

State of IoT

2015 Global Developer Study

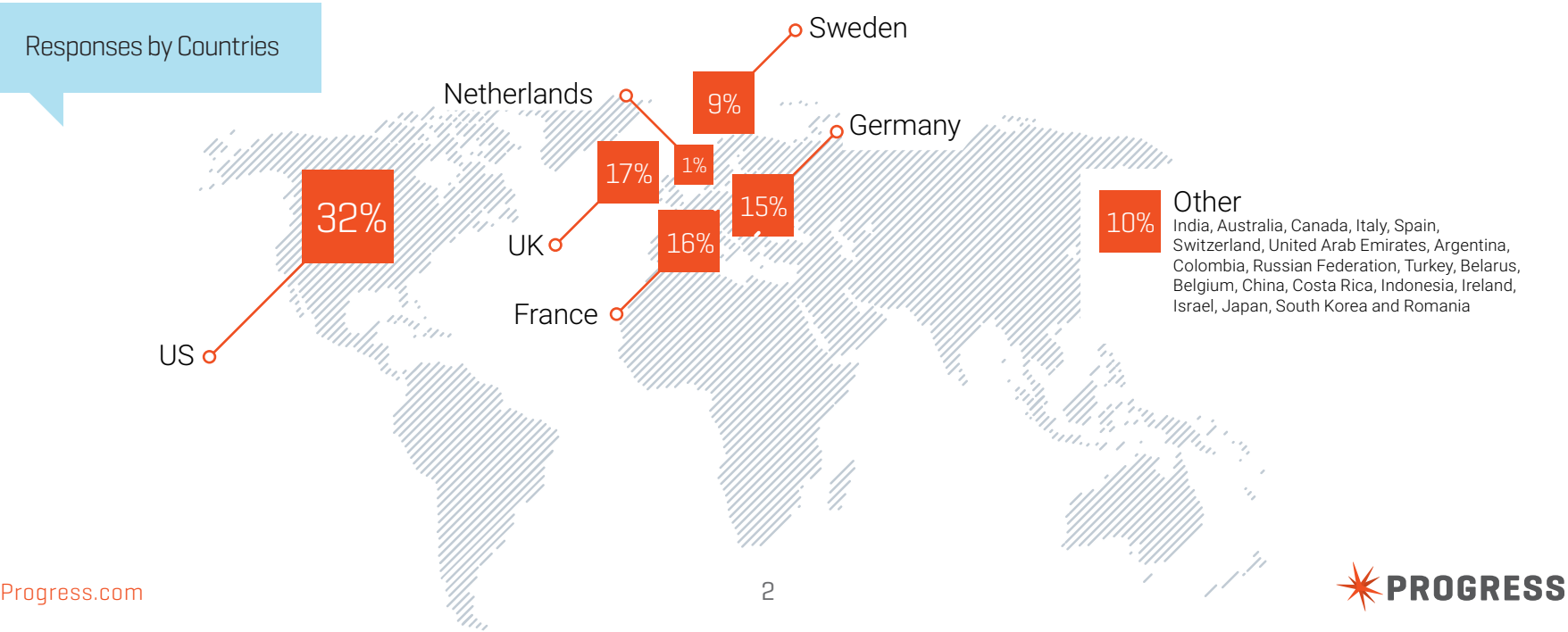


Summary

This Global IoT Developer Survey was designed to collect feedback from application and software developers on the Internet of Things (IoT) and the challenges and trends they face. The survey is primarily focused on the U.S. and European markets. The study has been commissioned by Progress, and done in conjunction with Harbor Research, a research technology and consulting business with a specific practice on IoT.

We surveyed 678 developers across the world during January and February 2015 in an attempt to answer some of the questions today on the developer and CIO mind alike—what is IoT, what are the leading industries and markets of today and tomorrow, do IoT apps generate revenue, what are the challenges before the developer community today and where is the IoT headed?

Answers to these questions and more can be found on the following pages.



