
Ken Moon*

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Introduction

An old issue

The precise legal nature of computer programs has yet to be definitively resolved - despite this question being at least as old as the very concept of unbundled commercial software1,2. The related issue of how to categorise transactions for the supply of computer programs is equally problematical3 but is outside the scope of this article. These are unresolved issues not just in common law jurisdictions but also in civil law jurisdictions such as Germany4.

1. Programs were supplied already loaded on computers and the allocated charge was included in the cost of the hardware until IBM “unbundled” its software in 1969.
2. Although in the UK the issue seems not to have been considered by the courts until Eurodynamics Systems v General Automation (unreported, QBD, 6 September 1988) where Steyn J refused to decide whether software was goods or whether a software licence was a sale. Cited in Reed and Angel, Computer Law (OUP 6th ed, 2007) 10.
4. Private correspondence with German IT law practitioners, Stefan Schuppert, Lovells, Munich and Thomas Heymann, Heymann & Partner, Frankfurt.
the country with the most jurisprudence on the nature of programs, the United States, the
courts are divided⁵.

"Programs" rather than "software"
The term "computer programs" is used in this article rather than "computer software" for a
number of reasons. The term "software" is less precise and is ambiguous. While it is
usually used in the computer industry to refer to programs as such and was coined for this
purpose⁶, and is so defined in computer dictionaries⁷, it is sometimes used to mean
computer programs together with the media on which they are stored.

Further, the common usage of the term "software" has led some to think "firmware" is
something technically quite different from programs and therefore of a different legal
nature⁸. Firmware is simply a program permanently stored in a semiconductor read only
memory (ROM), usually as part of computer hardware⁹. It is no different than any other
stored program. It is only the storage medium which is different.

Lastly, the term "software" is used increasingly more frequently outside the computer
industry as such to refer to information products which are played on electronic devices,
such as CDs and DVDs. Such products encapsulate "data", not programs.

Program Format
An analysis of the legal nature of computer programs should take into account all the
various forms in which a program may be manifested, namely, source code, machine code
(also termed binary or object or run-time code), human-readable and machine-readable
versions of both these code forms and all of them when stored in physical media. The
reason for this, as opposed to a broad brush generic approach¹⁰, is because of the
possibility that the answers to the "central questions" posed below may be format specific.
For example, the answers to each of the questions of whether programs are tangible, goods
or property, could conceivably be different depending on whether the program form is the
developer’s source code, bespoke run-time code for one user, or mass-distributed run-time
code.

Machine-Readable Program Code
There has been considerable confusion over the term "machine-readable" with reference to
program code in the software copyright cases. When Claude Shannon, one of the "fathers"
of the modern computer, brought together in his 1937 masters thesis all that was known in
the fields of binary coding, binary arithmetic, and binary logic and saw that a synthesis of
this knowledge could allow known binary switching circuits to be used to form computers,
he also was one of the first to appreciate the equivalence between the binary symbols (1
and 0) of Boolean logic and the ON and OFF states of electrical switches. That is, that

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⁵ See “Case Law on Tangibility of Programs”, post.
⁶ The term was coined in this sense in 1958 by John W Tukey, a US statistician.
⁷ eg the “Computer Software” entry in Wikipedia.
⁸ For example, "firmware" certainly sounds more “tangible” than “software”, a matter of some importan
c in ascertaining the legal nature of computer programs.
⁹ An example is the BIOS programs in IBM compatible PCs. Originally “firmware” referred only to
“microprograms” stored in a microprocessor chip which broke down complex instructions to a sequence of
simpler instructions which could be executed by a more limited hardware instruction set, such as in a reduced
instruction set computer (“RISC”). Microprograms presented special problems in US copyright law. See NEC
Corporation v Intel Corporation (1989) 14 IPR 1; (1989) 10 USPQ 2d.
¹⁰ Or even the two-format model recited by the Court of Appeal in Aerotel v Telco and Macrossan’s Application
[2006] EWCA Civ 1371 at [31] to decide the meaning of the exclusion of programs from patentable subject
matter in Art. 52 of the European Patent Convention. The court decided it was not just programs in the abstract
which were excluded, even if in writing, but programs in a form “ready to run”.

switches could be used to make binary code “readable”, executable and storable by computer hardware.

While easy to imagine as human operated switches (like a light switch for example),
electrical switches not requiring manual setting were required if switches were to provide
useful memories for computers. The electrical devices which were used as switches (in
historical sequence) to form memories included electromechanical relays, thermionic valves,
discrete transistors and large scale integrated transistors (the transistors in a “chip”).
However banks of “real” human operated switches were used as input devices (to input
programs and data) in early computers\textsuperscript{11} and indeed in mini-computers right up into the
early 1970s\textsuperscript{12} to enable operators to key in the computer “bootstrap program”.

The operator would have the bootstrap program written (by a human) in machine code (0s
and 1s) on a sheet of paper, one line per instruction. The operator would read and then
enter an instruction by setting a row of switches, ON for a 1 and OFF for a 0, and then press
an “execute” button which would cause that instruction to be read, loaded into a program
memory (“register”) and directly executed by the processor. It is most unfortunate
therefore that courts around the world in software copyright cases\textsuperscript{13} seem to have been
convinced that programs in machine code were only able to be read by a machine and could
not be read or understood by human beings. It is better to refer to machine code as
“machine-executable” rather than “machine-readable”.

To Shannon and the computer engineers to follow him the equivalence between human-
readable code and machine-readable code was and is obvious. The distinction in computer
science is trivial. However the distinction may be significant in any painstaking analysis of
the legal nature of computer programs.

What is a program for purposes of legal analysis?
A program is a set of instructions to be acted upon by a computer. The program
instructions may be written in binary code form which when rendered machine readable
may be directly executed by a computer. Or they may be written in a higher level code or
language\textsuperscript{14} (source code) from which a corresponding binary code and machine executable
program (object code) is machine-derived by a computer executing a “compiler” program.

Thus a program is both logical code (either source or object) and a machine readable
version of that code.

The machine readable code may be stored in a variety of electronic, magnetic or optical
storage media for use by a computer or for delivery to a computer. Or it may modulate a
signal so as to be transferred between computers by wired or wireless networks.

As products of the intellect of an instructional category, programs came to be considered in
copyright law to have the same status as “works” of that category which were intended for
human consumption. For the purposes of copyright a program is a literary work in common
law jurisdictions.

