

# Internet Of Everything Solutions Are Gaining Momentum

Addressing Security Concerns Is Key  
In Moving Forward

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## Executive Summary

Connected world solutions, often referred to as the Internet of Things (IoT), are transforming organizations worldwide by enabling objects and infrastructure to interact with monitoring, analytics, and control systems over Internet-style networks.<sup>1</sup> Some organizations are seeking to extend their connected world initiatives further by using the networked connection of people, process, data, and things to differentiate products, improve efficiencies, enhance customer interactions, and transform business processes. This broader definition is often referred to as the Internet of Everything (IoE).

In July of 2014, Cisco commissioned Forrester Consulting to evaluate industry and government sector understanding of and adoption timelines for IoE technologies, applications, and solutions. The online survey comprised 234 line-of-business or IT professionals with influence over their organizations' IoE strategy in organizations located in the United States, the United Kingdom, France, and Germany. US organizations had 1,000+ employees, while those in France, Germany, and the United Kingdom had 500+ employees. Survey respondents represented manufacturing, retail, healthcare, utilities, transportation, financial services, and oil, gas, and petroleum industries, as well as government and education. Key study objectives included understanding deployment timelines for IoE solutions, identifying important technology and solution elements necessary to deploy IoE solutions, and clarifying characteristics of third-party partners who can help organizations deploy IoE applications and solutions.

### KEY FINDINGS

Highlights of the study include:

- › **IoE solutions are a reality today.** These IoE solutions leverage sensors, technology infrastructure, applications, and data analytics to connect physical objects, processes, and individuals. Organizations representing every sector we surveyed are deploying IoE solutions.
- › **IoE solutions help organizations transform operations and enhance business processes.** Organizations use IoE solutions to achieve many different types of strategic, operational, and collaborative benefits. Enhancing real-time decision-making, reducing costs, and transforming business processes and operations are leading outcomes surveyed organizations are pursuing with IoE solutions.

Cost efficiencies are the top IoE solution benefit identified by healthcare and financial services firms, while real-time decision-making is the top benefit of IoE solutions among retail and transportation firms. Some organizations use IoE solutions to advance workforce productivity by improving workforce collaboration and optimizing labor utilization.

- › **There is strong IoE momentum, with many organizations implementing or planning to implement IoE solutions within the next five years.** Key IoE solutions deployed by surveyed organizations are focused on improving the cost-efficient use of assets, personnel, and resources; facilitating collaboration with employees, partners, suppliers, and customers; and improving regulatory compliance. Future IoE application deployment plans are focused on improving forecast accuracy, enhancing real-time decision-making capabilities, and improving customer experience.
- › **Security is an important IoE solution element, but many organizations are challenged in this area.** Implementing IoE solutions requires many different technical elements, such as networking, infrastructure, systems integration, devices, applications, and analytics for seamless deployment. Security, however, is of paramount importance. In fact, 75% of survey respondents rated security solutions as important or very important to IoE solution deployment. However, 60% of surveyed organizations also identify security solutions as a significant challenge (rated 4 or 5 on a 1-to-5 scale) for their organization to address.
- › **IT infrastructure and security firms are the leading vendors identified to assist organizations with IoE solution implementation.** Many surveyed organizations seek help from third-party vendors to implement IoE solutions. IT infrastructure and security solution providers are identified as the leading partners to provide implementation assistance. Surveyed organizations identified reliability, security, scalability, and solution integration expertise as important characteristics of these third-party IoE solution partners.

## Internet Of Everything Solutions Help Organizations Realize Differentiating Business Benefits

Connected world solutions, often referred to as the Internet of Things (IoT), leverage machine-to-machine (M2M) technologies (e.g., sensors, GPS technology, and RFID tags) to link physical assets to analytics and control systems through the Internet.<sup>2</sup> Organizations worldwide are currently utilizing these solutions in a number of transformative ways, such as optimizing assets, differentiating products and services, and transforming customer relationships.

