White Paper

Embracing the Internet of Everything To Capture Europe's Share of $14.4 Trillion

More Relevant, Valuable Connections Will Improve Innovation, Productivity, Efficiency & Customer Experience

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Business leaders should begin transforming their organizations based on key learnings from use cases that make up the majority of IoE's Value at Stake.

Executive Summary

- The Internet of Everything (IoE) creates $14.4 trillion in Value at Stake for the *private sector* worldwide – the combination of increased revenues and lower costs that is created or will migrate among companies and industries from 2013 to 2022. (Cisco's Value at Stake analysis does not include the public-sector and consumer segments.)
- Europe's share of the global Value at Stake is $4.3 trillion for the next decade.[1]
- The five main factors that fuel IoE Value at Stake in Europe are: 1) asset utilization (reduced costs) of $1.85 trillion; 2) employee productivity (greater labor efficiencies) of $1.06 trillion; 3) innovation (reducing time to market) of $766 billion; 4) supply chain and logistics (eliminating waste) of $440 billion; and 5) customer experience (customer acquisition and retention) of $206 billion.
- Technology trends (including cloud and mobile computing, Big Data, increased processing power, and many others) and business economics (such as Metcalfe's law) are driving the IoE economy.
- These technology and business trends are ushering in the age of IoE, creating an unprecedented opportunity to connect the unconnected: people, process, data, and things. Currently, 99.4 percent of physical objects that may one day be part of the Internet of Everything are still unconnected.
- Business leaders should begin transforming their organizations and policies based on key learnings from use cases that make up the majority of IoE's Value at Stake. In Europe, these use cases include next-generation workers, smart factories, connected marketing and advertising, physical and logical security, and faster time to market.
- Robust security capabilities (both logical and physical) and privacy policies are critical enablers of the Internet of Everything Economy. The IoE Value at Stake projections are based on increasingly broad adoption of IoE by private-sector companies over the next decade. This growth could be inhibited if technology-driven security capabilities are not combined with policies and processes that protect the privacy of both company and customer information.

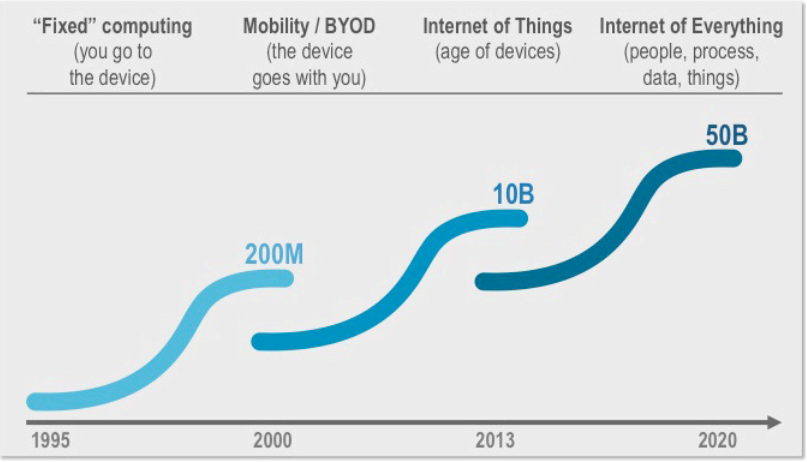
The next wave of dramatic Internet growth will come through the confluence of people, process, data, and things – the Internet of Everything.

The Internet of Everything Is Happening Now

Cisco estimates that 99.4 percent of physical objects are still unconnected.[2] Conversely, this means that only about 10 billion of the 1.5 trillion things globally are connected.[3] At a more personal level, there are approximately 200 connectable things per person in the world today.[4] These facts highlight the vast potential of connecting the unconnected.

Even so, the growth of the Internet has been unprecedented (see Figure 1). Cisco estimates that there were about 200 million things connected to the Internet in the year 2000. Driven by advances in mobile technology and the "bring your own device" (BYOD) trend, among others, this number has increased to approximately 10 billion today, putting us squarely in the age of the Internet of Things (IoT). The next wave of dramatic Internet growth will come through the confluence of people, process, data, and things – the Internet of Everything (IoE).[5]

Figure 1. Rapid Growth of the Number of Things Connected to the Internet.



