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# UNBUNDLING VALUE IN ELECTRONIC INFORMATION PRODUCTS: INTELLECTUAL PROPERTY PROTECTION FOR MACHINE READABLE INTERFACES

HENRY H. PERRITT, JR.\*

## INTRODUCTION

Digital electronic network and optical storage technologies are revolutionizing the publishing industry. These electronic publishing<sup>1</sup> technologies facilitate publishing on demand, a process in which material from multiple sources is assembled and packaged in response to customized user requests. This process is fundamentally different from the traditional method of print publishing. Traditional print publishers begin with a package of information in raw form. They proceed to assemble the information, design its content and format, and manufacture its final form. All this effort is made in anticipation of and not in response to customer demand. The burden of evaluating and developing customer demand still falls on the traditional publishers' shoulders: they must market and promote their final product. Traditional technologies publish just in case while new technologies publish just in time.

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1. Electronic publishing is the creating, organizing, duplicating, distributing, retrieving and accessing of information in digital electronic form.

The new publishing technologies enable a disaggregation of value<sup>2</sup> and an associated dis-integration of production.<sup>3</sup> As a result, the different tasks of publishing will no longer have to be performed by the same party. A future supplier of raw content can be a different party from one who organizes the information, designs and sells retrieval systems, distributes the information, presents information, or markets the published material.<sup>4</sup> Additionally, other suppliers may be responsible for guaranteeing the quality of the separate aspects of value. This unbundling of value can lower barriers to entry for suppliers of value-added components of electronic publishing, and ensure continuing competition and innovation in the market.

The unbundling of different types of value contained in an information product presents serious intellectual property concerns. The body of traditional copyright law assumed that only authors and publishers were entitled to intellectual property protection.<sup>5</sup> Currently, the digital electronic information technologies make it possible for each type of value to be provided by a separate supplier assembled together in a customer requested format at the time the information is used. Thus, consumers are given the freedom to create compilations and derivative works on the fly as easily as any particular supplier.

It is not possible at this point to determine accurately how intellectual property and other legal incentives should be structured

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2. Disaggregation of value permits different types of value to be sold separately and assembled by consumers.

3. Dis-integration of production permits multiple production stages that were formerly performed by one vertically integrated firm to be performed separately by different firms.

4. The dis-integration of production causes the part of the information industry previously characterized by a book publisher, who integrates all of the generation of information value, to resemble the video entertainment industry, in which the suppliers of different types of value are sharply distinguished. In the video entertainment industry, authors, production companies, networks, and broadcasters usually deal at arms length and only work together for the duration of a specific project.

5. L. RAY PATTERSON & STANLEY W. LINDBERG, *THE NATURE OF COPYRIGHT: A LAW OF USER'S RIGHTS*, 19-46 (1991) (arguing that copyright shifted from a publisher's right to an author's right in its early years; not acknowledging that the right might belong to intermediaries).

to maximize the generation of value in new electronic information products.<sup>6</sup>

The new technologies add protection for investment as well as taking it away. They make possible some means of protecting markets that were never possible in a print on paper world, such as encryption and metering of usage,<sup>7</sup> but they make traditional intellectual property rights harder to enforce.

It is clear that the disaggregation of value reduces some of the tension that exists between protecting a first supplier's investment and encouraging the preparation of a wide variety of secondary works<sup>8</sup> that build on the first supplier's contribution. The new value in secondary works can be sold separately, allowing the consumer to combine the new value with the preexisting value. Disaggregation permits intellectual property incentives to be more narrowly targeted. However, for the benefits of disaggregation to be realized intellectual property rights must not impede the

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6. Incentives for authorship exist even in the absence of intellectual property protection. See Stephen Breyer, *The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies and Computer Programs*, 84 HARV. L. REV. 281, 282 (1970). Breyer's article compares specific dollar estimates of costs confronting an original publisher and a free rider, and concluded that the free rider's advantage results from lower costs for type-setting, editorial, overhead, promotion, and author royalties. *Id.* at 294-95. For a press run of 5,000 copies, the original publisher's costs were 130% of those for the free rider. *Id.* at 296. The article also identified a number of countervailing forces that offset the free rider's cost advantages, including, lead time, and the possibility of retaliation. *Id.* at 299-300.

In addition, for information that requires periodic updating, the need for currency may be a better protection for some remotely accessible database providers than copyright protection.

7. As wide area networks evolve, security, including security for intellectual property, will migrate to the application layer. This is necessary because adequate network performance depends upon the absence of content processing. It also is desirable because it maximizes user choice as to the level of security. On the other hand, isolating security in the application layer encourages proprietary approaches aimed at prior arrangements between the sender and the receiver of information rather than an open architecture market for information. Henry H. Perritt, Jr., Protection of Intellectual Property in the National Information Infrastructure, Address Before the Working Group on Intellectual Property (Nov. 18, 1993) (transcript on file with author).

8. Secondary work means a separate type of value meant to be combined with preexisting value provided by another party.

compatibility of products. To reap the benefits of disaggregation the creation of a secondary work that is compatible with a preexisting work should not be considered an infringing act.

This Article begins by developing a taxonomy of ten different types of value in information products, which will facilitate the application of intellectual property concepts to the new publishing technologies. Next the paper develops the principal argument; that in order to promote independent production of associated types of value, legal protection of intellectual property rights must not extend to compatibility and machine-to-machine interfaces.

The Article's primary consideration is electronic information products which utilize public domain content, such as court opinions, statutes, and other information originating in government agencies. This approach helps to focus attention on incentives for producing alternative types of value, rather than focusing on producing content value. The production of alternative types of value is of particular importance in the electronic marketplace for information.

#### TYPES OF VALUE AND PRODUCT BUNDLES: LEVELS OF VALUE

Information products, whether produced and consumed in a paper or electronic form, are composed of ten different types of value. The value is bundled into information products through creating, organizing, retrieval-and-assembly, and marketing processes:<sup>9</sup>

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9. The chart and the accompanying text are an expansion of ideas presented by the author in a previously published article. See Henry H. Perritt, Jr., *Electronic Records Management and Archives*, 53 U. PITT. L. REV. 963, 976 (1992).

Process	Type of Value	Print Examples	Electronic Examples
Creating	1. content <sup>10</sup>	Content generated by original author	same
Organizing	2. chunking-and-tagging	Organizational boundaries: sections, paragraphs, pagination, chapter boundaries, headings and titles, running headers and footers, page numbers	same textual units, tagged with typeface codes, footnote codes, hypertext addresses; World Wide Web codes; WAIS headers
"	3. internal pointers	Table of contents, indexes	hypertext pointers to other parts of same information object; World Wide Web pointers
"	4. external pointers	Bibliographies	hypertext pointers to other information objects; menu selections; file names; Gopher pointers
Retrieval & Assembly	5. presentation	Print on paper	video displays; WAIS user interfaces

10. This is also called "authorship" value. *See id.* at 977. "Content" is a better label in the intellectual property context because authorship is a term of art, suggesting copyrightability. *See id.* In fact, some types of content may not be entitled to copyright protection, while other types of value shown on this chart, such as chunking and tagging and external pointers value, may involve copyrightable "authorship." *Feist Publications, Inc. v. Rural Tel. Serv. Co.*, 916 F.2d 718 (10th Cir. 1990), *rev'd*, 111 S. Ct. 1282, 1289 (1991) (holding that factual compilations which do not possess the requisite originality are not protected by copyright).

"	6. duplication	All copies after the first	all copies after the first on diskette, tape, or other media
"	7. distribution	Getting the information from the generator to the consumer	same
Marketing	8. promotion	Advertising; inclusion in lists; product reviews	same; inclusion in gateway lists and menus
"	9. billing	Identifying users; assessing prices, collecting money	same; metering usage of particular files or objects; automatic confirmation of billing authority like credit cards
"	10. integrity-assurance	Guaranteeing the accuracy, expertise of suppliers of each type of value; guaranteeing against forgery or tampering	same

Suppliers and consumers of information printed on paper are familiar with each type of value. The value provided by chunking and tagging and internal and external pointers increases consumer utility by reducing the cost of human browsing, searching, and retrieving. Chunking and tagging value includes all basic typographic design features in print technologies.<sup>11</sup> For example,

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11. Some aspects of typographic design are not protected under intellectual property laws. H.R. REP. NO. 1476, 94th Cong., 2d Sess. 54, 55 (1976), *reprinted in* 1976 U.S.C.C.A.N. 5663, 5668 (deferring protection of typefaces); *Eltra Corp. v. Ringer*, 579 F.2d 294 (4th Cir. 1978) (upholding refusal to register claim for copyright in typeface design); 37 C.F.R. § 202.1(a) (1993) (variations on

browsing a newspaper is simple because the material has considerable chunking-and-tagging value reflected in headlines, separate stories, and the inverted pyramid style of journalistic writing. Newspapers with state-of-the art design also facilitate browsing through the use of indexes and internal pointer value. The internal pointer value in turn points to particular pages and story headlines, which constitute chunking-and-tagging value. Researchers utilize external pointer value when consulting the *Index to the New York Times* or the *Readers' Guide to Periodical Literature*. These sources contain external pointers to human-processable chunks and tags, call numbers, volume numbers, dates, page numbers, and titles of the articles.<sup>12</sup>

In electronic formats, chunking and tagging value works with the internal and external pointers value to permit the selection, coordination, and arrangement of subsets of content. A pointer points to a tag and retrieves the particular chunk with which the tag is associated. This is the functional equivalent of a conventional index pointing to a page number, the tag, and permitting the human user to retrieve the page, the chunk, to which the page number tag is associated. Pure chunking and tagging value is evidenced by a

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typographic ornamentation and mere lettering are not copyrightable); 53 Fed. Reg. 38110 (1988) (Copyright Office policy notice that digitized representations of typeface designs are not copyrightable, but original computer programs to control digitization are copyrightable). See generally *Leonard Storch Enter., Inc. v. Mergenthaler Linotype Co.*, 208 U.S.P.Q. (BNA) 58 (1980), *aff'd*, 659 F.2d 1060 (2d Cir. 1981) (reviewing difficulty in protecting typefaces through patent, copyright or state unfair competition, and dismissing claim of infringement of photographic typefaces).

12. The ten types of value were developed from mechanical print conventions. Thus they are not necessarily completely adaptable to digital electronic techniques. Nevertheless, it is useful initially to define a taxonomy from familiar processes and conventions so that important changes in information use and value resulting from technological shifts can be identified. In adapting the ten types of value to digital electronic technologies the most important dichotomy stems from the fact that mechanical print technologies are designed to facilitate human retrieval and assembly, while digital electronic technologies are intended to facilitate computer retrieval and assembly. In the mechanical print environment, the organizing, assembly and communication processes are distinct. In the digital electronic environment the computer systems for organizing frequently are tightly integrated with the systems for retrieval and presentation.



blank form, an EDI transaction set, or any other data structure in a computer program.

Information products are bundles of these different value types. A book bundles value differently from a newspaper, which in turn is different from a law review article. A book bundles content value, which is reflected in the raw text, chunking-and-tagging value, which is reflected in its structure of articles, sections, pages, and paragraphs, internal pointers value in its structure of tables of contents and indexes, and presentation value in its method of printing all of this on paper bound between two covers. Each type of value adds utility to a consumer, principally by reducing the consumer's cost of using the information product.<sup>13</sup>

### COMPETING BUNDLES OF VALUE

While new electronic information technologies facilitate the unbundling of the types of value, it is unlikely that each discrete type of value will be sold by itself.<sup>14</sup> Rather, the types of value

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13. For example, internal and external pointers value and chunking and tagging value reduce the effort the consumer must expend in searching and browsing for desired information chunks. Duplication and distribution value reduce the consumer's effort by making her own copy available locally. Promotion value reduces effort otherwise expended in looking for the appropriate information product. Billing value makes it easier to contract to buy or use information. These are what economists call *hedonic* values. Hedonic price valuation is a market oriented method which measures the extent to which the value of a nonmarketed commodity, such as a pristine environment, is captured directly in the price of marketed commodities such as land. Frank B. Cross, *Natural Resource Damage Valuation*, 42 VAND. L. REV. 269, 313 (1989).

The best example of hedonic price valuation measures the value of air quality changes by linking high levels of pollution to lowered housing prices or wage rates. In this way researchers can measure the value of clean air by the willingness of homeowners to pay a premium to live in unpolluted areas.

*Id.*

Hedonic pricing relates to disaggregated value in information products in the following way: a user typically pays a single price for an entire bundle of information value. This is analogous to the price paid for a piece of land. The bundle is composed of different types of value, the aggregation of which determines the price for the bundle, much as discrete features like clean air would influence the price paid for a piece of residential land. *Id.* at 313-14.

14. *But see* Doug Barney, *Add-in for Quattro Pro Displays Data as Maps*, INFOWORLD, Apr. 19, 1993, at 17 (separately developed and marketed program

are likely to be sold in different and more numerous bundles than the bundles represented by a book.<sup>15</sup> The feasibility of bundling the different types of value in various ways is a potential enhancement to competition.

Electronic publishing, involving disaggregated production of different types of value, can be illustrated by the following hypothetical electronic publishing operation. The hypothetical builds logically on existing comprehensive commercial activities,<sup>16</sup> on the Supreme Court's Hermes initiative,<sup>17</sup> and on some distributed electronic publishing experiments underway at Cornell Law School, Villanova Law School, and at the Center for Computer Assisted Legal Instruction. The hypothetical enterprise might be called the Center for Distributed Electronic Publishing ("CenDEP"), which manages an FTP server connected to the Internet.<sup>18</sup>

CenDEP makes four different kinds of material available: (1) judicial opinions, (2) statutes, (3) student written law review articles and papers, and (4) practitioner-oriented textbooks and treatises. Some of these materials are already available electronically from several sources in word processing or ASCII form. All

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displays spreadsheet data in the form of a map). This software is unusual in that it produces relatively pure presentation value.

15. New producers are emerging as electronic publishing evolves. For example, "brokers" can specialize in integrity assurance value, similar to conventional specialized bookstores. Specialized proprietary software, like WESTMATE and Compuserve information managers, specialize in presentation value. Other software products specialize in both chunking and tagging and internal pointers value. Still other producers, like Internet service providers, specialize in distribution and duplication value.

16. Principally WESTLAW, LEXIS, Dialog, and NEXIS.

17. The Hermes system is employed by the Supreme Court to broadcast the full text of its opinions simultaneously to a defined set of subscribers who disseminate the information. Interview with Rob Jones, Administrative Assistant to the Chief Justice of the United States and James Donovan, Director of Information Systems for the United States Supreme Court, in Washington D.C. (Dec. 9, 1993).

18. Through Internet, users of dissimilar computer systems can access information stored on any other computer system connected to the network. TRACEY LAQUEY, *THE INTERNET COMPANION: A BEGINNERS GUIDE TO GLOBAL NETWORKING*, 93-96 (1993). An Internet protocol called Anonymous FTP permits anyone anonymously to obtain information stored on a particular server offering that information. *Id.* Anonymous FTP is a popular means of electronic publishing on the Internet. *Id.*

of the materials as they now exist have, in addition to raw content, chunking and tagging value in the form of paragraph breaks, section numbers, and titles which indicate the start of major sections. This value was produced by the original author.<sup>19</sup> Their utility would be increased by adding more chunking and tagging, internal pointers, external pointers, and better presentation value.

CenDEP makes these materials retrievable according to cited statutory and constitutional sections, cited Restatement sections, the name of the justice authoring an opinion, and major legal concepts. CenDEP performs the search by employing additional chunking and tagging value in the following manner. CenDEP writes two computer programs. The first program, written in the Word for Windows macro language, defines four "styles," one for each of the following statutory citations, Restatement citations, Justice authoring an opinion segment, and substantive legal concepts. After the user enters the search criteria, the first program searches for character strings likely to appear in a statutory or constitutional citation, for example, "U.S.C." or "Stat.," and applies the first style to them. The second style is applied to every phrase that includes the word "Restatement." The third style is applied to names preceded by the words "Judge," "Justice," or "Circuit Judge," or followed by the letters "J.," or "C.J." The fourth style is applied to every instance of a word, in a set of words, expressing predefined legal concepts such as "independent contract," "Employment at Will," "discrimination," "tort," or "duty."<sup>20</sup> A person can take this program, which is a separate file and run it as a macro against any compatible file, including court opinions, statutes, articles and textbook material. The result of the process is a new file with additional chunking and tagging value.

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19. The original authors for the four types of materials are the court, the legislature, the student author and the book author, respectively.

20. At best such natural language processing would produce incomplete results. A CenDEP editor could define some words and phrases to be tagged after a preliminary review of the documents to be processed. The program still would do the tagging, much as word processing programs create concordances from predefined lists of words.

The second step is to process the Word for Windows files through Z39.50 (WAIS software).<sup>21</sup> This hypothetical WAIS software accepts textual documents in Word for Windows format and automatically imposes a structure on the text that permits its retrieval through free text queries and hypertext pointers, using a proprietary set of file formats and computer programs.<sup>22</sup> The WAIS structure follows the Word for Windows style tags added in the first step. The WAIS software also exports the information as a text file "marked-up" with SGML codes.<sup>23</sup>

CenDEP makes available, through Internet, both a WAIS interface and the SGML tagged files. CenDEP charges the user an hourly based fee for access, and sells client software to browse and retrieve the material.

The second hypothetical entrepreneur might be called "Another-DEP," or "ADEP" for short. ADEP makes a competing client front end, which uses the same underlying material, but only when an ADEP purchaser has a subscription with CenDEP. ADEP writes a computer program that presents the user with a series of menus to search for statutory citations, and to limit such a search to particular titles of the United States Code, Articles of the Constitution, Restatement citations, and labor and employment law

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21. Alternatively, CenDEP could simply write a program in C to process WordPerfect files, and replace instances of the four styles applied by the first program with appropriate SGML (SGML is an international standard mark-up language in the public domain) tags. Under this approach, the C program contains SGML document type declarations ("DTDs") that express the structures of court opinions, statutes, articles and textbooks. A person can execute this program under MSDOS or Microsoft Windows. The program converts a WordPerfect file containing a court opinion, statute, article, or textbook chapter into an SGML file which reflects the structure of that material and contains tags to statutory and constitutional citations, Restatement citations, and labor and employment law concepts. The DTD can be seen as a kind of internal pointers value. It might also reflect or permit the generation of tables of contents and indexes for a particular opinion as the program is run. The text does not intend to suggest that WAIS is the only method of creating a hypertext chunked and tagged text base, but rather to emphasize that the issues discussed in the Article are ripe for consideration. Indeed, much of the chunking identified with the software hypothesized in the text is more closely associated with World Wide Web than with simple versions of WAIS.

22. See LAQUEY, *supra* note 18, at 101, 105-06, 132.

23. See *supra* note 21.

concepts. ADEP does not want to recreate the work already done by CenDEP. Moreover, CenDEP's programs are in wide use, and a substantial part of ADEP's expected market already uses CenDEP to rechunk and tag its court opinions, statutes, and secondary textual material obtained in word processing or ASCII formats from a variety of sources. Therefore, ADEP writes its program to search for the tags established by the CenDEP programs. This process requires ADEP to include a verbatim copy of the CenDEP Word for Windows style designation, the document type declaration and the SGML pointers in the ADEP program. The program described represents pure external pointers value, and may include some presentation value to enable a user to see highlighted search terms in the full text of a retrieved opinion.