In an effort build on these initiatives, some organizations seek to extend these IoT solutions by using the networked connection of people, process, data, and things to further differentiate products, maximize efficiencies, enhance customer interactions, and transform business processes. This broader definition, often referred to as the Internet of Everything (IoE) is defined as:

“Sensors, technology infrastructure, applications, and data analytics to connect objects, processes, and individuals for uses such as increasing sales, enhancing customer interaction, improving efficiencies, differentiating products and services, or transforming business processes.”

The breadth and variety of IoE solutions help surveyed organizations address a wide range of strategic, operational, and workforce enablement challenges (see Figure 1):

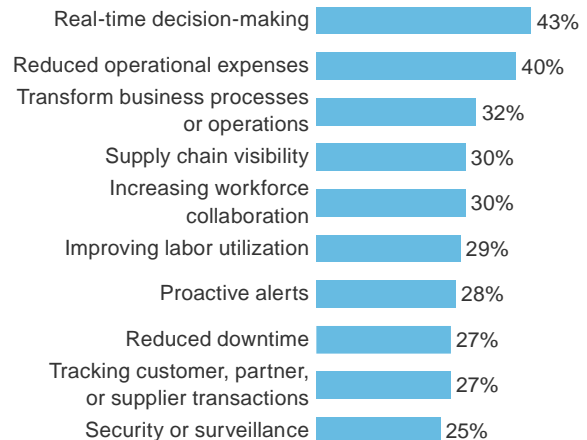
- › **Forty-three percent of organizations use IoE solutions to enable real-time decision-making in their organization.** Decision-makers in our study see the benefits of IoE chiefly in addressing strategic challenges such as real-time decision-making and helping to open new markets (21%).
- › **Thirty-three percent of organizations use IoE solutions to transform business processes or operations.** In fact, 30% of organizations are using IoE solutions to address supply chain management and visibility issues.
- › **Thirty percent of firms recognize IoE solutions as beneficial toward increasing workforce collaboration, and 29% see IoE solutions as beneficial for optimizing labor utilization.** Nearly one-third of decision-makers seeking to increase collaboration and optimize

FIGURE 1

Internet Of Everything Solutions Help Organizations Achieve Many Business And Operational Benefits

“Which of the following issues, if any, would your organization address by implementing applications and solutions that enable the ‘networked connection of people, process, data, and things’?”

Top 10 issues



Base: 234 Internet of Everything decision-makers

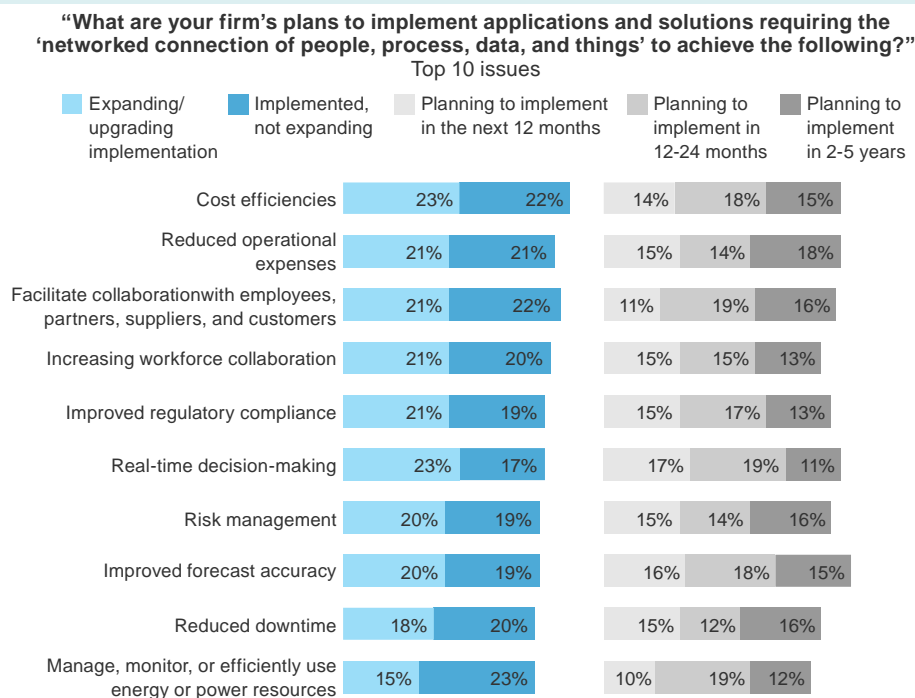
Source: A commissioned study conducted by Forrester Consulting on behalf of Cisco, July 2014

labor utilization with IoE solutions signify the importance of the human element as a key feature of IoE.

