IT Law in Context: A Critical Overview

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1 Introduction

Commentators variously infer or describe the nexus of modern Information Technology law (hereafter, IT law) as lying with computers[3], software[4] or the Internet[5]: what they have in common is that they identify this nexus as being technological, *not* legal. One can regard IT Law, therefore, as sitting on the shifting sands of technology, rather than on the traditional, firm regulatory bedrock, which, naturally, poses some difficulty when trying to define what constitutes IT law[6]. This mutability, in the view of the authors, means that the academic, the practitioner and the law-maker should all be cautious about trying to define IT law by reference to *specific* technologies (e.g. personal computers, the Internet, etc.). This, we would argue, is inflexible, technologically-determinist and is reflective neither of the history of IT law nor its future development. Instead, the authors posit that two *general* technological developments (and the unfolding legal responses to how their application evolves) define the boundaries of modern IT law: *digitisation*[7] and *the networked computer*[8]. Indeed, it is the combination of digitisation with the mass communicative characteristic of the networked computer that, in our view, has both expanded and decentralised the capacity to reproduce, control, distribute and publish information and that gives rise to the fast-moving nature and the regulatory challenges at the heart of modern IT law.

In this essay the authors offer a critical appraisal of modern IT law and its development, from a UK-centric perspective. The legal and technological importance of other

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[3] Please note that throughout this essay the term 'computer' is used to refer to *digital* computers; i.e. programmable electronic devices that process, store and retrieve digital data, comprising *hardware* (the tangible components) and *software* (the intangible instructions). Obvious modern examples of computers include personal computers (PCs) but today computers are embedded in a wide range of products, ranging from cars and mobile phones to kitchen ovens.

[4] As noted above, software is the intangible element of a computer (or, indeed, a computer network). Software is extremely pervasive today. For example, using the University of Southampton PC to draft this essay involved an operating system (Microsoft XP), an application (Microsoft Word) and online resources were accessed *via* a web browser (Microsoft Internet Explorer). The authors were able to 'see' their work on a computer screen thanks to a GUI (a graphical user interface, one of the functions of Microsoft XP) and were able to exchange drafts using e-mail (Microsoft Office Outlook). As this basic (albeit Microsoft-heavy) example illustrates, software can be multi-layered. It is also important to realise that the technical standards (or protocols) that enable computers to connect and for data to be exchanged frequently take the form of software, e.g. TCP/IP (see footnote 34 below) or the MP3 format (MP3 being a standard for the compression of digital auditory content).

[5] A definition of the term 'Internet' is provided at footnote 42, below.

[6] See section 2.1 below.

[7] Digital content is functionally flexible (inasmuch as it can be easily manipulated and changed and can embrace multi-media communication: e.g. text, visual images, audio etc.) and can be replicated without loss of quality The legal challenges of digital content are explored in more detail in section 3, below.

[8] As Dewar (Dewar, A.J., (1998) *"The Information Age and the Printing Press: Looking Backward to See Ahead"* RAND paper P-8014, at p.4.) argues, the networked computer is the foundation technology of modern IT law - being the first true mass-market 'many-to-many' technology-assisted communications medium. In contrast, earlier key communications technologies can be characterised as being 'few-to-many' (e.g. the printed book, radio, films and television).
Some of the legal issues raised by networked computers are briefly considered in section 2, below.

jurisdictions, principally the US, is noted by way of overview only. Although a number of methodologies could be used in such a task, the authors wish to avoid mere description and to provide insight as well as overview; therefore both a strictly chronological approach[9] and a traditional intra-disciplinary approach[10] have been eschewed. Instead, a more selective approach is taken; one that allows for critical reflection upon the symbiosis and conflict that exists between law and technology in the context of IT law.

There are three distinct parts to this essay, each necessarily brief: *context*, and an exploration of issues within Information Technology (IT) *infrastructure* and IT *content*. In section 2 the authors provide a critical overview of the academic, technological and legal context to IT law: thus the perennial academic question as to whether IT law is really law (section 2.1) is contemplated before a critical chronology of the technological-historical context of IT law development (section 2.2) is undertaken. Then the boundaries (and sub-disciplines) of IT law (section 2.3), are considered and section 2 concludes with the authors proposing a UK model of regulation for modern IT law (section 2.4). Having thus provided this analytical context, the authors then critically reflect upon selected issues pertaining to modern IT infrastructure (section 3) and contemporary IT content (section 4). In section 5, the authors draw their conclusions and reflect on past, present and future challenges for UK IT law.

It is necessary, of course, in an essay of limited length for the authors to be highly selective. Thus a number of important topics are not discussed in detail. Comparative methodologies are not employed and neither is this intended to offer an exhaustive review of UK IT academic legal literature. Nevertheless, the authors believe that this essay contributes useful insights as to the development of IT law up to the present day. The modern story of the digital revolution may not span the full 100 years of *Halsbury's Laws* but it rightfully takes its place among the legal milestones of the latter half century of this important work.

2 Context

2.1 Is IT Law really Law?

The authors believe that the conceptual roots of both IT and IT law can be found in the English academic Alan Turing's theories of the Turing Machine and the Universal Machine[11]: thus, functionality became independent of the tangible. Accordingly, with the ever-expanding sophistication and convergence of IT we can identify the rationale of legal participation before us. The law must adapt and develop to meet the new challenges of products, activities and behaviours that information technology (IT) facilitates.

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[9] To avoid a superficial and overtly technological treatment or a cursory law-led treatment.

[10] In the view of the authors, sole focus on key developments within the IT sub-disciplines – copyright law, data protection, etc., - would be inappropriate in a work of this length, and would fail to provide an effective overview of IT Law.

[11] Details of both the Universal Machine and the Turing machine theory were first published as Turing, A.M, "On Computable Numbers with an application to the Entscheidungsproblem", *Proceedings of the London Mathematical Society*, Series 2, Vol.42 (1936-37) pp.230-265. Both 'machines' are in fact abstract mathematical/philosophical constructs: for our purposes the import of the Turing Machine lies in its 'programmable' features (i.e. it was the first conceptualisation of software): thus providing the model for the digital computer. The Universal Machine (simply a Turing Machine able to 'read' and 'interact' with any other Turing Machine) prefigures modern concepts of computer communication, networking and convergence.

So, in answer to the question - is IT law really law? - the response must be very strongly that it is. Law must adapt to the new methodologies, norms and values of the present and within that process of adaptation can be found connections that bind legal development within fields of human endeavour. IT law emerged as a topic for academic study in the 1970's[12] and embedded itself within commercial legal practice and academia[13] in the 1980's. The 1990's saw convergence of technology, media, telecommunications and trade segments of activity within legal practice as well as within the manufacturing and service sectors supporting innovation and technological advance. These trends continue today as IT ever more deeply embeds itself into the fabric of daily life. The result, in legal terms, is of new legal rules and practices that have been specifically motivated and generated by the online world. Principles valid offline must now be adapted or redesigned for the digital environment. In this sense IT Law has become pervasive of law itself.