Source: Cisco IBSG, 2013

IoE is further being driven by several factors. First, powerful technology trends – including the dramatic increase in processing power, storage, and bandwidth at ever-lower costs (Moore's law still at work); the rapid growth of cloud, social media, and mobile computing; the ability to analyze Big Data and turn it into actionable information; and an improved ability to combine technologies (both hardware and software) in more powerful ways – make it possible to realize more value from connectedness.

Second, barriers to connectedness continue to drop. For example, IPv6 overcomes the IPv4 limit by allowing for 340,282,366,920,938,463,463,374,607,431,768,211,456 more people, processes, data, and things to be connected to the Internet. Amazingly, IPv6 creates enough address capacity for every star in the known universe to have 4.8 trillion addresses.

Value at Stake . . . is the potential bottom-line value (higher revenues and lower costs) that can be created or will migrate among companies and industries based on their ability to harness IoE.

Third, form factors continue to shrink. Today, a computer the size of a grain of salt (1x1x1 mm) includes a solar cell, thin-film battery, memory, pressure sensor, and wireless radio and antenna. Cameras the size of a grain of salt (1x1x1 mm) now have 250x250-pixel resolution. And, sensors the size of a speck of dust (0.05x0.005 mm) detect and communicate temperature, pressure, and movement. These developments are important because, in the future, things connected to the Internet may be hard for the human eye to even see.

Finally, IoE reflects the reality that business value creation has shifted to the power of connections and, more specifically, to the ability to create intelligence from those connections. Companies can no longer rely solely on internal core competencies and the knowledge of their employees; instead, they need to capture intelligence faster, from many external sources. This will occur through connections enabled by the Internet of Everything.

IoE Creates $14.4 Trillion of Value at Stake for Companies and Industries

Value at Stake, according to Cisco, is the potential bottom-line value (higher revenues and lower costs) that can be created or will migrate among companies and industries based on their ability to harness IoE. Cisco predicts that the IoE Value at Stake will be $14.4 trillion for companies and industries worldwide in the next decade (see Figure 2).[6] More specifically, over the next 10 years, the Value at Stake represents an opportunity to increase global corporate profits by about 21 percent.[7]

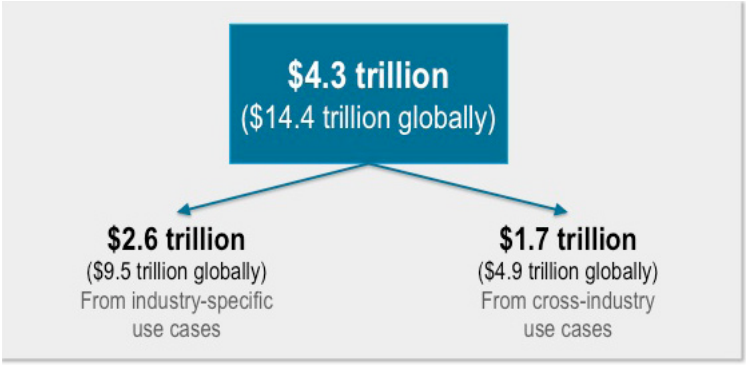
In other words, between 2013 and 2022, $14.4 trillion of value (net profit) will be "up for grabs" for enterprises globally – driven by IoE. IoE will both create new value and redistribute (migrate) value among winners and laggards, based on how well companies take advantage of the opportunities presented by IoE.

Globally, Cisco's analysis shows that most of the potential Value at Stake (66 percent, or $9.5 trillion) comes from transformation based on industry-specific use cases such as smart factories, smart grid, and smart buildings. The other 34 percent, or $4.9 trillion, is produced by cross-industry use cases such as faster time to market and business process outsourcing. In Europe, $2.6 trillion of the potential Value at Stake will come from industry-specific use cases, while $1.7 trillion will result from cross-industry use cases.

Cisco calculated the Value at Stake by taking a bottom-up approach considering the value created by more than 50 use cases in the private sector only – both industry-specific and cross-industry – and consolidating them into the 21 most material and value-generating examples. Top-down analysis was also performed as a cross-check to validate the completeness and order of magnitude of the more thorough bottom-up approach. Finally, care was taken not to double-count value across use cases.[8]

In Europe, Value at Stake opportunities are most prevalent in the manufacturing, consumer spending, and business services areas.

