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A Comparative Analysis of Proposals for the Legal Protection of Computerized Databases:
NAFTA vs. the European Communities

W. Joseph Melnik*

I. INTRODUCTION

This note compares two of the most recent proposals on the international scene for protecting computerized databases: Chapter Seventeen of the North American Free Trade Agreement1 and the proposal by the European Commission for a Council Directive on the legal protection of databases.2 The purpose of this comparison is to determine which of these two models will best protect a computerized database. The need for new database protection standards stems from the uniqueness of computerized databases,3 and from the immaturity of current database laws.4 The scope of this note does not extend to all databases.5 Instead, it is reserved only to databases in computerized form.

Databases are critical items in today's commercial and legal envi-

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1 J.D. Candidate, Case Western Reserve University School of Law (1994).
3 The first electronic computer, known as the ENIAC (Electronic Numerical Integrator and Computer), was created less than 50 years ago. ALICE R. BURKS & ARTHUR W. BURKS, THE FIRST ELECTRONIC COMPUTER: THE ATANASOFF STORY 105 (1988). The ENIAC was designed to compute ballistic tables for the U.S. Army during World War II, but was never put to this use since it was not completed until December, 1945, several months after the Japanese surrender. Id. In contrast, non-electronic computing devices have been available for centuries. See J. MACK ADAMS & DOUGLAS H. HADEN, COMPUTERS: APPRECIATION, APPLICATIONS, IMPLICATIONS - AN INTRODUCTION 207-51 (1973) (Computers date back thousands of years to the time of ancient civilizations.). The abacus of the ancient orient, and perhaps even Stonehenge are examples of such computational devices. Id.
4 See Explanatory Memorandum, supra note 2, at 4.
5 A database is generally defined as a collection of interrelated data stored in such a manner as to facilitate efficient addition, deletion, modification, and retrieval of information. See EDUARDO B. FERNANDEZ ET AL., DATABASE SECURITY AND INTEGRITY 25 (1981); JAMES MARTIN, COMPUTER DATA-BASE ORGANIZATION 22 (2nd. ed. 1977) [hereinafter Martin, ORGANIZATION].
The database industry is valuable in its own right, and also is a vital support to industry, commerce, education, and government which are dependent on the collection, manipulation, and preservation of information. Consequently, a lack of adequate legal protection for computerized databases could have a wide range of severely debilitating effects. Although legal rules are not the only means available to protect databases, they are the most problematic.

In comparing Chapter 17 of the NAFTA to the legal rules of the EC Proposed Directive, it will be illustrated that the European Community is poised to vault to the forefront of database protection. Part II of

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6 In fact, the information technologies sector as a whole is one of the fastest growing sectors in the U.S. economy. Office of Technology Assessment, U.S. Congress, Intellectual Property Rights in an Age of Electronics and Information 9 (1986) (hereinafter OTA Report). This same report quotes statistics which estimate that the information sector's share of the gross national product (GNP) is 34% and 41.23% of the national labor force. Id. at 41. The information technologies sector as referred to in the OTA Report is not limited solely to computerized databases, it also includes such industries as audio-video technologies, computer software, and telecommunications industries. See id. at iii. However, throughout the text of this report, the OTA clearly indicates that the computer database industry is one of the major components of this sector.


In addition to these traditional uses of a computerized database, database uses are expanding to many of the cutting-edge technologies. See, e.g., Morton D. Goldberg & David O. Carson, Copyright Protection for Artificial Intelligence Systems, 39 J. Copyright Soc'y 57, 58-64 (1991) (Computerized databases are necessary to store large quantities of information called “knowledge bases.” These “knowledge bases” are used to provide information for an application of artificial intelligence known as expert systems which are computer programs with the ability to solve problems in specialized areas of knowledge — such as products liability.).

8 Fernandez, supra note 5, at 1. See also Orrin G. Hatch, Better Late Than Never: Implementation of the 1886 Berne Convention, 22 Cornell Int'l L.J. 171, 180 (1989) (arguing that the lack of adequate protection for a high technology intellectual property could have national security implications).

9 See James Martin, Managing the Data-Base Environment, 590 (1983) [hereinafter Martin, Managing]. Other security measures include security and accuracy controls internalized within the database system, physical controls, and administrative controls. Id. See also Judy King, Evaluating Data Base Management Systems 181-96 (1981) (explaining that effective protection schemes involve identification verification, different levels of authorization, encryption of especially sensitive data, and effective monitoring of the use of the database); Jay-Louise Weldon, Data Base Administration 151 (1981) (Since most uses of a computerized database require use of underlying software, security measures should be implemented through this software.).

10 Martin, Managing, supra note 9, at 591. See also OTA Report, supra note 6, at 75. The uniqueness of computerized databases makes them especially difficult to protect under traditional legal means such as copyright. Id.
this note provides a brief description of the state of the computerized database industry in both the European Community and North America and the international trade issues that arise in the area of intellectual property protection. Part III analyzes both proposals beginning with a comparison of the copyright provisions. An analysis of the right to prevent unfair extraction of the Proposed Directive is then examined in detail. Part IV provides a brief review of the major issues which arise in the previous sections, and concludes that the European Commission’s Proposed Directive does, in fact, provide more effective protection for computerized databases than Chapter 17 of the NAFTA.

II. BACKGROUND

A. European Community

The relative immaturity of the EC database market has resulted in an underdeveloped legal regime. The EC database market’s immaturity does not make it an insignificant European market. In fact, European sales of databases have been, and are expected to continue to be, robust. The European Commission, would not only like this trend to continue, but also for EC computerized database sales to increase so that the gap between it and the U.S. database industry can be reduced. To effectuate this end, the Commission would like to increase the invest-

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11 In the North American context, special attention is given to the state of affairs of the U.S. computerized database industry due to their position as the world leader in this area.

12 See generally EDWARD S. YAMBRUSIC, TRADE-BASED APPROACHES TO THE PROTECTION OF INTELLECTUAL PROPERTY (1992) (explaining that the increasing commercial value of intellectual property has made insufficient levels of intellectual property protection a distorting influence on the normal flow of free trade).

13 Explanatory Memorandum, supra note 2, at 4.

14 The EC database market is valued at approximately $10.2 billion (8 billion ECU) which is about a one-third share of the world market. Charles Goldsmith, EC Weighs Database Protection, INT’L HERALD TRIB., Jan. 30, 1992. See also Proposed Directive, supra note 2, at 2 (detailing the value of the on-line information market of Western Europe alone at approximately $2.4 billion (2.188 billion ECU)).

15 EC database sales in 1991 were 2.9 billion ECU. Predictions for 1992 are that sales will be approximately 3.5 billion ECU. Goldsmith, supra note 14. See also Michael Pattison, The European Commission’s Proposal on the Protection of Computer Databases, 14 EUR. INTELL. PROP. REV. 113 (1992) (expecting that future database sales in the EC will grow exponentially).

16 The European Commission is made up of 17 individuals nominated by the individual Member States and affirmed by all of the Member States. The Commission is responsible for proposing new EC policies, acting as a mediator between Member States when conflicts arise over the interpretation of EC policy, and overseeing the execution of the existing EC policies. T.C. HARTLEY, THE FOUNDATIONS OF EUROPEAN COMMUNITY LAW 8 (2d ed. 1988).

17 The Commission is relying on data which puts the U.S. share of the world database market at twice that of the EC share. See Explanatory Memorandum, supra note 2, at 2.
ment in, and the creation of, computerized databases throughout the EC, thereby allowing their computer database market to keep pace with the increasing demand for information services throughout the world market. If this demand is not met by EC database producers, it will be met by database producers outside the EC.

From the beginning, the EC database market has been "fragmented by many technical, legal, and linguistic barriers . . . ". This has resulted in a restriction of the "free movement of information services," and has prevented the advancement of this market due to a failure to achieve the necessary economies of scale. The European Commission is aware that this type of environment is not conducive to increasing the EC's share of the world's database market. In order to stimulate investment and achieve the necessary economies of scale, "a stable and uniform legal environment . . . [must be] created within [the European Community]." The Commission recognized the need for such an environment with the release of the 1988 Green Paper, which is a compilation of wide-ranging opinions and reactions of the parties interested in intellectual property issues. The Green Paper emphasized that, inter alia, the current national system of copyright laws in Europe acts as a barrier to free trade. The Green Paper further recognized that any future harmonization of intellectual property laws must consider both the needs of the users of technology and the need to encourage creativity.

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18 Id. at 4.
19 Id.
20 Id.
21 Id. at 6.
22 Id.
23 Id. A fragmented market "prevents the achievement of the economies of scale which are necessary in order to launch advanced information services." Id. See also Victor Vandebeek, Realizing the European Community Common Market by Unifying Intellectual Property Law: Deadline 1992, 1990 B.Y.U. L. Rev. 1605, 1626 (1990) ("Different copyright laws not only affect trade flows but also the scale and nature of the connected manufacturing activities and the investments therein.").
24 Green Paper on Copyright and the Challenge of Technology - Copyright Issues Requiring Immediate Action: Communication from the Commission, COM(88)172 final [hereinafter Green Paper]. Article 6.2.1 states that the "creation of a European information services market, currently divided by juridical and linguistic barriers, is of prime importance." Id. at art. 6.2.1.
25 Explanatory Memorandum, supra note 2, at 4. See also id. at 2; Vandebeek, supra note 23, at 1605 ("It is of tremendous importance that the Community take the necessary steps to unify the national intellectual property laws of individual EEC Member States in order to bring the internal market into existence . . . ").
26 See Green Paper, supra note 24, at art. 1.4.7. This paper is "intended to constitute the basis of a broad consultation of interested circles." Id. The information in this paper was collected over an eighteen month period. Id.
27 Id. at art. 1.3.2.
Recognizing the need for harmonization, the Commission was faced with deciding whether it should harmonize all copyright law generally, or whether it should only provide specific directives aimed at individual areas of technology. The Commission ultimately rejected the former alternative — a decision which appears to have been wise. Due to the differing traditions and structures of the EC members' domestic intellectual property laws, a general harmonization directive would have been very disruptive and difficult to implement. Furthermore, developing and carrying out such a general directive would be a time-consuming venture, and the changes and growth in the high technology sectors of the EC necessitated more immediate responses. Thus, the Commission proceeded on essentially a case-by-case basis and is now proposing to add the protection of databases to this gradual harmonization.

The European Commission's Proposed Directive for the legal protection of databases involves traditional copyright and a newly created sui generis right to prevent unfair extraction. There are several ar-

28 Id. at art. 1.3.6. See also GILLIAN DAVIES & HANS HUGO VON RAUSCHER AUF WEEG, CHALLENGES TO COPYRIGHT AND RELATED RIGHTS IN THE EUROPEAN COMMUNITY 13 (1983). Generally, the granting of copyrights promotes the public's interest in the development and production of technologically advanced goods. Id.

29 See ADOLF DIETZ, COPYRIGHT LAW IN THE EUROPEAN COMMUNITY 9-10 (1978) (explaining that there is "de facto pressure to unify copyright law"); PETER STONE, COPYRIGHT LAW IN THE UNITED KINGDOM AND THE EUROPEAN COMMUNITY ix (1990) (The Commission's actions indicate that "complete unification is not envisaged in [the] sphere of copyright . . . ").

30 DIETZ, supra note 29, at 10.

31 See Explanatory Memorandum, supra note 2, at 16. Moreover, if a Community-wide legal regime is not quickly established, there is a risk that the Member States will enact widely differing legislation protecting databases. Id. This would seriously undermine the stability and uniformity for which the Commission is striving.


33 See John MacPhail, European Economic Community, in INTERNATIONAL COPYRIGHT AND NEIGHBORING RIGHTS 537 (Stephen M. Stewart ed., 2d ed. 1989) [hereinafter Stewart] (discussing that the progress of establishing Community-wide intellectual property rights is proceeding too slowly).

34 See Jessica Litman, Copyright and Information Policy, 55 LAW & CONTEMP. PROBS. 185, 186-87 (1992) ("Copyright has traditionally been viewed as a useful adjunct to information policy.").

35 Sui generis protection is entirely distinct from existing forms of protection such as copyright, patent, or trademark law. See OTA REPORT, supra note 6, at 91. See, e.g., Semiconductor Chip Protection Act of 1984, 17 U.S.C. §§ 901-14 (1984) (protecting the architecture of semiconductor chips).

36 See George Metaxas, Protection of Databases: Quietly Steering in the Wrong Direction?
Arguments advanced in favor of each form of protection. Copyright protection advocates offer three possible political advantages. First, and most importantly, copyright already enjoys international recognition as a means to protect compilations such as databases. This international recognition results primarily from the Berne Convention for the Protection of Literary and Artistic Works (Berne Convention) and the Universal Copyright Convention (UCC). Furthermore, databases protected by copyright in the EC will be granted reciprocal copyright protection in many countries worldwide. Second, since nearly every EC Member State already recognizes copyright as a valid means to protect databases, there is little difficulty anticipated in implementing this form of protection through the Proposed Directive. This suggests that it may be more difficult for an international or EC proposal to establish a different form of protection. Third, "a potentially copyrightable intellectual creation is always worth protecting to the maximum possible extent." Inherent in this argument is the belief that a court, faced with choosing between copyright and an easier to apply and less controversial sui

12 EUR. INTELL. PROP. REV. 227, 233 (1990) ("Interested circles appear to support the opinion that databases should be protected by the general copyright provisions and that a sui generis solution would be undesirable.").

37 Id. at 228.
38 Id.; Pattison, supra note 15, at 114.
39 The Berne Convention for the Protection of Literary and Artistic Works, Sept. 9, 1886, 828 U.N.T.S. 221 (1972) (amended) [hereinafter Berne Convention]; Metaxas, supra note 36, at 228; Hatch, supra note 8, at 172. The Berne Convention, with its 77 signatories, extends copyright protection worldwide. Id.
41 This reciprocal protection will be available through the Berne Convention which requires all members to protect those rights domestically granted by another member. Berne Convention, supra note 39, at art. 5(1). Therefore, if a copyright is granted to an author under the laws of Germany, this right must be respected by all the signatories to the Berne Convention.
42 See Explanatory Memorandum, supra note 2, at 34. One of the prime advantages of incorporating copyright protection into the Proposed Directive is that "existing legal structures in the Member States can be easily used or amended to include databases as a protected work . . ." Id.
43 Metaxas, supra note 36, at 228. See also Jean Hughes & Elizabeth Weightman, EC Database Protection: Fine Tuning the Commission’s Proposal, 14 EUR. INTELL. PROP. REV. 147, 148 (1992). There is "widespread agreement among Member States that copyright is an appropriate starting point for a harmonized system of database protection." Id.

On the other hand, this belief is rebutted by EC experiences in two previous directives addressing intellectual property issues which adequately establish that it is possible to create new rights in areas where they were previously not recognized. See, e.g., Council Directive 87/54, supra note 32; Council Directive 91/250, supra note 32 (legal protection of computer software).
44 Metaxas, supra note 36, at 228 (emphasis in original).
"sui generis" standard, would rarely apply copyright protection. However, due to the economic importance of the database sector, a court is likely to apply all available means of protection.