On the other hand, just as is the case with other legal fields, a selective process can be undertaken to define those laws and legal issues that owe their rationale to IT and can therefore be grouped in various ways for the purposes of academic study and understanding (see section 2.3, below). That is the position today. Thirty years on from its beginnings, IT Law is certainly advancing the case that is has a place among the established fields of academic legal study. Text books have been written in which the core principles that bind the field together have been exposed and discussed. Yet the significance of the question, as opposed to the conclusion, as to whether IT law is really law must be questioned. This debate, once popular amongst academics, is not one that the ordinary consumer or legal practitioner much cares about. While it may be fine for academics to assert the principles they say bind IT Law into a coherent body of regulation worthy of academic study, the more important question relates to the adequacy and suitability of that regulation within the body of law as a whole. That remains a much harder question to answer tempered as it always must be with the ever present problem of the speed of the digital advance and the human ingenuity applied to its application.

In summary, the authors response to the question – is IT law really law? – is (to paraphrase Descartes[14]) to suggest that since IT law is both practised and taught, therefore it *is* a defined body of law.

2.2 A Critical Technological Historical Chronology and Overview

As noted at the beginning of this essay, the authors argue that it is within the confines of digital content and networks that modern IT law is placed. Within this paradigm, the authors posit that the development of modern IT - i.e. the innovations of the Information Age - can be characterised into five eras in the UK, each posing distinctive technological and legal challenges, as indicated in the sub-sections below.

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[12] Early UK pioneers in IT academia included Professor Harry Bloom's work at the University of Kent at Canterbury in the early 1970s.

[13] For example, the first undergraduate course in UK IT law was established at the University of Southampton in 1981.

[14] '*Je pense, donc je suis' or* 'I think therefore I am'. (See Descartes' seminal 1637 work, for example: Descartes, R. *"Discours De La Methode,"* Le Livre De Poche: Classiques, 2000).

It should be noted that it is very easy to become fixated in the technicalities, and the acronyms, of modern IT; nevertheless, some grasp of the technical context of the key technologies (i.e., their inter-relationship and function) is necessary in order to comment critically upon their significance and legal regulation. In order to guide the reader and to avoid lengthy and turgid technical explanations, the authors have adopted the simplistic distinction between 'pipes' (the conduits of information technology[15]) and 'content' (everything else[16]). The authors are aware that some practising IT lawyers use similar 'pipes/content' analogies to *define* technologies, but we are not aware of any published work that utilises this distinction as a comprehensive tool of *legal analysis*.

Initially, the authors chose to use the 'pipes/content' distinction in this essay for practicality[17] and for its' legal import[18]: reasons why one of the authors has previously used this distinction in her teaching activities. Latterly, the authors have come to the conclusion that the 'pipes/content' distinction is even more fundamental than this. Much legal regulation and academic literature in IT to date is predicated on a 'hardware/software' distinction[19], a distinction which is based on *form*, as opposed to the *functional* basis for the 'pipes/content' distinction. The 'hardware/software' distinction may have served IT law well in the past, but from a technological perspective form is no longer a good guide to function; moreover, hardware and software are (technically) more seamless than ever before, so it is submitted that little regulatory insight can be gained from the use of the 'hardware/software' distinction any longer.

To clarify: hardware and software pervade both 'pipes' and 'content', but 'pipes' (conduits for information) are *functionally* distinct from 'content' (information conveyed in said conduits). The authors believe that the 'pipes/content' distinction is now the centre of gravity for IT development but that academic legal analysis has not yet caught up with this transition.

2.2.1 The First Era: The Foundation of the Information Age[20] (1940 – 1968)

During the tail end of the Industrial Age[21], many of the foundation technologies for the Information Age were developed. Although a number of important analogue computing

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15 Which we would define as not only including network *hardware* (e.g. the physical components of the modern telecommunications system and satellite technology) but also much *software*; from standards (e.g. the TCP/IP protocol), to search engines (e.g. Google).

16 For example, individual digital music files using the MP3 standard, conversations made *via* Internet telephony, word-processing files etc.

17 Being (i) shorthand for technological context (it is a simple and useful way of describing the technical 'place' of a technology) and (ii) future-proof (the semantics of the pipes/content distinction is relatively technology-neutral).

18 See section 3.1 for the argument that proprietary rights have a different effect on each and that the appropriate regulatory models may differ.

19 E.g. see section 3 below.

20 This essay is concerned with modern IT and modern IT law: this corresponds with the Information Age. Therefore, in this essay the authors do not discuss the information technologies of earlier Ages. Had this been necessary, the authors would have categorised time before the Information Age as follows: (i) the Hunter-Gatherer Age (circa 2.5million BC – 10 000 BC), which saw the development of human speech and art; (ii) the Agricultural Age (circa 10 000 BC – 1700 A.D.) which saw the invention of writing and the first cultural depositories (prototype museums, libraries and archives), and; (iii) the Industrial Age (circa 1700 - 1968) when printing, newspapers, photography, the typewriter, analogue computers, the postal system, the telephone, the phonograph, films, radio, television, the photocopier and other such information technologies were developed. See further: Saxby, *"The Age of Information,"* (Macmillan/New York University Press, 1990), Chapter 2.

21 *Supra* footnote 20.

inventions predate what the authors have termed the foundation era, it is here – circa 1940 to 1968 – that the direct origins of the digital computer can be found. This era is characterised by the fruition and progression of earlier analogue computing developments: key technological milestones in this era include the development of the stored-program computer. There was limited commercialisation of the early non-networked mainframe computers – such as the Ferranti Mark I computer[22] and LEO[23] - but computer use largely took place within public bodies. It is noteworthy that, at the dawn of the Information Age, computer content was primarily numerical and many technological advances in this era had their genesis in the military sphere or academia.

A generic regulatory approach, i.e. one not distinguishing IT from other regulatory subject matter, is evident in this era. Specific, formal legal regulation of IT was absent and the field had not really caught the attention of UK legal academics, although there was a nascent US literature. Overall, the challenges of the first era were largely technological with the focus on hardware development.

2.2.2 The Second Era: The Dawn of the Information Age (1969 - 1979)

This era saw a reduction in the size of computers, with the development of the microchip (also known as the semiconductor chip[24]), facilitating the subsequent introduction of personal computers and the development of further software applications[25] – marking the beginning of a move of IT usage beyond government and industry towards a mass market. However, computer use was still mainly institutional rather than personal[26]; residing in academia or industrial research, but also becoming well-established in businesses during this time. Although characterised by a rather narrow conception of IT, with particular emphasis on hardware (in the form of the computer), important software and network innovations took place during this period in the context of the development of the ARPANET[27].

