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Software as Discourse: The Power of Intellectual Property in Digital Architecture

By Professor Brian Fitzgerald[#]

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Abstract

As software increasingly facilitates our living the more we are drawn to conceptualise software as discourse. While this may sound trite it is a fundamental point to appreciate.

One of the most significant intellectual developments of the latter part of the twentieth century has been the poststructuralist writings of people such as Foucault, Derrida and Baudrillard that have explained the multitude of power relationships we each experience in our daily lives, the indeterminacy of law, the construction of meaning and the role of language, of discourse, to the construction of meaning and identity. These people told us that we live in an environment constructed from many elements – one of the dominant elements being language or discourse which itself contains inherent biases and tendencies. On the back of such philosophy we have seen the development of identity politics a space in which arguments are made for and against the construction of identity through language and other circumstances. In the end these poststructuralists have allowed us to appreciate and conceptualise our circumstantial being. As we are all aware, we are witnessing the exponential growth of a new form of social structure known as the information society. The quintessential element of discourse, of language, of speech, in this information society is (soft)ware. As we know software is now a key part of our social structure - we sense it in our cars, in our supermarkets, in our televisions, in our computers - we sense it everywhere; it is a ubiquitous, undulating, architectural, air like, water like commodity that infiltrates our daily lives. More interesting is that software through its various forms of (coded) structure can act to construct meaning and identity much the same way, as we understand speech can do. Software in the information society is discourse. It is not simply a literary text (a copyright law categorisation) it is fundamental to communicative architecture. The fierce debate over open code versus proprietary code software is intimately connected with this construction of identity through software.

If a software engineer has the tools to fully or partially construct discourse and identity in the digital world then the principles of law that mediate power relations (especially those between individuals, often described as private as opposed to public law) need to mediate such a construction process otherwise technological determinism will see me as simply another cyborg programmed to mediocrity and slavery. Laws that will play an important role in this process are laws that will govern the construction of this new discourse known as software.

Already battle lines have been drawn but major choices that will impact upon the value of our lives are being hidden beneath the veil of private law rhetoric. The role and function of software will initially be mediated by a blend of intellectual property law, contract law, competition law and privacy law, which I would term informational law or informational constitutionalism. It is the development of the principles of these areas of law in their relation to software that will determine much about the way we live in the future.

As we enter the digital millennium it is ever more pressing for us to fathom the genetic structure/code (natural and manufactured) of life. Here I have highlighted how software will act to construct us and how the law will facilitate such a process.

Introduction

With the coming of the information age we are continually represented though digital architecture constructed through digital wares.[1] The contours of this new digital landscape are yet to be fully realised but we are sufficiently entrenched in the information age[2] to know that conceptualising the digital environment is a new and challenging task.

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[1] Micahel Madison, "Legal-ware: Contract and Copyright in the Digital Age" 67 *Fordham Law Review*, 1025 at 1031 (1998).

[2] On this concept generally see: Frank Webster *Theories of Information Society* (1995) Routledge, London; G Gilder, E Dyson, J Keyworth, A Toffler, "A Magna Carta for the Knowledge Age", 11 *New Perspectives Quarterly 26* (1994); M. Castells *Information Age: Economy Culture and Society (Volumes 1-3)* Blackwells, Oxford (1996); J. Tomlinson, *Globalisation and Culture* Chicago UP Chicago (1999); A. Giddens, *The Consequences of Modernity* Stanford UP Stanford (1990); L Thurow "Needed: A New System of Intellectual Property Rights" (1997) *Harvard Business Review* 95; L Thurow, *Building Wealth: New Rules for Individuals Companies and Countries in the Knowledge-Based Economy*, Harper Collins NY, 1999; N Dodd, *Social Theory and Modernity* Polity Press Cambridge UK (1999); D. Harvey, *The Condition of Postmodernity*, Blackwell, Oxford (1990); A Heller, *A Theory of* Modernity, Blackwell, Oxford (1999); G Hearn, T Mandeville, D Anthony *The Communication Superhighway: Social and Economic Change in the Digital Age* (1998) Allen and Unwin Sydney Chapter 2 and the notions of "technological determinism" versus "social constructivisim"; T Jordan, C*yberpower:The Culture and Politics of Cyberspace and the Internet*, Routledge London UK (1999); J Thompson, *The Media and Modernity* Stannford UP, Stanford California (1995); S Turkle *The Second Self: Computers and the Human Spirit* Simon and Schuster NY 1984; J Wajcman *Feminism Confronts Technology* Polity Press Cambridge MA 1991; F Block *Post-industrial Possibilities: A Critique of Economic Discourse* UCLA Press LA 1990; N Garnham "Communication technology and policy" in *Mass Communications Review Yearbook* M Gurevitch and MR Levy (eds) Sage, Beverly Hils 1985 p 285 considering the pervasive nature of information society and its never ending expansion into the more private and less commercial spheres of life; *Esso Australia Resources Limited v The Commissioner of Taxation* [1999] HCA 67 (21 December 1999) para 101 per Kirby J acknowledging the information revolution; B Fitzgerald "Commodifying and Transacting Informational Products Through Contractual Licences: The Challenge for Informational Constitutionalism" in CEF Rickett and GW Austin (eds), *Intellectual Property and the Common Law World*, Oxford, Hart Pub, 2000 Chapter 3. On business models for information society see: R Kalakota & M Robinson, *E Business: A Roadmap for Success,* Adison Wesley, NY (1999); P Seybold *Customer.com,* Random House, NY (1998); D Janel, *Online Marketing Handbook*, John Wiley, Brisbane, 1998; J Ellsworth and M Ellsworth, *The Internet Business Book*, John Wiley, Brisbane 1995; E Lawrence, et al., *Internet Commerce: Digital Models for Business* John Wiley & Sons, Brisbane, 1998.

The aim of this paper is to conceptualise software as discourse, thereby allowing us to better understand the power of intellectual property rights in digital architecture. This simple if not trite point - that software is discourse - is not readily appreciated in legal (and much other) analysis of the digital environment. I suspect this emanates from sheer ignorance and our practice of blind faith or trust[3] in the ethical integrity of (digital) architecture; in our belief that the medium or the pathway is always acting in our best interests like some sort of virtual fiduciary.

My role is to challenge this complacency and to open up a framework of analysis sorely needed for social and cultural enhancement. If software is a form of discourse, in other words a way of making things known or manifest or letting them be seen, then the ability to create and hold proprietary rights in software (in discourse) is a fundamental determinant of social construction. The power to construct and control (through law) channels of communication is a most serious question in the digital era.

In order to assert my argument with clarity and authority this article will perform the following steps:

- define software
- explain the notion of discourse
- posit software as discourse
- explore how software acts to construct identity
- examine how the law regulates intellectual property rights in software and impacts on discursive formation
- introduce the notion of power and posit the new constitutionalism

To clarify things from the outset, let me say I am not arguing that all information should be free. Rather, my basic point is that when we commodify (or propertize[4]) information through property rights recognised by law we must hold in the balance and appreciate the value of free and open discourse. The quest for value in the digital economy challenges us to understand the boundaries which law will draw around the digital estate.[5] On one side stands the school of thought that information as the basic building block of knowledge should (and wants to) be free[6] and on the other hand the idea that in a market economy (value added to raw) information has been and

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[3] A Giddens, *The Consequences of Modernity* Polity Press Cambridge UK (1990) especially at 33-34; B Misztal, *Trust in modern societies : the search for the bases of social order* Polity Press, Cambridge UK (1996).

[4] On this notion generally see: E. Mackaay, "The Economics of Emergent Property Rights on the Internet" in P. Bernt Hugenholtz (ed.) *The Future of Copyright in the Digital Environment* (1996) Kluwer The Hague Netherlands, 13; M Heller "The Tragedy of the Anticommons: Property in the Transition From Marx to Markets" 11 Harv. L. Rev. 621 (1998); Felix Cohen, "Transcendental Nonsense and the Functional Approach" 35 Colum. L. Rev. 809,, 814-817; P. Samuelson and K. Opsahl, "Licensing Information in the Global Information Market: Freedom of Contract Meets Public Policy" [1999] *European Intellectual Property Review* 387.

[5] B Fitzgerald, "Conceptualising the Digital Environment" in A Fitzgerald, B Fitzgerald, P Cook and C Cifuentes (eds) *Going Digital 2000: Legal Issues for E Commerce Software and the Internet* Prospect Publishing Sydney Australia (2000) 1; B Fitzgerald "Commodifying and Transacting Informational Products Through Contractual Licences: The Challenge for Informational Constitutionalism" in CEF Rickett and GW Austin (eds), *Intellectual Property and the Common Law World*, Oxford, Hart Pub, 2000 Chapter 3; B Fitzgerald and E Sheehan "Trademark Dilution and the Commodifictaion of Information: Understanding the "Cultural Command"" (1999) 3 Mac LR 61; B Fitzgerald and L Gamertsfelder, "Protecting Informational Products through Unjust Enrichment Law" [1998] *European Intellectual Property Review* 244; R Dreyfuss, "We Are Symbols and Inhabit Symbols, So Should We Be Paying Rent? Deconstructing the Lanham Act and Rights of Publicity" 20 *Columbia -VLA Journal of Law & the Arts* 123 (1996); Carl Shapiro & Hal Varian *Information Rules: A Strategic Guide to the Network Economy* (1999) especially at 297-8.

[6] John Perry Barlow, *Selling Wine Without Bottles: The Economy of Mind on the Global Net* in P. Bernt Hugenholtz (ed.) *The Future of Copyright in the Digital Environment* (1996) Kluwer The Hague Netherlands, 169 < http://www.eff.org/barlow>

inevitably will be commodified and sold in the market. The end point lies somewhere between the extreme reaches of each argument.[7] My argument is that commodification of information has and will continue to occur - digital informational products will be propertized in our market economy[8]- however we must and need to infuse this process with respect and appreciation for free and open discourse.

Part I: The Traditional Definition of Software

The first element needed to underpin my explanation of software as discourse is a working definition of software.

Software may be described as a computer program, which facilitates the operation of a computer system.[9] The relationship between a computer and a program is described by Carr and Arnold[10] as follows:

> A program is executed by the central processing unit (CPU) of the computer, which is the centre of control for arithmetical and logic operations within the microprocessor. The CPU consists of an arrangement of electronic circuits which are activated by impulses of electric current. A logic gate within the CPU is either turned on or off depending on the presence or absence of such pulses.

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[7] E. Mackaay, "The Economics of Emergent Property Rights on the Internet" in P. Bernt Hugenholtz (ed.) *The Future of Copyright in the Digital Environment* (1996) Kluwer The Hague Netherlands, 13; B Fitzgerald, "Conceptualising the Digital Environment" in A Fitzgerald, B Fitzgerald, P Cook and C Cifuentes (eds) *Going Digital 2000: Legal Issues for E Commerce Software and the Internet* Prospect Publishing Sydney Australia (2000) 1; B Fitzgerald and M Head, "Law and Informational (Post) Modernity: Introduction to Digital Frontiers: Law and the Internet" (1999) 3 Mac LR vi;

[8] T Stewart, *Intellectual Capital* (1999); N Imparato *Capital for our Time: the economic legal and management changes of intellectual capital* Stanford California Hoover Institution Press (1999); D. Tapscott, *The Digital Economy: Promise and Peril in the Age of Networked Intelligence* (1995).

[9] Pamela Samuelson et al., "A Manifesto Concerning Legal Protection of Computer Programs", 94 Colum. L. Rev. 2308, 2315-30 (1994): "[P]rograms are, in fact, machines (entities that bring about useful results, i.e., behavior) that have been constructed in the medium of text (source code and object code)." See further: M Hamilton and T Sabety, "Computer Science Concepts in Copyright Cases: The Path to a Coherent Law" (1997) 10 Harv. J. Law & Tec. 239; M. Kane, "When is a Computer Program, Not a Computer Program? The Perplexing World Created by the Proposed UCC Art 2B" 13 *Berkeley Tech Law Journal 1013* (1998); B Gaze, *Copyright Protection of Computer Programs* Federation Press, Sydney Australia (1989) 2-12; *Data Access Corporation v Powerflex Services Pty Ltd* [1999] HCA 49 (30 September 1999) http://www.austlii.edu.au/au/cases/cth/high_ct/1999/49.html>*;* Section 10 *Australian Copyright Act1968* (Cth): 'computer program' means an expression, in any language, code or notation, of a set of instructions (whether with or without related information) intended, either directly or after either or both of the following: (a) conversion to another language, code or notation; (b) reproduction in a different material form, to cause a device having digital information processing capabilities to perform a particular function;"; s 101 US Copyright Act (17 USC): A "computer program" is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result. http://www4.law.cornell.edu/uscode/17/101.html; *Alcatel USA Inc v DGI Technologies Inc* 166 F. 3d 772 at 778 (5th Circ 1999), <http://caselaw.findlaw.com/cgi-bin/getcase.pl?court=5th&navby=case&no=9711339CV0v2&exact=1> "firmware, … is software embedded in a memory chip on the card." Amendments to the Australian Copyright Act 1968 Cth propose to replace the current definition of "computer program" in s10(1) with the following: "computer program means a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result" see further Copyright Amendment (Digital Agenda) Bill 1999 (Cth); Copyright Law Review Committee (CLRC) *Computer Software Protection* ("Final Report") (Attorney General's Department, Canberra, April 1995, <http://www.agps.gov.au/customer/agd/clrc/sware/index.html>

[10] Carr and Arnold, *Computer Software: Legal Protection in the United Kingdom*, 2nd ed (1992) at 1-2.

The presence or absence of pulses of current is represented by binary digits ('bits'). The CPU recognises '1' as indicative of the presence of a pulse, and '0' as indicative of its absence. A computer program is a series of bits, each bit representing the presence or absence of a pulse. The program operates within the CPU as a series of pulses in a prearranged sequence in accordance with the order of bits devised by the computer programmer. Accordingly, the 'instructions' of a computer program represent a series of impulses which operate within the computer to make the machine perform certain predefined functions.

Each instruction is held in a memory location within the computer, which has an address, by which the location may be identified. The addresses of the memory locations in which program instructions are to be found are held in the program counter. The CPU locates the address of each instruction of the program, accesses it from the memory location, from where it is reproduced and executed in the instructions register. The program counter may contain a 'jump' instruction, which makes the CPU jump beyond the next instruction in sequential order in the software, to access and execute a subroutine."

In the Australian case of *Computer Edge Pty Ltd v Apple Computer Inc*[11] Gibbs CJ explained the traditional notion of a computer program in these terms:

Computer science makes much use of jargon and metaphor, and to enable the matters in issue to be understood it seems desirable to attempt a brief explanation of the meaning of some of the expressions used in that science and to describe the manner in which a computer program is developed. **A computer program is a set of instructions designed to cause a computer to perform a particular function or to produce a particular result**. A program is usually developed in a number of stages. First, the sequence of operations which the computer will be required to perform is commonly written out in ordinary language, with the help, if necessary, of mathematical formulae and of a flow chart and diagram representing the procedure. … Next there is prepared what is called a source program. The instructions are now expressed in a computer language - either in a source code (which is not far removed from ordinary language, and is hence called a high level language) or in an assembly code (a low level language, which is further removed from ordinary language than a source code), or successively in both. Sometimes the expression source code seems to be used to include both high level and low level language. In the present case, the source programs were written in an assembly code, comprising four elements, viz. - (a) labels identifying particular parts of the program; (b) mnemonics each consisting of three letters of the alphabet and corresponding to a particular operation expressed in 6502 Assembly Code (the code used); (c) mnemonics identifying the register in the micro-processor and/or the number of instructions in the program to which the operation referred to in (b) related; and (d) comments intended to explain the function of the particular part of the program for the benefit of a human reader of the program. The writing has been destroyed, although it is possible to reconstruct the mnemonics, but not the labels and comments, which were comprised in it.

