

» The revolution of the Internet of Things

Sao Paulo » 07 » 2016

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Created in the 1960s in the United States initially as a computer network for military purposes (known then as ARPANET), the Internet has evolved and become overwhelmingly popular in recent decades. According to data from the International Telecommunication Union (ITU), there are already more than 3 billion people connected to this worldwide network.

More than a technological phenomenon, the Internet has proven to be a behavioral phenomenon. It has revolutionized, for example, how we communicate with other people (a good example of this is social networks like Facebook and messaging apps like WhatsApp) and how we receive information, listen to music and even buy products. E-commerce, in fact, has exploded – it should jump from \$1.5 trillion in retail sales alone recorded in 2015 to \$3.6 trillion in 2019, according to data from eMarketer research company.

FAR BEYOND COMPUTERS AND SMARTPHONES

Do you think that's a lot? You need to understand that a new revolution related to connectivity is already underway: the so-called Internet of Things. The term refers to the distribution of sensors in a variety of products and devices (from clothes to appliances, to industrial machinery and even dog leashes) that connect to the World Wide Web, sending information. By 2020, we will have more than 20 billion devices connected to the Internet, according to estimates from Gartner research company!

And does this change the lives of consumers and businesses? For the user, he will have more efficient products available, which make his life easier in various ways. Want a practical example of the Internet of Things? In some countries, it is possible to use smartphone app to find out where the bus you want to catch is, and so get to the stop just minutes before the vehicle comes. No more spending a long time waiting, right?

Another popular example of the so-called IoT is the Waze app. Just connect your smartphone to, thanks to a network with millions of users around the world who provide real-time information about position and travel speed, among others, find out the best way to go and even how long it will take to reach the destination.

In the area of wearables (devices that work like small computers connected to your body or even inserted into clothing), it is already possible to find bracelets, smartwatches and apps that record information about the user's health and about physical activities. Synchronized with the Internet, these devices work like a virtual personal trainer, and even record the wearer's performance histories. The French company Cityzen Science has already taken it a step further by creating the D-Shirt, a t-shirt that includes sensors in its fabric that measure the heart rate of the wearer, provides a GPS system than monitors the course and sends real-time data to the cloud.

BIG DATA

For companies, in addition to offering increasingly innovative products, they will have access to a never-before-seen volume of information about their customers – which is pure gold for those who know how to evaluate it. These sensors around the planet produce key data about consumer habits and preferences that will boost the so-called Big Data. It will be up to companies to intelligently analyze this collection of information and to turn it into a competitive advantage, by creating products more suited to the needs of users. Whoever doesn't have this type of tool will be left behind.

Giants of industry and e-commerce already know this, and have initiatives in this area to get increasingly closer to their customers. The online retailer Amazon, for example, works with partners such as GE to develop devices to automate the purchasing system. With this technology, equipment such as washing machines or printers will notify the stores that supplies are running low, allowing automatic purchase and delivery of products by the online retailers.

In addition to this interaction facilitated with the end consumer, IoT promotes a revolution on the factory floor, with the machines connected to each other and providing real-time data, a trend that has been called Industry 4.0. Within it, sensors can be used to monitor all stages of production, following the product lifecycle



from design to use. In this industry of the future, any problem identified in the manufacturing is automatically reported, faster and more efficiently, and is resolved even without human interference.

Along with the huge range of possibilities that this type of technology offers, there are important questions associated with the efficiency of the Internet of Things that need to be evaluated, so that the innovation does not undermine the reputation of a company or its customers:

- **Compatibility** – The idea of having several devices connected to the Internet and talking amongst themselves is very interesting. But for a conversation to be good, all of the participants have to understand, right? However, we have seen the development of several proprietary Internet of Things systems that do not talk to each other. In the coming years, we should see an arm wrestling match among the major market players seeking imposition of their formats – as has happened in the past, for example, with technologies like Blu-Ray (captained by Sony), which a few years ago went through a battle with HD-DVD (backed by Toshiba) for the standard in high definition video. So that consumers are not harmed by purchasing a product that is incompatible with other devices, it is best that the industry invest in open technology standards, ensuring compatibility.
- **Greater exposure** – In a world with more available connected personal devices, the trend is for monitoring and real-time data sharing to also grow, with greater brand exposure. Being attentive to what the customer thinks, motivating engagement and being flexible during crisis situations will continue to be essential in this scenario to preserve the image of the companies.

From the consumer side, so-called “virtual footprints” (the tracks that our online habits leave on the Internet) will be more evident. After all, we have thousands of sensors associated with our behavior, recording our steps at all times. This may be optimal for companies who want to know more and more about their customers, but it feeds the discussion on the ethical use of personal information collected from users.

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- **Digital divide** – According to data from the World Bank, despite the popularity of the Internet, only 40% of the world’s population has access to the World Wide Web. Having billions of devices connected to IoT will not mean a reduction in the digital divide that were currently face. Technology should serve to break down barriers, not to increase the chasms that separate the rich from the poor.

- **Safety**– Companies that embark into this new world of possibilities must also be attentive to the issue of data security, still one of the major obstacles to adoption by many brands. This is due to the fact that more devices connected can also mean greater number of vulnerabilities being exploited by Internet criminals. According to specialists, the

pace of adoption of this technology has been much greater than the development of solutions for the protection of this environment. A study conducted by HP with ten smartwatches last year, for example, found vulnerabilities in all of the smartwatches tested, with problems related to authentication and encryption, among others.

Remember that the leakage of user information has a strong impact on the level of trust and on a company’s reputation. If a company offers devices that monitor, for example, a person’s health, the company has an obligation to protect these sensitive data collected from undue public exposure, so that it does not have to deal with lawsuits and the association of its product with insecurity and neglect. Cases have already been identified of Wi-Fi cameras and camcorders that had their images captured by hackers. In countries like the United States and Brazil, episodes have been recorded of invasion of equipment such as baby monitors with Internet access. Imagine a mother’s satisfaction with a product when she learns that her child is being filmed by a criminal who can even talk to her child through the equipment... In this scenario, investment in solutions for protection and exhaustive testing of the products before their arrival onto the market will be essential to ensure satisfaction and consumer confidence – key points for a company’s good reputation.



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