Online Only Chapter

29

**The Future for IT Law**

To draw together the many themes discussed in this book is challenging. This book has attempted to contextualize the interface between law and technology as we move from the physical society to a digital society. This has involved discussion of digital and virtual property, even virtual societies and virtual identity. It has led us to examine the value of information, including free expression, data privacy, and data protection. It has also led us into the dark side of digital technology with examination of harmful content, digital crime, and even cyberterrorism; yet this chapter is the most difficult of all to write for almost as each chapter in this book was being written it was already on the way to being out of date.

This is because of the pace of change driven by technological advances in the information society. We have gone from computers that filled rooms to computers held in the palm of your hand within 50 years. Information stored on reams of punch cards can now fit on a single memory card the size of a fingernail, and processing power increases exponentially so that a computer that costs under £300 today has more processing power than the famous Cray 1 super-computer of the 1970s which cost at least $5m. The speed of development in computer and information technology is driven by a rule known as Moore’s Law, named in honour of Intel co-founder Gordon Moore who first set out his principle of computing processing power in his 1965 paper Cramming More Components onto Integrated Circuits.[[1]](#footnote-1) Moore’s Law, which states: ‘the number of transistors that can be placed inexpensively on an integrated circuit has increased exponentially, doubling approximately every two years’ has remained true since its introduction and is often credited with advances in data storage, data processing, and speed of data access.

Although there is no doubting the veracity of Moore’s Law, which is driven by intense competition in the micro-circuit sector, it doesn’t fully explain why so many technologies, and services, are driven forward with the same speed in the information society, so everything from storage capacity on HDD and memory cards to internet access speeds, to number of pixels in a digital camera are being driven forward at the same pace. Why is this? It is my belief that it is because Moore’s Law is not the driver of change and development but the means of measuring it. The driver of change in the information society was and remains the discovery of the bit.

Much as the discovery of subatomic particles revitalized physics throughout the twentieth century with the new discipline of quantum physics making the most incredible breakthroughs,[[2]](#footnote-2) the discovery of the common building block for storing, transmitting, and processing information has driven the information society forward on all fronts. This common driver of change allows designers of hardware and software, telecommunications engineers, designers of consumer digital goods, and service providers such as telecommunications companies and data processing companies to build a ‘virtuous circle’ where each feeds off the developments and breakthroughs of the others to allow products and services to develop with lightening speed.[[3]](#footnote-3) This means that information technology, and the information society, is moving forward more quickly than the law, and textbooks, can keep up with. The ambitious aim of this chapter is to gaze into the crystal ball: an exercise in futurology which may assist the reader in staying one step ahead of developments in technology and the challenges these will surely bring to lawyers and law-makers.

29.1 **Future developments**

29.1.1**Greater connectivity, greater control**

Exercises in futurology are often exercises in futility. That accepted, if we are to glance into the future of information technology law we need to identify what may prove to be the key characteristics of future technology design. Commentators seem to be split as to how future technologies will affect our society.

Some suggest that as technologies get more complicated and carry out many more functions we will seek refuge in tied devices that specialize in carrying out the tasks we ask of them.[[4]](#footnote-4) For them the future is centred upon consumer devices such as Smartphones, PVRs, tablets, and gaming devices. These devices are so-called ‘closed boxes’ meaning the software supplied with them is usually proprietary—the obvious exception being the Android operating system of which more below—and cannot be studied or copied except within the very strict limits allowed by ss. 50A–50C of the Copyright, Designs and Patents Act 1988. For these commentators the natural progression of devices is that each successive generation of consumer devices becomes more powerful and contains more functions but at a cost of freedom.

**Case study***Home video recording*

* The first generation of home video recording devices was the VCR which had no copy controls and allowed for transfer from TV to video and from video to video.
* The second generation was the VCR with macrovision. This prevented copying from pre-recorded videos with macrovision protection.
* The third generation was DVD-R. This allowed not only for macrovision but also for digital TPMs to be used to prevent copying.
* The fourth generation is PVRs (HDD recorders such as Sky+). These have a variety of controls; some designed for consumer benefits, others for the benefit of the manufacturer or TV broadcaster. Sky+ has a comprehensive parental control system which prevents playback of programmes rated ‘15’ or ‘18’ before the watershed times. Also parents can set controls for all content or varieties of content. There is also an advanced copy control mechanism called CGMS-A (copy generation management system––A) which allows Sky to encode all broadcasts with a copy activation code of either ‘00’ copying allowed; ‘10’ one time only copy; or ‘11’ no copying allowed.
* The fifth generation is remote storage and streaming delivery (NetFlix and Amazon Prime). Here the end user never possesses a full copy of the content, instead a copy is streamed on demand. This means the available library of content changes daily as content is added and removed and the end user has no way to retain a copy of the content.

