Copyright Protection of Computer Software

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Introduction

Every piece of software represents a substantial investment of time and creative energy with the result that software has an independent and often considerable economic value. In few other products is the ratio of development cost as large as it is for software yet, once developed, a software package can usually be produced and reproduced for a nominal sum. Piracy is easy and the temptation to copy software, be it for commercial exploitation or personal use, is great. Software developers, it is argued, have legitimate property interests in the computer programs they produce and are entitled to fair and just rewards for their work; widespread and unauthorised copying, and consequent undermining of the market, deprives such developers of their income. Technical protection strategies such as encryption have proved largely ineffective against the determined software plagiarist and attention has turned to possible legal solutions.

The international trend is to safeguard property interests in software by the use of copyright law. Copyright is an automatic and cheap form of protection which has much to commend it to software developers. Once an original literary work in material form is created, copyright immediately subsists in that work. Furthermore, the term of protection outlasts the commercial life of most technological products, enduring until fifty years have elapsed since the year of the author's death. As a corollary to the exclusive right to prevent others from copying or reproducing the work, software developers as copyright owners are granted a limited monopoly in their products. This protection can be seen to benefit the wider community by encouraging the distribution and circulation of information. Certainly, its absence of formalities

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means the copyright approach is well suited to mass produced and mass marketed goods such as computer software. Moreover, the law of copyright is not inconsistent with protection of computer software by way of the law of confidence, a method traditionally utilised in such bilateral, contractual relationships as when a software house is commissioned to write a tailor-made package for its client.[1]

Despite these positive qualities, the limitations of copyright as a method of software protection should also be acknowledged.[2] It is commonplace to declare that copyright is designed to protect any material expression of ideas but does not extend to protecting the ideas themselves. The fundamental axiom that copyright does not extend to ideas, procedures, processes or systems has its roots in the United States Supreme Court decision in *Baker v Selden*.[3] It that case it was suggested that the line between idea and expression may be drawn with reference to the ends to be achieved by the works in question:[4]

> [T]he purpose or function of a utilitarian work would be the work's idea, and everything that is not necessary to that purpose or function would be part of the expression of the idea. . . . Where there are various means of achieving the desired purpose, then the particular means chosen is not necessary to the purpose; hence there is expression, not idea.

Thus, while copyright law protects against copying, it does not preclude the independent creation of a new work with similar features. In any event, it may be difficult to prove that there has been an unauthorised infringement of software copyright as it is possible for the functions of a program to be plagiarised by using different codes or computer languages. Finally, as more and more computers permeate the workplace and private homes, the problems of detecting copyright infringements are exacerbated to such an extent that it may be impractical to bring proceedings even if widespread abuse is known.

The shortcomings of copyright law have prompted some commentators to argue for the creation of a new form of protection independent of existing legislative models.[5] In 1980 the New Zealand Industrial Property Advisory Committee recognised the potential for sui generis legislation and stated their belief that "in the long run an international solution through the World Intellectual Property Organisation will be necessary."[6] Australia has proceeded by way of amendment with the enactment of the Copyright Amendment Act 1984 (Cth). The unwillingness of legislatures to enact sui generis legislation

1   Niblett, *Legal Protection of Computer Programs* (1980) 59.
2   Hughes and Sharpe, *Computer Contracts* (1987) 76-77.
3   101 US 99 (1879).
4   *Whelan Associates Inc v Jaslow Dental Laboratory Inc* 797 F 2d 1222, 1236 (US Court of Appeals, 3rd Circuit, 1986).
5   See for example Kindermann, "A Review of Suggested Systems for the Protection of Computer Software" in Perry and Brett (eds), *The Legal Protection of Computer Software* (1981) 139-172.
6   *The Legal Protection in New Zealand for Computer Programs – Report to the Minister of Justice* (1986) para 3.6.

can, in part, be attributed to the fear that any such legislation would soon be rendered otiose by technological advances.

There are two major areas of continuing debate regarding protection of software by recourse to the law of copyright. The first concerns the availability of copyright protection for computer programs in source code and object code form. The second relates to the scope of protection given to both the structure and presentation of computer programs.

In the first part of this article, it is proposed to trace recent developments in Australia and New Zealand in order to identify relevant "first generation" copyright issues. Particular reference will be made to *Apple Computer Inc v Computer Edge Pty Ltd*[7] (*Apple v Computer Edge*) and to the recent judgment of Smellie J in *International Business Machines Corporation v Computer Imports Limited*[8] (*IBM v Computer Imports*).

The second part of this article will be devoted to a discussion of relevant "second generation" issues; whether the "look and feel" of user interface is copyrightable, or whether the screen format, structure, sequence and organisation of a program constitute "ideas" and are therefore outside the scope of copyright protection.

Look and Learn – First Generation Issues

Before considering the case law in this area, it is instructive to briefly discuss the nature of computer software and to highlight the distinction between source code and object code. In this form, the program consists of a series of electrical impulses. The computer is operated by the presence or absence of this electrical impulse in the programmed sequence. The presence or absence of such impulses is denoted by a "1" or a "0" respectively in written program representations, which are thus called binary object code. Such code is largely unintelligible to the human observer.

