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Debate the issues

The Internet of Things

by Rudolf Van der Berg of the OECD's [Science, Technology and Industry](#) Directorate.

Look around you for a second and count the number of electronic devices, machines and gadgets. All of them – light bulbs, cars, TVs, digital cameras, refrigerators, stereos, etc. – will be connected to the Internet over the next few years, if they aren't already.

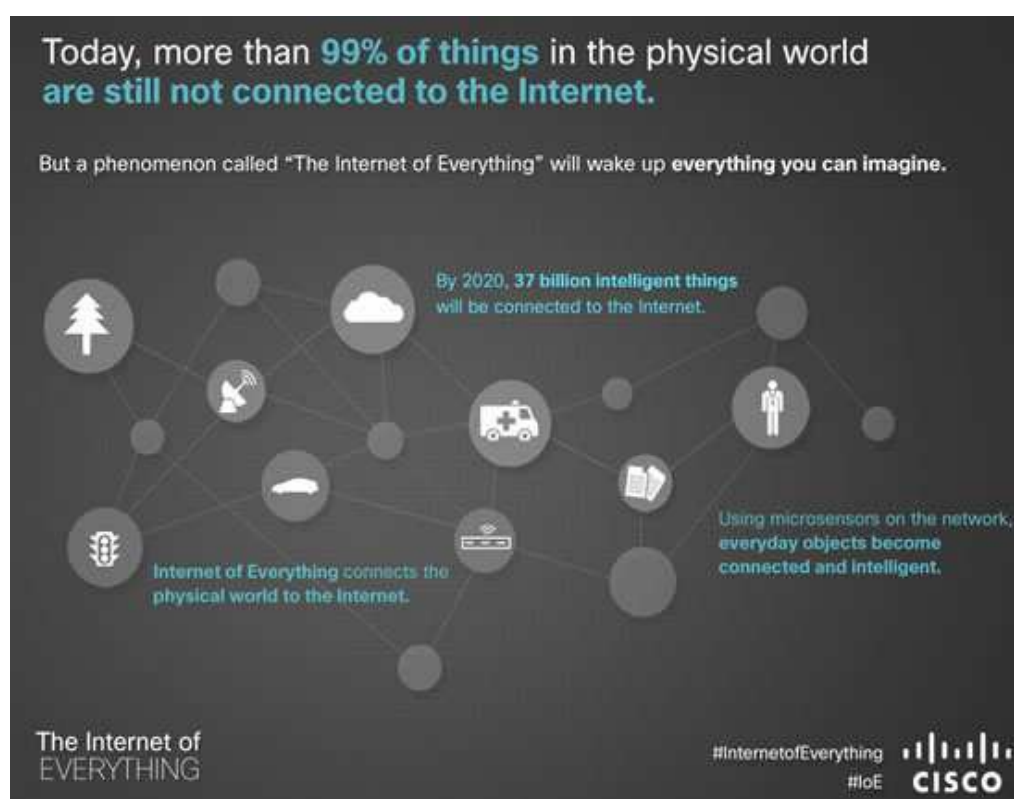
This is the potential of the “Internet of Things”: billions and billions of devices and their components connected to one another via the Internet. 50 billion devices by 2020, according to companies like [Ericsson](#). The Internet of Things will radically alter our world through “smart” connectivity, save time and resources, and provide opportunities for innovation and economic growth.

The trends are already visible: Internet-connected TVs are now widespread; eBook readers must have a Wi-Fi or 3G connection; and smart electricity meters have already become standard in many countries.

The Internet of Things is the subject of a new OECD report, [Machine-to-Machine Communication: Connecting Billions of Devices](#) that examines new technology (the drivers behind connecting devices to the Internet); new markets (user and business demands); new policies (what governments can do to promote this new source of growth).

The basic building block of the Internet of Things (IoT) is the so-called machine-to-machine communication (M2M), i.e. devices equipped to communicate without the intervention of humans. Different networking technologies can be used to connect M2M devices, depending on the amount of mobility needed, and dispersion over an area.

Mobile wireless is often an ideal technology for most applications. However, countries may run out of phone numbers in their current numbering plans as a result of M2M, because 2G and 3G equipped M2M devices require a telephone number to work, unlike 4G where M2M can work with just an IP-address. M2M creates a new player in the mobile market: the “million device” user. These new M2M users will potentially manage hundreds of thousands of smart meters, cars, and consumer electronics, possibly in higher numbers than some countries have citizens.



Possible Internet of Everything connectivity. Source: cisco.com

Large scale M2M users may offer their services to dozens of countries, selling the same devices globally. Their customers may then buy the devices abroad and travel with them. The telecommunication industry, however, is still largely organised and regulated on a [per country basis](#). Large M2M users will thus place new demands, and regulation and business models will have to adapt. Governments can set large-scale M2M users free by giving them access to global markets. This will open up markets and create a competitive market for roaming for M2M services. Liberalisation will be a major paradigm shift leading to billions in savings for services.

Privacy and security need to be designed into products. M2M could allow a detailed view of people's lives, and certain parliaments have already curbed or changed some projects as a consequence. For example, cars are increasingly using onboard M2M services and the European Union is now mandating their own service (eCall) to be built into every car.

Combining data generated by M2M devices may offer insights to improve our society. Cars could notify local governments of icy roads, or bottlenecks, in their infrastructures. This may not always be seen as positive, however, as shown by a case in The Netherlands where anonymous and aggregated data from GPS-systems was used by the police to identify prime locations for speed cameras, which led to a public outcry.

What is certain from the report is that governments will have to change regulations in the telecommunications market, will have to be vigilant to apply privacy and security regulation and stay innovative to make use of the many possibilities it offers. Doing so promises to transform the economy, promote growth in the telecommunications sector, and produce growth and efficiency savings in government and society.

Useful links

[OECD work on information and communications policy](#)

[OECD work on smart sensors](#)

[OECD work on smart grids](#)

[OECD statistics on broadband](#)

[OECD policy guidance on Radio Frequency Identification \(RFID\)](#)