Future regulation of the future internet

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Summary: *This article highlights the regulatory challenges posed by the rapid development of the Internet of Things and other technological advances. Issues relating to cryptocurrencies, crowdfunding, data protection and the recent Court of Appeal decision in* Grace v Black Horse Limited *are considered.*

The IOT/Big Data and Energy Internet

As consumers have adapted their lifestyles to accommodate fast and mobile internet computing, a transformational change is taking place which is predicted to have an even more dramatic effect than the advent of Microsoft Windows or Google. Known as the Internet of Things ("IoT") or the Industrial Internet, this technological revolution will connect every machine, business, residence and vehicle in an intelligent network, all embedded in a single operating system, continually feeding Big Data to servers from homes, cars and businesses. New computing algorithms will be used to process the Big Data, allowing decisions to be made by machines over all aspects of our lives.

Some of the leading IT companies around the world are already busy at work on the build-out of the IoT infrastructure. GE's "Industrial Internet," Cisco's "Internet of Things," IBM's "Smarter Planet," and Siemen's "Sustainable Cities" are among the many initiatives currently underway to bring online an intelligent infrastructure that can connect neighbourhoods, cities, regions, continents and the global economy, in what industry observers call a global "neural network." The network is designed to be open, distributive and collaborative, allowing anyone, anywhere, and at any time, the opportunity to access it and use the Big Data to create new apps for managing their daily lives.

In the United States, 37 million smart meters are now providing real time information on energy use. Within 10 years, almost every building in America and Europe will be equipped with smart meters. Every device – thermostats, assembly lines, warehouse equipment, TVs, washing

machines – will have sensors connected to the smart grid and IOT platform. The number of sensors connecting things to the internet has grown from 10 million in 2007 to 3.5 billion today, with projections of 100 trillion sensors by 2030. A new internet protocol, IPv6 has been developed by the Internet Engineering Task force with a massive capacity.[1] Cisco predict that by 2022, the IoT will generate $14.4 trillion in cost savings and revenue.

The IoT is already transforming a number of industries, such as healthcare, energy and the production and delivery of food. Factors that influence yield, such as weather and soil moisture, are now monitored by sensors that are also used to monitor logistics and transport on a minute by minute basis.

The economist Jeremy Rifkin in his recent book, *The Zero Marginal Cost Society: the Internet of Things, the Collaborative Commons and the Eclipse of Capitalism,*[2] points to the power of the IoT, which enables billions of people to engage in peer to peer social networks. This has led to the co-creation of new economic practices, challenging existing business models in a number of traditional capitalist markets.

Rifkin describes how producer/consumers called 'Prosumers' now produce and share their own information, entertainment, green energy, 3D- printed goods and online learning as well as sharing cars, homes and clothes via the internet in rental, redistribution clubs and co-operatives at low or near zero marginal cost. He points to young social entrepreneurs who are building ecologically sensitive businesses, crowdfunding new enterprises and even creating alternative new social currencies known as 'cryptocurrencies'.

The internet has already demonstrated its power to destroy the existing market in music by the file sharing peer to peer service Napster where many sellers and buyers disappeared to be replaced by providers and users. Ownership of CDs gave way to access to music libraries online. The new 'sharing' economy has extended to sharing rooms, or even couches ("Couchsurfing"), where sites like Airhbnb and HomeAway are now filling more rooms across the globe than the Hilton and Intercontinental hotel chains. Other industries that are coming under attack include toys (see Rent That Toy! and Spark Box Toys) and clothing (see Tie Society), with sites such as Yerdle allowing users to swap unwanted goods and Shared Earth allowing the sharing of gardens to produce vegetables.