To facilitate communication between programmer and machine, new totally unambiguous languages, such as BASIC or Pascal, had to be invented. Programs are initially written in these "high level" languages. The product is the source code. In order for source code to become "machine readable" it undergoes a conversion or compilation process into binary object code form. In this form it may be stored semi-permanently on a magnetic tape or disk or permanently in a ROM (read only memory) semiconductor chip.

Apple v Computer Edge

Apple Computer Inc (Apple) is an international corporation which designs, promotes, sells and distributes personal computers. Among its products is the

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7   (1983) 1 IPR 353; (1984) 2 IPR 1 (Full Federal Courts); (1986) 6 IPR 1 (HCA).
8   High Court, Auckland. 21 March 1989 (CP 494/86).

Apple II model, a microcomputer containing six Read Only Memory (ROM) chips, five of them storing an operating system[9] program in object code form known as "Applesoft" and one storing an operating system program in object code form known as "Autostart". Computer Edge Pty Ltd (Computer Edge) imported and sold in Australia "Wombat" computers manufactured in Taiwan. Each Wombat computer contained two ROMs and an erasable and programmable ROM (EPROM) which uncontested evidence revealed could only have been directly copied from the Apple ROMs.

In keeping with their reputation for pursuing organisations which violate their exclusive rights as copyright owners,[10] Apple brought proceedings against Computer Edge claiming, inter alia, that Computer Edge had breached copyright by copying the Apple programs in source code and object code.[11] Apple's alleged copyright was contingent upon a program (in source code or object code as circumstances required) being classified, pursuant to s 31(a)(i) and (vi) of the Copyright Act 1968 (Cth), as one or more of the following:

(i)   an original literary work;
(ii)   an "adaptation" of a literary work; or
(iii)   a "reproduction" in material form of an original literary work.

By the time *Apple v Computer Edge* reached the High Court of Australia, the status of source code as a literary work was not seriously in dispute. Nevertheless, each judge outlined the qualities of source code which entitled it to copyright protection. Brennan J, for example, stated:[12]

> [T]he source programs were the product of substantial originality and skill, they were prepared as instructions for the manufacture of Apple II ROMs, they were in writing and they conveyed meaning at least to computer scientists and technicians. That is sufficient to bring them within the scope of literary copyright.

Of course this must be correct. If a list of meaningless codes is a literary work,[13] how much more so is a clearly articulated sequence of instructions consisting of abbreviations of English words.

However, when the copyright status of the program in object code form was considered, the majority of the High Court (3:2) had difficulty equating a series of electrical impulses in a ROM with a traditional literary work and were not prepared to grant copyright protection to computer programs in this form. In reaching this conclusion, the High Court placed considerable weight on the fact that electrical impulses in a silicon chip cannot be perceived by the

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9   An operating system controls the internal functioning of the computer's components. It enables the computer to execute an application program (such as a word processing package) and to access files, disk drives and other system resources.
10 "First Loss in Apple's Long Battle" *Computerworld* (16 December 1983).
11 The arguments concerning alleged breaches of the Trade Practices Act 1974 (Cth) will not be canvassed in this article.
12 (1986) 6 IPR 1, 20.
13 *DP Anderson & Co Ltd v Lieber Code Co* [1917] 2 KB 469.

senses and are not intended to convey any message to a human being.[14] Echoing the dissenting judgment of Sheppard J in the Full Federal Court, Deane J declared:[15]

> [R]egardless of how widely one construes the phrase, the arrangement (or series) of electrons or electrical charges in the silicon chip does not constitute a "literary work". It is not written. It is not in a comprehensible language. It cannot be read. It cannot even be seen. Nor is it designed or produced to be read or seen. It is, and was designed and produced to be, an attribute of a functioning part of an operating machine.

Similar logic was applied to the question of whether object code was an "adaptation" (translation)[16] of the source code. It was argued by Apple that the conversion of source code into object code was a process which effected the translation of the source code from one language into another language and it was immaterial that the latter language could only be read and understood by a machine. Reliance was placed by Apple on the Shorter Oxford English Dictionary which defines "translation", inter alia, as "the expression or rendering of something in another medium or form."[17]

While Mason and Wilson JJ, in dissent, accepted that a translation need not be limited to a representation in a language spoken by human beings, Gibbs CJ considered that object programs embodied in the ROMs could not be a translation of the source code because they were not turned into another language; they were turned into electrical impulses. He took the view that translation meant the action or process of conversion from one language to another and that any other interpretation would upset the framework of the Act.[18] However, both Gibbs CJ and Brennan J held that Apple's translation argument foundered in any event because any such adaptation must itself be a literary work and nothing in the form of electronic impulses could be literary.