The effects of Sky’s CGMS-A system were keenly felt by Sky+ subscribers in late 2008 when a glitch with Sky’s broadcast signal caused all material stored to the HDD to be encoded ‘11’ for a period, meaning users could not archive programmes by copying them to DVD.[[5]](#footnote-5) Although in this case it was a technical glitch that had caused the problem, it served to demonstrate how fourth generation PVRs gave control over recordings not to the user in the way a VCR, or even a third-generation DVD did, but retained an element of control to the provider. This is magnified in the fifth generation where content remains always in the possession of the streaming service. This leads Jonathan Zittrain to title closed boxes which retain a connection to their supplier ‘tethered appliances’. Tethered appliances are devices, such as Sky+ but also including everyday devices such as the Mp3/Mp4 players, Smartphones, games systems, Tablets, Sat Navs, and eBook Readers, which ‘offer a more consistent and focused user experience at the expense of flexibility and innovation’.[[6]](#footnote-6) For Zittrain, and others, believe that the driving force for social change in the coming years will be technologically driven unless consumers mobilize against the technology industry.[[7]](#footnote-7)

Strong indications that Zittrain’s vision of technologically driven black boxes will come to dominate the user experience in the coming years can be seen in the greater deployment of closed environments driven by the use of applications or apps. The king of such content delivery is of course Apple which has developed a number of stable, consumer friendly products which remain (relatively) virus free; provide a central and easily accessible series of content stores, for music, audiovisual content, and apps; but in which environment Apple control everything that is on your system through a closed operating system and a closed sales environment.[[8]](#footnote-8) As Zittrain predicted the security this environment gives to the user allows them to forgive Apple many indiscretions. The App Store will not for example list Apps which recreate the native functions of the store which meant that for a period after the disastrous Apple Maps launch Google were blocked from providing a Google Maps app, and even now that such an app is available and is clearly superior to the Apple offering,[[9]](#footnote-9) third party apps on Apple devices which use mapping functions must integrate with Apple Maps as integration with Google Maps (or any other non-native mapping application) is not allowed.

This is a modern version of an old-fashioned concept: the walled garden. Walled gardens were common in information and communication technologies in the 1990s. Walled gardens are proprietary and controlled areas of technology access. In the 1990s famous walled gardens were operated by leading ISPs such as America On Line (AOL) and CompuServe. These were areas of dedicated content only for subscribers of their service and which were designed to keep subscribers within the controlled area rather than in the wider web environment. These were sensible for ISPs at a time when dial-up was 28.8 or 56.6 Kbps. With connection and download speeds slow, walled gardens were locally hosted optimized content allowing for quicker content delivery. These were sold to subscribers as safer parts of the web where the ISP could act as a gatekeeper to keep out undesirable content. A good example of such a walled garden was AOL’s ‘Kid Channel’ which established a walled garden to prevent children accessing inappropriate websites.[[10]](#footnote-10) Of course ISPs were not doing this purely for the convenience factor or out of a sense of social responsibility; they also controlled content within this closed environment meaning that they could sell advertising and third party content. Around the millennium ISP-driven walled gardens started to die out. People no longer wanted controlled internet access: they wanted to experience the whole of the web. Walled gardens did not disappear though—they moved from home internet access to mobile access provided though fledgling 2G mobile networks. Like ISPs mobile phone operators found that 2G download speeds of about 25Kbps (dependent upon infrastructure) were not fast enough and in any event phone handsets could not handle complex data like images very well. A new generation of walled gardens sprung up like Vodafone Live which replicated the model of the ISPs. By the late 2000s they had all gone; the arrival of 3G and later Smartphones negated the need for walled gardens again and consumers wanted wider access.

However, we find ourselves now in the midst of a third generation of walled gardens. As well as Apple’s lock-in system of iOS/iTunes/App Store, we have the Amazon Kindle ecosystem, and Facebook’s closed and managed social network platform. These walled gardens offer arguably a more controlled experience than either the ISP or mobile walled gardens, and here the commercial imperative is clearly the driver over technical limitations. Yet consumers flock to these platforms, suggesting Zittrain is right: we will sacrifice freedom of choice in return for a functional secure environment and user experience. Sensing the threat to the open standards we have become used to, Professor Sir Tim Berners-Lee wrote a spirited defence of open web standards in the December 2010 issue of Scientific American.[[11]](#footnote-11) In this he pointed out all that is lost in terms of creativity and wider risks to society through the construction of walled gardens:

Many companies spend money to develop extraordinary applications precisely because they are confident the applications will work for anyone, regardless of the computer hardware, operating system or Internet service provider (ISP) they are using—all made possible by the Web’s open standards. The same confidence encourages scientists to spend thousands of hours devising incredible databases that can share information about proteins, say, in hopes of curing disease. The confidence encourages governments such as those of the US and the UK to put more and more data online so citizens can inspect them, making government increasingly transparent. Open standards also foster serendipitous creation: someone may use them in ways no one imagined. We discover that on the Web every day.