\textsuperscript{11} The ENIAC for example, where programming was a very tedious chore of switch setting and also the connecting
of patch cords in the manner used in manual telephone exchanges. Also, Charles Babbage’s 1822 “difference
gine”, where instead of the cards proposed for his later “analytical engine”, an operator had to make a series
of mechanical settings.

\textsuperscript{12} For example, in the then popular Digital Equipment PDP11s.

\textsuperscript{13} A few are: Computer Edge v Apple Computer (1986) 65 ALR; Apple Computer v Franklin 545 F Supp 812
(District Court); IBM v Computer Imports [1989] 2 NZLR 395.

\textsuperscript{14} Such as COBOL, C, C++, Visual Basic and the like.
In the language of the US Copyright Act of 1976, section 101, 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". "Directly" refers to a program in binary or machine code form while "indirectly" refers to a program in a high level language - which must be compiled before it can instruct a computer.

Instructions, for whatever purpose, constitute information. Computer programs, being a set of instructions, are therefore information, albeit for machines rather than humans.

Intellectual property law has accepted these propositions despite the fact that, contrary to conventional usage, computer programs are works to be read and acted upon by a machine rather than by humans and are information to be used by a machine rather than used directly by humans.

The Central Questions
The legal nature of computer programs will be discussed in the context of three questions:
(a) Are programs tangible or intangible?
(b) Are programs goods, services or something else?
(c) Are programs property? That is, is there property in programs (apart from copyright and possibly other intellectual property)?

Are Programs Tangible or Intangible?
Deciding whether programs are tangible or intangible is vital so far as the applicability of tax legislation in some countries is concerned, since those are the defining terms in the relevant statutes. Clearly, findings here may also be significant in determining whether programs are goods and/or personal property.

Definitions of Tangibility and Intangibility
The common dictionary definition of "tangible" is simply "perceptible by the touch". Other definitions found particularly in tax statutes go beyond the dictionary definition to try and catch things traditionally regarded as intangible:

"Tangible personal property’ is personal property which may be seen, weighed, measured, felt or touched, or is in any other manner perceptible to the senses.";
"tangible personal property” means “(a) personal property that can be seen, weighed, measured, felt or touched, or that is in any other way perceptible to the senses, ...

On the other hand, "an intangible is something which is not cognisable with the sense of touch.”

Thus tangibles are equivalent to the Roman res corporales and intangibles equivalent to res incorporales. "Res corporales are according to the legal definition physical things that can be touched; and res incorporales are things which do not admit of being handled ..."
Starting from first principles and leaving aside for the moment legal arguments, how can one "touch" a program? Even ignoring the impossibility of touching programs in transmission via a telecommunications network, touching a disk or chip containing a program is doing no more than touching the storage medium. This is made obvious in the situation where the disk or chip contains not one, but two or two hundred programs. Even if the ability to touch the outer casing of the storage device is deemed to suffice, the notion breaks down completely when the unanswerable question of "which program is being touched" is considered.

A Work

Having already noted that programs are "works" in the copyright sense, albeit for machines, what does this mean in relation to their tangibility? Under copyright law a work is not to be confused with the manner in which it has been recorded or fixed. Copyright will only subsist upon fixation\(^{22}\), but the work can precede the subsistence of copyright. For example, a composer may compose music on a piano and may even play it to one or more people before writing it down or otherwise recording it. The composer’s work has been in existence before the latter event. The work is the product of his mind.

Similarly for computer programs. The program (the work) is the product of the programmer’s mind. Clearly, mental products are not tangible. They epitomise \textit{intangibility}.

Information for a machine

Programs are instructions for a machine. Instructions are information. Information is knowledge. It may be public or secret. It may be recorded (whether in writing or otherwise) or not ("know how"). It may be communicated orally, in a record medium or by demonstration ("show how"). Information is self-evidently \textit{intangible}.

Information in the form of instructions for a machine must be recorded or communicated in a form which is both machine readable and machine executable. While a record medium such as a punched card, a magnetic tape, a magnetic disk (hard drive) or a semiconductor chip memory (whether non-volatile read only memory (ROM) or volatile random access memory (RAM)), is necessarily tangible the information itself is not. Information transmitted by a telecommunications system is not even stored in a tangible medium when in transit. A cable in no sense stores or holds the information (in the form of electrical signals) passing through it. Radio transmission of information does not use any tangible medium for its propagation - even the mythical aether was itself intangible.

Information for machines is as intangible as information for humans. Programs as information are intangible.

Case Law on Tangibility of Programs

In \textit{St Albans City and District Council v International Computers Ltd}\(^{23}\) Sir Iain Glidewell in deciding on whether programs were goods\(^{24}\), commented on tangibility. He referred to the program as "the \textit{intangible} instructions or commands" [emphasis added] and to "the

\(^{22}\) At least in common law countries. In France, for example, fixation for most works is not required as a precondition for copyright.


\(^{24}\) See “Are Programs “Goods”, post.
(intangible) program itself. There seems to be no other UK cases touching on the tangibility of programs.

The dearth of UK decisions on the tangibility of programs may be contrasted with the very large number in the United States. Most are tax cases where property taxes, in particular, are levied according to whether property is tangible or intangible. However, in some criminal cases involving the theft of programs, tangibility was also an issue where under the law of theft prevailing at the time only tangibles could be stolen. There are also cases under sale of goods law, that is, state adoptions of Article 2 of the Uniform Commercial Code, where, while the ultimate issue was whether programs were "goods", an antecedent issue was whether they were tangible. Unfortunately the decisions in all these types of cases are split and it is proposed here to simply mention a few of the opposing decisions.

In District of Columbia v Universal Computer Associates (1972), one of the earliest cases, the Court of Appeals for the District of Columbia Circuit held that programs were intangible, the tangible storage media was not the true object of the transaction, and therefore the programs were exempt from sale tax.

The intangible view of programs seemed to predominate until Comptroller of the Treasury v Equitable Trust Company (1983) and Chittenden Trust Company v King (1983) where both courts decided "canned" software (mass marketed object code) supplied on tapes was tangible and subject to sales tax on the basis that the programs could not be conceptually severed from their transport media. Interestingly both courts also took the view that software delivered electronically over the telephone system would be intangible and not taxable.

The Supreme Court of Kansas in the case In re Protest of Strayer held that application programs were intangible, but operating system software was tangible because the latter "is to be considered an essential portion of the computer hardware and ... therefore taxable as tangible personal property in conjunction with hardware."

Numerous courts adopted the distinctions mentioned in the preceding three cases to hold custom software intangible, software delivered by telephone intangible and "canned" software along with operating system software, tangible.