The authors submit that there was a vital technological normative development during this era, namely the establishment of the principle of openness in modern IT engineering. This principle was not only a key technological feature of the ARPANET 'pipes'[28]; it was (and still is) a defining characteristic of the process of network development - as evidenced by the RFC[29] (Requests for Comments) series[30].

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22 This was based on the Manchester Mark I computer and was the world's first commercially available general-purpose computer.

23 It is a little-known fact that LEO - The Lyons Electrical Office - was the world's first business computer, being in use within Lyons UK in February 1953.

24 See footnote 36 below.

25 From this point, enabled by software development, digital content began to expand beyond tabulating financial data, statistics, and other numerical information. For example, e-mail and word-processing software were pioneered during this era.

26 Although at that time PCs tended to be developed and used by computer hobbyists; many such people becoming the workers and leaders of the then embryonic computer industry.

27 ARPANET, the network of the US Advances Research Projects Agency (ARPA, now known as DARPA) went online in 1969. It is generally accepted that the ARPANET was the precursor of the modern Internet, but the authors would go further to state that the ARPANET was the foundation of the 'pipes', both hardware and software, of modern networked computing.

28 Simply put, the 'pipes' of the ARPANET were specifically designed to be used as a platform for other hardware and software (as is the case with the modern Internet and the World Wide Web), thus decentralising network innovation and enabling third party innovation 'above' this platform.

29 RFCs are a collection of documents used by computer engineers to exchange IT ideas and theories. An RFC could variously constitute a work in progress, third party responses to the same or a draft proposal.

Interestingly, although the authors would argue that IT was perceived as being *technologically* divergent from other technologies in this era, actual legal regulation in the UK at this time still tended not to draw a distinction between activities (or products) assisted by or involving IT, and those not. With a few exceptions, principally the discussion on the copyright protection of computer programs[31], there was little appetite for technology-specific regulation. Technology-specific academic writings, however, did take hold during this era.

2.2.3 The Third Era: Expansion (1980 - 1989)

Although computer hardware innovations continued apace, the growing importance of software is notable during the third era[32], which saw the rise of key multinational software companies (e.g. Microsoft) and networking (e.g. Cisco Systems). We can also see evidence of modern IT moving into the office and the home with the commercialisation of the first user-friendly applications; for example, the launch of word-processing programs[33]. Networks other than ARPANET began to proliferate – many of them rather small scale intranets, often based in academia. ARPANET itself underwent a transformation[34] to become part of a 'network of networks' - the Internet.

In the context of this significant 'pipes' innovation, it is only during the third era that we see the emergence of a technology-specific regulatory model in the UK. This coincided with the establishment of the all-party Parliamentary Information Technology Committee (PITCOM[35]) and the privatisation of UK telecoms *via* the

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The RFC series began in 1969 and quickly established a significant role in developing technical protocols or standards: a role that continues to this day.

30 RFCs were first circulated by 'snail mail', then by e-mail. At the present time, there are a number of web sites that publish an index and repository of RFCs, one of the most comprehensive being found at http://www.ietf.org/rfc.html.

31 Both 'pipes' and 'content' software was affected by this, which is an example of existing law (copyright) being adapted in order to meet the perceived needs of the nascent software industry. Although it is documented that software *per se* was being treated as being literary works within US law in 1964 (see the *Sixty-seventh Annual Report of the Register of Copyrights. For the Fiscal Year ending June 30, 1964*, Copyright Office, Library of Congress, Washington: 1965, at p.4) and international law accorded with this position in 1971 (i.e., the Berne Convention for the Protection of Literary and Artistic Works 1886, as amended in 1971), one can also see evidence of a national imperative to reform national copyright laws in the light of software developments in the UK Whitford Report (*Copyright and Designs Law: Report of the Committee to Consider the Law of Copyright and Designs*, HMSO 1976), and, in the US, the CONTU Report (The National Commission on New Technological Uses of Copyright Works (CONTU) Report, July 31, 1976 at p.29-34), which resulted in, respectively, the Copyright, Designs & Patents Act 1988 in the UK and in the US in the 1976 Copyright Act and later changes to §117 of the same.

32 For example, the first IBM PC - IBM Acorn – went on sale in August 1981 complete with the MS-DOS 1.0 operating system. The Apple LISA computer (on sale in January 1983) was the first home computer with software that combined images, graphics and text (known as graphical user interface, or GUI) on a computer screen.

33 Such as MicroPro's WordStar – the first commercial word processing program.

34 Chief amongst these being the development of two key network protocols, the Transmission Control Protocol (TCP) and the Internet Protocol (IP). Together, TCP and IP created a flexible and enduring foundation 'language' for the networked computer. The TCP/IP combination was officially adopted by ARPANET 1983 and this is generally accepted to mark the beginning of what we now know as the Internet.

35 Which has proved influential in the UK (see Sarson, R. (ed) "*PICTOM at 25"*, available at http://www.pitcom.org.uk/pitcom25web.pdf). In more recent eras, other Associate Parliament Groups have been established, such as the All-Party Group on Telecommunications and the All-Party Internet Group (APIG).

Telecommunications Act 1984. Hereafter, we begin to see increasing evidence of a desire to change *existing* laws in the UK in order to meet the perceived needs of new IT industries and a willingness to *create* new laws to the same end[36]. It is notable, however, that some of the latter *sui generis* schemes have proved to be somewhat of a regulatory dead end[37].

Now, for the first time, a number of significant IT cases – mostly concerned with the application of intellectual property (IP) law to IT[38] - were litigated at the national level. It is unsurprising, therefore, that the third era also marked the development of IT law as a separate area of practice for legal practitioners and their clients[39] and of legal teaching[40] for the academic and student.

Further legal developments enabled commercial entities to obtain proprietary interests in IT pipes and IT content: key exemplars here are *sui generis* database protection[41] and the patenting of software (see section 3, below).

In the third era, therefore, significant challenges were posed equally to technology, law and legal academe.

2.2.4 The Fourth Era: Transition (1990-2001)

This era is characterised by two technological leaps forward – first, the ARPANET technically ceded to the Internet[42] in 1990 and second the user-friendly World Wide Web[43] was developed. The resultant increase in digital content, correspondingly

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[36] There are examples here relating both to 'pipes' and 'content': (i) The development of data protection law, is probably the first example of *sui generis* content regulation. It is generally accepted that Sweden and Norway led the development of data protection in the second era – see, for example, Bing, J. (1996) *"Data Protection in Norway,"* (http://www.jus.uio.no/iri/forskning/lib/papers/dp_norway/dp_norway.html), but it was only in the third era that the UK established by the Data Protection Act (DPA) 1984 (now the DPA 1998), and (ii) the development of *sui generis* computer chip protection was probably the first such 'pipes' regime. The protection of layout designs of integrated circuits as a specific subject matter was first mooted in the United States and resulted, in 1984, with the approval of the Semiconductor Chip Protection Act (the SCPA, which was codified at 17 U.S.C. §901-914 (1988)) and in the EU (Council Directive 87/54/EEC of 16 December 1986 on the legal protection of topographies of semiconductor products). International negotiations led to the adoption, in 1989, of the Washington Treaty (the Washington Treaty on Intellectual Property in Respect of Integrated Circuits).