Finally, on the issue of "reproduction", Apple failed to establish the requisite degree of similarity between the written source code and the Wombat ROMs and EPROM. Here the High Court compared the physical manifestation of works and not simply the works embodied therein. As stated by Gibbs CJ:[19]

> Neither the silicon chips nor the electrical impulses that may be generated in them have the slightest resemblance to the written source programs. The Wombat ROMs and EPROM may well be reproductions of the Apple ROMs but they are not reproductions of the Applesoft and Autostart source programs. . . . [t]he ROMs and EPROM embody the idea, and the

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14   Supra at note 7, at 7 per Gibbs J. It should be noted that the High Court did not rule out the possibility that copyright might subsist in object code print outs in binary or hexadecimal form. Gibbs CJ commented that "the printout of an object program may be a literary work" but that it was not necessary to decide the question in this instance.

15   Ibid, 31.

16   An "adaptation" of a literary work includes a "translation of the work" s 10(1) Copyright Act 1968 (Cth).

17   Supra at note 7, at 8.

18   Ibid, 10.

19   Ibid, 9-10. Gibb CJ's definition of reproduction appears to be unaffected by the Copyright Amendment Act 1984 (Cth).

logical structure, of the source programs, but they do not reproduce the expression of the idea of and the logical thought which is to be found in the source programs.

By imposing a requirement of visual similarity, it is submitted that the High Court – as they did when considering argument on adaptation – made the error of fixing attention on the medium and not the message. A work is distinct from the material form in which it is embodied. Apple did not claim copyright in the transitory electrical impulses, the "ink" of the computer, but rather the fixed collocation of words in the source code as represented by the ROMs. Further, to require that object code be communicable to the program user is to misunderstand the relationship between object code and source code. Object code corresponds exactly with the source code from which it is derived. The High Court rejected the argument which submitted that object code stored on disk, tape or silicon chip amounts to a fixed embodiment of a literary work in a material form and, instead, preferred to focus on the dynamic nature of object code as a sequence of electrical impulses.

IBM v Computer Imports

In New Zealand the first substantive court action to consider whether the Copyright Act 1962 (NZ) applies to protect computer software was *IBM v Computer Imports*. IBM claimed (inter alia) copyright in a chip containing a Basic Input Output System (BIOS)[20] computer program in object code form.

Because the defendants, in earlier proceedings, had conceded that copyright may subsist in both source code and object code, Smellie J's comments on this point must be regarded as obiter dicta and open to possible challenge. Nevertheless, his discussion of first generation issues usefully summarises the law in other jurisdictions and provides a conclusion which should reassure software developers in New Zealand. Smellie J concluded first that source code is protected as a literary work under s 7(1) of the Act "since it is designed to give information and instruction, and it is expressed in print or writing, albeit writing that consists of numerous algebraic symbols and technological keywords."[21] This view is supported by numerous overseas authorities as is Smellie J's opinion that object code does not qualify for copyright protection as a literary work in its own right. Like the High Court of Australia before him, Smellie felt that if electrical impulses in a silicon chip were held to be a literary work, it would be difficult to see what would give the work its literary quality.[22]

Unlike the Australian legislation, there is no requirement in New Zealand that an adaptation of a literary work be a literary work in its own right. The definition of "literary work" in s 2(2) includes "an adaptation of a literary

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[20]   A rudimentary operating system. See supra at note 9.
[21]   Supra at note 8, at 23.
[22]   Ibid, 27.

work" and "adaptation" is further defined to include a "translation" of the work. Smellie J, therefore, was able to distinguish the judgments of Brennan and Gibbs JJ in *Apple v Computer Edge*.

Smellie J gave the term "translation" a fair, large and liberal interpretation in accordance with the Acts Interpretation Act 1924 and concluded that object code was:[23]

> [N]othing more than the expression of source code in a form that the computer can read and act upon, and on that basis . . . is a "translation" of a literary work within the meaning of the Act, and hence protected by copyright.

Finally, Smellie J disposed of the remaining question as to whether object code amounts to a "reproduction" of the protected work in material form, by pointing out that so long as there is a way of comparing the program alleged to have been copied with the alleged infringing work, "it is not important that object code is not itself perceptible."[24] Because of the substantial similarity between the two programs, as found both in hexadecimal notation printouts and in dissembled in source code form, his Honour was left in no doubt that the defendant's program was an unauthorised reproduction of the plaintiff's source code in different material form.

The detailed conclusions set out by Smellie J in *IBM v Computer Imports* augur well for New Zealand software developers. Nevertheless, the expanding frontiers of the computer industry present new challenges to lawyers who seek to keep up with trail-blazing engineers and entrepreneurs.

Look and Feel – A Second Generation Issue

Actions Abroad: The Law to Date

In the United States, the thriving business of clone-makers has prompted many software houses to claim proprietary rights in the design and presentation of their products. By resorting to "clean room" procedures[25] manufacturers develop clone software which is designed to generate screen displays similar or identical to the original product. As a result, a user of the clone software enjoys the same user interface or "look and feel" as a user of an original product.[26]

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23 Ibid, 32.
24 Ibid, 37-38.
25 Under a clean room approach, the designers of clone software do not have access to the copyrighted code but instead work from functional specifications prepared by another group. Without direct reference to the program code of the original product no literal plagiarism occurs.
26 Hughes, "Australian Computer Law and the English Experience" (1988) 16 ABLR 208, 211. Note also that in *Lotus Development Corporation v Paperback Software International Inc* and *Lotus Development Corporation v Mosaic Software*, two case pending in the US District Court for the District of Massachusetts, Lotus has sought to restrain two much smaller companies from making products which emulate the famous 1-2-3 spreadsheet program.