Figure 2. How Much Value Is at Stake for Europe in the IoE Economy?



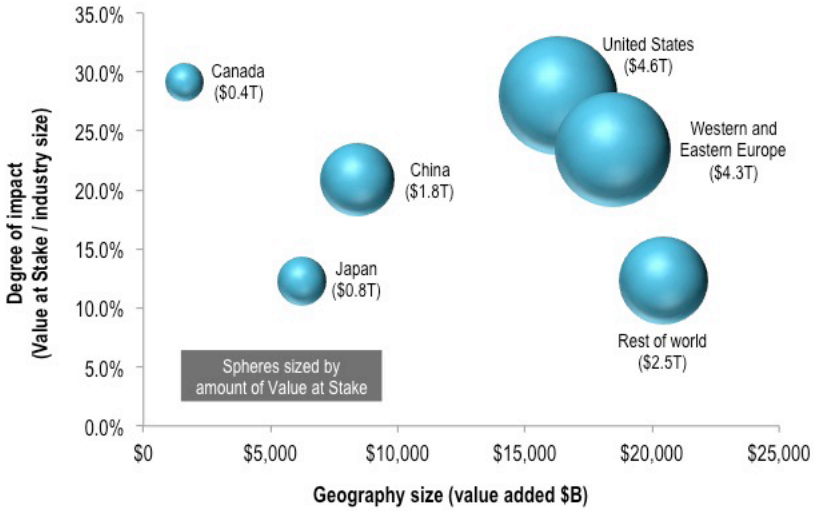
Source: Cisco IBSG, 2013

Europe's Share of Value at Stake

Europe's share of the Value at Stake is $4.3 trillion over the next 10 years (see Figure 3). This represents 30 percent of the $14.4 trillion global total. Figure 3 also shows the degree of beneficial impact by geographic region, as determined by dividing the Value at Stake by the size of each region's economic output.

The geographic distributions of Value at Stake are driven by each region's relative economic growth rate and by the relative size of each industry sector in each region. In Europe, Value at Stake opportunities are most prevalent in the manufacturing, consumer spending, and business services areas.

Figure 3. Europe's Value at Stake Makes Up 30 Percent of the Global Total.



Source: Cisco IBSG, 2013

Worldwide, there are five main drivers of Value at Stake. These are the same drivers for Value at Stake in Europe.

European companies that harness IoE best will reap this value in either of two ways:

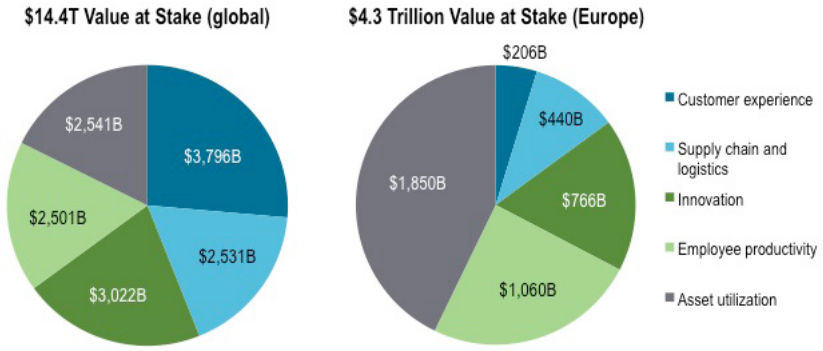
- By capturing new value created from technology innovation
- By gaining competitive advantage and grabbing market share against other companies less able to transform and capitalize on the IoE market transition[9]

5 Drivers Fuel IoE Value at Stake

Worldwide, there are five main drivers of Value at Stake (see left side of Figure 4). These are the same drivers for Value at Stake in Europe (see right side of Figure 4). The amount of Value at Stake for each driver in Europe is listed in parentheses. With this information, business and political leaders can begin planning how to benefit from the IoE Economy.

- **Asset utilization ($1.85 trillion) –** IoE reduces selling, general, and administrative (SG&A) expenses and cost of goods sold (CoGS) by improving business process execution and capital efficiency.
- **Employee productivity ($1.06 trillion) –** IoE creates labor efficiencies that result in fewer or more productive man-hours.
- **Innovation, including reducing time to market ($766 billion) –** IoE increases the return on R&D investments, reduces time to market, and creates additional revenue streams from new business models and opportunities.
- **Supply chain and logistics ($440 billion) –** IoE eliminates waste and improves process efficiencies.
- **Customer experience ($206 billion) –** IoE increases customer lifetime value and grows market share by adding more customers.