The source code or assembly code cannot be used directly in the computer, and must be converted into an object code, which is 'machine readable', i.e., which can be directly used in the computer. The conversion is effected by a computer, itself properly programmed. The program in object code, the object program, in the first instance consists of a sequence of electrical impulses which are often first stored on a magnetic disc or tape, and which may be stored permanently in a ROM ('read only memory'), a silicon chip which contains thousands of connected electrical circuits. The object code is embodied in the ROM in such a way that when the ROM is installed in the computer and electrical power is

[11] (1986) 161 CLR 171 at 178-179.

applied, there is generated the sequence of electrical impulses which cause the computer to take the action which the program is designed to achieve. The pattern of the circuits in the ROM may possibly be discerned with the aid of an electron microscope but it cannot be seen by the naked eye. Obviously, the electrical impulses themselves cannot be perceived. However the sequence of electrical impulses may be described either in binary notation (using the symbols 0 and 1) or in hexadecimal notation (using the numbers 0-9 and the letters A-F), and it is possible to display the description on the visual display unit of the computer, and to print it out on paper. And, as has been said, it is also possible to reconstruct the mnemonics in the source code. It will have been seen from this account that a program exists successively in source code and in object code, but the object code need not be written out in binary or hexadecimal notation in the process of producing and storing the program. (emphasis added)

This traditional definition of software (admittedly designed for copyright law) highlights its functional nature: a set of instructions that tell a computer how to operate.[12] My argument is that software is much more than this - it acts as a medium for communication - it is a form or variant of discourse.[13] Before developing this argument though it is important to consider more closely the notion of discourse.

Part II: Discourse, Software and the Construction of Identity

(i) What is discourse?

A chain of European ("linguistic") philosophers through this century from Saussure[14], Heidegger[15], Gadamer[16], Foucault[17] through to Derrida[18] and Baudrillard[19] have explored and explained the ways

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[12] L Long and N Long, *Computers* (1999) 6th ed Prentice Hall New Jersey Chapter 3 "Software: Telling Computers What To Do" - "Software refers to any program that tells the computer system what to do": C73. A suggestion that software is not solely focussed on directions to the computer is given when the authors note that "we interact with software to direct the overall activities within a computer program" C72.

[13] Consider E Moglen, "Anarchism Triumphant: Free Software and the Death of Copyright" *The Nation* (1998) <http://emoglen.law.columbia.edu/my_pubs/anarchism.htm>

[14] G Sampson, *Schools of Linguistics* Stanford UP , Stanford USA, (1980); F de Saussure *General Course on Linguistics* (1916) C Bally and A Sechehaye (eds) English ed Collins 1974; E Durkheim *Rules of Sociological Method* (1895) English ed Collier-MacMillan 1966; M Davies *Asking the Law Question* (1994) LBC Sydney, 229-235.

[15] C Sills and G Jensen (eds) *The Philosophy of Discourse* Vols I & II Bonton Books Portsmouth NH USA (1992)

[16] Hans-Georg Gadamer, *Philosophical Hermeneutics*, trans D. Linge, Berkeley, University of California Press (1976); S Feldman "Diagnosing Power: Postmodernism in Legal Scholarship and Judicial Practice" (1994) 88 *Northwestern University Law Review* 1046 at 1060-1062: "Philosophical hermeneutics, contrary to foundationalism, maintains that no matter what we do, we are always and already interpreting. All experience, perception, and understanding are interpretive. Thus the text is not an object in the foundationalist sense. No uninterpreted source of meaning stands outside of an interpretive act. And since the text does not exist in an independent and uninterpreted state, its meaning cannot be derived through some mechamcal technique or method. As Hans-Georg Gadamer, one of the foremost interpretivist philosophers. writes: " [O]ur perception is never a simple reflection of what is given to the senses." Nonetheless, according to philosophical hermeneutics, this reflection of objectivity does not mean that understanding or interpretation is purely subjective or capacious. The reader (or interpreter) is never an independent and autonomous subject who freely or arbitrarily imposes meaning on a text (or text-analogue). To the contrary, the interpreter is always situated in a "tradition" from which inherent prejudices and interests that constrain and direct our understandings of texts. One's life within a community and its traditions necessarily limits one's range of vision— what one can possibly see or understand in a text. As Gadamer says, the traditions of one's community help to shape the interpreter's "horizon": "the range of vision that includes everything that can be seen from a particular vantage point." Furthermore, the notion of an interpretive community underscores that we are historical beings who live in tradition: [W]e are always situated within traditions . . . [which are] always part of us . . Thus, tradition is not a thing of the past; rather it is

in which discourse (including language) can act to construct our existence. One of the most significant intellectual moments for legal and constitutional theory has been the development of understanding of discourse by these philosophers that has served to explain the multitude of power relationships we each experience in our daily lives, the indeterminacy of law, the construction of meaning and the role of language, of discourse, to the construction of meaning and identity.[20]

The "linguistic turn" of these philosophers has brought the realisation that discourse (in particular but not limited to language) does not simply point to an external reality but rather it mediates and represents such external reality.[21] We only understand through prevailing discourse, which carries with it a complex web of determinants having the ability to stereotype existence through lines/labels of nationality, race, gender, class and more recently software products. More on this constructive capacity of discourse at a later point. For the moment we need to move towards a more exacting definition of discourse.

Discourse may be considered in the following manner:

> A discourse is a group of statements which provide a language for talking about - i.e a way of representing - a particular kind of knowledge about a topic When statements about a topic are made within a particular discourse, the discourse makes it possible to construct the topic in a certain way. It also limits other ways in which the topic can be constructued. A discourse does not consist of one statement, but of several statements working together to form what Foucault called discursive formation. Discourse is about the production of knowledge through language. But it is itself produced by a practice: discursive practice - the practice of producing meaning. So discourse enters into and influences all social practices.[22]
> **Discourse constitutes not merely describes its object.**[23] (emphasis added)

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something in which we constantly participate. As Gadamer noted: "Tradition is not simply a permanent precondition; rather, we produce it ourselves inasmuch as we understand, participate in the evolution of tradition, and hence further determine it ourselves." A crucial element of philosophical hermeneutics is the recognition that although communal traditions and the concomitant prejudices constrain our possibilities for understanding, they simultaneously enable us to communicate and to understand. Our traditions, prejudices, and interests actually open us to meaning, understanding, and truth."

[17] M. Foucault: "language consists of vast tectonic discursive formations embodying sinister power plays that dictate texts and predetermine authorship" M Foucault, *Archaeology of Knowledge*, 25; Michael Foucault, *Power/Knowledge: Selected Interviews and Other Writings, 1972-1977* (Colin Gordon ed. & Colin Gordon et al. trans., 1980).

[18] Jacques Derrida, *Of Grammatology*, trans. G Spivak, Baltimore, John Hopkins University Press (1977); Jacques Derrida, *Writing and Difference*, trans. A Bass, Chicago, Chicago University Press (1978).

[19] Jean Baudrillard, *Simulacra and Simulation* (1981) (trans. by Sheila F. Glaser, Ann Arbor, Michigan University Press 1994); J Baudrillard, *The Consumer Society: Myths and Structures,* Sage, London (1998).

[20] See generally Mark Poster, *The Mode of Information: Poststructuralism and Social Context* (1990) Polity Press, UK; Kenneth J. Gergen, *The Saturated Self: Dilemmas of Identity in Contemporary Life,* Basic Books NY (1991); Jean-Francois Lyotard, *The Postmodern Condition: A Report on Knowledge,* Minneapolis: Minnesota University Press (1979); Jack Balkin "Deconstructive Legal Practice", *Yale Law Journal* 743 (1987); Stephen Feldman, "Diagnosing Power: Postmodernism in Legal Scholarship and Judicial Practice", *Northwestern University Law Review* 1046; K Gergen, *An Invitation to Social Construction*, Sage; London, (1999); D Litowitz *Postmodernism Philosophy and Law* University Press of Kansas, Lawrence, Kansas (1997)

[21] A. Hunt and G. Wickham, *Foucault and Law: Towards a Sociology of Law as Governance* Pluto Press London (1994) 7-8.

[22] S Hall and B Gieben, *Formations of Modernity* Polity Press Cambridge UK 1992 pp 291 ff

[23] M Foucault *Archaeology of Knowledge* 49

Martin Heidegger, a German philospher whose academic reputation was later put into question through his involvement with the Nazi regime, explained in *Being and Time* (1927) that we construct knowledge through the three concepts of Situatedness, Understanding and Discourse. He explained:

> We - humankind - are a conversation. Because language is the medium in which reality is constituted, language is at once the house of being and home of human beings. Discourse is the literal translation of the Greek word *logos* which means **to make manifest or to let something be seen**.[24] Discourse is the articulation of intelligibility.[25] It therefore underlies both interpretation and assertion [26] Discourse refers to the way we express ourselves as a being towards entities…[27] (emphasis added)

As Heidegger's words capture the essence of what is meant by discourse in a concise and understandable manner I adopt his words as my working definition - discourse means to make something manifest or let it be seen.[28] My next step then is to break with the traditional definition of software as a program of directions to a computer system and to posit software as a form of discourse; something that allows things to be seen or appreciated.

(ii) Software is Discourse: The Architecture of Knowledge

The raison d'etre of operating and application systems software[29] is to construct meaning or let something be seen. In this sense software is a discourse that acts to construct meaning amidst the new digital architecture of knowledge.

Much the same way as the linguistic philosophers explained that I experience meaning through the discourse or language employed, I now experience meaning through software. It is an interpretive filter that mediates my digital communication with things external to myself. For example imagine if I were to pick up off the shelf and use (say the Australian, Italian, Chinese or Irish) language as if speaking through a loud haler. Meaning flowing in and out of me and others would be constructed in accordance with the channel or haler (discourse) I am using. Or closer to home, imagine me as a lay person in a court trying to speak to a judge, where often legalese the official language of lawyers will defeat my attempts to construct legal meaning. This power of discourse or language is now regarded as being obvious. However we should be mindful to translate this effect of discourse

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[24] *Being and Time*, 55-56

[25] C Guignon, "Heidegger: Language as the House of Being" in Sills and Jensen eds. Supra, p 183: "Language is the medium through which our most basic sense of life comes to articulation and expression. Language constitutes our sense of reality and indeed our own identity as speakers employing sign systems."

[26] *Being and Time*, 203.

[27] *Being and Time,* 266. Consider J Prinz, *Art Discourse/Discourse in Art* Rutgers University Press New Brunswick NJ (1991).

[28] Discourse in a broader sense is a context for constructing meaning. As Scott Beattie pointed out to me in reference to the work of Judith Butler on feminism and discourse: J.Butler*, Bodies that matter : on the discursive limits of "sex"* New York : Routledge, 1993; discourse like law (and like context for that matter) is both a noun and a verb. Throughout this article discourse should be conceived of as an inclusive concept which represents any part of the communicative architecture.

[29] On this distinction see : L. Long and N Long Computers 6th ed Prentice Hall New Jersey (1999) Chapter 3. The broader issue of the construction of internet protocols also raises interesting questions: T Berners-Lee *Weaving the Web* Harper San Francisco (1999). On the notion of protocols see Long at C165: "Communication protocols are rules established to govern the way data are transmitted in a computer network".

to the digital environment. For example my use of a particular Internet browser, search engine or other software product acts as a channel to my construction of meaning. Many of us assume that when we look into the monitor the communication we are engaging in is pure. Most of us are unaware of the elaborate coding structure (labyrinth) that mediates our digital world of communications.

Software which acts as the customising agent of information technology, has become so integral to our daily lives that I am moved to conceptualise it as a form of discourse which in turn informs my understanding of how the law might regulate software.[30] Software provides us with a framework for understanding and knowing; it is a representational framework. At the most basic level software in object or source code is seen to be a literary (discursive?) text for the purpose of copyright law. Software though is much more than a literary text - in a broader and more abstract way software is seen to be a mode of understanding or a methodology for constructing meaning: it is part of the architecture of knowledge. The following case questions the level of appreciation of this dynamic communicative and constructive power of software.

(a) *Bernstein v USDOJ*[31]

Bernstein a professor in Computer Science at the University of Illinois at Chicago developed encryption[32] software that he dubbed "Snuffle". Seeking to present his work on Snuffle within the academic and scientific communities, Bernstein asked the State Department whether he needed a license to publish Snuffle in any of its various forms. The State Department responded that Snuffle was a munition under the International Traffic in Arms Regulations ("ITAR"), and that Bernstein would need a license to "export" the Paper, the Source Code, or the Instructions.[33] As a consequence of this response Bernstein challenged the constitutional validity of the regulations claiming they were facially invalid as a prior restraint on speech.[34] The Ninth Circuit Appeals Court held that the EAR regulations (1) operate as a prepublication licensing scheme that burdens scientific expression, (2) vest boundless discretion in government officials, and (3) lack adequate procedural safeguards. Consequently, we hold that the challenged regulations constitute a prior restraint on speech that offends the First Amendment.

Much of the controversy involved in this case concerned the question as to whether software was speech protected by the First Amendment. The Court specifically addressed the issue of whether the Export Administration Regulations (EAR) restrictions on the export of encryption software in

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[30] B Fitzgerald "Software as discourse? A Constitutionalism for Information Society" (1999) 24 *Alternative Law Journal* 144; B Fitzgerald "Software as Discourse: The Challenge for Information Law?" [2000] *EIPR* forthcoming.

[31] 176 F. 3d 1132 (9th Circ. 1999); http://laws.findlaw.com/9th/9716686.html On 30 September 1999 the Ninth Circuit voted to hear this matter en banc and vacated the judgment in discussion: 192 F.3d 1308 at 1309: "Upon the vote of a majority of nonrecused regular active judges of this court, it is ordered that this case be reheard by the en banc court pursuant to Circuit Rule 35-3. The three-judge panel opinion, *Bernstein v. U.S. Dept. of Justice*, 176 F.3d 1132 (9th Cir. 1999), is withdrawn." See also *Junger v Daley* 2000 Fed App. 0117P, WL 343566 (6th Circ April 4 2000)

[32] Encryption involves running a readable message known as "plaintext" through a computer   program that translates the message according to an equation or algorithm into unreadable "ciphertext." Decryption is the translation back to plaintext when the message is received by someone with an appropriate "key."

[33] This is based on the view that the power of encrypting software to secure information raises issues of national security.

[34] The district court found that the source code was speech protected by the First Amendment, *Bernstein v. Department of State* , 922 F. Supp. 1426 (N.D. Cal. 1996) and subsequently granted summary judgment to Bernstein on his First Amendment claims, *Bernstein v.Department of State*, 945 F. Supp. 1279 (N.D. Cal. 1996).

source code constituted a prior restraint in violation of the First Amendment. Judge Fletcher with whom Judge Bright concurred started his judgment by looking at the definition of source code:

> "Source code," at least as currently understood by computer programmers, refers to the text of a program written in a "high-level" programming language, such as "PASCAL" or "C." The distinguishing feature of source code is that it is meant to be read and understood by humans and that it can be used to express an idea or a method. A computer, in fact, can make no direct use of source code until it has been translated ("compiled") into a "low-level" or "machine" language, resulting in computer-executable "object code." That source code is meant for human eyes and understanding, however, does not mean that an untutored layperson can understand it. Because source code is destined for the maw of an automated, ruthlessly literal translator -- the compiler -- a programmer must follow stringent grammatical, syntactical, formatting, and punctuation conventions. As a result, only those trained in programming can easily understand source code.