In this context, an important second generation issue has arisen as to the extent to which plagiarisation of only the method of operation, appearance and general user interface of a program, without copying of source code or object code, will be held to be an infringement of copyright subsisting in the original program. As noted above,[27] copyright law is essentially concerned with the formal expression of intellectual endeavours and denies protection to ideas which have not been embodied in any material form. While the dichotomy between idea and expression has dominated copyright law for over one hundred years, the courts have found delineation problematic.

In *Whelan Associates Inc v Jaslow Dental Laboratory Inc*[28] (*Whelan v Jaslow*) the 3rd Circuit was confronted with exactly that difficulty in the context of computer software. The case concerned two programs for use in the business operations of dental laboratories. The defendant had hired an outside programmer to write management software for use on an IBM Series 1 computer. Later the defendant arranged for the program to be converted into a different language for use on a wider range of computers. The question was whether the latter program had been "copied" from the first.

In the absence of any evidence of duplication of program code, counsel for the defendant argued that there was no infringement because the structure and organisation constituted the idea of the program and not the particular expression of the idea that copyright was designed to protect. The 3rd Circuit, however, formulated a somewhat different test, based on the leading case of *Baker v Selden*.[29] It held that "the purpose or function of a utilitarian work [is] the work's idea and everything that is not necessary to that purpose or function [is] part of the expression of the idea."[30] Accordingly, the Court found that the structure of the plaintiff's computer program was not essential to a software package for dental laboratory management since there were several other packages on the market which performed the same function but had different structures and format. Because other structures were possible, the structure of the plaintiff's program was deemed to be an expression of the idea and, hence, protected by copyright.

The analysis used in this case has been the subject of much debate. If copyrightable expression in software extends beyond the exact program code to the structural/functional elements employed by the programmer, it is possible that a monopoly in the basic technique and procedures of programming would be created. This, like allowing mathematicians to copyright particular equations or painters to protect specific brush techniques, is anathema to copyright doctrine.

Notwithstanding this controversy, the *Whelan v Jaslow* proposition, that

27 See supra text accompanying note 3.
28 Supra at note 4.
29 Supra at note 3.
30 Supra at note 3, at 1236.

copyright infringement may occur despite the absence of program code copying, received a ringing endorsement from the District Court for the Northern District of California in *Broderbund Software v Unison World*[31] (*Broderbund*). The case involved the alleged copying of a menu driven program called "Print Shop", which enables its user to create customised greeting cards, signs, banners and posters. "Print Shop" was originally designed for use on Apple computers and the defendant approached Broderbund with a proposal to convert the program to run on IBM compatible machines. Work began before an agreement was formalised and when negotiations broke down the defendant went on to develop an enhanced version of "Print Shop" which was released onto the software market under the name "Printmaster".

Because "Printmaster" incorporated portions of Broderbund's work, including the menu screens, Broderbund filed suit for infringement. Citing *Whelan v Jaslow* the Court held that copyright protection "is not limited to the literal aspects of a computer program, but rather [extends] to the overall structure of a program, *including its audio visual displays.*"[32] The Court found that substantial similarity of screen displays is dispositive proof of infringement of the underlying program. The *Broderbund* Court concluded that a monopoly on menu driven printing programs would not be created if the "Print Shop" user interface were held to be copyrightable. This conclusion was based on the existence of "Stickybear Printer", a program designed for young children which performs many of the same functions as "Print Shop" but which uses clearly different screen displays.[33] The "Stickybear Printer" program, it was argued, shares the same idea as "Print Shop" but expresses it differently through its user-interface.

It should be noted that the Court misread and extended *Whelan v Jaslow*, which held that similarity of screen displays was merely indirect evidence of copying of the underlying program and not actual proof of infringement.[34]

It is submitted that the Court in *Broderbund* failed to recognise that a computer program and its display should be separate entities for the purposes of copyright protection. By erroneously equating the idea underlying a program's screen display with the idea underlying the program itself, over broad copyright protection was awarded to the "Print Shop" user interface. Application software programs are designed to make a computer perform a specific task. The foundation of ideas for these programs are varied: in the case of *Whelan v Jaslow*, the idea was a business management package for dental laboratories; in *Broderbund* the idea was a greeting card printing program. Computer programmers can write many different programs that are all designed to make a computer perform the same task. Each idea may be

31   648 F Supp 1127 (N Cal 1986).
32   Ibid, 1133. Emphasis added.
33   Ibid, 1132.
34   Supra at note 3, at 1244. See infra.

expressed in an unlimited number of ways.[35] By contrast, the idea underlying the interface of an application software package does not allow much scope for expression. The display screen performs a unique function – it communicates with the user and provides a way to input into the computer the data required to run the program – and it is inherent in the nature of interface design that the means of establishing such communication are limited, if the programmer is not to resort to outrageous methods or eccentric styles.