The essential machine-to-machine interface question that the hypothetical presents is whether CenDEP infringes any copyright held by Microsoft, the vendor of Word for Windows, by searching for format codes, and whether ADEP's program infringes CenDEP's intellectual property rights in the Word for Windows style designations and style tags, or in the SGML document type declaration or SGML tags.

One could elaborate this model by supposing that subsequent entrepreneurs add promotion value and integrity assurance value. For example, a third entrepreneur called "OneStop" might establish an Internet server that would run both CenDEP programs and ADEP programs under a license. OneStop could offer a service that promotes the dialup availability of its server and adds integrity assurances, by spell and cite checking the material, before it is run through the programs and made available to the user.

The CenDEP/ADEP competition is just around the corner. Already, The Mead Corporation's LEXIS and West Publishing Corporation's WESTLAW make court opinions, most state and federal statutes, many law review articles and a few treatises available in centralized remotely accessible databases. Subscribers to the services have dialup access to these databases through packet switched digital networks provided by Mead and West or, at the user's option for a particular session, provided by Sprint, British Telecom, or CompuServe.

The major difference between the CenDEP/ADEP hypothetical and the WESTLAW/LEXIS reality is the extent or degree of bundling. Both WESTLAW and LEXIS are completely bundled, except for content value. Both CenDEP and ADEP specialize in only certain types of value, and the interface between their complementary value types raises intellectual property questions.

Like modern print publishers, the early electronic publishers are brokers or assemblers of all of the types of value. A print publisher arranges with an author to supply content value, and hires designers and copy editors to supply chunking and tagging value. Substantial chunking and tagging value are also supplied by the author who typically designs the boundaries of chapter chunks, and determines the boundaries of section chunks. Publishers supervise extractors who prepare internal pointers value in the form of tables of contents and indexes, work in conjunction with the Library of Congress to arrange the cataloging-in-publication information and with *Books in Print* and reviewers to establish external pointers value. Publishers contract with printers and binders to supply duplication and presentation value, work with advertising agencies for promotion value, and handle distribution and billing value through warehousing and order fulfillment. Publishers traditionally also play an important quality control function, not only by editing and checking for clarity and accuracy, but also in the selection of material, that is, deciding which authors or concepts of information packaging are sufficiently authoritative to be useful to user communities.

New technologies may reduce the need for brokers of such broad scope. Advances in technology change the way types of value are bundled to meet user preferences and to reduce supplier costs.<sup>24</sup> Electronic technologies permit the unbundling of different aspects of added value, permitting each type, or clusters of only a few types, to be supplied separately to consumers and allow the consumer to assemble or bundle the different types of value on demand.

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24. See ANTHONY G. OETTINGER, PROGRAM ON INFORMATION RESOURCES POLICY, *THE INFORMATION EVOLUTION: BUILDING BLOCKS AND BURSTING BUNDLES* 3-6 (1989).

Existing electronic publishers are discovering this new freedom. Historically, both WESTLAW and LEXIS sold totally bundled products. They had the raw information and supplied all the other values in the ten value type taxonomy. Recently, however, there has been a trend away from this practice. The electronic publishers now provide some gateway services, and there are new kinds of author relationships for both services. Cornell Law Professor Peter Martin's Electronic Social Security Treatise, for example, is available through LEXIS, and WESTLAW provides a new kind of gateway service for the Dialog database.

Over time, WESTLAW and LEXIS may concentrate on providing chunking and tagging and external pointers value, and rely more explicitly on public institutions to organize content in a rudimentary fashion and only provide value-added gateways to consumers. Modeled after the Martin relationship, they would offer different kinds of author relationships to obtain other kinds of content value. Potential authors would provide much smaller chunks of contributions that would be licensed — but not necessarily physically transferred — to WESTLAW or LEXIS, who would then add their own kind of value. The gradual acceptance of conventions for expressing chunk boundaries and tags, like SGML, facilitate unbundling by making it easier to achieve compatibility among different types of value.<sup>25</sup>

The attention given by the Clinton Administration to visions for a National Information Infrastructure is encouraging commercial enterprises to use Gopher, Archie, World Wide Web, and other Internet protocols that inherently disaggregate the production of information value, and use the electronic network as a market from which the consumer dictates the final assembly of a bundle of information value.

The point is not that each discrete type of value will be unbundled from all the others and sold separately. Rather, the points are, that each type of value should be *thought about* separately and that value types may be bundled differently from the

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25. See generally Henry H. Perritt, Jr., *Format and Content Standards and Conventions in the Electronic Exchange of Legal Information*, 33 JURIMETRICS J. 265 (1992).

familiar print on paper bundles. In addition, disaggregation of value and a disintegration of production will result in greater competition and diversity among bundles, allowing greater consumer choice and greater reliance on the consumer to construct the ultimate bundle. Whether the law will allow a robust market in unbundled value to operate remains an unanswered question.

#### LAW AND ADDED VALUE

This Article considers a specific intellectual property issue: the predictability of computer readable interfaces in the context of disaggregated electronic publishing. Before examining the issue, it is necessary to establish a broader legal context.

All forms of intellectual property rights are justified by the need to protect creative or useful effort against free riding.<sup>26</sup> The risk of free riding depends on cost structures and the efficacy of technological protection.<sup>27</sup> The need for patent and copyright protection depends in part on the efficacy of contractual and trade secret protection.<sup>28</sup> The different forms of intellectual property rights protect different types of value in the overall bundle delivered to the consumer.

The need for legal protection of an innovator's investment depends on the risk of free riding.<sup>29</sup> The willingness to make a

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26. See Wendy J. Gordon, *Asymmetric Market Failure and Prisoner's Dilemma in Intellectual Property*, 17 U. DAYTON L. REV. 853, 855 (1992); Peter S. Menell, *An Analysis of the Scope of Copyright Protection for Application Programs*, 41 STAN. L. REV. 1045, 1058-59 (1989).

27. Breyer, *supra* note 6, at 282.

28. Contract and trade secret protection are alternative ways to prevent free riding.

29. Several commentators have developed sophisticated economic models of the conditions in which free riding is a significant risk worthy of legal attention. See, e.g., Gordon, *supra* note 27, at 853 (arguing that legislators and courts pursuing economic goals should give intellectual property rights only where creators without rights over copying face market failure because they are unable to exclude nonpayors, and should hesitate to give rights unless users bound by duties not to copy can obtain market deals).

Professor Gordon identifies two economic models used in evaluating the need for intellectual property protection: asymmetric market failure and the prisoner's dilemma. *Id.* at 853. Asymmetric market failure expresses the co-existence of two conditions: (1) in the absence of a no-copying rule, authors and inventors



significant investment in information value decreases as the potential for free riding increases.<sup>30</sup> When cost structures for producing a particular type of value encourage free riding and where the technological means of excluding free riders are impracticable,<sup>31</sup> legal protection is necessary if incentives are to

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could not obtain adequate payment for their work, and (2) once a no-copying rule is put into place, licensing will evolve. *Id.* at 854. The prisoner's dilemma model concludes that choosing not to be a creator is the best strategy when one is confronted with the potential of a large loss for creating and a large potential gain associated with copying. *Id.* at 864. See also Menell, *supra* note 27, at 1060 (arguing that the need for intellectual property protection must be justified by demonstrating a public goods problem and network externalities problem). Network externalities are benefits of standardization to consumers that cannot be appropriated by the supplier of a compatible product. See Michael L. Katz & Carl Shapiro, *Network Externalities, Competition, and Compatibility*, 75 AM. ECON. REV. 424, 434-39 (1985) (developing model for evaluating incentives for software and hardware developers to achieve compatibility in terms of network externalities).

30. Breyer, *supra* note 6, at 301-02.

31. New electronic publishing technologies leave the producers of external pointers value most susceptible to free riding. Producers of distribution, duplication and presentation value are protected by economies of scale and technical excludability. While producers of chunking and tagging and internal pointers value are exposed to free riding through the possibility of the appropriation of their software, this exposure is less than that of the producers of external pointers value.

Sunk costs are an important factor in determining the potential for free riding by subsequent producers. Sunk costs are product specific and are not recoverable by a producer through sale or lease. Most of the literature on sunk cost focuses on economic incentives and disincentives for a firm considering entry into a market in which at least one other firm is operating successfully. See generally HENRY HAZLITT, *THE CURIOUS EVOLUTION OF NATURAL MONOPOLY THEORY, UNNATURAL MONOPOLIES: THE CASE FOR DEREGULATION OF PUBLIC UTILITIES* (1985) (describing the role of non-salvageable sunk costs in determining whether a monopoly position is contestable, and noting that the airline and trucking industries have highly salvageable capital).

An example of a sunk cost in the information technology context is the cost charged to an on-line database subscriber for so many minutes of use of a particular LEXIS or WESTLAW database. Once a user's connect time has elapsed, the cost has been incurred. It is not recoverable through sale or lease since a subscriber has paid for a privilege that is no longer available. However, if a set of bound reporters are purchased instead, a transferable cost is incurred because the books are readily saleable.

A free rider benefits from the fixed investment of the initial producer. The portion of that investment which is sunk is "free rideable" only because it represents irreversible investments. Transferable costs are not free rideable

exist.

The law can protect markets in three basic ways: by enforcing private arrangements made between buyers and sellers, through contract law; by creating property interests in information value and allowing recovery of damages for, or injunctions against, invasions of those interests, through intellectual property law; and through tort law recovery for free riding accomplished by "wrongful" means.<sup>32</sup>

Different types of legal protection, which overlap but also maintain distinct foci, protect the different types of value. Copyright law tends to cover content, chunking and tagging and presentation value.<sup>33</sup> Trademark law tends to cover integrity assurance and promotion,<sup>34</sup> while patent law affords protection to the types of value falling in the middle, such as duplication and distribution.<sup>35</sup> Protection of internal and external pointers value,

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because the initial producer can sell the investment, recover its cost and negate any cost advantage held by the free rider. Free rideability thus depends on whether a significant part of a first producer's costs are sunk.

By automating certain publishing processes, publishers can reduce the fixed investment they must add to produce chunking and tagging and internal and external pointers value. By thus lowering sunk costs, electronic publishers can force a potential free rider to incur some, if not most, of the costs incurred by an initial publisher.

32. There is a substantial overlap among the three approaches. Contract can create interests that resemble property, and invasions of property interests are frequently torts.

33. A copyright is a property interest embodied in the tangible representation of information. Protecting only tangible representations results from the fixation requirement of 17 U.S.C. § 102(a) (1988 & Supp. IV 1992). The most important limitation in copyright is that, unlike interests in real property and those conferred by patents, copyright does not give the owner the right to exclude all uses of the property. Rather, a copyright owner may exclude only certain defined uses: copying, distributing, preparing derivative works and displaying or performing publicly. 17 U.S.C. § 106 (1988 & Supp. IV 1992) (certain of the rights are associated only with particular kinds of works, but those limitations are not material to the discussion).

34. Trademark, which is a hybrid of state and federal law, confers a limited property right in a particular word, phrase or symbol and therefore protects the goodwill of that product's name or mark from free riding. *See New Kids On The Block v. News Am.*, 971 F.2d 302, 305-08 (9th Cir. 1992).

35. Patents give the inventors or discoverers of new and useful processes, machines, manufactures and compositions of matter, 35 U.S.C. § 101 (1988) (patentable inventions), the right "to exclude others from making, using or selling"

and chunking and tagging and presentation processes is uncertain when they are disaggregated from content. These types of value are protected by trade secret,<sup>36</sup> as when the details of an interface<sup>37</sup> are kept secret,<sup>38</sup> or by contract, as in most remotely accessible database services.

Contract law, reinforced by trade secret concepts, can protect all kinds of value. However, contract protection has an important limitation. A contract protects only those who are parties to the contract. Absent another form of legal protection, a supplier of information value has no effective remedy against someone impairing his economic interest if he has no privity of contract with the actor. The supplier of content value may be able to enforce a contractual restriction on copying by his first customer, but if a customer of that customer copies, the original supplier has no remedy against the second downstream customer because there is no privity between that customer and the original supplier. Of

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the invention, and the right to prevent the importation of products made with a patented process. 35 U.S.C. § 154 (1988). Of all the forms of intellectual property, patents provide the most sticks in the bundle of rights. Patents exclude persons except the owner from any use of the covered innovation. Unlike other forms of intellectual property, a patent permits the property owner to exclude users of the patented concept even when the users are completely innocent and know nothing of the patented idea.

36. The rights in the trade secret bundle include the right to exclude all uses of a trade secret by someone with the requisite fault, not just certain uses, as in copyright law. Trade secret regulation, unlike patent, copyright, and trademark law, is a creature of state law, increasingly regularized by adoption of the Uniform Trade Secret Act. *See generally* HENRY H. PERRITT, JR., *TRADE SECRETS FOR THE PRACTITIONER* (forthcoming May 1994); C. Owen Paepke, *Interpretation of the Misappropriation Doctrine: Common Law Protection for Investments in Innovation*, 2 *HIGH TECH. L.J.* 55 (1987).

37. The interface referred to is a software-to-software interface not the kind of computer-to-human interface involved in the recent "look and feel" copyright cases. The recent cases involving copyright look and feel include *Apple Computer, Inc. v. Microsoft Corp.*, 799 F. Supp. 1006 (N.D. Cal. 1992), *modified* 821 F. Supp. 616 (N.D. Cal. 1992), and *Gates Rubber Co. v. Bando Am., Inc.*, 798 F. Supp. 1499 (D. Colo. 1992), *aff'd in part and vacated in part*, 9 F.3d 823 (10th Cir. 1993); *see generally* John Pinheiro & Gerard LaCroix, *Protecting the 'Look and Feel' of Computer Software*, 1 *HIGH TECH L. J.* 411 (1986).

38. When knowledge conferring a competitive advantage is kept secret, discovery of the secret through improper means is the tort of trade secret misappropriation. *See Paepke, supra* note 36, at 67-69.

course, the original supplier may require his immediate customer to impose contractual restrictions on its customers, but a failure to impose such restrictions is simply a breach of contract by the first customer and creates no right against the subsequent customers not so restricted. Contract law thus creates limited protection against free riding. Only if a potential free rider must obtain something directly from the original producer is she likely to have privity of contract with the original producer.<sup>39</sup>

The Supreme Court's *Feist* decision<sup>40</sup> diminishes the scope of copyright protection for electronically published works. Before the *Feist* decision, the "sweat of the brow" doctrine<sup>41</sup> recognized in some judicial circuits<sup>42</sup> allowed copyright protection for types of value that may no longer be protectable.<sup>43</sup> "Sweat of the brow" protected the compilation effort of a compiler of a telephone directory by protecting against copying of the factual information contained in the telephone directory.<sup>44</sup> This was so even though

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39. Almost any kind of restriction a supplier desires can be imposed by contract with the immediate customers of the supplier, whether they be ultimate consumers or potential competitors. Contracts are a means of granting privileges as well as imposing duties. Contractually created privileges are the prevailing means of arranging rights to information value by multiple producers in a value-added chain of production. Contractual protection has two important limitations beyond the privity limitation discussed in the text. First, seeking to extend intellectual property protection beyond the statutory term or seeking to tie a license of the intellectual property to the purchase, or forbearance to purchase, another product may be an antitrust violation. Second, contractual protections may be preempted as inconsistent with federal intellectual property law.

40. *Feist Publications, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340 (1991) (finding white pages noncopyrightable since they did not contain information selected, coordinated or arranged in any creative or original way). Subsequently, Rural Telephone was held liable under the antitrust laws for refusing to license its information to Feist, but this was reversed on appeal. *Rural Tel. Serv. Co. v. Feist Publications, Inc.*, 957 F.2d 765 (10th Cir. 1992).

41. The "sweat of the brow" doctrine, based on the notion that copyright is a reward for the efforts of compiling data, extends copyright protection beyond selection and arrangement to the facts themselves. 499 U.S. at 352-53.

42. See, e.g., *Leon v. Pacific Tel. & Tel. Co.*, 91 F.2d 484 (9th Cir. 1937); *Jeweler's Circular Publishing Co. v. Keystone Publishing Co.*, 281 F. 83 (2d Cir. 1922).

43. 499 U.S. at 352-56 (explaining and rejecting the "sweat of the brow" doctrine).

44. See *id.*

the facts themselves were not protected by copyright.<sup>45</sup> By implication, a compiler of an electronic database of judicial opinions and statutes could prohibit someone from copying the underlying public domain judicial opinions and statutes from his database even though the original information was not subject to copyright, and even though the amount of original authorship in the traditional sense involved in creating the database was *de minimis*. Conceptually, the "sweat of the brow" doctrine would protect suppliers against a free ride where the form of value enhanced utility to the consumer. Thus, a supplier who took raw content that was in the public domain and simply added duplication and distribution value would be entitled to recover for copyright infringement against a free rider who copied the public domain information at the point of delivery rather than adding his own duplication and distribution value.

*Feist* profoundly changes this approach in two ways. First, the preexisting information (for example, the names, addresses and telephone numbers in the case of the telephone book, or the judicial opinions and statutes in the case of WESTLAW or LEXIS) is no longer protectable merely because a compilation scheme or database structure has been superimposed on it.<sup>46</sup> Second, the new value added by the compiler is protectable only if some minimal amount of creative selection or arrangement is involved.<sup>47</sup> Copyright protection is no longer available simply to protect "sweat of the brow" value regardless of the eligibility of that kind of value for protection under the copyright statute.<sup>48</sup>

45. "Sweat of the brow" was not negated if the amount of original authorship involved in compiling the phone directory was *de minimis*. *Id.*

46. *Id.* at 348 (citing Jane C. Ginsburg, *Creation and Commercial Value: Copyright Protection of Works of Information*, 90 COLUM. L. REV. 1865, 1868 & n.12 (1990)).

47. *Id.* ("[C]hoices as to selection and arrangement, so long as they are made independently by the compiler and entail a minimal degree of creativity, are sufficiently original that Congress may protect such compilations through the copyright laws.") (citing 1 MELVILLE B. NIMMER & DAVID NIMMER, NIMMER ON COPYRIGHT §§ 2.11[D], 3.03 (1993) [hereinafter NIMMER]); see also Robert C. Denicola, *Copyright in Collections of Facts: A Theory for the Protection of Nonfiction Literary Works*, 81 COLUM. L. REV. 516, 523 n.38 (1981).

48. See, e.g., Wendy J. Gordon, *Reality as Artifact: From Feist to Fair Use*, LAW & CONTEMP. PROB., Spring 1992, at 93 (arguing that *Feist*'s result and the

After *Feist*, producers of duplication and distribution value are no longer entitled to copyright protection when they combine those increments of value with otherwise unprotectable expression.<sup>49</sup> Neither is chunking and tagging nor internal or external pointers protectable value unless the proponent of protection can show sufficient originality in the selection or arrangement, or both, represented by those types of value in a particular product.<sup>50</sup>

#### COMMON THEMES AND DILEMMAS

Patent and copyright protections are converging in high technology works.<sup>51</sup> Computer programs are utilitarian more than

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fair use concept are supported by need to allow secondary creators to use the facts of the first work's existence); Dennis S. Karjala, *Copyright and Misappropriation*, 17 U. DAYTON L. REV. 885 (1992) (arguing for enhanced role for misappropriation concepts in the interpretation of copyright law to protect high technology utilitarian works after *Feist*).

