

This is an artefact of ten years of watching the Internet of Things almost happen. It's a surplus passport photo of me with an rfid tag taped to the back. Ten years ago, when we were living in Helsinki, Finland, Matt (Jones) would touch his NFC-enabled Nokia phone to my picture to automatically send an "I love you" text. It's the thought that counts, rather than the actual typing, right?

According to Gartner's hype cycle, such near-field communication (or NFC) technology is now in the "trough of disillusionment". Its successor, on the other hand, the so-called Internet of Things, is at the "peak of inflated expectations".

The description of the Internet of Things that I like best at the moment is Bruce Sterling's, "Imagine an Android or iPhone unbundled into its tiny component parts and scattered across the whole world." (I don't say that just because Bruce is our guest here tonight.)



Seven years ago, I had the great pleasure of commissioning and producing an exhibition at the Science Museum in London: *The Science of Spying.* One of the galleries in the exhibition housed a collection of "speculative products," prototypes designed to express future scenarios for surveillance and countersurveillance.

Hari & Parker on the left are cute little toys that watch and listen. Hari has a microphone ear and Parker a video-camera nose and fingerprint-scanner paw. (Design by Onkar Singh Kular, Wilfrid Wood and Anthony Burrill.)

On the right is Troika's *How Do I Look?* a screen concealed in a make-up compact. It automatically connects you to the closest CCTV camera and enables you to check how you look on their recordings. Troika's projects were inspired by the idea that as spying seems to become more and more integrated in our popular culture, the main thing worth spying on will be yourself.

I show this now just to be clear that I'm not naïve about the privacy implications of the connected object and smart building. But I think there is a lot of potential to be explored too.



As the MoMA representative on tonight's panel, Paola asked me to focus my talk on the idea of a connected, or smart museum.

Considering the internet of things through this lens is really interesting because of the way technology is used in museums – especially in museums of science and history, which produce interactive exhibits. Museums don't do product design in the way you'd understand it. Design in museums is bespoke, for specific location(s), often a one-off. There are requirements of robustness and public safety but otherwise it's very different from product design.

The people who work with museums on interactive exhibits, more than once, tend to be artists or inventors or both. They're more interested in datasheets than product demos, stripping consumer electronics for useful components.

http://www.exploratorium.edu/texnet/exhibits/sound/delayed/media/



Museums also, necessarily, think about design at a number of levels, as advocated by Finnish architect Eliel Saarinen: the object, a collection of objects, a building, the city and the network.

I'm going to present a connected object use case for each of the first four levels – the use cases that seem to attract the most interest and attempts from museums themselves. (I won't talk about the acquisition and display of connected objects or artworks, because both opportunities were explored in depth by Paola through her *Talk to Me* exhibition in 2010.)

http://www.moma.org/interactives/exhibitions/2011/talktome/



The promise of the internet of things really resonates with museums because, in many ways, they already hold connected objects. Individual objects are already identified by an unique number (an accession number in the UK and US, or – far more evocatively - a national treasure number in Japan and Korea). Via this number, museum objects are represented in a database and associated with a folder in the archives.

But even more than that, museums are curious about the internet of things because it promises to transform the label. And museums love their labels.

In MoMA's *Talk to Me* exhibition, QR codes and Twitter hashtags were added to the labels to facilitate a networked discussion. The latest and most sophisticated effort is the Cooper Hewitt Design Museum's Pen, powered by NFC: "All visitors will be loaned an interactive Pen to collect and create during their visit. They will be able to record their visit, which can be viewed and shared online and supplemented during future visits."

http://www.cooperhewitt.org/new-experience/designing-pen/



The other recurring technology dream in museums is the "virtual visit", where people can remotely connect to the museum via the internet.

The 2012 *Web Lab* at the Science Museum in London allowed online visitors to control music instruments and sketch bots.

http://www.sciencemuseum.org.uk/visitmuseum/plan_your_visit/exhibitions/ web_lab.aspx



Tate's *After Dark* special events invited people to remotely control robots to visit the museum after closing.

Wearable technology like Google Glass will be another way for visitors to share their experience with people not at the museum. An app and "glassware" is expected at the New Museum Triennial in Feb 2015.

And pilots with tele-presence robots, like the Beam by Suitable Technologies, promise to make museums accessible to people who couldn't otherwise visit.

http://www.tate.org.uk/whats-on/tate-britain/special-event/after-dark and https://www.youtube.com/watch?v=tvEpJYZujnI http://www.slate.com/articles/technology/future_tense/2014/07/ telepresence_robots_make_museums_accessible_to_everyone.html



Moving up the scale to the building, you could argue that museums are already smart buildings – they're flooded with sensors for conservation, and cameras for security.

Shown here is the Cloisters at the Metropolitan Museum of Art, which contains 3,000 medieval works. The Met deployed 120 low-power temperature and humidity sensors to determine the ideal environmental conditions on an object-by-object basis.

http://www.technologyreview.com/news/427696/an-algorithm-for-preserving-art/

http://usatoday30.usatoday.com/money/industries/environment/2011-06-11metropolitan-museum-sensors_n.htm



We've already heard about Nest products – thermometers and smoke alarms – for the home. This is an IDEO proposal for a dynamic LEED plaque for public spaces, sharing real-time performance against a range of measures of energy and environmental design

(Reminds me of Indianapolis Museum of Art's transparency dashboard, showing almost live data for memberships, endowments, visits...)

http://www.ideo.com/work/making-buildings-smarter http://www.usgbc.org/ articles/leed-dynamic-plaque-finalist-fast-companys-2014-innovation-design-(Leadership in Energy and Environmental Design) http://dashboard.imamuseum.org/



And at the city level, I think *Hello Lamp Post* is a great illustration of how identifiable public infrastructure can be co-opted into less official, playful experiences.

http://www.hellolamppost.co.uk/



The examples I've covered so far address applications that are of primary interest to museums. What R&D function might internet of things projects in museums have for society?

Mike Kuniavsky, author of *Smart Things*, has argued that we need to explore the design space of a Local Area Network (or LAN) of things before we tackle the Internet of Things. That it's useful to identify narrow, site-specific uses of these technologies first. That's what museums already do. And in his recent pamphlet, *The Epic Struggle of the Internet of Things*, Bruce Sterling identifies an alternative to the cloud – something that is "anti-cloud, local on purpose." He cites the approach taken by Cisco, which is pursuing super-local "fog computing".

http://orangecone.com/archives/2010/10/the_lan_of_thin.html http://www.strelka.com/en/press/books/the-epic-struggle-for-the-internet-ofthings



I think it's really interesting that at the same time we're imagining "an Android or iPhone unbundled into its tiny component parts and scattered across the whole world," artists are experimenting with alternative local networks. Such as Dan Phiffer's occupy.here: a tiny self-contained darknet that emerged out of the occupy movement. Or the *LittleNets* show of alternative networks curated by Ingrid Burrington for Eyebeam. *LittleNets* consisted of site-specific mesh networks on Governor's Island with things that might be useful to have on a remote island—simple communication tools, artworks, and games.

http://www.eyebeam.org/events/littlenets



Created by artist Miranda July, *Somebody* is a messaging app. Inspired by the idea of singing telegrams, this app doesn't send your message directly to your friend but somebody nearby, who has volunteered to pass it on. The *Somebody* app is designed to work anywhere but is most successful when there's a concentration of people, so the app is now supported by a number of official "hotspots", such as the New Museum and the Venice Film Festival.

Just as wifi became a public utility provided by museums, perhaps museums will also offer site-specific networks or hotspots for art, experimentation, invention and activism?

http://somebodyapp.com/