There are three common methods for inputting data through the use of textual screen displays: menus, command languages and fill-in forms.[36] The programmer's choice of interface may be dictated by such factors as the expected frequency of use and expertise of the anticipated end user. For example, an experienced user may become frustrated with the inflexibility and slowness of a menu driven program whereas a novice user may not remember commands and will therefore not realise the potential speed of a command language. Considerations of efficiency, ease of understanding and skill retention may all limit the choice of viable interfaces. Where there are only a few good ways to accomplish a desired result, copyright law should not confer an exclusive right to any of those ways.

When formulating the idea/expression abstraction, the *Broderbund* Court focused on an irrelevant idea – the idea underlying the computer program. If the Court had instead concerned itself with the idea behind the "Print Shop" screen display, it would have realised that "Stickybear Printer" does not share the same idea and, therefore, does *not* demonstrate that the idea underlying the "Print Shop" user interface can be expressed in a variety of ways. "Print Shop" is aimed at the adult software market and is designed to provide an adult user interface.[37] By contrast, "Stickybear Printer" is specifically designed to provide an interface that can be easily understood by young children.[38] The "Stickybear Printer" expression is different because the idea being expressed is different.

It is submitted that the copyright protection for the "Print Shop" user interface should have been restricted to those elements which were not dictated by its underlying idea. This limited protection would have rewarded Broderbund's originality without granting it a monopoly on the idea underlying the

35   In *Plain Cotton Co-operative v Goodpasture Computer Service Inc* 807 F 2d 1256 (US Court of Appeals, Fifth Circuit, 1987) the Court held that similarities between the plaintiff's program and the defendant's program (both designed to provide information regarding cotton prices and availability, with accounting services and with the facility of electronic sales of cotton) were "largely dictated by the externalities of the cotton market". There was, however, no clear rejection of the principle that structure, sequence and organisation may constitute protectable expression rather than unprotectable ideas in appropriate circumstances.

36   Schneiderman, *Software Psychology* (1980) 238.

37   Scott Mackay, *"Broderbund Software Inc v Unison World Inc:* 'Look and Feel' Copyright Protection for Display Screens of an Application Microcomputer Program" (1987) 13 Rutgers Computer & Technology LJ 105, 127.

38   Ibid.

screen display of programs which create a computerised printing shop. As its stands, the *Broderbund* analysis would allow all menu method interfaces of a particular application program to be found substantially similar to one another, and would enable the first software developer to market its product to acquire a monopoly on the most efficient and logical interface for that program.[39]

It may be premature to assert that *Broderbund* represents the highwater mark in "look and feel" judicial pronouncements but a recent United States decision indicates that at least one court is questioning the reasoning used in that case. In *Digital Communications Associates Inc v Softklone Distributing Corporation*[40] (*Softklone*) the Court expressly declined to follow *Broderbund*, stating:[41]

> [T]he *Broderbund* court based its conclusion on what this Court believes to be an over expansive and erroneous reading of *Whelan*. The 3rd Circuit in *Whelan* dealt only with the evidentiary use of the copying of screen displays for the purpose of establishing copying of the underlying computer program. The *Whelan* case did not stand for ... the proposition that screen displays are protected by the computer program's copyright from copying.

Accordingly, the *Softklone* Court concluded that copyright protection of a program does not extend to screen displays generated by that program. Nevertheless, it did uphold the plaintiff's claim that the screen display was independently protected as a literary work. It is submitted that this approach is preferable to that employed in *Broderbund* because it concentrates on how the elements on the screen relate to the communication between user and computer rather than an the single abstract idea underlying the program.

In *Softklone*, it was alleged that the defendant had copied the format of the plaintiff's screen menu. This menu, which was a type of status screen, had an upper portion containing the parameter/command terms with values appearing next to them. The first two letters of the name of each parameter appeared in capitals and the user could activate that command by typing the two highlighted capitalised letters.

The defendant argued that the format of the status screen was a necessary expression of the idea underlying the screen display and therefore not a proper subject for copyright protection under the doctrine of merger.[42]

The Court determined that the idea underlying the screen display was the process or manner in which the status screen operated,[43] and went on to identify certain features of the user interface which were unprotected ideas. The use of a single screen to reflect the program's status was an idea as was

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[39] Ibid, 135.
[40] 659 F Supp 449 (ND Ga 1987).
[41] Ibid, 455.
[42] Where there are limited means of achieving the desired purpose and the particular means chosen is necessary to that purpose, merger occurs and the means of expression are unprotectable. See also *Baker v Seldon*, supra at note 3.
[43] Supra at note 40, at 458-459.

the command driven system which operated it. Both elements were necessary to the program's operation and therefore excluded from copyright protection. The Court concluded, however, that the manner in which the command terms were presented, that is the arrangement and highlighting of two characters, had no relation to how the program operated. The parameters and commands were arranged with "considerable stylistic creativity and authorship above and beyond the ideas embodied in the status screen"[44] and could have been arranged in a wide variety of patterns. Therefore, this expression was not a necessary incident of the idea of a status screen and qualified for copyright protection as an independent literary work.