- › **Key benefits achieved from IoE solutions vary by industry sector.** There are significant differences in the key benefits of IoE solutions within particular vertical markets. Cost efficiencies are the top IoE solution benefit identified by healthcare and financial services firms. In comparison, real-time decision-making is the top benefit of IoE solutions among retail and transportation firms. Government organizations are particularly focused on achieving risk management benefits from IoE solutions.

FIGURE 2

## Implementation Timelines Highlight Many Current And Planned Internet of Everything Initiatives



Base: 234 Internet of Everything decision-makers

Source: A commissioned study conducted by Forrester Consulting on behalf of Cisco, July 2014

## Internet Of Everything Solutions Are A Reality For Many Organizations Today

Deployment momentum is strong. IT and line-of-business decision-makers in our surveyed organizations have deployed or are planning to deploy a wide range of IoE applications and service initiatives (see Figure 2):

- Between 42% and 45% of organizations have implemented or are expanding implementation of IoE applications to enable cost-efficient use of assets or resources.** The leading category of IoE applications deployed by surveyed organizations addresses cost efficiencies. Momentum for these applications will continue in the future, as 47% of surveyed organizations plan to implement these cost-efficient IoE solutions within five years. In the manufacturing industry, industrial asset tracking and monitoring enables firms to ensure optimal performance and use of assets. These applications can enhance fabrication, assembly, and packaging processes. Manufacturers can also use IoE applications to prevent theft and reduce loss of expensive machinery and assets.

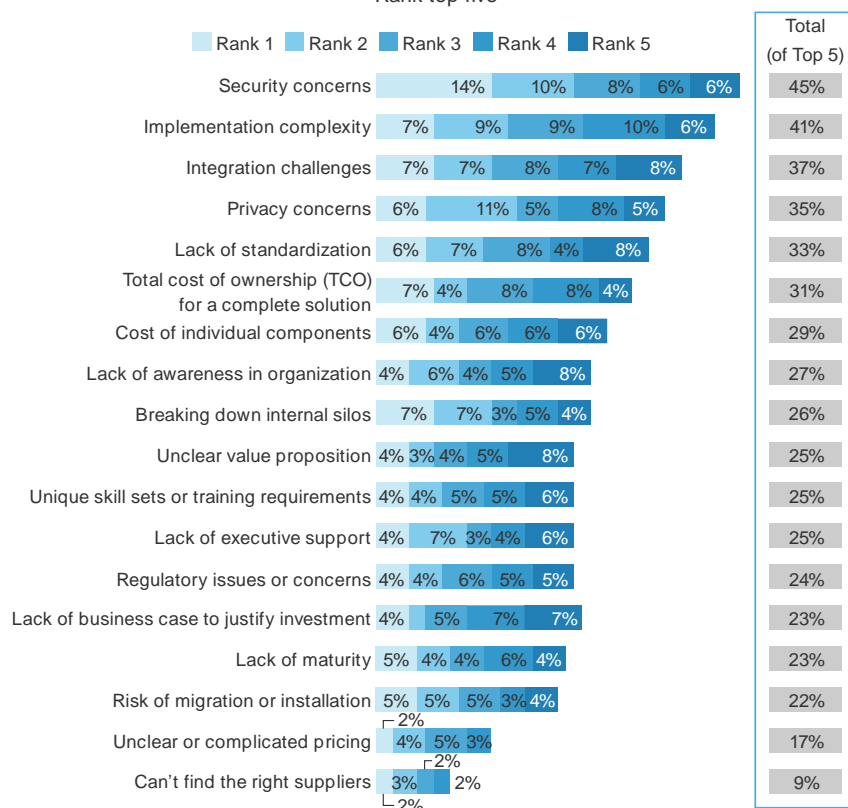
- Forty-three percent of organizations have implemented IoE applications to enhance internal and external collaboration.** Additionally, 41% of surveyed organizations have implemented solutions to specifically increasing workforce collaboration. Future plans to deploy these collaboration initiatives are significant, as another 43% to 46% of organizations plan to deploy these internal- and external-facing IoE collaboration applications in the future.