[37] In the view of these authors, the Washington Treaty is now obsolete.

[38] E.g. *Merrill Lynch's Application* [1989] RPC 561 on patentability of software.

[39] See section 2.1, above.

[40] See footnote 13, *supra.*

[41] The introduction of a *sui generis* database right by the Copyright and Rights in Databases Regulations 1997 (SI 1997/3032), following the Directive on the Legal Protection of Databases 96/9/EC, to supplement copyright protection of databases as literary works (s.3A CDPA 1988).

[42] Curiously, it was not until 1995 that a definition of the term 'Internet' was agreed (see Federal Networking Council (FNC) Resolution, *Definition of "Internet"*, October 24, 1995 (available at http://www.nitrd.gov/fnc/Internet_res.html). For our purposes, 'Internet' can be defined as the global network of 'pipes' that provides electronic connection between computers enabling them to communicate with each other.

[43] The Web, as it is known, was a key 'pipes' innovation developed by the UK academic Professor Tim Berners-Lee and first implemented in 1990. The Web is usually defined as the system of interlinked hypertext documents that can be accessed *via* the Internet. Simply put, the Web is a 'place' on the Internet (websites such as www.soton.ac.uk) where one finds *interlinked* content that is based on an Internet standard – hypertext (http). So, when you use Google to find a website you are directly using the Web, but when you use a modern telephone system (mobile or landline) you are directly using the Internet.

significant growth in software applications developed by industry and a growing interest in establishing proprietary interests in IT content, all characterise this era.

Thus, technical innovations fuelled what can be regarded as a huge cultural shift from a quasi-academic 'science'-based Internet culture to a commercialised Internet space. A wide variety of business models were explored during this era, fuelling the so-called dot-com boom. However, with the birth of e-commerce, attendant legal problems relating to jurisdiction[44], dispute resolution and intellectual property rights arose. Legal challenges posed by the Internet in this era were not confined to private law: privacy issues and 'e-crime' concerns were also prevalent. Yet in both private and public law the legal response was frequently technology-specific.

The fourth era, then, was one that posed great challenges and significant transition in a variety of contexts – technical, cultural, commercial and legal.

2.2.5 The Fifth Era: Social Diffusion (2002 onwards)

So far, the current era has witnessed further commercialisation and an exponential increase in the use of the Internet. It is during this time that we have seen the Web, in a meaningful sense, begin to realise some of its potential as a publishing medium. The most obvious characteristic of this era is, again, a social *consequence* of technical developments to date – the rise of user-generated online content, characterised today with the sobriquet 'Web 2.0'[45]: thus the rise of applications as diverse as social networking[46], blogs[47], podcasts[48] and commercial Internet-based virtual reality environments[49].

The rise of user-generated content has meant that the English language, although still prevalent, is no longer dominant in Web content; however the globalisation of the Internet has thrown into sharp relief the digital divide[50], and we must question the effectiveness of the international response to this[51]. For those on the 'right' side of the digital divide, the pervasiveness of technology in society is, today, extraordinary. However, meeting public expectations in areas such as enforcement and security (from national security to personal privacy) is a huge challenge. The public want a safe Internet environment in which to conduct their day-to-day activities and they also want the authorities to control illegal and harmful content that might threaten the individual and society, but they want this without the perception or reality of unwarranted intrusiveness by the State or commerce. Such concerns arise within the contexts of increased network capacity, the resultant increased content and technological sophistication of the general population (from tech-savvy children to the over 55s - the 'silver surfers').

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[44] See 2.4.1 below.

[45] Despite confident media reference to 'Web 2.0' there is no technical definition of this term. It is generally taken to refer to second generation web-based communities and hosted services claiming to offer enhanced collaborative and information-sharing applications to users.

[46] E.g. Facebook (http://www.facebook.com/).

[47] Online diaries or 'web logs'.

[48] User-friendly digital audio software which can be used to record webcasts or to broadcast Internet-based radio programmes.

[49] Such as Second Life (http://secondlife.com/).

[50] A euphemism commonly used to describe the 'haves' and 'have nots' of the Information Age.

[51] The international response recently featured two conferences, known as the World Summit on the Information Society (WSIS). The WSIS process has, in the view of these authors, so far generated a wide range of documents, policy and targets, but with negligible results.

One might characterise the fifth era as having a *community* rather than *individualistic* approach to IT usage. There is recognition of the need for public law to support, by regulatory means, a safer online community. Thus significant social change, supported by cheaper and ever more sophisticated and converging technology characterise the current era.

Where we are seeing true technical innovation today is in military[52] use of IT and in advances in surveillance techniques[53] that can monitor behaviour online and offline, for the benefit of government authorities, commercial enterprises or criminals. The resultant moral issues pose substantial regulatory challenges. Also, significant technical steps forward have been made in research and development on further reducing computer size, and the development of new networks for the future and software for said networks. Collective creativity is being facilitated by technology on a larger scale than ever before (e.g. http://en.wikipedia.org/wiki/Main_Page): this, as well as the reduced cost of publishing content, is forcing established commercial content providers to re-assess their traditional business models.

Lacking a historical perspective, it is difficult to discern at this stage the legal impact of the current era. At present there is some evidence to suggest a return to generic – rather than technology-specific – regulation in the UK, and current and future technologies will certainly pose new challenges for UK law, but it is difficult to predict as yet what these will be and how the law will respond.

2.2.6 Summary

The authors believe that a number of technological and legal themes have evolved in the UK through the five eras. From a technological perspective, for example, we have seen hardware and software development that has evolved beyond rare, expensive, hard-to-use mainframe computers with numerical content to user-friendly, digital multimedia content on decentralised but accessible networks, and cheap computers. Thus the evolution of the 'pipes' (technologies which the Internet community is fighting to keep as 'open' rather than becoming the property of one commercial entity) has driven the increasing availability and range of 'content'. Today, computers are pervasive and their increasing functionality and convergence can be expected to drive further increases in the quantity and forms of 'content'.

From a legal perspective we have seen a number of different formal legal responses, variously, generic and technology-specific in their approach to technological development and commercial pressures; which is to say that the law appears to play a *reactive* regulatory role[54]. However, this may not be the whole picture and it will be argued below[55] that other models of regulation have an important part to play in the regulation of IT. Despite the technological value of openness (at least with regard to 'pipes'), there is increasing pressure to establish proprietary rights in 'pipes' and 'content'

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[52] For example, US military forces currently use Artificial Intelligence-assisted technology such as unmanned 'drone' aircraft and are currently developing the first generation of 'robot' soldiers.
[53] Such as, modern CCTV technology.
[54] A number of questions flow from this that cannot be answered in this essay: does the (slower) pace of regulation act as a break on technological development? Can, and should, law lead technological development?
[55] See section 2.4, below.