Figure 4. How Much Value Is at Stake in the IoE Economy?



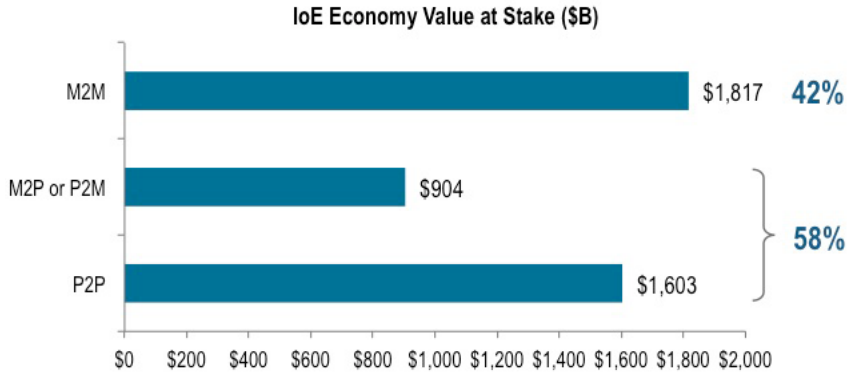
Source: Cisco IBSG, 2013

The bottom line is that the IoE Economy is about enabling people to be more productive and effective, make better decisions, and enjoy a better quality of life.

Which Connections Matter Most?

IoE includes three types of connections – machine-to-machine (M2M), person-to-machine (P2M), and person-to-person (P2P). Combined, P2M and P2P connections will constitute 58 percent of the total IoE Value at Stake by 2022, while M2M connections make up the remaining 42 percent (see Figure 5). It is important to note that while M2M connections are fast becoming a sizable source of value, the end result of these connections is ultimately to benefit people. The bottom line is that the IoE Economy is about enabling people to be more productive and effective, make better decisions, and enjoy a better quality of life.

Figure 5. P2M and P2P Still Make Up the Majority of Internet Connections.



Source: Cisco IBSG, 2013

Connected healthcare and patient monitoring provide a great example. By enriching the connections between medical devices and both patients and doctors (M2P), and among patients and doctors themselves (P2P), better hospital-level care can be provided at patients' homes. This improves quality of life, increases positive medical outcomes, and reduces costs for both providers and patients.

To receive the most value from IoE, business leaders should begin transforming their organizations based on key learnings from use cases that show how IoE works in the real world.

Real-World Use Cases Show the Impact and Potential of IoE

To receive the most value from IoE, business leaders should begin transforming their organizations based on key learnings from use cases that show how IoE works in the real world. The five use cases featured in this paper, which represent $2.39 trillion of the $4.3 trillion total Value at Stake for Europe, were selected for their usefulness in helping business leaders determine how to move forward with regard to their companies.[11]

Each of these use cases includes a general description, the amount of contribution to the total Value at Stake, and a comparison of the key use-case attributes in both 2013 and 2022 to highlight the impact of IoE. In addition, each use case describes the value of connections, top IoE drivers, types of connections, IoE technology enablers, and whether value is created or migrated.

1. Next-generation workers: $900 billion of total Value at Stake

Next-generation workers consists of four separate use cases:

- **Telecommuting ($509 billion of Value at Stake) –** allowing employees to remain productive even when they are remote.
- **Mobile collaboration ($277 billion of Value at Stake) –** increasing employee collaboration and productivity.
- **Bring your own device, or BYOD ($108 billion of Value at Stake) –** increasing employees' capacity for work while reducing IT total cost of ownership (TCO).
- **Virtual desktop integration, or VDI ($6 billion of Value at Stake) –** lowering TCO, improving operational efficiencies, and improving access to corporate applications in a highly secure environment.