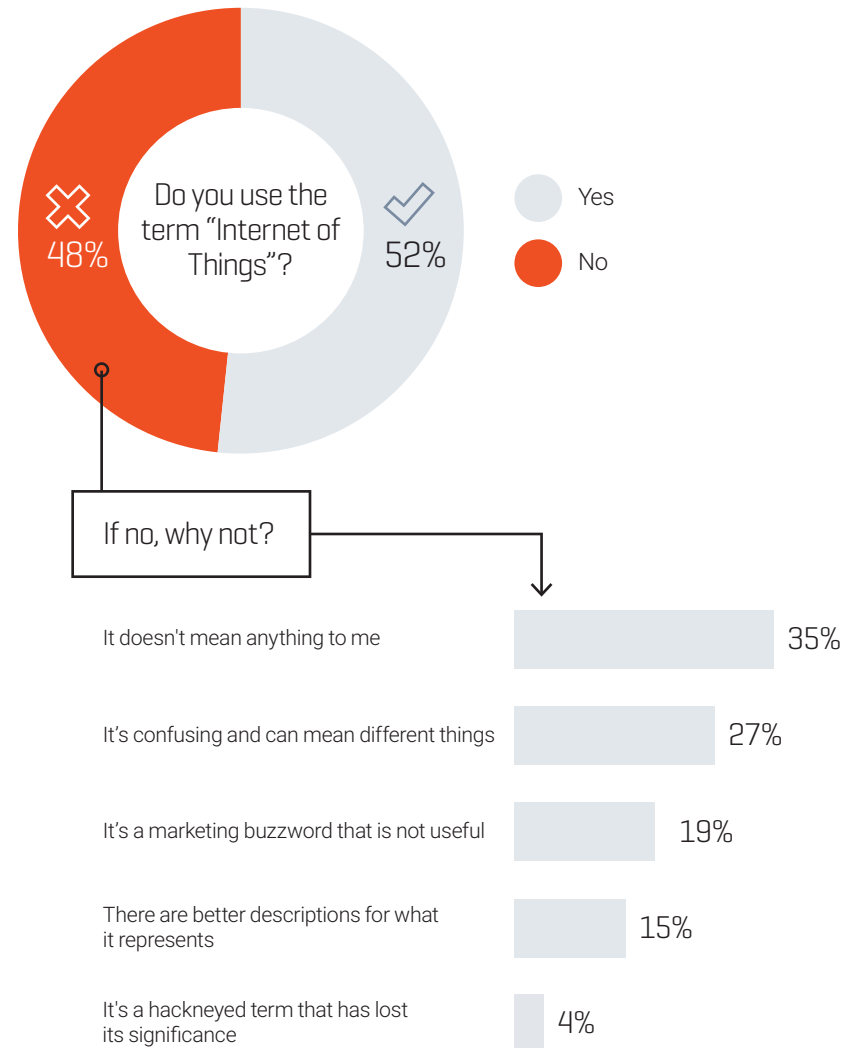
15 Key Findings

- 1 Just over half of respondents use the term “IoT.” Of those that don’t, 27% say it’s because the term is confusing and can mean many different things.
- 2 Over 75% of respondents are excited about IoT to some degree, while only half of developers surveyed feel prepared to deliver on IoT expectations.
- 3 Most respondents see mass adoption of IoT apps occurring within the next 5 years.
- 4 45% of all respondents are currently developing IoT apps.
- 5 Developers see strong IoT app development across industries. Current leaders include Smart Home, Automotive and Wearables, giving way to Healthcare, Smart City and Automotive in the next 3-5 years.
- 6 For 2/3 of developers, less than 25% of IoT apps in production are currently generating revenue.
- 7 Developers expect to see more of these apps bringing in revenue over the next 10 years.
- 8 Only 50% of developers say they have the skills, resources and technological tools to deliver on IoT expectations.
- 9 Interoperability, integration, and security and privacy are among the top concerns for IoT developers. Respondents are divided on when or if these challenges will be resolved.
- 10 Respondents are divided on which OS is best for building and coordinating IoT apps, with Android seen as the top OS by 29% of respondents.
- 11 Developers are not strongly united around a particular platform for developing IoT apps, although Java is the leader for server-side data with the support of 55% of respondents.
- 12 Over 60% of developers see future IoT apps running on the cloud and interacting with multiple devices.
- 13 Well over half of developers use Rapid Application Development (RAD) tools at least occasionally, while 25% of developers never use RAD tools.
- 14 In the development phase, respondents said they face challenges in managing large amounts of data and dealing with inflexible technologies.
- 15 Respondents are receiving support and training from a variety of sources. The open source community is considered by many to be a source of support, education and a potential engine for addressing development challenges.

What Is IoT, Really?

There is significant noise in the marketplace around the term IoT, and an uneven understanding of its value. Solution providers must clearly articulate their value proposition in order to break through the noise.

Lack of clarity surrounding the concept and potential value of the IoT continues to be a challenge for all. Offerings must provide a measurable return to users and be marketed to showcase those benefits.