In contrast, not using open standards creates closed worlds. Apple’s iTunes system, for example, identifies songs and videos using URIs that are open. But instead of “http:” the addresses begin with “itunes:,” which is proprietary. You can access an “itunes:” link only using Apple’s proprietary iTunes program. You can’t make a link to any information in the iTunes world—a song or information about a band. You can’t send that link to someone else to see. You are no longer on the Web. The iTunes world is centralized and walled off. You are trapped in a single store, rather than being on the open marketplace. For all the store’s wonderful features, its evolution is limited to what one company thinks up.[[12]](#footnote-12)

He then describes the true cost of the convenience of a walled garden.

Some people may think that closed worlds are just fine. The worlds are easy to use and may seem to give those people what they want. But as we saw in the 1990s with the America Online dial-up information system that gave you a restricted subset of the Web, these closed, “walled gardens,” no matter how pleasing, can never compete in diversity, richness and innovation with the mad, throbbing Web market outside their gates. If a walled garden has too tight a hold on a market, however, it can delay that outside growth.[[13]](#footnote-13)

We find ourselves therefore at something of a crossroads. Walled gardens have always been part of the environment of web content but there is something different, arguably, about the current generation as opposed to the earlier generations. Whereas both first- and second-generation walled gardens were operated by service providers, and other service providers were available, third-generation walled gardens are operated by hardware suppliers (Facebook excepted). Once you have invested in your Kindle Fire or iPad you are locked in to the ecosystem supplied by Amazon or Apple. Indeed in many ways it is incredible these ecosystems are permitted given the decision in the Microsoft Windows Media bundling case.[[14]](#footnote-14)

If this view is correct then the future direction of IT law will be moved further towards protecting individual rights as tethered technology intervenes more into our private actions. This view of the future of the information society thus envisages greater concentration of control in the hands of the hardware, software, and telecommunications companies, with law as the tool of the consumer. In this design rather disappointingly law is reactive and passive.

29.1.2**Greater connectivity, greater freedom**

Of course one part of the walled garden discourse has been conspicuous by its absence. While we have discussed Apple and Amazon we have failed to acknowledge that the market-leading operating system for Smartphones and tablets is Android.[[15]](#footnote-15) Android is of course owned by Google and, in accordance with much of their free data policy, it is an open source platform. This allows it to be freely modified and distributed by device manufacturers (such as Samsung), wireless carriers (like Verizon), and enthusiast developers. It is the antithesis of the iOS system. Yes there are still some restrictions on what can be listed in the Google Play store but these are not as restrictive as seen on iTunes/App Store and, as the software is open source, individuals can distribute apps without going via the Google Play store.[[16]](#footnote-16) The success of the open source Android platform suggests that perhaps the techno-deterministic view demonstrated by Zittrain, Lessig, and others is wrong.[[17]](#footnote-17)

This opens up a different model of the future. This sees the empowering nature of technological developments as the main driver of social change.[[18]](#footnote-18) For this school of thought, although it may be true that Apple rules the iOS environment, the opportunities offered by Smartphones and similar technological developments set users free rather than controlling their actions. Yes it is true that if you buy an iPhone you accept the rule of Apple, but this is a conscious trade-off by the consumer. They choose to buy an iPhone. If they do not like Apple’s fine-grained control over the after-market for their product they may choose to migrate to an alternative open ecosystem as provided for by any number of Android devices such as the Samsung Galaxy.

The point is that the end-user has a choice. She may choose to buy the tied Apple device with all the controls this brings or she may choose an Android device which brings her more freedom. This is therefore a market decision: the buyer trades the competing values of the iOS and Android handsets, or tablets. The key for commentators who believe that technological advances offer greater freedom is that without the advances in technology afforded by devices such as the original iPhone, the consumer does not have this choice. Advances in technology offer greater choice to the consumer: this allows the consumer to decide how much control they are willing to cede to device manufacturers in return for greater functionality.

This approach assumes that society drives technological advances rather than technological advances driving changes in society. Some new technologies make massive breakthroughs despite their design and marketing being undertaken by niche suppliers. Think of the breakthrough success of the Blackberry handset manufactured by unfashionable Canadian company Research in Motion or the dual cyclone vacuum cleaner manufactured in the first instance by start-up company Dyson. These products broke through because people wanted what they offered: for one email on the move and for the other the end to constantly buying new vacuum bags and losing power while vacuuming. Now think of technology designed at massive cost by leading corporations which have failed as there was no market for them. Sony has probably the most unenviable history of failed platforms with Betamax, Minidisc, Laserdisc, and Universal Media Disk (UMD) all failing to find success in the market. Sony must be relieved that Blu-ray eventually won the format war with HD-DVD (although it could be said it ultimately lost out to streaming services such as Netflix). Why though so many failures from such a successful company? At each turn their technology was the best or most convenient but Sony’s desire to retain proprietary control of the format led to competitors producing cheaper and more convenient alternatives. The reason Blu-ray broke the mould is that Sony, learning from their previous mistakes, agreed to share Blu-ray technology with competitors. Sony is not the only leading company who has invested heavily in technology which has failed to find a market. Failures such as Motorola’s Iridium satellite communications system and Apple’s Newton handheld PDA demonstrate that the largest and most successful of electronics companies can misjudge the market.