> Also important for our purposes is an understanding of how source code is used in the field of cryptography. …By utilizing source code, a cryptographer can express algorithmic ideas with precision and methodological rigor that is otherwise difficult to achieve. This has the added benefit of facilitating peer review by compiling the source code, a cryptographer can create a working model subject to rigorous security tests. The need for precisely articulated hypotheses and formal empirical testing, of course, is not unique to the science of cryptography; it appears, however, that in this field, source code is the preferred means to these ends.[35]

In light of this evidence the Court held that encryption software, in its source code form and as employed by those in the field of cryptography, must be viewed as expressive for First Amendment purposes. The government had argued that as source code was primarily functional it was not protected by the First Amendment. The Court rejected this claim saying source code could be read and understood by humans, and that furthermore an ounce of functionality does not negative the First Amendment.[36] The government also contended that the challenged regulations were immune from prior restraint analysis because they were "laws of general application" (eg a law requiring a building permit) rather than being "directed narrowly and specifically at expression." The Court rejected this saying that in the cryptography field source code is utilised as a means of expression, and because the regulations apply to encryption source code, they necessarily burden a particular form of expression directly through unbridled discretion vested in government officials.[37]
The Court emphasised the narrow scope of its holding saying that it was not suggesting that all software is expressive.[38] This is a very interesting yet somewhat vague assertion.

Justice Nelson dissented saying the majority judgment failed to recognize that the basic function of encryption source code is to act as a method of controlling computers. He explained that:

> … software engineers generally do not create software in object code--the series of binary digits (1's and 0's)—which tells a computer what to do because it would be enormously difficult, cumbersome and time-consuming. Instead, software engineers use high-level computer programming languages such as "C" or "Basic" to create source code as a shorthand method for telling the computer to perform a desired function. In this respect, lines of source code are the building blocks or the tools used to create an encryption machine. Encryption source code, once compiled, works to make computer communication

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[35] 176 F. 3d 1132 at 1140-1141
[36] Ibid at 1141-2.
[37] Ibid 1142-3.
[38] Ibid at 1145.

and transactions secret; it creates a lockbox of sorts around a message that can only be unlocked by someone with a key. It is the function or task that encryption source code performs which creates its value in most cases. This functional aspect of encryption source code contains no expression; it is merely the tool used to build the encryption machine.

This is not to say that this very same source code is not used expressively in some cases. Academics, such as Bernstein, seek to convey and discuss their ideas concerning computer encryption. As noted by the majority, Bernstein must actually use his source code textually in order to discuss or teach cryptology. In such circumstances, source code serves to express Bernstein's scientific methods and ideas.

While it is conceptually difficult to categorize encryption source code under our First Amendment framework, I am still inevitably led to conclude that encryption source code is more like conduct than speech. Encryption source code is a building tool. Academics and computer programmers can convey this source code to each other in order to reveal the encryption machine they have built. But, the ultimate purpose of encryption code is, as its name suggests, to perform the function of encrypting messages. Thus, while encryption source code may occasionally be used in an expressive manner, it is inherently a functional device.[39]

The activity or conduct at issue here is the export of encryption source code. As I noted above, the basic nature of encryption source code lies in its functional capacity as a method to build an encryption device. Export of encryption source code is not conduct commonly associated with expression. Rather, it is conduct that is normally associated with providing other persons with the means to make their computer messages secret. The overwhelming majority of people do not want to talk about the source code and are not interested in any recondite message that may be contained in encryption source code. Only a few people can actually understand what a line of source code would direct a computer to do. Most people simply want to use the encryption source code to protect their computer communications. Export of encryption source code simply does not fall within the bounds of conduct commonly associated with expression such as picketing or handbilling.[40]

This conceptualisation of software as conduct, at points, betrays understanding of the expressive or discursive nature of software and also too narrowly focuses on the act of export.

The *Bernstein* opinions in general fail to appreciate the representational and discursive competence of software. Software is a medium for communication; for representing meaning. No matter how embedded or hidden the function of software it is simply one to construct meaning - to make something obvious - that is discourse.

To contrast the expressive nature of source code with the functional industrial processes of technology is not convincing. The dichotomy collapses when we conceptualise software as the medium for communication, for expression - function then is seen to be an integral part of building the communicative framework. How would the Bernstein court react to a suggestion that the mechanism of voice, of speaking, or the mechanism of thinking (the brain), is not protected by the First Amendment because it is functional in that it just tells the body what to do? Software is digital speak. The Bernstein Court fail to appreciate the (functional) medium can also make up the message.[41] Cryptography is a great example of this - it allows us to construct a private and secure

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[39] Ibid at 1147-8.
[40] Ibid at 1149.
[41] Marshall McLuhan, *Understanding Media: Extensions of Man* (1964) MIT Press MA 1994 at 7-21; G. Genosko, *McLuhan and Baudrillard: The Masters of Implosion* Routledge, London (1999).

identity and discourse otherwise not available. In this case the Court is in essence dictating how we might speak - the discourse or dialect we might speak through. How would one react if the government said we could not whisper or send secret notes? Or said we must talk to others in English only?

There is a question of remoteness.[42] As the court points out, building regulation does not infringe the First Amendment even though in an abstract way building is part of the medium and will construct meaning in some sense. The "feel" of a building and its location may act to construct expression in a remote sense.

The proximity of code to communication though convinces us that software is discourse. Its primary purpose is to construct meaning and that is what the First Amendment is all about. By controlling code one has the power to control thought processes. In this digital environment the ability to distort the construction of meaning in any pure sense is immense and it is in the mechanism of distortion that bias and prevailing prejudices can be invoked.[43] The protectors of speech must be vigilant.

Should all software be protected by the First Amendment? *Primae facie*, the answer must be "yes" but the process of scrutiny could well find justifiable regulation.[44] For instance, the protection of national security or the prevention of crime may justify well-reasoned regulation.

The Bernstein facts also raise the further issue of "transnational constitutionalism".[45] The facts of the case concern exporting cryptography; the sending of a commodity out into the sea of

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[42] Lakewood v. Plain Dealer Publishing Co., 486 U.S. 750, 759 (1988)

[43] J Habermas *The Structural Transformation of the Public Sphere* MIT Press Cambridge MA (1996); J Habermas, *Philosophical Discourses of Modernity* MIT Press Cambridge MA (1987); J Habermas *Toward a Rational Society* (1971); J Habermas, *Communication and the Evolution of Society* (1984) Polity Press, UK; J. Habermas, *Moral Consciousness and Communicative Action* (1990) Polity Press, UK; J Habermas, *A Theory of Communicative Action Volumes 1 and 2* Boston, Beacon Press, 1984 and 1987; M, Deflem (ed) *Habermas, Modernity and Law* Sage Publications London, 1; Mark Poster, *The Second Media Age* (1995).

[44] At a number of the presentations (particularly at Cardozo (NY), Baker McKenzie (Chicago) and Institute for Information Law (Amsterdam)) of this paper some members of the audience were disturbed at the thought that software designed to be purely functional (e.g. software that assists in the operation of a steel mill) should be regarded as discursive. My claim is that functionality cannot automatically negative the discursive aspect of software - even in the steel mill software is used to construct meaning. A Court in assessing the constitutionality of regulating this kind of speech would consider whether the regulation is content based or content neutral and accordingly weigh the discursive value of the software through the balancing or scrutiny process. To resile from the notion that all software is discursive would be tantamount to saying that not all speech is discursive: see further L Tribe, American Constitutional Law 2nd ed Foundation Press NY 825-832 (1988). A number of people also pointed to the fact that copyright law regards software as a literary text and that this adds to the argument that all software is discursive.

[45] "Trans"national symbolises a notion of movement and cross border activity. Transnational society inhabits a global space and to this extent extends beyond territory, sovereignty and the state. "Inter"national symbolises a static notion rooted in territory and sovereignty. If I draw a picture of the international I might draw the blocks of stone (the buildings) in Harvard Yard, stationary in their territory controlling whoever walks in the door. While if I draw a picture of the transnational I might draw Harvard Yard as a space filled with a swirling mass of things, humans, corporations, blocks of stone (buildings) or states. The transnational is a space "beyond or without borders"; it does not seem to be merely a society of states, rather it is a society that inhabits spaces beyond borders, beyond territory and sovereignty; it is a space that is ever moving and not static, and one that fills every corner of the earth: see further BF Fitzgerald "Trade Based Constitutionalisms: A Framework for Universalising Substantive International law" 5 (1996-7) *University of Miami Yearbook of International Law* 131; G Teubner (ed.), *Global Law Without a State* (1997) Dartmouth UK; *Regina v. Bartle and the Commissioner of Police for the Metropolis and others ex parte Pinochet* (25.11.98)and *In re Pinochet* (15.1.99) <http://www.parliament.the-stationery-office.co.uk/pa/ld/ldjudinf.htm> ; AM Slaughter, "International Law in a World of Liberal States" (1995) 6 *EJIL* 1; D. Held et al *Global Transformations* Stanford UP, Stanford (1999); M Ryan, *Knowledge Diplomacy* Brookings Institute Press, Washington DC (1998); J Everard, *Virtual States: The Internet and the Boundaries of the Nation State* Routledge, London, (2000).

transnational space beyond state borders. This is a whole other topic concerning the process of law in the midst of transnational civil society and the consequent question of the protection of speech in this space. And this is no doubt why the act of export was an important criterion in the dissenting judgment.

In summary, while the majority judgment in *Bernstein* gives much support to the view that software is discourse its inability to clearly articulate this point (conceptualisation) and its hesitancy in fully embracing "all software" limit the persuasiveness of its argument. The holding that software in its coded forms can be expressive for First Amendment purposes is only one small step towards recognising we are not just talking about a (digital) text but a (digital) discourse or lanaguage. Flowing through this coded format is a constant stream of communicative activity that acts to construct meaning. It is this broader facilitative (or discursive) notion that must inform First Amendment analysis and other areas of law.

The dissenting judge while understandably concerned with the functional aspects of software falls into questionable reasoning through a lack of appreciation of the architectural capacity of software.

(iii) Constructing Identity: Rethinking the Traditional View of Software

As software possesses such deep discursive capabilities it has a tremendous capacity to construct our digital identities.[46] It is in essence the womb from which digital discourse is born.[47]

Understanding this capacity alerts us to the power of software developers to construct communication pathways and consequently identity. As the quintessential element of discourse, of language, of speech, in information society is software the intentions of the person or entity that creates software and their accountability are crucial issues. Unless you have not noticed software is now a key part of our social structure - we sense it in our cars, in our supermarkets, in our televisions, in our computers - we sense it everywhere; it is a ubiquitous, undulating, architectural, air like, water like commodity that infiltrates our daily lives. More interesting is that software through its various forms of (coded) structure[48] can act to construct meaning and identity much the same way, as we understand speech can do. Software in the information society is discourse. It is not simply a literary text (a copyright law categorisation) it is fundamental to communicative architecture[49]. The fierce debate over open code versus proprietary code software is intimately connected with this construction of identity through software.[50]

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[46] Much the same way as Gadamer saw tradition impacting upon the construction of meaning: Gadamer, supra n 16, Feldman supra n 16.

[47] It is the framework of construction; a digital interpretative community: S. Fish *Is There a Text in the Class* Harvard University Press Cambridge Mass.(1980); S Fish, *Doing What Comes Naturally* OUP Oxford (1989).

[48] L Lessig *Code and Other Laws of Cyberspace* Basic Books NY (1999); L Lessig, " The Limits in Open Code: Regulatory Standards and the Future of the Net" 14 Berkeley Tech LJ 758 (1999); L Lessig, "Intellectual Property and Code" 11 *St John's Journal of Legal Commentary* 635 (1996); L Lessig, "Constitution and Code" 27 *Cumberland Law Review* 1 (1997); L Lessig, "Law of the Horse: What Cyberlaw Might Teach"; "Open Code and Open Societies: Values of Internet Governance" <http://cyber.law.harvard.edu/lessig.html>; "Tyranny in the Infrastructure" (1997) *Wired Magazine* http://www.wired.com/wired/5.07/cyber_rights.html On the notion of "open code" see D. Bollier, "The Power of Openness: Why Citizens, Education, Government and Business Should Care About the Coming Revolution in Open Source Code Software" <http://cyber.harvard.edu> The call for open code or free software as opposed to proprietary software is intimately connected with the construction of identity in the digital environment.

[49] On this notion see J Habermas *A Theory of Communicative Action* (1984); J Habermas *Communication and the Evolution of Society* (1984) Polity Press, UK; J Habermas, *Moral Consciousness and Communicative Action* (1990) Polity Press, UK. On digital architecture generally see: J Fitzgerald, *Business Data Communications* (1993 4th ed.) John Wiley and Sons NY Chapters 8 and 9; A Wilden *Structure and System: Essays in Communication and Exchange* Tavistock Publications London (1972); D Reed J Saltzer D Clark, Comment on Active Networking and End to End Arguments IEEE Network 12 (3) (May/June 1998) 69-71; C Morris and C Ferguson, How Architecture Wins

Software then is not just a passive text that tells a computer what to do. It is an integral part of our lives that informs a process of knowledge and identity construction. Like law it is not just a thing but also a practice. It is in this aspect that we are challenged to fully comprehend the construction of meaning in the digital environment.

The Multiplicity of Meaning: The Antitrust of Knowledge

Foucault under the influence of Nietzschean philosophy invoked the concept of genealogy to expose humanity as a series of interpretations.[51] The notion that there is diversity of knowledge and viewpoints nowadays seems common place. Whether we like it or not the monopoly of knowledge by any one entity (at least in theory) is not acceptable. The Internet is said by some to be an agent for such diversity by ushering in an era of semiotic democracy where possibilities of self-determination are increased. Interestingly, this development of virtual social and political communities is implemented through a discourse of software.[52]

To augment diversity it is vital that law and information policy ensures the discourse of software is open to investigation, renewal, and reconstruction.[53]

Software as an agent of simulation

To highlight the notion of construction of identity through software let me refer to the writings of Jean Baudrillard who in *Simulacra and Simulation*[54] introduced us to the notion of simulation.[55]

Technology Wars (1993) Harvard Business Review 86; M Lemely and L Lessig "Exparte Petition to FCC re Proposed Merger of AT and T and Media One" (1999) http://cyber.harvard.edu; J Saltzer End to End Arguments in System Design http://www.mit.edu/saltzer/www/publications; F Bar (et al) Defending the Internet Revolution in the Broadband Era: When Doing Nothing is Doing Harm E-conomy Working paper 12 Berkeley Round table on the International Economy (BRIE) August 1999.

[50] The arguments are that in an environment of free (meaning freedom to change source code not free in price) or open as opposed to proprietary software we are guaranteed a freedom to construct our own identity. An argument similar to the sociological and communication theories of the seventies that we need to value and open public space where discourse can be pure and not systematically distorted: see Habermas *supra*. Who could forget Marshall McLuhan's cry that the medium is the message! (*Understanding Media: Extensions of Man* (1964) MIT Press MA 1994 at 7-21) The new medium of software aptly described as the new silk road, has inherent characteristics that act to mould our lives our identities. The open code movement urges us to support free software as it allows the user to modify and build on the distributed software, thereby facilitating diversity. To prevent developers using the open code software to build a modified product which they could copyright Richard Stallman from MIT popularised the notion of copyleft. The open code software is copyright but licensed on terms that it or any product derived from it may be distributed only in accordance with the terms of original distribution. In this way it is argued copyright is used to guarantee user freedom rather than to reduce user freedom as happens with copyright protection of proprietary code. [Consider how this licence might intersect with patent claims: http://lpf.ai.mit.edu/Patents/ipns/ipns-19991122.txt; Bryan Pfaffenberger, "The Coming Software Patent Crisis: Can Linux Survive?" http://www2.linuxjournal.com/articles/currents/003.html] The push for open code then is argued to be a push for a greater self-determination of identity in the digital environment. The law will need to play a similar role in the context of proprietary software.