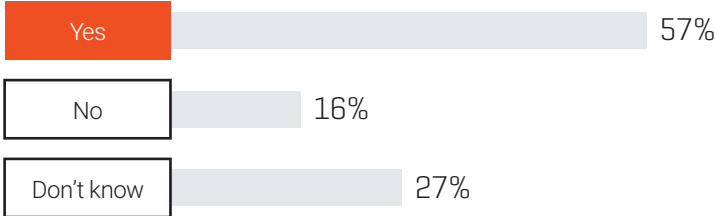


Commercial Potential of IoT Apps

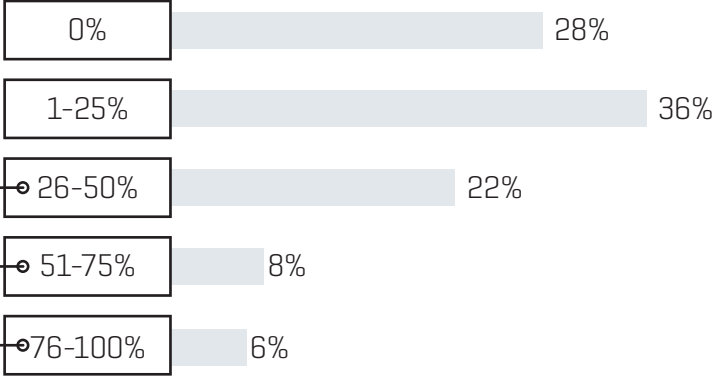
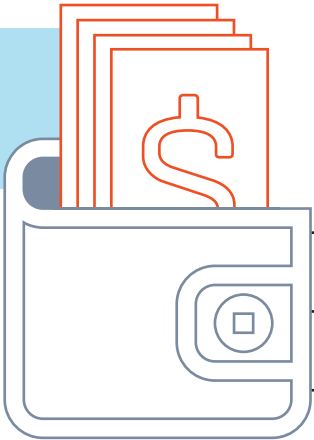
65% of IoT applications today generate revenue. Business models have not kept pace with technology advances, as hardware producers try to transform into service providers overnight without a clear value proposition or product strategy.

Low levels of monetization reflect the relative immaturity of the market and business models. However, once offerings become more mature, and developers focus more on services rather than devices, significant revenue potential will open up (for example, charging for a service rather than single download), and many developers predict revenue rising to 80 percent in the next 2-3 years.

Will building apps for the IoT require developers to shift from focusing on devices to focusing on services based on user data?



What percentage of your IoT apps in production today are generating revenue for you or your business?



Industries Leading the Way— From Smart Home to Smart City











The smart home has been a key growth area for the IoT so far due to applications such as energy management, home automation and security, delivering clear value that resonates with customers. While consumer segments such as smart home and wearables tend to dominate headlines as key markets in IoT, business and industry focused segments (for example, manufacturing, healthcare, automotive and smart city) will be key growth areas.

TODAY

When asked which industries are key to IoT app development, research respondents cited smart homes (19%), wearables (13%), automotive (11%) and sports/fitness (11%) as the primary markets. They also named these industries as having the highest IoT app revenues today. The public sector was at the bottom of the list (4%).

TOMORROW

A shift is predicted in 3-5 years' time, with app developers expecting healthcare (14%) to lead the charge, followed by smart city (13%) and automotive (12%) as the top three industries for IoT app development and revenue generation. Public sector also rises to match today's popular Wearables market (both 8%).