The case of South Central Bell Telephone Co v Barthelemy (1994) decided by the Supreme Court of Louisiana deserves special mention because it was considered in another jurisdiction in the 2004 New Zealand case discussed below. This case involved the imposition of "use tax" on software licensed for use by South Central Bell. Under the New Orleans City Code the tax was applicable to "tangible personal property".

The majority judgment given by Hall J first noted that Louisiana civil law equated the common law term "tangible personal property" with "corporeal movable property" and further "departed from the narrow Roman law conception that only 'tangible objects' were corporeal". Then adopting Planiol's view that incorporeal movables are rights, the court stated "Physical recordings of computer software are not incorporeal rights to be

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25. Supra at 265.
27. 464 A.2d 248 (Md. 1983).
29. 716 P.2d 588 (Kan. 1886).
30. 716 P.2d 588 (Kan. 1886) at 593.
31. 643 So. 2d 1240; 1994 La. LEXIS 2455.
32. Watson J dissented.
33. 643 So. 2d 1240; 1994 La. LEXIS 2455 at [12].
comprehended by the understanding. Rather they are part of the physical world”. The conclusion was “… we hold the computer software at issue in this case constitutes corporeal property under our civilian concept of that term, and thus, is tangible personal property, taxable under … the City Code.”

Hall J justified categorising the software at issue as tangible because “it is knowledge recorded in a physical form which has a physical existence, takes up space on the tape, disc or hard drive, makes physical things happen, and can be perceived by the senses”. Further, “That the software can be transferred to various media, i.e. from tape to disk, … or even that it can be transferred over telephone lines, does not take away the fact that the software was ultimately recorded and stored in physical form upon a physical object”. But this reasoning begs the question of the nature of the software (program) itself. A program is the thing recorded and is not the physical record.

Hall J was of the view that the form of delivery of the software was of no relevance, including delivery over telephone lines. It is suggested here the nature of the tax, a tax on “use”, strongly influenced the decision as South Central Bell was using the software when it was recorded on the hard drive of their computers. The decision may have been different, even in this court, if an application service provider (ASP) business model was employed where Bell would hold no recording of the software, that being held by the remote service provider. Hall J did note “we need not address the issue of whether use of the software, through telephonic transmission, which is never reduced to physical recordation and at rest in the City of New Orleans, is subject to the City’s use tax …”

In New Zealand the issue of tangibility was determinative in the case Erris Promotions Limited and Others v Commissioner of Inland Revenue. The owners of software source code purchased from the developers sought a tax advantage by claiming depreciation deductions for their software assets. The Commissioner of Inland Revenue disallowed the depreciation claims on the basis that the software was not allowable “depreciable property” under the Tax Administration Act 1994.

The depreciation provisions in the Act defined “depreciable property” to “not include … intangible property other than depreciable intangible property” and “depreciable intangible property” was defined in the Act to mean “intangible property of a type listed in Schedule 17”. Schedule 17 listed only, so far as software was concerned, “the copyright in software, the right to use the copyright in software, the right to use copyright in software, or the right to use software.”

The court considered the reasoning in South Central Bell (supra) and distinguished it on the basis that the definitions of tangible personal property in the New Orleans City Code and the Louisiana Civil Code were wider than would be derived from a dictionary definition – “unable to be touched” – which should be relied upon in the present case as there was no definition of “intangible” in the New Zealand statute. Furthermore, the sale and purchase agreement expressly itemised “source code” separately from its physical representation and also any copyrights related to it.

Evidence that source code was a set of instructions and thus ideas expressed in logical form, was accepted and as such the court decided source code could not be touched and was therefore not tangible. “… software is a set of instructions. Instructions cannot be touched until they are recorded in some medium and then it could be said that the medium rather than the instructions is being touched.”

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34 [2004] 1 NZLR 811.
35 [2004] 1 NZLR 811 at 826, [78].
The court followed Sir Iain Glidewell’s view in *St Albans City and District Council* that while a program on a disk was a “good”, the programs themselves were intangible and therefore not goods.

In this case, since the statutory schedule did not include source code (or any software) as such, the court disallowed the claim for its depreciation.

It can be concluded that in the UK and New Zealand programs as such are intangible at common law. In the US the situation is less clear, although it might be safe to say that at least source code would be considered to be intangible on the basis of cases which analysed whether software was goods or services, rather than tangible or intangible.

**Are Programs "Goods"?**

**Not tangible means not Goods?**

It seems logical, at least uninstructed by the case law, that it will follow that if programs are intangible they cannot be goods. Also, in contrast with goods, programs do not deteriorate with time nor wear out with use and the state of a “second hand” program used for several years will be identical to its state when new and unused.

The question of whether programs are personal property is addressed shortly, but the answer to that question may also throw light on the goods question. For example, if programs are not personal property it might be difficult to argue they are goods because sale of goods law is built on the notion of property in goods and title passing from vendor to purchaser. Indeed, it is said that personal property falling in the category called *chooses in possession* is “goods” when forming the subject of a sale\(^{36}\). On the other hand the answer may turn on whether the programs contracted for are contracts for services rather than goods, thereby side-stepping the tangible-intangible debate in relation to programs per se.

**Statutory Definitions**

Under the Sale of Goods Act 1979 (UK) section 61(1) and the Supply of Goods and Services Act 1982, s.18: "goods" includes "all personal chattels other than things in action and money ..." Chattels seem to be restricted to tangible objects at common law\(^{37}\). In *St Albans v ICL*, Sir Iain Glidewell seemed to think so, "Clearly a disc is within this definition. Equally clearly, a program, of itself, is not”\(^{38}\).

For Scotland the definition in the Acts is “all corporeal moveables except money”. "Corporeal" means tangible – the opposite of incorporeal – and therefore programs as such cannot be goods under the law of Scotland.

**Case Law: the supply medium does matter**

The common law has long been familiar with situations where what is delivered is partly goods and partly services\(^{39}\). The question is whether the deliverable is more readily characterised as goods rather than services and which is ancillary or incidental to the

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\(^{37}\) Ibid, 11. But Garrow & Fenton, *Law of Personal Property in New Zealand*, (6th ed. 1998), para 2.001, observe that fungible goods such as oil or wheat are not usually regarded as chattels.

\(^{38}\) Supra, 265.

\(^{39}\) For example, *Lee v Griffin* (1861) 1 B & S 272, where it was held that the supply of dentures by a dentist was a supply of goods because although skilled services were employed the substance of the contract was the production of goods.
predominant other. Something which is “mass produced” rather than a one off is likely to be classified “goods” and in the 1983 New South Wales case *Toby Construction Ltd v Computer Bar (Sales) Pty Ltd*\(^{40}\) Rogers J held that was the case where what was contracted for was a complete “system” comprising computer hardware, a financial software package and a word processing package. The sale of the whole computer system, was a sale of “goods”\(^{41}\).