Several arguments suggest that a "sui generis" right to prevent unfair extraction is an effective—if not essential—means of database protection. First, it may be difficult for a computerized database to meet the requirement of originality necessary to qualify for copyright protection. Thus, a "sui generis" right to prevent unfair extraction would provide limited protection for the substantial investment made by the database author. Second, a "sui generis" right could be specifically tailored to avoid unique problems of authorship inherent in applying copyright laws to databases, since with a "sui generis" right the European Commission could designate exactly who would be granted the right to prevent the unfair extraction of the database's contents. Third, a "sui generis" right would allow a duration of protection which does not depend on the life of the author. In contrast, the Berne Convention binds member states to set the duration of the copyright as a function of the life of the author. Finally, and possibly most importantly, a "sui generis" right would allow protection against acts which would not otherwise infringe a copyright.

Copyright protection of compilations has been developed over the centuries in response to forms of compilation substantially different from a computerized database. As a result, the limited set of developed infringing acts is unlikely to adequately protect a computerized database.

The Commission recognized the persuasiveness of the arguments in favor of both traditional copyright protection and a "sui generis" form of protection. As a result, the Commission adopted a two-pronged approach combining copyright protection and the right to prevent unfair extraction. This approach demonstrates that the Commission has come

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45 Id.
46 Id. ("The economic interests at stake are too important to ignore in [favor] of a one-sided, maximalist devotion to the protection of authors' rights.").
47 Id. at 228-29. See also infra part III.A(2).
48 Metaxas, supra note 36, at 230-31. See also infra part III.A(3).
49 Metaxas, supra note 36, at 231-32.
50 See Berne Convention, supra note 39, at art. 7(1).
51 See Metaxas, supra note 36, at 232-33.
52 The first forms of copyright initially appeared in Renaissance Italy during the mid to late fifteenth century as a means to promote the development of the newly created printing press. See BRUCE W. BUGBEE, GENEsis OF AMERICAN PATENT AND COPYRIGHT LAW 43-44 (1967).
53 See Explanatory Memorandum, supra note 2, at 31-36. In choosing its legal regime, the Commission recognized that in order to meet all of its desired objectives, it was necessary to take advantage of both traditional copyright protection and a "sui generis" right. Id.
down on the side of the developed countries in favor of a higher level of protection. By requiring two independent forms of protection, the Commission is sending developing countries the message that all Member States should strive to obtain a share of the growing computer database sector through long-term investments, rather than short-term acquisition of databases protected in other Member States.

B. NAFTA

On August 12, 1992, the United States, Canada, and Mexico finalized negotiations of the North American Free Trade Agreement (NAFTA), which is an effort to create the world’s largest trading bloc. The objectives of these negotiations were to eliminate trade barriers, promote fair competition, increase investment and protect intellectual property rights. An agreement of this nature was almost inevitable given the intimate relationship of the parties. Not only has the sharing of common borders resulted in many cultural relationships; it has also created strong economic ties. In fact, Canada is the U.S.’s largest trading partner, while Mexico is the third largest. Canada’s exports to Mexico total approximately $350 million annually, and Mexico returns approximately $1.4 billion in annual exports to Canada.

This intimate economic interrelationship naturally gives rise to

54 See infra part II.C.
55 Id.
57 Id. The implementation of NAFTA has created a trading bloc of 360 million people with an economic output of $6 trillion. Id.
58 NAFTA, supra note 1, at art. 102(1)(a).
59 Id. at art. 102(1)(b).
60 Id. at art. 102(1)(c).
61 Id. at art. 102(1)(d). See also Joseph Mott, Pact Widens Legal Safeguards, ARIZ. BUS. GAZETTE, Sept. 17, 1992, at ss17 (explaining that the protection of intellectual property rights is one of the prime objectives of the NAFTA).
62 See, e.g., Carla Hills, Remarks at the Luncheon on the North American Free Trade Agreement (Nov. 18, 1992), available in LEXIS, Legis Library, Allleg File (contains former U.S. Trade Representative Hills’ comments on the extent to which the destinies of the U.S. and Mexico are interwoven).
63 See U.S. Department of State Dispatch, Feb. 17, 1992, at 110. In 1990, the combined U.S. commerce with both Canada and Mexico totaled about $234 billion. Id. See also Clinton Will Wait Before Moving NAFTA, House Staff Member Says, Daily Rep. for Executives (BNA) No. 242, at D-23 (Dec. 16, 1992) (“While Canada has always been the U.S.’s largest trading partner, Mexico is the most dynamic . . . .”).
important issues in intellectual property rights. This is an issue of particular concern to the U.S. because reproduction of intellectual property rights annually results in losses to the U.S. copyright industry of $12-$15 billion.

C. Trade-Related Aspects

There are two differing views on how to best increase computerized database production. In developed countries, the pervasive belief is that there should be a high minimum level of protection afforded computerized databases. This view is predicated on the belief that standard levels of protection will encourage research and development, not only in developed countries, but also in developing and newly industrial-
ized countries (NICs). Due to the inherently high cost of creating a computerized database, and the comparatively low cost of reproduction, higher levels of legal protection are needed in order to allow the recoupment of the author's investment in a reasonable period of time. Without the probability of recovering one's costs, nor a possibility of profit, an author will not have the necessary incentives to invest her time, effort, and money into database creation. In such a situation, fewer databases will be created which will be detrimental to both developed and developing countries due to the reduced means of information dissemination.

intellectual property protection makes it especially difficult for industry to finance and develop new products.

NICs are countries which have experienced rapid growth and industrialization due to increased access, legal or illegal, of the high technology goods of the industrialized countries such as the U.S., Japan, and the EC. YAMBRUSIC, supra note 12, at 11. The term NIC is particularly meant to refer to the 'four tigers of South East Asia' - Taiwan, Korea, Singapore and Hong Kong . . . ." Id.


See OTA REPORT, supra note 6, at 97 ("Technology is making it cheaper to copy, transfer, and manipulate information and intellectual property."). (emphasis in original). The increase in technology is also making reproduction quicker and harder to detect. Id.; Abbott, supra note 68, at 697 (explaining that the marginal cost of reproducing any form of intellectual property is "near zero"). This results in the possibility of near infinite reproduction. Id. Since downloading information from a computerized database is convenient, these databases "may be extremely cheap to steal." Schatz, supra note 71, at 434.

Protection against infringement "encourage[s] research and artistic effort and hence is an incentive for investment in innovative and creative activities." Id. See also Jane C. Ginsburg, Creation and Commercial Value: Copyright Protection of Works of Information, 90 COLUM. L. REV. 1865, 1908 (1990) [hereinafter Ginsburg, Creation]. The creations which are most in need of the incentives provided by protection methods such as copyright "are those in which personal authorship is least apparent." Id. at 1908. See also Mall, supra note 69, at 284 (discussing that adequate economic returns are necessary in order to finance the next generation of inventions).

The developed country will experience less creation of computerized database, while the developing country will not have as many computerized databases to reproduce.

See Michael J. Huangs, Copyright of Factual Compilations: Public Policy and the First Amendment, 23 COLUM. J.L. & SOC. PROBS. 347, 357 (1990). Copyright protection for databases achieves the twin goals of "creation of new works and the dissemination of information." Id.
The developed countries' viewpoint is also based on the assumption that higher levels of protection will encourage research and development of computer databases not only in developed countries, but also in developing countries. Developing countries with a high level of protection will have created an environment in which investment in innovative and creative activities is encouraged. It is in this type of environment that long-term gains in the public welfare are made through the gradual influx of talented and creative individuals. More than anything else, this shift in human capital is inspired by economic self-interest. A country which grants a quasi-monopoly to the database author, affords more economic opportunities to that author than a country which provides ineffective or unenforced laws.

The view that increased protection of computerized databases will increase production and societal welfare is not universally held. Developing countries and NICs generally take the view that when deciding intellectual property issues, the greatest weight should be given to facilitating technology transfer, not encouragement of innovation. According to this view, increased intellectual property protection is more likely to appear as a means to restrict, rather than to facilitate, access to new technology. In fact, many developing countries view intellectual prop-

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77 See supra note 69.
78 STALSON, supra note 68, at 30.
79 See YAMBURUSC, supra note 12, at 9-10.
80 Id. at 9. See also STALSON, supra note 68, at 30 ("[T]he creator and inventor [will tend] to go where there is a high level of protection and [will tend to] avoid countries where protection is inadequate or absent . . . ").
81 See, e.g., Carlos Alberto Primo Braga, The Economics of Intellectual Property Rights and the GATT: A View From the South, 22 VAND. J. TRANSNAT'L L. 243 (1989). The evidence offered by both sides of the argument does not conclusively establish that increased protection of intellectual property rights will result in either more or less benefit for developing countries. Id. In order for there to be an increase in the net welfare of a country, the social benefits of higher protection must increase faster than the social costs of the higher level of protection. Thus, those who argue that higher levels of intellectual property protection will not benefit a developing country maintain that costs are increasing faster than benefits. Id. at 258.
82 Merges, supra note 69, at 244; Dettmann, supra note 68, at 351 (discussing that developing countries consider technology transfers essential to economic development). See also R. Michael Gadbaw, Intellectual Property and International Trade: Merger or Marriage of Convenience?, 22 VAND. J. TRANSNAT'L L. 223, 224 (1989). Most developing countries view intellectual property rights more as economic rights and less as inherent rights. Id. at 224.
83 Professor Braga indicates that many people are beginning to interpret the developed countries' desire to increase the level of intellectual property protection as an attempt to gain a technological monopoly — "a weapon in the struggle of 'haves' against 'have nots.'" Braga, supra note 81, at 252 (quoting Stern, Intellectual Property, in THE URUGUAY ROUND: A HANDBOOK FOR THE MULTILATERAL TRADE NEGOTIATIONS 202, 203 (J. Finger & A. Olechowski eds.,
property safeguards as a barrier to the modernization of their economies. As a result, it is believed that maximum access to developed countries products is necessary in order to obtain the requisite levels of technology which will “close the growth gap between the developed and developing countries.”

Countries which adopt this viewpoint do so to avoid the cost inherent in enforcement and administration and to reap the benefits of the presently available technology. The costs avoided may be substantial and manifest themselves in three general areas. First, there are the administrative costs to the government in establishing laws and agencies required for a higher level of database protection. Second, costs to consumers will increase due to the monopolistic effect of copyright. Third, there is a cost to creating intellectual property as opposed to merely acquiring it on the open market. For example, an acquirer can produce similar goods at substantially reduced production costs, since she does not have to include research and development in her cost equation. An acquirer will also copy only successful goods, thereby avoiding the risk of market failure. Finally, since the cost of developing effective duplication methods is far less than the cost of developing valuable intellectual property, duplication “provides a healthy return on [one’s] investment.”

84 STALSON, supra note 68, at 32. These developing countries take the view “that counterfeiting and imitation are a natural route to modernization and that the economic and technological development of their countries and the chance to increase export earnings are hindered by patent and copyright protection afforded to products of the developed countries.” Id.
85 YAMBRUSIC, supra note 12, at 9.
86 Peterson, supra note 68, at 280. Piracy allows products to be provided at a lower cost to the consumer, and also provides other benefits such as stimulated production, enhanced domestic competition, and increased domestic employment. Id.
87 See Braga, supra note 81, at 256. Typical proposals for creating intellectual property systems fail to consider many substantial costs which can be particularly detrimental to smaller developing countries. Id.
88 Leaffer, supra note 68, at 281. Due to the level of abstractness at which most intellectual property exists, it requires a complex set of costly administrative controls. Merges, supra note 69, at 241.
89 Leaffer, supra note 68, at 280.
90 Id. at 282. With available technology, a computerized database can be reproduced at a substantially lower cost than was required to produce the original. See STALSON, supra note 68, at 11; OTA REPORT, supra note 6, at 97; Dreyfuss, supra note 71, at 897-98 (explaining that high development costs and easy reproduction are the primary characteristics of information products).
91 Leaffer, supra note 68, at 282.
92 Id.
Although there are benefits to providing little or no protection, these benefits are usually limited to the short-term.\(^93\) In addition to the cost avoidance described above, the short-term benefit may also include a rapid influx of technology at relatively low cost.\(^94\) However,\

... the short-term gains seem to distract from the economic reality, that only through indigenous research and development [can] a country . . . achieve sufficient growth and relative economic independence vis-a-vis other trading partners of the international community. For, in the final analysis, creativity and technological progress means economic growth and high standard of living.\(^95\)

In other words, these short-term gains are realized at the expense of long-term benefits. This result can be understood by an application of the new industrial-organization (I-O) approach to international trade theory.\(^96\) This approach can be summarized as follows. A country with industries operating in an "imperfectly competitive international market"\(^97\) may be able to increase its welfare by implementing strategic trade-policies such as tariffs, restrictions of exports, or by under-protection of intellectual property.\(^98\) However, there are real-world limitations on this theory: most importantly, retaliation by other countries.\(^99\) In the short-term, retaliation is usually rare because of the developing countries' relatively diminutive market share.\(^100\) However, as a develop-

\(^93\) Yambrusic, supra note 12, at 9.
\(^94\) Leaffer, supra note 68, at 282.
\(^95\) Yambrusic, supra note 12, at 9.
\(^97\) An "imperfectly competitive international market" essentially means that one nation has a comparative advantage in the production of computerized databases even though the other countries in that industry possess basically similar resources. H. Speight, Economics: The Science of Prices and Incomes 359 (2d ed. 1964). This comparative advantage usually is the result of entering and becoming successful in an industry before any others do. Id. The resulting situation is a market in which there is neither perfect competition nor a perfect monopoly. See generally Alfred W. Stonier & Douglas C. Hague, A Textbook of Economic Theory 106-107 (3d ed. 1964) (discussing that an imperfectly competitive market exists between the extreme boundaries of perfect competition and perfect monopoly).
\(^98\) Baldwin, supra note 96, at 804. See also Braga, supra note 81, at 244 ("Differences among national intellectual property systems are tantamount to nontariff barriers . . . to trade insofar as they may affect trade in knowledge-intensive products.").
\(^99\) See Baldwin, supra note 96, at 810 (concluding that retaliatory trade wars will likely result, and all of the participants will be in an economically worse position than if free trade had prevailed).
\(^100\) If the market share is low, the developing country's firms will not be substantially reducing the gross receipts of the developed countries' firms. This being the case, the developed country may actually profit by an increased dissemination of the developed country's cultural
As discussed in detail infra, the European Commission has chosen to increase protection of computerized databases and thus realize long-term gains. In order to do this most effectively, the Commission has proposed to set a common level of protection that must be afforded to computerized databases in all Member States. This policy will avoid the problems that differing levels of protection could create, including market distortions and an overall lower level of database production. The Commission avoided these trade imbalances fearing material which may lead to improved relations. See OTA REPORT, supra note 6, at 231; EDWARD W. PLOMAN & L. CLARK HAMILTON, COPYRIGHT: INTELLECTUAL PROPERTY IN THE INFORMATION AGE 24 (1980) ("[E]very nation desires] to have access to the works of other nations, frequently in order to improve its own cultural development . . . .").