49. The underlying value is assumed to be unprotected; merely duplicating and distributing preexisting expression does not qualify for copyright. 17 U.S.C. § 101-02 (1988 & Supp. IV 1992).

50. *Feist* appears to allow unfair competition protection under *INS*. The majority opinion cites *International News Serv. v. Associated Press*, 248 U.S. 215 (1918), for its denial of copyright protection, and also quotes Nimmer as follows:

Protection for the fruits of such research . . . may in certain circumstances be available under a theory of unfair competition. But to accord copyright protection on this basis alone distorts basic copyright principles in that it creates a monopoly in public domain materials without the necessary justification of protecting and encouraging the creation of 'writings' by 'authors.'

499 U.S. at 354 (quoting 1 NIMMER, *supra* note 47, § 3.04, at 3-23). The Court characterized the grounds for the *INS* decision as not relevant to its analysis. *Id.* The problem is that *Feist* undermines copyright protection for novel database retrieval schemes. The likelihood of producers of those types of value being able to make that showing is considered in the sections on chunking and tagging value and external pointers value.

51. See generally J.H. Reichman, *Overlapping Proprietary Rights in University Generated Research Products: The Case of Computer Programs*, 17 COLUM.-VLA J.L. & ARTS 51 (1992) (discussing the difficulty of fitting new technologies into traditional intellectual property regimes). The Register of Copyrights testified before Congress in 1991 and identified a number of copyright law issues deserving congressional attention. *Hearing On Copyright Office On The Copyright Royalty Tribunal Before The Subcomm. On Intellectual Property And Judicial Administration Of The Comm. On The Judiciary*, 102d Cong., 1st Sess. 6, 10 (1991) (testimony of Ralph Oman, Register of Copyrights). He urged enactment of design protection legislation, to take some of the pressure off the

expressive,<sup>52</sup> and the Supreme Court *Feist* opinion, the District Court opinion in *Lotus* and the Third Circuit opinion in *Whelan* all embrace a patent-like novelty threshold for the copyright originality elements roughly akin to, but less demanding than, the patent law novelty requirements.<sup>53</sup> Patent protection is being extended to compilations of data and to computer programs.<sup>54</sup> The utilitarian

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copyright statutes resulting from trying to "shoehorn protection of useful articles under the copyright law, [which is] not a good fit." *Id.* at 8. He referred to the interoperability of software as a major issue in copyright protection for computer software. *Id.* He emphasized the need for resolving problems about overlapping patent and copyright protection for computer software, promising a joint report by the copyright office and the patent and trademark office. The report optimistically recommended that no patent/copyright interaction problems require legislative attention. See Marybeth Peters, *The Copyright Office (Registration and Recordation) and Recent Developments in Administrative, Legislative and International Matters*, in HOW TO HANDLE BASIC COPYRIGHT AND TRADEMARK PROBLEMS 1992, at 19, 35 (PLI Patents, Copyrights, Trademarks, & Literary Prop. Course Handbook Series No. 337, 1992).

52. Expressive works have more content value than other types of value, while utilitarian works usually have more chunking and tagging and internal and external pointers value than content value. See Philip D. Bartz & Jonathan Band, *Feist v. Rural Telephone: The Beginning of the End of Software Overprotection?*, COMPUTER LAW., July 1991, at 10, 11.

53. None of the cited authorities suggests that patent-level novelty is a prerequisite for copyright protection; they merely say that copyright originality requires that the author add something of value. See, e.g., *Lotus Dev. Corp. v. Borland Int'l., Inc.*, 799 F. Supp. 203, 219 (D. Mass. 1992) (evaluating creativity involved in establishing menu commands, menu command hierarchy, macro language and keystroke sequences, and finding them more than trivial). The *Feist* opinion forswears requiring "novelty," while also denying copyright protection to works "in which the creative spark is utterly lacking or so trivial as to be virtually nonexistent." *Feist*, 499 U.S. at 359. *Whelan* invests relatively little in exploring the threshold of originality, but stretches to protect sequence and organization because of a conviction that these are products of creativity. See *Whelan Assocs., Inc. v. Jaslow Dental Lab., Inc.*, 797 F.2d 1222, 1240 (3d Cir. 1986) *cert. denied* 479 U.S. 1031 (1987). See Pamela Samuelson, *Allocating Ownership Rights in Computer Works*, 47 U. PITT. L. REV. 1185, 1209-11 (1986) (discussing the possibility under copyright law of some original authorship existing in an infringing derivative work). Of course, some of the emphasis on novelty in these cases was a justification for extending copyright protection rather than a threshold prerequisite to protection as under the patent statute. This was true in both *Whelan* and *Lotus*.

54. See, e.g., U.S. Patent 5,065,447 (Nov. 12, 1991) (method and apparatus for processing digital data, involving compressed image representation through fractal transforms, useful for scalable fonts and compression of color images).

character of computer produced and delivered works is more apparent when different types of value are unbundled.

Despite the convergence, the interests and subject matter protected by existing forms of intellectual property differ depending on the particular type of value. The Supreme Court's *Feist* opinion disavows intellectual property protection for entire bundles of information value, and targets intellectual property protection on the particular increments of value added by the person seeking protection.<sup>55</sup> The traditional subject matter of copyright is highly congruent with content, chunking and tagging, internal pointers, external pointers and presentation value. All of these are comfortably described as "expression." The subject matter of patent protection is most congruent with presentation, duplication, and billing value because patents can protect the processes that yield these types of value. According to the Uniform Trade Secrets Act ("UTSA") § 1(4), trade secret protection is applicable to the same instances as patent protection, and not beyond, because trade secret protection for other potential subject matter is lost when the subject matter is disclosed in the publishing process.<sup>56</sup>

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55. *Feist*, 499 U.S. at 359 ("The copyright in a compilation . . . extends only to the material contributed by the author of such work, as distinguished from the preexisting material employed in the work, and does not imply any exclusive right in the preexisting material.") (quoting 17 U.S.C. § 103(b) (1988)). The court in *Apple Computer, Inc. v. Microsoft Corp.*, 799 F. Supp. 1006, 1022-23 (N.D. Cal. 1992), *modified*, 821 F. Supp. 616 (N.D. Cal. 1993), noted that Apple's "look and feel theory" was necessitated because the "use of graphic imagery of office objects in computer interfaces is indisputably unoriginal to Apple" because it existed before Apple began its effort. The court repeatedly rejected Apple's claims of predictability on unoriginality grounds because the feature was preexisting. *Id.* at 1026-29 (citing overlapping windows and iconic representation as examples). In other words, the increment of value supplied by Apple, to the extent there was any, was so insignificant as to be unprotectable.

56. 14 U.L.A. 433 (1985) ("Trade secret" is defined as: "information, including a formula, pattern, compilation, program, device, method, technique, or process, that: (i) derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use, and (ii) is the subject of efforts that are reasonable under the circumstances to maintain its secrecy."). According to this definition, when the secrecy ends, the trade secret ends as well.



In recent years,<sup>57</sup> state courts have been willing to extend unfair competition and misappropriation concepts to protect information that otherwise is unprotected by traditional intellectual property law categories.<sup>58</sup> This trend draws upon *International News Service v. Associated Press*.<sup>59</sup> Building on this trend, Professor Wendy Gordon has proposed a comprehensive new tort that she calls "mal-competitive copying," that would afford broad legal protection for information, while minimizing harms resulting from undue restrictions on value adding producers who use protected information.<sup>60</sup> Gordon's scheme would achieve many of the same results as a scheme of broad protection accompanied by compulsory licensing, but it achieves it without the need for extensive statutory amendment.<sup>61</sup>

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57. Professor Gordon suggests that the trend is toward broader protection of information. Wendy J. Gordon, *On Owning Information: Intellectual Property and the Restitutionary Impulse*, 78 VA. L. REV. 149, 151-57 & nn.7-26 (1992).

58. See *Zacchini v. Scripps Howard Broadcasting Co.*, 433 U.S. 562, 575-79 (1977) (concluding that a state can create a right to control publicity given to performances, consistent with First Amendment); *Carpenter Inc. v. United States*, 484 U.S. 19, 25-26 (1987) (approving newspaper's prepublication right to exclusive use of information); *Factors Etc., Inc. v. Pro Arts, Inc.*, 579 F.2d 215, 221-22 (2d Cir. 1978), *cert. denied*, 440 U.S. 908 (1979) (New York law created publicity interest in Elvis Presley that survived his death); *but see Factors Etc., Inc. v. Pro Arts, Inc.*, 652 F.2d 278 (2d Cir. 1981).

59. 248 U.S. 215, 245-46 (1918) (approving injunction against copying of uncopyrighted current news).

60. See Gordon, *supra* note 57, at 222-24; see also Jules L. Coleman, Commentary, *Intellectual Property and Corrective Justice*, 78 VA. L. REV. 283 (1992) (commentary on Gordon article). Professor Coleman questions Professor Gordon's conclusion that restitution provides the best framework for rationalizing intellectual property law, yet finds interesting her focus on moral foundations for intellectual property rather than the more fashionable economic theories. *Id.* at 292. He notes that the "reap/sow" principle governs entitlements or holdings, while "unjust enrichment" analysis governs departures from a set of holdings or entitlements, making them different levels of analysis. *Id.* at 285; see also Edmund W. Kitch, Commentary, *Intellectual Property and the Common Law*, 78 VA. L. REV. 293 (1992) (commentary on Gordon article). Professor Kitch argues that contract provides a stronger common law analogy to intellectual property than restitution. *Id.* at 297.

61. Professor Gordon's proposal is valuable because it can be implemented under the common law, without amendments to the copyright statute, and because it represents a way of implementing both compulsory license and eminent domain ideas. Moreover, it provides guidelines for pricing and valuation under a

## AVOIDING BLOCKAGES TO NEW ADDITIONS OF VALUE

Historically, intellectual property protection reinforced technology, encouraging producers to bundle value.<sup>62</sup> As new information technologies make it easier to produce a single type of value without having to own and sell other types of value along with it, fewer inputs are required for a saleable product. The producer of one or two types of value need not pay to copy, adapt or distribute other types of value protected by intellectual property.<sup>63</sup> Thus technology now permits unbundling.

But unbundling permitted by the technology will occur only if intellectual property does not impede compatibility among different

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compulsory license approach, and, by setting the default price at the highest market price, it encourages private markets. Lastly, Gordon's approach has a narrower scope of compulsory licensing than the Ginsburg proposal, thus leaving certain kinds of things in the public domain.

62. Bundling is a form of vertical integration. Industrial organization literature says that vertical integration of production results when the costs of internal production (sometimes called "production costs") are less than the costs of acquiring the same resource in the outside market (sometimes called "transaction costs" or "coordination costs"). Stuart D. Frank & Dennis R. Henderson, *Transaction Costs as Determinants of Vertical Coordination in the U.S. Food Industries*, 74 AM. J. AGRIC. ECON. 941 (1992) (expanding Oliver Williamson's industrial organization theory to consider a wider range of transaction costs); Neil M. Kay, *Markets, False Hierarchies and the Evolution of the Modern Corporation*, 17 J. ECON. BEHAV. & ORG. 315 (1992) (criticizing Williamson's transaction cost economics in industrial organization theory); Ernest J. Englander, *Technology and Oliver Williamson's Transaction Cost Economics*, 10 J. ECON. BEHAV. & ORG. 339 (1988) (criticizing Williamson's transaction costs analysis for undervaluing the economic importance of technology). When a non-vertically integrated producer (one who does not make all the relevant works himself) must use a work protected by intellectual property, he incurs costs in the form of royalty payments to the owner of the intellectual property interests or in the form of potential liability for infringement. See Henry H. Perritt, Jr., *Electronic Records Management and Archives*, 53 U. PITT. L. REV. 963, 976-80 (1992).

63. Even if a type of related value is within the scope of intellectual property protection, a particular type of value may be able to fulfill its intended purpose without a consumer of it (and a potential competitor) doing any of the acts reserved to the copyright owner by 17 U.S.C. § 106 (1988), or (less likely) doing any of the acts reserved to a patent owner by 35 U.S.C. § 271 (1988 & Supp. IV 1992) (stating "whoever without authority makes, uses or sells any patented invention, within the United States during the term of the patent therefor, infringes the patent.").

types of value intended to be assembled by a consumer. New producers must be free to add external pointers, presentation and distribution value which draws upon preexisting value of other types. Producer B, wishing to construct a computerized topical guide to employment law, must be able to point to tags contained in a computer accessible employment law work belonging to A, without infringing on A's intellectual property.<sup>64</sup>

Affording broad intellectual property protection to low content works can foreclose access by other suppliers of value to basic data.<sup>65</sup> Similarly, affording intellectual property protection to interfaces diminishes the advantages to consumers of unbundling the type of information value now permitted by technology. Exclusive control over preparation of compatible works raises the cost to a consumer of buying one type of value and bundling it with other types of value contributed by other suppliers. It requires a supplier of subsequent value either to pay the other suppliers or to regenerate underlying value rather than simply using (without copying) what has been supplied by someone else.

Intellectual property law must permit a producer of one type of value to design his product to work in conjunction with another protected product containing primarily a different type of value.<sup>66</sup> The second producer's objective is compatibility, which is assured by having a common interface.<sup>67</sup>

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64. The potential legal impediment suggested by the text arises from intellectual property protection of chunking and tagging value. Of course, the owner of the chunking and tagging value might elect not to assert intellectual property rights. Without chunking and tagging value, the electronic market for content information is greatly restricted. Producers of such value may be willing to put chunking and tagging value in the public domain in order to increase the market for their products.

65. Jane C. Ginsburg, *Creation and Commercial Value: Copyright Protection of Works of Information*, 90 COLUM. L. REV. 1865, 1870 (1990).

66. A different form of this problem is presented by a second producer wishing to design his product so that it may be used in conjunction with a preexisting product representing the same type of value. The motivation for this kind of compatibility - which might be called horizontal compatibility - is to facilitate a user's switch to the second product without sacrificing user investment in information formatted for the first product.

67. See *supra* note 37.

The first producer might argue that "appropriating" the interface infringes its intellectual property rights. Resolving this claim implicates two generic concerns: the scope of the "property" protected by the intellectual property doctrine, and the scope of the conduct with respect to that property that creates liability.<sup>68</sup> These concerns require consideration of the boundaries between protectable value and unprotectable ideas, the differences between facts and mental processes<sup>69</sup> and the variations of expression protectable by copyright and processes protectable by patent and trade secret. Recent decisions by the courts of appeals in *Altai*<sup>70</sup> and *Sega*,<sup>71</sup> and the directions of European Community law<sup>72</sup> correct-

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68. The scope of protection obviously affects the range of conduct constituting infringement. One may copy another's idea without committing a copyright infringement, because the idea is not protectable. *Harper & Row Publishers, Inc. v. Nation Enters.*, 41 U.S. 539, 556 (1985).

69. A common theme in intellectual property law is the reluctance to extend protection so far that ideas or facts are preempted. Copyright does not protect ideas as opposed to expression. Patents do not protect ideas, mental processes and mathematical algorithms. Moreover, one can get a patent only on the value one has added; prior art is not patentable. Facts are unprotected for the same reason that ideas are not protected; they are a species of idea. See Kristin Loebar, Comment, *Feist Publications, Inc. v. Rural Tel. Serv. Co.*, 44 BAYLOR L. REV. 409, 410-415 (1992).

70. *Computer Assoc. Int'l, Inc. v. Altai, Inc.*, 982 F.2d 693 (2d Cir. 1992) (affirming denial of copyright infringement claim). The plaintiff claimed that similarities in the lists of operating system services handled by both allegedly infringed and infringing computer programs constituted infringement. *Id.* at 702. While the court of appeals accepted the proposition that copying of nonliteral components of computer programs can constitute infringement, *id.* at 703, it found that the nonliteral overlap between the two programs was dictated by compatibility requirements — "dictated by the nature of other programs with which it was designed to interact and, thus, is not protected by copyright." *Id.* at 715. *Altai* deals with a particular type of compatibility: compatibility between A and C, where the alleged infringement is A's copying B's compatibility with C, rather than copying aspects of B in order to make A compatible with B. Nevertheless, the rationale of *Altai* can be extended to any type of compatibility. The logic is that compatibility is the type of necessity that warrants treating the thing copied as unprotectable expression.

71. *Sega Enters., Ltd. v. Accolade, Inc.*, 977 F.2d 1510 (9th Cir. 1992) (affirming conclusion that copyright fair use doctrine privileged video game producer's reverse engineering of game cartridge interface).

72. Commission Proposal for a Council Directive on the Legal Protection of Databases, art. 2(3), 1992 O.J. (C 156). See generally Rick G. Morris, *Use of Copyrighted Images in Academic Scholarship and Creative Work: The Problems*

ly leave interfaces between different types of value free for exploitation. But a recent decision by the district court deciding Lotus' claim against Borland allows an initial producer to monopolize the interface.<sup>73</sup>

#### PROTECTING INTERFACES — COMPATIBILITY AS INFRINGEMENT

Disaggregation potential and the associated potential for modular products make interfaces important. Through interfaces a subsequent producer builds on top of another producer's product without free riding on the value supplied by the first producer.<sup>74</sup>

The new world of disaggregated value will be realized only if intellectual property law does not discourage compatibility.<sup>75</sup> A

*of New Technologies and a Proposed "Scholarly License,"* 33 IDEA: J.L. & TECH. 123, 147 (1993) (describing EEC database protection proposal including its compulsory license feature).

73. *Lotus Dev. Corp. v. Borland Int'l, Inc.*, 831 F. Supp. 223 (D. Mass 1993).

74. *See supra* note 37. This is a software rather than a human interface. The computer/user interface can be standardized by making uniform conventions like pressing the F1 key for help and having a pull down menu entitled "file" at the upper left corner of the screen. The interface in the applications programs and operating systems can be standardized by using the same procedure calls for common functions. The interface between program and data or between two programs sending and receiving data can be standardized by making the data format uniform.

75. If intellectual property restricts interface compatibility, compulsory licensing may be necessary even though types of value are unbundled in production and marketing. The problem is not entirely hypothetical. Folio, one of the most popular new textual database products, accepts textual documents in whatever word processing format the author used and, by using a proprietary set of file formats and computer programs, automatically imposes a structure on the text that permits its retrieval through free text queries and hypertext pointers. This conclusion depends on the practical inaccessibility of information while it is in an infobase. As long as the details of the infobase format and structure are kept secret, these details are protected as trade secrets against misappropriation. Uniform Trade Secrets Act ("UTSA") § 1(4) (1985). "Trade secret" for the purposes of the UTSA means:

Information, including a formula, pattern, compilation, program, device, method, technique, or process, that: (i) derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use, and (ii) is the subject of efforts that are reasonable under the circumstance to maintain its

second supplier must be able to copy a previous supplier's data structures or query syntax so the second supplier's value can be matched up at the time of use with the first supplier's value; the two works must exchange information in compatible representations.<sup>76</sup> For example, unbundling can flourish only if the creator of external pointers value (or presentation or distribution value) is entitled to a limited kind of free ride on a separately existing and separately sold content and chunking and tagging value. This condition is a surrogate for the broader question of whether producers of separate types of value are entitled to free rides on preexisting value of other types as long as they do not copy and distribute the preexisting value, but only facilitate the use of such value by consumers. Some computer software copyright litigation raises doubts about whether copyright law permits this. In the hypo developed earlier in this article CenDEP would argue that ADEP, which directly produces only external pointers value,<sup>77</sup> has

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secrecy.