- Other IoE applications address regulatory compliance or enable resource management.** Forty percent of surveyed organizations have implemented or are expanding implementation of IoE applications to improve regulatory compliance. In some vertical markets — including financial services, healthcare, government, transportation, and utilities — organizations use IoE solutions to monitor and track high-value resources such as expensive medical equipment or field service vehicles. Thirty-eight percent of organizations are using applications to manage, monitor, or efficiently use energy or power resources.

FIGURE 3

## Organizations Must Overcome Security Concerns And Other Challenges In Order To Deploy Internet Of Everything Solutions

“Please rank the top five hurdles/challenges your organization must overcome to implement applications and solutions requiring the ‘networked connection of people, process, data, and things.’”  
Rank top five



Base: 234 Internet of Everything decision-makers

Source: A commissioned study conducted by Forrester Consulting on behalf of Cisco, July 2014

## IoE Solution Deployment Has Its Challenges

Organizations must overcome various hurdles in order to deploy Internet of Everything solutions. Specifically, security concerns, implementation complexity, integration challenges, privacy concerns, and lack of standardization are ranked as the top five challenges by between 33% and 45% of surveyed organizations (see Figure 3).

Seamless IoE solution deployment often requires firms to evaluate and integrate a wide variety of technology elements (see Figure 4). Survey respondents rated the importance of each technology element to their organization's IoE solutions, as well as how challenging it is to implement each element. A comparative analysis of these

ratings highlights opportunities for third parties to assist organizations with particular elements of their IoE solution deployment:

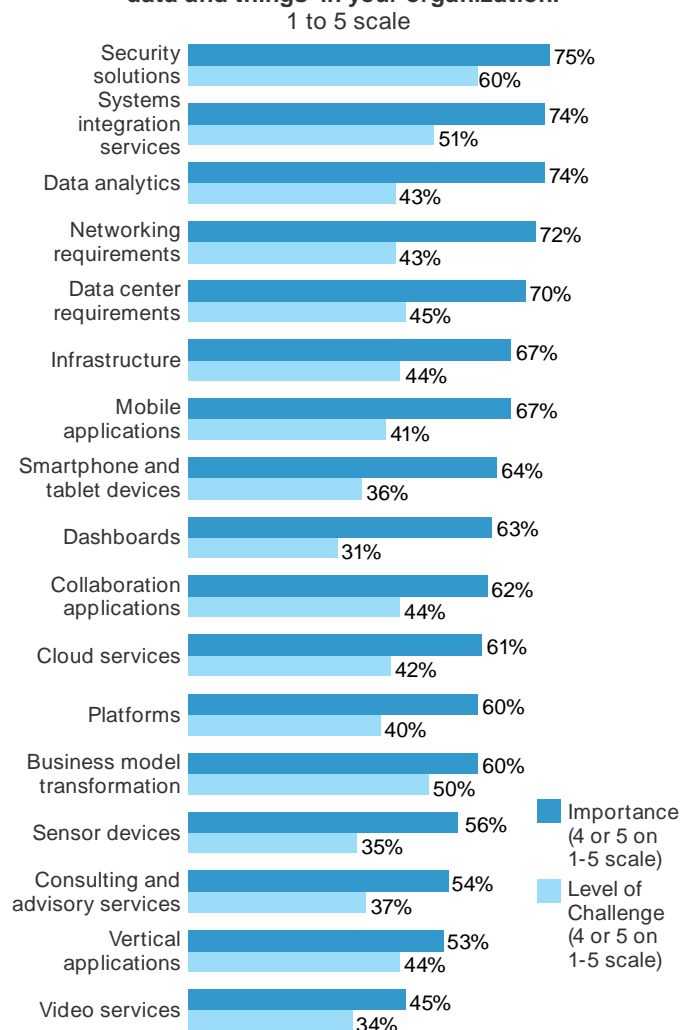
- › **Security is an important IoE technology element but is a significant challenge for many organizations.** As Internet-connected devices capture and transmit data, and take autonomous actions using this data, there are significant network, device, and data security implications.<sup>3</sup> Security issues can include device authentication, tampering or hacking detection, and ensuring data output integrity. Three-quarters of decision-makers consider security solutions important or very important to enabling IoE solutions. However, 60% of respondents rate security solutions as a key challenge to implementing Internet of Everything solutions.