101 See supra note 99.
102 See generally infra part III.
103 Currently, computerized databases are afforded protection that varies substantially in each Member State. See Hughes & Weightman, supra note 43, at 147.
104 DIRK SCHOEDER, COMPUTER SOFTWARE PROTECTION AND SEMICONDUCTOR CHIPS 3 (1990) ("[T]he differences between national provisions affecting intellectual property have a direct negative impact on intra-Community trade and on the ability of enterprises to treat the common market as a single environment for their economic activities.") See also Mall, supra note 69, at 284 (providing that the differential treatment for developing countries would substantially undermine the goals of developed countries since even a single database pirate can injure the industry).
105 If a single country provides low levels of protection, then that country will be able to legally reproduce the databases produced by other Member States without incurring any of the costs. This results in an advantage to the single country providing low levels of protection.
that economic tensions would result, causing "protectionist retaliatory measures and countermeasures of economic nationalism."\(^{106}\)

For years, the U.S. has been attempting to increase the protection afforded its intellectual property at the international level.\(^{107}\) The U.S. is using the NAFTA as a vehicle to increase intellectual property protection in Mexico,\(^{108}\) and possibly other developing countries.\(^{109}\) Again, this higher level of protection is predicated on the belief that it will encourage research and development of computer databases in the U.S. and in developing countries such as Mexico.\(^{110}\) By agreeing to the higher levels of protection in the NAFTA, Mexico is evidencing its desire to implement an internationally acceptable level of intellectual property protection. The Mexican government has recognized that increased levels of protection are necessary in order to attract foreign investment and technology.\(^{111}\) Mexico has apparently agreed to forego

Similarly, if only a single country provides high levels of protection while all others provide lower levels, the country providing the higher level of protection will be at a disadvantage to the other countries. The country with the higher level of protection will force its firms to pay for the costs of producing intellectual property that can be appropriated by firms in low-protection countries, thereby guaranteeing it little or no economic return. See Braga, \textit{supra} note 81.\(^{106}\)

\textit{Yambrisic,} \textit{supra} note 12, at 2.


\(^{108}\) See Rudy Sandoval, \textit{Mexico's Path Towards the Free Trade Agreement With the U.S.}, 23 \textit{U. MIAMI INTER-AM. L. REV.} 133, 140 (1991). It is interesting to note that Mexico was admitted to GATT as an advanced developing nation.

\(^{109}\) The NAFTA parties have left the door open for other countries to join this pact. See NAFTA, \textit{supra} note 1, at art. 2205(1). This article allows "[a]ny country or group of countries . . . [to join the NAFTA] subject to such terms and conditions as may be agreed between such country or countries and the Commission and following approval in accordance with the applicable approval procedures of each country." \textit{Id.}\(^{101}\)

\(^{101}\) See \textit{supra} note 69 and accompanying text.

\(^{111}\) M. Jean Anderson, et al., \textit{Intellectual Property Protection in the Americas: The Barriers Are Being Removed}, 4 \textit{J. PROPRIETARY RTS.} 2 (1992); John B. McKnight & Carlos Müggenburg, \textit{Mexico's Industrial Property and Copyright Laws: Another Step Toward Linkage with a Global Economy}, \textit{in} \textit{1 DOING BUSINESS IN MEXICO} Part IV 2-1-2-18 (Michael W. Gordon ed., 1992) (discussing how Mexico's new Industrial Property Law and reforms to its copyright laws have raised protection of intellectual property in Mexico to a level on par with most industrialized nations). See also Interview with Dr. Roberto Villareal Gonda, Director General of the Mexican Technological Development at the Secretariat of Commerce, \textit{available in LEXIS}, Nsnamer Library, Allisa File (Nov. 1992). Dr. Villareal expresses the view that it is vital that Mexico retain a sufficiently high level of protection for industrial property in order to effectively compete with the developing Eastern European countries for new investment capital and technologies. \textit{Id.} However, not all are in agreement with the view that protection of intellectual property in Mexico has risen to a level commensurate with the international community. See generally Tod
the short-term benefits previously mentioned in return for the long-term benefits of increased investment in innovation and creativity. In other words, the U.S. negotiators have achieved their objective to increase international intellectual property protection for U.S. companies.

III. COMPARISON OF PROPOSALS

A. Copyright

It is generally accepted that a sufficiently original computerized database may qualify for copyright protection as a compilation. Therefore, since copyright only protects original creations, such a database will be entitled to copyright protection only to the extent that the selection or arrangement of its data is original.

Conceptualizing the selection and arrangement of a computerized database can be difficult. The selection of data refers to the universe of data included in the database. For example, a selection function which includes a statistical summary of all left-handed free agent pitchers with an earned run average below 4.00 would sufficiently define the universe of data to be included. Such a selection function defines the parameters of a body of information that will be contained in the database.

Within the mass of information defined by the selection function, each piece of data will be in no particularly definable order. In order to access the data efficiently and effectively, it must be ordered. Thus, an

Robberson, Mexico's New Image Still Needs Focusing, Say Foreign Businessmen, WASH. POST, Nov. 6, 1992, at A21. Although the Salinas administration has made it easier for foreign businesses to operate in Mexico, "Mexicans continue to flout international laws on intellectual property rights, and [the] prosecution of copyright [violators] ... remains lax." Id.


113 See, e.g., Explanatory Memorandum, supra note 2, at 45 ("The exclusive rights of the author of a database under copyright refer to the right to prohibit acts in relation to the selection or arrangement of the contents."); NAFTA, supra note 1, at art. 1705. Article 1705 provides that any work which would be considered original under the Berne Convention shall be protected. Id. The proposal then provides that any compilation which meets the "selection" or "arrangement" standard of originality, shall receive protection of that "selection" or "arrangement." Id.

114 This selection function would concomitantly define which data is to be excluded from the database. For example, a right-handed pitcher would be excluded regardless of his earned run average.
arrangement function must be devised which will place the data in a predictable order. "Arrangement" refers to the manner in which data are placed in relation to each other. Some common examples of arrangement are alphabetical ordering, numerical ordering, and chronological ordering; however, there can be a large number of possible arrangements even if there are only a small number of data in the selection universe.\(^\text{116}\)

Therefore, the selection and arrangement of a computerized database basically refers to an ordered set of data with the parameters of this set defined by the selection function, and the ordering of this set determined by the arrangement function. This database is then electromagnetically stored in either main or external computer memory for access by the user.

I. Defining "Database"

Both the NAFTA\(^\text{117}\) and the Proposed Directive\(^\text{118}\) provide protection for databases under copyright.\(^\text{119}\) However, the two proposals do not agree on what should be considered a database for the purposes of such protection. The NAFTA does not explicitly use the word "database."\(^\text{120}\) Instead, it provides that "compilations of data or other material, whether in machine readable or other form"\(^\text{121}\) shall be the subject of copyright protection in the appropriate circumstances. This is a rather amorphous definition, especially when compared with the definition given in the Proposed Directive which states that a database is

\(^{116}\) The number of possible arrangement functions is a function of the number of units of data contained in a given selection universe. The possible number of arrangements is determined by simply counting all the possible permutations of the data contained in the selection universe. This can easily be done by using the following mathematical factorial function: if a given selection universe contains \(Y\) units of data, then the number of possible arrangements is \(Y! = Y \times (Y-1) \times (Y-2) \times \ldots \times 3 \times 2 \times 1\). For example, if the selection universe contains 4 data units, then \(Y = 4\), and there could be \(4! = 4 \times 3 \times 2 \times 1 = 24\) different arrangements of the given selection universe.

\(^{117}\) See NAFTA, supra note 1, at art. 1705.

\(^{118}\) See Proposed Directive, supra note 2.

\(^{119}\) The inherent benefits of protecting databases under copyright are substantial. See, e.g., CONTU Final Report, supra note 113, at 38 ("Copyright applied to data bases [sic] should encourage the development and dissemination of useful stores of information to make this information readily available to the public."); Ginsburg Creation, supra note 74, at 1899 ("Inclusion of [databases] within the subject matter of copyright will on the whole promote the progress of knowledge . . . ."); Huang, supra note 76, at 357 ("Copyright law promotes both the creation of new works and the dissemination of property . . . increasing knowledge for the benefit of society . . . .").

\(^{120}\) See generally NAFTA, supra note 1.

\(^{121}\) Id. at art. 1705(1)(b).
a collection of works or materials arranged, stored and accessed by
electronic means . . . [including all] the electronic materials necessary
for the operation of the database such as its thesaurus, index or system
for obtaining or presenting information . . . [but not] computer pro-
gram[s] used in the making or operation of the database.122

An important conclusion can be drawn from the Commission’s willing-
ness to formulate such a definition. The Commission is trying to achieve
a degree of uniformity and predictability. Since this definition answers
some questions that will inevitably arise in practice — such as whether
a database management system (DBMS)123 would be protected as part
of the database — there will be less uncertainty and fewer inconsistent
interpretations. Additionally, this definition may draw into question the
use of past precedent involving other forms of compilations. By provid-
ing an explicit definition within which a computerized database is in-
cluded, the Commission has implicitly indicated that such databases
should be treated differently from other forms of compilations.124 This
could conceivably undermine one of the Commission’s reasons for in-
cluding copyright as a mode of protection for databases. However, copy-
right was included in the Proposed Directive so that past resolutions of
copyright issues could be drawn upon for guidance.125 In light of the
Commission’s clear intention that past copyright precedent should be
applied to computerized databases, there will be predictability and stabil-
ity regardless of how the term “database” is defined.

On the other hand, the NAFTA generically includes computerized
databases in the same class as all other “compilations of data.”126 This
highlights the NAFTA conclusion that computerized databases are to be
considered the equivalent of other more mundane forms of compila-
tion,127 possibly with the unfortunate result that they will be subjected

122 Proposed Directive, supra note 2, at art. 1(1).

123 A DBMS is the underlying computer program which provides one of the links between
the human user and the electromagnetically stored data. JEFFREY D. ULLMAN, PRINCIPLES
OF DATABASE SYSTEMS 4 (1980). A DBMS allows the user to deal with the data abstractly rather
than having to refer to the data as a series of binary digits and physical addresses. Id.

124 See Proposed Directive, supra note 2, at art. 2(2) (indicating that the given definition of
an electronic database is “without prejudice” to non-electronic databases). See also Explanatory
Memorandum, supra note 2, at 41 (“To the extent that Member States have expressly or im-
pliedly provided for the protection of collections or databases in non-electronic form . . . that
protection remains unaffected by the present Directive.”) (emphasis added).

125 Explanatory Memorandum, supra note 2, at 34. Copyright issues involving computerized
databases can draw upon “existing case law as to the protection of collections or compilations of
works in paper or electronic form . . . .”

126 NAFTA, supra note 1, at art. 1705(1)(b).

127 For example, a computerized database efficiently handling enormous amounts of informa-
to legal precedents relating to other forms of compilation. Due to recent judicial decisions in the U.S., this may be counterproductive to the underlying objectives of the NAFTA. If precedents such as *Feist* and its progeny preclude a substantial number of computerized databases from receiving protection in the U.S., then the high expectations of the NAFTA parties will be unfulfilled, and a lower level of protection will result. This will lead to short-term development favoring Mexico and the expectation of long-term retaliations. These long-term implications will cause an overall decrease in the aggregate welfare of the three parties. To avoid these results, the NAFTA parties should have provided an express or implied distinction between computerized databases and other compilations.

The most obvious difference between the two definitions of the term “database” is the Proposed Directive’s inclusion of peripheral material such as a thesaurus, index, and “system for obtaining or presenting information” (i.e., a retrieval system). By including these peripheral materials in the definition of a database, the Commission has provided them with copyright protection when the actual compilation of data is itself protected. This is extremely important considering the Commission’s underlying objective of increasing the EC’s share of the world database market.

By analyzing the effect of extending copyright protection to each of these three peripheral materials, one sees that the Commission has provided protection would be considered no different from the average yellow pages or telephone directory. See *Ginsburg Creation*, supra note 74, at 1866. Professor Ginsburg lumps databases into the same class of “low authorship” works as directories and indexes based on the premise that they are all “personality-deprived information compilations.” *Id.* But see *Hicks*, supra note 113, at 1013-14.

The inherent characteristics of a computerized database (ease of access, ability to store large quantities of data, the ability to provide for greater dissemination of information to the public, etc.) provide a valid basis for drawing a distinction between computerized databases and traditional databases. *Id.*

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128 See, e.g., *Feist Publishing v. Rural Telephone Co.*, 111 S. Ct. 1282, 1296 (1991). In this case, Rural Telephone was seeking copyright protection for what Justice O'Connor described as an “entirely typical . . . garden-variety white pages directory, devoid of even the slightest trace of creativity.” *Id.* As such, Rural Telephone’s white pages directory was not deemed to be original due to a lack of even a “modicum of creativity.” *Id.* Since “[o]riginality is a constitutional requirement,” the court rejected copyright protection. *Id.* The “modicum of creativity” test for determining originality of a compilation has been followed in the lower courts. See, e.g., *Kregos v. Associated Press*, 937 F.2d 700, 704 (2d Cir. 1991) (“[A]n independent creation as to selection and arrangement will not assure copyright protection . . . .”).

129 See *supra* notes 58-61 and accompanying text.


131 See *Baldwin*, supra note 96, at 810.

132 See generally supra note 99.
vided additional incentives to database authors to invest more of their time and effort in the production of effective and valuable computerized databases. A thesaurus and index are actually databases themselves. They are stored with the underlying database in order to facilitate access. An index is essentially a distinct database containing the addresses at which the components of the underlying database are stored. Use of an index results in decreased retrieval time of the components of the underlying database. The reference to a thesaurus is essentially to a computerized version of the standard thesaurus in book form. In a database, a thesaurus is "used to define certain items of data as being of equivalent meaning." A thesaurus is almost essential to the effective operation of a database since different users of a database may refer to the same data by different names. It is important to extend copyright protection to thesauri and indices because not only are they indispensable to an effective database, they are essentially useless independent of the underlying database. Protection of peripheral materials will provide an incentive to database creators to invest more time and effort in creating more effective thesauruses and indices. Increasing the effectiveness of a database's thesaurus and index will increase its ease of use and speed, which will, in turn, increase the market value of the database.

The retrieval system is actually a reference to the commands that must be given to the DBMS to retrieve the appropriate data. The user obtains desired data through such means as boolean operators, rel-

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133 Pattison, supra note 15, at 115.
134 An "index" is simply one of several means which the DBMS may use to determine the address of each data record. See Martin, ORGANIZATION, supra note 5, at 86. An index is created by storing certain key values in a file separate from the actual data file — this separate file is known as the index file. Id. In addition to key values, the index file contains the address of the data record, in the data file, which corresponds to each key value. Id. Therefore, when a user searches an indexed database, what actually happens is the index file is searched for the desired key value. Id. If and when this key value is located, the corresponding data record (in the data file) is accessed by means of the data address stored with the key value. See generally id.; ULLMAN, supra note 123.