(which contrasts with the technological value of openness and, in the fifth era, the increased community approach to IT usage); an issue which will be briefly re-visited in sections 3 and 4 below.

2.3 What is IT Law?

Defining the boundaries of IT law was a difficult task in the early years. Indeed, early critics of the establishment of IT law as a separate discipline carped that IT law was merely a rag-bag of aspects of established legal disciplines such as contract law and intellectual property law. As noted above, IT law has since become established as a separate legal discipline; however, how should we define IT law? The problem here was identified at the beginning of this essay: the boundaries of IT law flex according to IT development. The authors assert that the boundaries of IT law were diffuse in the first era, but began hardening in the second and third eras[56]. However the authors suspect that, throughout the fourth and current eras, the boundaries have again become diffuse: indeed, the syllabi of academic UK IT law courses has become highly diverse during this time and we see evidence that the more informal regulatory models are being used in practice (see section 2.4 below). Moreover, the formal regulatory impact of information technologies is increasingly found *within* more traditional legal disciplines[57]. Perhaps this is reflective of the ubiquity of IT and technology convergence? If these speculations are true – and further research is necessary here – then perhaps the question – is IT law really law? – has renewed practical, as well as academic, import.

2.4 The Regulatory Context: a Critical Overview

It was noted in section 2.2.6 above, that formal legal regulation provides only part of the regulatory framework for IT. In this section, these questions and the import of more informal regulation will be considered (in 2.4.2) in proposing a theory of IT regulation. This theory, espoused in section 2.4.3, consists of five regulatory models; characterised as three standard regulatory models[58] and two alternative models[59]. It is these constructs that the authors argue can be discerned from the present study of IT law.

2.4.1 Jurisdiction: a brief note

Before these models are introduced, it should be noted that as modern IT facilitates communications and activities across national borders, an important aspect of its regulation must be enforcement: and that leads us to the topic of jurisdiction. As noted in the Introduction to this essay, the authors have had to be selective in choosing the topics for critical discussion. Jurisdiction is one such omission, but it is relevant to note that the authors refute what has been termed 'the cyberspace fallacy'[60], i.e. the view that the internet is a virtual space over which no jurisdiction has *de facto* or *de jure* control of activities. The authors, along with numerous commentators and most IT legal

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[56] At which point IT law could be said to encompass – amongst others - telecommunications law, intellectual property law, the law of e-commerce and e-crime law.

[57] E.g. the impact of the Electronic Commerce (EC Directive) Regulations 2002, SI 2002/2013, on UK contract law, and of the Sexual Offences Act 2003 on UK criminal law.

[58] The *technological model* (regulating technology by technology), the *legal model* (regulating technology by law) and the *hybrid model* (regulating technology by a combination of law and technology).

[59] These being *'soft' legal regulation* and the *trust-based regulatory model.*

[60] A term coined by Prof. Chris Reed – see Reed, C. *"Internet Law: Text and Materials"* 2nd edition, Cambridge University Press at p.1 – one of the many commentators who has written on the topic of jurisdiction in IT law.

practitioners[61], accord with the view that the actors in internet activity are, in essence, human - using human-designed software and physical equipment (hardware). Ultimately, both the human and hardware elements are based in legal jurisdictions and are, thus, within the reach of national laws and therefore subject to legal regulation.

2.4.2 The Role of Institutions in IT Regulation

In assessing what drives IT law development it is important to note the role of institutions working within their spheres to develop policy, standards and compliance processes. Both general and technological institutions have been very important in the genesis of both IT and IT law, with examples of the former including the United Nations (UN) and the Organisation of Economic Co-operative Development (OECD). In this context much of what has been achieved thus far has largely been accomplished by 'soft law' processes i.e. not by the sledgehammer of legislation but by codes of practice, often negotiated voluntarily with regulatory authorities, designed to promote best practice and to minimise formal action. Technological measures taken as a result of industry collaboration and co-operation with public authorities may also provide a greater deterrent, for example to online criminal activity, than sterner criminal sanctions alone.

In some instances the issue has gone full circle with evidence, for example, that the police are increasingly calling on the banks to take necessary enforcement action to tackle credit card fraud rather than for the police themselves to investigate and prosecute such activity through the courts. Whilst the banking industry clearly has responsibilities to minimise fraud, there are dangers should this approach to policing extend to other less well supported crime victims where the individual may feel that he or she is on their own against the criminal.

The increasing complexity of the challenge is also encouraging the establishment of partnerships and national specialist agencies such as SOCA – the Serious Organised Crime Agency - which is an executive non-departmental public body sponsored by, but operationally independent from, the Home Office[62]. SOCA tackles a range of criminal activity and abuse involving the use of IT in perpetration. By contrast the Internet Watch Foundation[63] operates on a non-statutory basis, funded by the EU and the online industry, to minimise the availability of potentially illegal content online.

Internationally, the blend of 'soft' and 'hard' law activity continues through the auspices of technological organisations such as the International Telecommunication Union (ITU). The ITU is a United Nations Agency within the information and communication technologies acting as a "global focal point for governments and the private sector" within the areas of radio communication, standardisation and development. Established by the first International Telegraph Convention in 1865 its 191 Member States and 700 sector members and associates work together to establish global policies for the global telecommunication environment while developing standards for emerging new systems.

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[61] A fair reflection of the average UK IT legal practitioner's perspective is that whilst it is not *legally* difficult to establish jurisdiction (the global nature of the Internet means that a single IT activity usually will fall within UK jurisdiction, and indeed, that of other countries: principally the U.S.), there may be *practical* barriers to achieving this and to then enforcing UK rights and laws; and the time and effort this can involve often meaning that the cost may preclude enforcement from being commercially feasible. In this area, as with so many other issues, the response of the practitioner is to reduce his client's risk *via* creative use of contract law.

[62] See: http://www.soca.gov.uk/aboutUs/index.html.

[63] See: http://www.iwf.org.uk/public/page.103.htm.

At the apex the global summits and plenipotentiary conferences define the direction for exploitation and development of the global telecoms resource.

Via similar mechanisms of international treaties, working groups, meetings and assemblies, another international organisation - the World Intellectual Property Organisation (WIPO) - also works with more than 90% of countries in the world, and a wide range of stakeholders and organisations, *inter alia*, "to promote the protection of intellectual property throughout the world through co-operation among States and, where appropriate, in collaboration with any other international organisation". Thus WIPO has been instrumental in developing international IP laws and standards consistent with the demands of the online world which have then been implemented within the domestic law of its member states.

