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## Want eternal life? It could be possible in the Internet of Things

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**Untangling the Web**

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WOULD you feel hurt if your refrigerator stopped returning your emails? Would you be annoyed to have your dinner interrupted by a pot plant demanding a drink? Are you friends with your toilet on Facebook?



The Internet of Things is changing how we relate to technology.

Do you like the idea of a virtual avatar that contains your personality and memories — the essence of you — that could communicate with your descendants?

It's only a matter of time.

Treating machines as though they're human might sound like a stretch but Web 2.0, the social web — the internet in which everyone is a content producer and everyone is connected — is creating a new relationship between people and technology.

Welcome to The Internet of Things.

The Internet of Things is a web in which gadgets, machines, everyday products, devices and inanimate objects share information about themselves in new ways, in real time.

Using a range of technologies — such as embedded radio frequency identification (RFID) chips linked with IP addresses (internet signatures), near-field communications, electronic product codes and GPS systems — just about anything can be connected to a network. The connected objects can then be tracked and output information can be recorded, analysed and shared in countless ways via the internet — some productive, some frivolous, some a little unnerving.

Some examples:

\* A range of toilets developed in Japan can analyse your stool, body fat, blood pressure, heart rate, urine sugar levels, albumin and blood in urine and send the results to your GP to flag potential health issues. Hiroyuki Matsui, chief engineer at high-end Japanese toilet manufacturer Matsushita calls the toilets "health measuring centres".

\* US Courier company FedEx has plans for a sensor to track in real time a package's position and record details such as whether it has been opened and whether it is too hot or cold

\* Fridges are being developed that monitor their contents, including the health values and use-by dates of various foods and whether you need to buy more milk

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\* The Botanicalls system enables a plant to broadcast its moisture level and text, phone or tweet when it needs to be watered

\* A networked bathroom scale developed by BodyTrace, launched last year, wirelessly uploads a user's information to a website, calculates weight and BMI charts, and offers dietary recommendations

\* Beef farmers in Japan have IP addresses embedded on RFID chips implanted in the skin of cattle to track them through the production process

\* Puppy Tweets, a dog collar designed by toy-maker Mattel, tweets random messages from your pet (example: "I bark because I miss you. There, I said it. Now hurry home.")

\* London's iconic clock Big Ben marks time by tweeting "BONG" for every chime of the hour. The account has about 57,000 followers. (There's parody version, similarly named but ruder, that tweets DONG for every BONG. It has just 100 followers.)

Some of these are gimmicks, but they point to the technology's potential.

In a world in which every device is connected, monitored and able to communicate, the web becomes as much a part of our environment as air and sunlight. When data from those devices is cached, sorted and analysed, new relationships develop between humans and technology.

An example of this is Life Account, developed by a group of Mexican university students and the recent winner of Cisco's I-Prize.

Melding social media with the Internet of Things, Life Account uses "smart" objects to collect information about a person from both the physical and virtual worlds. The aggregated data is then pulled together into an avatar that reflects the habits and behaviours of the subject.

Life Account has mainly marketing applications for companies wanting to better target and deliver products to consumers. For example, tracking your online behaviour — Amazon searches, Facebook comments, photo-tagging activities and tweets — it could know that your partner has a birthday coming up and push tailored gift suggestions to you.

But similar avatar-development projects have a less commercial purpose. Lifenaut (see *New Scientist*, June 5 issue) aims to combine personal information collated through interviews and online behaviour to create a virtual replica of a person that would survive beyond their death and be able to interact with relatives and descendants. Creepy.

**According to a February 2010 report by The Hammersmith Group ("The Internet of Things: Networked objects and devices"), there are currently about 1.5 billion internet capable computers and more than a billion smartphones. Within five years, says the report, there will be 100 billion devices connected to the internet, all generating enormous information trails.**

Talking about the "sensor revolution" — the proliferation of mobile phone devices that can see (camera), hear (microphone) and feel (touch screen) the world around us — Google vice president Marissa Mayer has noted that in 2009 there was more than 280 exabytes of data online, 56 times more than in 2002. Riffing on the same theme, Hewlett Packard CEO Mark Hurd has said that more data will be created in the next four years than in the history of the planet.

Will you become friends with your toilet on Facebook in this brave new world?

Perhaps not. But in The Internet of Things, it might be a good idea to introduce it to your doctor — otherwise you might need that virtual avatar sooner than you'd like.