135 Pattison, supra note 15, at 115.
136 Id.
137 Id.
138 Id. Both an index and a thesaurus are provided to increase the ease and speed of access. Id.
139 It is the ability to quickly access the desired data which provides the distinction between a highly valuable database and a less valuable database. CONTU FINAL REPORT, supra note 113, at 41. See generally Hicks, supra note 113, at 1013-14 (discussing the impact of the data arrangement on database use).
140 The set of Boolean functions generally consist of at least the operators "NOT," "AND,"
tional operators,\textsuperscript{141} mathematical operators,\textsuperscript{142} and with such functions that sort the retrieved data. Designing a retrieval system can be complex.\textsuperscript{143} In fact, this can be quite similar to designing a high-level computer programming language.\textsuperscript{144} Yet, the retrieval system will be protected by copyright only if the underlying database is protected by copyright.\textsuperscript{145} This is true even though some of the available retrieval system operators may be quite substantial and creative,\textsuperscript{146} and might even have met the highest standards for copyright protection on their own.\textsuperscript{147} The value of an effective retrieval system should be apparent to anyone who has used a computerized database. A highly effective retrieval system would provide useful functions which would make it very easy for the user to obtain the desired data.\textsuperscript{148} Given a choice between buying an easy to use computerized database and a difficult to use database—with everything else being equal—the consumer is much more likely to choose the easy to use computerized database. Therefore, there is an economic incentive for the author to provide an effective retrieval system. The author who has devised a new and effective retrieval system should be sure to include it with a database which she is fairly certain will qualify for copyright protection. Otherwise, the author's competitors will be able to appropriate the system.\textsuperscript{149} This would result in the author bearing substantially all of the cost of designing the new retrieval system, but not being able to realize all of the economic benefits arising from her new development.

and "OR." For a general description of the properties of a Boolean algebra system, see I. N. HERSTEIN, TOPICS IN ALGEBRA 8 (2d ed. 1975) (problem number nine therein describes these properties).

\textsuperscript{141} This refers to the following functions: greater than (>), less than (<), equal to (=).

\textsuperscript{142} This refers to the following functions: addition (+), subtraction (-), multiplication (*), division (/).

\textsuperscript{143} For every computerized database, the author must decide upon which is the best hierarchical structure of the operators, which operators shall be allowed to interact with which data, and how to best present the user's request to the DBMS which does the actual retrieval.

\textsuperscript{144} Pattison, \textit{supra} note 15, at 115.

\textsuperscript{145} See Proposed Directive, \textit{supra} note 2, at art. 2(1). \textit{See also id.} at art. 1(1).

\textsuperscript{146} Pattison, \textit{supra} note 15, at 115.

\textsuperscript{147} \textit{Id.} It would be more desirable for command procedures to be protected as separate works under the Software Directive. \textit{Id.}

\textsuperscript{148} \textit{See} Hicks, \textit{supra} note 113, at 1014.

\textsuperscript{149} \textit{See} Pattison, \textit{supra} note 15, at 115. If the database fails to achieve the requisite level of originality contained in the Proposed Directive, then the retrieval system will be wholly unprotected. \textit{Id.} It has been suggested that "[i]t would be preferable to allow [protection of] the [retrieval system] to stand or fall on its own merits, rather than depending on the selection or arrangement of the data with which it is used." \textit{Id.} However, this is not the case under the Proposed Directive. \textit{See supra} text accompanying note 145.
In sum, the Commission’s definition of database is substantially more detailed and broader than that proposed by the NAFTA parties. It is clear that this increased breadth will be advantageous to the database’s creator in that more of his creation will be protected. There should also be a concomitant increase in benefits to the public interest in the form of more efficient databases disseminating additional information to the public. In contrast, the narrow scope of the NAFTA’s database definition will not only result in relatively less protection for computerized databases, but also higher levels of uncertainty and unpredictability. Failing to provide explicit protection for peripheral tools such as indices and thesauruses, the NAFTA definition allows them to be precluded from protection. Since each Party may interpret this omission differently, this will allow the creation of a legal regime lacking uniformity and predictability.

2. Standard of Originality

The threshold question in whether a database is eligible for copyright is the requisite standard of originality. The NAFTA proposal would protect a computerized database if the “selection or arrangement of... [its] contents constitute[s an] intellectual creation[.].” Similarly, the Proposed Directive offers to protect a computerized database “if it is original in the sense that it is a collection of works or materials which, by reason of their selection or their arrangement, constitutes the author’s own intellectual creation.” A standard of originality based on selection or arrangement of the data has met with near worldwide acceptance through the provisions of the Berne Convention.

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150 The NAFTA explicitly provides that the provisions of the agreement shall be implemented and enforced within the established administrative and judicial systems of each Party. Article 105 merely obligates the parties to “ensure that all necessary measures are taken in order to give effect to the provisions of this Agreement.” NAFTA, supra note 1, at art. 105. While Articles 1714 through 1718 outline the general parameters of the NAFTA’s intellectual property enforcement provisions, nowhere does the agreement provide for any supra-national review — judicial or otherwise — which would promote a uniform interpretation of the agreement. See generally id. at arts. 1714-1718.

151 Id. at art. 1705(1)(b).

152 Proposed Directive, supra note 2, at art. 2(3).

153 In particular, Article 2(5) of the Berne Convention reads as follows: “Collections of literary or artistic works such as encyclopedias [sic] and anthologies which, by reason of the selection and arrangement of their contents, constitute intellectual creations shall be protected as such, without prejudice to the copyright in each of the works forming part of such collections.” Berne Convention, supra note 39, at art. 2(5). See also Hatch, supra note 8, at 171 (“[T]he Berne Convention features the highest internationally recognized standards for the protection of works of authorship.”).

It is not a coincidence that the U.S. did not enter into an agreement with intellectual
As discussed above, a computerized database is best conceptualized as a chosen universe of data ordered in a manner to facilitate access. This view of a computerized database only contemplates which data will be chosen and how it will be juxtaposed. A computerized database can be thought of in this manner without regard to the contents of the underlying data. Since the structure of a computerized database can be determined independent of the underlying data, it follows that if the structure is protected by copyright, this protection should not include the underlying data. This view is followed by both the NAFTA and the Proposed Directive.

Precluding the underlying data from copyright protection will prove beneficial to members of both proposals regardless of whether they are a developing or developed country. If the underlying facts and ideas are copyrightable, then scientific and artistic progress would be impaired. Facts and ideas are the building blocks upon which greater discoveries rest. If a database author could acquire the right to exclude others from the facts or ideas contained in her database, then she would be able to stand in the path of progress. Even if such an author chose to allow some use of the facts or ideas through a licensing scheme, whereby someone could purchase the right to use that fact or idea, progress still would be impaired. By charging for the use of facts or ideas, the author will have increased the cost of research and development in nearly every sector of the economy. With this in mind, the benefit of reduced research and development costs due to the free

property provisions as extensive as those in the NAFTA at an earlier time. It was not until March 1, 1989, that the Berne Convention was finally adopted by the U.S. Berne Convention Implementation Act of 1988, Pub. L. No. 100-568, § 1, 102 Stat. 2853 (1988). Before the Berne Convention, U.S. copyright law was incompatible with the requirements of the Convention. For a brief historical outline of the events leading up to U.S. adoption of the Berne Convention, see generally Hatch, supra note 8. It was the failure of the U.S. to timely adopt the Berne Convention which was used as a negotiating ploy to thwart past U.S. efforts to increase protection of intellectual property on an international level. David M. Spector, Implications of the United States Adherence to the Berne Convention, 17 AM. INTELL. PROP. L. ASS'N Q. J. 100, 105 (1989). This proved especially costly to U.S. efforts since there are 77 signatories to the Berne Convention, 24 of whom do not have a copyright relationship of significance with the U.S. As might be expected, all of the EC Member States and each NAFTA Party are now signatories to the Berne Convention. See, e.g., NAFTA, supra note 1, at art. 1705(1) (stating that copyright protection for a compilation "shall not extend to the data or material itself . . ."); Proposed Directive, supra note 2, at art. 2(4) ("The copyright protection of a database given by this Directive shall not extend to the works or materials contained therein . . .").


Id. at 525.

See Leaffer, supra note 68, at 280. By increasing short-term prices, all protection of intellectual property impedes the free flow of information. Id.
flow of information will outweigh the monetary benefit which the holder of a copyright in facts or ideas would receive. The free flow of information is consistent with developing countries' views that economic welfare is best promoted by appropriation rather than creation. As a result of reduced research and development costs, developed countries will also be in a better overall position if facts and ideas are not protected. Although these lesser levels of protection may reduce the incentive to produce databases, this effect should be more than offset by reduced research and development costs.

It is in the standard of originality requirement of original selection or arrangement that each proposal's underlying objectives become clear. Therefore, an analysis of the meaning of "selection" and "arrangement" is in order.

(a) Selection

In examining the two criteria required for originality, the "selection" criterion poses fewer conceptual problems when applied to computerized databases. The long-standing rule on "selection" is that a "subjective selection of information . . . satisfies the minimal creativity standard." A corollary to this rule is that selectivity is considered inversely proportional to comprehensiveness. The prevailing line of reasoning is that the more comprehensive the database's scope, the less likely that there was any original selection of the contents. This creates a disincentive to create highly comprehensive databases, since it will be difficult to receive copyright protection due to their lack of originality. However, it is a computerized database's ability to efficiently search a comprehensive set of data which makes it valuable to the user. Thus, the "selection" criterion is a severe limitation on computer-
IZED DATABASE PROTECTION. It is ironic that one of the most valuable attributes of a computerized database — its exhaustive nature — threatens to preclude it from legal protection. By implicitly limiting the exhaustive nature of a computerized database, the "selection" criterion forces a database creator to choose between designing a protected original selection or an exhaustive compilation which the user would consider more valuable, but one that would not necessarily be protected. A possible means to balance comprehensiveness with original selection is by including "complementary information" in the database. Complementary information refers to non-essential information, such as subjective information. Thus, instead of the "selection" criteria being interpreted to refer to the creator's choice of universe, it can be interpreted to refer to the creator's choice of how much information concerning that universe to include. In this way, the requirement of originality in selection will not become such a severe limitation on the ability to obtain copyright.

The EC interpretation of "selection" appears slightly more liberal than that which is likely to prevail in North America. Although the European Commission rejected the United Kingdom's even more lenient standard of content originality, it also rejected the much stricter German standard which would allow protection by copyright only if its "selection, accumulation, arrangement and organisation" has been the subject of know-how beyond that possessed by the 'average programmer.' The UK standard is met by establishing that the database author has independently selected the materials. This is a relatively simple test that is fulfilled by demonstrating that the database has not been copied. Similar to the UK standard, the Commission

be most attractive to the user, who need not fear that potentially desirable information has been excluded according to the compiler's perhaps unwanted selection criteria.

164 Ginsburg Copyright, supra note 160, at 345.
165 Id. at 347.
166 Id.
167 Id. at 346-47.
168 Pattison, supra note 15, at 115. See also Copyright, Designs and Patents Act, 1988, ch. 48, sec. 12 (Eng.).
170 Id. at 113.
171 Id. The UK is responsible for about 34% of the databases produced in the EC and as much as 63% of the EC databases sold. Goldsmith, supra note 14. Although it would be unreasonable to assume that the lower standard of originality is the sole cause of the UK's leadership in the EC database community, it would similarly be unreasonable to assume that it was not a significant factor in attaining that position. An additional and obvious factor which would lead to more UK databases being sold than in any other EC country is that the primary
opined that the "selection" criterion will be met when the author makes an original, "personal choice."\textsuperscript{172} That is, if the database's selection criteria were independently developed by the author, then the database is eligible for copyright protection.\textsuperscript{173} However, if the selection criteria were copied from another source, then there will be no copyright protection based on original selection.\textsuperscript{174}

Therefore, the "selection" criterion of the Proposed Directive appears to be somewhat similar to the standards set forth in the NAFTA. Both require a form of personal or subjective choice as to the type of information that will be included in the database. The two proposals will diverge if the Proposed Directive's interpretation of the "personal choice" definition of original selection is more liberal in practice than the "modicum of creativity" standard likely to prevail in North America. This divergence will become particularly significant as the interdependence of countries on both sides of the Atlantic continues to increase.\textsuperscript{175}

(b) Arrangement

As with the "selection" criterion, the "arrangement" criterion under both the NAFTA and Proposed Directive appear to require a similar level of creativity. Unlike the "selection" criterion, however, the "arrangement" criterion raises several troubling issues when applied to computerized databases. At least one commentator has suggested that all computerized databases may lack any original "arrangement" since "they are designed to permit the user to impose her own search criteria on the mass of information."\textsuperscript{176} In theory, this may seem like a plausible interpretation of the "arrangement" criterion. However, it is unlikely that this is the interpretation intended by either the European Commission or

\textsuperscript{172} Explanatory Memorandum, supra note 2, at 22.

\textsuperscript{173} Pattison, supra note 15, at 116.

\textsuperscript{174} Id.

\textsuperscript{175} See, e.g., Sherry M. Horgan, Comment, Foreign Data: Is It Safe in United States Data Banks?, 16 CAL. W. INT'L L.J. 346, 347 (1986). The author relays the true story of a Swedish fire department relying on a computer program to provide information vital to fighting fires. Id. In turn, this program relied on a computerized database for the relevant information. Id. This database was stored in Cleveland, Ohio, and due to a severe blizzard in Cleveland, the Swedish fire department was unable to access the database. Id.

\textsuperscript{176} Ginsburg Copyright, supra note 160, at 345. See also Denicola, supra note 155, at 528 ("[T]he arrangement is often dictated exclusively by function and accomplished with the push of a computer key . . . . ").
the parties to the NAFTA. It is unrealistic to assume that the Commission would have produced a seventy-five page document protecting computerized databases based on their "selection" or "arrangement" if it believed it was impossible for such databases to be arranged in an original manner. A similar argument, albeit on a smaller scale, can be made to signify the intentions of the NAFTA parties. Given the importance of this industry, both monetarily and otherwise, and the underlying objectives of each proposal, it would be highly irrational for either agreement to establish an impossible threshold for legal protection.

Although the "arrangement" criterion is not a misplaced requirement, it is nonetheless, confusing to speak of an original "arrangement" of a computerized database. Neither the NAFTA nor Proposed Directive make it clear in what context the "arrangement" criterion is to apply. The two most obvious possibilities are the manner in which the data is stored in the computer's memory, and the way in which the data is presented to the user.

It appears that the European Commission intended that "arrangement" refer to the manner in which the data is stored. The Proposed Directive states that the "arrangement" of a computerized database "depends to some extent on the indexing system." An "indexing system" is one of several means which the underlying software may use to determine the address of each data record. An index has no relation to how the data is presented to the user, its purpose is to decrease the access time of the data records. However, if the "arrangement" crite-

\[177\] See supra notes 6-7 and accompanying text.

\[178\] See, e.g., NAFTA, supra note 1, at art. 102(1)(d); Explanatory Memorandum, supra note 2, at 2 (explaining that the objective of this directive is to "provide a harmonized and stable legal regime protecting database created within the Community").

\[179\] Pattison, supra note 15, at 116.

\[180\] Explanatory Memorandum, supra note 2, at 27. Since the Proposed Directive does not state, nor imply, that the index defines the arrangement of a computerized database, see generally Proposed Directive, supra note 2, it follows that two databases with the same indexing system could be independently protected by copyright. Therefore, full-text searchable databases (i.e., databases which index on all words) will not be precluded from copyright protection simply because they have the same indexing system.

\[181\] See Martin, ORGANIZATION, supra note 5, at 86.

\[182\] Indexed files allow direct access to the desired record. See ALFRED V. AHO ET AL., DATA STRUCTURES AND ALGORITHMS 361-68 (1983). In contrast, sequential files must be sequentially searched from the first record to find the desired record. Id. This difference in accessing methods allows the indexed file to retrieve data records in orders of magnitude less time than the sequential method. Id. A computerized database which provides only sequential access to the data must access each previous data record before locating the desired record. See ALAN L. THARP, FILE ORGANIZATION AND PROCESSING 28-29 (1988). For example, if the tenth record of the database is desired by the user, then using sequential access, data records 1 through 9 must be accessed...
rion is interpreted to mean the arrangement of the data in the computer's memory, then "it is questionable whether . . . [it] is a desirable criterion for determining the eligibility of a database for copyright protection." The reason for this is that the underlying software and the operating system of the computer are responsible for the actual determination of where to place a data record in storage. There is no apparent reason why the database creator should benefit from the "arrangement" chosen by the software which the database creator did not necessarily create.

