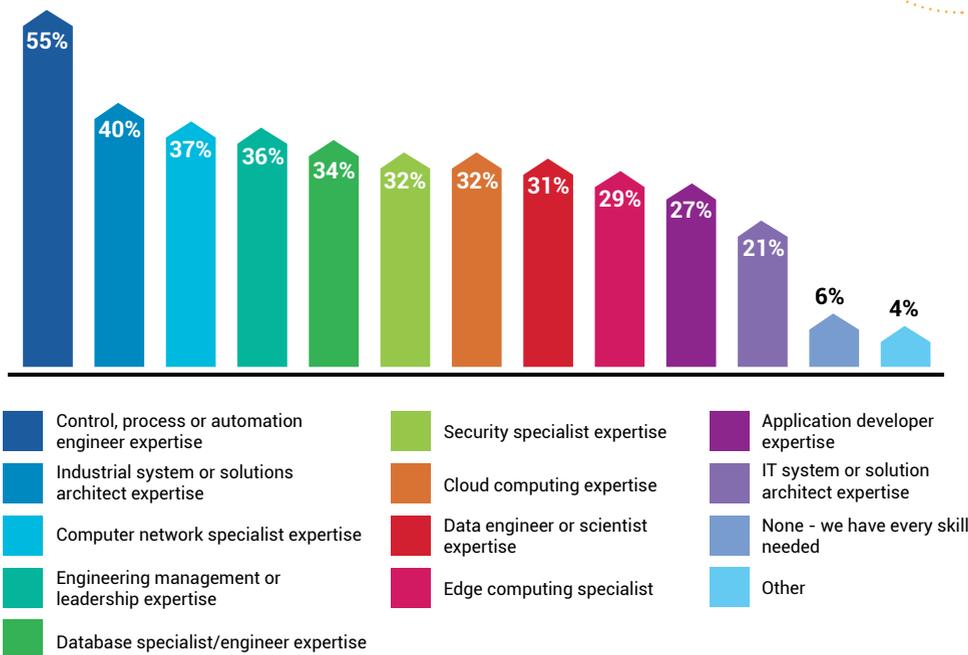


QA

What skill sets does your team need to add to take advantage of edge computing?

While **55%** of survey respondents believe control, process or automation engineering expertise are core to edge computing success, near **30% to 40%** believe skills related to systems architectures, computer networking, cloud computing, database security, data engineering, data science and application development are also vital.

Only **6%** have all the skills they need.



SOME DO, SOME DON'T



When you are buying digital things, you are doing digital things. And as you progress down that path, you are going to want to converge those digital streams. What you're doing now are the early steps in a journey to get to where you're ultimately going, which is edge computing.

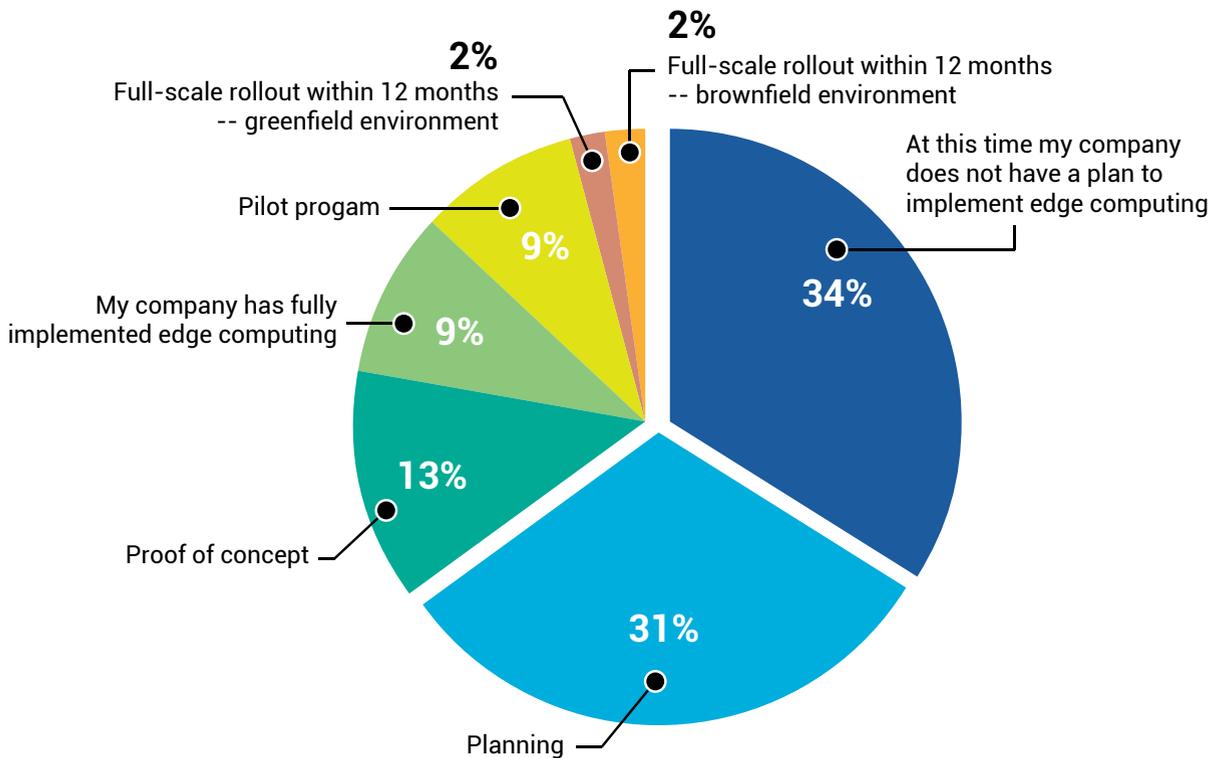
- Jason Andersen,
vice president, strategy
and business line management



