IoT

Internet of Things

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If you think that the internet has changed your life, think again. The IoT is about to change it all over again!

Brendan O'Brien (Aria Systems)

The Internet will disappear. There will be so many IP addresses, so many devices, sensors, things that you are wearing, things that you are interacting with, that you won't even sense it. It will be part of your presence all the time.

Eric Schmidt (Google)

The global industrial sector is poised to undergo a fundamental structural change akin to the industrial revolution as we usher in the IoT. Equipment is becoming more digitized and more connected, establishing networks between machines, humans, and the Internet, leading to the creation of new ecosystems that enable higher productivity, better energy efficiency, and higher profitability.

Goldman Sachs report.

Sarcasm: the last refuge of modest and chaste-souled people when the privacy of their soul is coarsely and intrusively invaded.

Fyodor Dostoevsky

I grew up with the understanding that the world I lived in was one where people enjoyed a sort of freedom to communicate with each other in privacy, without it being monitored, without it being measured or analyzed or sort of judged by these shadowy figures or systems, any time they mention anything that travels across public lines.

Edward Snowden

America will never be destroyed from the outside. If we falter and lose our freedoms, it will be because we destroyed ourselves.

People love - with all reason - to have access to a fabulous database like Internet, which surely would make the most imaginative writers of the *Arabian Nights* feel themselves very small. People love their cell phones and smartphones. They love so much that many sleep with them. It is a love extended to the comfort provided by the still somewhat "mechanical" voices of GPS devices, which calmly lead us like Ariadne led Theseus to annihilate the Minotaur. Or audio-visual programs - often still in television - that reveal us lost civilizations, human universes that may be happening now, in real-time, on the other side of the planet.

To these, we can easily join a lot of other "loves" - many of which are invisible.

From wristwatches to surveillance cameras, from ATMs to augmented reality glasses, from services like Google to advertising and marketing programs - everything is networked, and such network implies a permanent connection between objects that communicate among themselves.

Labels with RFID tags - which means Radio Frequency Identification - can be almost everywhere, ultra miniaturized, denouncing the movement of the objects, their location - objects that can be practically anything we use, interacting with other "things".

Léon Theremin, Russian musician and inventor, responsible for the invention of the fabulous musical instrument called *theremin*, entered into History as the father of the precursors of the RFID, in 1945, after an espionage device he created.

The concept of the IoT - Internet of Things started evolving especially since the early 1980s, when the speculation about the possibility of a world where objects would communicate with each other, connected in a network, started.

In 2014, Harvard Business School published an interesting study on the Internet of Things, where it says: "The rapid proliferation of connectivity, availability of cloud computing, and miniaturization of sensors and communications chips have made it possible for more than 10 billion devices to be networked. (...) Estimates suggest that IoT could be adding tens of

trillions of dollars to GDP within ten years. It goes far beyond wearables, smart meters, and connected cars. Organizations worldwide are pushing ahead with deployment and reaping benefits such as enhanced customer service, increased revenue, and improved use of assets in the field. In addition, IoT has broad implications for sustainability, providing ways for consumers and businesses to use resources such as water and energy more efficiently. IoT is far from new. Companies have been using sensors and networks to provide a steady stream of information about where devices are, how they're being used, their condition, and the state of their environment for more than 20 years. What's helping to bring it to the forefront today is the explosive growth in mobile devices and applications and the broad availability of wireless connectivity. Other factors include the emergence of the cloud as a way to store and process large volumes of data cost-effectively, and the rapid deployment of analytics technologies that enable enterprises to manage and extract useful information from large volumes of data, quickly and cost-effectively".

But, as the ancient Romans taught, the god Janus is everywhere.

Janus was the god of change, of transformation, he was past and future, good and evil, enlightenment and obscurantism, present in one single head with two faces.

In 1997 I made an installation called *Janus* at Centro Cultural Belém, in Lisbon, Portugal, in the ambit of the Cyber Arts Festival. In that work, at the entrance, people were confronted with four large and powerful computers with four large screens, digital drawing tables and hyper-pencils, with which visitors could draw. Those computers tremendously expanded the capabilities of the pencils, making very easy to change texture, color, tactile sensitivity, serving as a doorway to images, and so on. Each visitor thus became, even before entering the exhibition, into an artist, through experimentation. But it was a deep involvement on the effect, entertainment and immediate satisfaction. Enchantment without reasoning. Then, the questioning of what art is emerged. That happened in the first part of the installation, in a universe of quality. As soon as people entered the space of the exhibition, they didn't expect to see their drawings and digital paintings projected onto large surfaces of fabric - like those of a ship - inside a dark room, in real-time, through which they could walk. As time passed, they realized that what had been created by them was inevitably erased by who was entering the exposition. Everything was ephemeral, and that room full of luminous fabric surfaces was the concrete relation to life. But what people really didn't expect is that at the end of the big exhibition, when they had already gone through all the artists, on the way out, they would be faced to big screens showing what people were doing at the entrance. Disguised, hidden cameras were scattered near the computers and in the dark room. In the end, everyone controlled everything, there was no more room for privacy.

In a sense, this is the reality of the Internet of Things. As it consolidates, it increases comfort and ends any possibility of democracy, because everything and everyone become known and controlled.

The Internet of Things, just like the universe of personal computers, smartphones, or almost any electronic device from the beginning of the twenty-first century, is nothing more than military equipment financed by its own victims - as I show in my book *The Grasshopper Man*. Everything would have started with the American military, and now it spreads through Europe and China among other countries.

We are permanently monitored when walking in the streets. We make a purchase and all information belongs to a network. Faster or slower we walk, everything is detected. Our preferences, our political ideas, our sexual preferences, our behavior, everything is known.

This permanent vigilance and control, invisible and painless, implies a network of communication between things, a robotization of reality, the emergence of a parallel reality that is beyond our consciousness.

In 2017, I mapped the networks connecting "things" along Garrett Street, in one of the central zones of the city of Lisbon, in Portugal. I identified four hundred and thirty-one transmission and reception points along the seven hundred feet of the street.

A bombardment of electromagnetic waves every about 19 inches.

So the musical composition IoT was born, lasting forty minutes.

The course of this distance in forty minutes means walking at a speed of about a quarter of the normal pace of walk, that is, going very slowly up the street - from Camões Square to the old Armazéns do Chiado.

This is the base of the musical composition IoT. From the four hundred and thirty-one points of the network of things scattered along Garrett Street, I selected five sets, or five voices. Those points were placed inside a space elaborated inside Virtual Reality. Each time the person passes a point, a sound is emitted. The fifth voice, with only nine elements, has longer durations.

The trajectory reveals a web of network points, through which thousands of people pass, whose personal objects or "things" are sending and receiving information to and from other "things".

This cloud of information, constituting a second city, is materially imperceptible, but it is present in virtually everything.

Again, as in prehistory, the boundaries of the individual are disintegrating in a process where everything becomes again environment.

The State automatically fills out our income statements; certificates, evidence and all kinds of documents are required as preventive actions; no privacy is allowed in the face of security; we give away our information every minute; there is practically no possibility of traveling or even moving without being subject to surveillance. But, paradoxically, crimes and terrorist attacks continue.

But, this doesn't mean to be against technology. Technology is, ultimately, everything we do, our instruments, our means, it is what we think.

Everything is made of changes, all the time.

New technologies, new ways to do, can only emerge with questioning, with the understanding of the world.

Which reminds us Heraclitus when he argued that in Nature nothing is immutable, only change.