2013 Current state (without IoE)	2022 Potential with IoE
BYOD: employee devices, plans, and support provided by employer; corporation is liable	**BYOD:** employees pay for the devices, plans, and support they want
Mobile collaboration: employees work mostly face-to-face and use multiple unconnected devices	**Mobile collaboration:** greater connectivity among people and mobile devices improves innovation, increases productivity
Telecommuting: commute time is expensive, unproductive, and impacts environment; local talent is scarce; work space required	**Telecommuting:** increased employee productivity, satisfaction; ability to hire needed expertise; reduced environmental impact
VDI: time-consuming and expensive for IT; data on devices increases security risks	**VDI:** lower costs; increased employee productivity; enhanced security; greater scalability

Worldwide and in Europe, smart factories represent one of the two largest use cases in terms of Value at Stake.

- **IoE value created:** Increased employee productivity and satisfaction; lower CapEx and OpEx expenses; reduced environmental impact; improved security
- **Main IoE driver(s):** Employee productivity, asset utilization, cost reduction, supply chain and logistics efficiency, and innovation
- **Type of connection(s):** Machine-to-machine, people-to-machine, and people-to-people
- **IoE technology enabler(s):** Cloud-based IT management, VDI, smart devices, pervasive video, web conferencing, unified communications, mobility, unified communications, web conferencing
- **Value created or migrated:** Both

Even with the rapid increase in number of devices, machines, and sensors in IoE, employees will continue to be companies' most important asset. In fact, workers will become even more important to help analyze, manage, and make decisions based on all of the new data that will be gathered by connecting the unconnected. In addition, IoE will play a key role in helping Europeans work with others in different time zones – without needing to be in the office.

2. Smart factories: $574 billion of total Value at Stake

Adding connectivity to manufacturing processes and applications increases factory productivity, reduces inventories with real-time inventory supplies, and cuts average production/supply-chain execution and input-purchase costs.

Worldwide and in Europe, smart factories represent one of the two largest use cases in terms of Value at Stake. The value is largely derived from more intelligent machines that incorporate better sensors, improved connectivity to other machines, and more intuitive interfaces with people. These new capabilities allow machines to be programmed more easily and make them more adaptable to their conditions so they can be more efficient at doing their work. In addition, back-end connections to the cloud for analytics enable more effective integration of labor, capital, and technology.

2013 Current state (without IoE)	2022 Potential with IoE
Automated assembly machines are expensive and complicated to create and install	Reduced costs as automated tools become less expensive to manufacture and implement
Often inflexible and costly product-line changes	Revenues increase with ability to produce multiple products with variations in inputs. Allows for greater customization of products and smaller product-line runs.
Quality controls rely on human perception and dexterity	Sensors help workers improve product quality
Reliance on low-cost manufacturing countries. Employees with IT and data interpretation skills are costly, scarce.	Socialization of knowledge flattens the skills curve; IoE maximizes access to human talent pools at lower cost
Inefficient use of key inputs for production. Lack of flexibility among assembly locations.	Reduced waste (materials, energy). Greater freedom and agility to reallocate production and optimize inputs.

IoE will enable companies to have a complete view of their customers (behaviors, preferences, demographic profile) and deliver individually targeted messages and offers to them on any device, at the time and location where they will have the most beneficial impact.

- **IoE value created:** More intelligent design of machines; greater control of instrumentation and production conditions
- **Main IoE driver(s):** Asset utilization, supply chain and logistics
- **Type of IoE connection(s):** Machine-to-machine
- **IoE technology enabler(s):** Machine design tools, production sensors, employee training
- **Value created or migrated:** Migrated from inefficient producers and countries

Value in smart factories is obtained from cost-cutting, revenue growth, and better workforce collaboration. With this in mind, manufacturing leaders should accelerate adoption of IoE technologies and consider initiatives that focus on improved collaboration among workers to make employees more efficient.

3. Connected marketing and advertising: $484 billion of total Value at Stake

Broad IT and social applications for marketing and advertising transform the way companies engage with customers, analyze their behavior, and optimize the impact of their interactions. Examples include location-based services, viral marketing, and mobile advertising.

Today, it is very difficult to create and implement cohesive marketing and advertising strategies across numerous and disparate channels (TV, radio, Internet, point of sale). IoE will enable companies to have a complete view of their customers (behaviors, preferences, demographic profile) and deliver individually targeted messages and offers to them on any device, at the time and location where they will have the most beneficial impact. Within this new paradigm, companies can react more quickly by assessing and reacting to their markets in real time; increase profits by offering pricing based on customers' situation and ability to pay; and grow revenues by bundling their offerings with other products and services based on a holistic assessment of customers' wants and needs.