*Id.* The UTSA has been enacted in more than half the states. Linda B. Samuels & Bryan K. Johnson, *The Uniform Trade Secrets Act: the States' Response*, 24 CREIGHTON L. REV. 49, 50 (1990). If the infobase qualifies as a "computer program," it is protected by copyright. 17 U.S.C. § 101 (1988 & Supp. IV 1992) (computer programs protected as literary works); 17 U.S.C. § 117 (1988 & Supp. IV 1992). While the information is in a FolioViews "infobase" it is protected from free riding by trade secret and copyright protection for the computer programs. But users of FolioViews also may want to export their information as it has been chunked and tagged in FolioViews. The version of FolioViews introduced in May, 1993 (version 3.0) permits such exportation in a text file "marked up" with SGML codes. (SGML is an international standard mark up language in the public domain.) The underlying text presumably belongs to the user. But the chunking and tagging value represented by the SGML mark up codes was created by the FolioViews program. If this value cannot be used by pointers created by someone else, there is an impediment to unbundling of value.

76. The notion of permitting the preparation of derivative works using relatively small parts of preexisting value while treating gross copying as an infringement is consistent with the idea of "thin" protection for compilations suggested by Justice O'Connor in *Feist Publications, Inc. v. Rural Tel. Serv. Co.*, 111 S. Ct. 1282, 1289 (1991), and by Professor Ginsberg. Jane C. Ginsburg, *Creation and Commercial Value: Copyright Protection of Works of Information*, 90 COLUM. L. REV. 1865, 1897 (1990). Thin protection permits someone to copy parts of a compilation and treats as an infringement only wholesale copying of the entire collective work. 111 S. Ct. at 1289.

77. If an electronic publishing system is composed solely of external pointers value with no new content value, the system can be classified in one of four

infringed CenDEP's intellectual property. ADEP would not copy the content of the CenDEP material; that would be acquired by the user of the electronic book under the user's own subscription. But ADEP would copy parts of the CenDEP interface: the query syntax and the citations. Although CenDEP might have little economic incentive to object, because use of the electronic treatise would increase revenue to CenDEP theoretically, CenDEP could make three copyright arguments against ADEP: literal copying of the query language,<sup>78</sup> copying of protected structure,<sup>79</sup> and preparation of a derivative work.<sup>80</sup>

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alternative ways. First, it may be ineligible for copyright protection under *Feist*, because the value increment does not meet the originality threshold. 111 S. Ct. at 1288 (holding that originality is a constitutional requirement). Second, the system is a process as much as it is expression, and thus might be excluded from protection by § 102. 17 U.S.C. § 102 (1988). Third, the system (or the external pointers value in it) may be an original work, much as a bibliography or an edition of Shepards is an original work. Fourth, it may be a derivative work because it incorporates the underlying works's interface and its pointers adapt the organization of the pre-existing works.

78. In *Nintendo v. Atari Games*, a district court held that making a cartridge compatible with another producer's video games was a copyright infringement on the grounds that the sequence and timing of the interlock signals was analogous to a tune, and the second producer copied the tune. *Atari Games Corp. v. Nintendo of Am. Inc.*, 18 U.S.P.Q.2d 1935 (N.D. Cal. 1991) (rejecting argument that purpose of being functionally indistinguishable, i.e. compatible gives rise to merger defense), *aff'd in material part*, 975 F.2d 832, 840 (Fed. Cir. 1992) (affirming finding that copying arbitrary bit sequence constituting proprietary video game interface lock constituted copyright infringement; arbitrary nature of code necessarily means that many alternative expressions exist); *but see id.* at 843 (holding that intermediate copying incident to reverse engineering to discover higher level unprotected elements of computer program is fair use).

79. This is similar to the *Whelan* issue. *Whelan Assoc. v. Jaslow Dental Lab.*, 797 F.2d 1222, 1237 (2d Cir. 1986) (concerning copyright infringement of dental lab record-keeping software), *cert. denied*, 479 U.S. 1031 (1987). For a discussion of the argument that copying tagging value as a way of referencing a pre-existing work constitutes infringement, see L. Ray Patterson & Craig Joyce, *Monopolizing The Law: The Scope Of Copyright Protection For Law Reports And Statutory Compilations*, 36 UCLA L. Rev. 719 (1989) (criticizing *West Publishing Co. v. Mead Data Central, Inc.*, 616 F. Supp. 1571 (D. Minn. 1985) (granting of preliminary injunction on copyright issue), *aff'd*, 799 F.2d 1219 (8th Cir. 1986), for approving copyright in page numbers of judicial opinion reports).

80. *Addison-Wesley Publishing Co. v. Brown*, 223 F. Supp. 219 (E.D.N.Y. 1963) (holding that work containing answers to problems published in college text book was infringement). "The solutions . . . have no independent viability . . .

The first argument is based on the proposition that the interface is a computer programming language or a computer program that is protected expression owned by the producer of the underlying work and that copying this interface is infringement.<sup>81</sup> This theory is best evaluated by considering the predictability of computer programming languages.<sup>82</sup> The second argument is based on the proposition that the interface represents protectable organization and structure of the underlying work. This argument is best evaluated by considering the reasoning of the *Whelan*, *Altai* and *Lotus* cases. The third argument is based on the proposition that

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What gives the solutions their value is that which, and only that which is already in the pirated works." *Id.* at 223-24. The plaintiffs argued that the problem solutions were a kind of translation of the problems in the underlying work, and hence infringed the exclusive right to prepare translations or different versions of the work, in then-effective 17 U.S.C. § 1. *Addison-Wesley*, 223 F. Supp. at 226. The court declined to embrace that approach, relying instead on more general unfair competition, and negative effect-on-the-market ideas drawn from fair use analysis, in order to find infringement. *Id.* In the *Atari* case, there was some copying of Nintendo's copyrighted program code in order to develop the compatible game cartridge. 18 U.S.P.Q.2d 1935. Thus there is a traditional basis, other than mere compatibility, for a finding of infringement. Professor Nimmer notes that the *Addison-Wesley* case is only ambiguous authority for the proposition that non-copying linkage may be infringement because the answer-author's close paraphrasing of the question text arguably was copying. NIMMER, *supra* note 47, § 8.01[F]. Nimmer suggests that furnishing answers to copyrighted questions might be better treated under state unfair competition principles. *Id.* In the concepts developed in the appendix, unlike the *Addison-Wesley* context, the second supplier would enhance, rather than reduce, the market for the first supplier's work.

81. If suggestions that protection for utilitarian works should be "thin" are accepted, the theories of prima facie infringement would be rejected.

82. Copyrightability of interfaces — the "look and feel" controversy — raises the same issues as copyrightability of programming languages, which are, after all, simply sophisticated interfaces between human and machine. See Elizabeth G. Lowry, *Copyright Protection for Computer Languages: Creative Incentive or Technological Threat*, 39 Emory L.J. 1293, 1311 n.77 (1990) (concluding that neither programming nor command languages are copyrightable; as systems, integral parts of systems, and as building blocks, they fall within the exclusions of 17 U.S.C. § 102). This implicates the arguments in the *Ashton-Tate v. Fox Software* case, *Ashton Tate v. Fox Software*, No. 88-6837-TJH (C.D. Cal. filed Nov. 18, 1988), and in the *Lotus* macro facility decision. *Lotus Dev. Corp. v. Borland Int'l., Inc.*, 831 F. Supp. 223 (D. Mass 1993) (finding that literal copying associated with making Quattro compatible with Lotus 123 macro programs constituted infringement).



new value, like external pointers value, that has a compatible interface with preexisting value is a derivative work. This theory is best evaluated by considering the purpose of the derivative work protection. In addition to these three theories for extending intellectual property protection are three arguments against protection: public domain status of the interface, lack of free-riding involved, and fair use.

#### INTERMEDIATE COPYING

Production and marketing of disaggregated value in electronic works, like most of the recent video game interface cases,<sup>83</sup> is likely to involve some intermediate copying. In the video game cases it was necessary for the developer of a compatible work to copy certain parts of the original work in order to discover the interface. In almost every case of electronic publishing, some literal copying of tagging value in the chunking and tagging structure will be essential to implementation of a compatible interface.<sup>84</sup> If the interface, whether constituting a static data structure or a dynamic programming language, is protectable, then use of that interface involves literal copying. If such intermediate copying is an unprivileged copyright infringement, compatible works cannot be developed, produced and marketed without the

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83. *Sega Enters. Ltd. v. Accolade, Inc.*, 977 F.2d 1510, 1518 (9th Cir. 1992) (holding that intermediate copying of object code in order to produce compatible Genesis game cartridges constituted prima facie infringement); *Atari Games Corp. v. Nintendo of Am. Inc.*, 975 F.2d 832 (Fed. Cir. 1992) (holding that intermediate copying to understand ideas and processes in copyrighted work is fair use). The court's analysis in *Atari* implies that such copying is prima facie infringement. *Id.*

84. Copying of data structures is not the only literal copying that is likely to be involved in producing value added electronic works. For example, the first producer may argue that literal copying is involved: copying the section numbers of an underlying work in order to produce a compatible supplement, copying the format codes of WordPerfect, copying the query syntax and citations in WEST-LAW. This was the successful argument in the *Lotus* macro facility decision. Borland copied the command hierarchy from Lotus 123 in order to permit its product, Quattro, to interpret Lotus 123 macro programs. 831 F. Supp. at 233 (holding that copying of command hierarchy is not permissible even if only way to achieve macro compatibility).

permission of the owner of the works embodying the types of value the new works are meant to complement.

The prevailing view in the video game cases is the correct one. Intermediate copying is a *prima facie* infringement as long as the material copied qualifies for protection.<sup>85</sup> The best way to permit the limited amount of intermediate copying necessary to produce a compatible work is through the fair use analysis.<sup>86</sup> Such privilege analysis makes it unnecessary to imply some new category of conduct - "intermediate copying" - not explicitly recognized in the statute.

#### COPYING OF PROTECTABLE LANGUAGE?

Some of the arguments made in *Ashton Tate v. Fox Software*<sup>87</sup> suggest that compatibility at the command and syntax level constitutes copyright infringement.<sup>88</sup>

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85. *Sega Enters. Ltd. v. Accolade, Inc.*, 977 F.2d 1510, 1518 (9th Cir. 1992) (holding that intermediate copying of object code in order to produce compatible Genesis game cartridges constituted *prima facie* infringement); *Atari Games Corp. v. Nintendo*, 975 F.2d 832 (Fed. Cir. 1992) (holding that intermediate copying to understand ideas and processes in copyrighted work is fair use; analysis implies that such copying is *prima facie* infringement).

86. The problem with the *Lotus Macro Facility* decision is not its conclusion that the copying of the command hierarchy represented *prima facie* infringement, but with its conclusion that fair use did not make the copying privileged. 831 F. Supp. at 242-44.

87. No. 88-6837-TJH (C.D. Cal. Nov. 18, 1988). The United States Department of Justice required that this case be dropped by Borland as a condition of Justice Department approval of the merger of Borland International and Ashton Tate. Scott Mace, *Borland shows Windows extensions to dBase*, 14 INFO WORLD 115 (1992) (Borland Database Conference); Roger Rudick, *Law meets Silicon Valley*, 12 COMPUTER SHOPPER, Sept. 1992, at 589 (Borland International, Inc. drops Ashton Tate's suit against Fox Software after Borland acquires Ashton Tate and Microsoft acquires Fox, but Lotus Development Corp. continues its suit against Borland); Jeff Bertolucci, *Borland's Paradox: to make dBASE better: anxious users await the product of Borland's plans*, 10 PC WORLD, Feb., 1992 at 71 (reporting on Justice Department requirement that suit be dropped); Gus Venditto, *Free at last: dBASE future is secure*, 11 PC MAG., Feb. 11, 1992, at 30 (Ashton Tate, Fox Software, Inc. copyright lawsuit); Kent Kirkpatrick, *Fox, Ashton Tate resolve legal disputes*, 17 COMPUTING CANADA, Dec. 5, 1991, at 25(1).

88. The arguments in the Ashton-Tate case implicate a broader set of arguments over the copyrightability of computer programming languages. Generally, the weight of commentator opinion is against the proposition that

Ashton Tate's (now Borland's) dBASE IV is the market leader in desktop computer database management software.<sup>89</sup> Users of dBASE can interact with their data in one of two ways. They can make selections from menus contained in the software delivered by the vendor, or they can write programs in the dBASE programming language. The set of menus, the choices available, and the actions taken in response to user choices are protected, if at all, under the look and feel doctrine accepted in the *Lotus* case.<sup>90</sup> The *Ashton Tate* case involved a different set of questions relating to the predictability of the commands and syntax making up the dBASE programming language.<sup>91</sup>

The programming language works because Ashton Tate supplies an interpreter and a compiler, both of which are computer programs that take commands written in the dBASE programming language and translate them into lower level operations on the database, storage devices, output devices like video display screens and printers, and input devices like keyboards. The interpreter and compiler programs are protected expression. It would be an infringement for Fox or any other competitor to copy the programs and distribute them without Ashton Tate's permission. But that is not what Fox did. Fox wrote its own computer program, without copying Ashton Tate's programs, that accepts the same commands that are accepted by Ashton Tate's programs. The Fox software permits a user to write programs in the dBASE programming language just as though they were using dBASE software, but they buy Fox software instead. This availability of the Fox alternative

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programming languages can be copyrighted. See Lowry, *supra* note 82. It is reasonably clear, however, that the interpreters and compilers that implement computer programming languages are copyrightable computer programs. *Id.* Thus, a second producer can implement the same language developed by a first producer but only if the second producer writes her own compiler or interpreter independently of the first producer's programs.

89. HENRY H. PERRITT, JR., *HOW TO PRACTICE LAW WITH COMPUTERS*, (2d ed. 1992).

90. 799 F. Supp. at 220.

91. The *Ashton Tate* case illustrates the difference between the predictability of computer programs and the treatment of computer programming languages. See generally Lowry, *supra*, note 82 (concluding that neither programming languages (*Ashton Tate*) nor command languages (*Lotus*) are protectable under copyright law).

diminishes Ashton Tate's share of the market. Ashton Tate thus has an economic incentive to argue that the dBASE programming language is protectable, so it can exclude others from marketing systems that perform database operations according to dBASE commands. Lotus' position on the macro facility part of its case against Borland was similar to that of Ashton-Tate. When Borland made it possible for consumers with Lotus 123 macros to execute the macros under Quattro, it diminished the market for Lotus 123 that otherwise would be the only way to make the macros usable.<sup>92</sup> Fox's and Borland's position is remarkably like that of ADEP, which supplies hooks (external pointers) that fit into someone else's tags.

The programming language encompassing the command set is not, by itself, a computer program; rather, it is a set of acceptable commands and their syntax. Each command, when executed, triggers a process. A program written in the language, when executed, puts all the processes together into an application. Most of the commands are ordinary English words, the meaning of which bears a relationship to the action taken by the database management system when the commands are interpreted or compiled. For example, the word "find" is a command that finds database records meeting certain criteria. One cannot copyright the English language. It is in the public domain, and from a policy standpoint the restrictions on commerce resulting from intellectual property protection of ordinary words and phrases would be unacceptable. Furthermore, it is outside the scope of copyright because of the proviso in § 102(b) excluding ideas, concepts, processes and systems.<sup>93</sup>

Under *Feist*, however, selection and arrangement may be protectable even when the underlying raw material is not protectable.<sup>94</sup> Thus, Ashton Tate and Lotus argued that the command set and the syntax represent protectable selection and arrangement

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92. 831 F. Supp 223, 243-44 (finding meaningful likelihood that Borland macro compatibility feature negatively affects the market for Lotus 123).

93. 17 U.S.C. § 102(b) (1988).

94. 111 S. Ct. at 1289.

from the larger set of English language words and English grammar syntax.

Independently, Ashton Tate argued that the command set and syntax were equivalent to a code or cipher, which is protectable regardless of whether the words in the code may have an ordinary meaning. As used in the code, or in the computer program command set, the words have a unique meaning and the association of the words in the command set with this unique meaning is an act involving substantial creativity. Ashton Tate sought not to prevent every copying, distribution, or derivative work of the word "find;" it sought only to prevent copying, distribution, or derivative works of the word "find" when it stands for this set of database operations developed and implemented by Ashton Tate in its dBASE language.

The prevailing view is that programming languages are not protected by either intellectual property concept.<sup>95</sup> This consensus view has the advantage that it makes it easier for the producers of value-added electronic products to make those products compatible with underlying protected works and inventions.

#### COPYING PROTECTED STRUCTURE AND ORGANIZATION?

Apart from the literal interface copying arguments, a compatible interface may be an infringement if it copies other protectable expression.<sup>96</sup> If the structure and organization of the underlying value is protected by copyright, as *Whelan Assoc. v. Jaslow Dental Lab.*<sup>97</sup> and *Atari*<sup>98</sup> allow, and if designing a compatible interface

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95. See Lowry, *supra*, note 82. See also Pamela Samuelson, *Computer Programs, User Interfaces, and Section 102(b) of the Copyright Act of 1976: A Critique of Lotus v. Paperback*, 6 HIGH TECH. L.J. 209 (1992) (stating that interfaces may be unprotectable "systems").

96. See *Sega Enters. Ltd. v. Accolade, Inc.*, 785 F. Supp. 1392, 1397 (N.D. Cal. 1992) (holding that intermediate copying of object code in order to design and produce compatible video game cartridge constituted copyright infringement).

97. 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 479 U.S. 1031 (1987).

98. *Atari Games Corp. v. Nintendo Of Am. Inc.*, 975 F.2d 832 (Fed. Cir. 1992) (affirming finding that copying arbitrary bit sequence constituting proprietary video game interface lock constituted copyright infringement; arbitrary nature of code necessarily means that many alternative expressions exist).

necessitates copying the structure, then compatibility constitutes infringement.<sup>99</sup>

The Third Circuit's *Whelan* case<sup>100</sup> stimulated a major controversy over the test for distinguishing unprotectable ideas from protectable expression.<sup>101</sup> Most of the post-*Whelan* cases have accepted the basic Learned Hand abstractions test for determining whether a merger between expression and idea has occurred so that the expression may not be protected without foreclosing use of the idea.<sup>102</sup> Most courts allow protection for the structure, sequence

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99. See *Lotus Dev. Corp. v. Borland Int'l., Inc.* 831 F. Supp. 223, 233 (D. Mass 1993) (holding that copying of command hierarchy is not permissible even if only way to achieve macro compatibility); *id.* at 233 (rejecting argument that Lotus command hierarchy constitutes unprotectable idea, system, process, procedure, or method).

100. *Whelan Assoc. v. Jaslow Dental Lab.*, 797 F.2d 1222, 1240 (3d Cir. 1986).