The rationale for an independent copyright for a screen display is that the same screen display can be created by a variety of separate and independent computer programs while virtually identical sets of computer instructions can produce dramatically different screen outputs. The Court emphasised that, in its view:[45]

> [C]opyright protection [of a computer program] does not extend to the program's screen displays and that copying of a program's screen displays, without evidence of copying of the program's source code, object code, sequence organization or structure, does not state a claim of infringement.

Accordingly, screen display may not infringe the copyright in a computer program but a computer program may be an infringement of a separate copyright in a screen display.

Action Abroad: The Way Ahead

The question of copyrightability of screen displays assumes even greater importance when it is realised that graphical (as opposed to textual) user interface operating environments represent the current state of the art in software innovation. Describing this development as "The Next Wave", *PC/Computing* magazine explains:[46]

> By all accounts, standardised graphics based operating environments will rule the marketplace by the early 1990s. . . . [T]here will be a move away from analytic products to products that emphasize information and communication. That's going to require the right tools and part of that is a graphic user interface.

An important benefit of a standardised interface is that the user can carry over know-how from one application program to another. Several major software houses[47] are now in the process of developing and marketing graphics based systems to be implemented as an overlap to their more traditional character based, command line interfaces. Inevitably, these graphical user

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44 Ibid, 460.
45 Ibid, 456.
46 Bonner, "User Interface Wars: The Next Wave" *PC/Computing* (November 1988) 72, 74-75.
47 For example, Microsoft – Windows; IBM – OS/2 Presentation Manager; Hewlett Packard – New Wave; Tandy Deskmate.

interfaces are partially modelled upon the successful Macintosh operating environment.

Since its release in 1984, the Macintosh personal computer has achieved astounding commercial success in the United States and throughout the world. A major reason for that success may be attributed to the distinctive user interface developed by Apple which makes the Macintosh unique and, in computer parlance, extremely "user friendly". Included among the features of the Macintosh screen display, all of which can be activated with the click of a "mouse", are multiple on-screen windows, visual icons which represent disk drives and files, popdown menus and "alert" boxes that warn the user that the command that she or he has issued could have destructive consequences. Accordingly, anyone who has learned one Macintosh application program will be able to use any other application program to perform such basic but key tasks as loading or saving a file, copying or deleting data and printing. The appeal of a graphical user-interface like that used on the Macintosh to IBM/compatible software developers is obvious. Apple's decision, therefore, to file a "look and feel" infringement suit against Microsoft and Hewlett Packard in respect of the "Windows 2.03" and "New Wave" programs has shocked the industry. Because the strategies adopted by the protagonists are likely to set the agenda for software copyright law as we enter the next decade, it is instructive to look at the nature of the dispute as defined by each of the parties.

In its statement of claim, Apple maintains that it has:[48]

> [E]xpended millions of dollars and years of creative effort in the development of artistic, aesthetically pleasing visual displays and graphic displays that enhance the value and commercial appeal of Apple's products.

Apple alleges that Hewlett Packard's New Wave program embodies and generates infringing copies of the Macintosh audiovisual works. Microsoft is drawn into the proceedings because New Wave must be used in conjunction with a computer program sold and distributed by Microsoft known as Windows 2.03.

By way of response, Microsoft says Apple's allegations seek to confuse Windows 2.03 with the New Wave program. New Wave runs on top of Windows 2.03 so that the user can switch to Windows 2.03 whenever she or he chooses. Although Windows 2.03 has been licensed to Hewlett Packard and is used together with New Wave, this does not mean that the two programs incorporate each other's screen displays. According to Microsoft, there is no substantial similarity in protectable expression between Windows 2.03 and the Apple product. Windows 2.03 does not offer an equivalent to Macintosh's icon based desktop, the visual metaphor for the Macintosh's underlying file system. In any event, Microsoft denies that Apple has any proprietary rights

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[48] "Apple – Microsoft Litigation" 5 Applied Comp Law and Communications 2, 5.

in the Macintosh audiovisual works.[49]

Similarly, in the countersuit filed by Hewlett Packard,[50] it is claimed that Apple does not hold valid copyrights for the visual displays and images in question because Apple did not originate them.[51] Hewlett Packard is also reported to believe that:[52]

> Apple's real concern is not that some features of HP New Wave resemble those of Macintosh, but that HP New Wave delivers what Apple itself has described as its vision of the future.

Both defendants allege that Apple, by claiming sole authorship of the Macintosh audiovisual works, deliberately misled the United States Copyright Office in order to stifle competition. They further characterise the screen displays at issue as "common and ordinary treatment of unprotectable ideas", although unfortunately the relevant underlying idea is not spelled out.

A proper balance between protection and competition is fundamental to the protection of computer programs and user-interface design. Once a work is found to be copyrightable, the principal means of preserving competition is the exclusion of ideas from copyright protection. It is, therefore, important to clearly define the underlying idea. It can perhaps be implied from the Microsoft/Hewlett Packard counterclaims that they consider the unprotectable idea to be the use of graphics to communicate with the user. Apple would obviously prefer the underlying ideas of the Macintosh user interface to be defined in such a way that its famous "trash" icon (used for deleting files), for example, cannot be duplicated in Hewlett Packard's New Wave package as a "Waste Basket".