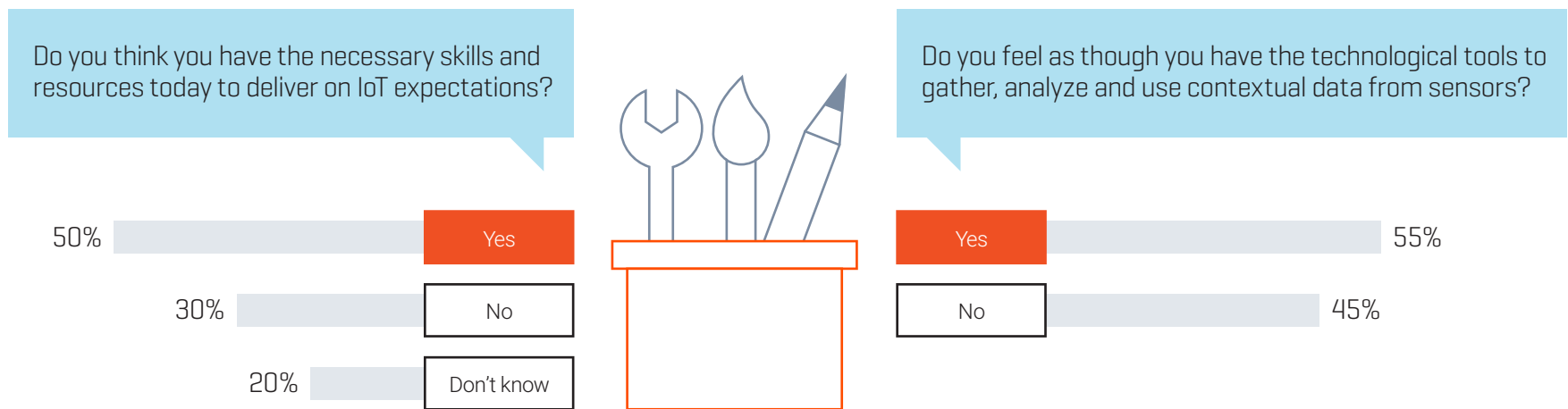
Industry	Rank today	Change	Rank in 3-5 years
 Smart Home	1	↘	5
 Retail	9	↗	4
 Automotive	4	↘	3
 Manufacturing	7	↗	6
 Healthcare	6	↗	1
 Sports/Fitness	3	↘	10
 Wearables	2	↘	9
 Logistics	5	↘	7
 Public Sector	10	↗	8
 Smart City	8	↗	2

Technology and Language Preferences

Without a single set of standards in IoT or a clear winner among OS or platforms, developers will continue to require flexible technologies that allow to develop once/ deploy everywhere, and that can integrate and operate with other related applications.

To cope with the fragmentation in standards and heterogeneous ecosystems of device interactions, new methods of software development that are flexible and allow rapid development and easy integration with a variety of other platforms will be required.

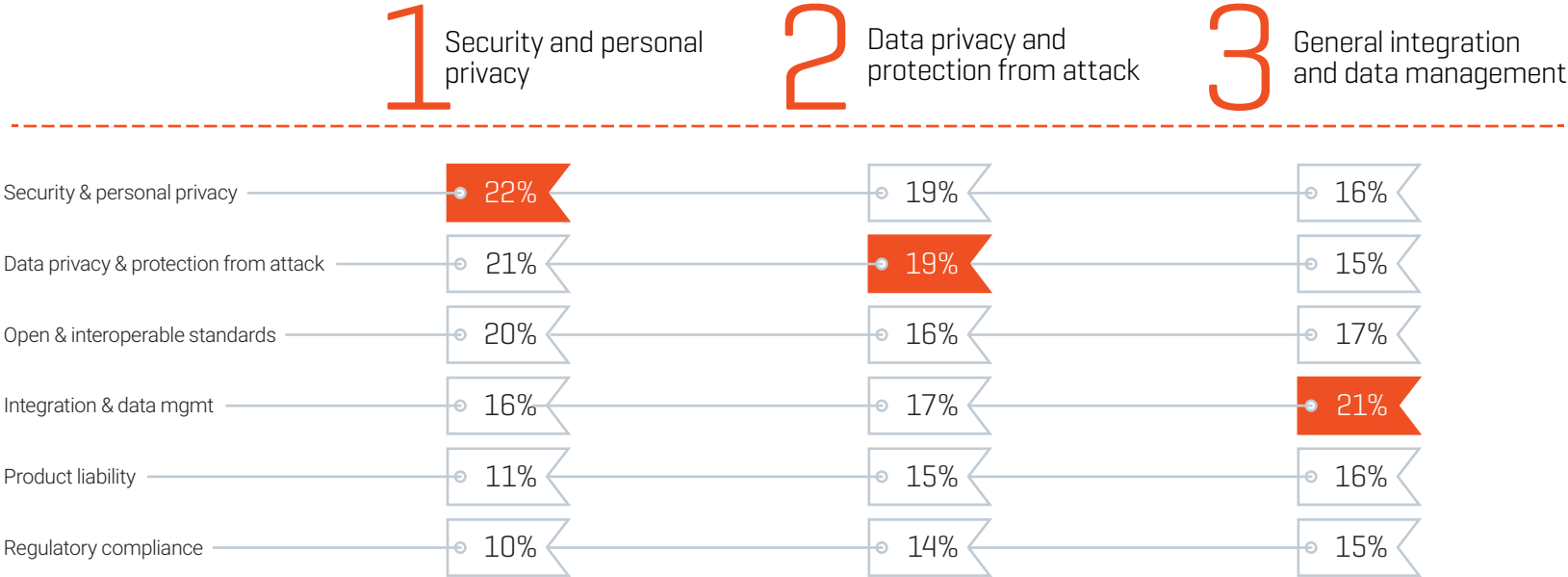
- ▶ Developers cite Android as the best operating system (OS) for building apps for IoT devices (29%), followed by Windows (24%), Linux (21%) and iOS (16%).
- ▶ Java proves the most popular platform/language used to collect and integrate data from the server side (55%), followed by PHP (17%) and Node.js (12%).
- ▶ 40 percent of respondents always or usually use a Rapid Application Development (RAD) tool to build apps, rather than building from scratch, a significant shift from traditional development approaches.