101. See W.H. Baird Garret, Note, *Toward A Restrictive View Of Copyright Protection for Nonliteral Elements Of Computer Programs: Recent Developments In The Federal Courts*, 79 VA. L. REV. 2091 (1993) (describing controversy stimulated by *Whelan*). Predictability of organization and structure, like scope of derivative work, directly involves consideration of the costs and benefits of intellectual property protection. The more abstract or general the elements for which protection is sought the greater the foreclosure in terms of alternate means of expressing the elements. To protect a general proposition is to make all of the specific instances of that proposition infringeable. On the other hand, protecting a more specific instance does not preempt other instances, nor does it preempt a generalization of the protected instance. If intellectual property protects only the details of the Lotus 123 implementation of the spreadsheet idea, then Borland is free to sell Quattro Pro and Microsoft is free to sell Excel. On the other hand, if the general idea of a spreadsheet is protected, then Quattro and Excel infringe. It is important to understand that preclusion and foreclosure, as the terms are used in this discussion, imply, not only that consumers may be deprived of alternative products, but more likely that the costs of producing alternative products will be increased because of the need to pay royalties or the need to develop independent starting points for the products. Also, the more general the protection, the greater the vertical scope of foreclosure. Not only will direct substitutes for a specific product be preempted, but products that may use the specific product as an input or complementary output will also be protected. It is this vertical foreclosure that is a particular concern in the disaggregated type of value analysis.

102. For cases considering *Whelan* and Learned Hand's abstractions test, see: *Gates Rubber Co. v. Bando Chem. Indus., Ltd.*, 9 F.3d 823 (10th Cir. 1993); *Autoskill, Inc. v. Nat'l. Educ. Support Sys., Inc.*, 994 F.2d 1476 (10th Cir. 1993); *Atari Games Corp. v. Nintendo of America, Inc.*, 975 F.2d 832 (Fed. Cir. 1992); *Softel, Inc. v. Dragon Medical and Scientific Communications, Inc.*, No. 87-CIV-0167 (JMC), 1992 WL 168190 (S.D.N.Y. Jun 30, 1992); *Autoskill, Inc. v. Nat'l.*

and organization, and user interface, as long as there is room for different expressions of the function addressed by a particular structure, sequence, expression or user interface.<sup>103</sup>

In *Computer Associates International, Inc. v. Altai, Inc.*,<sup>104</sup> the court of appeals held that certain interface similarities are unprotectable because they are dictated by operating system requirements.<sup>105</sup> Interfaces designed to be used by programmers also

Educ. Support Sys., Inc., 793 F.Supp. 1557 (D.N.M. 1992); *Computer Assoc. Int'l, Inc. v. Altai, Inc.*, 775 F. Supp. 544 (E.D.N.Y. 1991); *Kregos v. Assoc. Press*, 937 F.2d 700 (2nd Cir. 1991); *Micro Consulting, Inc. v. Zubeldia*, 813 F. Supp. 1514 (W.D.Okla. 1990); *Lotus Dev. Corp. v. Paperback Software Int'l*, 740 F. Supp. 37 (D.Mass. 1990). The *Whelan* test asks whether there are other ways of expressing the idea (or implementing the process). If there are many other ways, then the particular way embodied in the work in question is protectable. Conversely, if there is only one way, then that way cannot be protected without protecting an idea or process. 797 F.2d at 1238. *Whelan* and its intellectual competitors begin with Judge Hand's abstractions test, which recognizes that, as one moves the boundary of protection from the specific to the general, more foreclosure occurs. See also *Jones v. CBS, Inc.*, 733 F. Supp. 748, 753 (S.D.N.Y. 1990) (holding that character and plots of two scripts for radio plays were similar only at the most general or abstract level and thus no infringement of protected expression).

103. *Computer Assoc. Int'l, Inc. v. Altai, Inc.*, 982 F.2d 693, 702-703 (2d Cir. 1992) (agreeing that non-literal copying of computer programs can infringe, citing *Johnson Controls, Inc. v. Phoenix Control Sys., Inc.*, 886 F.2d 1173, 1175-76 (9th Cir. 1989); *Lotus Dev. Corp. v. Paperback Software Int'l*, 740 F. Supp. 37, 54 (D. Mass. 1990); *Digital Communications Assocs., Inc. v. Softklone Distrib. Corp.*, 659 F. Supp. 449, 455-56 (N.D.Ga. 1987); *Q-Co Indus., Inc. v. Hoffman*, 625 F. Supp. 608, 615 (S.D.N.Y. 1985); *SAS Inst., Inc. v. S & H Computer Sys., Inc.*, 605 F. Supp. 816, 829-30 (M.D.Tenn. 1985)).

*Plains Cotton Coop. Ass'n v. Goodpasture Computer Serv., Inc.*, 807 F.2d 1256 (5th Cir. 1987), frequently is cited as disagreeing with *Whelan*, and the *Plains Cotton* court did "decline to embrace *Whelan*." *Id.* at 1262. Nevertheless, it actually used the *Whelan* analysis, merely reaching a different result on the *Plains Cotton* facts. Actually, the Fifth Circuit found, in reviewing a denial of a preliminary injunction, that the "organizational copying" involved in the case was dictated by the function to be performed by the software. In other words there were no alternatives to the organization and structure of the first work. This applies the *Whelan* test, but reaches a different conclusion based on different facts.

104. *Computer Assoc. Int'l, Inc. v. Altai, Inc.*, 982 F.2d 693 (2d Cir. 1992) (affirming denial of copyright infringement claim).

105. *Id.* at 702 ("we must decide whether and to what extent these elements of computer programs are protected by copyright law;" elements included: flow chart, intermodular relationships, parameter lists and macros, list of operating

may be unprotected because they are in the public domain.<sup>106</sup> The court found no infringement because all the similarities were either dictated by functional requirements or were in the public domain.<sup>107</sup> Of particular importance in the *Altai* decision is the principle that "compatibility requirements of other programs with which a program is designed to operate in conjunction" causes expression to be merged with idea and thus makes it unprotectable.<sup>108</sup>

*Altai* would exclude alternatives that are commercially inferior.<sup>109</sup> If the commercial objective is compatibility, there are no commercially acceptable alternatives except copying the interface. Indeed, the *Altai* court applied the merger conclusion to elements dictated by external factors, explicitly mentioning compatibility requirements of other programs and widely accepted programming practices within the industry.<sup>110</sup> Under this alternatives test,<sup>111</sup> an interface is not entitled to protection. There are no alternative ways to achieve compatibility between computerized works representing complementary types of value except by copying the interface. On efficiency grounds, viewed both from the perspective of the producer and the consumer, this single alternative means that

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system services).

106. *Computer Assoc. Int'l, Inc.*, 775 F. Supp. at 561.

107. *Id.* at 561-62.

108. "Those aspect of a work, which 'must necessarily be used as incident to' the idea, system or process that the work describes are also not copyrightable." 982 F.2d at 704 (quoting *Baker v. Selden*, 101 U.S. 99, 104 (1879)). Therefore "those elements of a computer program that are necessarily incidental to its function are similarly unprotectable." *Id.* at 705.

109. According to the court of appeals the cornerstone of the merger doctrine is that elements dictated by efficiency are unprotectable. *Id.* at 707. When there is only one *efficient* way to express a process or idea, that is equivalent to there being only one way to express it. For example, in computer programming, sometimes there are only a limited number of efficient file structures available. *Id.* at 708 (citing "L" design of spreadsheet from *Lotus Dev. Corp. v. Paperback Software Int'l*, 740 F. Supp. 37, 66 (D. Mass. 1990)).

110. 982 F.2d at 709.

111. The alternatives test is the same thing as the merger doctrine. If there is only one alternative, expressing that alternative expresses the idea, and the expression merges into the idea.



the interface should be treated as an idea rather than expression.<sup>112</sup>

There is one major problem with the *Altai* formulation that prevents it being a complete solution to the unbundled value interface problem. The compatibility efficiency/merger rationale of *Altai* does not necessarily extend to compatibility with the allegedly infringed work; the facts of *Altai* involved compatibility by both infringing and infringed programs with a third computing environment: the operating system.<sup>113</sup> On those facts, it was easier to conclude that the similar interfaces were dictated by *external* factors, given that the operating environments were external to both infringing and infringed programs. In the unbundled value scenario, the structure dictating the interface of the infringing program is not external; rather, it is the creative choice of the designer of the infringed program, not dictated by any desire of that original designer to be compatible with anything else.

The effort required to create an interface is significant and characterized by highly creative thought. It may be better analytically to consider the original designer's intended use for the interface than to have protection depend on whether he followed an industry standard or was creatively arbitrary.

In *CMAX/Cleveland, Inc. v. UCR, Inc.*<sup>114</sup> the significant and creative nature of the interface posed a problem for the defendant. A system of equipment rental stores developed an in-house store management program to replace one originally licensed from the plaintiff.<sup>115</sup> The plaintiff argued that the in-house program was either a copy of the plaintiff's program or a derivative work based on the plaintiff's program.<sup>116</sup> The defendant had copied screens and file structures in developing the in-house program.<sup>117</sup> The district court found that "the selection and arrangement of the field

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112. Admittedly, the last step in this logic is not overwhelmingly compelling.

113. *Id.*

114. 804 F. Supp. 337 (M.D. Ga. 1992) (granting permanent injunction).

115. *Id.* at 351.

116. *Id.*

117. *Id.* at 344.

definitions within the files . . . are the expression of an idea.”<sup>118</sup> The court rejected the defendant’s argument that the file structures were dictated by market forces, concluding that the structures were not alphabetic or otherwise systematic nor were they functionally significant.<sup>119</sup> The court also found that transaction codes for use in the program were protectable expression rather than ideas because they were arbitrary and because they were not dictated by efficiency or by the industry. It rejected the defendant’s argument that “it would not make sense to change the codes [so the employees familiar with the earlier system] would have to learn new ones.”<sup>120</sup> Eliminating retraining costs was not an external factor sufficient to negate the copyrightability of the codes.<sup>121</sup>

The court, using the *Computer Associates* analytical framework,<sup>122</sup> including the external factors branch of the merger doctrine,<sup>123</sup> found infringement of protected expression based on evidence that the allegedly infringing file structures were not dictated by external factors.<sup>124</sup> *CMAX* thus used the *Altai* formula and reached a different outcome.

But that is not all there is to the analysis. *Altai* was influenced by policy considerations, as well as mechanical application of its filtration analysis.<sup>125</sup> Those policy factors suggest that protected

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118. *Id.* at 354. The court also rejected the defendant’s argument that the file structures were merely blank forms. Rather, the file structures are sufficiently informative to be expression and not idea. *Id.* at 355.

119. *Id.* at 354 (finding that testimony that other store management systems involved conversion programs to transfer data meant that different file formats were common and therefore sequence of field definitions were not dictated by industry conditions).

120. *Id.* at 355.

121. *Id.*

122. *Computer Assoc. Int’l., Inc. v. Altai, Inc.*, 952 F.2d 693 (2d Cir. 1992).

123. 804 F. Supp. at 353. It did, however, say that the facts of *Altai* were of limited help because they involved literal copying of source and object code. *Id.* at 354.

124. *Id.* at 354-55.

125. 982 F.2d at 711-12 (admitting that the court was influenced by policy not to impede innovation and creativity).

expression is not infringed when the copying is no greater than necessary to assure compatibility.<sup>126</sup>

### PATENT PROTECTION

The analysis of protection for interfaces should not end with copyright. If a data structure representing an interface is patentable,<sup>127</sup> or if an interface has algorithms as well as data structures [as it might in the case of the ADEP product described in the appendix] or if there are interfaces between the different pieces of the dBASE bundle, a patent might be granted for important parts of the interface.<sup>128</sup> Such patent protection would have a much stronger cost-increasing effect on production of types of value that need to use the interface. This type of protection precludes use by others and, as such, creates a valuation difficulty where the operation of discrete but compatible types of value does not involve use of the interface between them.

### DERIVATIVE WORK

The disaggregated value concept implicates the derivative work and compilation concepts<sup>129</sup> in two respects. First, external

126. It is, perhaps, more analytically rigorous to reach this conclusion under the public domain or fair use evaluations *infra* rather than retrospectively defining the work based on the purpose of the copying.

127. It is not clear that data structures are patentable subject matter.

128. See, e.g., U.S. Patent Nos. 5,179,555 (Jan. 12, 1992) (high speed data compression and transmission for wide area network connections in LAN/bridging applications); 5,146,221 (Sep. 8, 1992) (data compression apparatus and method); 5,126,739 (Jun. 30, 1992) (data compression apparatus and method); 5,016,009 (May 14, 1991) (data compression apparatus and method); 5,003,307 (Mar. 26, 1991) (data compression apparatus with shift register search means).

129. It may not be easy to tell the difference between a derivative work and a compilation. Preparation of a derivative work is the exclusive right of the owner of the copyright in the original work. 17 U.S.C. § 106(2)(1988). Preparation of collective works and other compilations is not an exclusive right belonging to the copyright owner, although copying associated with much compilation activity is an exclusive right of the copyright owner. 17 U.S.C. § 106(1)(1988). Professor Nimmer distinguishes among derivative works, compilations, and collective works in the following way: a compilation "consists merely of the selection and arrangement of preexisting material without any internal changes in such material," while a derivative work involves changes in the preexisting material regardless of whether it is combined with other

pointers value may be a derivative work or compilation.<sup>130</sup> Second, such secondary works may result from a particular session in which a consumer uses the second producer's external pointers value to retrieve certain material from content and chunking and tagging value produced by someone else. The external pointers value (or the system in which it is associated) produces derivative works or compilations under the control of the consumer.<sup>131</sup>

In the newer information technologies both derivative works and compilations involve low-content additions to preexisting value (such as when someone takes preexisting content and chunking and tagging value and makes it more accessible or useful for certain markets by adding additional chunking and tagging and external pointers value). In the example given in the hypothetical,<sup>132</sup> the CenDEP and ADEP products themselves arguably are derivative works of the CenDEP works, and the collection produced by the ADEP product working in conjunction with the CenDEP products

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preexisting material. 1 NIMMER, *supra* note 47, § 3.02.

Nimmer's insistence that derivative works must involve internal changes in the preexisting material is questionable. *See, e.g.,* Mirage Editions, Inc. v. Albuquerque A.R.T. Co., 856 F.2d 1341, 1343 (9th Cir. 1988) (mounting selected pages of book on ceramic tiles was infringing derivative work), *cert. denied*, 489 U.S. 1018 (1989); Addison-Wesley Pub. Co. v. Brown, 223 F. Supp. 219 (E.D.N.Y. 1963) (work containing answers to problems published in college text book was infringing). In these cases, the courts found that there was a derivative work, although there were no changes in the preexisting material. Moreover, while most of the examples given in the statutory definition of derivative work under 17 U.S.C. § 101 (1988) involve internal changes, "annotations", or "elaborations", these holdings do not follow that definition.

130. In 17 U.S.C. § 103(b)(1988), it is stated that "[t]he copyright in a compilation or derivative work extends only to the material contributed by the author of such [compilation or derivative] work, as distinguished from the preexisting material . . . ." The statute treats the new value added by the second producer (the producer of a derivative work) as a separate work. *Id.* Thus, the pointers that are designed to function only in conjunction with an underlying work are the derivative work in which the pointer's creator may be entitled to a copyright.

131. In this variant of the derivative work argument, the supplier of the external pointers value would be liable as a contributory infringer. *See* Sony Corp. of Am. v. Universal City Studios, 464 U.S. 417, 434-42 (1984) (describing the contributory infringement concept); Lewis Galoob Toys, Inc. v. Nintendo of Am., 964 F.2d 965 (9th Cir. 1992) (stating that "[c]ontributory infringement is a form of third party liability"), *cert. denied*, 113 S. Ct. 1582 (1993).

132. *See supra* notes 14-23 and accompanying text.

and the public domain judicial and legislative materials is either a compilation<sup>133</sup> or a derivative work.<sup>134</sup>

Commentators and at least one court have correctly rejected both possibilities.<sup>135</sup> Professor Samuelson's article on computer-authored works marshals the arguments as to why neither the external pointers nor the resulting combination of works generated by the computer is a derivative work.<sup>136</sup> She explains that the exclusive right to prepare derivative works has never extended to use, but rather included only specific activities that included significant amounts of copying, such as preparing translations.<sup>137</sup> The broad language in the Copyright Act of 1976 reflects only an attempt to simplify copyright laws, not a legislative intent to

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133. The session output is a compilation if it is merely a particular selection and arrangement of material from the underlying works. *See generally* Jack B. Hicks, Note, *Copyright and Computer Databases: Is Traditional Compilation Law Adequate?*, 65 TEX. L. REV. 993, 1001-10 (1987) (arguing that traditional copyright protection for compilations according to the "arrangement doctrine" and the "effort" ("sweat of the brow") doctrines adequately protect computer databases; the "subjective selection doctrine" is less useful). If the materials extracted from the preexisting works are themselves copyrighted, the result is then a collective work. 1 NIMMER, *supra* note 47, § 3.02. The author of this compilation may be the author of the underlying works, the author of the external pointers value, the user of the external pointers value, or two or more of them jointly. *See* Samuelson, *infra* note 136, at 1221-24. A disadvantage to the joint author approach is that many more than two producers potentially would be joint authors, leading to a complex web of property rights in a particular package of information value. This could complicate the marketing of that package inasmuch as a transferee might have obligations to a multiplicity of people, not all of whom are available for negotiating licenses. On the other hand, any joint author could transfer all of her rights, which should give the transferee a privilege vis-a-vis the other joint authors. Thus, the transferee need not fear liability to upstream joint authors. The concept is exactly that of a tenancy in common. Under this property concept, any co-owner can transfer his rights giving the transferee co-owner a right to use the entire property, without fear of trespassing liability to the other common tenants.

134. Alternatively, if the application of the external pointers value affects internal modifications of the material extracted from the preexisting works, then the session output may be a derivative work. 1 NIMMER, *supra* note 47, § 3.01.

135. *See infra* 136-61 and accompanying text.

136. Pamela Samuelson, *Allocating Ownership Rights in Computer Generated Works*, 47 U. PITT. L. REV. 1185, 1216-18 (1986).

137. *Id.* at 1213.

broaden the derivative work concept.<sup>138</sup> Moreover, in copyright generally, the scope of protection may vary depending on the nature of the work.<sup>139</sup>

The unbundling of the different types of value makes it possible for someone to create a collective work without copying the underlying works. The collective work creator simply defines external pointers to each of the underlying works.<sup>140</sup> As such, the external pointers value and the collective work that it permits a user to create are analogous to a simple bibliography. Just as there is no precedent for considering a simple bibliography to be a derivative work of all of the primary work cited in the bibliography, so the external pointers value in the electronic environment should not be considered to be a derivative work.

One of the most significant decisions on the derivative work concept in the computer context<sup>141</sup> is the Ninth Circuit's *Lewis Galoob Toys, Inc. v. Nintendo*.<sup>142</sup> After a bench trial, a split

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138. *Id.* at 1213-14.

139. See Ginsberg, *supra* note 46, at 1916-18 (enumerating examples of how the scope of protection may be narrower for low authorship works, resulting in an infringement only when there is outright copying of the entire work or nearly the entire work).