Q
A

Does your company have a plan to implement edge computing?

53% of survey respondents are actively evaluating or planning their edge computing implementations. Meanwhile, **one-third** still need a plan.



HAVING WHAT IT TAKES



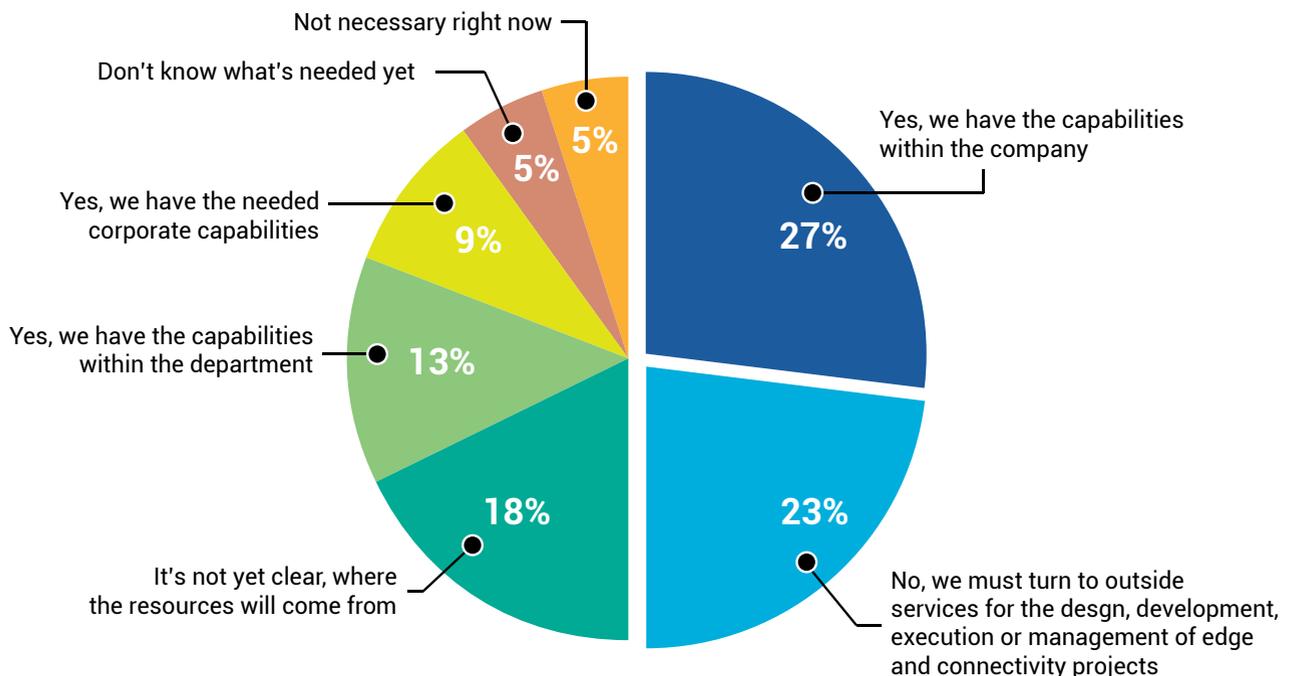
Analytics and machine learning is not quite mainstream yet, so you still need people with a data science background. Some applications can be a heavy lift and require know-how and skill sets found in a limited set of people.