Challenges for the Developer Community

Concerns about security, privacy and integration are widespread, and current activity to address these issues is scattered among government organizations, various company alliances and other disparate groups. A concerted movement by developers has not yet occurred.

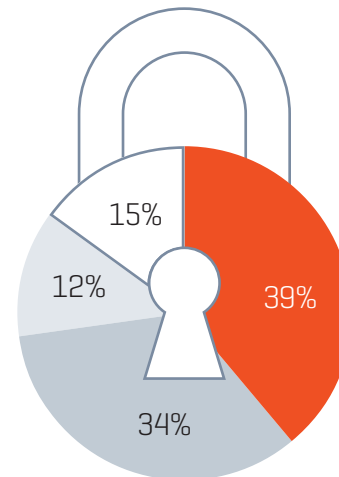
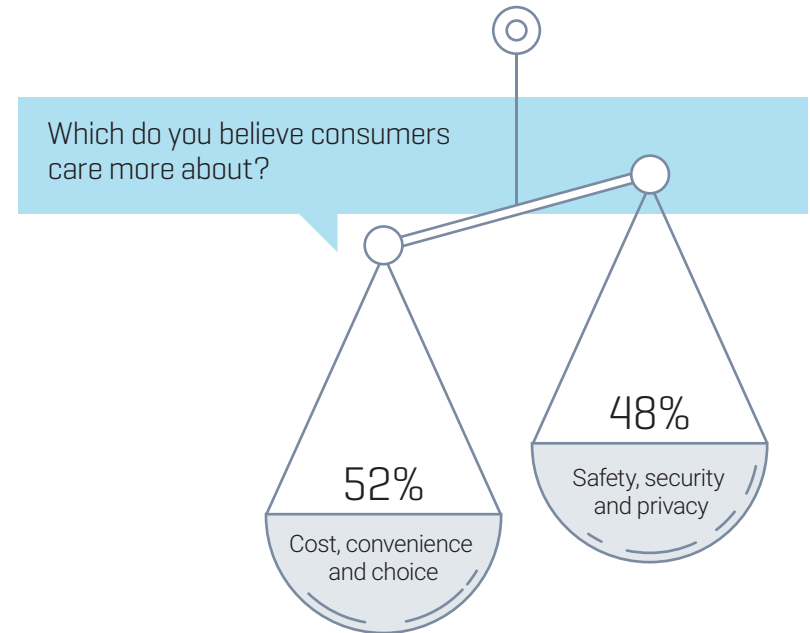
Successful players will help develop a robust and collaborative ecosystem of developers, end users and other relevant market participants. This will help spearhead the development of standards and solutions to overcome challenges of IoT.



Regulation, Privacy and Security a Must

Security has consistently been seen as a major concern in IoT. Regulation surrounding IoT is in the early stages or nonexistent, and is inconsistent across geographies.

- ▶ Security must be factored in from the beginning of development of any IoT product or application.
- ▶ Security worries among businesses and consumers are driving an increased interest in and need for government involvement.
- ▶ At the same time, survey respondents believe commercial vendors (31%) and the open source community (24%) have the greatest power to help overcome these top challenges. They have little faith in the potential contribution from Government (8%) or industry bodies (7%).