2013 Current state (without IoE)	2022 Potential with IoE
Missed or unidentified sales opportunities	Increased sales from real-time market assessments and reactions
Inefficient geographical selling	Increased sales from location-based selling
Inflexible product lines	Increased sales from better use of Internet-driven "freemium" market segmentations
Lost sales due to shifting competitive pressures and poor timing	Increased sales by directly tying pricing to current selling situation and customers' ability to pay
Little holistic assessment of customers' wants and needs	Increased sales from improved coordination with other products and services (two-sided markets)

Data-driven business agility is also at the core of achieving the Value at Stake from connected marketing and advertising.

- **IoE value created:** Assimilation and analysis of customer demographic and purchase histories from multiple sources
- **Main IoE driver(s):** Customer experience, innovation
- **Types of IoE connection(s):** Machine-to-machine, person-to-machine, and person-to-person
- **IoE technology enabler(s):** Cloud computing, Big Data, real-time decision tools
- **Value created or migrated:** Both

Data-driven business agility is also at the core of achieving the Value at Stake from connected marketing and advertising. Business leaders should use Big Data and cloud computing to improve decision making across their companies. To succeed, every customer-facing department, including marketing, sales, service, and support, must be able to adapt more quickly to rapidly changing customer demands in the IoE Economy.

4. Faster time to market: $262 billion of total Value at Stake

IoE helps product development teams collaborate better with all areas of production and delivery, enabling first-mover benefits and better customer relationships.

Faster time to market involves both goods and services. The value from this use case focuses on the ever-accelerating discovery of unmet or previously unidentified consumer and business needs. To gain the most value from this use case, businesses should transform in two ways: 1) use Big Data to identify customer needs, and 2) increase agility to bring products and services to market more quickly than key competitors.

2013 Current state (without IoE)	2022 Potential with IoE
Inefficient meeting management	Automated management of available resources
Subject-matter experts (SMEs) unknown, unavailable, or hard to find	Easy access to stored SME knowledge; devices enable ubiquitous access
Random product development ideation	Product development ideation based on deep analysis of past successes and failures
Linear production and delivery processes with other departments (marketing, finance, etc.)	All key business departments brought early into product development process
Duplication of thought processes	Best practices stored for expedient reuse

- **IoE value created:** Enables more effective collaboration among product development and R&D teams to drive more business agility and reuse of relevant information
- **Main IoE driver(s):** Innovation
- **Types of connection(s):** Machine-to-machine, person-to-machine, and person-to-person
- **IoE technology enabler(s):** Collaboration, video, and workplace tools
- **Value created or migrated:** Both. Value created through first-mover advantage, improved product quality, and more intimate customer relationships

Internal collaboration within firms' R&D and production departments, and external collaboration with customers, will be necessary to achieve the innovations required to garner the Value at Stake.

Internal collaboration within firms' R&D and production departments, and external collaboration with customers, will be necessary to achieve the innovations required to garner the Value at Stake. Smart grid and supply-chain processes will also need to be revamped since cost containment is essential to competing in markets for globally traded goods.

5. Optimized supply chain and logistics: $175 billion of total Value at Stake

More efficient purchasing, delivery, storage, and billing operations reduce the costs of direct and indirect procurement.

2013 Current state (without IoE)	2022 Potential with IoE
Inefficient negotiations result in suboptimal pricing and inflexible terms	Multiple vendors result in "least-cost" pricing and more flexible, favorable terms
Frequent vendor turnover	Quality vendors more easily vetted; improved supplier management techniques
Exclusive inventory and warehousing costs	Lower costs due to linkages with production and older schedules
Delivery errors and inaccurate billing and payments create additional work	Back-office processes increasingly automated and optimized

- **IoE value created:** Connections among production departments (order receipt, supply chain, vendor management, inventory management, accounts payable/receivable, etc.) become automated and optimized
- **Main IoE driver(s):** Asset utilization / cost reduction
- **Types of connection(s):** Machine-to-machine and person-to-machine
- **IoE technology enabler(s):** Linked suites of supply-chain applications
- **Value created or migrated:** Value created through lower costs and improvements in process quality

This use case combines all the benefits of a streamlined purchasing and delivery process. The supply-chain process itself will be as automated as possible, especially the supplier relationship management aspects. That is, collaboration between the buyer and seller is finely tuned, with the seller being acutely aware of the buyer's production needs on a continuous basis. Deliveries are made on time and contain the correct goods; billing is automated; and payments are made at the latest possible time before penalty charges are incurred. In addition, the buyer can choose from an array of preapproved suppliers who can meet these conditions, resulting in aggressive price competition among these suppliers. Logistics benefits are also included, where not only delivery routes are optimized, but the volume of materials that have to be delivered are also optimized, saving inventory costs.