The principle was accepted by Sir Iain Glidewell in *St Albans*, to whom *Toby Construction* was cited, even though he was firmly of the view that software itself was not goods. Nevertheless he accepted that “if the disc is sold or hired by the computer manufacturer, but the program is defective, in my opinion there would prima facie be a breach of the terms as to quality and fitness for purpose implied by the Sale of Goods Act or the Act of 1982.”\(^{42}\) In the *St Albans* case the mode of supply was such as to divorce the programs from the disc transfer medium because apart from finding the defective program was not sold or hired (it was licensed), the judge noted “an employee of ICL went to St Albans’ premises … taking with him a disc on which the new program was encoded, and himself performed the exercise of transferring the program into the computer.”\(^{43}\)

In the old cases the problematical intangible was “services” while the software cases have focussed directly on the intangible nature of the programs and whether the character of the programs has been predominated by any goods supplied with them. In *Horace Holman Group Ltd v Sherwood International Group Ltd*\(^{44}\), citing *St Albans v ICL*, it was decided the contracted programs had not acquired the quality of “goods”, because the contract did not specify the supply of a disk. The contract required that “The supplier shall deliver and install one copy of the software in respect of each permitted person on the equipment at the location on the delivery date …” and “the software so delivered shall consist of the object code of the software in machine readable form only”. Judge Havery decided this was not a contract for the sale or other supply of goods in so far as it was a contract for the supply of software. The contract was for the supply of “the computer programs specified in schedule 1 in machine readable object code form. The contract is the grant of a licence to use the software.”

In the United States, although there is some inconsistency, many courts have held that a contract for custom (or bespoke) software is a contract for services\(^{45}\) and not goods and is to be contrasted with mass-marketed software which is considered goods, at least when supplied on a physical medium. In between there is the situation where a standard software package is customised. The predominant purpose test was used and in many such instances it was held that despite the delivered software being a mix of product and services the predominant purpose was to supply a product\(^{46}\). But to many commentators, such as Nimmer, “the program is neither goods nor services”\(^{47}\).

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\(^{40}\) (1983) 2 NSWLR 48; 1 IPR 334.

\(^{41}\) This has also been the universal approach of the US courts, starting with *Sperry Rand Co v Industrial Supply Corp*, 337 F.2d 363 (5th Cir. 1964), decided at a time prior to programs being unbundled from hardware.

\(^{42}\) Cited above fn. 23 at 226.

\(^{43}\) Cited above fn. 23 at 226.

\(^{44}\) 2000 WL 491372 (QBD (TCC)).


\(^{46}\) For example, *Advent Systems Limited v Unisys Corporation* 925 F 2d 670 (3rd Cir. 1991), where it was also held that policy grounds required software to be considered as a “good”.

\(^{47}\) Raymond Nimmer, one of the founding fathers of the Uniform Computer Information Transactions Act (UCITA) and reiterated in his commentary “What law governs in the absence of UCITA?”, 10 *Hawkland UCC Series UCITA* §103:24.
These cases indicate it is not whether the programs are conveyed to the purchaser on goods which counts, rather whether any goods have been purchased along with the programs. It is almost as if the test is whether the intangible programs have been sufficiently mixed with goods when delivery is taken by the purchaser. It is tempting to see an analogy with legal doctrines (or fictions) under which intangibles were made tangible and therefore susceptible to a remedy (and no doubt conceptually easier to deal with). An example being “documentary intangibles”, where paper is deemed to have the value of the right which it represents – negotiable instruments, bills of lading etc. In the United States this merging of intangible property with something which is tangible, namely a document, to allow tangible property remedies to apply, is called the merger doctrine and is reflected in the Restatement (Second) of Torts, §242.

What of the now extremely common situation where programs are acquired online as part of an e-commerce transaction and downloaded over the internet from the vendor site. In that transfer mode the programs are neither supplied with a disk and nor is a disk even temporarily used to transport them. They are not merged with any “thing” which can be termed goods. They are merely merged with another intangible, namely an electrical signal. It is only after receipt that the programs are merged with goods, namely the computer already owned by the recipient. Programs so delivered cannot be characterised as “goods” under the principles derived from the goods versus services cases. It can be concluded that the supply of programs online cannot be a supply of goods. The supply of programs on a disk to which the purchaser does not take title and which is retained by the vendor after the program has been loaded onto the purchaser’s computer is not a supply of goods. But the supply of programs on a disk or other physical storage medium to which the purchaser takes title is a supply of goods.

This apparently contradictory conclusion seems bizarre, but must be accepted as the current law, even when it may be the same program which is being delivered in two different ways. For example Microsoft Office programs may be acquired pre-loaded on a newly purchased computer, where they will be considered goods, but if instead the Office programs are acquired online and downloaded onto a pre-owned computer they will not be considered goods.

The conclusion at common law is that the supply of programs may or may not be a sale of goods depending on what the purchaser has contracted for and receives in addition to the programs as such.

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48. Roy Goode, Commercial Law, 3rd ed. (Penguin, 2004), pp 29, 47. “In many respects documentary intangibles are treated in law in the same way as tangibles, for example in the susceptibility to claims for conversion.” The importance of this legal doctrine is surely declining in the face of electronic trading where there may be no physical document and an “electronic intangible” is surely not a tangible. An example of the law merchant once again outstripping the common law?


50. Although in some states even the impossibility of a merger (eg, pure intangible not evidenced by a paper document) no longer prevents a remedy being granted for conversion: see note 96.

51. A digital signal conveying stock market data was held not to be “electricity” and therefore not goods under the Australian Trade Practices Act (which defined electricity to be goods for the purposes of the Act) by the Full Court of the Federal Court in Pont Data Australia Pty Ltd v ASX Operations Pty Ltd (1991) ATPR 41-069.

The anomaly concerning the applicability of sale of goods rules is still at large in many countries, although it has been resolved by statutory fantasy in New Zealand, by simply amending the definition of "goods" in the Sale of Goods Act 1908 to include "software". This means that even programs purchased online and downloaded over the internet will be "goods", even when in transit.

If the implied terms from sale of goods legislation as to quality and fitness for purpose do not apply to programs, being not goods, aggrieved purchasers must look to the common law. In *St Albans v ICL*, the Court of Appeal decided the facts were such that it could imply a fitness for purpose term into the contract under common law, but this remedy is available if and only if the court finds that the parties must have intended that term to form part of their contract.

