Attempting to Interpret the Internet of Things

By Emma-Jayne Reekie

The Internet of Things (IoT) is a difficult concept to get one's head around. Though its existence was once questioned, IoT is now undeniably part of our increasingly connected world. The Internet of Things is defined as being simple in its intention; devices connecting and interacting over the internet. As simplistic as this definition appears, the sheer number of devices and diverse selection of users, be that individuals, companies or governments, that are now capable of using and developing IoT complicates its purpose somewhat. IoT can function at a personal level, controlling the heating of a home through a mobile app for example, or on a larger, more collaborative level such as farmers connecting sensors to monitor their crops and cattle or smart cities, which could help to improve efficiency and reduce waste like Nottingham's installation of 'smart bins', solar powered compactor bins that can hold up to 8 times as much waste as a normal bin which use GPRS data to inform maintenance crews when they are full[1].

It has been predicted that by the year 2020 there will be 50 billion connected IoT devices[2], resulting in much potential for smarter living, more efficient usage of valuable resources and further technological advances but there is equal concern, following the recent worldwide cyber-attack which targeted the NHS amongst others, for how data storage and privacy will be managed and contained. There are already initiatives being developed around ensuring people's personal data is protected such as Databox[3], a project led by Dr Hamed Haddadi at Queen Mary's University London in collaboration with the University of Cambridge and University of Nottingham. What Databox hopes to do is create an open-source personal networked device that is supported by cloud hosted services which will form the centre of an individual's personal data processing ecosystem allowing them to exercise control over third party usage of their data.

The European Union has been explicit in its support for IoT, investing over €100 million in IoT between the years 2007 and 2012, in the hope that by investing in IoT they can ensure that the real benefactors of IoT are European citizens rather than machines and corporations. Similarly, the UK government has invested £32 million into IoT, part of which has helped to fund IoT UK, a national programme of activities powered by Digital Catapult

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[1]
https://iotuk.org.uk/smart-bins-as-a-service-in-nottingham/#1463069850260-40432ad9-2af3

[2]
http://www.rcrwireless.com/20160628/opinion/reality-check-50b-iot-devices-connected-2020-beyond-hype-reality-tag10

[3] https://www.databoxproject.uk

and Future Cities Catapult, that hopes to advance the UK's lead in IoT entrepreneurship and collaborate with organisations across many different fields such as health, industrial applications and cities.

IoT, like most other technological developments, has captured the imaginations of other fields such as education and art. Australian based artist Matthew Sleeth created *A Drone Opera* in 2015, an opera loosely based on the ancient Greek tale of Icarus, centred around remotely operated flying machines that are usually associated with conflicts and war and instead examining their social and cultural impact. Described by ABC News as "a sensory assault", the audience are engulfed by the noise of the drones, improvising opera singers and ambushed by the air reverberating from the drone's blades, all accompanied by laser beams and smoke. Sleeth hopes the immersive nature of the opera will demonstrate that drones are not autonomous, that they are very much technology controlled by humans.

At FACT, IoT and its potential for expanding traditional educational borders has been experimented with through its 'Cloudmaker: Making Minecraft Real' project in 2014. The focus of the project was to encourage young people to collaborate and learn through digital and physical interaction, thus preparing them for the increasingly digitised and globalised world they're occupying. There were several different aspects to this project including 'The Minecraft of Things' which extended IoT through Minecraft by passing messages to and from objects in the Minecraft game and objects in real life encouraging young people to think about the how buildings are designed and in what spaces.

FACTLab, a workshop space that compliments and reveals the creative processes behind FACT's exhibits, and the Object Liberation Front, a group of technologists, researchers and artists, presented the exhibition *Ob_ject and Ob_serve* in 2016. The exhibit explored how objects and non-humans shape and categorise their own world through observing the different languages used for making up their memories, desires and conversations and then applying that knowledge to thinking about how these objects shape and influence the human world. There were a series of different resident artists and projects as part of this exhibition including Radamés Ajna and Thiago Hersan's project 'memememe' which gave

phones their own language based on the idea that phones are having more fun communicating than we are.