Similarly, the NAFTA gives no indication as to what the "arrangement" criterion applies. Based on the text of the proposal, it is impossible to glean any understanding of whether "arrangement" was intended to refer to the storage of data or presentation of information to the user. The parties to the NAFTA, as well as the European Commission, would be wise to interpret "arrangement" to apply to the manner in which the data is presented to the user. If this was the interpretation, the "arrangement" of a database would be under the control of the database's authors. In turn, the originality, or lack thereof, would be the result of choices made by the author, not the software which may or may not have been designed by the author. In order for the developed countries' incentive argument to have merit, copyright protection first. Therefore, the number of accesses — and therefore the amount of time — required to find a data record using sequential access increases linearly with the number of data records in the data file. Id.

On the other hand, if the database is indexed, the index can be searched and the address of the data record found using one of several different search strategies. Id. It is outside the scope of this note to go into a detailed description of each search method; however, suffice to say that the number of accesses and the amount of time required by these search methods increase logarithmically with the number of data records in the database. See generally ULLMAN, supra note 123, at ch. 2 (describing the method of calculating the required number of accesses for different search strategies); AHO, supra note 182, at 361-74 (describing several methods of efficiently searching indexes).


ULLMAN, supra note 123, at 7. One should note that the definition of "database" provided in the Proposed Directive includes neither the underlying software nor the computer's operating system. Proposed Directive, supra note 2, at art. 1(1); Hughes & Weightman, supra note 43, at 148; Pattison, supra note 15, at 116.


The NAFTA was implemented on January 1, 1994. See NAFTA, supra note 1, at art. 2203. NAFTA can, however, be modified by agreement of the parties. See id. at art. 2202.

Since the Proposed Directive has yet to be finally adopted by the European Council, there still is time for clarification. See Pattison, supra note 15, at 116 (suggesting the possibility that the Directive, when finally adopted, may contain criteria other than original "selection or arrangement" as the test for copyright protection).

This argument is based on the belief that innovation and creativity are encouraged by
should be available only to those databases which are original due to choices made by the author. Otherwise, the author would have no incentive to spend time and money to develop an original "arrangement" when originality actually depended upon the manner in which the DBMS and the operating system stored the data.

Under this interpretation, the ability to copyright a database is "totally dependent on the command procedures." Command procedures allow the user to request particular data in a desired format. The presentation of the data depends on which command procedures are employed by the user. This, in turn, depends on which command procedures are made available by the author. Thus, by simply changing or replacing the available command procedures, the database's maker may effectively determine whether the same collection of data will be protected by copyright. This can lead to several undesirable results. First, if the originality of the arrangement is determined in relation to all of the possible command procedures which might have been chosen, then most any databases will be protected. This will eliminate any incentive the author may have to produce an original database. Second, if the originality of the arrangement is determined in relation to those command procedures available at the time the database was created, then two similar, yet inconsistent, results may occur. The database author will be able to retain perpetual copyright protection by simply re-issuing the same selection of data with only a slightly changed arrangement due to modified command procedures. This is not the result intended by either proposal. Additionally, if the original database creator received copyright protection based solely on the "arrangement" criterion, a second-comer could conceivably reproduce the entire database with a separate set of command procedures, and thereby also receive greater database protection. See supra note 69 and accompanying text.

In rejecting the proposition that machine-produced works could be granted copyright protection, the authors of the OTA REPORT opined that "[w]hen the element of human labor involved in the processing of information is replaced by automation, the incentive of copyright protection may become entirely disconnected from the authorship that it seeks to inspire." OTA REPORT, supra note 6, at 76.


For example, a pseudocode of a command procedure may read as follows: Find all free-agent left-handed pitchers sorted in ascending order on earned run average (referring to the example originally provided in supra note 115 and accompanying text).

The user can determine if the data is to be retrieved in ascending, descending, or some other order.


Id.

See generally NAFTA, supra note 1; Proposed Directive, supra note 2.
There is no perfect solution to this dilemma. However, the following solution would prove compatible with each proposal’s underlying objectives. First, the “arrangement” criterion should be interpreted to refer to the manner in which the data is presented to the user. As discussed above, this will allow originality, and thus copyright to depend on choices made by the author. In this manner, the author is provided with an incentive to be innovative and creative since recoupment of her investment is dependent on originality.

Second, since copyright eligibility will normally be totally dependent on the command procedures, their originality should be determined in relation to only those command procedures available at the time the database was created. This would require the author to develop a new set of command procedures different from any set currently in use. Although this solution requires the author to incur more initial research and development costs than she otherwise might, there are several long-term benefits which will flow from this solution. First, society will experience a long-term increase in efficient and effective databases. The ingenuity required to produce the author’s first original database can be subsequently applied to later projects. Additionally, the creativity exhibited by the author may inspire other authors to be equally, if not more creative. This innovation cycle should lead to the development of more efficient procedures for creating original databases, resulting in lower costs over the long-term.

Third, the creative author will benefit by being able to recoup his investment. If an author develops a new and creative set of command procedures, he can be sure that ample opportunity will be available to recover the costs. No subsequent author will be able to divert the financial benefits due to the creative author simply by making minor changes to the set of command procedures.

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196 See Zechariah Chafee, Jr., Reflections on the Law of Copyright: I, 45 COLUM. L. REV 503, 511 (1945). Progress is a result of each person building on the work of his predecessors. The author summarizes this phenomenon with the following quote: “A dwarf standing on the shoulders of a giant can see farther than the giant himself.” Id.

197 See, e.g., YAMBRUSIC, supra note 12, at 10 (suggesting that a policy which encourages the production of new technology similarly encourages developing the ability to produce that technology).

198 See STALSON, supra note 68, at 2. Since research and development costs have increased in recent years, these costs can only be justified if a reasonable return on the investment can be expected. Id.
(c) Implementing the Standard of Originality

The final point of interest in determining the prevailing standard of originality under either the NAFTA or Proposed Directive may be the most important: that is, what are the obligations of the parties in implementing the standard of originality. The NAFTA allows a party, through domestic legislation, to "implement . . . more extensive protection of [databases] than is required under this Agreement, provided that such protection is not inconsistent with this Agreement." In effect, the NAFTA text only establishes the minimum level of protection that must be afforded databases in each country. Databases may be afforded more protection than that set forth in the NAFTA, but not less.

In contrast, the Proposed Directive requires that "[n]o other criteria shall be applied to determine the eligibility of a database for this protection." The Member States must grant copyright protection to databases which by reason of their original "selection" or "arrangement" are an intellectual creation. Similarly, the Member States must deny copyright protection to those databases which exhibit no originality in their "selection" or "arrangement." The Commission has made the determination that this is the point at which both the stimulation of investment and free-flow of information is optimal.

Therefore, while one of the underlying purposes of both proposals is the standardization of protection, only the Proposed Directive contains a complete standardization. The NAFTA has eschewed a complete standardization—such as in the Proposed Directive—in favor of creating simply a minimum level of protection.

The NAFTA minimum level of protection is a sign that the NAFTA parties recognize that although a sufficiently high level of protection will best promote their long-term goals, some of the parties may benefit by slightly higher domestic protection, while others may not. As long as each Party establishes a standard of protection which meets or exceeds the minimum established in Chapter 17 of NAFTA, then each Party is only obligated to enforce their standard of protection regardless of the standards maintained by the other parties. This will prove

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199 NAFTA, supra note 1, at art. 1702.
200 Proposed Directive, supra note 2, at art. 2(3).
201 Id. at 40. The Commission is of the opinion that "[t]he [Proposed Directive] will favour the free circulation of databases . . . ." Id.
202 See NAFTA, supra note 1, at art. 1703(1) ("Each Party shall accord to nationals of another Party treatment no less favorable than that it accords to its own nationals with regard to the protection and enforcement of all intellectual property rights.").
beneficial to a developing country such as Mexico if it chooses to provide a lesser degree of protection. By meeting the minimum, Mexico would be preventing the development of the computerized database industry through acquisition rather than investment. As such, all of the long-term benefits would be realized. However, if another Party, for example the U.S., chooses to provide more protection to computerized databases, the Mexican computer database industry would benefit from the long-term increase in U.S. computerized database production. For example, if a computerized database which is protected in the U.S. is brought to Mexico where it would not be protected, then the Mexican government could lawfully permit acquisition of that database. The reverse is not true. Under this scenario, a computerized database protected in Mexico would always be protected in the U.S.

These events will not occur in the EC. As the European Commission desired uniformity will prevail. This system has its own benefits, such as providing author’s with a predictable legal environment. Author’s will not be required to be aware of the nuances of each particular Member State’s laws. They only have to learn one legal system, and will be prepared for computer database production regardless of the state in which they reside. Also, a more uniform than expected distribution of database production might result due to a database author’s lack of legal incentive to discriminate between states in distribution of his databases. However, a completely uniform distribution of database producers should not be expected since there are many other variables which must be considered by the author.

3. Authorship

Determining the author of a compilation such as a computerized database is not an easy task. One approach would provide the copyright to those individuals who collected the data. However, it is neither the techniques used in collecting data, nor the data itself, which are protected by copyright. Since it is the “selection” or “arrangement”

203 See generally supra part II.C.
204 See Explanatory Memorandum, supra note 2, at 4 (The Commission clearly stated one of its goals was to establish a “stable and uniform legal environment” throughout the EC.).
205 There are several other factors instituted by governments which effect the location of industry: for example, regulations, technical standards, tax burdens, levels of education. See OTA REPORT, supra note 6, at 170-71.
206 See Metaxas, supra note 36, at 230 (referring to this as the traditional approach).
207 It is the “selection” or “arrangement” of the contents of the database which are protected by the copyright. See supra note 114 and accompanying text.
208 Id.
of the database which is protected by copyright,\(^{209}\) it follows that the rights of authorship should be granted to the one who is responsible for creating the selection or arrangement. This will effectively link the creative costs with the ultimate financial benefits made possible by the copyright.\(^{210}\) Only if this link exists will there be an incentive to incur the costs necessary to produce a computerized database.\(^{211}\) Furthermore, since both the NAFTA and the Proposed Directive aim to promote database production over the long-term by encouraging innovation,\(^{212}\) the creator of the selection and arrangement should be deemed the author since it was her innovation which made the database original and copyrightable.

(a) Co-authorships

Commonly, a computerized database is not the product of only a single individual's efforts.\(^{213}\) Typically, many individuals will be involved in the production process. Their jobs may range from planning the types of data that will be included in the database to implementing the database's security strategy.\(^{214}\) As an individual becomes more involved in determining the selection or arrangement of the data, this individual becomes more akin to an author.\(^{215}\) Databases of this type are usually classified as either collective works\(^{216}\) or works of joint authorship.\(^{217}\)

Under the Proposed Directive, the person designated as the author of a collectively created database is to be determined solely by domestic legislation.\(^{218}\) Similarly, the NAFTA makes no mention of collective works,\(^{219}\) apparently leaving the determination of authorship to domes-

\(209\) See \textit{Id.}

\(210\) See Ploman & Hamilton, \textit{supra} note 100, at 25. Copyright is one means of successfully bridging the world of ideas with the world of commerce. \textit{Id.}

\(211\) See Stalson, \textit{supra} note 68, at 2. The increased research and development costs of producing high technology goods can only be justified if they can be recovered over a reasonable time. \textit{Id.; Ploman & Hamilton, supra} note 100, at 24 (The underlying purpose of copyright protection is to enable authors to recover their costs and earn a profit so that they are encouraged to produce intellectual creations.).

\(212\) See \textit{supra} notes 102-12.

\(213\) Ploman & Hamilton, \textit{supra} note 100, at 33.

\(214\) See Martin, \textit{Managing, supra} note 9, at 69-83.

\(215\) Ploman & Hamilton, \textit{supra} note 100, at 33.

\(216\) A "collective work" is a work in which several independent contributions are consolidated into a collective whole. \textit{Black's Law Dictionary} 263-64 (6th ed. 1990).

\(217\) In a "joint authorship," several persons execute a common design. \textit{Id.} at 837.

\(218\) Proposed Directive, \textit{supra} note 2, at art. 3(2).

\(219\) See generally NAFTA, \textit{supra} note 1.
tic legislation.220 In fact, neither proposal indicates who the author should be if there is no controlling domestic legislation.221 Failing to provide a default rule could prove troublesome. A computerized database collectively authored in a country not providing for collective works could result in the copyright being granted to a single author, thereby excluding the other contributors. This result would undermine the objectives of each proposal. Since both proposals desire to encourage the production of creative databases, multiple author ventures should be encouraged by granting a copyright to the author of each original portion. Collectively authored databases allow important jobs to be divided between the authors, which allow each author to devote considerably more of her ability and time to a specific part of the computerized database. However, if only one or a few of the contributors to the collectively created database will be able to recoup their investment by means of a copyright, then the incentive for engaging in these ventures is reduced. Granting each of the collective authors copyright benefits will serve to promote these ventures.

As with collective works, the NAFTA makes no mention of works of joint authorship.222 On the other hand, the Proposed Directive provides that if “a database [is] created . . . jointly, [then] the exclusive rights shall be owned jointly.”223 Since the authors will become joint owners of the copyright, this should provide an incentive for EC authors to collaborate on a given project in order to devise the most effective and efficient types of computerized databases. Additionally, the Proposed Directive instructs that the exercise of the rights granted to joint authors by this Directive shall be “left to contractual relations between the joint authors.”224 This further protects an author’s investment in a computerized database by preventing a co-author from exercising the rights of a copyright holder to the detriment of the other authors. Although this contract requirement will restrict each author’s rights to a degree, its burden will be greatly outweighed by the added benefit that the author receives from being able to protect himself from the acts of his co-authors. The result is that a joint author will be able to protect his investment from both the public and her co-authors.