If it is the case that society determines whether or not a new technology succeeds in the marketplace then this changes our assumptions for modelling legal responses to technological developments. This suggests new technologies will not, as of themselves, restrict or control the rights and choices of individuals. The law does not need therefore to react to threats posed by new technologies; instead the law must ensure consumers have the market information they need to assess whether or not to invest in a new product or service. This means the role of the law switches from being reactive to proactive. The role of the law is to ensure the market functions by allowing customers to exchange information and to allow them access to new products and services whosoever markets them.[[19]](#footnote-19)

29.1.3**Developing technologies and legal responses**

Whichever approach is correct, it is predicted that we will see major upheaval in the information society as developments drive us towards the next evolution of the World Wide Web, the arrival of the Internet of Things and intelligent processing (IoT/IP). These will impact hugely on all corners of society, with changes being driven by the promise of what the new technology can offer and by the desire of users to make use of that potential. The web is in many ways the ultimate ‘killer application’: everyone wants access to it and in a variety of formats (home computer, Smartphone, tablet, games system, etc.); it is free (excepting access charges) and is of limitless potential.

IoT/IP will change our interaction with information in all forms, and in particular will change how we locate and access data. If you are of the techno-deterministic school you will believe that the law will be called upon to respond to changes in the way data is gathered, stored, and accessed, with the major challenges being data privacy, data security, and freedom of expression. If you are a follower of the socially mediated school then you will believe the major challenges will be in ensuring quality of access to data, data security, and data privacy.

Whichever approach you favour the outcome is the same, IoT/IP unsettles the established legal settlement in the same way that web 2.0 unsettled copyright law, defamation, and freedom of expression. The law must evolve to reflect how both society and technology evolve, for the truth is that neither the techno-deterministic school nor the socially mediated school are completely correct. The information society is rooted in connections between people enabled by, and mediated by, digital technology. The area of law which deals with this is similarly rooted in both technology and society. To predict the future of information technology law we must therefore begin by predicting how technology will enable social changes in the next five to ten years.

29.2 **The Internet of Things and Intelligent Processing**

The first issue that lawyers will have to deal with is the technology of IoT/IP. This is because it is a rather more radical departure than the change from web 1.0 to web 2.0. While the development of web 2.0 was evolutionary—a democratizing process that gave more power to the user— IoT/IP has the potential to be revolutionary. A new intelligent network is emerging, a network of devices and processing power. The devices form the internet of things and include such things as personal health monitoring wearables such as fitbit and the Apple Watch, smart home devices such as the Nest thermostat and LIFX connected light bulbs, devices fitted to cars such as the Telematics insurance ‘black box’, and near field communication enabled Smartphones. The processing power comes from what the creator of web 1.0, Sir Tim Berners-Lee calls the semantic web. It is ‘a Web [in which computers] become capable of analyzing all the data on the Web––the content, links, and transactions between people and computers. [Although] yet to emerge, when it does, the day-to-day mechanisms of trade, bureaucracy and our daily lives will be handled by machines talking to machines. The “intelligent agents” people have touted for ages will finally materialize.’[[20]](#footnote-20)

Berners-Lee wrote this in 2000. Today the semantic web is very nearly upon us. Intelligent agents are such as Apple’s Siri assistant. Siri, at a basic level, manages the day-to-day data of the user. It can schedule reminders, give you the weather forecast, send emails (via the native email software), recommend restaurants or hotels, and show locations via maps. Siri in essence is ver.1.0 of what eventually will become the semantic web. More sophisticated software is already in development and has been trailed as part of the Google Glass system. Google are continuing to develop this technology both through new releases to their Google Now app[[21]](#footnote-21) and developments in the second edition of the Google Glass product currently in development. Let’s imagine a near future scenario with an advanced version of the Google Now system.

**Example**Semantic Google Now 2.0

Sarah is going out for the night. She wants to go to see a movie and then for some dinner afterwards at a restaurant near to the movie theatre. She takes out her Android device and says to her Google Now app ‘I want to see a funny movie and then eat at a good restaurant. What are my options?’ Unlike web 2.0 search engines an intelligent or semantic assistant can understand a complex request such as this and produce complex results.

Sarah will get a limited number of personalized recommendations with a selection of movies showing in her local cinema and suitable restaurants nearby. These will be displayed as single pages of data via her device showing the name of the movie recommended, where it is showing, when it is showing, the opportunity to link to reviews, the trailer, and the option to view the map of the cinema location. Alongside this information will be an option to open similar information for the restaurant: reviews, menus, location, opening times etc. Sarah’s intelligent search assistant can even remember preferences such as ‘I don’t like Mexican food’ and filter out inappropriate restaurants.