The Object Liberation Front were involved in another project, titled *OLF City Game*, at FACT as part of the 2016 International Festival of Business which was curated by arts organisation Metal in conjunction with Red Ninja, the University of Liverpool and Draw and Code. Twenty beach huts were placed along the waterfront as temporary work stations for performances, conversations, live music and workshops throughout the IFB, with one beach hut using equipment from Google's Internet of Things Research Program and makeshift machines designed by artist Alex Pearl to create an experimental city game which challenged the user, through the platform of an app, to decode a number of clues in an attempt to uncover more about our relationships with objects around us.

Perhaps one of the most interesting, and mind boggling, developments around the Internet of Things has been the foray into philosophical thinking surrounding it. Somewhat inevitably, as technology has developed and expanded, traditional thinking has been turned on its head with object oriented ontology emerging as the antithesis to philosophies that place humans at the centre of understanding and instead contend that objects exist independently from human interpretation. This thinking remains in its infancy and is not without its critics, with Barbara Johnson rather succinctly remarking that "the problem is not, as it seems, a desire to treat things as persons, but a difficulty in being sure that we treat persons as persons"[4], and Ben Kafka criticising the "dehumanizing" nature of OOO and its related post-humanism schools of thoughts[5]. What these arguments demonstrate is the sheer breadth of change that technology has the ability to harness and invoke; it is turning the axis of hundreds of years of philosophical thought on its head and, regardless of whether or not its current embodiment will be its final, the way that humans evaluate their

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[4]

https://books.google.co.uk/books?id=0aCiCwAAQBAJ&printsec=frontcover&dq=barbara+johnson+persons+and+things&hl=en&sa=X&ved=0ahUKEwiXz9qbj73UAhVBXRoKHePzBl0Q6AEIJjAA#v=onepage&q=barbara%20johnson%20persons%20and%20things&f=false

[5]

http://www.artspace.com/magazine/interviews_features/the_big_idea/a-guide-to-object-oriented-ontology-art-53690

existence clearly needs to be revisited in order to incorporate the undeniable force of technological led change.

The Internet of Things will continue to evolve and expand in ways we cannot yet imagine and art and philosophy will continue to play its role of interpreter as we attempt to navigate these unknown waters. Intriguing and innovative projects such as A MOEDA, a semi-autonomous object passed through human hosts that wants to travel around the world[6], will continue to pose questions that will allow humans to locate themselves, technology and their relationship into a broader context of understanding the Internet of Things.

Additional Reading/Viewing:
- What is the Internet of Things?
  https://www.theguardian.com/technology/2015/may/06/what-is-the-internet-of-things-google

- A Simple Explanation of the Internet of Things
  https://www.forbes.com/sites/jacobmorgan/2014/05/13/simple-explanation-internet-things-that-anyone-can-understand/#6c3d84e51d09

- How it Works: Internet of Things
  https://www.youtube.com/watch?v=QSIPNhOiMoE

- What is the Philosophy of the Internet of Things?
  http://www.digitalartsonline.co.uk/news/interactive-design/what-is-philosophy-of-internet-of-things/

- From the Sociology of Things to the "Internet of Things"
  http://ac.els-cdn.com/S1877042814049799/1-s2.0-S1877042814049799-main.pdf?_tid=20d4d40c-50f0-11e7-a91d-00000aab0f26&acdnat=1497437973_279bd79bd8009f992a1134864f12a72a

- Is Art the Next Frontier in the IoT Revolution?
  https://readwrite.com/2016/09/02/art-tech-new-chapter-iot-revolution-pl1/

- Architecting the Internet of Things: State of the Art
  https://www.researchgate.net/publication/274718805_Architecting_the_Internet_of_Things_State_of_the_Art

- How IoT & Smart Home Automation Will Change the Way We Live
  http://uk.businessinsider.com/internet-of-things-smart-home-automation-2016-8?r=US&IR=T

- The Internet of Everything for Cities
  http://www.cisco.com/c/dam/en_us/solutions/industries/docs/gov/everything-for-cities.pdf

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[6] http://www.amoeda.eu

- The Future of the Internet of Things is Amazing, If We Don't Muck it Up

  http://www.huffingtonpost.com/alisa-valudes-whyte-/the-internet-of-things-future_b_8640360.html