- Jason Dietrich,
chief revenue officer



As the engineering disciplines related to operations technology, information technology, process control, automation and data science increasingly intermingle, does your organization have the resources and capabilities needed?

48% of the respondents say they have the resources and capabilities needed within their organization.



WHAT TO DO WITH THESE CAPABILITIES



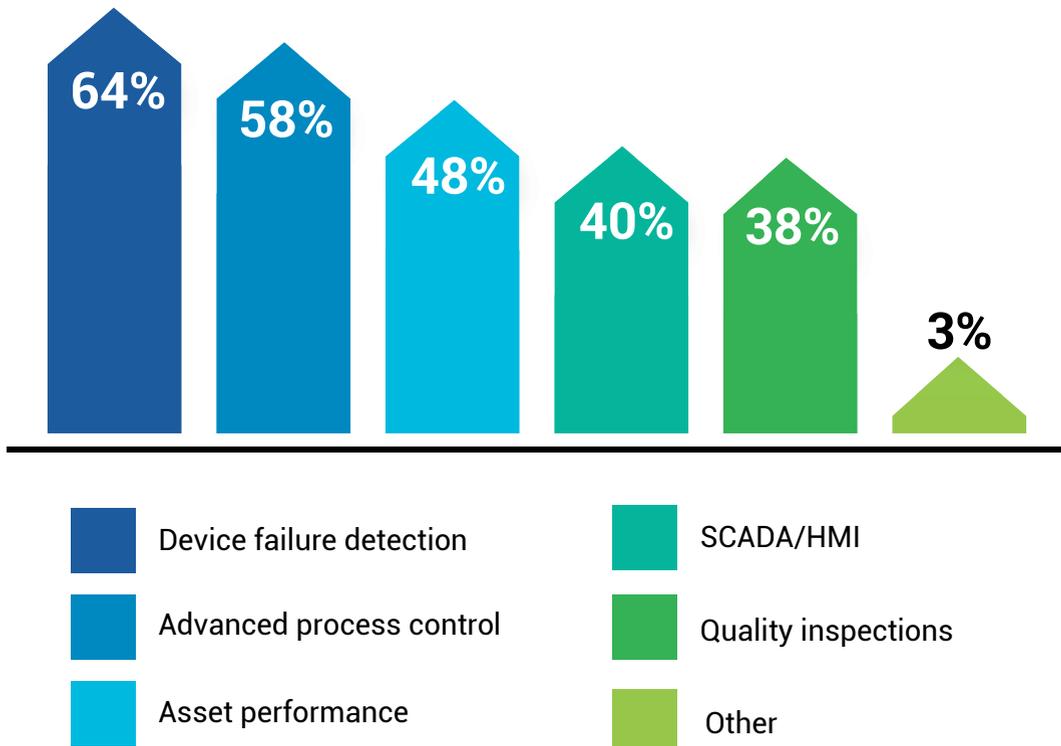
We are still in learning mode, but as we've become more mature, we've focused less on first trying to identify use cases. When you do that, it's a symptom of trying to limit the risk involved. What's more important is to discover the data and then apply "what-if" scenarios to it.

- Mike Carroll,
vice president



Q What edge computing use cases do you see as most valuable?

A Top use cases today – equipment uptime and reliability, advanced process control and asset performance management – will evolve as organizations gain more experience at the edge.