It is submitted, however, that screen displays should not benefit from extensive copyright protection. Graphical operating environments may indeed be the future of software development but, in the end, the external "look and feel" of a program is cosmetic. The overall richness of the Macintosh interface, for instance, derives in large part from the close links between the screen displays and the machine's underlying file management operating system. This richness is proving difficult for IBM/compatible software developers to emulate because of their need to graft graphics-based systems on top of command line interfaces. Whatever the judicial determination in the Apple – Microsoft/Hewlett Packard dispute, it is sure to generate controversy.

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49 In a decision of the US District Court, San Francisco, noted in "Judge Narrows Apple Claim" *Computerworld New Zealand* (31 July 1989) 10, it was held that most of the visual displays is the Microsoft Windows 2.03 program were licensed under agreement between Apple and Microsoft. Apple's suit regarding the use of icons and overlapping windows remains to be tried.

50 US District Court, San Jose, 17 March 1988.

51 The distinctive Apple interface was actually pioneered by Xerox which it now licenses to Apple. Interestingly, AT & T claims a patent for much of the "Windowing" technology Apple, Hewlett Packard and Microsoft are squabbling over.

52 *The New Zealand Herald* (26 July 1988).

Australasia

A software house mounting a "look and feel" infringement action in Australia or New Zealand would attempt to fit its case within the existing legislative framework. A two-tiered approach seems likely. First, it would argue (as in *Whelan v Jaslow* and *Broderbund*) that copyright protection in a computer program carries with it protection of the structure and user interface of those programs and that clone software constitutes an unauthorised "reproduction" or "adaptation". Second, if this argument is unsuccessful, the software house would no doubt argue, as was held in *Softklone*, that the screen displays of their software are independently protected either as literary or artistic works.

In relation to the first argument, it is submitted that the reasoning of the High Court of Australia in *Apple v Computer Edge* gives the would be Australian plaintiff little cause for optimism. According to the High Court, it is well established that there has to be "objective similarity" between the reproduction and the work which has been allegedly reproduced. Furthermore, this requires a *physical* resemblance between the works. To use Brennan J's example, while a building resembles and therefore reproduces a drawing, it is hard to imagine it resembling a piece of writing. It might give effect to the directions in the writing, it might embody the idea contained in the writing but it would not resemble or reproduce it.[53] Thus, by analogy, an Australian court is likely to find that because the "look and feel" of a computer program, embodied most obviously in the screen format, does not physically resemble the set of coded instructions which is the computer program, imitation of the program structure does not constitute a reproduction.

It is possible, however, that a "look and feel" imitation of a computer program might be considered an adaptation by virtue of falling within the extended notion of "version",[54] in the sense of dramatisation and pictorialisation of literary works. However, if the High Court's requirement that an adaptation be a visible work is respected, and similarly if the test of reproduction is taken to be the comparison of the physical manifestation of the respective works, then there is little latitude under the Copyright Act 1968 (Cth) for bringing a "look and feel" infringement suit.

Even though Smellie J in *IBM v Computer Imports* held that object code *reproduced* source code and that there was no requirement for visual similarity, this does not assist the cause of the New Zealand plaintiff claiming that a rival program's user interface infringes its protected object code. It is one thing to say one code reproduces another because of its one-to-one correspondence and because it has already been decided that the second code is a translation of the first; it is quite another to say that a screen display can

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53 Supra at note 2, at 24.
54 Section 3, Copyright Amendment Act 1984 (Cth).

reproduce a program's code.

Plaintiffs on both sides of the Tasman would probably be left with the argument that the devising and display of information in an original and attractive way on the screen (such as through menus and forms for filling in by the user) should be protectable as a separate work. In neither Australia nor New Zealand is there a separate definition of or protection for "audio visual" works, and the definition of "cinematograph film" is insufficient to embrace VDU images. Thus the software house would argue that the user interface qualifies for copyright protection as a literary or artistic work. On this issue, however, the plaintiffs are confronted with the difficulty that the screen formats of many application programs in themselves convey no factual information; they simply provide for such information to be keyed in by the person who has acquired the program.

The proposition that blank forms are ineligible for copyright protection since they do not express anything is supported by authority.[55] In *Libraco Ltd v Shaw Walker Ltd*[56] copyright was denied to a card index system consisting of a box in which a number of cards of different colours and with different headings were inserted. The Judge commented that a card with information written upon it might be a literary work capable of copyright protection and the fact that it was a card would not prevent this. Individually, however, the cards conveyed no meaning and were part of a system. There was no unusual arrangement of words on the card, simply the headings "name", "address" and, in Warrington J's terms, "other words which might be used by anybody". Many screen displays generated by the computer programs in which they are embodied are in the nature of such cards, conveying no independent meaning until the user enters the data within the framework provided by the program.