[51] Foucault "Theatrum Philosophicum" *Critique* 282 (1970) p 899; Foucault " Nietzche genealogie et l' histoire" *Hommage a Jean Hyppolite* (1971) p146.
[52] On the notion of virtual communities see: http://www.communities.com and for virtual community software see: http://www.webraven.com.au
[53] *Associated Press v US* 326 US 1, 20; *Turner Broadcasting Systems Inc v FCC* 512 US 622, 662-4 (1994); 137 L Ed 2d 369, 389-92 (plurality opinion Kennedy J, Rehnquist CJ, Stevens and Souter JJ), 410-1 (concurrence of Breyer J) (1997); 520 US 180. "The basic tenet of national communication policy is that the widest possible dissemination of information from diverse and antagonistic sources is essential to the welfare of the public": *Turner Broadcasting* at 663.
[54] (1981) (trans. by Sheila F. Glaser, Ann Arbor, Michigan University Press 1994)

Baudrillard wrote much more in the context of television and aimed to highlight the layers of representation that serve to hide the origin of events through simulation. In the early 1990s he ignited some controversy suggesting the Gulf War was not a real war but merely a product of simulation designed for network television.[56] A simple example of simulation is gleaned from the notion of televised field sports - played under lights, on artificial surfaces, in covered stadiums, filled with statistics and player profiles, instant replay and so on - where the original notion of the sport is now buried beneath layers of representation and commodification. Software in its constructive or discursive capacity has an immense power to augment simulation (from simple digitised versions of the hard copy items such as diaries, books, letters, clocks etc through to fully functioning virtual reality) and thereby impact upon digital identity.

Without wishing to move too far off point let me recount some of the basic points of Baudrillard's theory as it does allow us to see more clearly the potential of software to construct or represent (let it be seen) digital identity. And while Baudrillard writing (initially) in the 1970s (and in part as a critique of Marxist philosophy) may have seen simulation as pernicious and questionable,[57] the digital era, the Internet and virtual reality have found positive uses for simulation although the overriding question of accountability remains.[58]

Gergen explains that "for Baudrillard, media portrayals of the world are driven not by the way the world "is", but by the steadily emerging histories of portrayal itself. As these histories unfold, each new lamination is influenced by the preceding, accounts are layered upon accounts, and reality is transformed into hyperreality."[59].

Rheingold further explains that "in Baudrillard's historical analysis, human civilization has changed itself in three major stages, marked by the changes in meaning we invest in our symbol systems. .... According to Baudrillard, during the first step of civilization, when speech and then writing were created, signs were invented to point to reality. During the second step of civilization, which took place over the past century, advertising, propaganda, and commodification set in, and the sign

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[55] "Computers lead us to construct things in new ways. With Computers we can simulate nature in a program or leave nature aside and build second natures limited only by our powers of imagination and abstraction": S. Turkle *Life on the Screen: Identity in the Age of the Internet* Simon and Schuster, New York, 1995, p 47.

[56] J Baudrillard, *The gulf war did not take place* Sydney : Power Publications, 1995.

[57] The primary purpose of his work was to critique rationalist political theory like Marxism for going beyond the manifest to the latent and thereby ignoring the surface - the layers of simulation: Mark Poster (ed.), *Jean Baudrillard: Selected Writings*, Stanford, Stanford University Press, 1988, 4-7.

[58] BF Fitzgerald "Life in Cyberspace: A Simulating Experience" [1997] 3 *Computer and Telecommunications Law Review* 136 - 139; Sherry Turkle, *Life on the Screen: Identity in the Age of the Internet* Simon and Schuster, New York, 1995; S Turkle *The Second Self: Computers and the Human Spirit* Simon and Schuster NY 1984; Mark Taylor *Imagologies*, MIT Press (1994).

[59] Kenneth J. Gergen, *The Saturated Self: Dilemmas of Identity in Contemporary Life,* Basic Books (1991) 121-122. Baudrillard's theory can be better understood by positing two words, "origination" and "simulation", which are meant to act as labels, as metaphors and as themes. Origination - is the notion that things have origin or creation (centering). Simulation - is the notion that things have no origin, they exist in an imaginary way, they are make believe (decentering): BF Fitzgerald "Life in Cyberspace: A Simulating Experience" [1997] 3 *Computer and Telecommunications Law Review* 136 - 139.

begins to hide reality. The third step includes our step into the hyperreal, for now we are in an age when signs begin to hide the absence of reality."[60] .

Baudrillard in his own words introduces simulation in this way:

> To dissimulate is to pretend not to have what one has. To simulate is to feign to have what one doesn't have. One implies a presence the other an absence. But it is more complicated than that because simulating is not pretending... pretending leaves the principle of reality intact .. whereas simulation threatens the difference between the "true" and "false". the "real" the "imaginary"[61].

> By crossing into a space whose curvature is no longer that of the real, nor that of truth, the era of simulation is inaugurated by a liquidation of referentials - worse: with their artificial resurrection in the system of signs, a material more malleable than meaning, in that it lends itself to all systems of equivalences, to all binary oppositions, to all combinatory algebra. It is no longer a question of imitation, nor duplication, nor even parody. It is a question of substituting the signs of the real for the real .....[62]

> Representation stems from the principle of equivalence of the sign and of the real .... Simulation on the contrary stems form the utopia of the principle of equivalence, from the radical negation of the sign as value, from sign as reversion and death sentence of every reference. Whereas representation attempts to absorb simulation by interpreting it as a false representation, simulation envelops the whole edifice of representation itself as a simulacrum.[63]

> On the contrary it is as hyperreal events, no longer with a specific content or end, but indefinitely refracted by each other .. it is in this sense that they cannot be controlled by an order that can only exert itself on the real and the rational, on causes and ends, a referential order that can only reign over the referential .. but cannot do anything against this indefinite recurrence of simulation, against nebula whose weight no longer obeys the laws of gravitation of the real..[64]

Baudrillard's notion of simulation highlights how discourse can act to distort and reconfigure an appreciation of events.[65] Software is very much an agent of simulation in that it has tremendous capacity to reinvent reality through digitisation. In understanding software and the regulation of it

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[60] Howard Rheingold, *The Virtual Community: Homesteading on the Electronic Frontier,* Harper Perennial (1994) 298-299.

[61] Simulacra and Simulation supra at 3

[62] Ibid. at 2.

[63] Ibid at 6

[64] Ibid at 21. See further Mark Poster (ed.), *Jean Baudrillard: Selected Writings*, Stanford, Stanford University Press, 1988.

[65] G. Genosko, *McLuhan and Baudrillard: The Masters of Implosion* Routledge, London (1999).

through law we must be alert to its ability to distort and structure communication and the power of those that create software to structure our identities through this process.

Part III: Legal Regulation of the Digital Architecture (Software): Intellectual Property

The role and function of software will initially be mediated by a blend of intellectual property law, contract law, competition law and privacy law[66], which I would term informational law or informational constitutionalism. It is the development of the principles of these areas of law in their relation to software that will determine much about the way we live in the future.

(i) IP: Copyright and Reverse Engineering

Intellectual Property law in the form of copyright protects computer software as if it were a literary text allowing the copyright owner exclusive rights in relation to the reproduction of that text.[67] The rationale of copyright is that it will protect the expression of information but not the ideas supporting such expression. An example of the way in which copyright law will serve to shape our identity through the way it treats the expressive language of software is found in the context of reverse engineering and decompilation of software.

If a software engineer or developer constructs software that becomes industry standard that software acts as architecture for communication, it becomes in essence a discourse which allows me to speak to you. Copyright law then bears upon its shoulders the need to mediate the power given to the copyright holder to monopolise rights in discourse that may have become an industry standard, in other words become common form, with the needs of the user or speaker. Herein lie the battles over reverse engineering and the decompilation of software. In order to develop complementary and improved software products (speech) software developers have reverse engineered the industry standard software in attempts to make software that can be interoperable (conversant) with the industry standard. In many cases in order to reverse engineer software you need to copy (and in some cases "borrow" parts of) the software which is technically an infringement of the copyright owner's exclusive rights over reproduction. In the US the Courts[68] have employed fair use doctrine[69] to mediate this issue while in Australia the government has enacted a (part) legislative solution through amendment to the Copyright Act.[70] Fair use defines the appropriate balance between a monopoly right given as an incentive for innovation and the public

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[66] Law can play an important role in ensuring diversity: *Turner Broadcasting Systems Inc v FCC* 512 US 622, 662-4 (1994); 137 L Ed 2d 369, 389-92, 410-1 (1997).

[67] S 31*Copyright Act 1968* (Cth)

[68] *Sega Enterprises Ltd v Accolade, Inc.* 977 F. 2d 1510 (9th Cir. 1992); *Computer Associates International Inc v Altai Inc* 23 U.S.P.Q.2d 1241 (2d Cir. 1992); *Sony Computer Entertainment Inc v Connectix Corp* 203 F. 3d 596 (9th Circ 2000). See also s 1201(f) *Digital Millennium Copyright Act 1998* (USA) 17 USC http://thomas.loc.gov; Art 5(3) , Art 6 *European Software Directive* 91/250 (1991) O.J. L 122/42

[69] Section 107 *Copyright Act 1976* (17 USC); B Fitzgerald, "Underlying Rationales of Fair Use: Simplifying the Copyright Act" (1998) 2 *Southern Cross University Law Review* 153. On reverse engineering and decompilation generally see: A Fitzgerald and C Cifuentes, "Interoperability and Computer Software Protection in Australia" [1998] 4 *Computer and Telecommunications Law Review* 271; C Cifuentes and A Fitzgerald, "Reverse Engineering of Computer Programs: Comments on the Copyright Law Review Committee's Final Report on Computer Software Protection" (1995) 6 *Journal of Law and Information Science* 241; Anne Fitzgerald and Cristina Cifuentes "Pegging Out the Boundaries of Computer Software Copyright: The Computer Programs Act and the Digital Agenda Bill" in A Fitzgerald, B Fitzgerald, P Cook and C Cifuentes (eds) *Going Digital 2000: Legal Issues for E Commerce Software and the Internet* Prospect Publishing Sydney Australia (2000).

[70] Attorney General D Williams and Senator R Alston "Copyright Changes to help Australian Software Industry" 23.2.99 http://www.dcita.gov.au; see sections 47 D-F *Copyright Act* introduced by *Copyright Amendment (Computer Programs) Act 1999*; cf s 1201(f) *Digital Millennium Copyright Act 1998* (USA) 17 USC http://thomas.loc.gov; *Universal City Studios, Inc. v Reimerdes* 82 F. Supp. 2d 211

interest in the free flow of information for a variety of cultural reasons[71]. In Australia the CLRC[72] has recommended we adopt a more broad based fair use right similar to the US model in place of our narrower and more specific fair dealing exceptions.[73]

The following case which was decided by the High Court of Australia (our equivalent to the United States Supreme Court) on the 30 September 1999, suggests that the legality of reverse engineering for interoperability purposes will be quite narrow. This raises concerns for the vitality and diversity of digital discourse.

(a) Data Access Corporation v Powerflex Services Pty Ltd [1999] HCA 49

Data Access Corporation, a company incorporated under the law of the State of Florida in the United States, claimed to own copyright in an application development system Dataflex, which had been in use in Australia since 1982. DataFlex was designed to develop computer programs which establish and manage and manipulate databases by providing facilities for the storage, organisation and retrieval of information and for computation and comparison with respect to the information. DataFlex also included developed computer programs which the purchaser could use instead of developing their own programs. DataFlex incorporated a "run time" program which enabled computer programs and databases developed by means of the system to operate or "run". Data Access charged a licence fee for the run time program.

The third respondent Dr. David Bennett aspired to create an application development system which would be highly compatible with DataFlex so that persons who had been using the DataFlex application development system would be persuaded to acquire the system. By December 1987, when he purchased the latest version of DataFlex, Dr. Bennett had gained a profound understanding of that system and was steadily preparing his own system. By early 1989 he had so refined the system that he procured members of the Victorian DataFlex Users' Group, a voluntary association of persons who used or were otherwise interested in the DataFlex system, to test and report on his system. In September 1989 he and his wife, the fourth respondent Margaret Ann Bennett, caused the second respondent (Powerflex Corporation Pty Ltd) to be incorporated and that company began selling Dr. Bennett's system under the name "Powerflex", which in 1990 was changed to "PFXplus". PFXplus was marketed as being fully compatible with existing Dataflex files eliminating the need for payment of Dataflex run time fees.

Out of the 225 words of DataFlex language (excluding 29 words relating to graphics) 192 are in the PFXplus language. The use of each of those 192 words causes a device having digital information processing capabilities to perform the same function as they cause in DataFlex. Importantly though there is no objective similarity between the expression in the source code of PFXplus and the expression in the source code of DataFlex, except that in each case the word is found in that expression.

[71] B Fitzgerald, "Underlying Rationales of Fair Use: Simplifying the Copyright Act" (1998) 2 *Southern Cross University Law Review* 153; William Fisher III, "Reconstructing the Fair Use Doctrine" 101 *Harvard Law Review* 1659 at 1700-1704 (1988); Paul Goldstein, *Copyright's Highway* (Hill and Wang, 1994) Chapter 5; W Gordon, "Fair Use as Market Failure: A Structural and Economic Analysis of the Betamax Case and Its Predecessors" 82 *Columbia Law Review* 1600 (1982); W Patry, *The Fair Use Privilege in Copyright Law* Bureau of National Affairs, Washington DC (1985); J Lawrence and B Timberg, *Fair Use and Free Inquiry* Ablex Publishing New Jersey (1989); *Campbell v Acuff-Rose Music Inc* 510 US 569 (1994).

[72] Copyright Law Review Committee, *Report on the Simplification of the Copyright Act 1968 Part 1 Exceptions to the Exclusive Rights of Copyright Owners* (1998) <http://www.agps.gov.au/clrc/>

[73] See for example sections 40, 41, 42 *Copyright Act 1968* (Cth).

The key issue for determination was whether the use of the same word in the two computer programs to perform the same function was in contravention of the copyright owner's exclusive rights bestowed pursuant to the Australian *Copyright Act 1968* (Cth). Further copyright issues were raised in relation to macros and a compression table. The High Court of Australia held that copying command words associated with the Dataflex program (such as "AUTOPAGE", PAGEBREAK" and "FILELIST") was not a breach of copyright. It also held that the copying 3 Dataflex macros (ie, "REPORT", ENTERGROUP" and "ENTER") in the same program did not infringe Australian copyright law. However on the issue of the compression table it found the product of Dr Bennett's act of black box reverse engineering to be a breach of copyright.

Huffman Compression Table

In relation to the compression table the High Court explained:

> Data Acess alleged that part of the PFXplus program called "Runtime Program" reproduced part of the DataFlex runtime program containing the DataFlex Huffman Compression Table which is a system by which characters in a file expressed in a code of eight bits for each character are represented by much shorter strings of numbers. The shortest string is assigned to the most frequently occurring character and the length of each string is inversely proportional to the probability of occurrence of the character. Thus the saving of space required for the storage of data on memory devices such as hard disk drives and tapes is very great. It was common ground that the two tables, DataFlex and PFXplus, of the compressed code and corresponding character in eight bit code are identical and that Dr.Bennett intentionally caused them to be identical.