"You can't win if you don't play. As technology and connectedness accelerate the pace of determining the winners and losers, preparing for IoE is not a question of if, but of when."

Joseph Bradley,
General Manager and Senior Director, Cisco IBSG Global Research & Economics, Communications, and Planning Practices

How To Get Started

While the scope of IoE may seem daunting, there are actually some very simple steps you can take to begin capturing your share of the IoE Value at Stake:

- **Determine where your business is today with regard to IoE.** With the huge number of connections that need to be made among people, data, and things, as well as the myriad of ways that these connections can add value, companies must assess their strengths and weaknesses in the areas of technology skills, business process management, data analytics, connectedness, and security.
- **Understand the role of IT in enabling your company to benefit from IoE.** Using IT to reduce costs has diminishing returns; investing in IT to strengthen and grow the customer base has greater upside potential.

  The use cases with the most Value at Stake for Europe reveal several critical IoE enablers, including Big Data, analytics, video, and the use of cloud-based technologies and services. In order to garner the benefits from these enablers, investments should be accompanied by changes in a company's internal culture. Some examples of these changes include more fact-based decision making (both more facts and more decisions); greater collaboration with team members from other departments; and an increased reliance on third parties to execute and support non-critical business processes.
- **Take steps now to maximize your firm's capabilities in the areas of security and privacy.** IoE security will be addressed through network-powered technology: devices connecting to the network will take advantage of the inherent security that the network provides (rather than trying to ensure security at the device level). Privacy, on the other hand, will require that companies combine technology with effective processes and policies. To benefit from IoE, firms will need to identify new privacy models that meet company and customer expectations.

Most important, firms will need to consider their own internal cultural changes that are necessary to embrace IoE. The value of any IT investment will be determined by the capabilities it enables outside the IT department. The IoE Value at Stake emanates from the marketing, HR, finance, production, sales, and other corporate departments. Therefore, a company's IT decisions must consider the requirements of these departments. Corporate policies on employment, input sourcing, and in customer-facing areas may need adjustment to embrace these IoE-driven best practices.

Implicit in this analysis is that Europe's economic growth will be increasingly dependent on exports and knowledge-worker productivity in the coming decade. It is imperative, therefore, that European companies make the IoE investments that will enable them to compete successfully in globalized markets and result in new products and services that will provide a competitive advantage. These transformations will require increased amounts of technical education, a depth of understanding of what exactly determines value to a customer or end user, and a finely tuned entrepreneur's eye to pull it all together.

The Game Is on . . .

Challenges abound for today's business leaders. The rapid pace of change creates confusion and misinformation, which often leads to poor decision making or, worse, inaction. When combined with price transparency and global supply chains, many of the same technology trends that are ushering in the IoE era are also enabling new entrants to become viable threats in just weeks and months rather than years.

In this environment, winners and losers are determined faster than ever before. With $14.4 trillion Value at Stake globally, IoE presents an important opportunity to increase market share, gain competitive advantage, strengthen and grow your customer base, and increase profitability. And because the stakes are high – over 10 years, companies stand to lose more than a year of profits if they do not embrace IoE – the time to act is now.