**Are Programs Property?**

Is there property in programs – apart from intellectual property rights such as copyright and possibly patents? Specifically, are programs per se personal property? This is the most difficult of the three major questions addressed in this article, not least because even the notion of "property" is a difficult concept. It seems that the common law courts have not directly decided this question and nor is it evident in any code or legislation in civil law jurisdictions. Many have asserted programs must be personal property, but such assertions must be taken as assumptions since they are not conclusions drawn from a detailed analysis of personal property law.

The question "are programs property?" is only a meaningful question for program code per se including when in machine-readable form. The answer for programs merged with removable storage media for transfer is obvious – in this situation the book analogy is correct – the media carrying the program will attract (for the owner of the media) the usual property protection laws such as the crime of theft and the tort of conversion. The question becomes meaningful when a program is resident on a computer hard drive (whatever transfer mechanism was used to get it there) because the hard drive will be owned by the owner of the computer irrespective of the "owner" of the program. It is also meaningful in the common situation where the end user licence agreement (EULA) expressly provides that while property in the media will pass to the user, the user will acquire no property in the program.

Before discussing the fundamentals of personal property law and whether programs may fall within the established categories of property it is worth making use of some of the findings made so far about the nature of programs to see what light these findings may shed on the property question.

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54. Fantasy seems appropriate to the phenomenon where things which the common law deems goods are converted to electromagnetic signals which are then transmitted from one geographical location to another to emerge as goods again at the other end. In the real world teleportation remains in the realms of science fiction.
55. *Trollope & Colls v NW Metropolitan Hospital Board* (1973) 1 WLR 601, per Lord Pearce at 609.
56. If not, what, for example, does the following ubiquitous title clause in software licences mean? "The [Licensed Programs] and the copyright and any other intellectual property rights of whatever nature in the Licensed Programs … are and shall remain the property of the Licensor …" [emphasis added].
57. See "What is Property?", post.
58. Unlike electricity, which although not in the French Civil Code is made "special property" by statute.
59. For example, even apart from the drafters of typical program licences (see note 56), Sir Iain Glidewell stated in *St Albans v ICL* (supra at 265) that "the property in the program … remained with ICL …"
It was noted that programs are mental creations (literary creations) and information. From each of these two findings tentative legal propositions on whether programs are property may be derived by induction.

**Property in Literary Creations**

It was decided as long ago as 1774 that there is no common law property in literary creations. The House of Lords so held in the famous case of *Donaldson v Becket*. This was a case brought by the book publishers to effectively extend the temporary period of copyright conferred in books under the 1709 Statute of Anne. They argued that in addition to temporary statutory copyright there was a perpetual property right in literary creations at common law. The Lords, by a 22 to 11 majority, held there was no such property known to the common law and the only property at law was statutory copyright.

By induction from the law on literary works, so far as programs are such works, no property should subsist apart from statutory copyright. In view of the weak basis for the long abolished common law copyright for unpublished works it is not suggested here that property at common law should exist in even unpublished computer programs.

**Property in Information**

Throughout the 20th century there were conflicting views in the courts and amongst the commentators as to whether information, and in particular confidential information, constitutes property. The first (and possibly older view so far as court decisions are concerned) was that it was. The bluntest declaration of a “property is anything of value” view was given in 1927 by Stringer J in *New Era Printers and Publishers v Commissioner of Stamp Duties* deciding: “anything owned by one person that could be sold and transferred to another must be property and that secret processes could be so owned and sold”.

The view that confidential information is not property is exemplified by the 1981 Law Commission (UK) in its report, *Breach of Confidence*. The Law Commission noted that the law which did protect confidential information (the equitable doctrine of misuse of confidential information) had developed notwithstanding the absence of any property concepts. In relation to theft of computer stored information the Law Commission was similarly opposed, on the basis that including information in the definition of “property” in

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60. See “What is a Program for the Purposes of Legal Analysis?”, ante.
61. (1774) 17 Parliamentary History col. 953.
62. At this time the Lords were not today’s “law lords”, but the whole House after receiving opinions from the judiciary.
63. Lord Radcliffe in *Herbert Morris v Saxelby* [1916] 1 AC 688 at 714, considered know how as a form of property, intangible in the way goodwill is. But whether even goodwill constitutes property may be doubted. Harris, for example, thinks not: J W Harris, *Property & Justice* (OUP, 1996), 52.
65. See note 63.
68. Although in the US, information has sometimes been recognised as intangible personal property, particularly if a document recording the information exists, so as to allow a remedy for misappropriation under the tort of conversion: Dodd, “Rights in Information: Conversion and Misappropriation Causes of Action in Intellectual Property Cases”, Houston Law Review [32:459 1995], citing *G S Rasmussen & Associates, Inc v Kalitta Flying Service, Inc* 958 F.2d 896 (9th Cir 1992) and other cases.
the Theft Act 1968 would cause "problems which have general implications outside the region of computer misuse".\(^ {69}\)

One difficulty\(^ {70}\) is that the vendor of confidential information inevitably retains that information\(^ {71}\). It is as if the purchaser receives only a "copy". Of course the vendor may be contractually prohibited from using the information, but that state of affairs is somewhat different from a classic property transaction\(^ {72}\). Similarly, in the criminal sphere in cases where information (data or program files) is alleged to have been "stolen" from a computer, the thief has actually made a copy and generally left the original files intact in the computer.

The way in which existing law protects against misuse of confidential information is by examining the nature of the relationship between the parties and conferring rights \textit{in personam} on the owner, and corresponding duties on the recipient of the information under equitable principles\(^ {73}\).

There is also a middle-ground view that commercial information (only) should be given limited property rights allowing for alienation and a trespassory right against commercial competitors only\(^ {74}\).

However, in at least the last few decades of the 20\textsuperscript{th} century the courts in the UK and the Commonwealth have refused to accept the invitation to confer property status on information in both civil\(^ {75}\) and criminal\(^ {76}\) matters\(^ {77}\). As was said by Latham CJ in \textit{The Federal Commissioner of Taxation v United Aircraft Corporation}, "Knowledge is valuable, but knowledge is neither real nor personal property."\(^ {78}\)

The currently prevailing view of the courts leads to an initial conclusion that to the extent programs are mere information then they are not property, even if kept confidential as is source code (if not made "open source") although not the run-time code distributed to users.