THE SHAPE OF THINGS TO COME

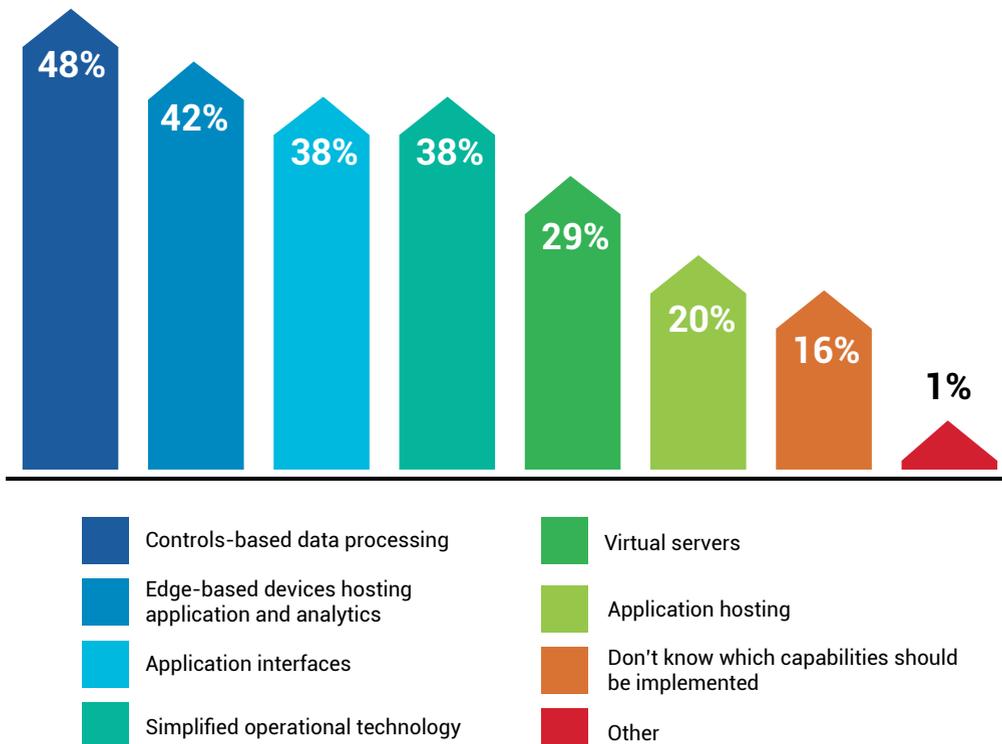
The traditional DCS or PLC, with an HMI/SCADA, a historian and maybe an MES is becoming obsolete fast. The cost of the architecture makes it costly to sustain and maintain. Instead we'll have devices in the plant that are provisioned and maintained centrally. We engineer it in the cloud, register the edge device, bind them together, and deploy it, so there is no install anymore.

- Tim Sowell,
digital portfolio strategy



Q What capabilities should be implemented on the edge versus the cloud, to properly address bandwidth, latency, network availability and security issues?

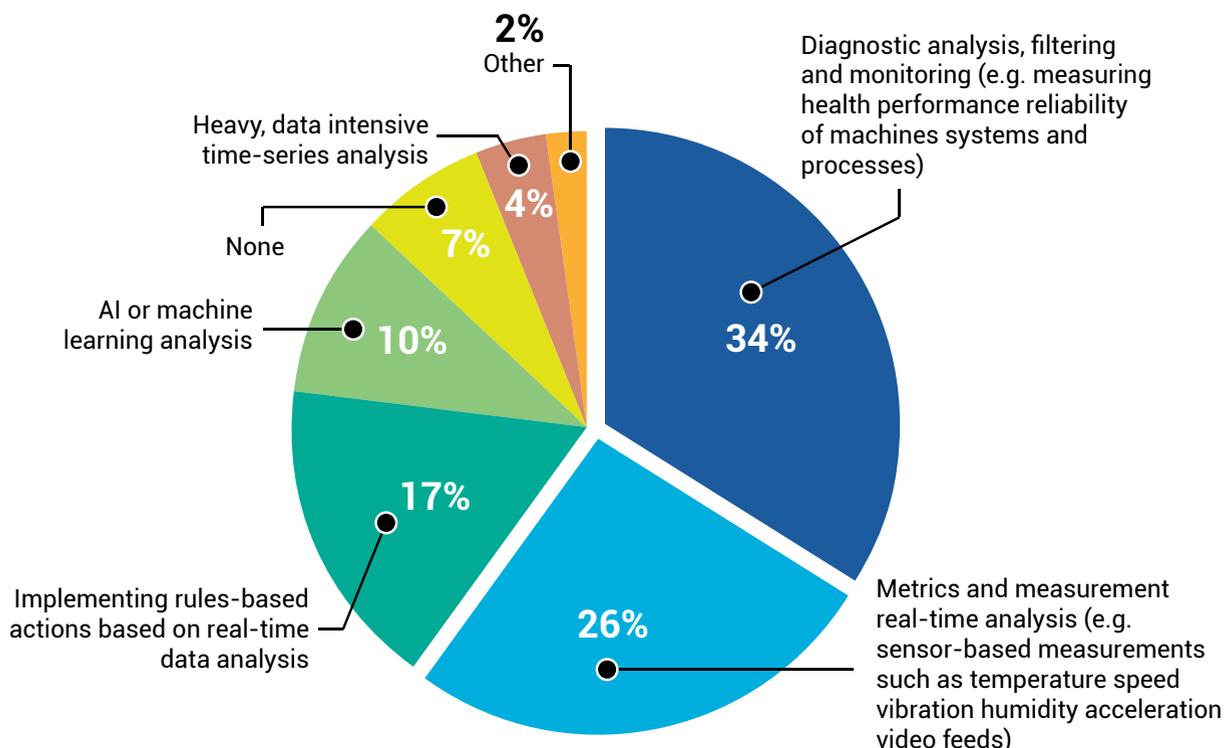
A Respondents look forward to a computing environment that blends traditional closed-loop control with technologies like analytics and virtualization that are simple to deploy and easy to manage.