Then with a command Sarah can both book tickets for the movie and reserve a table at the restaurant; another command will allow her to invite her friend Jacob, sending him all the data including a map of where to meet and when. The system can then send an e-ticket to her Smartphone so Sarah does not have to queue on her arrival and can even inform the restaurant if Sarah is likely to be late if she is caught in traffic (though the mapping function should ensure she misses any traffic problems).

We are very close to this world today. Essentially what I have described is a convergent device with the next-generation Siri/Google Now assistant and the already existing communication capabilities. In time your intelligent search assistant will have sufficient artificial intelligence to allow it to learn your preferences and then deliver to you what you want or need. It will be able to prepare a personalized newspaper, Negroponte’s Daily Me become real,[[22]](#footnote-22) drawn from stories reported worldwide and collated on a personalized news service. Your assistant will be able to learn from your reading habits if you are interested in banking regulation, tennis, or celebrity gossip and deliver to you news only of interest to you. In addition, all your devices and accounts will work in harmony so if you book flights and a hotel to attend a conference in Rome your calendar will automatically block this time out, your email account will set up an out of office reply, your bank account will be informed of your travel plans, thus avoiding the embarrassment of your card being refused overseas, and your calls will be automatically forwarded to your mobile (assuming these are all things you want).

It is clear from these examples that there are three defining features of IoT/IP. Two are user-experience features while the third is a technical feature.

**Highlight**Semantic web features

1. User immersion in the digital environment via augmented reality and the ‘Internet of Things’. The human-machine interface changes from being via a screen to natural interaction.

2. Personalized services via your intelligent assistant. The idea of old-fashioned ‘static’ web pages is replaced with dynamic information services tailored to the user.

3. Artificial intelligence allows your devices and accounts to learn your preferences and to ‘mix and mash’ available data to provide tailored results.

From the lawyer’s point of view the key attribute of IoT/IP is the last of these three features. Its creation involves intelligent agents which will make decisions on our behalf.[[23]](#footnote-23) This changes the nature of the interaction between human and machine: we need to ask is the machine now an actor in any transaction or does it remain simply a carrier of information?[[24]](#footnote-24) This is likely to be the key issue for information technology lawyers in the next ten years.

29.3 **Law 2.0**

It is my belief that the role of the cyber lawyer and the design of the network he is seeking to control are symbiotically linked. We can trace developments in cyberlaw theory as being in parallel with technological developments. The internet has a long history which may be traced back as far as 1969 but the discipline of cyberlaw remained undeveloped until the 1990s. This is because there was no need for the separate discipline of cyberlaw before the release of web 1.0 as the internet was mainly used by a select group of researchers and was self-regulated. Research into information technology law in the 1970s and 1980s was focused on the computer itself with books on databanks and data processing being the expected output of the researcher into law and computers, as the subject was then known.[[25]](#footnote-25)

The release of web 1.0 was heralded as the beginning of serious research in, and the practice of, cyberlaw. As discussed in chapter 4, the first stage of this process was the development of the cyberlibertarian movement which responded to the apparent freedom of cyberspace with claims of an unregulable space, freed from the constraints of real-world regulation by its lack of internal borders and its virtual border with ‘real space’. This corresponds to the early network environment which was seen as lawless, a digital equivalent of the old ‘wild west’ where individuals made claims for valuable land (cybersquatting) and regulation came from within the community only (Town Hall Democracy).[[26]](#footnote-26)

The cyberpaternalist movement quickly appeared in opposition to this idealized view of self-regulation and local democracy.[[27]](#footnote-27) The rise of cyberpaternalism may be mapped onto the rise of regulatory intervention in cyberspace. New initiatives such as the UNCITRAL Model Law on Electronic Commerce,[[28]](#footnote-28) the intervention of the courts in early cybersquatting cases, and early attempts at legislative intervention, such as the Communications Decency Act of 1996,[[29]](#footnote-29) had demonstrated that legal initiatives could affect actions in ‘sovereign cyberspace’. Thus as with cyberlibertarianism, cyberpaternalism’s roots may be found in the environment it is seeking to study. Even cyberpaternalism’s techno-centric approach to law and the information society may be traced to the preponderant use of technological solutions at this period in time. Thus the Digital Millennium Copyright Act focuses legal protection on technical protection measures, while the Telecommunications Act of 1996 required for the installation of the so-called V-chip (a chip used to control minor access to violent or explicit content) in all TV sets sold in the US. Cyberpaternalism and cyberlibertarianism may therefore be seen as reflecting two stages of regulatory development seen in web 1.0. They cannot, unfortunately, claim to be at the forefront of developments as a study of the timelines shows that they formed as explanations of pre-existing structures of control within the larger environment of cyberspace.