But is there such a direct equivalence between programs and information that compels such a conclusion? It is suggested that the informational characteristic of programs can be distinguished from "normal" information with which the law has dealt with in the past and therefore that any conclusion drawn from the status of information \textit{simpliciter} need not necessarily hold for programs. Programs are instructions to be acted upon directly by machines, that is, computers, to determinatively control the machine's behaviour.

\(^{69}\) Law Commission Working Paper 110.
\(^{70}\) Hammond sets out eight difficulties in “Quantum Physics, Econometric Models and Property Rights to Information” (1981) 27 McGill LJ 47, 54.
\(^{71}\) An influencing factor \textit{in Federal Commissioner of Taxation v United Aircraft} (1944) 68 CLR 525 at 535, (High Court of Australia) where property status was denied.
\(^{72}\) An exclusive licence may be the true form of transaction for the conveyance of trade secrets.
\(^{73}\) “That is, the law protects confidential relationships, and improper conduct with respect thereto”: Hammond, “Theft of Information”(1984) 100 LQR 252 at 257.
\(^{74}\) J W Harris, \textit{op cit}, Chap 17(iii). An intermediate approach is also alluded to in Bridge, \textit{op cit}, 5.
\(^{75}\) \textit{Boardman v Phipps} [1967] 2 AC 46 at 128 per Lord Upjohn, “But in the end the real truth is that it is not property in any normal sense but equity will restrain its transmissions to another if in breach of some confidential relationship”.
\(^{76}\) \textit{Oxford v Moss} (1978) 68 Cr. App. R 183 (theft of examination paper with intent to return it); \textit{R v Stewart} (1988) 1 SCR 963 (Comprehensive analysis by Lamer J giving the unanimous judgment of the Canadian Supreme Court on attempted theft of list of names and addresses of employees of a hotel).
\(^{77}\) Interestingly the legislature in New Zealand made the theft of trade secrets a crime, provided they are embodied in a document, by the Crimes Amendment Act 2003. A similar proposal was made in the UK 1997 Law Commission Consultation Paper 150, “Legislating the Criminal Code: Misuse of trade Secrets”, but the Commission has yet to issue a report.
\(^{78}\) Supra, see note 70.
Programs are not intended primarily, or at all, to be for the enjoyment or instruction of humans. They literally form part of a machine (albeit an intangible part) and without them a computer is a completely non-functional machine. Programs, while being information are more than just information. The law may well be expected to view machine “parts” as being in a different category to information simpliciter.

Judicial support for this view is to be found in the early English cases on the patentability of computer programs79. In Gevers Application80, which was an appeal on a finding of a Patent Office hearing officer that computer program-related inventions were not patentable inventions, Graham J decided a computer program was analogous to a mechanical cam whose surface shape causes a machine to perform in a predetermined manner.

"[A computer program is recorded in a deck of punched cards] which ensure that it is capable when placed in its machine of controlling that machine in accordance with predetermined directions. In this respect it seems to me to differ from a card which is merely printed and which is intended to convey information to the human eye or mind, but which is not intended to be ancillary to some machine being specifically shaped or constructed for that purpose."81

In view of these distinctions it is posited that the absence of property in information intended for humans does not require a legal conclusion that there is no property in programs for computers and that the nature of the differentiating features of programs may point to the opposite conclusion.

What is Property?

Attempting to draw conclusions on the property status of programs by induction from the property status of the conceptual components of programs is one approach, but what can be deduced from a review of the fundamental elements of the legal concept of (personal) property?

A fundamental analysis of property, whether in terms of the now criticised82 open-ended Hohfeldian “bundle of rights”, a closed bundle of the most important rights83, Harris’s trespassory, property-limitation, expropriation and appropriation rules84 or Pretto-Sakmann’s rights in rem for a thing locatable in space (rights in rem locabiles)85 does not assist in answering the question whether a thing is definitively property at common law. These theories seek to explain the nature of property or property rights, but only the courts (or the legislature) can say whether a thing has the status to attract such property rights.

In the absence of applicable decisions of the courts, all that can be done is to ascertain if a particular thing could possibly fall within a plausible category of property so as to make it more or less likely that a future court can pronounce it to be property.

Under Roman law, property was subdivided into res corporales and res incorporales. That is to say, tangible things (both realty and personalty) on the one hand and intangible things

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79. These cases were decided under the Patents Act 1949 (UK) and have been largely forgotten within the UK since the coming into force of the Patents Act 1977 which, contrary to the patents legislation in Australia and New Zealand, excludes computer programs as such from patentability.
81. At page 98.
82. eg Penner, The Idea of Property in Law (OUP, 1997), 23.
83. Often stated to be (i) the power of enjoyment (eg the determination of the use to which the res is put); (ii) possession, which includes the right to exclude others; (iii) power to alienate inter vivos, or charge as security; and (iv) power to leave the res by will. See Paton and Derham, A Text-book of Jurisprudence, 4th ed. (1972), 517.
84. Ibid, Harris, Property & Justice, 139.
85. Pretto-Sakmann, op cit, 218.
on the other. Unfortunately neither the common law nor the civil law followed this logic. Both instead focussed on the division between realty and personalty - immovables and movables in civil law.

What can be personal property? In civil law jurisdictions it is what is specified in the codes or in subsequent special legislation. Computer programs are not expressly movable property under either the more liberal French style law, which recognises intangibles can be property, or the more rigid German style law, which does not. In common law there are no limitative definitions of property, and personal property is any property which is not real property. However, by 1885 the English courts had decided personal property had to fall within either one of only two categories of property: "All personal things are either in possession or in action, the law knows no tertium quid between the two."

That is to say, personal property must either be a chose in possession or a chose in action. It seems to have been accepted that a chose in possession must be a tangible thing - possibly because choses in possession have been assumed to correspond directly to the Roman Law category of personal property, "res corporales" (tangible thing). Notwithstanding the apparently rigid 1885 categorisation of personal property it is frequently said that (unlike in the civil law) common law property is capable of expansion, and indeed the House of Lords visited this issue in 1965 in National Westminster Bank v Ainsworth, Lord Wilberforce stating: "before a right or interest can be admitted into the category of property ... it must be definable, identifiable by third parties, capable in its assumption by third parties and have some degree of permanence or stability."

Unfortunately modern reality seems no longer to match theory as the courts have proven resistant to creating new forms of property in the last century. In addition to...
the example of confidential information already discussed, another example is electricity\textsuperscript{95}. Even judicial recognition of full property rights for \textit{chooses in action}, despite the latter’s unchallenged status as property, has recently been denied on the ground that this property is not tangible\textsuperscript{96}.