140. With the advent of digital electronic technologies, it is more feasible to prepare new materials that build upon preexisting material in a way in which the increments of value can be separated. Indeed, this is the unbundling concept. Because of unbundling, derivative works will no longer exist. Everything will be either a compilation or a collective work. Following this reasoning, the preparation of an unbundled type of value never infringes the derivative work right of the original producer. The exclusive right to produce derivative works is implicated only if the new value is bundled with the old.

141. In *CMAX/Cleveland, Inc. v. UCR, Inc.*, 804 F. Supp. 337, 355-56 (M.D. Ga. 1992), the district court applied the derivative work concept in the computer program copyright context to hold that the defendant infringed plaintiff's "exclusive right to prepare derivative works." Thus, the court granted a preliminary injunction against the defendants. *Id.* at 360. In this case, the plaintiffs designed a computer software system for businesses. The defendant, a previous licensee of plaintiff's computer system, developed an in-house system to avoid dealing with the plaintiff. *Id.* at 343. There were new aspects in the allegedly infringing in-house system that were not found in the original system. *Id.* at 355. Thus, the court found that the new system was at most a derivative work. *Id.* at 356. The defendant's program did not merely interact with the first program; instead it replaced it which involved both copying of the value represented by the original work as well as adding new value.

142. 964 F.2d 965 (9th Cir. 1992), *cert. denied*, 113 S. Ct. 1582 (1993).

panel affirmed a judgment in favor of the defendant declaring that an add-in device called a Game Genie did not violate any Nintendo copyright.<sup>143</sup> The Game Genie alters the performance of Nintendo's video games.<sup>144</sup> It intercepts and replaces a single data byte used by Nintendo, changing the capability of a video game character and increasing the speed at which the character moves.<sup>145</sup> Nintendo had argued that audio visual displays created by the Game Genie were derivative works and that by making and selling the Game Genie, the defendant had violated Nintendo's exclusive right to make derivative works.<sup>146</sup> The trial court and the Ninth Circuit disagreed with Nintendo's argument. The Ninth Circuit noted that the examples of derivative works provided by the Copyright Act physically incorporate the underlying work.<sup>147</sup> Likewise, the Copyright Act's legislative history states that an infringing derivative work must incorporate a portion of the copyrighted work.<sup>148</sup>

The Ninth Circuit found that the Game Genie did not create any independent work, derivative or otherwise.<sup>149</sup> "The Game Genie merely enhances the audiovisual displays . . . that originate in

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143. *Id.* at 968.

144. *Id.* at 969.

145. *Id.* at 967.

146. *Id.* at 970.

147. *Id.* at 967. The fact that the image created by the Game Genie was not fixed did not eliminate the possibility that it could have been a derivative work. *Id.* at 968. The court noted that fixation is a requirement for protection under the Copyright Act. *Id.* See also 17 U.S.C. §§ 101, 102 (1988 & Supp. IV 1992). Furthermore, the examples of derivative works provided by the Act involve the physical incorporation of the underlying work.

148. *Galoob*, 964 F.2d at 967. In some sense, all works are derivative because knowledge is cumulative. Unless the exclusive right to prepare derivative works is limited, it becomes an exclusive right to use. See Samuelson *supra* note 136, at 1210. Copyright, unlike patent, has never included use within the bundle of rights exclusively reserved to the owner of the intellectual property interest. See 17 U.S.C. § 106 (1988 & Supp. IV 1992). The Ninth Circuit noted that the legislative history of the Copyright Act included statements to the effect that the infringing derivative work must incorporate a portion of the copyrighted work.

149. *Galoob*, 964 F.2d at 968. "[T]he Game Genie cannot produce an audiovisual display; the underlying display must be produced by a Nintendo Entertainment System and game cartridge." *Id.*

Nintendo game cartridges.”<sup>150</sup> Thus, it is not a derivative work.<sup>151</sup> The Ninth Circuit declined to stretch the derivative work concept because it feared chilling innovation.<sup>152</sup> It specifically cited add-in spell checkers as an example of something that should not be classified as a derivative work because to do so would hinder the creation of such useful adjuncts.<sup>153</sup> Add-in spell checkers are relatively pure examples of disaggregated value; they add integrity assurance value to pre-existing bundles of other types of value. Moreover, the Ninth Circuit found that even if use of the Game Genie by purchasers created a *prima facie* infringing derivative work, such use was allowed by the fair use privilege.<sup>154</sup>

The Ninth Circuit was correct in extending the fair use privilege to any creation of a derivative work by the consumer and in refusing to label the secondary work. If followed by other circuits, *Galoob* preserves the potential for disaggregated value in electronic publishing; at a minimum, it prevents the derivative work concept from presenting an impediment.

In both patent and copyright law, the scope of protection interacts with privileges and defenses. The first producer's scope of protection may be broad enough under the derivative work

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150. *Id.*

151. The *Galoob* court distinguished *Mirage Editions, Inc. v. Albuquerque A.R.T. Co.*, 856 F.2d 1341, 1343 (7th Cir. 1988) (emphasizing that the ceramic tiles physically incorporated the copyrighted works), *cert. denied*, 489 U.S. 1018 (1989), from its case. *Galoob*, 964 F.2d at 968. The Seventh Circuit has expanded the definition of a derivative work to include “speeded-up video games.” *Midway Mfg. v. Artic Int’l, Inc.*, 704 F.2d 1009, 1014 (7th Cir. 1983), *cert. denied*, 464 U.S. 823 (1983). In *Midway*, a computer chip that speeded-up the play of the video game was found to be infringing work. *Id.* The Ninth Circuit limited the holding of *Midway* by rejecting the Seventh Circuit’s expansion of the derivative work definition, an expansion that the Seventh Circuit itself had acknowledged was “stretching” the Act’s definition of a derivative work. *Galoob*, 964 F.2d at 969. In reaching its conclusion the Ninth Circuit noted that Artic copied and replaced the chip originally distributed by Midway (game supplier). *Id.*

152. *Id.*

153. *Id.*

154. *Id.* at 972. “Game Genie users are engaged in a non-profit activity. Their use of the Game Genie to create derivative works therefore is presumptively fair.” *Id.* at 970. See 17 U.S.C. § 107 (1988 & Supp. IV 1992).



concept to encompass addition of new value, but the addition of new value may be a fair use.<sup>155</sup> Except for the "thin protection" idea, the scope of copyright protection does not vary depending on the degree of inventiveness or market conditions.<sup>156</sup> Market factors and social costs of copyright protection are dealt with by the fair use privilege.<sup>157</sup> Conversely, in patent law, there are only a few defenses, but the scope of patent protection is influenced by the amount of value added to the prior art and by market conditions under the variable range application of the doctrine of equivalents.<sup>158</sup>

When applying the derivative work concept in the value-added electronic work context, the analysis should focus on the copying done by the second producer. In the patent context, the focus should be on the use of the preexisting patented invention by the second producer. If the second producer does not copy any protected value created by the first producer, then there is no derivative work and no copyright infringement. If the second producer does not use any patent-protected value created by the first producer, then there is no patent infringement.<sup>159</sup> If the only

155. See *infra* notes 171-216 and accompanying text.

156. Once a copyright exists, 17 U.S.C. § 106 grants to the holder the exclusive right to engage in certain conduct. There is no statutory sliding scale.

157. See *infra* notes 171-216 and accompanying text.

158. *Rite-Hite Corp. v. Kelley Co., Inc.*, 629 F. Supp. 1042, 1066 (E.D. Wis. 1986) (explaining that the range of equivalents from which a patentee is entitled to protection is determined under a sliding scale which depends on the nature of the invention), *aff'd*, 819 F.2d 1120 (Fed Cir. 1987). The policy issues involved in determining the scope of the derivative work concept are applied in defining the interface between patent and antitrust law more than in interpreting patent law itself. Many patent license agreements also license "know-how." Know-how is unpatentable expertise useful in realizing the economic benefits of a patent. Typically, a patent and know-how license limits competition by the licensee with the patent owner. Such limitations potentially raise antitrust concerns because they restrict competition. The courts deal with something similar to the derivative work concept in scrutinizing patent and know-how licenses for field-of-use restrictions. *Amgen, Inc. v. Chugai Pharmaceutical Co., Ltd.*, 808 F. Supp. 894, 903 (D. Mass. 1992) (explaining the field-of-use inquiry in determining the scope of patent protection).

159. The objection to this proposition is that it makes the derivative work category in 17 U.S.C. § 106 (1988 & Supp. IV 1992) irrelevant; under the proper definition of a derivative work any conduct that constitutes preparation of a derivative work also constitutes copying. See *supra* note 127 and accompanying

copying involved is the copying of the interface or, in the patent context, if the only use of the patented product is use of the interface, then the principles developed in the following section should be applied.

If the new work produced by the second producer permits the user to use the patented product or to copy the underlying work, then the content of marketing messages can be scrutinized to determine whether the new work constitutes contributory infringement.<sup>160</sup> It is contributory infringement if its only advertised purpose is to facilitate infringement and it has no overriding independent social value.<sup>161</sup>

Ultimately, the interpretation of the derivative work concept in the value-added electronic work context is a question of the scope of intellectual property protection. Scope is a question of interests more than of principled interpretation of existing statutory terms. Whether intellectual property protection for underlying value should receive broad or narrow protection depends upon whether a monopoly over a broad range of secondary uses is really necessary in order to induce people to produce the underlying works. The evidence that people will not produce content unless they can control all conceivable ways of adding value to their underlying work is thin at best.

#### POLICY CONSIDERATIONS: THE INVOLVEMENT OF FREE-RIDING

The validity of any of the theories restricting use of compatible interfaces should depend on the degree to which the production of a compatible product and use of the interface constitutes free-riding.<sup>162</sup> Whether these activities constitute free-riding is

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text.

160. See *Sony Corp. v. Universal City Studios*, 464 U.S. 417, 446-47 (1984) (explaining that the sale of copying equipment does not constitute contributory infringement of copyright if the equipment is widely used for legitimate, unobjectional purposes).

161. The *Sony* Court stated that although there may be copying of an entire work, it may still be a fair use. *Id.* at 449-50.

162. The need for protection from free-riding always has made informed copyright laws by distinguishing between protectable expression and unprotectable ideas and facts.

dependent on the impact on the potential market for the underlying value. Protecting such market opportunities is the only economic justification for giving the author of a primary work exclusive control over the preparation of derivative works or over copying of the interface. If a *prima facie* infringement is found, this competitive-effect factor is the same as that involved in a finding of fair use.

The existence of free-riding is often a question of perspective. In Ashton Tate's eyes,<sup>163</sup> there was not only the risk, but the reality, of free-riding by Fox Software. Ashton Tate's product concept was to bundle several different types of value in database management software. By keeping the interface among the different pieces of the bundle out of the public domain, Ashton Tate protected itself against competition for individual pieces of the bundle.<sup>164</sup> Fox Software found a way to get a free-ride on the promotion value embedded in the large number of copies of dBASE, and a large amount of information chunked and tagged in the dBASE format. By monopolizing the interface, Ashton Tate could monopolize this installed-based market.<sup>165</sup>

163. See *supra* notes 87-93 and accompanying text. These notes explain the position taken by Ashton Tate, since it has merged into Borland International, claiming that Fox Software's use of the dBASE programming language constituted copyright infringement.

164. Ashton Tate's preferred bundle included both chunking and tagging value (or processes for adding and representing chunking and tagging value), internal and external pointers value (or processes for adding and representing internal and external pointers value) and processes for adding presentation value. Fox Software sought to compete with Ashton Tate for the internal and external pointers and the presentation pieces of the bundle.

165. The competitive situation is nearly identical to that presented in *Worlds of Wonder v. Vector Intercontinental, Inc.*, 653 F. Supp. 135 (N.D. Ohio 1986). In that case, the plaintiff had developed a market for a family of toy products centered on a bear called Teddy Ruxpin. *Id.* at 137. This bear can move its eyes, nose, and mouth by an electromechanical system. *Id.* This system is controlled by two cassettes, one of which is a command track and the other is a sound track. *Id.* The defendant produced compatible cassette tapes for the bear and plaintiffs claimed that defendants obtained a free-ride on the commercial success of Teddy Ruxpin. *Id.* The district court applied the idea/expression dichotomy, which is a doctrine that states that an idea is not protected by copyright laws but expression of that idea is protected. *Id.* On a motion for preliminary injunction, the district court concluded that it was very likely that the plaintiffs could prove copyright infringement of the protected expression. *Id.* at 140. The effect of

The intellectual property policy question is whether a monopoly justifiable for one type of value should be extended to other types of value through protecting the interface between types of value when the original producer wants to do so. When production of different types of value is disaggregated, a compatible interface increases the market for the primary work (the content and chunking and tagging value) rather than reducing it. If infringement occurs only when free-riding occurs, and free-riding occurs only when the market for the underlying work is diminished, supplying a compatible interface should not constitute infringement or, if it does, it should be fair use.

But in these circumstances, producers of the underlying work will not assert copyright protection. Whenever initial producers elect not to bundle separate types of value, they will not seek to protect the interfaces. Instead, they benefit from other producers using their interface to produce other types of value desired by

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playing the allegedly infringing tape in the Teddy Ruxpin bear was very similar to the effect of playing an authentic Teddy Ruxpin tape. *Id.* at 139. Using the word "compatible" twice in describing the business concept of the alleged infringer, *id.* at 137, 141, the court apparently concluded that compatibility constituted copyright infringement. There was no indication that the actual music or speech content on the tapes were similar; only the voice quality of the narrator and the effects produced in the toy by synchronization codes were similar. *Id.* at 39-40; *see also* *Worlds of Wonder, Inc. v. Veritel Learning Systems, Inc.*, 658 F. Supp. 351, 356, 356 n.4, 358 (N.D. Tex. 1986) (following the holding in both *Vector International* and *Midway*; holding that the compatible cassette tapes for Teddy Ruxpin bear were infringing derivative works, under audiovisual look and feel similarity analysis). The audio visual nature of the copyright justifies a somewhat broader consideration of the overall impression and look and feel of the activities of the toy when actuated by copyrighted and allegedly infringing tapes than might be appropriate in comparing other kinds of compatible works. Many commentators doubt that the Teddy Ruxpin case is still good law. Edward G. Black & Michael H. Page, *Add-on Infringements: When Computer Add-Ons and Peripherals Should (and Should Not) Be Considered Infringing Derivative Works Under Lewis Galoob Toys, Inc. v. Nintendo of America, Inc., and Other Recent Decisions*, 15 HASTINGS COMM. & ENT. L.J. 615, 621 n.10 (1993) (noting that commentators reject the Teddy Ruxpin doctrine); Christian H. Nandan, Note, *Proposal to Recognize Component Works: How A Teddy Bears on the Competing Ends of Copyright Law*, 78 CAL. L. REV. 1633, 1651-54 (1990) (criticizing the Teddy Ruxpin approach).

Significantly, in *Lotus Dev. Corp. v. Borland Int'l, Inc.*, 831 F. Supp. 223, (D. Mass. 1993), Lotus' position with respect to Borland was very similar to Ashton Tate's position with respect to Fox over the interface monopoly issue.

consumers. Then, consumer demand for the second type of value can induce demand for the first producer's value. In these circumstances, the free-riding is not a disincentive to production. It is a positive incentive.

#### DEFENSES TO PRIMA FACIE INFRINGEMENT

Regardless of the validity of the arguments developed in the preceding section, a second producer may have good defenses based on the public domain character of certain interfaces, an implied license argument, or fair use. As has been suggested at several points in the preceding analysis, it is analytically neater to deal with the purpose and market effects of the secondary work's compatibility through defenses or privileges rather than through manipulation of the scope of copyright protection.

Each of the major defenses has some advantages and disadvantages. Public domain affords the broadest set of privileges, but a public domain characterization presupposes an express dedication or explicit intent to dedicate.<sup>166</sup> Conversely, fair use does not depend on the subjective intent of the author of the underlying work,<sup>167</sup> and may prove more advantageous. Its unpredictability in application however may deter investment in secondary works. The third possibility is implied license, but this, even more than public domain, is entirely within the control of the author of the first work, who can expressly negate an intent to license. A legal implication cannot stand in the face of an express intent to the contrary. The most attractive possibilities, in order of desirability, are to rationalize fair use,<sup>168</sup> to develop an irrebuttable presumption of public domain dedication of interfaces,<sup>169</sup> or to impose

166. See Pamela Samuelson, *Creating a New Kind of Intellectual Property: Applying the Lessons of the Chip Law to Computer Programs*, 70 MINN. L. REV. 471, 493 (1985).

167. The fair use privilege is a statutory privilege and is not dependent on the copyright holder's intent to grant such a privilege. 17 U.S.C. § 107 (1988 & Supp. IV 1992); *Campbell v. Acuff-Rose Music, Inc.*, 114 S. Ct. 1164, 1170 (1994) (reversing the court of appeals and concluding that the commercial character did not create a presumption against fair use because a case-by-case analysis, rather than bright line rules, is envisioned by § 107).

168. See *infra* notes 171-216 and accompanying text.

169. See *infra* notes 217-20 and accompanying text.

compulsory licenses.<sup>170</sup> The following sections consider each possibility in turn.

### THE FAIR USE PRIVILEGE

The fair use doctrine may shield the user of the interface from liability for infringement, even if one or more of the theories considered in the preceding sections support intellectual property protection for computer-to-computer interfaces, or even if conduct by the producer of added value invades an exclusive right of a copyright owner.<sup>171</sup> Fair use permits the social benefits and costs of intellectual property protection to be assessed in individual cases. There are four statutory factors to be considered in evaluating an assertion of fair use.<sup>172</sup> The four factors are not exclusive, rather, they are merely the starting point for a broad equitable inquiry.<sup>173</sup> Most significant to fair use's policy concerns is the impact on markets for the underlying work.<sup>174</sup>

Fair use analysis involves a free ranging market effect inquiry as a part of a more general equitable inquiry.<sup>175</sup> This is both its strength and weakness as a guarantor of the availability of computer-to-computer interfaces in an electronic marketplace for disaggregated value. The inquiry into effects on potential markets

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170. See *infra* notes 221-41 and accompanying text.

171. 17 U.S.C. § 107 (1988 & Supp. IV 1992).

172. The four statutory fair use factors are as follows:

- (1) the purpose & character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;
- (2) the nature of the copyrighted work;
- (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and
- (4) the effect of the use upon the potential market for or value of the copyrighted work.

17 U.S.C. § 107 (1988 & Supp. IV 1992).

173. See *Campbell v. Acuff-Rose Music, Inc.*, 114 S. Ct. 1164, 1170 (1994) (explaining that fair use be determined on a case-by-case basis.); *Sony Corp. v. Universal City Studios*, 464 U.S. 417, 448 (1984) (explaining the fair use factors and proposing a supplementary functional test); 3 NIMMER, *supra* note 47, § 13.05.

174. See 3 NIMMER, *supra* note 47, § 13.05 [B] (explaining the proposed functional test for fair use in terms of market impact).