> The respondent in the case, Dr Bennett, needed to "replicate precisely the...compression table" (used to compress data and therefore save disk space) in a competitor's database application (called Dataflex) because he wanted his database (called Powerflex) to interoperate with the Dataflex program. In order to achieve interoperablity, Dr Bennett did not sit down and literally copy the internal code used in the Dataflex program. He used a technique called black box reverse engineering. Black box reverse engineering means that Dr Bennett did not make a direct copy of the compression table. He indirectly copied it by observing the behaviour of the Dataflex program and deducing the exact contents of the Dataflex compression table.[74]

The High Court ruled that black box reverse engineering and a consequent (different source coded) literal representation of a compression table in another database application was a breach of copyright. The fact that the defendant used black box reverse engineering to determine the contents of the compression table was irrelevant for the purposes of copyright law. The Court said: "the fact that Dr Bennett used an ingenious method of determining the bit string assigned to each character does not make the output of such a process any less a "reproduction" than if Dr Bennett had sat down with a print-out of the table and copy-typed it into the PFXplus program."

This raises a major issue for reverse engineering in Australia as the recent amendments to the *Copyright Act*[75] expressly allowing reverse engineering for interoperability (security testing and

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[74] Para ?? http://www.autlii.edu.au

[75] 47B Reproduction for normal use or study of computer programs

(3) Subject to subsection (4), the copyright in a literary work that is a computer program is not infringed by the making of a reproduction of the work if:
   (a) the reproduction is made in the course of running a copy of the program for the purpose of

error correction) purposes require the activity to be undertaken on behalf of the owner or licensee[76] of the copy of the program from which the reproduction or adaptation is made.[77] This can be contrasted with the *Digital Millennium Copyright Act* and fair use doctrine in the USA which allows for reverse engineering without the consent of the owner or licensee of the copy of the program.[78]

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                studying the ideas behind the program and the way in which it functions; and

        (b) the running of the copy is done by, or on behalf of, the owner or licensee of the copy.

    (4) Subsection (3) does not apply to the making of a reproduction of a computer program from an infringing copy of the computer program.

  47D Reproducing computer programs to make interoperable products

    (1) Subject to this Division, the copyright in a literary work that is a computer program is not infringed by the making of a reproduction or adaptation of the work if:

        (a) the reproduction or adaptation is made by, or on behalf of, the owner or licensee of the copy of the program (the ***original program***) used for making the reproduction or adaptation; and

        (b) the reproduction or adaptation is made for the purpose of obtaining information necessary to enable the owner or licensee to make independently another program (the ***new program***), or an article, to connect to and be used together with, or otherwise to interoperate with, the original program or any other program; and

        (c) the reproduction or adaptation is made only to the extent reasonably necessary to obtain the information referred to in paragraph (b); and

        (d) to the extent that the new program reproduces or adapts the original program, it does so only to the extent necessary to enable the new program to connect to and be used together with, or otherwise to interoperate with, the original program or the other program; and

        (e) the information referred to in paragraph (b) is not readily available to the owner or licensee from another source when the reproduction or adaptation is made.

    (2) Subsection (1) does not apply to the making of a reproduction or adaptation of a computer program from an infringing copy of the computer program.

[76] On the nuances of these terms see: B Fitzgerald "Commodifying and Transacting Informational Products Through Contractual Licences: The Challenge for Informational Constitutionalism" in CEF Rickett and GW Austin (eds), *Intellectual Property and the Common Law World*, Oxford, Hart Pub, 2000 Chapter 3; David Nimmer, Elliot Brown, Gary N. Frischling, "The Metamorphosis of Contract into Expand" (1999) 87 *Calif. L. Rev.* 17 at 32-40 ; Mark A. Lemley "Beyond Pre-emption: The Law and Policy of Intellectual Property Licensing" (1999) 87 *Calif. L. Rev*.111 at 128-131

[77] The House of Representatives Standing Committee on Legal and Constitutional Affairs following a submission by Anne Fitzgerald has recommended this requirement be removed in relation to security testing to bring Australian law into line with the DMCA: *Advisory Report on the Copyright Amendment (Digital Agenda) Bill 1999* (1999) paragraphs 4.65-4.66 <http://www.aph.gov.au/house/committee/laca/digitalagenda/contents.htm>.   See further Anne Fitzgerald and Cristina Cifuentes "Pegging Out the Boundaries of Computer Software Copyright: The Computer Programs Act and the Digital Agenda Bill" in A Fitzgerald, B Fitzgerald, P Cook and C Cifuentes (eds) *Going Digital 2000: Legal Issues for E Commerce Software and the Internet* Prospect Publishing Sydney Australia (2000), 37 at 45-6.

[78] **Digital Millennium Copyright Act', 1998 (US)**
http://www.supnik.com/digmel.htm

    (f) REVERSE ENGINEERING- (1) Notwithstanding the provisions of subsection (a)(1)(A), a person who has lawfully obtained the right to use a copy of a computer program may circumvent a technological measure that effectively controls access to a particular portion of that program for the sole purpose of identifying and analyzing those elements of the program that are necessary to achieve interoperability of an independently created computer program with other programs, and that have not previously been readily available to the person engaging in the circumvention, to the extent any such acts of identification and analysis do not constitute infringement under this title.

    (2) Notwithstanding the provisions of subsections (a)(2) and (b), a person may develop and employ technological means to circumvent a technological measure, or to circumvent protection afforded by a technological measure, in order to enable the identification and analysis under paragraph (1), or for the purpose of enabling interoperability of an independently created computer program with other programs, if such means are necessary to achieve such interoperability, to the extent that doing so does not constitute infringement under this title.

    `(3) The information acquired through the acts permitted under paragraph (1), and the means permitted under paragraph (2), may be made available to others if the person referred to in paragraph (1) or (2), as the case may be,

The question also remains as the extent to which reverse engineering rights can be contractually prohibited.[79]   The degree to which reverse engineering can survive the contractual licence is seen by many software developers as being of the utmost significance. The commentary to UCITA (see further details below) while not being definitive suggests contractually prohibiting reverse engineering in some cases will fall foul of s 105 (b).[80] In Australia, the current law as amended by the *Copyright Amendment (Computer Programs) Act 1999*(Cth) provides in s 47H that an agreement that has the effect of limiting ss 47D-F (which permit reverse engineering for certain purposes on certain conditions) is of no effect. However, as ss 47D-F are conditioned on the activities being undertaken by or on behalf of the owner or licensee of a copy of the program and the copy of the software not being an infringing copy, there may be scope for arguing that the software manufacturer still has the capacity to license the product on terms that do not permit reverse engineering thereby defeating ss 47D-F and circumventing 47H.

In summary, it is suggested that a well reasoned and evenly balanced view of the legality of reverse engineering (analysed through the framework of software as discourse) is vital to a diverse and vibrant digital communicative architecture/discourse (premised on interoperable or conversant standards) and should be vigorously asserted.

(ii) IP: Patent Law

A patent gives a very strong form of protection (monopoly right for up to 20 years) over the using and selling of inventions. It is now clear that software (in the form of algorithms and data structures) can be patented[81] even though under the TRIPs Agreement the preferred form of protection is through copyright.[82] The role of copyright in this area has now been overtaken by events.

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provides such information or means solely for the purpose of enabling interoperability of an independently created computer program with other programs, and to the extent that doing so does not constitute infringement under this title or violate applicable law other than this section.

   (4) For purposes of this subsection, the term `interoperability' means the ability of computer programs to exchange information, and of such programs mutually to use the information which has been exchanged.

[79] Under the European Software Directive (Council Directive of May 14 1991 on the legal protection of computer programs [1991] O.J.L. 122/42) contractual prohibition of reverse engineering for interoperability purposes is not allowed: Art. 6(1), Art. 9 (1)

[80] Commentary of the NCCUSL Drafting Committee on UCITA available at <http://www.law. upenn.edu/bll/ulc/ucita/citaam99.htm>

[81] J Swinson and G Middleton " Patents in Cyberspace: Electronic Commerce and Business Methods Patents" in A Fitzgerald, B Fitzgerald, P Cook and C Cifuentes (eds) *Going Digital 2000: Legal Issues for E Commerce Software and the Internet* Prospect Publishing Sydney Australia (2000), 71, http://www.prospectmedia.com.au; cf. Art 52 (2) c) *European Patent Convention* (1978) 13 ILM 270; E. Liesegang, "Software Patents in Europe" [1999] 5 *CTLR* 48; K Nichols *Inventing Software: The Rise of "Computer-Related " Patents* Quorum Books Connecticut 1998; T Furong and K Pun, "Patent Protection of Computer Software: An Under-Explored Avenue in China" [1999] *CTLR* 172
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[82] Article 10(1) of the *Agreement on Trade-Related Aspects of Intellectual Property Rights* (TRIPS) Agreement, part of the World Trade Organisation Agreement of 1994 and binding on all members of the World Trade Organisation provides that: "Computer programs, whether in source or object code, shall be protected as literary works under the Berne Convention (1971)." Further on this issue see: BF Fitzgerald "Lotus Development Corporation v Borland International Inc: Is the Lotus 1-2-3 Menu Command Hierarchy Copyrightable" (1995) 6 *Journal of Law and Information Science* 277; BF Fitzgerald, "Computer Copyright: Same Words, Different Source Code: *Data Access v Powerflex*" (1996) 2 *Computer and Telecommunications Law Review* 120

During the last decade, the number of software patents granted in the US has increased tremendously. Over 13,000 software patents were issued in 1997, 17,500 are estimated for 1998 and 22,500 are estimated for 1999. In fact, ten times the number of patents granted in 1992 and 1993 will be granted in 1998 and 1999.[83]

In recent times there have been more and more extensive claims to (monopoly) patent rights in software that acts as the basic architecture of electronic commerce. There have been a number of claims in the United States that methods of transacting electronic commerce (including digital cash) are patented and cannot be replicated without a licence.[84] Here we have the very foundations of the information society, the commercial structure or architecture, being monopolised by the patent holder. The patent monopoly is something we aspire to in order to reward inventors for the public good but the patent monopoly is difficult to fathom where the basic building blocks of action or speech are being patented. As highlighted by the following case, in defining the patenting of software we will be defining the accessibility to new forms of discourse.

(a) State Street Bank[85]

This case concerned the validity of patent for a system that allowed an administrator to monitor and record the financial information flow and make all calculations necessary for maintaining a partner fund financial services configuration. A partner fund financial services configuration essentially allows several mutual funds, or "Spokes," to pool their investment funds into a single portfolio, or "Hub," allowing for consolidation of, inter alia, the costs of administering the fund combined with the tax advantages of a partnership. The court was asked whether the claimed subject matter fell into one of two alternative judicially-created exceptions to statutory subject matter; the "mathematical algorithm" exception and the "business method" exception.[86]

The Court explained that the plain and unambiguous meaning of section 101 *Patent Act* meant that any invention falling within one of the four stated categories of statutory subject matter may be patented, provided it meets the other requirements for patentability set forth in sections 102, 103, and 112, ¶2. They further explained that repetitive use of the expansive term "any" in section 101 evidenced Congress's intent not to place any restrictions on the subject matter for which a patent

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[83] G Aharonian, Internet Patent News, 18 Oct 1998; A Fitzgerald and C Cifuentes, "Interoperability and computer software protection in Australia" [1998] 4 *Computer and Telecommunications Law Review* 271

[84] See e.g. *State Street Bank & Trust Co v Signature Financial Group Inc* 149 F. 3d. 1368 (Fed. Cir. 1998) patent on computing financial data ; Cybergold patent on paying to view Internet advertisements; Sightsound patent for downloading audio or visual material for a fee transmitted over the network: http:/www.nytimes.com/library/tech/99/02/biztech/artciles/01digi.html. See a list of recent e commerce software patent claims at http://lpf.ai.mit.edu/Patents/patents.html Note *Amazon.com Inc v. Barnesandnoble.com Inc*, 1999 WL 1095502 (W.D. Wash. Dec. 1) a preliminary injunction granted by a District Court judge in Seattle prohibiting Barnes&Noble from using one-click technology in the online shopping process. Paragraph One of the Amazon's complaint reads: "Amazon.com brings this suit to redress Defendants' willful infringement of Amazom.com's patent encompassing its 1-Click method for processing on-line shopping orders. Amazon.com's 1-Click system is a major innovation in e-commerce: it allows customers to order, pay for, and arrange for delivery of any item Amazon.com sells, all with a single click of the mouse. The 1-Click method is popular with customers because it gives them a faster, more convenient, more efficient, and more pleasant shopping experience. In May 1998, Defendants meticulously copied Amazon.com's 1-Click process, dubbed it "Express Lane", and introduced it on their barnesandnoble.com website. Defendant's Express Lane ordering system infringes Amazon.com's United States Patent No. 5,960,411 (the "411 patent")"

[85] 149 F. 3d 1368 (1998); See also: *AT&T Corp v Excel Communications Inc* 172 F. 3d 1352 (Fed. Cir. 1999).

[86] Section 101 US *Patent Act* reads: Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title.

could be obtained beyond those specifically recited in the section. As they went on to say, the Supreme Court has acknowledged that Congress intended section 101 to extend to "anything under the sun that is made by man",[87] and therefore it would be improper to read limitations into the section on the subject matter that may be patented.[88]

On the claim that a mathematical algorithm exception invalidated this patent the Court reasoned:

> The Supreme Court has identified three categories of subject matter that are unpatentable, namely "laws of nature, natural phenomena, and abstract ideas." Diehr, 450 U.S. at 185. Of particular relevance to this case, the Court has held that mathematical algorithms are not patentable subject matter to the extent that they are merely abstract ideas. The Court explained that certain types of mathematical subject matter, standing alone, represent nothing more than abstract ideas until reduced to some type of practical application, i.e., "a useful, concrete and tangible result."
>
> Unpatentable mathematical algorithms are identifiable by showing they are merely abstract ideas constituting disembodied concepts or truths that are not "useful." From a practical standpoint, this means that to be patentable an algorithm must be applied in a "useful" way. ..Today, we hold that the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces "a useful, concrete and tangible result"--a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades. [89]

More interestingly on the claim that a business method exception invalidated the patent the Court held:

> As an alternative ground for invalidating the patent the lower court relied on the judicially-created, so-called "business method" exception to statutory subject matter. We take this opportunity to lay this ill-conceived exception to rest. Since its inception, the "business method" exception has merely represented the application of some general, but no longer applicable legal principle, perhaps arising out of the "requirement for invention"--which was eliminated by § 103. Since the 1952 Patent Act, business methods have been, and should have been, subject to the same legal requirements for patentability as applied to any other process or method.
>
> The business method exception has never been invoked by this court, or the CCPA, to deem an invention unpatentable.(11) Application of this particular exception has always been preceded by a ruling based on some clearer concept of Title 35 or, more commonly, application of the abstract idea exception based on finding a mathematical algorithm. Illustrative is the CCPA's analysis in In re Howard, 394 F.2d 869, 157 USPQ 615 (CCPA 1968), wherein the court affirmed the Board of Appeals' rejection of the claims for lack of novelty and found it unnecessary to reach the Board's section 101 ground that a method of doing business is "inherently unpatentable." Id. at 872, 157 USPQ at 617.(12)
>
> Similarly, In re Schrader, 22 F.3d 290, 30 USPQ2d 1455 (Fed. Cir. 1994), while making reference to the business method exception, turned on the fact that the claims implicitly recited an abstract idea in the form of a mathematical algorithm and there was no

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[87] *Diamond v.Chakrabarty* 447 U.S. 303, 309 (1980); *Diamond v. Diehr* 450 U.S. 175, 182 (1981).
[88] 1372-3
[89] 1373

"transformation or conversion of subject matter representative of or constituting physical activity or objects." 22 F.3d at 294, 30 USPQ2d at 1459 (13)

Maucorps dealt with a business methodology for deciding how salesmen should best handle respective customers and Meyer involved a 'system' for aiding a neurologist in diagnosing patients. Clearly, neither of the alleged 'inventions' in those cases falls within any § 101 category. However, closer scrutiny of these cases reveals that the claimed inventions in both Maucorps and Meyer were rejected as abstract ideas under the mathematical algorithm exception, not the business method exception. See In re Maucorps, 609 F.2d 481, 484, 203 USPQ 812, 816 (CCPA 1979); In re Meyer, 688 F.2d 789, 796, 215 USPQ 193, 199 (CCPA 1982).(14)

Even the case frequently cited as establishing the business method exception to statutory subject matter, Hotel Security Checking Co. v. Lorraine Co., 160 F. 467 (2d Cir. 1908), did not rely on the exception to strike the patent.(15) In that case, the patent was found invalid for lack of novelty and "invention," not because it was improper subject matter for a patent. The court stated "the fundamental principle of the system is as old as the art of bookkeeping, i.e., charging the goods of the employer to the agent who takes them." Id. at 469. "If at the time of [the patent] application, there had been no system of bookkeeping of any kind in restaurants, we would be confronted with the question whether a new and useful system of cash registering and account checking is such an art as is patentable under the statute." Id. at 472. This case is no exception.

