Below John Chambers, Chairman and CEO of Cisco Systems, tells us how we can tap into the huge potential of the Internet of Things in Europe

Out of every 1,000 devices that may one day be networked, today only six currently are -- think about that opportunity. All of these connections are creating a massive amount of digital data. With analytics, data can be turned into intelligence and even wisdom, enabling countries worldwide to enhance decision-making, processes, productivity, scenario-planning and experiences for their citizens whether at work, leisure, school or home.

And while the opportunity may seem far off – it is actually a reality. For Europe, this opens the door to an estimated $4.3 trillion in economic value for the private sector alone over the next decade. That value derives from reduced costs, employee productivity, the supply chain and logistics, customer experience and innovation.

But we should not just think about this in terms of statistics. It is about solutions that change the lives of real people. Internet of Everything solutions can help tackle real urban issues – job creation, urbanization, and global warming, as well as reshape how we think about the urban experience. It can reduce traffic congestion and save lives, monitor threatened environments, reduce waste of valuable resources in agriculture and support better energy practices by encouraging energy efficiency in the home, enabling clean energy technologies and optimizing the efficiency of existing products.

There are cities and leaders who are charting a new course in this area. Barcelona and Nice, for example, have embraced the Internet of Everything vision. They have implemented smart solutions for traffic and parking management, for lighting, for waste management and for environmental monitoring. And it is working. Because sensors recognise when a parking spot is taken or not and share that information with citizens, parking is getting easier in the city and revenues are increasing by approximately $50 million a year in Barcelona. Smart lighting that adapts to the environment and among other capabilities dims in times when traffic decreases and allows for remote monitoring for maintenance has decreased lighting costs in the city by a third. The Smart City pilot in Nice is assessing how cross-fertilisation can spur new insights, how data produced by such solutions can be combined and reused. Data from traffic sensors, for example, may be usable beyond smart parking, to optimise waste collection or monitor the environment.

This Internet of Everything (IoE) is the next wave of computing and the Internet. In the late 1990s, we moved from fixed computing where you went to the device, to mobile, where the device came with you. Early this century, we moved from mobile to the Internet of Things, the age of devices. But now we are entering a new phase, the Internet of Everything, where it is not just about things being connected but about people, data and processes too. It is about machine-to-machine, but it is also about person-to-machine and person-to-person connections. It is about converting data into intelligence to make better decisions and processes – delivering the right information to the right person (or machine) at the right time.

This development is being driven by technology. We are in a world of shrinking form factors. Once a computer would sit on your desk (or even fill a room); today computers the size of a grain of salt can have a battery, memory, pressure sensor and wireless radio and antenna. Sensors no larger than a speck of dust can detect and communicate temperature, pressure and movement. Computing is getting more powerful and cheaper, including processing power, storage and bandwidth.

The convergence of all these technology trends coming together: cloud and mobile computing, network programmability and Big Data analytics. They are all part of the same ecosystem. And there is still plenty of room for improvement. While 90% of the world's stored data was created in the last year alone, only 0.5% of all data is currently being analysed for insights. Applying analytics to a greater share of current data could lead to productivity improvements, economic growth and societal developments.

The result of this all is growth. Europe's IP traffic will grow two and a half times between 2013 and 2018 to reach 25 exabytes a month – or to put that another way, the data equivalent of five times all the words **ever** spoken by humans. Broadband will be getting faster, from 19 Mbps to 48 Mbps on average, content will be getting richer, with video making up 75% of traffic and there will be more devices – with approximately 5 connections for every person in Europe.

So what's the role for policy makers in this success story? Well, Europe has the choice between being a leader or a laggard. The opportunity is there to embrace it and plan for it. There are four properties of the Internet of Everything that will determine how successful it can be in Europe and around which government policy can be shaped.

1. **The Internet of Everything needs to be built on a sound base.**
   Traffic growth dictates the need for greater network bandwidth and hence there is a need to create the right policy framework to stimulate investment in higher speed and more robust broadband networks. All types of technology will have a role to play but it's clear that Europe needs fibre, and governments need to support this transition. Radio spectrum will also need to be made available to deal with a wireless world. Internet of Everything includes all kinds of networks and so radio spectrum needs to come in all shapes and sizes too.
   IPv6 is the addressing system for the Internet of Everything and we need to ensure all parts of the ecosystem are adopting it. The IoE will create new demands on the workforce and the public and private sector will need to work together to ensure we are prepared. Finally, a review of regulated sectors should be coordinated to ensure there are no sector-specific rules impeding IoE development.
2. **The Internet of Everything needs to be smart.**
   Intelligence is built-in throughout the network, including at the edge, in order to make the right decisions in the right place at the right time. To do this we need to get rules around traffic management and net neutrality right, in a way that opens the door to network management, specialized services, and new business models, not closes it off.
3. **The Internet of Everything needs to be trusted.**
   With the network playing a greater and greater role in our lives, we need to know that services are reliable and resilient. Citizens need to know that data about them is being used in ways they support and feel comfortable about and that it is being kept in a secure manner. Security is a joint effort, and we will need to work closer together, both across industry and between the public and the private sector to get it right in the new era. It will also be necessary to adopt data protection rules that allow the IoE to reach its potential, as its very value is dependent on the ability to cross-reference or reuse data in new ways.
4. **The Internet of Everything needs to be open.**
   We should recognise that Internet Protocol (IP) is becoming the common language for most data communication. Electricity grids, building systems, industrial manufacturing and oil systems are all shifting from proprietary networks to IP. While the IoE is a network of both closed and open networks, in order to maximise its potential we need to adopt open standards in existing global forums, based on transparent licensing terms. Open standards are key to driving interoperability, and the consequent benefits for the quality and capabilities of analytics.

The bottom line is this: policy makers can lead this success story. This year signals a major inflection point for the Internet of Everything, which I believe will have a much bigger impact on the world and its cities than the first 20 years of the Internet. And I am excited by the ways that it is going to transform our lives. Europe is well placed to seize the opportunity, and technology leaders stand ready to work with business and government leaders to help Europe lead and embrace this vision.

John Chambers, Chairman and CEO, Cisco Systems