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Endnotes

1. For the purposes of this paper, Europe includes all Western, Central, and Eastern European countries.
2. Source: Cisco IBSG, 2013.
3. Ibid.
4. Ibid.
5. Cisco defines the Internet of Everything as bringing together people, process, data, and things to make networked connections more relevant and valuable than ever before – turning information into actions that create new capabilities, richer experiences, and unprecedented economic opportunity for businesses, individuals, and countries.
6. Value at Stake differs from Internet Market Size, or total addressable market (TAM). Value at Stake is a forecast of the potential bottom-line value that can be created or that will migrate among companies and industries globally based on their ability to harness the Internet of Everything over the next decade (10-year net present value). Cisco estimates this value at $14.4 trillion over the next 10 years. By contrast, the Internet Market Size, or TAM, is projected to reach $4.1 trillion in annual revenue for all participating vendors by 2016. Beyond relevant information and communications technologies (ICT), it includes e-commerce and advertising. Cisco will

address $258 billion (6 percent) of this Internet market (source: Cisco SMO, 2012). Value at Stake includes shifts of benefits among competing firms in an industry; shifts of benefits among different industries; new-to-the-world revenue growth from innovation; cost savings from more efficient processes; and allowances for implementation costs. Value at Stake *does not* include extent of losses at firms that don't transform; consumer or government benefits; social benefits; and value estimates for reduced risk of operations.

7. We selected a period of 10 years because it is a reasonable amount of time for companies to identify, design, and implement changes to capture their share of the IoE Value at Stake. The $14.4 trillion number is the net Value at Stake. The gross Value at Stake is $18.7 trillion. In other words, an investment of $4.3 trillion is required to achieve the net Value at Stake of $14.4 trillion over 10 years. In addition, Cisco estimates that the $14.4 trillion in Value at Stake represents an increase in aggregate corporate profit of about 21 percent over 10 years.
8. To illustrate how Value at Stake was calculated, we'll use the example of the "Connected Commercial Ground Vehicles" use case. Cisco's analysis considered two factors: 1) lower costs for fleet owners and 2) the potential revenue increase for service providers. We also projected the penetration of commercial ground vehicles as a percentage of the total global commercial fleet – from lower penetration today (6.3 percent) to estimated penetration of 24.5 percent by 2022. Using research, we then estimated the IoE benefits per commercial vehicle (including fuel efficiency and driver productivity) at $970 annually. From these benefits, we deducted one-time and recurring costs. We also considered SP revenue opportunities. Based on the same penetration numbers, the analysis also considered new revenue opportunities for SPs, including connectivity and value-added services. To estimate the Value at Stake for SPs, we assumed a conservative average margin of $12-$15 monthly. The overall Value at Stake number – $347 billion – reflects the combined net present value of the benefits for fleet owners and service providers. We believe Cisco is the only company to take this kind of use-case-driven, bottom-up approach to evaluate the opportunity offered by the Internet of Everything.
9. Cisco estimates that 59 percent of Value at Stake will be new value resulting from technology innovation, while 41 percent will be generated by companies capturing market share from the competition.
10. Sources: Global Insight, American Productivity and Quality Center, U.S. Bureau of Economic Analysis, U.S. Bureau of Labor Statistics (all 2012), and Cisco IBSG, 2013. The 18 industries measured for the amount of Value at Stake, in order of size, include: 1) manufacturing; 2) retail trade; 3) information services; 4) finance and insurance; 5) healthcare; 6) educational services; 7) professional, scientific, and technical services; 8) administrative and waste management services; 9) wholesale trade; 10) arts, entertainment, and recreation; 11) other services except government; 12) agriculture, forestry, fishing, and hunting; 13) construction; 14) transportation and warehousing; 15) management of companies and enterprises; 16) real estate, rental, and leasing; 17) mining; and 18) utilities.

11. The $14.4 trillion in Value at Stake comprises the following use cases and values: 1) smart factories, $1.95 trillion; 2) connected marketing and advertising, $1.95 trillion; 3) smart grid, $757 billion; 4) connected gaming and entertainment, $634 billion; 5) smart buildings, $349 billion; 6) connected commercial ground vehicles, $347 billion; 7) connected healthcare/patient monitoring, $106 billion; 8) connected private college education, $78 billion; 9) innovative payments, $855 billion; 10) wealth management, $451 billion; 11) improved time to market, $1.03 trillion; 12) business process outsourcing, $742 billion; 13) virtual attendants, $163 billion; 14) supply chain cost savings, $697 billion; 15) smart farming, $189 billion; 16) digital signage, $38 billion; 17) next-generation workers (BYOD, mobile collaboration, telecommuting, VDI), $2.16 trillion; 18) travel avoidance, $980 billion; 19) physical and logical security, $1.09 trillion; 20) next-generation retail bank branches, $20 billion; 21) next-generation vending machines (digital malls), $49 billion.

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