**Programs and Common Law Categories of Personalty**

Assuming for the moment that Fry LJ’s dictum is still good law, can computer programs be \textit{choice in possession}? Or \textit{choices in action}? Or neither? If the latter, then on the traditional view of common law personal property they cannot be property.

Dealing with the first category of Fry LJ, a \textit{choice in possession} is a thing characterised by being capable of: (a) physical possession, (b) being enjoyed by the possessor, (c) transfer by delivery, (d) either absolute or qualified possession, and (e) characterised (usually by implication) by its tangibility.

A computer program, whether source or object code and whether stored in a hard drive or on portable storage media, arguably\textsuperscript{97} meets the first four requirements of a \textit{choice in possession}, but, based on the conclusion expressed earlier, is not tangible. It is therefore not a \textit{choice in possession} unless the notion that only tangibles can be in possession is displaced. The usually unstated requirement of tangibility has only come about by the belief that \textit{chooses in possession} are direct analogues of the Roman Law \textit{res corporales} – a belief formed when the existence of intangible property other than legal rights was unimaginable. Nevertheless, the long tradition of this characterisation of \textit{chooses in possession} makes it difficult to displace.

\textit{Chooses in action} are “personal rights of property which can only be claimed or enforced by action and not by taking physical possession”\textsuperscript{98}. A \textit{choice in action} has also been defined as “a thing which you cannot take, but must go to law to secure”\textsuperscript{99}. It is a legal right (usually a contractual right) upon which property rights are conferred. The classic example of a \textit{choice in action} is a debt.

A computer program is self-evidently, of itself, not a legal right of any sort, and therefore cannot in logic be considered a \textit{choice in action}.

Are Fry LJ’s property categories correct – both in number and in content? Many, even in the late 19\textsuperscript{th} century, have been reluctant to accept the dichotomy and in particular its consequences for the validity and usefulness of the \textit{choices in action} category.

\textsuperscript{95} Ball, op cit, 20 states in a comparative law context that in England “Electricity … is not capable of ownership”, citing the theft case, \textit{Low v Blease} [1975] Crim LR 513, but does not discuss any civil cases. In New Zealand the result in \textit{Low v Blease} had been anticipated with the Crimes Act 1908 being amended in 1952 to make electricity “a thing capable of being stolen”. In 2003 this elegant solution (which had been adopted in the subsequent Crimes Act 1961) was superseded by crudely redefining “property” to include “electricity”. This raises the question that if electricity is not property at common law, how is the generator able to sell it? See note 51 for cases on whether electricity is “goods”.

\textsuperscript{96} OBG Ltd v Allan [2007] UKHL 21, where the House of Lords by a 3:2 majority denied the applicability of the tort of conversion to anything other than chattels. The courts in some states of the US have now abandoned this traditional view of conversion and have held that pure intangible property, and not just legal rights, can be converted: \textit{Thyroff v Nationwide Mutual Insurance Co} 8 NY 3d 283 (2007), relating to electronic documents and citing the other cases where the tort of conversion has been extended.

\textsuperscript{97} On the other hand how does a dispossessed owner regain possession of a program on the hard drive of someone else’s computer? A fragment of a hard drive cannot be taken – the program owner does not own that anyway. A copy must be made, using the computer, onto a removable storage medium and then the program on the hard drive deleted. The concepts of “copying” and “deletion” seem very alien to the repossession of property.

\textsuperscript{98} \textit{Torkington v Magee} [1902] 2 KB 427 at 430.

\textsuperscript{99} T Cyprian Williams, “Property, Things in Action and Copyright”, (1895) 11 \textit{LQR} 223 at 232.
Lindley LJ, one of the majority of the Court of Appeal in *Colonial Bank v Whinney* had stated, “Though debts, money in the funds, shares in companies, copyrights and patents are all incorporeal personal property. They are so different in their nature and legal incidents, that care must be taken not to be mislead by giving them all a common name which conceals their differences. We all know that our law has not been put into a very scientific shape, and there is often considerable difficulty in determining in what sense a particular expression, such as a *chose in action*, is used.”

Fry LJ did not test his own definition against copyright, patents and registered trade marks which were declared property under the statutes which sustained them. Elphinstone doubted these statutory properties were *chooses in action* and quoted Williams, “For want of a better classification these subjects of personal property are now usually spoken of as ‘chooses in action’. They are, in fact, personal property of an incorporeal nature ...”. Elphinstone’s article seems to have sparked the celebrated debate in *The Law Quarterly Review* in 1895 and 1896 (only 10 years after *Colonial Bank*) between Sweet, Spencer Brodhurst and Cyprian Williams, on which of Fry LJ’s categories was appropriate for copyright. They all noted a number of characteristics which copyright did not share with debts and it says little for the aptness or utility of the categorisation that Brodhurst argued that if one category had to apply then it should be a *chose in possession* while Sweet and Cyprian Williams came to the opposite conclusion, namely *chooses in action*.

In the 20th century the Fry LJ property categories were refuted by at least one judge and either questioned or more politely put to one side by the property theorists. Kiralfy in 1958 asserted the term *chooses in action* “does not strictly include certain modern forms of property, such as patents ...” Starke in 1972 argued that Fry LJ’s dictum “is hardly tenable today when such interests as, eg secret processes and know how, have gained legal recognition, and are treated as sui generis, without being deemed *chooses in action*. “ Paton and Derham were critical of the “wide extension of the term *chose in action*” with all manner of legal rights therefore bound by the same rules - eventually requiring “a patchwork of statutory amendments dealing with particular problems.” Lawson and Rudden apologise for even using the term *chooses in action*. Bridge describes *chooses in action* in the words: “These are what remain after the elimination of corporeal chattels and are the residual category of personal property.” Pretto-Sakmann sees no merit in a category comprising the residue, stating “*chooses in action* are best encouraged to slip into obsolescence ... when chattels are subtracted from things, the taxonomical utility of a category of “all the rest” is marginal.” Penner has emphasised the bizarre nature of a category which groups together *rights in rem* (such as copyright and patents) with *rights in personam* (such as debts and shares).

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100 (1885) 30 Ch D 261 at 283
103 Sweet, “Chose in Action” (1895) 10 LQR 303; Spencer Brodhurst, “Is Copyright a Chose in Action?” (1896) 11 LQR 64; T Cyprian Williams, “Property, Things in Action and Copyright”, (1895) 11 LQR 223.
104 Stringer J in *New Era Printers and Publishers Ltd v Commissioner of Stamp Duties* [1927] NZLR 438 at 444, “... and if there is no place for a secret process in existing definitions the result is not that the secret process is not property, but that the definitions are defective”.