An illustration of a computerized database which is individually,

220 Since each NAFTA Party has the right to enact domestic legislation which is not inconsistent with the NAFTA provisions on intellectual property, each Party may establish their own standards for handling collective works. See NAFTA, supra note 1, at art. 1702.
221 See generally Proposed Directive, supra note 2; NAFTA, supra note 1.
222 See generally NAFTA, supra note 1, at ch. 17.
223 Proposed Directive, supra note 2, at art. 3(3).
224 Explanatory Memorandum, supra note 2, at 44.
jointly, and collectively authored is as follows. Suppose a computer programmer proposes to create a copyrightable computerized database. This programmer hires a secretary to perform clerical tasks and all of the data entry. The programmer designs a computerized database that has both "selection" and an original "arrangement." To implement this design, the programmer delegates to the secretary the task of entering all of the data into the computer in a manner consistent with the "selection" and "arrangement" functions. Although precise and accurate data entry is vital to a viable computerized database, the secretary has performed none of the tasks which resulted in the originality of the "selection" and "arrangement" of the computerized database; therefore, only the programmer should be considered the author for copyright purposes. However, if, in the beginning, the programmer had hired an associate as well as a secretary, and this associate worked closely with the programmer on all facets of the database's design, then the programmer and associate would be considered joint authors. The third variation would be if the associate was delegated the job of independently determining the "selection" of the database, while the programmer applied his talents exclusively to the "arrangement." In this case, the database would be considered a collective work with the associate holding a copyright in the "selection" and the programmer holding a copyright in the "arrangement."

(b) Who May Hold a Copyright?

Another issue which may arise in the authorship context is determining who may be granted a copyright. Is the granting of a copyright restricted to natural persons, or may it also be granted to legal entities? Since both proposals claim to rely on the Berne Convention, one might expect some guidance on this issue from the Convention. However, the term "author," while used widely throughout the Berne Convention, is not defined therein. Nonetheless, based on the way the term "author" is used, it is generally accepted that the term only refers to natural persons.

Although the NAFTA Chapter on intellectual property contains

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225 See NAFTA, supra note 1, at art. 1701(2)(b); Explanatory Memorandum, supra note 2, at 44.
227 RICKETSON, supra note 226, at 159. See also Explanatory Memorandum, supra note 2, at 44.
228 See NAFTA, supra note 1, at ch. 17.
a definition section, this section fails to include a definition of "author." Additionally, a careful review of this chapter reveals that nowhere is the term "legal entity," or any similar term, used. References to the concept of a database author are made with the generic term "person." Additionally, the term "natural person" is used only one time in Chapter 17. This differentiation between the use of the terms "natural person" and "person" indicates that the NAFTA did not intend the two terms to encompass the same meaning. Therefore, it appears that the NAFTA intends to include both natural persons and legal entities as prospective database authors.

The practical effects of a determination that a database author covered under NAFTA includes both natural persons and legal entities become apparent when taken in conjunction with the contract provision of Chapter 17. The NAFTA recognizes that "any person acquiring or holding . . . [a copyright] by virtue of a contract, including contracts of employment . . . shall be able to exercise those rights in its own name and enjoy fully the benefits derived from those rights." Thus, the NAFTA would allow employers to contract for the copyrights of their employees' creations. Importantly, this will provide an incentive to entities to invest in computerized database production.

The Proposed Directive offers very little in the way of substantive standardization in the area of authorship. It is almost entirely deferential to Member State legislation or contractual agreements. The Proposed Directive begins with the proposition that "[t]he author of a database shall be the natural person or group of natural persons who create the database." However, this definition is quickly qualified by a provision allowing Member States to pass legislation which would expand the definition of "author" to include legal entities. This deferential posi-

229 Id. at art. 1721.
230 Id. at ch. 17.
231 See, e.g., NAFTA, supra note 1, at art. 1716(5)(a). In describing the required notice for ex parte implementation of provisional measures by a judicial authority of one of the Parties, the NAFTA requires that "a person affected shall be given notice of those measures without delay . . . ." Id. (emphasis added).
232 Id. at art. 1705(4). (The term "natural person" is used only to reject the generally accepted Berne Convention principle that the term of protection should be a function of the life of a natural person.). RICKETSON, supra note 226, at 159. (A term of protection based on the life of a natural person is one of the factors leading to the conclusion that under the Berne Convention, "author" refers only to a natural person.).
233 See NAFTA, supra note 1, at art. 1705(3).
234 See id. at art. 1705(3)(b).
235 Proposed Directive, supra note 2, at art. 3.
236 Id. at art. 3(1) (emphasis added).
237 Id. A legal entity may be considered the author in those cases "where the legislation of
tion creates the possibility of a considerable lack of uniformity and predictability in the area of authorship. Some Member States are likely to want legal entities to hold copyrights as a means to encourage corporate investment. However, since all Member States are also parties to the Berne Convention, some may also feel bound to follow the Berne Convention's definition of "author." Although all of the Member States have a duty to abide by the Berne Convention, the potential benefits of encouraging corporate investment in computerized databases by allowing legal entities to hold copyrights may be too much to resist. In light of the Proposed Directive's adoption of a policy aimed at long-term benefits through increased investments in producing creative databases, the investment capabilities of the corporate sector should be welcomed and encouraged by including legal entities within the definition of "author."

Finally, the Proposed Directive addresses the employer-employee context by creating a definitive rule to be followed. The rule is simply that an employee who creates a database shall be the author of the database. However, if the database was "created . . . in the execution of . . . [the employee's] duties or following the instructions given by his employer, [then] the employer exclusively shall be entitled to exercise all economic rights in the database so created." Thus, the employee will be considered the author of the database, but will not be entitled to any of the generated economic benefits. Continuing its deferential approach, the Proposed Directive permits the employer and employee to contract around this rule. In this regard, it is similar to the NAFTA provisions discussed above in conjunction with legal entities holding copyrights.

Therefore, it appears that the NAFTA and Proposed Directive are somewhat similar in the area of authorship. Both proposals will likely interpret the term "author" to include both legal entities and natural persons. This interpretation, while explicit in the Proposed Directive, is only implied in the NAFTA. Accordingly, both proposals would allow

the Member States permit[]." Id.

238 See STONE, supra note 29, at 1. See also Spector, supra note 153, at 121.

239 It is generally accepted that the Berne Convention confers copyright protection only on natural persons, not legal entities. See supra note 227 and accompanying text.

240 See supra notes 102-06 and accompanying text.

241 See Proposed Directive, supra note 2, at art. 3(4).

242 Id. (emphasis added).

243 Explanatory Memorandum, supra note 2, at 44 ("The employer and employee remain free to contract in ways other than those prescribed by Article 3.4."). It is only through contract that this rule may be circumvented. The Proposed Directive does not provide the Member States the opportunity to legislate around this rule. See generally Proposed Directive, supra note 2.
corporations or other large business entities to hold a copyright. This is consistent with each proposal's underlying objective of increasing investments in database production and to promote long-term benefits, since corporations usually have more resources to invest than individuals. However, it is the Proposed Directive's approach to joint authorship which provides it with the advantage over the NAFTA authorship rules. By specifically providing that authors jointly own the copyright, but can exercise their rights only with the consent of their co-authors, the Proposed Directive provides an incentive to authors not found in the NAFTA.

4. Infringing Acts

What is the practical effect of holding a copyright in a computerized database? In other words, once it is determined that a natural person, or a legal entity, is the holder of a copyright in a database, to what benefits will that person be entitled? Under both the NAFTA and the Proposed Directive, a copyright in a computerized database protects only the "selection or arrangement," it does not extend to, or affect, any existing rights in the contents of the database. It is, therefore, implicit in both proposals that in order for there to be an infringement of the computer database's copyright, an infringing act must be performed on the protected selection or arrangement.

The Proposed Directive provides an enumerated list of exclusive rights granted to the author which protect the "selection" or "arrangement" of the contents as well as the index, thesaurus, and retrieval system. As a result, the author of a computerized database protected by copyright under the Proposed Directive will have the exclusive right to prohibit the "temporary or permanent reproduction of the data-

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244 The question of what constitutes an infringing act may be the most important question to any database author. This issue is likely to be of even greater importance to the author of a computerized database, since such a database is relatively "difficult and expensive to create [yet] may be extremely cheap to steal." Schatz, supra note 71, at 434. See also OTA REPORT, supra note 6, at 97; STALSON, supra note 68, at 2; Dreyfuss, supra note 71, at 897-98.

245 See, e.g., Explanatory Memorandum, supra note 2, at 45 ("The exclusive rights of the author of a database under copyright refer to the right to prohibit acts in relation to the selection or arrangement of the contents.") (emphasis added); NAFTA, supra note 1, at art. 1705(1)(b) ("[C]ompilations of data or other material . . . which by reason of the selection or arrangement of their contents . . . shall be protected as such.") (emphasis added). Additionally, both proposals rely on the Berne Convention which has long protected only the selection and/or arrangement of compilations. See Ricketson, supra note 226, at 298-99.

246 See NAFTA, supra note 1, at art. 1705(1)(b); Proposed Directive, supra note 2, at art. 2(2).

247 See Proposed Directive, supra note 2, at art. 5.
base... in whole or in part," the "translation, adaptation, arrangement... [or] any other alteration of the database," the distribution of the database to the public (including rental), and "any communication, display or performance of the database to the public."

These restricted acts are subject to several exceptions. The first is an implied requirement of substantiality. In order for there to be a recognized infringement of a database, one of the previously listed restricted acts would have to be performed on such a substantial portion of the database's contents as to constitute an infringement of either the "selection" or "arrangement." An infringement of an insubstantial portion of the database will not be considered to have infringed upon the selection or arrangement, and therefore, will not be recognized. In order to avoid infringement of the "selection" or "arrangement" every time the database is accessed, the Proposed Directive provides a second exception to the infringement rule to the lawful user and/or acquirer. Even though some of the actions performed by a lawful user and/or acquirer would technically constitute copyright infringement, no such infringement will be deemed to have occurred to the extent that the actions were performed pursuant to a contract. Such a provision allows an author to benefit from copyright protection while, at the same time, allowing the user free access to the extent of the agreement with the author. Therefore, both the author's interest in protection of his intellectual creation and the public's interest in the free-flow of information will be advanced.

The NAFTA provides no similar list of acts which would infringe upon a computerized database's copyright. Instead, the rights enumerated in the Berne Convention are incorporated by reference. These rights

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248 Id. at art. 5(a).
249 Id. at art. 5(b).
250 Id. at art. 5(d).
251 Id. at art. 5(e).
252 Explanatory Memorandum, supra note 2, at 45-46. Hence, the determination of what constitutes "selection" and "arrangement" becomes even more important due to the effect it has on the availability of a remedy.
253 Article 1(3) defines "insubstantial part" as those "parts of a database whose reproduction, evaluated quantitatively and qualitatively in relation to the database from which they are copied, can be considered not to prejudice the exclusive rights of the maker of that database to exploit the database." Proposed Directive, supra note 2, at art. 1(3).
254 Explanatory Memorandum, supra note 2, at 46.
255 Id. at 47.
256 See NAFTA, supra note 1, at art. 1705(2) ("Each Party shall provide to authors and their successors in interest those rights enumerated in the Berne Convention . . . ").
are substantially similar to those explicit in the Proposed Directive. The Berne Convention grants the author the exclusive rights to prohibit any form of reproduction, translation, communication to the public, or adaptation, arrangement, or other alteration of the database.

Furthermore, the NAFTA explicitly provides that a computerized database author, protected by copyright, will have the right of first distribution. This is a grant to the author of "the right to authorize or prohibit ... the first public distribution of the original and each copy of the work by sale, rental, or otherwise ..." However, after the first distribution of this copy, the author has no control over its subsequent distributions. In other words, the author's right to control distribution in relation to this copy is said to have been exhausted.

Although the Proposed Directive confers a similar right of public distribution, it contains an important exception not found in the NAFTA. The Proposed Directive grants to the author the "exclusive right ... to do or to authorize ... any form of distribution to the public, including the rental, of the database or of copies thereof." This right will be exhausted after the first distribution of the database or copies thereof, except with respect to controlling subsequent rental. Thus, unlike the NAFTA, the Proposed Directive grants the author the "right to authorize the rental of copies of ... [a computerized database]"
notwithstanding the first sale of those copies." This exception to the exhaustion of the author’s right of first distribution will provide more incentive to potential authors to create computerized databases than there will be in countries adhering to NAFTA. The right to control the rental of previously distributed computerized databases gives the author the ability to prohibit such rental unless he receives a portion of the proceeds. The author’s opportunity to recoup his investment, and possibly make a profit, is increased due to the increased control over the database. This is an opportunity not available to authors under the NAFTA.

In conclusion, the two proposals have similar definitions on which acts will infringe a computerized database. The European Commission chose to explicitly list in the Proposed Directive’s text those acts which would cause an infringement. On the other hand, the NAFTA chose to refer to the Berne Convention for its definition of infringing acts. Although the means chosen are different, the end result is that, in most cases, an act which would infringe a computerized database under the Proposed Directive would also infringe a computerized database under the NAFTA and vice-a-versa. The two most important differences between the two proposals are the substantiality requirement and the non-exhaustion of an author’s control over the rental of copies after distribution—both contained in the Proposed Directive.

5. Term of Protection

The NAFTA and Proposed Directive take fundamentally different positions on what the duration of copyright protection should be. The basic difference lies in how each proposal defines the term of protection. The Proposed Directive creates an extremely deferential definition by requiring a term of protection equal to that which each Member State provides for literary works. This has the potential to result in an extreme lack of uniformity which would violate the prime objective of establishing a “harmonized and stable legal regime protecting databases created within the Community.” Recognizing the potential for inconsistency, the European Commission provided that this term of protection shall be subject to “any future Community harmonization ... of copyright and related rights.” Here, the European Commission is

268 Stewart, supra note 33, at 63.

269 Proposed Directive, supra note 2, at art. 9(1). See, e.g., Copyright, Designs and Patents Act, supra note 168 (stating that literary and artistic works are protected for the author’s life plus 50 years).

270 Explanatory Memorandum, supra note 2, at 2.

271 Proposed Directive, supra note 2, at art. 9(1).
leaving the door open for an ancillary proposal which would standardize
the term of protection for literary works in the Community at the life of
the author plus seventy years.\textsuperscript{272} Such a proposal would achieve nearly
perfect uniformity in the duration of copyright protection for computer-
ized databases. In the interim, however, the Commission has created a
system which is likely to lack uniformity.

On the other hand, the NAFTA makes a substantial departure from
the Berne Convention by requiring that the "term of protection of a
work . . . is to be calculated on a basis other than the life of a natural
person."\textsuperscript{273} The NAFTA provides for a fifty year term of protection
beginning at "the end of the calendar year of the first authorized publi-
cation of the work."\textsuperscript{274} In the case where there is no authorized publi-
cation within fifty years of the date the work was created, the term of
protection shall extend "50 years from the end of the calendar year of
making."\textsuperscript{275} The result is a highly structured term of protection which
will provide uniformity and predictability. However, it also requires that
the parties clearly violate their duties under the Berne Convention.\textsuperscript{276}

In conclusion, there are clear distinctions between the term of pro-
tection contained in the Proposed Directive and the NAFTA. The
NAFTA provision of a static term of protection will allow authors and
the public to easily predict the exact duration of the copyright. This
allows all interested parties to plan their future intellectual endeavors
with assurances of what will and will not be the subject of copyright
protection. On the other hand, the Proposed Directive provides a term of
protection which is not uniform. However, the duration of any copyright
is currently in a state of flux, and may result in a duration which
matches the NAFTA standard of predictability and uniformity.

\textsuperscript{272} See Amended Commission Proposal for a Council Directive harmonizing the term of Pro-
tection of Copyright and Certain Related Rights, 1993 O.J. (C 27) 7, 11.