The Court pointed out that the District Court at first instance while explaining the rationale of the business method exception as set forth in several treatises, actually gave as its primary reason for decision the following statement:

If Signature's invention were patentable, any financial institution desirous of implementing a multi-tiered funding complex modelled (sic) on a Hub and Spoke configuration would be required to seek Signature's permission before embarking on such a project. This is so because the '056 Patent is claimed [sic] sufficiently broadly to foreclose virtually any computer-implemented accounting method necessary to manage this type of financial structure. 927 F. Supp. 502, 516, 38 USPQ2d 1530, 1542.

The Appeals Court explained that whether the patent's claims were too broad to be patentable is not to be judged under § 101, but rather under §§ 102, 103 and 112 and had nothing to do with whether what was claimed was statutory subject matter. [90]

In summary the Court rejected (to the extent alleged) the existence of judicially created exceptions to the statutory subject matter and confirmed the validity of the patent in what has been seen as a landmark decision for e commerce software patents.

It is interesting to ponder whether the business method would have been patentable without the software? What made the claim patentable? One interpretation of the case is that the business method was patentable because it was wrapped up in software (in digital speak) and that digitising the business method has some magical legal effect.[91]

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[90] 1375-6

[91] As one writer points out the real space non digital "drive through" business method for delivery of fast food would not have been patentable in the past: C. Melarti, "Note:State Street Bank Trust Co v Signature Financial Group Inc: Ought The Mathematical and Business Method Exceptions Return to Business as Usual?" 6 *J Intell Prop L* 359 (1999). This real space business method could be protected to some extent through contract (e.g. franchise agreement) trademark and unfair competition law.

The ever increasing number of e commerce business method software patents especially those concerning fundamental e commerce architecture are making it impossible to move (speak) in digital space without fear of patent infringement.

This is a matter of serious concern as a method of doing business is a discourse. The way we communicate to transact commercial affairs is a discursive practice. How would one react to a claim that they had to pay a licence fee to say "The item be five dollars, please hand over your money"? As can be seen from this, digital architecture is inherently discursive and the more we allow proprietary rights in it the more we impact upon the freedom of communication or discourse. However the incentive to build digital architecture is intimately connected with the enforcement of intellectual property rights.

This raises an interesting question. The development of digital discourse is an expensive business and if we aspire to the best digital communicative architecture we may be expected to pay for such development. The difficulty is that more traditional elements of discourse like speaking the English language are not proprietary but open; they are not subject to a patent. I do not expect to have to pay someone a licence fee to speak to you here today. My dilemma is that I strongly believe that if we are to fully exploit the truly amazing opportunities of information society we need to reward inventors and be able to understand the importance of commodifying informational products. On the other hand when e commerce becomes the norm I shudder at the thought of the basic communicative architecture of business being proprietary. [92]

My respective audiences to these arguments gave various responses. One person suggested that the answer might well lie in more effective patent claim processes in which more attention is given to the prior art thereby acting to protect the fundamental value of free and open discourse.[93] Others suggested compulsory licensing or the patent misuse defence could allow access to the essential architecture.[94] Some queried whether we have a right to expect the business infrastructure to be

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[92] R Merges, "As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform" *14 Berkeley Tech LJ* 577 (1999); M Janis, "Second Tier Patent Protection" 40 *Harv Int'l L J* 151 (1999); FM Keeley-Domokos "Note: Intellectual Property" *14 Berkeley Tech LJ* 153 (1999); C. Melarti, "Note:State Street Bank Trust Co v Signature Financial Group Inc: Ought The Mathematical and Business Method Exceptions Return to Business as Usual?" 6 *J Intell Prop L* 359 (1999); G Drews *The Patent Right in the National Economy of the United States* Central Books NY (1952)

[93] R Merges, "As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform" *14 Berkeley Tech LJ* 577 (1999)

[94] For an overview of patent misuse cases see: D Chisum, *Chisum on Patents: A Treatise on the Law of Patentability, Validity and Infringement* Matthew Bender NY Vol 6 19.04 [3] (1999), footnote 110 infra. In the future we may see stronger arguments for application of the antitrust based essential facilities doctrine to proprietary digital architecture although current case law would suggest this is not an easy route to take: see USA law: *MCI Communications v AT&T* 708 F 2d 1081 (7th Circ 1983), 464 US 891 (1983); P Areeda, "Essential Facilities: An Epithet in Need of Limiting Principles" 58 ABA Antitrust L.J. 841 (1990); A Kezsbom and A Goldman, "No Shortcut to Antitrust Analysis: The Twisted Journey of the "Essential Facilities" Doctrine" 1 *Columbia Business Law Review* 1 (1996); Byars v Bluff City News Co., Inc 609 F. 2d 843 (6th Cir. 1980); W Greg Paciak "Essential Facilities Doctrine: Intergraph Corp v Intel Corp" 14 Berkeley Tech. L. J. 323 (1999); Hecht v Pro-Football Inc. 570 F 2d 982 (D.C. Cir. 1977) cert denied, 436 US 956 (1978); Cyber Promotions Inc v AOL 948 F. Supp 456 (E.D. Pa. 1996); AOL v Cyber Promotions Inc (E.D Pa 26 November 1996); Intergraph Corp v Intel Corp 3 F Supp 2d 1255 (N.D. Ala. 1998) vacated 195 F. 3d 1346 (Fed Circ 1999); Data General Corp v Grumman Systems Support Corp 36 F. 3d 1147 (1st Circ 1994); Aspen Highland Skiing Corp v Aspen Skiing Corp 472 US 585 (1985); Eastman Kodak Co v Image Technical Servs., Inc 504 US 451 (1992); Eastman Kodak Co v Image Technical Servs., Inc 125 F. 3d 1195 (9th Circ 1997); Re Independent Service Organisations Antitrust Litigation 203 F. 3d 1322 (Fed. Cir. (Kan.) 2000); EU law: *Radio Telefis Eireann and Independent Television Publications Ltd v ECCommission(Magill Case)* [1995] 4 CMLR 718; *Oscar Bronner v Mediaprint Zeitungs- und Zeitschriftenverlag GmbH & Co.* KG C-7/97 http://curia.eu.int/jurisp/cgi-bin/form.pl?lang=en&Submit=Submit&docrequire=alldocs&numaff=&datefs=&datefe=&nomusuel=bronner&domaine=&mots=&resmax=100; C Cowie and C Marsden "Convergence, Competition and Regulation" IJCLP Web - Doc 6-1-1998 <http://www.digital-law.net/IJCLP/1_1998/ijclp_webdoc_6_1_1998.htm>; Australian law: *Melway Publishing*

free - phone lines are not free! Agreed, however English is not proprietary, software patents have the potential to exclude competitors who invest resources not just free riders (as the District Court pointed out in *State Street*), and no one is claiming that you do not have to pay for a business service provided. Many of these issues are complex and deserve much more thought however an immediate response is that they can be accommodated especially if we remember that free and open discourse is a fundamental value but not the only value that is to be weighed in the balance.

In summary, the conceptualisation of software as discourse makes us aware of the broad reaching power of e commerce software patents and of our need to carefully consider the proprietary nature of digital discourse/architecture.

(iii) Contract Law: The Software Licence

The main form of distributing software is through a software licence - shrink-wrap or click-wrap. Software is not distributed through a sale of a tangible good but rather through a licence of an intangible commodity. The licence is the product.[95]

"Shrink-wrap licences" normally used where the software is sold in a store are those shrink wrapped around the software product and disclosed usually after opening the package containing the software. "Click-wrap licences" normally used in an online environment such as the Internet involve the acceptance of the terms and conditions of a software license by clicking on a button before first using a program. The decision of *ProCD, Inc v Zeidenberg*[96] held that shrink-wrap, and arguably click-wrap, licences are enforceable in the US.

In the digital world, licensing of information commodities is the essential transaction, not the sale or transfer of a tangible product. The value of the commodity is the information, and the right to control and exploit it. In this regard, the rights that are assigned in conjunction with the licence, set out as terms of the contract, are crucial, as they define the product the licensee receives. The more restrictions placed on the licensee's use of the software, the less its value, and the greater the value retained by the licensor to use the same information in future transactions. The proposed Uniform Commercial Code (UCC) Article 2B in the US (now to become *Uniform Computer and Information Transactions Act* (UCITA) and adopted by National Conference of Commissioners on Uniform State Laws (NCCUSL) on 29th July 1999[97]) is an attempt to provide guidelines for the appropriate scope of software licensing. To this point in time it has not achieved total support.

This licensing mechanism said to be necessary to protect investment in innovation is mooted to allow privately legislated informational property rights to arise. In some instances it is even suggested that public domain rights currently recognised by copyright law can be ousted by the contractual software licence. Contract law then, needs to be infused with some notion of public

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Pty Ltd v Robert Hicks [1999] FCA 664 <http://www.austlii.edu.au>; Part IIIA Australian *Trade Practices Act 1974 (*Cth); *Hamersley Iron Pty Ltd v NCC* FCA 28.6.1999 <http://www.austlii.edu.au>

[95] Robert W. Gomulkiewicz, "The License Is The Product: Comments on the Promise of Article 2B for Software and Information Licensing" (1998) 13 *Berkeley Tech.L.J.* 891; G Evans and B Fitzgerald, "Information Transactions Under UCC Article 2B: The Ascendancy Of Freedom of Contract in the Digital Millennium" (1998) 21 *UNSW Law Journal* 404; David Nimmer, Elliot Brown, Gary N. Frischling, "The Metamorphosis of Contract into Expand" (1999) 87 *Calif. L. Rev.* 17.

[96] 86 F.3d 1447 (7th Cir. 1996)

[97] See commentary at <http://www.badsoftware.com>

interest in relation to informational goods such as software. And if software is discourse we need to factor that into the rights that private ordering will allow. [98]

(iv) Competition/Antitrust Law[99]

In an ideal world competition law will act to balance the monopolies copyright, patent and contract create in software. It will act to define the scope of the grant of intellectual property rights. Originally the approach in the European Union was that dealings within the scope of the intellectual property rights granted by the relevant intellectual property law were immune from competition law, while other dealings were subject to competition law. The continuation of such an approach has been questioned in a decision that looks primarily at the anti-competitive effect of intellectual property rights; in other the words the scope of the grant as defined by intellectual property and competition law. [100]

The appropriate interplay between competition law and intellectual property law is of utmost importance to the construction of our digital identity and is currently being played out in the *US v Microsoft* case.[101] In Australia much focus has been placed on s51(3) *Trade Practices Act 1974* (Cth) which exempts licensing of certain intellectual property rights from the full application of the Act. S 51(3) was set for reform in accordance with the Draft Report[102] published by the National

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[98] On this notion see: article: J.H. Reichman and Jonathan A. Franklin, "Privately Legislated Intellectual Property Rights: Reconciling Freedom of Contract with Public Good Uses of Information" (1999) 147 *U. Pa. L. Rev.* 875; ; Y. Benkler, "Free as the Air to Common Use: First Amendment Constraints on Enclosure of the Public Domain" (1999) 74 *New York University LR* 354 at 429-440; C McManis, "The privatisation (or Shrink-Wrapping) of American Copyright Law" (1999) 87 *Calif L Rev* 173; Micahel Madison, "Legal-ware: Contract and Copyright in the Digital Age" 67 *Fordham Law Review*, 1025 (1998); G Lunney "Protecting Digital Works: Copyright or Contract?" http://www.tulane.edu/journal/jtip; J. Boyle, *Shamans, Software, Spleens* (1996) Harvard University Press, Cambridge MA; D. Lange, D, "Recognising The Public Domain" (1981) 44 *Law and Contemporary Problems* 147; David Nimmer, Elliot Brown, Gary N. Frischling, "The Metamorphosis of Contract into Expand" (1999) 87 *Calif. L. Rev.* 17; Mark A. Lemley "Beyond Pre-emption: The Law and Policy of Intellectual Property Licensing" (1999) 87 *Calif. L. Rev.*111; cf R Nimmer, "Breaking Barriers: The Relationship Between Contract and Intellectual Property Law" (1998) 13 *Berkeley Tech LJ* 827.

[99] J Taubman, *Copyright and Antitrust* Federal Legal Publications Inc NY (1960).

[100] See further: *Radio Telefis Eireann and Independent Television Publications Ltd v ECCommission(Magill Case)* [1995] 4 CMLR 718; Arts 85, 86 (now Arts 81, 82) *Treaty of Rome* (European Union); G.Morgan and A.Wilson, "Restrictions on the Transfer of Software" [1996] 3 *CTLR* 82; Art 40 TRIPS; IA Stamatoudi, "The Hidden Agenda in *Magill* and Its Impact on New Technologies" (1998) 1 *Journal of World IP* 153; I Govaere, *The Use and Abuse of Intellectual Property Rights in the EC* (1996) Sweet and Maxwell, London; *Oscar Bronner v Mediaprint Zeitungs- und Zeitschriftenverlag GmbH & Co.* KG C-7/97 http://curia.eu.int/jurisp/cgi-bin/form.pl?lang=en&Submit=Submit&docrequire=alldocs&numaff=&datefs=&datefe=&nomusuel=bronner&domaine=&mots=&resmax=100;.

[101] http://www.microsoft.com For the findings of fact delivered by Judge Jackson on 5/11/99 see http://www.usdoj.gov/atr/cases/f3800/msjudgex.htm Judge Jackson has since concluded in *US v Microsoft* 87 F. Supp. 2d 30> (D.D.C. April 3 , 2000) that Microsoft violated antitrust law (sections 1 and 2 of the Sherman Act and Section 1 of the Clayton Act) in the internet browser software market The nature of the remedy to be awarded in this case is currently being considered by Judge Jackson. On the notion of copyright misuse which at this point is seen as being distinct from general competition law see: *Alcatel USA Inc v DGI Technologies Inc* 166 F. 3d 772 (5th Circuit Court of Appeal 26.2.99) http://www.findlaw.com; *Lasercomb America v Reynolds,* 911 F.2d 970 (4th Cir. 1990); *Practice Management Info. Corp v American Med. Ass'n*, 121 F.3d 516 (1997); Mark A. Lemley "Beyond Pre-emption: The Law and Policy of Intellectual Property Licensing" (1999) 87 *Calif. L. Rev.*111 at 151-159.

