Internet of Things

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The Internet of Things could well be more about people than about things and technology. This was one of the lessons of the Lift+Fing conference (Marseilles, June 2009) and of the New Industrial World Forum (Paris, November 2009).

"Internet of Things", "Communicating Objects", "Ubiquitous Computing", "Ambient Intelligence", "Machine to Machine", "Augmented Reality"… There is no shortage of terms. This is indicative of the wide variety of perceptions that exists with regard to what we will refer to here as the Internet of Things.

The technology exists. The "markers" are passive or active, read-only or read and write contactless RFID[1] chips. At present, readers are devices that are specific to each application, but there is no doubt that mobile phones are quickly becoming "universal readers". As for networks, the adoption of IPv6[2], a vital component of the Internet of Things, will make it possible to attribute a permanent address to each individual on the planet and to all the objects we would like to make communicative, and there will still be plenty of addresses left over for extra-terrestrials.

Numerous applications already exist in a number of domains, such as:

- **traceability** (e.g. to check in a supermarket that the fish being purchased has not been affected by a break in the cool chain, or to reduce the loss of baggage at an airport)

- **logistics** (e.g. to identify the content of parcels without opening them during delivery)

- **identification** (e.g. passports, the tagging of animals or books from a library)

- **authentication** (e.g. to certify that medicines or works of art are not counterfeit)

- **electronic keys** (already used for certain cars)

- **provision of contextual information** (e.g. to receive information by phone when you are approaching an object in a museum or a sign in the street)

- **contactless payment.**

This list is clearly not exhaustive; we could add all the applications that came under the heading of home automation or "Domotics" a few years ago (remember the refrigerator that managed stocks and placed orders to replenish them?), and new uses will soon be invented on a daily basis.

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[1] Radio-frequency identification (*http://en.wikipedia.org/wiki/Radio-frequency_identification*)
[2] Internet Protocol version 6 (*http://en.wikipedia.org/wiki/IPv6*)

In 2006, at the Autrans meetings, Bernard Benhamou, a lecturer at Sciences Po, France's leading institute for political studies, said:

"The internet will soon no longer be linking computers alone – it will connect all kinds of objects: cars, tools, household appliances, and so on. RFID chips will take over from bar codes. They will be connected to the internet and will provide information about the object concerned. The network will move closer to all of us, and we will all be permanently connected."

This prediction is evidently fast becoming a reality. The Internet of Things is no longer just a vision of the future, it is already happening in part... but only in part.

If the Internet of Things were to catch on a significant scale, far more objects would soon be connected than internet users (100 times more!) – which will probably bring about a profound change in internet architecture itself.

This outlook obviously gives rise to ambivalent feelings and reactions ranging from enthusiasm to scepticism.

It is exciting to see the emergence of certain highly promising application prototypes:

In medical circles, with regard to "dependence" issues associated with physical or mental disabilities, experiments are being carried out with environments in which interconnected objects are able to monitor people medically and give them practical assistance to retain their independence in their own homes and, if possible, in society as a whole.

In the world of automobile transport, vehicle intercommunication will improve traffic safety and traffic flow.

Of the exciting experiments linking the internet and physical objects, mention must certainly be made of Fab Labs.[3] This is a program launched by the MIT with the aim, for example, of producing objects on "3D printers" steered by programs that are available on the internet. One automatically thinks of developing countries, which will thus be able to acquire specific know-how and to produce much needed goods locally (e.g. solar panels).

To gain a forward-looking idea of the Internet of Things, reference may lastly be made to "spimes" – futuristic objects postulated by Bruce Sterling in his book "Shaping Things".[4] He describes a spime as "a users group first, and a physical object second" and refers to the Internet of Things as follows: "The main advantage of the Internet of Things is that I no longer itemise my possessions mentally. They are listed by an 'automagic' voodoo inventory, the work being carried out by a host of machines unseen to me. I no longer have to remember where I put things. Nor where I found them. Nor what they cost. And so on. I just have to ask. And the answer reaches me with instantaneous precision in real time."

A tapestry of relations – that's what the Internet of Things weaves. This point was discussed by Bernard Stiegler at the New Industrial World Forum. He equated the object with a memory system,

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[3] The Fab Lab program is part of the MIT's Center for Bits and Atoms (CBA), which broadly explores how the content of information relates to its physical representation (*http://en.wikipedia.org/wiki/Fab_lab*).

[4] "Shaping Things" (*http://www.amazon.com/Shaping-Things-Mediaworks-Pamphlets-Sterling/dp/0262693267*)

adding: "The reticular society of things is a generalised indexation society based on the attribution, production, search and control of metadata[5], installing a relational system without limitation in time and space."

That is what prompts scepticism and caution.

For more than 20 years, technology has ceased to simply respond to needs and has been running ahead of them. This is what is meant by "technological push". As push exists, so the Internet of Things will be applied in a useful or a useless manner; these applications will place the "always on" human being at the centre of a network in which he or she will be identified, localised, solicited, assisted, informed, monitored and controlled …

It used to be said that the "the trick will be to switch off", and perhaps that is where we are now! The Internet of Things really is more about human beings than about things and technology.

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[5] metadata: data about data *(http://en.wikipedia.org/wiki/Metadata)*