\textsuperscript{273} Compare NAFTA, supra note 1, at art. 1705(4) with Berne Convention, supra note 39, at
art. 7(1).

\textsuperscript{274} NAFTA, supra note 1, at art. 1705(4).

\textsuperscript{275} Id.

\textsuperscript{276} Since all of the NAFTA parties are also signatories of the Berne Convention, see
SPECTOR, supra note 153, at 121, they are all obligated to abide by Article 7 of that Conven-
tion. Article 7 mandates that "[t]he term of protection . . . shall be the life of the author and
fifty years after his death." Berne Convention, supra note 39, at art. 7(1) (emphasis added).
6. Updating a Protected Database

The contents of a computerized database are usually quite volatile. This inherent characteristic gives rise to the question of whether the copyright protection afforded to the original database will be lost, enhanced, or remain unchanged by performing an update. In other words, will updating a database change it so much that a new database will be created which will be unprotected by the original copyright? Because the copyright protects the original "selection" or "arrangement" of information, an update must change the "selection" or "arrangement" in some way to affect the copyright.

If the addition of new records, or the modification or deletion of existing records, results in a broadening of the universe of data selected for inclusion in the database, then a change in "selection" has occurred. The addition or deletion of one, or several records, may also result in a change in the order of the data as it is stored in the computer's memory. Whether this results in a change in the "arrangement" depends on whether "arrangement" refers to the arrangement of the data in computer memory, or the arrangement of data as it is presented to the user. If arrangement refers to the data as it is stored in computer memory, then the addition or deletion of records results in a change to the database's "arrangement." However, if, as suggested above, the computerized database "arrangement" refers to the presentation of data to the user, then "arrangement" will not be changed since the data will still be presented in the same manner. For example, consider a computerized database which presents data to the user in alphabetical order. The addition or

277 Hughes & Weightman, supra note 43, at 149. (It is an inherent characteristic of a computerized database to be updated regularly, if not continuously.). See also Schatz, supra note 71, at 433. In general, "compilations tend to require frequent updates in order to have value to users." Id.

278 Whether the protection afforded the database is lost or enhanced depends on whether the updated version of the database is original or not. If the updated version is original the protection afforded the database will have been enhanced by the updates by virtue of a new term of protection. However, if the updated version is not original, the protection will be lost due to the inability to meet the requirements for copyright protection.

279 Updating a computerized database includes adding new data records, deleting old data records, and modifying existing data records. See ULLMAN, supra note 123, at 20.

280 Of course, the copyright will subsist in the original database if that database still exists. However, this is of little practical importance. Updates are performed on a computerized database to keep the information contained in the database relevant and current. See Schatz, supra note 71, at 427-33. Therefore, after the updating is performed, the original database is usually outdated, irrelevant, and only nominally valuable which may result in its disposal.

281 See supra note 114 and accompanying text.
deletion of any number of records will not change the fact that the data are presented in alphabetical order. From the user's perspective, he receives data in alphabetical order both before and after the updating.

The manner in which each proposal addresses these problems is best illustrated by the following two examples. First, real-time databases are, by definition, updated continuously. As a result, at the end of the day, a real-time database may contain a selection of data quite different from that at the beginning of the day. However, each real-time update can be viewed as a distinct change to the database. Each update will have changed at most one data record, even though at the end of the day, the database is entirely different.

The Proposed Directive addresses this issue by providing that “[i]nsubstantial changes to the selection or arrangement . . . shall not extend the original period of copyright protection.” The addition, deletion, or modification of relatively small amounts of materials will have no effect on the duration of protection. Thus, a real-time database updated continuously would neither receive extended protection, nor lose existing protection; each update, although occurring continuously, would be considered a separate and insubstantial change in the selection or arrangement.

The next illustration is the updating of a database using batch processing. In this case, the end result is the same as if the changes occurred real-time, even though the means through which these changes have occurred are quite different. This method of updating could re-

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282 Real-time processing involves instantaneous implementation of the desired changes in the database. SUSANNE M. HUMPHREY & BIAGIO J. MELLONI, DATABASES: A PRIMER FOR RETRIEVING INFORMATION BY COMPUTER 37 (1986). Examples of real-time databases familiar to the legal community are LEXIS and WESTLAW.

283 Hughes & Weightman, supra note 43, at 149.

284 Under this interpretation, the database should be considered as continuously in the process of being updated, as opposed to considering the sum total of changes over the course of a day as a single update.

285 Proposed Directive, supra note 2, at art. 9(2). The Proposed Directive defines “insubstantial change” as any "additions, deletions or alterations to the selection or arrangement of the contents of a database which are necessary for the database to continue to function in the way it was intended by its maker." Id. at art. 1(4).

286 See Explanatory Memorandum, supra note 2, at 53.

287 Batch processing is a method where all of the updates made to a database are collected over a period of time, and then the updates are made in the database in one “batch”. See KING, supra note 9, at 68; DIONYSIOS C. TSICHRITZIS & FREDERICK H. LOCHOVSKY, DATA BASE MANAGEMENT SYSTEMS 9 (1977).

288 The basic difference between batch processing and real-time processing is that batch processing involves a single update after the collection of changes that have accrued over time whereas real-time processing implements each change as it happens.
result in substantial changes to the data in a single update. This does not necessarily mean that a change in the computerized database “selection” or “arrangement” has occurred. As mentioned above, unless the universe of data selected for the database is broadened or narrowed, the “selection” will remain unchanged. This view is adopted by the European Commission. In light of the Commission’s apparent intention to interpret the “arrangement” of a database to mean the manner in which the data is stored in computer memory, batch updating may result in a substantial change to that “arrangement” since the data will not be stored in the same order as it was before the update. This will result in a loss of copyright protection for a computer database which had been protected as an original arrangement. Such a database will either have to meet the standard of originality independently or remain unprotected.

As a practical matter, the Proposed Directive’s requirement that changes to a database must meet a threshold of substantiality before protection will be altered is a necessity. However, some undesirable incentives may be created. By providing that the updating of a database is an insubstantial change, there will be a disincentive to database manufacturers to keep their databases current, especially late in the term of the copyright protection. Although a single update is considered an insubstantial change under the Proposed Directive, the cost to the author of updating is substantial. It would be in the author’s best interest to simply collect the changes to the original database, and create a new version of the original database instead of modifying the original design. This new database could then be protected independently by copyright, if it meets the standard of originality.

More problematic is that the Commission has created an incentive to produce and copyright databases which are incomplete or limited in scope. This incentive arises from the language indicating that a database will be eligible for a new term of copyright protection upon widening the scope of the database. Thus, instead of producing the most com-

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269 See, e.g., Explanatory Memorandum, supra note 2, at 54. An example of a substantial change would be adding magazine articles to an existing database containing only newspaper articles. Id.

270 See supra notes 180-85 and accompanying text.

271 If the pre-updated computer database’s selection and arrangement were both protected as original intellectual creations, a change in the arrangement will not affect the originality of the selection.

272 The costs associated with updating a database are proportionate to the costs incurred in collecting and assembling the data for the original version of the database. Schatz, supra note 71, at 433.

273 See Explanatory Memorandum, supra note 2, at 53-54. The Commission provided its own hypothetical database which contained all of the newspaper articles on a given subject published
plete—and thus more valuable—database possible, an author may withhold portions of the database to be released at a later date so as to extend the term of protection.294

Unfortunately, the NAFTA gives no guidance on the effect of additions, deletions, or modifications to a database.295 This is a major omission from the text which may result in substantial differences between the parties. The line which demarcates a modified original database from a new database must be drawn in the same place for all parties. If it is not, two identical databases which undergo identical modifications, could fall on either side of the line depending on something as fortuitous as in which country the database is located. Since the NAFTA text gives no consideration to this issue, each of the parties will apparently decide independently where to draw this line.

7. Conclusion

In conclusion, it is apparent that the copyright provisions of each proposal are quite similar. Both provisions require a computerized database to meet a threshold of originality determined by its “selection” or “arrangement.” Although both proposals have similarly worded tests of originality, the actual interpretation of these tests may vary. The European Commission’s indications that the test of originality will be satisfied if there is a personal choice by the author is likely to be a more liberal test than the NAFTA test where the modicum of creativity standard will prevail.

The proposals are also similar in their deference to domestic legislation in the area of authorship. Both the NAFTA and Proposed Directive provide that issues involving co-authors will be determined domestically, with the exception of joint authorships under the Proposed Directive. The copyright of a database authored jointly under the Proposed Directive will be owned jointly, but can only be exercised with the consent of the other authors. Under both proposals, either a natural person or a legal entity can be considered the computerized database’s author.

In the area of infringing acts, the reliance of both proposals on the Berne Convention is apparent. The Proposed Directive enumerates the

294 See Hughes & Weightman, supra note 43, at 149 (analogizing this to authors releasing new editions of books so as to obtain a new term of copyright protection).
295 See generally NAFTA, supra note 1.
acts which will infringe a computerized database, whereas the NAFTA incorporates the Berne Convention provisions on infringing acts by reference. The proposals are nearly identical in this area with the exception of the Proposed Directive’s exception to the exhaustion of the author’s rights after the first public distribution regarding subsequent rental.

The term of protection provided by the proposals is one of the areas where there is substantial difference. The Proposed Directive allows the currently disuniform regime of domestically determined terms of protection to continue until the Commission harmonizes this area. On the other hand, the NAFTA provides a term of protection which is inconsistent with the Berne Convention, but will provide stability and uniformity. Even after the European Commission harmonizes the duration of copyright protection, the actual duration of each proposal’s copyright protection will not be identical. However, the proposals will be similar in providing a uniform duration of copyright.

B. Right to Prevent Unfair Extraction

The largest distinguishing factor between the NAFTA and the Proposed Directive is the “right to prevent unfair extraction” granted by the Proposed Directive. It is with this right that the European Commission extends the boundaries of traditional database protection. There is no similar right granted by the NAFTA; in fact, copyright protection is the only manner in which a database could be protected under the NAFTA.

In designing the Proposed Directive, the Commission not only sought to “protect acquired rights and encourage investment,” but also to provide for “certainty and stability.” A sui generis form of protection — such as the right to prevent unfair extraction — for databases can provide most of the objectives in formulating a protection scheme, since it can be tailored to address specific problems. However, the concomitant disadvantage of any sui generis legal regime is that it will take a considerable length of time to develop sufficient pre-

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296 See Proposed Directive, supra note 2, at art. 2(5).
297 See generally NAFTA, supra note 1, at ch. 17.
298 Explanatory Memorandum, supra note 2, at 31.
299 Id.
300 See supra note 35.
301 Since a sui generis form of protection is new and unique, it can “be adapted to the specific characteristics of databases.” Explanatory Memorandum, supra note 2, at 31. See also OTA REPORT, supra note 6, at 92; Pattison, supra note 15, at 117.
cedent in which a consistent interpretation of the new legal regime can be found. Thus, such a form of protection will not, by itself, provide "certainty . . . [and] stability." In order to remedy this, the Commission has combined a sui generis right to prevent unfair extraction with the traditional form of copyright protection discussed earlier.

1. Defining the Right to Prevent Unfair Extraction

The right to prevent unfair extraction is "a right for the maker of a database to prevent the unauthorized extraction or re-utilization, from that database, of its contents, in whole or in substantial part, for commercial purposes." This right has its origins in unfair competition law and is not an extension of copyright law. A form of this type of protection appears in the laws of Denmark, Finland, Norway, and Sweden. However, the Proposed Directive takes one step further by prohibiting not only the unauthorized extraction of the database's contents, but also the re-use of the information contained therein. The Commission has made its intent in providing this form of protection obvious: to prevent "parasitic behaviour." It is this type of behavior by competitors which creates a barrier to database investment. It will nearly always be less expensive to misappropriate a competitor's database than to invest the necessary time and money to independently create a database. By preventing "parasitic behaviour" the Commission hopes to create an environment in which "investment . . . can be stimulated and

302 Explanatory Memorandum, supra note 2, at 31. See also OTA REPORT, supra note 6, at 92; Pattison, supra note 15, at 117.

303 The Commission specifically recognized that, in light of the "considerable period of time" which would be required to develop the necessary precedent, "neither certainty nor stability . . . would be provided. Explanatory Memorandum, supra note 2, at 31.

304 This solution is in accordance with the prevailing opinions of those interested in protecting EC databases. Metaxas, supra note 36, at 233.

305 Proposed Directive, supra note 2, at art. 2(5).

306 Explanatory Memorandum, supra note 2, at 35.

307 These countries provide a ten year right to prevent reproduction of compilations. Id. at 16.

308 Id. at 25. The Commission implicitly defines "parasitic behaviour" as the actions of someone who misappropriates the contents of a database. Id.

309 By preventing "parasitic behaviour," the right to prevent unfair extraction is "intended to create a climate in which investment in data processing can be stimulated and protected against misappropriation." Id.

310 Abbott, supra note 68, at 697; Schatz, supra note 71, at 433-34. See also Peterson, supra note 68, at 279.
[databases can be] protected against misappropriation."

This form of protection is extraordinary in that the requirements a database must satisfy in order to qualify for protection are minimal. The right to prevent unfair extraction is available regardless of whether or not the database is protected by copyright under the Proposed Directive. In fact, the only requirement is that the contents, not the "selection" or "arrangement," of the database must not already be protected by copyright or neighboring right. In other words, data which is not otherwise protected from misappropriation by copyright or neighboring right will receive such protection by means of the right to prevent unfair extraction. Theoretically, a single database could have contents which are protected by copyright, neighboring right, and the right to prevent unfair extraction. Although this conglomeration of rights in the contents of a database may appear confusing, the net result will be to afford protection to all of a database's contents. Thus, in one form or another, the contents of all databases in the Community will be protected.

For purposes of illustration, consider the author who creates a computerized database which contains as its data all of the computer programs written or used by a particular EC company. This database is likely to contain at least some programs which are protected by copyright under the computer software directive. The protection of these programs will be unaffected by the right to prevent unfair extraction. However, those programs which do not qualify for copyright protection will become the subject of the computerized database author's right to prevent unfair extraction.

2. Protection Available Under the Right to Prevent Unfair Extraction

The right to prevent unfair extraction empowers the maker to prevent the extraction and/or re-utilization of the contents of the database; however, it "does . . . [not] create any rights in the information as

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311 Explanatory Memorandum, supra note 2, at 25.
312 Proposed Directive, supra note 2, at art. 2(5).
313 This is to avoid the imposition of a compulsory license on copyrighted material. Id. Neighboring rights are also known as related rights. See L. Lee Phillips, Related Rights and American Copyright Law: Compatible or Incompatible?, 10 ASCAP COPYRIGHT L. SYMP. 219 (1959). Broadly speaking, these rights provide protection for photographs, films, and sound recordings. Stewart, supra note 33, at 185.
314 On May 14, 1991, the Council of the European Communities promulgated a directive which protects "[a] computer program . . . if it is original in the sense that it is the author's own intellectual creation." Council Directive 91/250, supra note 32, at art. 1(3).
Instead, the Proposed Directive draws a distinction between the ideas contained in the contents and the expression of those ideas. In order to avoid restricting the free-flow of information, the ideas contained in a database's contents remain freely accessible. It is the expression of these ideas that is affected by the right to prevent unfair extraction. In other words, an author with the right to prevent unfair extraction has the right to prevent the extraction and/or re-utilization of the form of expression contained in the database, but has no rights in the ideas. This distinction allows for the simultaneous stimulation of investment by preventing the unfair extraction of expressions while not preventing the free-flow of information. Furthermore, although the Proposed Directive contains no explicit statement to this effect, it appears that the right to prevent unfair extraction does not extend to a thesaurus, index, or retrieval system. The manner in which the Commission has crafted the right to prevent unfair extraction indicates that it applies only to the "contents" of a database, but not to any peripheral "electronic materials necessary for the operation of the database. Therefore, the only way in which a database's thesaurus, index, or retrieval system will be protected is if the database qualifies for copyright protection.