RELIABILITY AND OPTIMIZATION

Q What types of data analysis should your company be undertaking at the edge/perimeter?

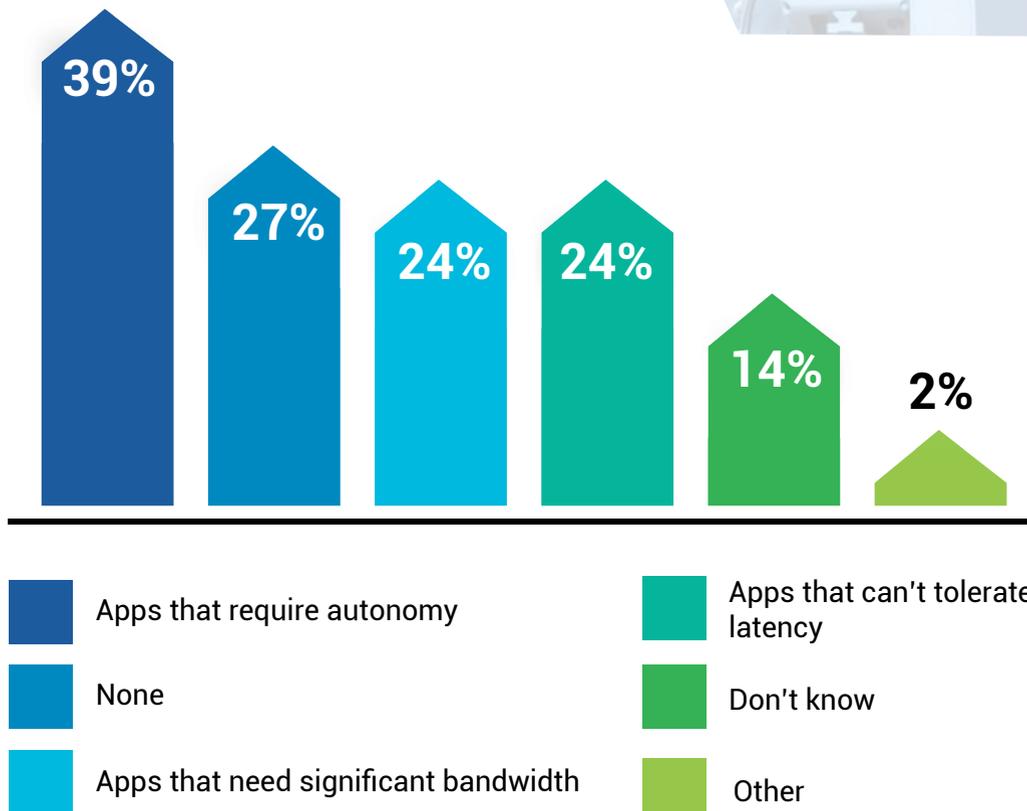
A Data analytics applied in industrial computing environments tend to be either predictive or aimed at process automation. Machine learning applies computerized statistical methods to production environments.