So whilst there is little dispute that international collaboration is essential to enable the 'pipes' to deliver what governments, business and consumers want, it is less clear what regulatory contributions are required when the technology and its applications filter though into everyday life. At that level, particularly in relation to 'content', the priorities and politics of nation states kick in along with the everyday demands of business and the public, all of which will temper and influence the priorities and pressures for regulatory development. This means of course that regulatory differences may emerge between nations in the actions taken. This is particularly the case with regard to the sensitive issue of online content regulation which some governments see as vital to the maintenance of the regime in power.

In assessing the contribution of public law towards information technology the approach in terms of legislation has always been to lay down parameters and to permit the law to evolve within the interpretation of the regulators, including the courts. This can be seen in the UK in the functioning of the Computer Misuse Act 1990 (as amended) and the Data Protection Acts 1984 and 1998. Public law has also been a facilitator of modernisation. For example, section 8 of the Electronic Communications Act 2000 permits the appropriate Minister to modify legislation so as to facilitate electronic communication or storage as an alternative to traditional hardcopy methods in a wide variety of formal contexts. This includes electronic alternatives to documentary evidence. Although used sparingly by government the measure does at least fulfil the modernising responsibilities that such provisions imply. The direct effect of such measures contrasts well against the achievements of international treaties. Despite their contribution to global or regional regulation, treaties can be slow in coming to fruition and inflexible when legally binding on signatory states.

If one can step outside public law for a moment and focus on public sector policy towards IT one can see governments striving to gain the financial efficiencies that IT can offer. In the UK, public sector policy towards e-Government for example has grown from an aspiration to improve government services into a transformational government agenda designed to radically change the way government operates in the delivery of public services. However, despite much effort in this regard, reports of inadequacies and failings in the modernisation of public sector IT infrastructure and the evident needs of policymaking for a more sophisticated government information policy, demonstrate that there is still much to be done.

2.4.3 A Theory of IT Legal Regulation

The authors tentatively hypothesise that five distinct regulatory models can be discerned from the legal regulation of IT in the UK. It should be made clear from the outset that these regulatory models are not alternatives: they can be complementary to each other and can also be rather promiscuous (thus, combinations of the different models can evolve in practice). Below, each model is briefly described with their attendant advantages and disadvantages critically analysed in outline.

2.4.3.1 The Standard IT Regulatory Models

It is difficult to think of examples of the technological regulatory model (technology regulating technology) outside computer engineering itself. The 'architecture' of the 'pipes' of the Internet is regulated by technology; what we might term *macro*-technological regulation, however it is difficult to see where else the technological model could be useful. A rare example might be so-called vigilante justice websites, such as http://hollabacknyc.blogspot.com/ (which 'empowers' New Yorkers to 'holla back' at street harassers). This rare (and antisocial) form of 'content' could be characterised as a form of *micro*-technological regulation of social behaviour in public places. Overall the technological model does not appear to have great import outside computer engineering because, in practice, most regulatory use of technology takes place in concert with proprietary rights, contract or public law.

Yet, regulation of technology purely by law (the legal model) carries its own risks: principally that of legal obsolescence. As discussed earlier in this essay, two common forms of IT legal regulation are generic regulation and *sui generis* regulation: many of the examples discussed earlier have employed the legal regulatory model which appears to be the most common model employed in formal IT law. However, we are increasingly seeing new laws that would fall into the hybrid model, i.e. regulation that employs a combination of law and technology. The hybrid model would seem to be both more useful than the technological model and at less risk of legal obsolescence. A good example of this is digital rights management in the context of copyright law (see section 4.2 below).

2.4.3.2 The Alternative IT Regulatory Models

As pointed out above, the potential applications of the technological model are relatively narrow. Further, by their nature both the legal and hybrid models are dependent on legislative or common law developments (or at least on contractual relationships). However, these standard regulatory models do not appear to reflect the whole picture of legal regulatory practice within IT. Not only does IT provide a technical and fast-moving environment for regulation, but we have to contend with the actions of important institutions (see section 2.4.2 above) as well as the ever-evolving human activities that IT facilitates. Consequently, more flexible, policy-based and 'bottom-up' regulatory approaches are needed. It is therefore unsurprising that the academic legal literature suggests that other forms of regulation are evolving to fill this 'regulatory gap'. In generalist academic legal literature there is an acceptance that so-called soft law[64] has a regulatory role to play and in academic circles there is some discussion of trust-based regulation. This accords with the authors' own experience as to how IT is regulated in

[64] For example, it has been used in EU law (e.g. Senden, L. "*Soft Law in European Community Law*" (Hart Publishing, 2004). Soft law can be defined as regulation by non-binding instruments: such instruments might include resolutions, codes of conduct, guidelines and recommendations.

practice: that there are alternative regulatory models, which we have characterised in this essay as the soft law model and the trust-based model.

A 'pipes' example of the soft law model would be IT protocols and standards (such as the TCP/IP protocol) and a content example would be the Internet Watch Foundation[65]. One can also see that soft law, combined with contract law, is increasingly used to deal with a range of private law issues over which there is relatively little formal legal regulation; this evolution of the soft law model might be characterised as a 'hybrid-soft model' regulatory approach.

Trust-based regulation is technically a feature of the decentralised infrastructure of the Web[66] and has traditionally been part of the 'science'-based ethos of IT. Although trust infuses the 'pipes' of the web[67] it is difficult to see a trust ethos being widely used in a commercial environment, but there are some examples of this ranging from Google[68] to eBay[69].

2.4.4 Summary

As we have seen, there is a plethora of regulatory actors (law-makers, judges, institutions, etc) in IT. It is our submission that there is also a wide choice of regulatory models that have been and are being used in the regulation of IT. The authors consider that this pluralism is a strength, rather than a weakness, of IT law, but concede that it may add credence to the argument that IT law is not law (see sections 2.1 and 2.3 above). Nevertheless, there is the regulatory flexibility to adopt different models for different contexts.

There are two additional factors that, in practice, can be expected to add complexity to this regulatory theory: (i) that the five regulatory models can variously be directed to the 'pipes', 'content', or a combination of both (to good or ill effect) and, (ii) that the regulation of modern IT is a global task, while regulation is primarily at the national level, so this can lead to regulatory competition.

These regulatory insights, together with earlier elements from this essay, will now be brought to bear in a brief consideration of modern examples of 'pipes' and 'content' legal issues (respectively, sections 3 and 4, below).

3 IT Infrastructure ('the pipes')

3.1 An Exemplar: Software Patents

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[65] The IWF plays an important, but informal, UK-focused co-ordinating role in controlling Internet content that includes child sex abuse, obscene content and content that incites racial hatred. Individuals can notify the IWF of such content *via* the IWF hotline; the IWF subsequently alerts the relevant hosting service providers that criminal content is found on their servers (see http://www.iwf.org.uk/public/page.2.htm).

[66] Professor Tim Berners-Lee refers to these as 'social mechanisms' (e.g. see his Testimony before the United States House of Representatives' Committee on Energy and Commerce Subcommittee on Telecommunications and the Internet Hearing on the "Digital Future of the United States: Part I -The Future of the World Wide Web". See http://dig.csail.mit.edu/2007/03/01-ushouse-future-of-the-web.html).