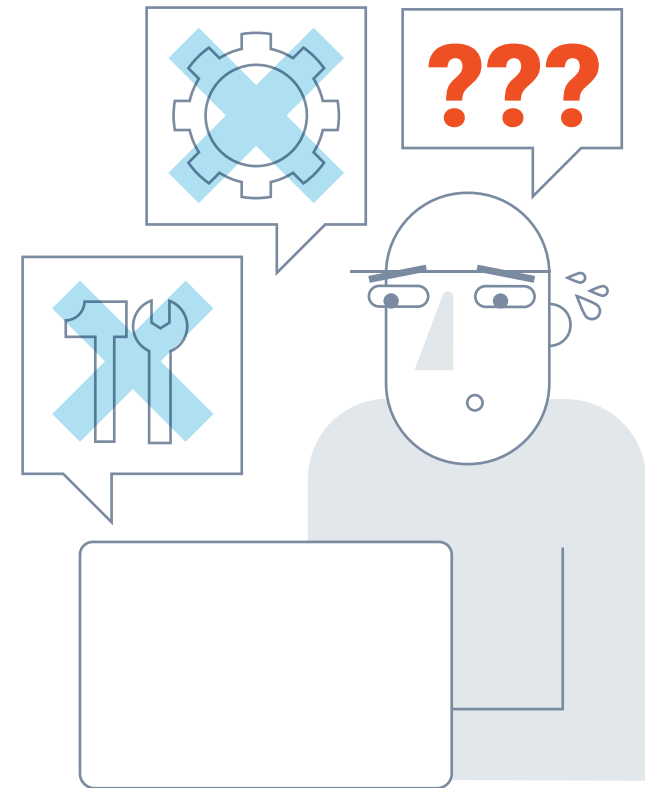
Will regulation to protect privacy affect the development of IoT technology?

- Yes, regulation will positively affect IoT app development
- Yes, regulation will negatively affect IoT app development
- No, regulation will not affect IoT app development
- Don't know

Lack of Technology, Skills and Tools

While 77 percent of respondents consider the IoT opportunity exciting, many still feel they are lacking the necessary technology, skills or tools.

- ▶ 50% of developers don't have or are unsure if they have the necessary technology today to deliver on IoT expectations
- ▶ 51% of developers are unsure or definitely don't have the necessary skills and resources today to deliver on IoT expectations
- ▶ 45% do not feel they have the technology tools to gather, analyze and use contextual data from sensors
- ▶ Nearly a third (30%) experience data overload and feel overwhelmed trying to manage it all when managing data sets for contextualized IoT apps, such as location-based apps



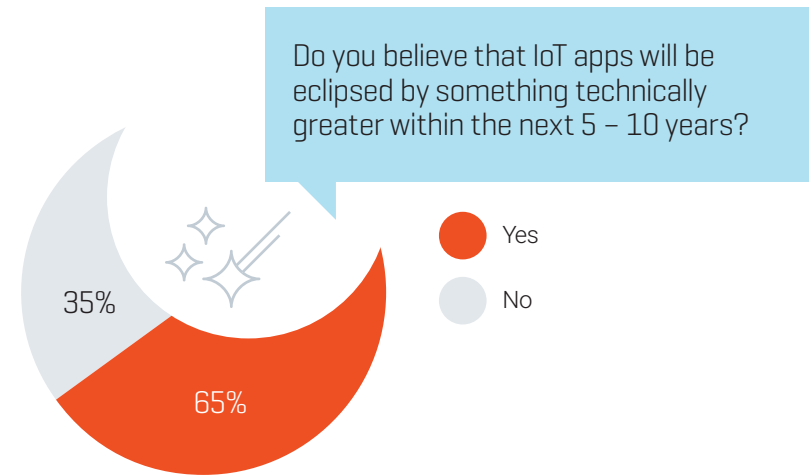
What's Down the Road?

The IoT is rapidly expanding, and IoT-related products are cropping up in all kinds of devices. Although the hype may fade, the effects of the IoT are unlikely to go away in coming years even as technology advances.

The IoT is still in its infancy. Any new offerings should be highly flexible and forward-looking to adapt to new technologies and future needs.

- ▶ **IoT will have a broad impact across all venues:** Healthcare, retail/commercial, facilities and security, transportation, consumer and professional IT and communications, resources, energy and manufacturing.
- ▶ **IoT will require new software tools and interoperability:** To date, the IoT opportunity has consisted of “simple” monitoring applications and related tracking/location services. The biggest challenge IoT faces is the enablement of seamless interoperability between each connection. Addressing this challenge is essential to unlocking the full potential of IoT.
- ▶ **Device data management systems need to mature rapidly:** A new generation of data services will be required to meet data volume, velocity, complexity and overall management challenges, providing real-time analytics, closed-loop control, and local systems collaboration.

- ▶ **Need for architecture that will drive data aggregation, usage and management:** Data management and information management models are required for this market opportunity to flourish. Systems need to be designed to accommodate and provide interoperability between existing M2M systems, different device manufacturers, pre-existing service providers.



About Progress

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