APPS JUST WANT TO BE FREE

Q What applications have you implemented, or do you plan to implement, on edge computers?

A According to respondents, edge computing is best suited to applications that require autonomy, high bandwidth and low latency.



IN THE AGE OF VIRTUALIZATION



More and more, higher performing control systems need highly available server infrastructure. But the plants we work with, they don't have support staff. Stratus is a good opportunity for us to use something that's monitored 24 by 7. They're continuously available.

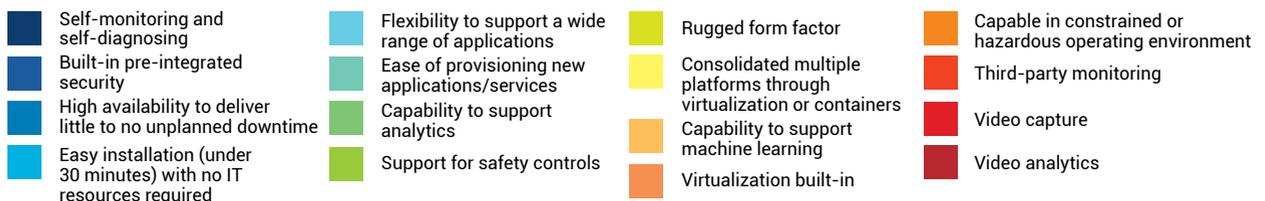
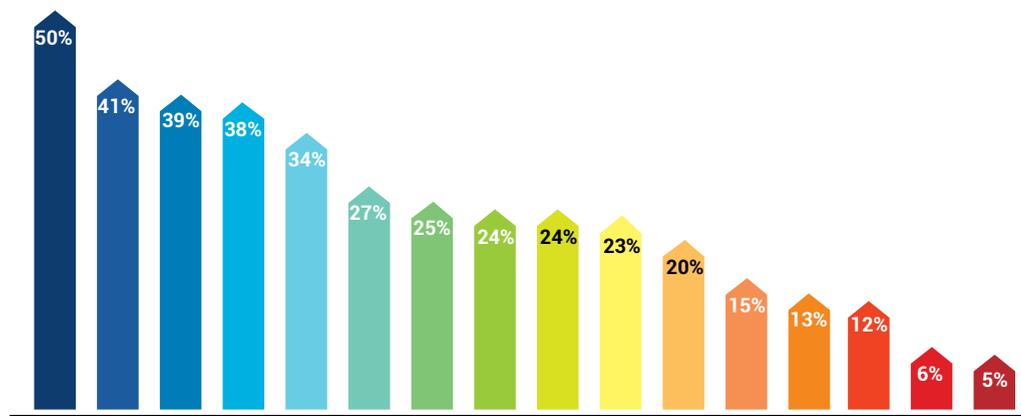
- Dan Malyszko,
director of operations



Q Which of the following capabilities should be most important when selecting an edge computing device supplier?

Respondents identify the top 5 attributes to look for in a supplier:

1. Self monitoring and self-diagnosing
2. Built in pre-integrated security
3. High availability, little to no downtime
4. Easy to Install
5. Ability to support a wide range of applications



An engineering career



Engineers looking to advance their careers are embracing opportunities and addressing the challenges of integrating and analyzing data to derive information that supports decision making about controlled processes.

96% of those surveyed agree with the following:

"All engineers seeking to successfully advance their career must address the challenges and embrace the opportunities brought by new technologies that intake and analyze data to support decision making about controlled processes."

Recently interviewed by CFE Media publication, *Oil & Gas Engineering* magazine, Drew Lafleur, chief technology officer, Technical Toolboxes, said:

"In my experience, I've seen that there are frequently top-performing engineers who are basically working as data scientists. They're motivated to learn how to find, quality control, and integrate data from various sources quickly and can evaluate the soundness of the inputs and outputs. They also find ways to learn new processes and disciplines quickly. This makes them very productive, and other people often leverage their skills to ride in the wake of those efforts."

Learn more about edge computing and hear from some of the brightest automation engineers.