The arrival of web 2.0 obviously changed this settlement and as a result one would expect a change in the views of commentators on cyberlaw and regulation. As has been extensively discussed throughout this book, web 2.0 was an evolutionary development which saw interactivity brought to the fore of the user experience with democratization of the internet being seen as the key social contribution of web 2.0. We therefore should have seen the development of a new parallel theory of cyberlaw: law 2.0, if you will. This was not the case. Instead we saw a further incremental development of cyberlaw theory: law 1.5, rather than law 2.0. Law 1.5 manifested itself in the development of network communitarianism. Here commentators focused on the power of the network to connect individuals and their ability as a community to influence and to accept or reject regulatory interventions.[[30]](#footnote-30) Again the school of thought follows the environmental developments. Now instead of the direct delivery of content seen in web 1.0 and reflected by Lawrence Lessig’s model of external modalities pressing down on a pathetic dot, network communitarianism reflects the divergent network of user-generated content and social networking found in web 2.0 by focusing on concepts such as Andrew Murray’s active dot matrix.

It is clear there that since the development of the web in late 1990 at each stage of development in the environment of cyberspace there has been a corresponding development in cyberlaw theory. With this in mind we can finally predict what is likely to be the next development in cyberlaw theory. With the development of the IoT/IP or semantic network, the focus switches from users to intelligent network agents. The semantic network in some ways sees a retreat to the values of web 1.0 with users seeking assistance from the network designers to make sense of the massive amounts of information now available online. But to retain the values of web 2.0 we seek not to return to delivered content but to extend the feeling of personalization and control that web 2.0 brings. For lawyers and law-makers, though, the key aspect of the semantic network is the intelligent agents designed to manage the information flow. A malevolent programmer could use these to censor content, to gather personal information, to observe patterns of behaviour or even, due to the interaction between the virtual and the physical environment, to track the physical whereabouts of individuals.

The legal issues raised by the semantic network are therefore substantially the same as those seen in both web 1.0 and web 2.0: privacy, freedom of expression, censorship, democratic discourse, property rights, and commercial interests. The difference is where the locus of power is to be found. Whereas web 1.0 was about passive consumerism and web 2.0 was about user democracy, the semantic network is about personalization and user selectivity, BUT that personalization will be done by the user in concert with their device settings: in other words our semantic search assistant has the power to tailor our informational experience.

The next school of cyberlaw is therefore likely to focus on the role machines will play as intelligent agents in the network. Law 2.0 will, like the semantic network, be an evolutionary development on what we conceive of as cyberlaw today. The early building blocks of law 2.0 may already be seen in the work of Gunther Teubner[[31]](#footnote-31) and Mireille Hildebrandt.[[32]](#footnote-32) It is likely to ask questions such as how may electronic agents control individuals? Who is responsible for the actions of electronic agents? Is it ethical to use electronic agents to control certain forms of expression? How may users protect their rights to personal and data privacy when they rely heavily on electronic agents? And how do we prevent abuse (including criminal abuse) of the network of electronic agents that form the backbone of the semantic web?

A central question for both philosophers and lawyers will be: does an over-reliance on technology potentially lead to injustice? Too often today individuals suffer unjustly because of poorly programmed computer systems which can make all forms of unjust decisions from denying them access to housing or to financial benefits through to denying them access to an overseas state.[[33]](#footnote-33) It is this social injustice that forms the basis of the Little Britain comedy sketch ‘computer says no’ and it brings with it the spectre of a Kafkaesque situation where someone is denied access to a just decision for reasons beyond their comprehension and which they cannot challenge because, perversely, the computer is entrusted as the arbiter in such decisions. This is likely to be a major focus of law 2.0. When intelligent agents begin making decisions based upon learned behaviour they exceed just the programmed parameters: they are likely to make errors and these errors are likely to cause harm. Thus law 2.0 is going to be the most philosophical enquiry into law. It is going to require us to discuss identity, decision-making, fairness, and justice against a backdrop of computer-aided decision-making.

There is no reason to suspect the semantic web will be anything less than a positive revolution in the way we interact with technology. We all already benefit from some of the early fruits of the network of things through such tools as contactless payment systems, health tracking technology (and apps), GPS mapping and car tracking and remote disabling systems used to prevent theft of high-value vehicles, smart thermostats, and smart home security cameras. Unfortunately no one turns to lawyers when everything is going well. Lawyers tend to become involved when systems fail, when individuals suffer injustice or when harm has occurred. Much of law 2.0 will be about anticipating these potential harms and about identifying and delineating lines of responsibility, in particular with regard to non-human actors—which, aside from animals in tort cases, are a whole new category of actors on the legal stage. My advice for anyone hoping to practice law 2.0 is therefore to read Franz Kafka’s The Trial and Arthur C. Clarke’s 2001: A Space Odyssey. Neither, I hope, are a vision of our future, but both raise questions of control, morality, and justice which will be at the centre of both the semantic network and law 2.0.

**Test Questions**

**Question 1**

Are walled garden technologies such as the iOS ecosystem likely to adversely affect individual liberty and freedom of choice? If so is this a legal issue or simply a consumer issue?