175. See *Sony Corp. v. Universal City Studios*, 464 U.S. 417, 450 (1984).

legitimizes the need to consider the economic consequences of any of the three theories for holding the producer of new chunking and tagging or external pointers value liable as an infringer.<sup>176</sup>

Consider a producer of external pointers value who designs the pointers to be compatible with another producer's chunking and tagging value.<sup>177</sup> The first statutory fair use factor considers the purpose and character of a subsequent use, including its commerciality,<sup>178</sup> to determine its presumptive fairness. The purpose of creating external pointers is to attain compatibility with the underlying work, which is a commercial purpose, militating against a finding of fair use.<sup>179</sup> The nature of the underlying published work,<sup>180</sup> if found to be fact-oriented, militates in favor of the external pointer being a fair use.<sup>181</sup> The third factor assesses minimalization of the second producer's copying of the first work's protected expression. The producer of pure external pointers value has used relatively little of the underlying work, indeed, only the

176. See *Atari Games Corp. v. Nintendo of Am. Inc.*, 975 F.2d 832, 842-43 (Fed. Cir. 1992) (distinguishing free-ride from productive extension of first producer's investment; suggesting that fair use encompasses minimum amount of copying necessary to the creation of additional value, but finding copying of video game interface not a fair use because of subterfuge).

177. In network publishing environments, it is easy to envision external pointers value being marketed in relatively pure form, as in a Gopher interface, or in the hypertext links in a World Wide Web coded document. Gopher is a menuing system that permits users to read and transfer files through selecting from menu items. World Wide Web and its associated client interface, Mosaic, are protocols which permit hypertext and hypermedia resources to be published and accessed on the Internet. The hypertext links in such a document, like the pointers in a gopher menu, are capable of getting the objects to which they point, but they do not incorporate them.

178. 17 U.S.C. § 107(1) (1988 & Supp. IV 1992).

179. *Sony*, 464 U.S. at 449. But see *Campbell v. Acuff-Rose Music, Inc.*, 114 S. Ct. 1164, 1170 (1994) (stating that "[t]he language of the statute makes clear that the commercial or nonprofit educational purpose of a work is only one element of the first factor enquiry into its purpose and character" and a commercial purpose does not militate against a finding of fair use).

180. 17 U.S.C. § 101 (1988 & Supp. IV 1992) states that a "publication is the distribution of copies or phonorecords of a work to the public by sale or other transfer of ownership, or by rental, lease, or lending."

181. 17 U.S.C. § 107(2) (1988 & Supp. IV 1992). Indeed, one can argue that the use of the value, which is contributed by the first produced to the producer of external pointers value is so foreseeable that one may be able to sustain an implied license argument. See *infra* notes 221-41 and accompanying text.

minimal amount necessary to ensure compatibility,<sup>182</sup> a characteristic that militates in favor of a fair use finding.<sup>183</sup>

The most important statutory factor is the fourth factor, which examines the potential market impact.<sup>184</sup> At this point in the analysis, the fair use doctrine becomes both flexible and unpredictable. On the one hand, production of external pointers value that are compatible with the underlying work enhances the market for the underlying product's value. Yet, one must also consider the market for derivative works.<sup>185</sup> As noted in the discussion of free-riding potential, one must consider an initial producer's desire to bundle different types of actual or potential value. Obviously, production of unlicensed external pointers value diminishes the market for a possible derivative work constituting external pointers value that might be produced and sold by the author of the underlying work. In this sense, independent sale of the external pointers value diminishes the overall market for the underlying work in the same sense that the production and sale of a movie diminishes the overall market for an underlying book and its foreseeable derivative works, even though the movie enhances the market for the book itself.

Using the market impact factor in this way, however, is tautological. The owner of the underlying work would always prefer a position that includes the market for the alleged fair use work as a part of his own market. Then he can appropriate some of the revenue available from the demand for the second work with the external pointers value. All producers of chunking and tagging

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182. The supplier of pointers value uses the organization and structure of the underlying [target] work, some data structures and programming language code to automate the matching of the pointers with the target tags so the desired chunks of content can be retrieved on user demand.

183. *But see* Sega Enters. Ltd. v. Accolade, Inc., 785 F. Supp. 1392, 1398-99 (N.D. Cal. 1992) (explaining that the fair use privilege is not available to engage in intermediate copying of object code in order to design and produce a compatible product; Accolade's product competed directly with Sega's video game cartridges), *aff'd in part, rev'd in part and remanded*, 977 F.2d 1510 (9th Cir. 1993).

184. 17 U.S.C. § 107(4) (1988 & Supp. IV 1992).

185. 3 NIMMER, *supra* note 47, § 13.05[B]; Cable/Home Comm. Corp. v. Network Prod., Inc., 902 F.2d 829, 845 (11th Cir. 1990) (potential market includes markets for derivative works).



value have an economic incentive to charge "tolls"<sup>186</sup> to ADEP.<sup>187</sup>

The *Sony* Court endorsed a more flexible approach than that.<sup>188</sup> A general equitable inquiry can take into account the foreseeability of external pointers value compatible with the underlying work,<sup>189</sup> the social utility in having external pointers value contributed by as many competing producers as possible, and the social utility in having a great variety of external pointers value being compatible with a great variety of underlying content and chunking and tagging value. In other words, fair use analysis encompasses the public policy in favor of competitive markets for information.<sup>190</sup>

In addition, the fair use inquiry should include attention to the magnitude of any free-ride by the second producer. As long as the producer of external pointers value uses only the minimum from the underlying work necessary to ensure compatibility, any appropriation of investment is *de minimis*.<sup>191</sup> This is qualitative-

186. A toll is another term for royalty.

187. ADEP is a hypothetical supplier of external pointers value. ADEP might produce Gopher interfaces or World Wide Web marked secondary text, with hypertext links.

188. A post-*Sony* court of appeals case considers cross-market effects. In *Cable/Home*, the first producer's business was in pay television programming. 902 F.2d at 834. The direct market was the market for pay television programs. *Id.* The first producer protected this market by encrypting the television programs and making decryption chips available only to those consumers who paid for the programs. *Id.* The promoter of pirate chips claimed fair use of the computer program, 93% of which he copied into pirate chips. *Id.* at 836. The Eleventh Circuit rejected the fair use defense, finding, among other things, that the primary market for the television programming was adversely affected. *Id.* at 845. This is interesting in as much as the market for the infringing product was wholly distinct from the market in which the effect was felt.

189. This consideration in a fair use inquiry overlaps with implied license analysis. *See infra* notes 221-41 and accompanying text.

190. This argument admittedly is somewhat question-begging. Copyright, like other grants of intellectual property, is an exception to the general policy in favor of competition. Evaluating fair use claims in terms of the pro-competitive effect of the use is little different from an aggregate evaluation of the desirable scope of copyright protection.

191. Consider an example in conventional publishing technologies. A bibliography or a footnote citation is a form of external pointers value. To work, the bibliography or citation must copy the title of the work cited and information

ly different from a competitor in the same market getting a free ride by copying an entire work.

Two recent court of appeals decisions evaluate market impact in a way that extends the fair use privilege to appropriation of the interfaces in a preexisting work. The *Galoob* court found that even if use of the Game Genie by purchasers created a *prima facie* infringing derivative work, such use was a fair use.<sup>192</sup> The Ninth Circuit considered the potential market for derivative works based on the Nintendo game cartridges and found that this factor in the fair use analysis militated against a finding of infringement. Nintendo had not issued or considered issuing altered versions of its games; it failed to show the reasonable likelihood of a market for such altered games; indeed altered versions of the games would appeal to no market because the original games were designed to appeal to the widest possible market.<sup>193</sup> The court was unwilling to presume the existence of any market for the purported derivative works. The court also indirectly endorsed the basic concept of publishing on demand, implicitly concluding that publication on demand as an activity of the ultimate consumer is a fair use, even if it involves creation of a derivative work.<sup>194</sup>

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about where it appears. The title may be protectable expression, and the information about where it appears may be protectable arrangement. *See* West Pub. Co., Inc. v. Mead Data Cent., 799 F.2d 1219, 1223-24 (8th Cir. 1986), *cert. denied*, 479 U.S. 1070 (1987). Yet, the copying involved should be a fair use.

192. *Lewis Galoob Toys, Inc. v. Nintendo of Am., Inc.*, 964 F.2d 965, 970 (9th Cir. 1992), *cert. denied*, 113 S. Ct. 1582 (1993). "Game Genie users are engaged in a non-profit activity. Their use of the Game Genie to create derivative works therefore is presumptively fair." *Id.*

193. *Id.* at 971.

194. The court refused Nintendo's invitation to distinguish *Sony* because it involved copying rather than creating derivative works. *Id.* at 971. "It is difficult to imagine that the Court would have reached a different conclusion if Betamax purchasers were skipping portions of copyrighted works or viewing denouements before climaxes. *Sony* recognizes that a party who distributes a copyrighted work cannot dictate how that work is to be enjoyed. Consumers may use a Betamax to view copyrighted works at a more convenient time. They similarly may use a Game Genie to enhance a Nintendo Game Cartridges audio visual display in such a way as to make the experience more enjoyable." *Id.*; *accord* Atari Games Corp. v. Nintendo, 975 F.2d 832, 842 (Fed. Cir. 1992) (stating that the principles of copyright do not envision protecting unintelligible formats against reverse engineering). The court explained that intermediate literal copying of interfaces

In *Sega Enterprises, Ltd. v. Accolade, Inc.*,<sup>195</sup> another video game case, the Ninth Circuit concluded that some intermediate copying for the purposes of reverse engineering is privileged by the fair use doctrine,<sup>196</sup> although intermediate copying constitutes prima facie infringement.<sup>197</sup> It reversed the district court's conclusion on the issue of fair use.<sup>198</sup> The district court held that fair use was not involved because the copying by the competing video cartridge manufacturer adversely impacted the commercial market for the underlying product.<sup>199</sup> Instead, the Ninth Circuit found that the first (purpose of use), the second (nature of copyrighted work), and fourth (market effect) factors supported a fair use conclusion.<sup>200</sup> The court concluded that a fair use analysis permits it to "consider the public benefit resulting from a particular use notwithstanding the fact that the alleged infringer may gain commercially."<sup>201</sup> It found that compatibility of the defendant's work increased the number of the independently

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is privileged by fair use, but fair use depends on possession of the authorized copy of an underlying work. *Id.* at 842-43. The Federal Circuit quoted *New Kids on the Block*, and cited *Galoob*, to support a requirement that fair use copying not "exceed what is necessary to understand the unprotected elements of work." *Id.* at 843. On the facts before the Federal Circuit, the copy from which the intermediate copying was done was not authorized, having been obtained from the Copyright Office by deception, and thus, the court found no fair use privilege. *Id.*

This analysis distinguishes markets pursued by the original producer from markets pursued by the second producer. This is consistent with Professor Gordon's suggestion that an original producer control only those markets she shows she is ready, willing and able to exploit. See Gordon, *supra* note 183, at 161-62. It also is consistent with the analysis used by the Ninth Circuit in *New Kids on the Block v. News Am. Pub., Inc.*, 971 F.2d 302 (9th Cir. 1992), a trademark infringement case. The court allowed, as a fair use, a newspaper to use a trademark in conjunction with a profit-making public opinion poll, largely because the market sought by the newspaper was entirely distinct from the markets sought by the trademark owner. *Id.* at 308.

195. 977 F.2d 1510 (9th Cir. 1992).

196. *Id.* at 1520.

197. *Id.* at 1518-19 (characterizing and rejecting arguments that intermediate copying is not prima facie infringement).

198. *Id.* at 1527.

199. *Id.* at 1517.

200. *Id.* at 1522.

201. *Id.* at 1523.

designed video game programs compatible with the Genesis console (the plaintiff's machine), and thus, represented an increase in creative expression that the copyright laws intend to promote.<sup>202</sup> Even though the manufacture of the compatible game cartridges affected the plaintiff's market in an indirect fashion, the court was unwilling to find that the competing cartridges directly undercut the market for the primary work.<sup>203</sup>

Both of these cases support application of the Fair Use Doctrine to the production of complementary value involving the appropriation of interfaces. Their approach to market impact is correct. If the new work is genuinely complementary, its immediate impact on the market pursued by the author of the underlying work is de minimis. Therefore, creation of the complementary work should be privileged. On the other hand, if the author of the underlying work has attempted to occupy the market sought by the second producer, for example, by producing a work that bundles several types of value, including the type of value offered by the second producer, then the market impact attribute of fair use analysis is less favorable to a determination of fair use. Indeed, the only way that the second producer's appropriation of the interface, which almost certainly is not in the public domain,<sup>204</sup> should be privileged is if there is some articulable difference between the market segments sought by the two producers. This is one of the primary reasons that Borland's fair use argument was unsuccessful against Lotus in a recent district court case.<sup>205</sup> Borland's product was not complementary to Lotus 1-2-3; it directly competed with it, and

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202. *Id.*

203. *Id.* The court noted that game users typically purchase more than one game. *Id.* The court's analysis did not explain why the availability of competing cartridges did not diminish Sega Enterprises' market for its own cartridges with similar games. *Id.*

204. If the producer of the first work stops with production of chunking and tagging value, it is reasonable to suppose that he has put the interface in the public domain so that others can use his product. On the other hand, if the first producer also produces external pointers value, and bundles the two types of value, the inference of public domain dedication is less plausible.

205. *Lotus Dev. Corp. v. Borland Int'l, Inc.*, 831 F. Supp. 223 (D. Mass. 1993).

the compatibility of the macro facility enhanced its competitive position at the necessary expense of the original product.<sup>206</sup>

Fair use analysis also could be focussed more narrowly by creating a special category of fair use for functional features of the underlying work or by proposing a privilege<sup>207</sup> for copying functional features of intellectual property.<sup>208</sup> Significantly, the *Sega* court buttressed its fair use analysis by noting that the underlying game work was mostly functional - or at least comprised of functional elements such as the interlock part of the work.<sup>209</sup> As a functional work, it was entitled to "only weak protection" under the copyright statute.<sup>210</sup> In such cases, equitable considerations weigh on the side of public access under the fair use doctrine.<sup>211</sup> The court reiterated two preconditions for establishing when disassembly is a fair use of a copyrighted work: (1) when the disassembly is the only way to gain access to the ideas and functional elements and (2) when there is a legitimate reason for seeking access.<sup>212</sup>

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206. *Id.* at 243-44.

207. One commentator does not explicitly propose such a privilege but pursues the same goal by narrowing the scope of protection. See A. Samuel Oddi, *Functionality and Free Market Theory*, 17 AIPLA Q.J. 173 (1989).

208. Professor Oddi supports this line of reasoning by proposing limits on the scope of copyright protection to exclude functional features. *Id.* at 181-183. He observes that patent and copyright can have disjointed or overlapping subject matters and disjointed or overlapping scopes of protection. *Id.* at 180-81. Copyright protection for computer programs illustrate overlapping models. *Id.* at 181-82 (observing that copyright of computer programs potentially extends protection into areas also protected by patent law, and into area not protected by patent law because (1) an algorithm is not patentable subject matter, (2) there is insufficient novelty when expression is in the public domain and (3) the expression is either not "useful" or too "obvious" in the patent sense). He concludes that overlapping subject matter does not present a threat to competition. *Id.* at 186. Conversely, he concludes that a serious threat to competition would result from overlapping protection, especially resulting from extending copyright protection into areas of utility. *Id.* at 186-87. Interestingly, he suggests that the prohibition on copying may be a type of exclusivity more stringent than the types of exclusivity granted by a patent. *Id.* at 195-96.

209. *Sega Enters., Ltd. v. Accolade, Inc.*, 977 F.2d 1510, 1527 (9th Cir. 1992).

210. *Id.*

211. *Id.*

212. *Id.*

A special fair use category for functional aspects would draw analogies to trademark law.<sup>213</sup> Under trademark law, one may copy the features of a product that are essential to the successful practical operation of a product ("utility functionality"), features that promote efficiency of use ("user functionality"), and features that enhance efficiency of producing the product ("maker efficiency").<sup>214</sup>

There is no fair use privilege in patent law, although there are policy-based defenses.<sup>215</sup> Under the doctrine of reverse equivalents, even some literal infringements may be justified on the grounds that the second producer has not done things in exactly the same way, but rather in an equivalent way not claimed by the patentee.<sup>216</sup> Techniques for determining infringement accommodate certain legitimate needs and thus are related to the fair use concept in copyright law.

#### PUBLIC DOMAIN?

When an initial producer of information value markets a product intended to be used in conjunction with other products, as when the

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213. Borrowing a concept from trademark law, Oddi suggests mitigating the adverse effect of broad copyright protection by allowing the copying of *functional* features. Oddi, *supra* note 208, at 189.

214. *Id.* at 192 (defining the three types and discussing *In re Diester Concentrator Co.*, 289 F.2d 496 (C.C.P.A. 1961), and *In re Morton-Norwich Products, Inc.*, 671 F.2d 1332 (C.C.P.A. 1982)). Similar to the question posed in connection with application of the copyright merger doctrine, trademark is less likely to find a feature utilitarian functional if there are several equally functional ways to do the same thing. Oddi, *supra* note 208, at 197.

215. There is, however, a very limited defense that overlaps copyright's fair use doctrine. A *prima facie* infringer can escape liability by demonstrating that the use of the patented item was only for experimental purposes with no commercial gain involved. 4 DONALD S. CHISUM, PATENTS § 16.03[1] (1993) (explaining experimental purpose and *de minimis* defense); *accord* 35 U.S.C. § 271(e) (1988) (providing a statutory extension of the testing use exception). Misuse, though a defense to infringement, is not established by a refusal to license. 5 DONALD S. CHISUM, PATENTS § 19.04[3][f] (1993) (noting also that 35 U.S.C. § 271(d)(4) excludes refusal to license as a defense).

216. *SRI Int'l v. Matsushita Electric Corp. of Am.*, 775 F.2d 1107, 1118 (Fed. Cir. 1985) (explaining doctrine of equivalents and reverse equivalents); *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 771 (Fed. Cir. 1983) (applying reverse equivalents doctrine), *cert. denied*, 465 U.S. 1026 (1984).

supplier of a bundle of content and chunking and tagging value intends that separate external pointers, presentation and distribution products be used to retrieve information from the first work, the law may presume that the interface to be used by the second and subsequent products has been placed in the public domain. In *Computer Associates International, Inc. v. Altai, Inc.*,<sup>217</sup> the district court suggested that IBM had placed certain interfaces in the public domain. This, however, was not the holding of the case.<sup>218</sup> In that case, neither the infringed nor the infringing program authors wrote the interfaces. Therefore, it was not explicitly tested whether or not the author of a program writing interfaces for other people to use constructively puts those interfaces in the public domain. But the court's language does invite consideration of the possibility that the author of a computer work, with respect to which other programs must achieve compatibility, impliedly puts the interface necessary for compatibility in the public domain.<sup>219</sup>

Under the Berne Amendments to the copyright statutes, whether a work is in the public domain is determined by objective manifestations of intent rather than by the formalities of a copyright notice.<sup>220</sup> When the creator of a computerized work designs it to operate in conjunction with other works representing other types of value, it is reasonable to infer that the creator of the first work intended to place the interface in the public domain. On the other hand, if the creator of a work bundles several types of value, it is less likely that the producer meant for the interface between the bundled types of value to be in the public domain.