[Visit our Simplifying edge computing for engineers.](#)



Advice from your peers

At the conclusion of the survey we asked respondents for any comments they might have as to the present and future state of edge computing, or any recommendations as how to best get where you're going.

Have a clear scope of work. Choose a solution that is as agnostic to other solutions/technologies as possible.

Break it up into small steps. Provide training and mentoring. Help employees see the value for themselves and the company. Engage employees every step of the way. Follow up on the initial technology training.

Make network security a top priority when starting these programs.

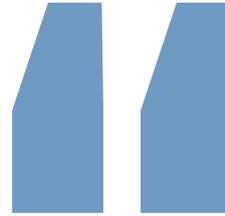
Act as the technical focal point for a cross-function team of business unit leaders, program managers and engineers to define vision and direction in cutting-edge technology development, examining new technologies and developments.

Have at least a need defined with a value proposition statement. Reasonable and clear expectations of what your solution will be expected to deliver so as to define success.

Be prepared for broad implementation and a spectrum of advances.

Closing thoughts

Edge computing, because of the disruption caused by digital transformation, has the same kind of far-reaching benefits and implications to organizations across numerous industries. The same kind of far-reaching advancements following technology advance have been noted many times in the history of the last several hundred years, and especially in the last 40 years. This next wave of digital transformation offers tremendous potential to those who respond early and capitalize on the improvements that can be brought to their operations.



Jason Andersen
vice president, strategy and business line management, Stratus

Companies driven by digital transformation and Industry 4.0 are progressing down a path. They're on a journey to get to an agile, self-adaptive enterprise, which requires edge computing.

See where your organization is on its journey to the edge.

**TAKE YOUR
SELF-ASSESSMENT
TODAY**



Mike Carroll,
vice president, Georgia Pacific

For us, it's about having an ecosystem that you can share with your partners, and, more importantly, with your customers; just as Amazon does with almost every one of us. It's everyone having the same data that's important. It's the ecosystem that's important. You don't need to own the math, the data engineering and data science. You can buy that.



Survey Methodology

Objective

This custom study was conducted on behalf of Stratus Technologies by CFE Media and Technology. The survey was designed to gauge the usage, implementation and challenges of edge computing in production and operations environments.

Sample

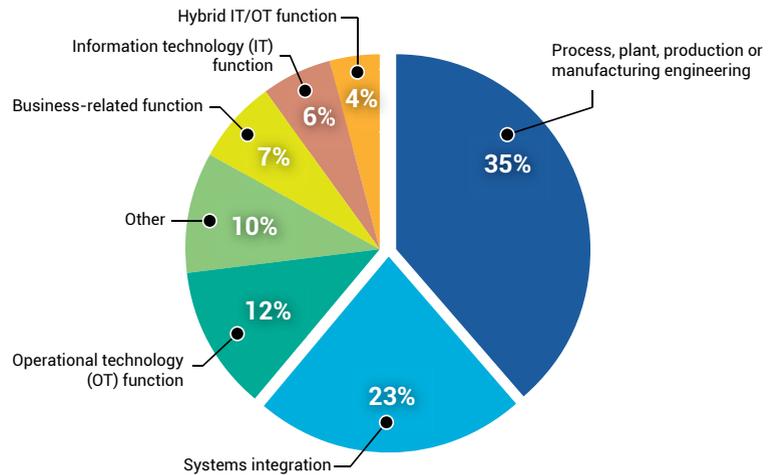
The sample was selected from qualified subscribers of Control Engineering and Plant Engineering products with valid email addresses. One qualifying question began the survey, ensuring the sample only contained individuals who are involved in the research, design, procurement, selection process, management or disposition of products, services or programs meant to enable edge connectivity, control and computing in production or operations environments.

Method

One questionnaire was created and deployed by CFE Media and Technology. Recipients were not informed that the survey was being conducted on behalf of Stratus Technologies.

- **Data collected:** June 17 through August 1, 2019
- **Number of qualified respondents:** 292
- **Margin of error:** +/- 5.74% at a 95% confidence level
- **Incentive:** Survey participants were offered the opportunity to enter a drawing for the chance to receive a \$300 Amazon.com gift card.

What is your primary job role?



In U.S. dollars, what is your company's annual total gross revenue?