The well documented decline of the high street is only the first wave of the damage that will be inflicted on the current way of business. The proponents of 'the Circular Economy' advocate

[1] 2^{128} or approximately 3.4×10^{38} addresses. This would be about 40,000 addresses for every atom on the surface of the earth

[2] Palgrave McMillan April 2014

access to goods by leasing or sharing rather than purchase, so that products can be returned to their manufacturers where their components and materials can be properly reused rather than recycled. As automation, robotics and Artificial Intelligence ("AI") replace tens of millions of workers, consumer purchasing power in the marketplace will contract as the sharing marketplace on the internet continues to grow.

Cryptocurrencies

Currency is another area where the Future Internet is bringing about transformational change. Rifkin points to the 2008 global banking crisis as being the time when people began to realise that governments might not stand behind their deposits and currencies. People began to turn to gold, causing a spike in the price which was unsustainable. Alternative local currencies began to develop, so that 4,000 are now in circulation around the world, notably Greece and Spain where economic difficulties have been most severe.[3] Bitcoin, the first 'cryptocurrency' was created in Amsterdam to facilitate international money transfer.

A cryptocurrency, often denominated in units called Altcoins, is a line of code with a monetary value. From a regulatory or legal perspective, the development of these processes raises concern as there is no current control over the design or management of the currencies, and their existence makes it easier to avoid money laundering regulation. Most cryptocurrencies are designed to decrease in production over time, this creating a market cap. Following Bitcoin in 2009, Namecoin was created in 2011, and by 2013 had reached a market capitalisation of $1 billion.

In the USA, the IRS ruled that Bitcoins are to be treated as personal property for tax purposes and therefore liable to Capital Gains Tax; the Financial Crimes Enforcement Network has warned that those who develop them are transmitting currency and liable to regulation.

On 3rd March 2014, HMRC published briefing document no 9, *Bitcoin and other Cryptocurrencie*s, with the following provisional guidance:

- VAT: income received from Bitcoin will be considered outside the scope of VAT as there is insufficient link between any services rendered and consideration received. Although VAT will not be payable when Bitcoin is exchanged for Sterling or foreign currencies, if goods or services are sold for Bitcoin, VAT is payable in the usual manner.

- Corporate Tax, Inheritance Tax & CGT: depend on the activities of people involved on a case by case basis taking into account the specific facts. As with gambling or betting

[3] Ben Block 'Local Currencies grow During Economic Recession' 2009.

> wins not being taxable, a transaction may be so speculative that it is not taxable and losses not relievable.

Commentators think that the decision in respect of VAT was made to avoid further VAT fraud as has happened with carousel frauds and problems with the carbon emissions trading market. The European Banking Authority ("EBA") has created a taskforce to advise on virtual currency regulation, to assess the risk to consumers of using virtual currencies as 'a means of payment' as well as the risk to regulators in controlling money laundering activities. In December 2013, the EBA issued a warning to consumers of the risks of buying, trading or holding virtual currencies such as Bitcoins. Virtual currencies are not currently regulated in Europe and if something goes wrong, consumers will be unable to claim compensation through the usual channels: the European Central Bank's October 2012 paper, *Virtual Currency Schemes*, confirmed that the Payment Services Directive and the Electronic Money Directives do not apply to virtual currencies.

Although governments have been slow to encourage the development of the new internet based economies, organisations such as the European Union have woken up to the power of the new IoT based economies and started to encourage development of platforms with programmes such as the European FI [Future Internet] Project, which has provided funding to build an ecosystem based on building blocks, to allow entrepreneurs to build their own IoT 'Apps' in a variety of market sectors. This new world of open source development, freed up from intellectual property restraint, is aimed at promoting creativity and innovation, based less on financial incentives and more on advancing collective benefit.

Data Protection issues

Following an intensive three month consultation in 2012, the European Union, recognising the challenge of fostering a dynamic development of the IoT in a single digital market while ensuring appropriate protection and trust of EU citizens, established a broad principle to guide all future development of the IoT.

> 'In general, we consider that privacy & data protection and information security are complimentary requirements for IoT services. In particular, information security is regarded as preserving the confidentiality, integrity and availability (CIA) of information.'