Thus, if an electronic publisher produces only a single type of value, or a bundle of different types of value necessitating still

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217. 775 F. Supp. 544, 561 (E.D.N.Y. 1991), *aff'd in part and vacated in part*, 982 F.2d 693 (2d Cir. 1992) (affirming denial of copyright infringement claim).

218. The court found no infringement because all of the similarities were either dictated by functional requirements or were in the public domain. *Id.* at 561-62.

219. *Id.* at 561 ("the forms for calls of services from each of the three IBM operating systems lie in the public domain, because they are intended to be known in the industry and to be used by programmers.").

220. See generally Robert A. Kreiss, *Abandoning Copyrights to Try to Cut off Termination Rights*, 58 MO. L. REV. 85, 93-94 (1993) (discussing the Berne Amendments and the abandonment of formal copyright notice).

other types to achieve full consumer functionality, the product design supports an inference that the interface for other types of value is in the public domain. It can further be inferred that designing, producing and delivering compatible, complementary types of value is also not an infringement.

#### IMPLIED AND COMPULSORY LICENSES

Owners of copyrights in underlying works can transfer their rights to producers of derivative works and compilations through licenses,<sup>221</sup> as well as by putting the interfaces in the public domain.<sup>222</sup> They can do this through express licenses, but transaction costs make express licensing unattractive in an electronic marketplace with a rich assortment of unbundled, fine-grained value. This is precisely the direction in which information architectures are likely to move.<sup>223</sup> Unbundling types of value proliferates the number of producers and number of individual works or inventions. Collective licensing through institutions like the Copyright Clearance Center, ASCAP or Broadcast Music, Inc. is conceivable as a way of reducing transaction costs for express licensing,<sup>224</sup> but voluntary collective licensing might not work because there may not be enough information providers sharing the same interests.<sup>225</sup>

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221. See 17 U.S.C. § 101 (1988) (defining a "transfer of copyright ownership" as "an assignment, mortgage, exclusive license, or any other conveyance . . .").

222. See *supra* notes 216-220 and accompanying text.

223. Professor Ginsburg notes, however, that one of the difficulties with broad copyright protection for low content works is the transaction cost of negotiating licenses with multiple proprietors of multiple databases. Jane C. Ginsburg, *Creation and Commercial Value: Copyright Protection of Works of Information*, 90 COLUM. L. REV. 1865, 1923 (1990) (also noting that a supplier of subsequent value might demand an exclusive license).

224. See generally Stanley M. Besen et al., *An Economic Analysis of Copyright Collectives*, 78 VA. L. REV. 383 (1992); Paul Goldstein, *Commentary on "An Economic Analysis of Copyright Collectives"*, 78 VA. L. REV. 413 (1992) (commenting on Besen article); William R. Johnson, *Commentary on "An Economic Analysis of Copyright Collectives"*, 78 VA. L. REV. 417 (1992) (commenting on Besen article).

225. Ginsburg, *supra* note 223, at 1923-24 (noting difficulties in collective administration of photocopy rights for printed works with the Copyright Clearance Center (CCC)).



Implied licensing is a way of allowing use of computer-to-computer interfaces, but it may not add much as an independent analytical category. Like public domain dedication analysis, implied licenses may be found from objective manifestations of intent. The problem is that the producer of the underlying value can expressly disclaim the intent to license the interface. Moreover, licensing is a contractual concept, and the probable absence of privity between the producer of the chunking and tagging value and the producer of the external pointers value complicates implied license analysis.

A final possibility is to frame a compulsory license for the same producers, statutorily or through common law evolution. Through compulsory licensing the law can balance the needs of second producers for low-cost access to content and chunking and tagging value and the needs of the producers of such underlying value to prevent free riding. Professor Ginsburg would give broad copyright protection subject to a compulsory license.<sup>226</sup> The compulsory license would permit suppliers of new value to "access, copy, and reorganize data gathered by the first compiler, but afford[] the first compiler compensation for the appropriations."<sup>227</sup> Professor Gordon would define the scope of protection more narrowly,<sup>228</sup> but would permit use of the first creator's information only upon payment of damages by an appropriator who has not made a contract — a way of achieving the compulsory license result in common law.<sup>229</sup>

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226. *Id.* at 1870-71 Professor Gordon comes to a similar conclusion by using the common law. See Wendy J. Gordon, *On Owning Information: Intellectual Property and the Restitutionary Impulse*, 78 VA. L. REV. 149, 258-63 (1992) (imposing a monetary penalty on a defendant which would be much higher than the cost had he initially approached the plaintiff to seek a license will in turn induce people to utilize the market). Professor Ginsburg's focus was on low-authorship works, but her suggestion logically applies to computer-to-computer interfaces, because the need for subsequent producers is similar to their need for second production of low-authorship works.

227. Ginsburg, *supra* note 223, at 1871.

228. See Gordon, *supra* note 226, at 223-24, 257-58 (discussing element (g) - suitability for trading in market context, and suggesting further development of the idea that some type of information may be unsuitable for private ownership for policy reasons).

229. The result of the Gordon scheme is similar to a compulsory license because no injunction is available to stop the second provider's use of the first

The Ginsburg compulsory license scheme would be a kind of eminent domain power given to suppliers of information value. Such suppliers could “condemn,” that is obtain a compulsory license, of underlying pre-existing information value they need to prepare their derivative works. Professor Gordon’s approach offers another means of *de facto* condemnation: the second comer simply uses the first provider’s value and then pays damages if the first producer sues.<sup>230</sup> Gordon is not the only commentator to find an implied license in the common law. Professor Carter, in his commentary on Professor Epstein’s article favoring judicial deference to private custom,<sup>231</sup> points out that custom can impose positive duties to allow use of one’s property, as well as negative rights of exclusion.<sup>232</sup> Accordingly, there is room in the evolution of a common law based on custom of requiring mandatory licensing as a part of the common law doctrine, when licensing is a part of the accepted practice. A legal regime would be more hospitable to such a duty if it followed Professor Epstein’s suggestion of beginning with custom in the industry rather than with welfare economics as the starting point for legal rules.<sup>233</sup> Shaping fair use would be an example.

Professor Ginsburg acknowledges the principal disadvantage with compulsory licensing schemes — they are a form of price regulation.<sup>234</sup> She suggests that compulsory licensing not be accompa-

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provider’s value. *Id.* at 259-60.

230. *See id.* at 260-61. Damages would be due only if the first producer could show that she was ready and able to serve the market served by the second producer. *Id.* at 239. Gordon’s proposal can reasonably be characterized as involving a privilege for the second producer, or a compulsory license, because it would deny injunctive relief to the first producer and limit relief to damages for free riding. *Id.* at 260-61, 265-66. *See also id.* at 161-63 (explaining utility of tort privileges in making sure that intellectual property law does not chill productive behavior by over-broad protection).

231. *See generally* Richard A. Epstein, *International News Service v. Associated Press: Custom and Laws as Sources of Property Rights in News*, 78 VA. L. REV. 85 (1992).

232. Steven L. Carter, *Commentary, Custom, Adjudication, and Petrushevsky’s Watch: Some Notes from the Intellectual Property Front*, 78 VA. L. REV. 129, 136 (1992).

233. Epstein, *supra* note 231, at 126.

234. Ginsburg, *supra* note 223, at 1924.

nied by detailed administrative rate setting.<sup>235</sup> Instead, she offers as alternatives a duty to license accompanied by the possibility of judicial price setting if negotiations over a price break down, under the example of the ASCAP antitrust decree<sup>236</sup> or through compulsory last-offer arbitration.<sup>237</sup> Another analogy is common law eminent domain valuation.<sup>238</sup> Professor Gordon goes further than Professor Ginsburg in sketching the factors that would be used to determine an appropriate price. She achieves this result by avoiding injunctive relief and by basing the measure of damages on the loss to the first provider's intended markets rather than basing the measure on all of the gain to the free rider who may have very well added considerable value of his own.<sup>239</sup>

Pricing would be difficult for a compulsory license of computer-to-computer interfaces, if only because intuitively it is not clear that the interface or tags, by themselves, have much utility, or that use of the interface deprives the supplier of the underlying content and chunking and tagging value of any market opportunities. The test for pricing determination should be loss of market opportunities to the licensor, which in many cases would produce a license fee close to zero. This valuation analysis merges with the market impact analysis considered in conjunction with fair use analysis.<sup>240</sup>

Professor Ginsburg makes the case that despite the disadvantages of a compulsory licensing system, it may be better than the alternatives.<sup>241</sup> But the necessity for such a system presupposes that information value must be bundled. It assumes that the

235. *Id.* at 1933.

236. *Id.* at 1934. See generally Garner, *United States v. ASCAP: The Licensing Provisions of the Amended Final Judgment of 1950*, 23 BULL. COPYRIGHT SOC'Y 119 (1976).

237. Ginsburg, *supra* note 223, at 1934.

238. FED. R. CIV. P. 71A(h), (k) (procedure for valuation in eminent domain condemnation).

239. Gordon, *supra* note 226, at 258-62.

240. See 3 NIMMER, *supra* note 47, § 13.05[A][4] (1993) (discussing the fourth fair use factor - the effect upon plaintiff's potential market).

241. See Ginsburg, *supra* note 223, at 1918-23 (discussing the negative alternatives of no copyright liability on one hand, and full copyright liability on the other).

supplier of additional value in a derivative work must copy or distribute pre-existing value within the scope of someone else's copyright. This is unnecessary in a market where types of value are unbundled and sold separately. The supplier of external pointers value has no need to copy and resell the content and chunking and tagging value with which her external pointers value is intended to be used. Instead, the consumer puts the separately produced types of value together. It is only in the interface between the two that intellectual property protection would get in the way. To the extent that intellectual property protection extends to interfaces such as data structures, and if fair use and public domain analyses fail to create a privilege for compatibility, compulsory licensing may be appropriate in limited applications.

When the different types of value are unbundled, compulsory licensing is less necessary. Unbundling the production and marketing of the different types of value and allowing them to be bundled by the consumer relieves the tension between protecting the fruits of the first supplier's labor and increasing the subsequent supplier's costs. The Ginsburg/Gordon broad protection<sup>242</sup> — the motive for their compulsory license suggestions — does not increase the cost of supplying unbundled value.

#### LIMITS ON PRIVILEGES

There must be limits on unlicensed use of another's external pointers value, however. Without such limits, the free ride potential would be substantial without offsetting additional value. For example, a competitor of CenDEP could simply resell CenDEP's external pointers value, having copied it, and claim it is simply adding distribution value on top of the underlying external pointers value. Similarly, another competitor could add a completely pedestrian interface on top of pirated external pointers value and claim the same privilege.

The most workable limitation would extend the privilege of using underlying external pointers value only to producers who could demonstrate the addition of significant external pointers value

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242. See *supra* note 228 and accompanying text.

of their own and further demonstrate the efficiencies to consumers of using the underlying external pointers value. Such a limitation would make use of two analogies. The first analogy is to one who claims a copyright based on a work that is built on another. Such a person must show originality in the increment of added value. The second analogy is to the *Altai* alternatives test,<sup>243</sup> except that it would be the person claiming the privilege who must exclude alternatives rather than the person claiming the copyright who must establish them.

#### MULTIMEDIA AND DIGITIZATION'S IMPACT ON UNBUNDLING AND INTERFACE PROTECTION

Why should this unbundling and rebundling happen now? Electronic information technologies are not new. Sound recording, video tape, radio, and television are electronic information technologies, the oldest of which is more than 100 years old and the newest of which is about 20 years old.<sup>244</sup>

There are, however, some important differences between video entertainment technologies and newer digital electronic text technologies. These differences may shape how copyright and other legal regulatory concepts, developed for the older electronic technologies, should be adapted for the newer technologies.

One basic difference is that the older technologies are primarily analog and inherently sequential.<sup>245</sup> Once stored, information can

243. The "alternatives test," which is more conventionally called the merger doctrine, determines the predictability of a particular level of abstraction by asking whether there are alternative ways of expressing the same idea. *Computer Assocs. Int'l, Inc. v. Altai, Inc.*, 982 F.2d 693, 707-08 (2d Cir. 1992). The more alternatives, the greater the likelihood that the particular alternative in litigation is copyrightable expression rather than idea.

244. All of these technologies, such as the newer digital electronic text technologies and print-on-paper technologies, involve fixation of information in a medium from which it can be retrieved at a different time from when it was initially created. In this respect, they differ from the first electronic information technologies: telephony and telegraphy.

245. The older technologies involve sound and video images almost entirely, while the newer technologies have, until recently, involved text and numerical information almost entirely. Now, multimedia concepts merge the three types of information representation. The textual heritage of the newer technologies has some important implications because of the higher level of machine processability

be retrieved only by processing the information that precedes it on a physically defined storage device. There are a few strategies for mitigating the effects of this sequential characteristic, but they involve significant levels of human intervention. The delimiters on a long-play phonograph record between individual musical compositions permit a measure of direct access. Although one may set the needle directly at the beginning of a particular composition, the machine cannot search for a particular musical selection without human intervention.

The newer technologies are easily implemented to permit direct or random access to information,<sup>246</sup> although some long-term high density storage techniques involve sequential access.<sup>247</sup> Random access reduces the costs associated with sequential access. Sequential access increases costs at several levels of information production and use. Sequential access increases the cost of using information because a user cannot browse and cannot retrieve a desired chunk of information directly. Sequential access increases the cost of producing secondary works that make use of bits and pieces of earlier works. While it is certainly possible to incorporate a short segment of television broadcast or a sound recording into a new television or recording work, significant human intervention is necessary to extract the segments. For the same reasons, it is less attractive to unbundle different types of value in analog electronic technologies and let a consumer fit the different types together at the time of consumption.

The newer technologies are quite different. With appropriate chunking, tagging and pointers value, the incorporation of a small

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of textual information than that of sound and video images.

246. The newer technologies make random access easier because their digital character makes it much easier for a computer to match a user-supplier search term with a tag on possible chunks of information, duplicating and presenting only the chunks whose tag matches the search term. This is true for the selection number for chunks of music on a CD audio recording and for the text of a word in a free-text searchable judicial opinion. Programmable CD and tape players are available in the consumer market.

247. Primary computer storage like random access memory ("RAM"), most optical storage techniques, hard disk and floppy disk storage are examples of random access storage architectures. Magnetic tape and cassette storage use sequential access technologies.

segment of an earlier work can be completely automated. Thus, a consumer can purchase raw data and a retrieval template, including retrieval processes, separately and combine the information types, retrieving the desired chunks at the time of consumption.

Merely because technology allows something to be done does not mean that people will want to do it. Reduced costs of browsing and information retrieval are attractive for a particular information use such as the kind of organization and retrieval of information desired by lawyers. This pattern of information use extends comfortably to other kinds of reference activities such as those beginning with largely bibliographic sources and ending with primary documents that are used in full text form. Other kinds of information use value this kind of organization for retrieval differently. For example, entertainment uses have dominated the evolution of television and are manifest in the organization of novels and short stories in print formats. These uses emphasize sequential access to works whose unities are important to their character (such as unities of time and place), and relatively low levels of interaction between user and information source. For entertainment applications, sequentiality is a virtue, and interactive capability and easy random access may be irrelevant.

Other information uses value random access and low-cost retrievability differently. Newspaper and magazine print formats are designed to facilitate browsing. Headlines, subheadings, and the "inverted pyramid" style of writing in journalism all make it easy for a casual reader to know everything that is in the newspaper without reading the paper sequentially from beginning to end. Persuasive communication in advertising, political rhetoric, or legal advocacy contemplates greater producer control over the sequence of consumption than typical research information.

While discrete forms of value will never be unbundled for all information categories, new technologies for entertainment works enlarge the potential for extensive electronic markets in which finely grained unbundled information value is exchanged. Digitization of video and audio information and multimedia techniques for organizing and presenting a combination of text, graphics, audio and full motion video blur formerly distinct boundaries between utilitarian and entertainment categories. As the

markets become more expansive and more important to increasing categories of information consumers, the issue of interface availability becomes of greater significance. Conversely, the possibility of compatibility as infringement becomes more troublesome.

### CONCLUSION

It is not possible at this point to develop a closed-form analytical answer to how intellectual property and other legal incentives should be structured to maximize the generation of value in new electronic information products. However, a few areas are reasonably clear and certain related questions can be narrowed.

It is clear that the disaggregation of value, permitting different types of value to be sold separately and assembled by consumers, reduces some of the tension between protecting a first supplier's investment by precluding the preparation of secondary works without that author's permission. Conversely, disaggregation encourages the preparation of a wide variety of compilations or derivative works which, by definition, include new value, by diminishing the scope of the original author's protection.<sup>248</sup> With the new technologies, derivative works and compilations can be prepared on demand. The second supplier simply sells her new value, and allows the consumer to put that new value together with the pre-existing value.

Discrete forms of value will be exchanged in complex, dynamic networks. A complete work will only be created on demand. The work created on demand is not particularly valuable to others, and thus piracy with respect to it is not a major concern. The invest-

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248. The only cost will be to the producer of one type of value who wishes to use the legally-created monopoly in that type of value to exclude others from producing adjacent types of value — a kind of tying power. Generally, the law has disfavored extending market power in one market to another market, a principle that should also apply in electronic publishing. Judge Bork and others debate whether, as a matter of economics, it is possible to multiply market power from one market to another. ROBERT H. BORK, *THE ANTITRUST PARADOX* 366 (1993) (the fallacious transfer-of-market-power theory fails to justify the illegality of tying). One need not take sides in that debate to conclude that an intellectual property scheme should not make it easy to accomplish the disfavored market-power extension.



ment of the new entrepreneurs is protected by technical means of limiting access to the dynamic network. Thus, the most important issue for intellectual property is not how to prevent free rides, but how to ensure that old intellectual property concepts do not block realization of the benefits of new technology.

The new world of disaggregated value can function effectively only if intellectual property does not impede the matching of interfaces. A second supplier must be able to copy a previous supplier's interface so that the second supplier's value can be matched up at the time of use with the first supplier's value.

Achievement of the potential of electronic information technologies in the context of electronic publishing depends on the pursuit of the following principle for the scope of intellectual property protection of digital electronic information formats:<sup>249</sup>

*producers of distinct value should be able to use sufficient value from other producers to permit compatibility and associated marketing of different types of value, permitting the consumer to combine related types of value.*

Lastly, the remaining issue is whether intellectual property doctrines allow producers of chunking and tagging value and external pointers value reasonable access to interfaces with other types of value, either through circumscribing the scope of intellectual property protection through a fair use privilege or through compulsory licensing.

This Article concludes that the fair use privilege is the most appropriate way to permit the use of interfaces by producers of complementary value in an electronic marketplace. There are also other theories available that advocate imposing a kind of indirect compulsory license. However, application of these theories would either require legislation or common law decisions that significantly depart from the historical absence of compulsory licenses in intellectual property and antitrust law. Finally, if interfaces are excluded from copyright protection, as this paper suggests, the

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249. The text suggests a positivist approach. Professor Epstein would disagree. Epstein suggests that custom rather than economic analysis should be followed in cases where there are repeat and reciprocal interactions between the same parties, "for then their incentives to reach the correct rule are exceedingly powerful." Epstein, *supra* note 231, at 126.

benefits of disaggregated production and marketing of value will be enhanced.