**Question 2**

Does the development of the semantic network relocate decision-making in vital areas such as privacy and freedom of expression away from the individual to data suppliers like Google? If so, what legal challenges does this raise and what should lawyers do about them?

**Further Reading**

**Books**

Mireille Hildebrandt and Antionette Rouvroy (eds.), The Philosophy of Law Meets the Philosophy of Technology: Autonomic Computing and Transformations of Human Agency (Routledge 2011)

Mireille Hildebrandt, *Smart Technologies and the End of Law: Novel Entanglements of Law and Technology* (Edward Elgar 2015).

Jaron Lanier, You Are Not a Gadget: A Manifesto (Knopf 2011)

Evgeny Morozov, The Net Delusion: How Not to Liberate The World (Public Affiars 2012)

Eli Pariser, The Filter Bubble: What The Internet Is Hiding from You (Penguin 2012)

Jonathan Zittrain, The Future of the Internet: And How to Stop it (Yale UP 2008)

**Chapters and articles**

Jon Bing ‘Code, Access and Control’, in Mathias Klang and Andrew Murray (eds.), Human Rights in the Digital Age (Glasshouse 2005)

Mireille Hildebrandt and Bert-Jaap Koops, ‘The Challenges of Ambient Law and Legal Protection in the Profiling Era’, 73 Modern Law Review 428 (2010)

Gunther Teubner, ‘Rights of Non-humans? Electronic Agents and Animals as New Actors in Politics and Law’, 33 Journal of Law and Society 497 (2006)