- › **At least two-thirds of organizations rate IT networking and infrastructure components as important IoE technology elements.** Fixed or wireless network infrastructure such as cellular, Wi-Fi, satellite, and WLAN technologies are required to connect the fragmented array of devices used in IoE solutions. Corporate decision-makers must evaluate the benefits and challenges relative to the security issues, installation costs, and reliability for each network technology. Between 43% and 44% of respondents stated that their organization is challenged with implementing IoE network infrastructure elements.

**FIGURE 4**

**Many Technical Elements Are Important To Enable Seamless, End-To-End Internet Of Everything Solutions**

**“On a scale of 1 to 5, please rate the following elements based on how important and the level of challenge each is to implementing applications and solutions that enable the ‘networked connection of people, process, data and things’ in your organization.”**



Base: 234 Internet of Everything decision-makers

Source: A commissioned study conducted by Forrester Consulting on behalf of Cisco, July 2014



## Organizations Seek Partners To Assist With IoE Solution Implementation

The challenges and complexity associated with IoE solution deployment drives many decision-makers to seek assistance from trusted partners. Many vendors and service providers are positioning their capabilities to address the needs of firms that request IoE solution deployment assistance (see Figure 5). The leading categories of vendors considered by our study respondents are IT infrastructure and security solution providers. In fact, 50% of organizations seek assistance from IT infrastructure providers, and 43% of respondents seek assistance from security solution providers. Key attributes used to select vendors who can assist with IoE solution deployment are identified below (see Figure 6):

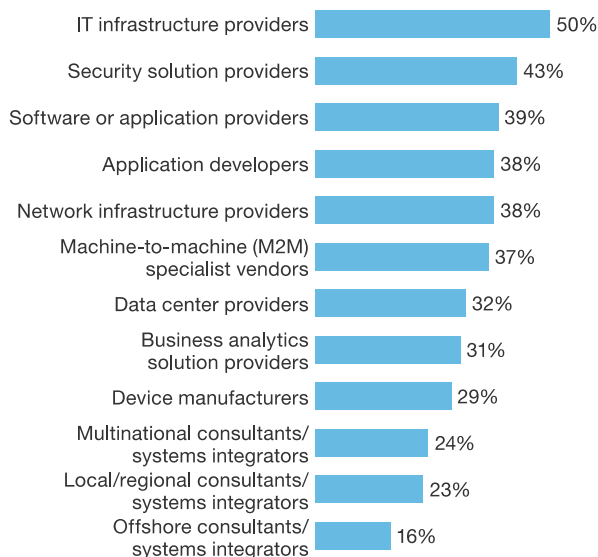
- › **Reliable and scalable solutions as well as security expertise are important attributes of third-party vendors.** Deploying IoE solutions requires many different technical and service elements. The leading

**FIGURE 5**

**Respondents Turn To A Variety Of Third Party Providers To Assist With Internet of Everything Solution Implementation**

**“When thinking about implementing applications and solutions that enable the ‘networked connection of people, process, data, and things,’ which of the following partners, if any, would be helpful to your organization?”**