[102] Draft Report "Review of Sections 51(2) and 51(3) of the *Trade Practices Act 1974*" pp.93-132 http://www.ncc.gov.au/nationalcompet/section%2051%20review/section%2051.htm

Competition Council[103]. The proposal was to remove the licensing of intellectual property rights from the s51(3) exemption[104] which would have made competition lawyers even more eager to look at the monopolies created through Intellectual Property legislation; and more particularly, the monopolies imposed by a contractual licence of intellectual property such as software.[105] However the Final Report has recommended against removing the licensing of intellectual property rights

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[103] <http://www.ncc.gov.au> > See further: J Fung, "The Case of an Awkward Interface - Patents v Competition" (1998) 21 *UNSWLJ* 757.

[104] S 51 (3) does not prevent application of s 46 which covers abuse of market power. It is suggested that s 46 can be infringed through exercise of property and contract rights: *QWI Pty Ltd v BHP Co Ltd* (1989) 167 CLR 177 at 202 per Dawson J; cf *Warman International Ltd v Envirotech Australia Pty Ltd* (1986) 11 FCR 478. For a general introduction to Australian law see: S Corones, *Competition Law in Australia* 2nd ed LBC Information Services Sydney (1999); A Bruce and E Webb, Trade Practices Law, Butterworths Sydney (1999). Section 46 reads:
Misuse of market power
　(1)A corporation that has a substantial degree of power in a market shall not take advantage of that power for the purpose of:
　　(a)eliminating or substantially damaging a competitor of the corporation or of a body corporate that is related to the corporation in that or any other market;
　　(b)preventing the entry of a person into that or any other market; or
　　(c)deterring or preventing a person from engaging in competitive conduct in that or any other market.
　(1A)For the purposes of subsection (1):
　　(a)the reference in paragraph (1)(a) to a competitor includes a reference to competitors generally, or to a particular class or classes of competitors; and
　　(b)the reference in paragraphs (1)(b) and (c) to a person includes a reference to persons generally, or to a particular class or classes of persons.
　(2)If:
　　(a)a body corporate that is related to a corporation has, or 2 or more bodies corporate each of which is related to the one corporation together have, a substantial degree of power in a market; or
　　(b)a corporation and a body corporate that is, or a corporation and 2 or more bodies corporate each of whch is, related to that corporation, together have a substantial degree of power in a market;
the corporation shall be taken for the purposes of this section to have a substantial degree of power in that market.
　(3)In determining for the purposes of this section the degree of power that a body corporate or bodies corporate has or have in a market, the Court shall have regard to the extent to which the conduct of the body corporate or of any of those bodies corporate in that market is constrained by the conduct of:
　　(a)competitors, or potential competitors, of the body corporate or of any of those bodies corporate in that arket; or
　　(b)persons to whom or from whom the body corporate or any of those bodies corporate supplies or acquires goods or services in that market.
　(4)In this section:
　　(a)a reference to power is a reference to market power;
　　(b)a reference to a market is a reference to a market for goods or services; and
　　(c)a reference to power in relation to, or to conduct in, a market is a reference to power, or to conduct, in that market either as a supplier or as an acquirer of goods or services in that market.
　(5)Without extending by implication the meaning of subsection (1), a corporation shall not be taken to contravene that subsection by reason only that it acquires plant or equipment.
　(6)This section does not prevent a corporation from engaging in conduct that does not constitute a contravention of any of the following sections, namely, sections 45, 45B, 47 and 50, by reason that an authorization is in force or by reason of the operation of section 93.
　(7)Without in any way limiting the manner in which the purpose of a person may be established for the purposes of any other provision of this Act, a corporation may be taken to have taken advantage of its power for a purpose referred to in subsection (1) notwithstanding that, after all the evidence has been considered, the existence of that purpose is ascertainable only by inference from the conduct of the corporation or of any other person or from other relevant circumstances.

[105] D. McGowan, "Free Contracting, Fair Competition and Draft Art 2B: Some Reflections on Federal Competition Policy, Information Transactions and "Aggressive Neutrality"" (1998) 13 *Berkeley Tech LJ* 1173; R Cass, "Copyright, Licensing, and the "First Screen"" Michigan Telecommunications and Technology Law Review, Vol. 5, No. 2, 1999.

from the s 51 (3) exemption[106] although another government inquiry on the interplay of intellectual property and competition law is currently being undertaken by the Australian Intellectual Property and Competition Review Committee.[107]

In 1995 the United States Department of Justice and Federal Trade Commission issued the *Antitrust Guidelines for the Licensing of Intellectual Property* which govern the interaction of intellectual property and competition law. The guidelines contain three main principles:

> (a) *for the purpose of antitrust analysis, the Agencies [the DOJ and FTC] regard intellectual property as being essentially comparable to any other form of property;*
>
> (b) *the Agencies do not presume that intellectual property creates market power in the antitrust context; and*
>
> (c) *the Agencies recognize that intellectual property licensing allows firms to combine complementary factors of production and is generally procompetitive.*

These guidelines along with the European approach and the call for reform in Australia are a good indication that competition law will act to inform the scope of intellectual property rights in the future and in so doing serve to mediate attempts by any one entity to dominate the construction of informational discourse and identity. Furthermore the notion of convergence whereby digitisation facilitates the merging of communication and distribution channels (through a discourse of software) will demand that competition/antitrust law acts to preserve the multiplicity of meaning and the antitrust of knowledge.[108] This will be no easy task for as we are seeing in the Microsoft case the allegations of technology tying, the digital converging of two software products, are challenging the ability of antitrust law to fathom new business methods.[109]

The intention of making competition law more prominent in the digital environment in order to open access to discourse is evidenced by the wide reaching decision in *Alacatel v DGI* which overrides the copyrights owners right in the name of misuse.[110] It is said to be a

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[106] Final Report "Review of Sections 51(2) and 51(3) of the *Trade Practices Act 1974*" http://www.ncc.gov.au/nationalcompet/section%2051%20review/NCC%20TPA.pdf

[107] See further details at: http://ipcr.gov.au/ipcr/

[108] The tradition of antitrust law in the United States and important role it is likely to play in the digital environment highlights the fact that while it is not formally entrenched as a constitutional principle it will certainly act like one especially in relation to intellectual property rights in software where speech restrictions have been legitimated and First Amendment challenges negatived. In this last instance antitrust law has the potential to act as a surrogate champion of open and free (digital) speech/discourse.

[109] *USA v Microsoft* (District of Columbia, June 23 1998) < http://caselaw.findlaw.com/cgi-bin/getcase.pl?court=DC&navby=case&no=975343A>

[110] The patent of architecture is vitally important and will necessarily invoke competition law. On patent misuse and associated anti competitive conduct see: *Vitamin Technologies v Wisconsin Alumni Research Foundation* 146 F 2d 941, 946-7, 956 (9th Cir) cert denied 325 US 876 (1945); *US v General Electric Co* 272 US 476 (1926); *US v Line Material Co* 333 US 287 (1945*); General Talking Pictures v Western Electric Co* 304 US 175 reaffirmed on rehearing 305 US 124 (1938); H Hovenkamp, *Federal Antitrust Policy: The Law of Competition and its Practice* West Publishing St Paul Minn (1994) 218-225; Areeda and Kaplow *Antitrust Analysis: Problems Text and Cases* 4th ed Little Brown and Co (1988) 182-5; 428ff..; Intergraph Corp v Intel Corp 3 F Supp 2d 1255 (N.D. Ala. 1998) vacated 195 F. 3d 1346 (Fed Circ 1999); Data General Corp v Grumman Systems Support Corp 36 F. 3d 1147 (1st Circ 1994); Eastman Kodak Co v Image Technical Servs., Inc 125 F. 3d 1195 (9th Circ 1997); Re Independent Service Organisations Antitrust Litigation 203 F. 3d 1322 (Fed. Cir. (Kan.) 2000).

doctrine that arises from the equitable notion of clean hands[111] (and seems to invoke constitutional enumerated powers rhetoric[112]) attaching to copyright and patent law. While it is said not to emanate directly from competition/antitrust law such law surely defines its motivation.

(a) *Alcatel USA Inc v DGI* [113]: Copyright Misuse[114]

The facts of the case[115] concerned telephone switching systems[116] designed made and sold by DSC to long-distance telephone service providers, such as MCI and Sprint. DSC switches were controlled by its copyrighted operating system software which unlike the switches were not sold but licensed to users on the following terms:

> (1) the operating system software remains the property of DSC; (2) the customer has the right to use the software only to operate its switch; (3) the customer is prohibited from copying the software or disclosing it to third parties; and (4) the customers are authorized to use the software only in conjunction with DSC-manufactured equipment.

DSC's customers, like other long distance providers, frequently needed to expand the call-handling capacity of their switches and often did this through adding groups of "cards" to the switch. In 1989, DGI was founded to design and sell expansion cards for use with DSC switches, however prior to 1989, DSC was the only manufacturer of such cards.

DGI claimed that it developed its cards by reverse engineering DSC's unpatented products and then duplicating their functionality to achieve a better designed card using newer-generation electronics and adding additional features. DSC asserted that DGI did not engage in legitimate reverse engineering, but rather misappropriated DSC's intellectual property by wrongfully obtaining schematics and manuals provided only to DSC customers on the express condition that there be no disclosure to third parties.

Between 1992 and 1994, DGI developed and introduced four DSC- compatible cards -- the Digital Trunk Interface ("DTI"), the Bus Terminator ("BT"), the Digital Tone Detector ("DTD"),4 and the Pulse Code Modulation Interface ("PCMI"). None of these initial DGI cards were microprocessor cards. As the Court explained:

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[111] Morton Salt Co v G.S. Suppiger Co. 314 U.S. 488, 492 (1942) "It is a principle of general application that courts, and especially courts of equity, may appropriately withhold their aid where the plaintiff is using the right asserted contrary to the public interest. Virginian R. Co. v. System Federation, 300 U.S. 515, 552, 57 S.Ct. 592, 601; Central Kentucky Natural Gas Co. v. Railroad Commission, 290 U.S. 264, 270, 273 S., 54 S.Ct. 154, 156, 157; Harrisonville v. U.S. Dickey Clay Mfg. Co., 289 U.S. 334, 337, 338 S., 53 S.Ct. 602, 603; Beasley v. Texas & Pacific Railway Co., 191 U.S. 492, 497, 24 S.Ct. 164, 165; Securities & Exchange Comm. v. United States Realty Co., 310 U.S. 434, 455, 60 S.Ct. 1044, 1053; United States v. Morgan, 307 U.S. 183, 194, 59 S.Ct. 795, 801"

[112] Morton Salt supra at 492 " The grant to the inventor of the special privilege of a patent monopoly carries out a public policy adopted by the Constitution and laws of the United States, 'to promote the Progress of Science and useful Arts, by securing for limited Times to ... Inventors the exclusive Right ....' to their 'new and useful' inventions. United States Constitution, Art. I , 8, cl. 8; 35 U.S.C. 31, 35 U.S.C.A. 31. But the public policy which includes inventions within the granted monopoly excludes from it all that is not embraced in the invention. It equally forbids the use of the patent to secure an exclusive right or limited monopoly not granted by the Patent Office and which it is contrary to public policy to grant."

[113] 166 F.3d 772 (5th Circ); Rehearing and Rehearing En Banc Banc Denied May 6, 1999, (5th Circ) 180 F.3d 267.

[114] For a detailed introduction to this topic see: P Goldstein, *Copyright* 2nd ed Aspen Law and Business Publishers NY (1999) Chapter 9.6; M Nimmer and D Nimmer, *Nimmer on Copyright* (1999) Chapter 13.09.

[115] The following summary of facts is taken from the judgement at pp 777-780.

[116] A telephone switch routes long distance telephone calls to their destinations.

When installed in a switch, a microprocessor card controls the "boot up" -- that is, it downloads DSC's copyrighted operating system software into its random access memory ("RAM"). A DTI, DTD, or BT card alone cannot expand the capacity of a switch; a customer must install a group of cards together with a microprocessor card to achieve expansion. For this reason, DGI obtained DSC microprocessor cards -- then known as MP-2s -- in the used market to sell along with three DGI cards. This enabled DGI to offer a customer a complete expansion card complement, which it did.

In 1995, as a result of a new dialing plan implemented by the Federal Communications Commission ("FCC") and customer demands for new features, DSC revised and expanded its operating system software. These changes required DSC customers to upgrade to a new microprocessor card -- the MP-8. As few MP-8 cards were available on the used market, DGI was no longer able to offer a complete card complement. Its marketing problems were exacerbated by DSC's practice of offering substantial discounts to customers who purchased whole complements of cards from DSC, but charging much higher prices for individual MP-8 cards. This motivated DGI to develop its own microprocessor card -- the DMP-2800.

To develop a microprocessor card, DGI had to overcome several difficulties. First, DGI needed to understand DSC's firmware. For this purpose, DGI purchased an MP-8 card and, using a "burner" to remove the DSC firmware from a memory chip, obtained the machine-readable object code. DGI engineers then used a process called "disassembly" to convert the firmware into human-readable form. In this way, DGI was able to write its own firmware -- which it claims is not substantially similar to DSC's firmware -- for its DMP-2800 microprocessor card. DSC asserts that DGI violated the copyright on its firmware when it copied DSC's firmware several times in this process.

Second, the DGI microprocessor card had to accept a download from the switch of the DSC operating system. To obtain the software needed for this function, several DGI engineers took an MP-8 card to NTS Communications ("NTS"), a DSC switch owner/ software licensee and DGI customer. There, Ernie Carrasco, an NTS employee who also consulted for DGI, placed the MP-8 card into an NTS switch and copied the operating system to a laptop computer. DGI engineers then took the laptop back to DGI. DSC maintains that DGI never told NTS that it was copying and removing DSC's copyrighted software, only that it was "testing" MP-8 cards.

DGI engineers returned to NTS several times to test MP-8 cards containing versions of DGI's firmware. To avoid having to perform all this testing at NTS, DGI modified an MP-8 card to include a device called a "punch" card or "snooper" card, which monitored the firmware during the operating system download. Using this snooper card, DGI was able to understand which parts of the DSC firmware were accessed during the "boot" of the operating system. DSC maintains that DGI used this snooper card to copy the messages contained in DSC's copyrighted operating system software. It insists that, but for DGI's "theft" of DSC's operating system, it would have been extremely expensive and time-consuming for DGI to develop its own microprocessor card.

DGI counters that the copy was used only to discern the size of the operating system download to the MP-8 card, as it was investigating the possibility of upgrading the older MP-2 card. DGI insists that, as the content of the software was irrelevant in determining its size, it never even disassembled the operating system software from unreadable machine language.[117]

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[117] 778-9

DSC filed suit in 1994, alleging that DGI misappropriated its trade secrets, and engaged in unfair competition and DGI counterclaimed, asserting amongst other things that DSC had breached the Sherman Act by monopolizing the relevant product market for expansion products compatible with DSC telephone switches. In 1995, DSC filed a supplemental complaint, asserting direct and indirect copyright infringement claims. After a three week trial, the jury returned a mixed verdict, finding amonst other things that DSC violated the Sherman Act and that DGI infringed certain DSC copyrights, engaged in unfair competition by misappropriating DSC's time, labor, skill, and money, and misappropriated DSC's trade secrets. The jury also determined that both parties had "unclean hands."

Nine months later, in November 1997, the district court entering its Final Judgment and Permanent Injunction dismissed DGI's antitrust claim, stating that DGI had failed to prove the relevant product market under *Eastman Kodak Co. v. Image Technical Services, Inc.*[118] and permanently enjoined DGI from developing any new microprocessor cards with the assistance of DSC's operating system software and from selling any other DGI microprocessor card designed to use DSC's software. The court also ordered DGI to turn over all DMP-2800 microprocessor cards to DSC for destruction, but the court stayed that order pending resolution of any appeal. DGI appealed, and DSC cross-appealed.