[67] This is why the Web is, at a technical level, vulnerable to abuses of trust – spam (unsolicited e-mail) is the prime example of such an abuse.

[68] Google has an informal corporate motto: *"Don't be evil."* (see http://investor.google.com/conduct.html).

[69] Trust metrics are important to eBay users: see, for example, http://pages.ebay.co.uk/services/forum/feedback.html.

As noted earlier in this essay, many key aspects of the 'pipes' take the form of software. The purpose of this section is to briefly reflect on the issue of software patents.

First, a brief overview of UK patent law in this context is needed. Under the Patents Act 1977 (PA 1977)[70] a patent, a property right, can be granted to inventions that are novel, capable of an inventive step and are industrially applicable. However, s.1(2)(c) PA 1977 provides that 'a computer program…..is not an invention as such.' UK patent law is heavily influenced by an EEA system – the European Patent Convention (EPC) 1973, as interpreted by the European Patent Office[71] (EPO)[72], and it was the influence of the latter that led UK courts over the years to make it clear that inventions incorporating software are not necessarily to be regarded as being 'computer programs as such' (and thus, excluded from patentability): where a computer program has a *technical effect*, such inventions may be deemed to escape the restriction of s.1(2)(c) PA 1977.

There are a number of issues that arise here. Firstly, the PA 1977 can be categorised as an example of the legal regulatory model. Secondly, the wording of s.1(2)(c) PA 1977 is clearly influenced by the old 'hardware/software' distinction: s.1(2)(c) providing that hardware is potentially patentable but software is not an invention 'as such'. However, latter interpretation of this section (which allows inventions incorporating software to be patentable where there is a technical effect) can be seen as an example of the adaptation of existing law to meet the perceived needs of the software industry[73]. An interesting development in this area is the presence of a collective and individual technological backlash – in the form of the Open Source and Free Software movements[74] - to the patenting of software applications. The result being that for basic personal and office use, there is a choice between patented proprietary software (e.g. Microsoft) or open-source applications (e.g. Linux); thus, the IT community (not the legal system) has delivered consumer choice.

As implied above, software patents is an example of an area of law where the old 'hardware/software' distinction was applied, but has subsequently broken down. It is interesting to speculate as to what might happen if UK patent law abandoned this old distinction entirely. Clearly this would necessitate the reference to software in s.1(2)(c) PA 1977 being removed[75]- while the 'pipes/content' distinction in UK patent law might offer a useful alternative basis for lawmaking[76]. Opponents of software patents would clearly like to retain the 'hardware/software' distinction, and strengthen the impact of s.1(2)(c) PA 1977, but the authors believe that this academic debate should be more

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[70] Please note, further changes to the PA 1977 are expected: all references to this Act were correct at the time of writing.

[71] See http://www.epo.org/about-us/epo.html.

[72] Although UK patent jurisprudence has recently diverged from the EPC jurisprudence on computer programs (see the Court of Appeal's decision in *Aerotel Ltd v Telco Holdings Ltd* [2006] EWCA Civ 1371).

[73] Most commentators agree that the EPO's interpretation of the EPC 1973, and the subsequent UK, adaptation of the technical effect doctrine in relation to the PA 1977, were a result of regulatory competition with the US (where software patents are more readily available).

[74] These are examples of two of the social movements, with their origins in the technology community, which support and foster the development of non-proprietary software. For example, see the GNU Project at http://www.gnu.org/).

[75] It should be noted that, as a signatory of the EPC 1973, the UK is not currently in a position to unilaterally make such important changes to the PA 1977.

[76] It should be noted that UK patent law already contains restrictions on inventions to be used for certain functions (e.g. methods used in medical treatment, surgery and diagnosis in s.4 PA 1977) so there are prior examples, for policy reasons, of the use of functional distinctions in determining patentability.

realistic, and that adaptation of the 'pipes/content' distinction could lead to better and more creative law-making in patent law.

Further development of the 'pipes/content' distinction might lead to a more nuanced approach to software patents. Given the existence (and growing success) of Open Source and Free Software, it is the authors' opinion that IT innovation and consumer choice does not appear to have unduly suffered from the patenting of software applications. What *is* of concern to the authors though is the growing trend of commercial entities trying (through patent law and other means) to establish proprietary rights in IT standards. Here, we would argue that the commercial monopolisation of IT standards can only have a detrimental effect on consumer choice and future innovation. Thus, we believe that establishing property rights in high level 'pipes' such as IT standards is inappropriate, whereas establishing property rights in low level 'pipes', such as software applications, may be less harmful in terms of innovation. Developing the 'pipes/content' distinction along these lines[77] within patent law might address these concerns: distinguishing high level 'pipes' (which would be excluded from patentability on policy grounds) from low level 'pipes'. This is an interesting suggestion which requires further research, but the key point here is that current patent law appears ill-equipped to deal with the monopolisation of IT standards, and, at present, it is left to competition law to attempt to regulate this issue.

4 IT Content

4.1 Content Generation

There are a wide range of important legal issues relating to IT content. For example, how should the UK regulate children's access to dangerous Web content such as audio-visual recordings of 'tombstoning' stunts[78] and damaging 'pro-ana' tips[79] on social networking sites such as *Bebo* and *Facebook*? If a person directs their avatar, their digital embodiment, to engage in undesirable behaviour in a virtual reality world such as *Second Life* should this give rise to a criminal prosecution? Although, in these examples, contractual relationships would provide the basis for some content regulation; is it desirable for justice to be privatised in this way? Or, is contract law the best mechanism given the techno-legal obstacles to UK regulation of any website activity? As a *global* medium, with actors that are often geographically disparate and the servers for the relevant websites often being based outside the UK, there is only so much that can be achieved by the UK acting alone. Would Web content best be regulated technically (e.g. by making ISPs formally liable for Web content that they host)? Would legal regulation be helpful (some sort of international treaty on Web content)? Or some combination of the two? These are questions that require further research.

However, in the absence of international treaties, contract currently provides the most effective way of formally regulating general Internet content; but contract only provides

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[77] The imprecise nature of this high level/low level 'pipes' distinction is conceded, but a similarly imprecise distinction – that of macro-biological and micro-biological processes (PA1977, Schedule A2 s.3(f)) is already used in UK patent law. It should be noted that there may also be consumer and innovation benefits in distinguishing between 'high level' and 'low level' 'content' in copyright law, but further discussion of this is beyond the scope of this essay.

[78] Where untrained individuals jump off high vantage points (piers, harbour walls, cliffs etc.) into the sea. The (consensual) recordings of such stunts usually include images of the serious injuries or deaths that result.

[79] That is, pro-anorexia tips on dieting and the avoidance of medical intervention.

an *indirect* form of content regulation. In section 4.2 below, the main example of *direct* formal regulation of original content, copyright law, is considered in more detail.