1. Gordon E Moore, ‘Cramming More Components onto Integrated Circuits’ (1965) *Electronics* 114. [↑](#footnote-ref-1)
2. It took only 36 years for physics to progress from Ernest Rutherford’s discovery of the atomic nucleus in 1909 to J. Robert Oppenheimer’s successful testing of the first atomic bomb, ‘Trinity’ in Los Alamos, New Mexico. [↑](#footnote-ref-2)
3. An example of a virtuous circle would be in the delivery of entertainment products. First, a software development, data compression, allowed for the development of compressed sound files (MP3s). This led to an ability to trade MP3s across the improved network speeds of 56.6Kbps. This led hardware manufacturers to design an MP3 player. In turn one manufacturer (Apple) developed an ‘online shop’. Increased demand for downloads from the shop led to faster network connection speeds being required (Broadband), and this allowed for video to be downloaded. Apple (and others) then designed higher-capacity multimedia players. This allowed TV and movies to be sold via the online shop. This called for more capacity in storage and a better interface. Consumers started to demand access wherever they went and wireless capability was added. Eventually the MP3 player converged with the mobile phone as the Smartphone. And demand for streaming led initially by YouTube, then services like iPlayer and Netflix have led to LTE (4G) and Fibre. [↑](#footnote-ref-3)
4. See e.g. Jonathan Zittrain, The Future of the Internet and How to Stop It (Yale UP 2008); Jaron Lanier, *Who Owns The Future?* (Simon & Schuster 2013). [↑](#footnote-ref-4)
5. George Cole, ‘Sky+ Glitch Sparks Fears over TV Archiving’ The Guardian (London, 4 December 2008). [↑](#footnote-ref-5)
6. Zittrain (n 4) 59. [↑](#footnote-ref-6)
7. See further Lawrence Lessig, Code Version 2.0 (Basic Books 2006) 323–4; Lawrence Lessig, Free Culture: How Big Media Uses Technology and the Law to Lock Down Culture and Control Creativity (Penguin 2005) 139–61; Joseph Cannataci, ‘Lex Personalitatis and Technology-driven Law’ (2008) 5(1) SCRIPTed 1. [↑](#footnote-ref-7)
8. Of course you can sideload music and AV content onto your device from a computer and you can jailbreak your device to install unauthorized apps. However if you do jailbreak your device Apple iOS updates will attempt to lock out any jailbroken content and Apple warn you make yourself susceptible to viruses and worms. [↑](#footnote-ref-8)
9. As admitted by Apple CEO Tim Cook <www.apple.com/uk/letter-from-tim-cook-on-maps/>. [↑](#footnote-ref-9)
10. Dick Thornburgh et al., Youth, Pornography, and the Internet (National Academies Press 2002) 276. [↑](#footnote-ref-10)
11. Tim Berners-Lee, ‘Long Live the Web’ (2010) 303.6 Scientific American 80. [↑](#footnote-ref-11)
12. ibid 83. [↑](#footnote-ref-12)
13. ibid. [↑](#footnote-ref-13)
14. Commission Decision of 24 May 2004 relating to a proceeding pursuant to Article 82 of the EC Treaty and Article 54 of the EEA Agreement against Microsoft Corporation (Case COMP/ C-3/37.792—Microsoft). [↑](#footnote-ref-14)
15. Data from Q2 2018 gives Android 88% of the Smartphone market as opposed to iOS’s 11.9% while data from the same period shows that in that year 75% of new tablets shipped with iOS installed against 23.7% with Android. [↑](#footnote-ref-15)
16. There are in fact a large number of alternative Android apps stores including SlideMe, GetJar, and Amazon Appstore. [↑](#footnote-ref-16)
17. Victor Mayer-Schonberger, ‘Demystifying Lessig’ (2008) Wisconsin Law Review 714. [↑](#footnote-ref-17)
18. See e.g. Robert Heilbroner, ‘Do Machines Make History?’ in Merritt Smith and Leo Marx (eds), Does Technology Drive History?: The Dilemma of Technological Determinism (MIT Press 1994); Gunther Ropohl, ‘A Critique of Technological Determinism’ in Paul Durbin and Freidrich Rapp (eds), Philosophy and Technology (Reidel 1983); Langdon Winner, ‘Do Artefacts Have Politics?, in Langdon Winner, The Whale and the Reactor: a Search for Limits in an Age of High Technology (University of Chicago Press 1986). [↑](#footnote-ref-18)
19. Andrew Murray, The Regulation of Cyberspace: Control in the Online Environment (Routledge 2007) ch 6. [↑](#footnote-ref-19)
20. Tim Berners-Lee and Mark Fischetti, Weaving the Web: The Original Design and Ultimate Destiny of the World Wide Web by its Inventor (Harper Business 2000). [↑](#footnote-ref-20)
21. In May 2015 Google revealed an extension of Now that allows it to watch, and offer assistance in response to, your activity in any app on a device powered by its Android operating system. The feature, called Now on Tap, is activated when a user holds down the device’s home button. For example, if someone suggested a particular movie during a text conversation, Now would offer up an information card summarizing reviews of that movie and presenting links to read more or view the trailer. In a conversation in which someone asked you to pick up the dry cleaning, Now would offer to remind you about this later. [↑](#footnote-ref-21)
22. An idea first advanced by Nicholas Negroponte in Being Digital (Hodder & Stoughton 1995) 152–4, and developed extensively by Cass Sunstein, Republic.com (Princeton UP 2001). [↑](#footnote-ref-22)
23. In truth this is not new. Intelligent agents already filter content. Cleanfeed filters for obscene content, while Google Safesearch routinely filters Google search returns to remove obscene and offensive content. The difference with the semantic web is both the scale of such systems and their ability to learn, a key cornerstone of intelligence. [↑](#footnote-ref-23)
24. See Bruno Latour, Reassembling the Social:  An Introduction to Actor-Network-Theory (OUP 2005); Gunther Teubner, ‘Rights of Non-humans? Electronic Agents and Animals as New Actors in Politics and Law’ (2006) 33 Journal of Law and Society 497. [↑](#footnote-ref-24)
25. See e.g. Alan Westin and Michael Baker, Databanks in a Free Society: Computers, Record Keeping and Privacy (Times Books 1972). [↑](#footnote-ref-25)
26. See Henry H Perritt Jr, ‘Cyberspace Self-Government: Town-Hall Democracy or Rediscovered Royalism?’ (1997) 12 Berkeley Technology Law Journal 413; John P Barlow, A Declaration of Independence for Cyberspace 8 February 1996 <http://homes.eff.org/~barlow/Declaration-Final.html>; David Johnson and David Post, ‘Law and Borders––The Rise of Law in Cyberspace’ (1996) 48 Stanford Law Review 1367. [↑](#footnote-ref-26)
27. Joel Reidenberg, ‘Lex Informatica: The Formation of Information Policy Rules Through Technol­ogy’ (1998) 76 Texas Law Review 553; Lawrence Lessig, Code and Other Laws of Cyberspace (Basic Books 1999). [↑](#footnote-ref-27)
28. Discussed in ch 16. [↑](#footnote-ref-28)
29. Discussed in ch 20. [↑](#footnote-ref-29)
30. See discussion in ch 4 and Andrew Murray, The Regulation of Cyberspace: Control in the Online Environment ch 8. [↑](#footnote-ref-30)
31. Teubner (n 24). [↑](#footnote-ref-31)
32. Mireille Hildebrandt and Bert-Jaap Koops. ‘The Challenges of Ambient Law and Legal Protection in the Profiling Era’ (2010) 73 Modern Law Review 428; Mireille Hildebrandt and Antionette Rouvroy (eds.), The Philosophy of Law Meets the Philosophy of Technology: Autonomic Computing and Transformations of Human Agency (Routledge 2011); Mireille Hildebrandt, *Smart Technologies and the End of Law: Novel Entanglements of Law and Technology* (Edward Elgar 2015). [↑](#footnote-ref-32)
33. See Jon Bing, ‘Code, Access and Control’ in Mathias Klang and Andrew Murray (eds), Human Rights in the Digital Age (Routledge-Cavendish 2005). [↑](#footnote-ref-33)