In *Softklone*, the defendant contended that the status screen was merely a "blank form" and, therefore, that it was not copyrightable. However, the Court considered that the arrangement of commands under the status screen's descriptive parameter headings effectively assisted the user in understanding their availability, importance and function. In particular, the screen's distinctive highlighting and capitalisation scheme was indicative of its ability to inform the user which symbols to enter to activate selected commands. Hence, the Court concluded that the status screen, even if a form, "clearly expresses and conveys information."[57]

Ultimately, the questions of whether the protection given to computer programs carries with it protection for the user interface of those programs, and of whether screen displays are independently copyrightable are likely to turn upon a practical application of the distinction between an idea and the

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55   See for example, *Aldrich v Remington Rand Inc* 52 F Supp 732 (ND Tex 1942); *Kalamazoo (Aust) Pty Ltd v Compact Business Systems Pty Ltd* (1985) 5 IPR 213.

56   (1913) 30 TLR 22.

57   Supra at note 40, at 462.

expression of that idea. It is far from clear that the flexible approach towards the traditional expression/idea dichotomy adopted by the United States judiciary will be acceptable to the Australasian courts.

Conclusion

The computer program differs significantly from conventional copyright subject matter and the use of copyright protection to permit commercial software development and marketing leads to distortion of traditional copyright doctrine. In Australasia, we are only now beginning to recognise the extent and implications of this distortion as the scope of copyright protection comes under closer scrutiny.

As demonstrated in the first part of this article, it cannot be said that first generation copyright issues concerning computer software have been definitively settled in either Australia or New Zealand. Programs expressed in source code are probably protected in both countries as original literary works. The copyright status of a program in its object phase is more problematic. Technically speaking, object code "contains" the protected expression. The fact that this expression is unintelligible to humans is thought by some, most notably the High Court of Australia, to preclude copyright protection. It is submitted that the embodiment of a literary work in the form of ROMs, or other electromagnetic media, need not affect the applicability of copyright law. Copyright attaches to a work rather than to the storage medium and thus, for copyright purposes, machine readable object code is no more "mechanical" than a sound recording.

There remains the theoretical objection that computer programs are simply used to operate a machine; their real utility lies in the tasks which they perform.[58] Certainly the utilitarian nature of software presents conceptual difficulties since essentially functional works are usually the subject of patent law but not copyright law. The submission that computer programs (in both source code and object code) should be protected by copyright, despite this duality, is yet to be wholeheartedly accepted in Australasia.

Because mass-produced software is generally marketed in object code form, it is a matter of considerable commercial importance that the copyright status of object code be affirmatively clarified. As observed by Mason and Wilson JJ in *Computer Edge v Apple*:[59]

> [I]f there is no copyright in the object programs which are a natural and necessary derivative of the source programs then there is no point in protecting the source programs.

Copyrighting source code alone is insufficient to protect computer software. Unless copyright protection extends to the machine usable versions of

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[58]   Fulton, "Copyright (Computer Software) Amendment?" [1987] NZLJ 329, 332.
[59]   Supra at note 7, at 16.

programs, those versions can be misappropriated by electronic means without
any danger of infringing the copyright in the source code program. In New
Zealand, software developers may take some comfort from the High Court's
decision *IBM v Computer Imports*, but it should be remembered that much of
Smellie J's judgment concerning first generation computer software copyright
issues takes the form of obiter dicta.

In addition to first generation issues, the scope of copyright protection is
being further tested as the entire debate undergoes a shift in emphasis and
second generation legal arguments focus on whether copyright subsists in the
so called "look and feel" of a program's user interface. Whether Australasian
courts will follow the United States lead and find that a program's structure
and sequential operation is protected, as in *Whelan v Jaslow*,[60] or that screen
displays are independently copyrightable, as in *Softklone*,[61] is a matter for
speculation. It is, however, certain that if the arguments of leading software
houses are correct and if they are to be granted a monopoly in the way their
programs work, many new and vexing questions will arise.[62] For example, was
there any copying by the defendant? Do the enhancements made by the de-
fendant to the original product prevent the conclusion that there is substantial
similarity between the works? Is the defendant's program no more than an
embodiment of information and ideas already known in the marketplace?
These legal conundrums are part and parcel of the second generation com-
puter software copyright debate. Until recently, copyright has been confined
to regulating the interests of authors, publishers and consumers in discrete
works. As computer technology advances, copyright is being transformed into
a bargaining chip used in the competitive market game. When one observes
the difficult manoeuvres performed by the courts in addressing first and sec-
ond generation issues, there is naturally concern that copyright law is being
forced to play a role to which it is ultimately unsuited. While it is unlikely that
New Zealand and Australia will enact sui generis legislation before similar
statutes have been implemented by technological leaders such as the United
States of America and Japan, the conscious policy decision to protect com-
puter software under a copyright regime should not preclude the development
of an instructive body of Australasian case law which clearly defines what is
protectable and what is not. This common law process can only be accom-
plished judicially. The mouse is in the judges' hands.

60 Supra at note 4.
61 Supra at note 40.
62 Sharpe, "New Challenges for the Software Industry – 'Look and Feel' Software" [1987]
    Australian Accountant 65, 66.