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Schumpeter's notebook

The internet of hype

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MANAGEMENT gurus are always discovering the next big thing (and source of income). Last year it was emerging markets and "frugal innovation". This year it is "[the internet of things](#)



(<http://www.economist.com/node/17388368>)", or, as it has rapidly become "the internet of everything".

Over the past decade billions of people have hooked themselves up to the internet via the computer and, more recently, mobile devices. This communication revolution is now extending to objects as well as people. Imagine if all the objects in the world had all the information that they needed to function optimally. Buildings would adjust themselves according to the temperature. Ovens would cook things for exactly the right time. The handles of umbrellas would glow when it was about to rain. We long ago inserted "intelligence" into objects in the form of thermostats and the like; the internet of everything will extend this principle exponentially, giving us unprecedented control over the objects that surround us.

The internet of everything will help solve two of the biggest problems facing the world: energy and health care. Buildings currently waste more energy than they use effectively. We will be able to cut this waste down to almost nothing. Health care is currently delivered in lumps: we visit the doctor a couple of times a year at most, and get our blood pressure checked every now and again. The internet of everything will allow us to monitor our bodily functionings all the time. A few sensors discreetly attached to the body will keep you constantly informed about how your vital functions are doing. It will also help us to keep ourselves healthy. Pill bottles will tell us when to take our medicines; wine glasses will be able to tell us when we have had enough to drink; sugar bowls will warn us about our sugar intake.

This was the beguiling vision of the future laid out at a conference in Madrid on December 1st-3rd put on by Bankinter's [Fundación de la Innovación \(http://www.fundacionbankinter.org/es\)](http://www.fundacionbankinter.org/es). The conference brought together an interesting group of thinkers and businesspeople: Paul Horn, the former director of IBM Research; Neil Gershenfeld, the director of the [Centre for Bits and Atoms \(http://cba.mit.edu/\)](http://cba.mit.edu/) at MIT; Joseph Kvedar, the chief executive of Connected Health; Robin Chase, founder of Zipcars; Peter Hirshberg, the former chairman of Technorati; and many more. These luminaries inevitably encouraged each other to produce ever more wonderful ideas about this emerging technology. I, as the person who knew least about the subject, was asked to throw some cold water on the proceedings. Here is a brief summary of the doubts I raised (doubts, I

must say, which were listened to with extraordinary good humour by people who actually knew what they were talking about).

Can the infrastructure support such a huge expansion of the internet? The conference took place in the Madrid Ritz, one of the world's great hotels. But the internet connection was glacial (hence, along with my congenital laziness, the recent paucity of blog postings). Many of the presenters found their presentations if not ruined, then at least rendered quasi-comical, by the fact that they could not get an internet connection. Nor is this just a charming Spanish idiosyncrasy. I live an hour away from London. But my BlackBerry does not operate and many of my neighbours cannot get a functioning internet connection. It surely makes little sense to entrust "everything", from our health care to our ovens, to a technology that can easily crash. We are trying to run before we can walk.

What about privacy? The internet of everything will allow companies and governments to collect unprecedented amounts of information on ordinary people. The police and tax authorities will be able to discover what you own, what you do with it, and whether you are living in your house, for example. Companies will be able to "anticipate your needs" for a new toaster or fridge. "Smart" wine glasses might sound wonderful in theory. But do we really want dumb objects warning us about our behaviour?

What about catastrophic failure? The more we trust to the internet, the more dependent we are on it. The more interconnected the world becomes, the more we have to lose from catastrophic failure. Terrorist attacks, hackers' vandalism and plain old disasters could wreak havoc on a world where everything is connected to a giant electronic brain.

Is it worth it? Many of the problems that the internet of things is supposed to solve actually have simple, non-technological solutions. Google likes to boast that your smartphone can tell you the ratio of men and women in any given bar. But there is actually a much simpler solution: you can look through the window! Many of the wonders of the internet of things fall into this category. Sensors can tell you when a baby's nappy is full. There is a perfectly reasonable old-fashioned solution to this problem. Sensors can turn the stem of an umbrella to glow blue when it is about to rain. You can always listen to the weather forecast. Mr Kvedar argued that hooking people up to the internet would reduce their need to go to the doctor, because they will be constantly updated about their health. But will elderly people, who are nervous enough about mobile phones, really embrace this high-tech wonderland? It might be better to loosen the grip of professional doctors on medical advice, and allow nurse-practitioners and other para-professionals to monitor people's health. In health care, above all else, technology is a poor substitute for the human touch.

What will be the human costs of the internet of everything? Imagine that we can overcome problems with the infrastructure, sweep aside privacy objections, and create this interconnected paradise. This will turbo-charge the automation of the service sector, a process that is already gathering pace. This will have a devastating impact on the employment prospects of less-educated workers. Check-out jobs in supermarkets and pharmacies are already going the way of many manual jobs. The internet of everything will render millions of people who currently look after buildings or perform low-level medical services redundant. What sounds wonderful for the digital elite could be a nightmare for less-skilled workers.

There are strong objections to all of these objections, of course, most of them convincing. But, at the very least, we need to debate the implications of this powerful new technology, rather than simply bowing down before the great god "interconnectedness".

Apart from the vital issue of privacy, I suspect that we need to keep a watchful eye on three great issues, as this new technology unfolds:

Will buildings, particularly your humble home, become the new battle-ground between huge corporations? People crave simplicity: they want a single bill, a single provider, a single integrated solution. This gives giant companies, which can roll together a wide variety of internet-

based services, a huge opportunity to gain control of everything that is needed to keep houses heated, information-enabled and otherwise connected to the internet.

Will the developing world leap-frog over the developed world in the internet of everything? The most connected building in the world is Cisco East in Bangalore. South Korea and Singapore are leading the world in linking their infrastructure to the internet. The Chinese government has declared that it wants to lead the world in this new technology: Chinese manufacturers are focusing intensely on this new world of sensors and intelligent objects, with a view not only to supplying a growing market, but also to laying down global standards.

Will the internet of everything reinforce China's top-down model or the West's more bottom-up approach? The betting would be on the latter. But the top-down approach may have surprising advantages: in the establishment of the necessary standards to ensure that things can talk to things; in the construction of smart public infrastructure; and in the introduction of toll roads and other forms of metering. At the very least, China and Singapore seem to have got off to a very impressive start in what is likely to be, regardless of my doubts, a very big next big thing.

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