To advance these protections and safeguards, the EU proposed that mechanisms be put in place,

> 'to ensure that no unwarranted processing of personal data takes place and that individuals are informed of the processing, its purposes, the identity of the processor and how to exercise their rights. At the same time processors need to comply with the data protection principles.'

The commission proposed further specific technical means to safeguard user privacy, including technology to secure data protection. It will be interesting to see whether data protection law is able to keep up with the rapid development of the IoT. The application of the Data Protection Act 1998 is often somewhat unpredictable even in well-established contexts. A good example of this is the Court of Appeal's recent decision in *Grace v Black Horse Limited* [2014] EWCA Civ 1413 that a finance company breached the fourth data protection principle (that data should be accurate) by reporting a borrower's default under a credit agreement without also reporting that the credit agreement was unenforceable under the Consumer Credit Act 1974. The fact that the credit reference agency reporting mechanism had no facility for a finance company to disclose the "unenforceability" of any credit agreement did not make a difference: reporting the default without this crucial information was held to be inaccurate by omission. This decision is somewhat surprising, as it could be said to be even more inaccurate for a finance company not to report such a borrower's default and by implication suggest to potential future creditors that the borrower is creditworthy. Nevertheless, the fact that an industry used to heavy regulation could be taken by surprise by this interpretation of data protection legislation in *Grace* suggests that other industries will face still greater compliance issues whilst striving to stay competitive in the fast moving IoT environment.

Funding

Peer to Peer lending has also shown signs of growth with Zopa processing over £414 million of loans in 2012. Kickstarter, the leading crowdfunding enterprise, was launched in April 2009 raising money from the public in schemes that have public support. A pledge is made contingent on take up of the full offer. Early beneficiaries have been solar energy and other micro generation projects.

Crowdfunding falls within the scope of regulation by the FCA if it involves a person carrying on a regulated activity in the UK, such as arranging deals in investments, or the communication of a financial promotion in relation to securities. If a crowdfunding platform enables a business to raise money by arranging the sale of equity or debt securities, or units in an unregulated collective investment scheme, then this is investment-based crowdfunding. As such, it is regulated by the FCA and the firm operating the crowdfunding platform needs to be authorised, unless an exemption is available.

Similarly, loan-based crowdfunding will generally involve a regulated activity if the lender is advancing credit to an individual borrower by way of business. The challenge faced by the FCA in regulating such loan-based crowdfunding is that it can be difficult to determine when such lending is "by way of business" and the FCA would traditionally regard both parties to the loan agreement as potentially deserving of regulatory protection: the lender by analogy with the

protection given to investors or those making deposits under the FSMA 2000; the borrower by reference to the traditional protections under the CCA 1974. In March 2014, the FCA published new rules on the regulation of internet crowdfunding (Policy Statement 14/4) and from 1 April 2014 it has been a regulated activity to operate an electronic system in relation to lending (i.e. to operate a peer to peer lending platform: see the new Article 36H of the Financial Services and Markets Act 2000 (Regulated Activities) Order 2001).

Future regulation of the future internet

The above observations highlight the many challenges associated with the regulation of the future internet. With "driverless" cars set to be released on UK roads in 2015, every aspect of our daily lives is becoming increasingly impacted by technology. The controversy surrounding the alleged cyber-attack made by North Korea against Sony Pictures illustrates that the online world is already an arena in which states as well as corporations and individuals can quickly exert damaging and wide-ranging influence. Perhaps even more worrying is the suggestion that the most serious future threat might well come from the machines themselves, with Bill Gates and Stephen Hawking suggesting that, unless developed with appropriate restraint, AI could ultimately spell the end of the human race.[4] The potential risks and rewards associated with the future internet could hardly be clearer, or the need for good regulation more apparent.

[4] "*Microsoft's Bill Gates insists AI is a threat"*, BBC news article 29 January 2015, www.bbc.co.uk