Select all that apply



Base: 234 Internet of Everything decision-makers

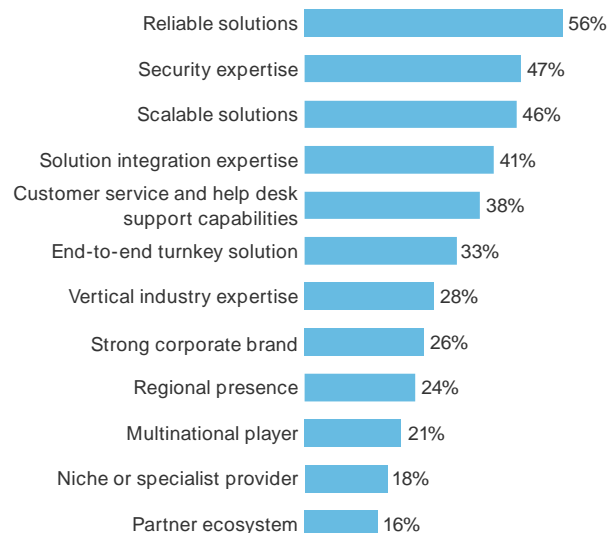
Source: A commissioned study conducted by Forrester Consulting on behalf of Cisco, July 2014

**FIGURE 6**

**Reliable Solutions, Security Expertise, Scalability, And Integration Expertise Are Important Attributes Of A Third-Party Internet Of Everything Partner**

**“When thinking of a potential partner for implementing applications and solutions that enable ‘networked connection of people, process, data, and things,’ which of the following company attributes, if any, would be the most important?”**

Select all that apply



Base: 234 Internet of Everything decision-makers

Source: A commissioned study conducted by Forrester Consulting on behalf of Cisco, July 2014

characteristics used to identify vendors who can assist with IoE solution implementation include: reliable solutions (56%), security expertise (47%), and scalable solutions (46%). In addition, 41% of organizations identified integration expertise as an important capability of vendors who help with IoE solution implementation.

- › **Other characteristics include customer service support and vertical industry expertise.** Customer support and help desk concerns are important vendor criteria for 38% of organizations. In addition, it is important for third-party partners to understand vertical industry regulations and requirements. These characteristics are particularly relevant in healthcare, energy, government, manufacturing, transportation, and financial services markets.



## Key Recommendations

Results from our study of large organizations in the United States, the United Kingdom, France, and Germany show that Internet of Everything solutions are currently being deployed by organizations in many sectors including: manufacturing, retail, healthcare, utilities, transportation, financial services, and oil, gas, and petroleum, as well as government and education organizations. IoE solutions enable organizations to use sensors, technology infrastructure, applications, and data analytics to connect objects, processes, and individuals to innovate by increasing sales, enhancing customer interaction, improving efficiencies, differentiating products, or transforming business processes. Successful adoption of IoE solutions requires decision-makers in industry and government organizations to:

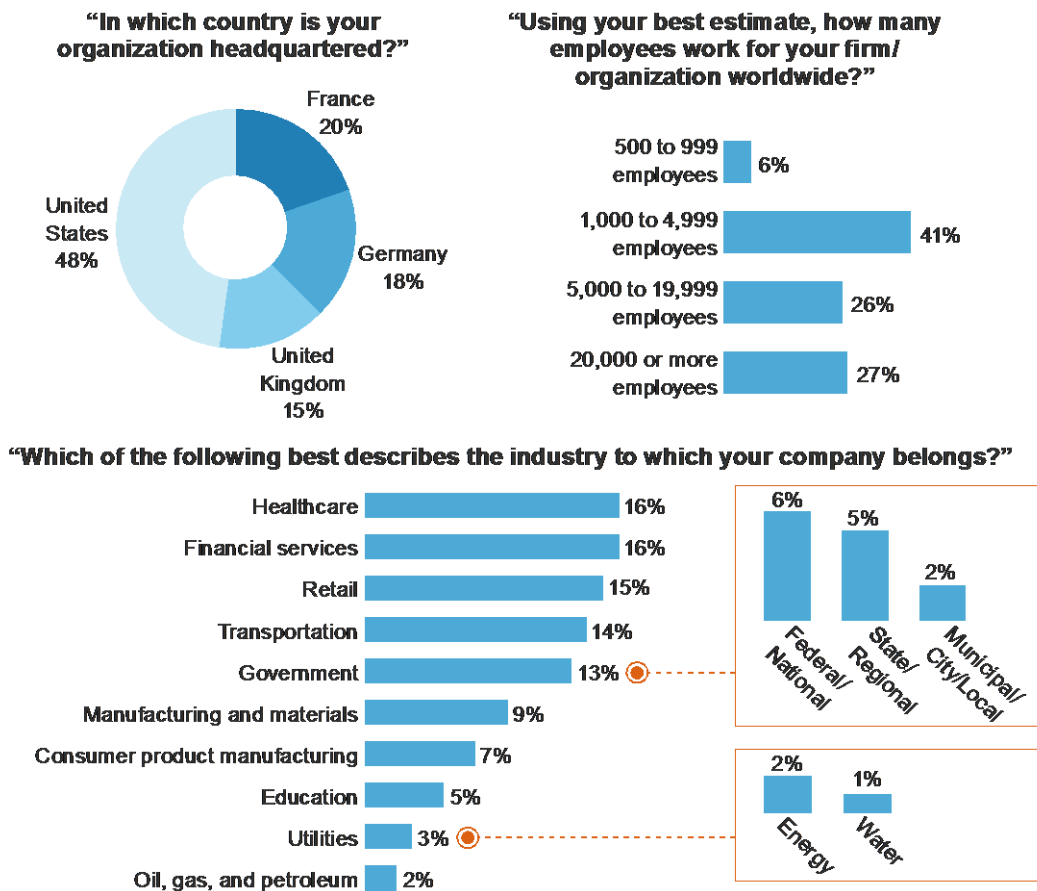
- › **Prioritize opportunities and risks of deploying Internet of Everything solutions in their organization.** Decision-makers should develop and implement a cross-functional team initiative to identify, evaluate, and prioritize the most relevant IoE applications and opportunities. This solution identification and evaluation process must take into consideration the organization's unique value proposition, regulatory or public sector issues, and competitive landscape.
- › **Identify key technology elements that are critical for IoE solution deployment success.** End-to-end solution implementation requires many elements including network infrastructure, security solutions, integration with applications and processes, and data analytics services. Decision-makers must focus on identifying and evaluating important technical and service elements necessary to develop and deploy IoE solutions as well as assess their organization's ability to implement these technical elements. Successful implementation requires decision-makers to identify and evaluate vendors who can assist with developing and deploying IoE applications and solutions.
- › **Evaluate third-party vendors with necessary expertise to enable seamless IoE solution deployment.** The organization's IoE innovation team should identify a list of network infrastructure providers, security solution providers, and other types of vendors who can help them achieve their implementation goals. Network infrastructure and security elements are identified as particularly important components of IoE solutions. This vendor assessment process will enable decision-makers to identify vendors with the necessary characteristics and attributes to assist with their IoE solution implementation goals.

## Appendix A: Methodology

In this study, Forrester conducted an online survey of 234 line-of-business or IT professionals with influence over their organization's IoE strategy in organizations located in the United States, the United Kingdom, France, and Germany. Organizations in the United States had 1,000+ employees, while organizations in France, Germany, and the United Kingdom had 500+ employees. Key study objectives included understanding deployment timelines for IoE solutions, identifying important technology and solution elements necessary to deploy IoE solutions, and clarifying characteristics of third-party partners who can help organizations deploy IoE applications and solutions. The study began in June 2014 and was completed in July 2014.

**FIGURE 7**

**Decision-Makers Surveyed For This Study Represented The US And Western Europe, A Variety Of Industries, And Primarily Came From Organizations With 1,000 Or More Employees**



Base: 234 Internet of Everything decision-makers

Source: A commissioned study conducted by Forrester Consulting on behalf of Cisco, July 2014

## Appendix B: Supplemental Material

### RELATED FORRESTER RESEARCH

"Mapping The Connected World," Forrester Research, Inc., October 31, 2013

"Prepare Your Security Organization For The Internet Of Things," Forrester Research, Inc., October 23, 2012

## Appendix C: Endnotes

<sup>1</sup> See the October 31, 2013 Forrester Research report, "Mapping The Connected World."

<sup>2</sup> See the October 31, 2013 Forrester Research report, "Mapping The Connected World."

<sup>3</sup> Insight into the security implications of Internet of Things solutions are addressed in the October 23, 2012 report, "Prepare Your Security Organization For The Internet Of Things."