Copyright Misuse

On appeal[119] to the Fifth Circuit Court of Appeals, DGI reasserted amongst other things its claim that even assuming that it committed acts of copyright infringement, the "copyright misuse" doctrine precluded injunctive relief based on that infringement. In accepting this argument the Court explained the doctrine and its application in this way:

> This doctrine -- which has its historical roots in the unclean hands defense -- "bars a culpable plaintiff from prevailing on an action for the infringement of the misused copyright." It "forbids the use of the [copyright] to secure an exclusive right or limited monopoly not granted by the [Copyright] Office and which it is contrary to public policy to grant." The copyright misuse defense is analogous to the patent misuse defense, which was originally recognized by the Supreme Court in Morton Salt Co. v. G.S. Suppiger. The Fourth Circuit was the first to extend the rationale behind patent misuse to copyrights. In Lasercomb America, Inc. v. Reynolds, the Fourth Circuit explained that, whereas "copyright law [seeks] to increase the store of human knowledge and arts by rewarding . . . authors with the exclusive rights to their works for a limited time . . . , the granted monopoly power does not extend to property not covered by the . . copyright."

> …..We agree with the DSC I panel's conjecture and the jury's finding that DSC's licensing agreement for its operating system constitutes misuse. The district court instructed the jury, in pertinent part:

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[118] "The offense of monopoly under § 2 of the Sherman Act has two elements: (1) the possession of monopoly power in the relevant market and (2) the willful acquisition or maintenance of that power as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident.'"17 Eastman Kodak Co. v. Image Technical Services, Inc., 504 U.S. 451 at 481 (1992) (quoting United States v. Grinnell Corp., 384 U.S. 563, 570-71 (1966)). P780-1

[119] DGI's antitrust claim was also dismissed on appeal. The Court explained: "We are convinced that DGI, like the plaintiff in United Farmers, is trying to define the market as narrowly as possible (in order to make it look as if [defendant] had market power). Because (1) DGI did not present legally sufficient evidence that DSC's customers faced significant information and switching costs, and (2) DGI's proffered relevant market does not comport with market realities, its aftermarket monopoly claim fails as a matter of law.": 784

If DSC has used its copyrights to indirectly gain commercial control over products DSC does not have copyrighted, then copyright misuse may be present. The grant to the author of the special privilege of a copyright carries out a public policy adopted by the Constitution and laws of the United States, "to promote the Progress of Science and useful arts, by securing for limited Times to [Authors] . . . the exclusive Right . . ." to their "original" works. United States Constitution, Art. I, § 8, cl. 8, 17 U.S.C. § 102. But the public policy which includes original works within the granted monopoly excludes from it all that is not embraced in the original expression. It equally forbids the use of the copyright to secure an exclusive right or limited monopoly not granted by the Copyright Office and which is contrary to public policy to grant.

A reasonable juror could conclude, based on the licensing agreement, that "DSC has used its copyrights to indirectly gain commercial control over products DSC does not have copyrighted," namely, its microprocessor cards. The facts on which we based our misuse prediction in DSC I have not changed substantially. As we reasoned then:

Any competing microprocessor card developed for use on DSC phone switches must be compatible with DSC's copyrighted operating system software. In order to ensure that its card is compatible, a competitor such as DGI must test the card on a DSC phone switch. Such a test necessarily involves making a copy of DSC's copyrighted operating system, which copy is downloaded into the card's memory when the card is booted up. If DSC is allowed to prevent such copying, then it can prevent anyone from developing a competing microprocessor card, even though it has not patented the card.

Under these facts, DSC's assertion that its licensing agreement does not prohibit the independent development of compatible software is simply irrelevant. Despite the presence of some evidence -- the testimony of a DSC executive -- that DGI could have developed its own software, there was also evidence that it was not technically feasible to use a non-DSC operating system because the switch has a "common control" scheme in which each microprocessor card in a network of such cards runs the same operating system. Hence, without the freedom to test its cards in conjunction with DSC's software, DGI was effectively prevented from developing its product, thereby securing for DSC a limited monopoly over its uncopyrighted microprocessor cards. Furthermore, the jury instructions never mentioned that misuse could only be present if DSC's agreement prohibited the independent development of software. Consequently, we conclude that the district court abused its discretion in awarding injunctive relief based on DGI's infringing acts.[120]

This doctrine has the potential to play a significant role in determining the scope of proprietary rights in software. It will normally arise as a defence to an action for copyright infringement and is apparently broader in scope than antitrust law. The copyright misuse defence is somewhat idiosyncratic yet potentially broad reaching in its operation and will most likely take primary (but not sole) definition from fundamental principles of antitrust law. The *Alcatel Case* highlights how effective this notion will be in defining the ambit of copyright in software and provides an avenue for assessing the property right and associated actions against other fundamental values such as free and open discourse.

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[120] 166 F. 3d 772 at 792-4 (5th Cir. 1999)

Part IV: Power[121] and the New Constitutionalism

Traditionally constitutionalism (which means the regulation of power) has focused on regulating or limiting the vertical exercise of government or public power over the citizen.[122] On the other hand the horizontal exercise of power between citizens occurred in the private sphere and was rarely analysed in terms of power or constitutionalism, although the (largely common) law played a mediating role.

It is the writing of Michel Foucault that informed us that power was not just something that was exercised by sovereign entities like the state but that power relations were everywhere. As Foucault explained:

> What I mean is this: in a society such as ours, but basically in any society, there are manifold relations of power which permeate characterise and constitute the social body, and these relations of power themselves cannot themselves be established, consolidated nor implemented without the production accumulation, circulation and functioning of a discourse. … We are subjected to the production of truth through power and we cannot exercise power except through the production of truth ... Power never ceases its interrogation, its inquisition, its registration of truth: it institutionalises, professionalises and rewards its pursuit. In the last analysis, we must produce truth as we must produce wealth, indeed we must produce truth in order to produce wealth . . .[123]

This redefinition of power made us aware that power is ubiquitous in our daily lives and demanded a reassessment of the mechanism, methodology or epistemological framework that we invoke for understanding the role and effect of power within our worlds. That demand which has lain dormant for some years now promises to be satisfied to some degree.

It seems that the nature and role of corporate power combined with the information revolution (especially increasing reliance on digitised information) and the growth of transnational civil society have motivated arguments that move towards talking about the exercise of power in the private sphere in terms of the regulation of power or constitutionalism. More interesting the three dimensional process of Congress/Parliament regulating (vertical) the power relations of private citizens (horizontal) is starting to be more vigorously questioned (at least in the United States) in terms of constitutionalism.

In the United States the First Amendment along with a broad view of the notion of state action[124] has the potential to intersect with legislatively mediated power relations between individuals[125] in

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[121] See generally: T Jordan, *Cyberpower:The Culture and Politics of Cyberspace and the Internet*, Routledge London UK (1999) especially Chapter 1.

[122] "Constitutionalism refers to implicit and or explicit limits on political or state decision making, limits which can be procedural or substantive. Constitutionalism defines the proper forms and limits of state action": D Held "The Development of the Modern State" in S Hall and B Gieben *Formations of Modernity* Polity Press 1992, p 71 at 89; C H McIlwain, Constitutionalism and the Changing World, Cambridge Cambridge University Press (1939); C H McIlwain Constitutionalism: Ancient and Modern, NY Cornell University Press (1947).

[123] M Foucault, *Power/Knowledge* (C Gordon ed) Harvester Press (1980) 93. "Every relation of force implies at each moment a relation of power (which in a sense is its momentary expression) and every power relation makes a reference, as its effect but also as its condition of possibility, to a political field of which it forms a part. To say everything is political, is to affirm this ubiquity of relations of force and their immanence in a political field…" p189

[124] *Shelley v Kraemer* 334 US 1 (1948); *Flagg Brothers Inc v Brooks* 436 US 149 (1978); L Tribe *American Constitutional Law* 2nd ed (1988) at 1711 ff.

the private sphere.[126] In other countries like my own the statutory (eg copyright) or common law (eg contract) rules that mediate relations between individuals in the private sphere are largely beyond constitutional review by the courts.[127] In Australia, this is a product of the Westminster notion of parliamentary sovereignty - parliament can make or unmake any law - and that it is through parliament and the common law that rights are protected.   In my system I am trying to convince my colleagues that power relations in the private sphere in particular those defined by information law are fundamental constitutional issues and should be informed by fundamental constitutional principles - like freedom of discourse. [128] In the US a new generation of scholars are showing how the First Amendment will inform the private sphere in this regard by arguing that the DMCA, proposed data base legislation and UCITA are infringing principles of free speech[129]; although I do not think they have got to the Patent Act - yet![130]

The pervasiveness of the digital environment of the information age and its discursive nature (along with the ever-increasing importance of corporate power and globalisation) has forced a reassessment of where constitutionalism starts and finishes. The interesting question is how far the US Supreme Court through the act of balancing or scrutiny will travel into civil society to determine constitutionality (of legislation like the *Copyright Act* or the *Patent Act* which impose

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[125] This could be categorised as horizontal as opposed to vertical constitutionalism: see further P Bernt Hugenholtz, "Copyright and Freedom of Expression in Europe" paper presented NYU Law School Engelberg Centre in Florence (Spring 1998).

[126] It has been suggested that the First Amendment to the US *Constitution*, the right to free speech, will play a role in determining the constitutional validity of database legislation; as well as the limiting scope of Art 1 Section 8 Clause 8 of the US *Constitution* (in part the copyright head of legislative power): M Hamilton, *Database Protection and the Circuitous Route Around the United States Constitution* in INTERNATIONAL INTELLECTUAL PROPERTY AND THE COMMON LAW WORLD (Charles Rickett and G Austin, eds., Hart Publishing, Oxford, 2000); W. Patry, "The Enumerated Powers Doctrine and Intellectual Property: An Imminent Constitutional Collision" 67 *Geo Wash L Rev* 359. On the limiting scope of Art 1 Section 8 Cl 8 see: *Graham v. John Deere Co.*, 383 U.S. 1, 5 (1966); *Bonito Boats, Inc. v. Thundercraft Boats, Inc.* 489 U.S. 141, 146 (1989).

[127] For an excellent overview of the position in Europe see P Bernt Hugenholtz "Copyright and Freedom of Expression in Europe" paper presented NYU Law School Engelberg Centre in Florence (Spring 1998).

[128] B Fitzgerald "Software as discourse? A Constitutionalism for Information Society" (1999) 24 *Alternative Law Journal* 144; BF Fitzgerald "Principles of Australian Constitutionalism" (1994) 1 (2) *Proceedings of the 49th ALTA Conference* 799; BF Fitzgerald "Australian Constitutionalism" (20/6/97 Unpublished Manuscript on file with author) ; A Hutchinson, *Waiting for Coraf: A Critique of Law and Rights* University of Toronto Press, 1995; *Associated Press v US* 326 US 1, 20. See further A Giddens, *The Constitution of Society* Polity Press, Cambridge (1984); Alan Hunt *Foucault and law: towards a sociology of law as governance* London Pluto 1994; E Ehrlich (1936) *Fundamental Principles of Sociology of Law* trans. By WL Moll (NY: Arno Press edn 1975).

[129] Amongst others see: Hamilton, M, *Database Protection and the Circuitous Route Around the United States Constitution* in INTERNATIONAL INTELLECTUAL PROPERTY AND THE COMMON LAW WORLD (Charles Rickett and G Austin, eds., Hart Publishing, Oxford, 2000); Benkler, Y, "Free as the Air to Common Use: First Amendment Constraints on Enclosure of the Public Domain" (1999) 74 *New York University LR* 354; L Lessig, *Code and Other Laws of Cyberspace* Basic Books NY 1999; cf N Netanel, "Copyright and a Democratic Civil Society" 106 *Yale LJ* 283 (1996). For an overview of arguments see: P Goldstein, *Copyright* 2nd ed Aspen Law and Business Publishers NY (1999) Chapter 10.3; M Nimmer and D Nimmer, *Nimmer on Copyright* (1999) Chapter 1.10. For established case law arguably in conflict this view see: *San Francisco Arts and Athletics Inc. v US Olympics Committee* 483 US 522 (1987); *Harper & Row Publishers Inc. v Nation Enterprises* 471 US 539 (1985); *Zacchini v Scripps-Howard Broadcasting Co.* 433 U.S. 562 (1977);

[130] On challenges to the *Patent Act* see: Richard M. Cooper, *Legislative Patent Extensions*, 48 Food & Drug L. J. 59 (1993); *Jordan v. Dobson*, 13 F. Cas. 1092, 1095-96 (C.C.E.D. Penn. 1870); *Bloomer v. Stolley*, 3 F. Cas. 729 (C.C.D. Ohio 1850); *Blanchard's Gun-Stock Turning Factory v. Warner*, 3 F.Cas. 653, 657 (C.C.D. Conn. 1846); *Blanchard v. Sprague*, 3 F. Cas. 648 (C.C.D. Mass. 1839); *Evans v. Jordan*, 8 F. Cas. 872 (C.C.D. Va. 1813); *The Fire-Extinguisher Case, Graham v. Johnston*, 21 F. 40, 42 (C.C.D. Md. 1884); *Bloomer v. McQuewan*, 55 U.S. 539 (1852). I owe thanks to Jonathan Zittrain and members of the Berkman Centre at Harvard Law School for pointing out these authorities.

restrictions on digital speech).[131] In the challenge to and subsequent scrutiny of this type of legislation we will see the US Supreme Court draw the boundaries of (public) constitutionalism for the information age. In other countries the new constitutionalism will depend on courts realising that fundamental issues of copyright, patent, contract and competition/antitrust laws are the constitutional questions of the information age. In these other countries moving constitutional lawyers from atoms to bits may not ride on the back of or enter through the spectrum of First Amendment jurisprudence[132] but rather a broader appreciation of the dynamic constitutive choices they are making in adjudicating upon issues of interpretation of the private law.

The boundaries of information law and in particular rights in digital architecture raise important issues of constitutionalism. In appreciating software as discourse we start to see the importance of the new communicative structures to our social and cultural being and to the question of constitutionalism.

Conclusion: The Challenge

As we enter the digital (discursive? [133]) millennium it is ever more pressing for us (especially as lawyers) to fathom the genetic structure/code (natural and manufactured) of life. Here I have highlighted how software will act to construct us and how the law will facilitate such a process. The task is for us to appreciate this perspective in the development of (information) law.

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[131] Like an arm reaching out, the First Amendment along with the notions of state action and enforceable judicial review, gives public constitutionalism the potential in the digital era to touch what traditionally may have been regarded as private rights/affairs between two citizens. The growth of corporate power and its pivotal role in ordering the digital environment mean this further exploration of private power relations will be fiercely pursued.

[132] In the sense that the digital environment is a new discourse, in the US the First Amendment has the potential to play a dominant role. However this should not blind people in the US to the fact that other areas of (non constitutional) law such as antitrust law have an important role to play especially where First Amendment challenge has been negatived by lawful commodification of software/information through intellectual property rights.   And in this instance the constitutional principle of a free and open discourse will be implemented through interpretation of non-constitutional antitrust law.

[133] It may be more appropriate to say we are entering the discursive millennium as convergence and digitisation make us ever more reliant on digital discursive frameworks like software. And this suggests that our paradigm of thought will rapidly and necessarily move beyond (as it no doubt has started to do) the sacred yet rudimentary notion of freedom of speech to something more intimately concerned with the free and open nature of discursive frameworks and practices. Ultimately then, the spectrum or should I say the transporter that will move constitutional scholars from atoms to bits may not be the First Amendment but a broader understanding of communicative architecture and how software, digitisation and informationalism are coming to inhabit most everything we do!