4.2 An Exemplar: Copyright and P2P Music Networks

A relatively recent issue within IT academe is the regulation of so-called peer-to-peer (P2P) computer networks[80] upon which MP3 music files are exchanged. As with any unauthorised use of copyright works, sharing an MP3 file, without the permission of the copyright proprietor(s) *via* an unauthorised peer-to-peer network, clearly constitutes copyright infringement. Although this fact causes some consternation amongst young UK music fans, this is both clear and appropriate in the eyes of the authors: what *is* of concern to the authors is the *extent* of copyright in this area.

First, a brief summary of the UK copyright regime is appropriate. Copyright is a property right, governed by the Copyright Designs and Patents Act 1988 (CDPA 1988), that subsists in certain categories of works, including: original literary works (most forms of written matter, including song lyrics); musical works (e.g. song melodies), and, sound recordings[81]. There is significant regional and international regulation of copyright, which has had great influence on the UK regime, with clear evidence that the international copyright regime has been adapted in the light of the challenges that digital content poses[82]. In the view of the authors, copyright is the *de facto* mechanism whereby the original content of the digital age is directly regulated.

However, academics such as Lessig[83] have pointed out that copyright is conceptually unsuited to regulate digital content. Copyright ('*copy right*') developed around the concept of *copying* as the cornerstone to copyright infringement. But with digitised copyright material, mere *access* to a work[84] *technically* involves copying and thus, constitutes copyright infringement. It should be noted that the civil and criminal consequences of copyright infringement *per se* are both significant and broad[85]. At a fundamental level, therefore, copyright law is ill-adapted to the digital environment. There are additional complications relating to the regulatory 'pipes' that many copyright works flow through. Permission to use copyright works is traditionally garnered from the network of national collecting societies[86] (to whom copyright proprietors traditionally cede the tasks of monitoring use of and collecting revenue from use of their copyright works). But with digital content it is technically possible to avoid or supplement this. Technologies for restricting and tracking usage (e.g. encryption and digital watermarking) and collecting revenue (e.g. iTunes) collectively are known as digital rights management (DRM). As in most other jurisdictions, controversially both common law[87] and statute[88] now afford

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[80] A typical P2P computer network is based on an application which utilises the Internet to allow users to exchange content with each other, either directly or through a mediating server.
[81] See ss.3 and 5A CDPA 1988.
[82] For example, the WIPO Copyright Treaty (WCT) 1996.
[83] First posited in Lessig, L. *"Code and other Laws of Cyberspace",* Persus, 1999.
[84] Which, with non-digital works, typically does not constitute copyright infringement.
[85] For example, see ss.96(2), 97 and 107 CDPA 1988.
[86] For example, the Performing Rights Society in the UK.
[87] *Sony Computer Entertainment Inc v Edmunds* [2002] All ER (D) 170. Affording protection, thus, to DRM is a clear example of establishing proprietary rights in 'pipes'.
[88] This *sui generis* protection has been achieved by the introduction in the CDPA 1988 of civil remedies against the act of circumvention as well as the making and dealing in circumvention devices and the provision of circumvention services (CDPA 1988 ss.296(2), 296ZA(3) and 296ZD). Criminal sanctions (CDPA 1988 s.296ZB) are only available against the making and dealing in circumvention devices and the provision of circumvention services. This is controversial legally (because CDPA 1988 ss.296 and 296ZA

direct protection to DRM. Thus, *via* copyright and *sui generis* DRM protection we have what the authors' term a *digital format dichotomy*, i.e. the same content is treated differently in law depending on whether it is in analogue or digital form.

Returning to our exemplar – let us illustrate the impact of this with two scenarios. Say person A buys a new analogue music record and listens to it both on his own record-player and that of a friend (person B). A then lends, on a non-remunerative basis, the record to another friend (person C); none of these activities could constitute infringement under the CDPA 1988. However, undertaking *substantially the same* activities on an online, authorised MP3 music service would give rise to liability and penalties under the CDPA 1988: where A paid to access an MP3 file from such a service (company Z), both downloading and listening to the file is technically copyright infringement (although A's contract with Z would usually allow for this. However, A may only be able to access the music file for a certain period of time or a certain number of times[89]). It would almost certainly constitute copyright infringement[90] for A to listen to the MP3 file on a friend's computer and similarly for A to e-mail or otherwise distribute the MP3 file to C. To extend this scenario, if A became frustrated with the lack of functionality of the music supplied by company Z, 'cracked' the DRM technologies applied and posted guidance on how to 'crack' Z's DRM technologies on a website, this would give rise to criminal sanctions.

In summary, works in digital format are less functional and subject to more robust copyright regulation than those in analogue form. Whilst this may be justifiable in terms of the interests of the right-holder (whose digital content can be more easily exploited without authorisation than equivalent analogue content), and may even have some benefits for the consumer (an authorised MP3 music file may well be cheaper than the equivalent offline version), the authors question whether copyright is an appropriate mechanism for regulating original digital content or whether *sui generis* regulation of original digital content might be the way forward. This is clearly an area that requires further research.

5 *Conclusion*

In this essay the authors have critically explored the relationship between technology and law in a way that, they hope, is of interest to the non-IT lawyer and specialist IT lawyer alike. By way of background, the authors have posited that the development of IT and UK IT law can be divided into five eras (section 2.2). More fundamentally, the necessity for a new paradigm for IT law has been discussed: the old hardware/software distinction is no longer useful from a technological perspective, so why should we expect it to be useful in academic analysis? Further research, including comparative research, will be required to explore how the best regulatory environment for 'pipes' and 'content' can be secured: as this is where the authors believe the future of IT law lies.

Other contributions of this essay are to be found in the consideration of the academic context of IT law (section 2.1, but also section 2.3). Here the authors suggest that IT law

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have had the effect of making DRM a form of quasi-property when applied to copyright works) and in practice (because copy-protected material often has reduced functionality, e.g. some forms of copy-protection will prevent CDs from being played on a computer).

[89] There are no such contractual restrictions in the analogue scenario, above.

[90] Also, DRM would make this technically difficult. Further, circumventing any DRM would also give rise to a separate cause of action in copyright.

may have come full circle as a legal subject – from an ill-defined emergent topic to a separate legal subject, to now, where there is some evidence of IT issues 'filtering back' to traditional legal subjects. The modern academic study of IT law arguably has parallels with that of jurisprudence: perhaps it is evolving into a 'meta-subject', one that can provide insight as to how the law/technology relationship should be managed within the context of other traditional legal subjects.

Another contribution of this essay is to be found in the hypothesis that IT law can be characterised as utilising five different, sometimes complementary, regulatory models (section 2.4). Further insights into IT legal regulation are to be found in sections 3 and 4.

The authors believe that these insights may be fundamental in considering how IT law should evolve in the future.