106 See note 65.
109 Op cit, 4.
110 Op cit, 65.
As can be seen there is considerable doubt as to the validity of Fry LJ’s “too all-embracing” categorisation of personal property. The implication is that a choice in action does not appropriately and consistently describe all property which is not in possession or tangible. Alternatively there must be a third category into which some of the present components of choice in action ought to be moved. In 1977 the English legislature seemed to agree. The Patents Act 1977, s.30(1) declares patents to be “personal property (without being a thing in action)”. As choises in possession seem to require tangibility, patents granted under the 1977 Act must be a form of property not recognised by Fry LJ. They are clearly intangible (they are not only legal rights but also rights to an intangible – ideas) and the straight-forward answer is that they are simply “intangible property” - as they would have been if they had existed under Roman Law. This seems more useful than the only alternative, namely, that they are sui generis property having no commonality with any other form of personal property.

It is suggested that the appropriate view of the categories of personal property at common law, especially after taking into account legal and technological developments since Colonial Bank v Whinney in 1885, is that the major category counterposed to choises in possession is “intangible property”, of which choice in action are but a sub-category. Intangible property, extending beyond merely those legal rights which might rightly remain in the sub category of choice in action could accommodate both new intangibles of significant economic value and also legal rights such as patents, which in the UK at least are by statute no longer choice in action.

It is proposed that computer programs could and should be personal property by virtue of being “intangible property”. Although not the subject of this article, it seems that this category could also capture electricity, were the common law to at long last recognise electricity as property. And no doubt also, the third building block of the information age, confidential information - if and when the arguments for its property status outweigh those against.

Unfortunately, in the absence of a definitive decision of the courts of the UK and Commonwealth admitting programs into the category of property, the conclusion for the present must be that the property status of computer programs is indeterminate – apart

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113. re Marshall (Deceased), Commissioner of Inland Revenue v Public Trustee [1965] NZLR 851 (Court of Appeal) at 861 per McCarthy J.
114. Suggested for copyright by Vaver in “Can Intellectual Property Be Taken to Satisfy a Judgment Debt?”, 6 Banking & Finance Law Review 255 at 293 note 109, querying Fry’s “binary” classification and referring to Starke’s third category for confidential information (see note 63).
115. The Patents Act 1949, by contrast, had expressly stated patents were choice in action in sections 38(5) and 54(5). The only practical effect of this unexplained (but theoretically desirable) change, according to at least one author, is that patents may now be the subject of seizure: Terrell on Patents, (Sweet & Maxwell 16th ed, 2006), [10.09]. But at common law seizure is a personal property remedy available for choice in possession rather than for anything not a choice in action and therefore cannot be available for intangible property such as patents. As summarised by Vaver, op cit, 256: “a sheriff could generally seize only what he could physically lay his hands on”.
116. Interestingly, in Green, “To have and to hold? Conversion and intangible property”, (2008) 71 MLR 114 at 118, the author, dealing only with different legal rights in an analysis of the House of Lords decision in OBG v Allan (supra), proposed the opposite, namely that “intangible property” should be a sub-class of choice in action.
117. Despite the courts in former years holding that electricity, being intangible, was not property for the purposes of criminal law, thereby requiring legislation deeming it to be a thing capable of being stolen.
118. The position of programs under the criminal law is no better. Tapper’s conclusion following the decision in Oxford v Moss still seems correct: “… it means that computer programmes cannot be stolen unless they are recorded on some physical medium which the thief intends to keep”: Tapper, Computer Law (Longman, 3rd ed 1983) 216.
from the subsistence of intellectual property, namely, copyright\textsuperscript{119}. On the other hand a few US courts have at least tacitly recognised programs as being property by holding that the property protection tort of conversion applies to misappropriated programs.\textsuperscript{120}

**Conclusion**

Computer programs have been in commercial use since the 1960s and their economic value (on one estimate $320 billion was spent globally on programs and associated computer services in 2005\textsuperscript{121}) has been very significant and growing for decades, not to mention their omnipotence in business and personal life. Yet the law is ambiguous as to whether programs are tangible or intangible, whether they are goods, services or something else and apart from some enlightened attempts in the US\textsuperscript{122} leaves their property status indeterminate. And this is due to the law’s failure to understand intangibles in general and to evolve to properly recognise them without the use of anachronistic legal fictions which pretend they are tangibles in situations which have diminishing applicability in modern (electronic) commerce.

Unnoticed by the legal profession a “law merchant” is in fact underpinning current software transactions. However, structures which do not incorporate full property rights in their subject matter may be very fragile indeed if the views of the noted Peruvian economist, Hernando de Soto\textsuperscript{123} are correct. Namely, that the absence of true property and property relations resulting from the securitisation of sub-prime mortgages and other lending transactions was a facilitator of the 2008 global financial collapse.\textsuperscript{124}

\textsuperscript{119} The New Zealand Court of Appeal in *Pacific Software Technology Ltd v Perry Group Ltd* [2004] NZLR 164 per Hammond J at 179, came close to at least deciding whether the property protection tort of conversion was applicable to programs per se, but unfortunately, although rightly in view of the parties’ arguments, decided merely that the *copyright* in program source code could be converted and delivery up of the original source code held by the developer was an appropriate remedy for the party found to be the copyright owner. While perhaps reflecting a developing US view, this itself seems at odds with *OBG v Allan* (supra, see note 19) and *R v Wilkinson* [1999] 1 NZLR 403 which both resisted the applicability of the tort of conversion to *chooses in action*.

\textsuperscript{120} *National Sur. Corp v Applied Syst. Inc* 418 So 2d (Ala 1982); *Cole v Control data Corp* 947 F2d 313 (8th Cir 1991).

\textsuperscript{121} SIIA report, “Software and Information: Driving the Global Knowledge Economy”, [www.siia.net/estore/globecon-08.pdf](http://www.siia.net/estore/globecon-08.pdf).

\textsuperscript{122} See note 94 (extension of trespass to goods to cybertrespass and note 96 (conversion of intangibles).

\textsuperscript{123} President of the Institute for Liberty and Democracy based in Lima.

\textsuperscript{124} Keynote address given by de Soto at the opening of the 2008 International Bar Association conference in Buenos Aires on 12 October 2008 where he stated “Property creates the most important informational relationship ever” and “In the sub-prime crisis people left real estate and went into securitization, which negated relationships. Now we don’t know who owns what”: [www.ibanet.org/iba/home_edit.cfm](http://www.ibanet.org/iba/home_edit.cfm).