The effectiveness of the unfair extraction right will ultimately depend on how the "unauthorized extraction or re-utilization" clause is interpreted. Unfortunately, the Proposed Directive contains little guidance on how the Commission intended this interpretation to proceed. The Proposed Directive does provide that the extraction

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315 Explanatory Memorandum, supra note 2, at 25.
316 This distinction is drawn from copyright law and is applied in the realm of unfair extraction. Id. at 44. The basic concept of the idea/expression dichotomy is that facts are discovered, but cannot be authored. The facts themselves existed before being discovered, yet realization of these facts does not occur until a person takes the necessary steps towards discovery. Regardless of even the high degree of creativity necessary to discover a fact, the fact does not owe its origin to the discoverer. In contrast, an author creates an expression as a vehicle for a fact. Creative modes of expression are precisely what comes within the scope of copyright. See OTA REPORT, supra note 6, at 62; Denicola, supra note 155, at 523-24.
317 Explanatory Memorandum, supra note 2, at 44 ("[T]he ideas contained in the works incorporated into a database remain accessible . . . ").
318 Id. Although the ideas in a database are not protected, "the expression of [those] ideas are protected under copyright." Id.
319 See Denicola, supra note 155, at 524.
320 Pattison, supra note 15, at 117.
322 See Pattison, supra note 15, at 117.
323 Proposed Directive, supra note 2. See also Pattison, supra note 15, at 117.
324 "Extraction" is presumably aimed at users who make an unauthorized copy . . . of a
must be "in substantial part" and "for commercial purposes."\textsuperscript{325} However, neither of these terms are explicitly defined in the proposal.\textsuperscript{326} The slight guidance present is that an act may infringe upon the unfair extraction right without concurrently infringing a copyright, if present, in the database.\textsuperscript{327} Thus, an act of unauthorized reproduction, for example, could affect a "substantial part" of the materials of the database, and therefore be an infringement of the unfair extraction right, without proceeding so far as to infringe the "selection" or "arrangement" of this material. However, the Commission gives no further indication as to where the line of substantiality should be drawn, other than that it must infringe upon more than an insubstantial part of the database;\textsuperscript{328} yet, it may be less than an infringement of the selection or arrangement.

The Commission further blurs the location of this line by providing an exception to the substantiality requirement. As stated, to have an infringement of the unfair extraction right, there must be, \textit{inter alia}, an extraction or re-utilization of a \textit{substantial part} of the computerized database.\textsuperscript{329} However, the Commission has provided the author with the right to prevent such extraction or re-utilization even in those cases where it was insubstantial. The Commission states that a "lawful user of a database . . . without authorization of the database maker, [may] extract and re-utilize \textit{insubstantial parts} of works or materials from a database for commercial purposes \textit{provided that acknowledgement is made of the source}."\textsuperscript{330} Thus, a lawful user may not extract and/or re-utilize even an insubstantial portion of the database without some form of attribution. This extension of the author's right to prevent extraction and/or re-utilization of even insubstantial parts of the database, in the absence of attribution, will provide the author with even more opportunity to recover her investment.

3. Exceptions to the Right to Prevent Unfair Extraction

In spite of the foregoing extension of the right to prevent unfair extraction, the Commission has attempted to provide two exceptions to this right. The first of these, however, may not be an exception at all, and may only result in confusion. This "exception" would allow person-
al users "without authorization . . . and without acknowledgement of the source, [to] extract and re-utilize insubstantial parts of works or materials from that database for personal private use only."\(^{331}\) An extraction "for personal private use only"\(^{332}\) clearly does not violate the right to protection against unfair extractions and extensions, since this right operates only against extractions and extensions for "commercial purposes."\(^{333}\) Using any reasonable definition of "personal private use" would not result in such use being considered a violation of the "commercial purposes" requirement. Therefore, there could not be an infringement of the right to prevent unfair extraction if only "personal private use" occurred. It is not clear why the Commission chose to include this as a substantive provision in the proposal. The only potential benefit from this provision is alluded to in the Explanatory Memorandum to the Proposed Directive which defines personal private activities as those activities in which the data extracted from the database is not given to third parties, and which does not fall within in either a professional, commercial, or educational environment.\(^{334}\)

The second exception is a rational, substantive, and extremely important exception to the unfair extraction right. The Commission recognized that, unless certain safeguards were put on the unfair extraction right, there could be serious "anti-competitive implications."\(^{335}\) To resolve this, the Commission provides that "in the interests of competition and greater consumer choice,"\(^{336}\) the author is required to license the use of the contents of the database in two limited circumstances. The first situation is where the database has been "made publicly available" and "the works or materials contained [therein] . . . cannot be independently created, collected or obtained from any other source."\(^{337}\) If a database meets both of these criteria then the contents of that database "shall be licensed on fair and non-discriminatory terms."\(^{338}\) Therefore, a database which has not been published or is used solely for private purposes will not be subject to the licensing requirement.\(^{339}\) Similarly, a license will not be required under this exception when the materials could be independently created, collected, or obtained even if this would

\(^{331}\) Id. at art. 8(5) (emphasis added).

\(^{332}\) Id.

\(^{333}\) Id. at art. 2(5); id. at art. 8(4).

\(^{334}\) Explanatory Memorandum, supra note 2, at 53.

\(^{335}\) Id. at 35.

\(^{336}\) Id. at 29.

\(^{337}\) Proposed Directive, supra note 2, at art. 8(1).

\(^{338}\) Id.

\(^{339}\) Explanatory Memorandum, supra note 2, at 50.
be impractical due to time or financial costs.\textsuperscript{340}

The second situation in which the compulsory license requirement will become effective is when the database is "made publicly available by a public body which is either established to assemble or disclose information pursuant to legislation, or is under some general duty to do so."\textsuperscript{341} Again, the contents of a database shall be "licensed on fair and non-discriminatory terms."\textsuperscript{342} Although this scenario also involves public disclosure, the question of when a public body is under an obligation to disclose information raises other issues. The Commission answers the most prevalent question here: what happens when the public body enters the private market by commercializing its database? Under this scenario, even if the public body was under no duty to disclose the information, the database has been made publicly available. As a result, if the data contained in the database cannot otherwise be independently obtained, the compulsory licensing requirement applies.\textsuperscript{343}

As stated above, the terms of any license granted to a database's contents must be on terms that are "fair and non-discriminatory" for both parties. While a database's author will be allowed, to some extent, to protect her investment in the database,\textsuperscript{344} she will not be allowed to negotiate in a manner which would constitute an abuse of her dominant position in derogation of the EC Treaty.\textsuperscript{345} Thus, while an author cannot be forced to grant a license without consideration, she may be barred from charging a price commensurate with the costs incurred in initially collecting the materials or works. To resolve those situations where the parties are unable to independently agree on what constitutes "fair and non-discriminatory terms," each Member State is required to "provide appropriate measures for arbitration."\textsuperscript{346} Therefore, under no circumstances would either an author or second-comer be faced with acquiring a license which is either unfair or discriminatory.

Finally, the compulsory licensing requirement is inapplicable where it would conflict with "any other prior rights or obligations, including

\textsuperscript{340} Id. at 51.
\textsuperscript{341} Proposed Directive, supra note 2, at art. 8(2).
\textsuperscript{342} Id.
\textsuperscript{343} See Explanatory Memorandum, supra note 2, at 52. See also Proposed Directive, supra note 2, at art. 8(1) (stating that materials taken from a database for commercial purpose shall be licensed on fair and non-discriminatory terms).
\textsuperscript{344} Explanatory Memorandum, supra note 2, at 29.
\textsuperscript{345} The Treaty Establishing the European Economic Community [EEC Treaty], Jan. 1, 1958, art. 86, 298 U.N.T.S. 11. The Treaty states that no person or entity may "take improper advantage of a dominant position within the Common Market." Id. See also Hughes & Weightman, supra note 43, at 148.
\textsuperscript{346} Proposed Directive, supra note 2, at art. 8(3).
the legislation or international obligations of the Member States or of the Community. In other words, a database’s author is unable to license more rights in the contents than she actually holds. For example, if a database contained information of a personal or sensitive nature, and unauthorized release of this information would violate any Community or domestic law, then the compulsory license requirement is inapplicable.

4. Duration

The duration of the right to prevent unfair extraction shall extend for at least ten years; however, the cunning database author may be able to receive almost an entire year extra. The duration of this right is determined without consideration to the duration or availability of copyright protection. In circumstances where the contents of the database are not protected, this right will arise on the “date of creation of the database” and will continue for ten years from “the first of January of the year following the date when the database was first made available.” Thus, the right of unfair extraction arises on the date of creation, and presumably could extend indefinitely thereafter if it is never made available to the public. However, if the author makes the database available to the public, then the right to prevent unfair extraction will expire ten years after the first of January following the date of lawful release. For example, an author who lawfully releases his database to the public on June 12 will be able to prevent unfair extraction from June 12 until the subsequent January 1, and for ten years thereafter. This is likely to result in numerous releases of databases in the early months of the year and relatively few releases in the final months of the year. In fact, all other things being equal, it would be most advantageous for an author to release the database on January 1, thereby giving herself a right to prevent unfair extraction for an effective term of eleven years.

Although the duration of the right to prevent unfair extraction has no relation to the duration or existence of a copyright, it is subject to a qualification similar to that imposed on the duration of a copyright. The author may not extend the duration of the right simply by making “insubstantial changes” to the database’s contents. The effect of this

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347  *Id.* at art. 8(6).
349  Proposed Directive, *supra* note 2, at art. 9(3).
350  *Id.*
351  *Id.* at art. 9(4).
qualification is uncertain due to the Commission's use of the term "in-substantial changes." "Insubstantial changes" are defined in Article 1 in terms of the "selection or arrangement" of the materials in a database. However, the right to prevent unfair extraction protects the database's contents; yet, it is not in any way dependent on the "selection" or "arrangement" of these contents. The Proposed Directive makes no mention as to what constitutes an "insubstantial change" in a database's contents. Therefore, whatever may have been the intended effect of this provision, it will likely be ineffective—or at the very least unpredictable—due to the fundamental inconsistency in its use of terminology.

A further problem is sure to arise in determining the duration of the right to prevent unfair extraction. Since the Commission has imposed the requirement that the unfair extraction right may not accrue in contents of the database already protected by copyright or neighboring right, some of the database's contents may be protected longer than others. The situation where the copyright or neighboring right subsists for ten or more years following public release of the database will not give rise to any unusual situations. However, in the case where the copyright or neighboring right will expire less than ten years after public release of the database, unexpected situations will arise. In this case, not all of the contents will be protected for at least ten years following the public release of the database. The database's author with the contents protected by copyright or neighboring right, could be left with no way to prevent unauthorized extraction or re-utilization of the contents if the copyrights or neighboring rights in the contents expire shortly after public release of the database. This is an area which needs to be addressed by the Commission. A solution to this problem would be to allow the right to prevent unfair extraction to arise with the expiration of the copyright or neighboring right in the contents, and to subsist for the remainder of the ten year term described above. This would provide for the complete measure of protection intended by the Commission, without interfering with existing protection of the contents.

5. Reciprocity

The final intriguing characteristic of the proposed right to prevent unfair extraction may be the one which sheds the most light on the European Commission's underlying motivations. The Proposed Directive

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352 Id. at art. 1(4) ("[I]nsubstantial change' means additions, deletions or alterations to the selection or arrangement of the contents of a database which are necessary for the database to continue to function in the way it was intended by its maker to function.") (emphasis added).
provides that the only databases eligible to receive protection against unfair extraction or re-utilization are those "whose makers are nationals of the Member State or who have their habitual residence on the territory of the Community." 353 This also applies to firms or companies which are formed under the laws of a Member State and have their "registered office, central administration or principal place of business within the Community." 354 However, this right will be extended to nationals or residents of countries outside the Community only if a similar form of protection is provided by that country on a reciprocal basis. 355 By restricting the availability of the right to prevent unfair extraction to EC nationals or nationals of countries providing reciprocal protection, the Commission is taking direct aim at reducing the gap between the quantity and value of databases produced in the EC and the U.S. The Commission must have recognized that the U.S. does not provide any reciprocal protection of this type. The result is that those databases produced by U.S. authors will not be eligible for protection against unfair extraction and re-utilization. This may provide the additional stimulation to investment in databases needed to help close the gap with the U.S. The reciprocity requirement is of increased importance due to the uncertain ability to copyright computerized databases in the U.S., in light of recent judicial decisions. 356 Thus, just as the U.S. may be restricting the scope of protection available to computerized databases, the EC is expanding their scope of protection. It follows that a concurrent increase in database investment should be expected in Europe, while a simultaneous decrease in database investment in the U.S. should be expected.

III. CONCLUSION

In light of the foregoing, it is apparent that both the NAFTA parties and the European Commission have recognized the importance of the computerized database sector to their respective economies. In order to stimulate long-term production of computerized databases, both proposals endeavor to increase the degree of protection afforded. The increased protection is intended to provide database authors with the op-

353 Id. at art. 11(1). This requirement of EC nationality does not extend to the copyright provisions of the Proposed Directive. Id.
354 Id. at art. 11(2).
355 Explanatory Memorandum, supra note 2, at 55.
356 See generally Ginsburg, Copyright, supra note 160 (claiming that the U.S. Supreme Court's recent decision in Feist Publishing v. Rural Tel. Serv. will substantially restrict the availability of copyright protection to computerized databases); Miller, supra note 71, at 521 (Under a Feist analysis, "most automated databases would . . . fail to qualify for copyright protection.").
portunity to recoup their investment in the database, and possibly even make a profit. A casualty of the increased levels of protection will be those developing countries which rely on the transfer of technology rather than the production of technology. These countries will be forced to accept the short-term costs of adopting high levels of protection so that all of the parties to the respective proposals may experience long-term benefits.

Both the NAFTA and the Proposed Directive would protect a database under copyright if it constituted an intellectual creation due to its "selection" or "arrangement." Although both proposals concur that this form of protection should be available, there are some technical, yet important variations between the two proposals. Probably the most important variation is in the definition of what constitutes a computerized database. While the NAFTA provides merely a bare bones definition of a database as a "compilation[] of data", the Proposed Directive provides a much more comprehensive definition which includes such peripheral material as indices, thesauruses, and retrieval systems. More than anything else in the copyright provisions of each proposal, it is the breadth of the Proposed Directive's definition of database which sets it apart from the NAFTA.

Both proposals also require a computerized database to meet a threshold of originality determined by the "selection" or "arrangement" of the database before copyright protection will be available. However, this test of originality is likely to be interpreted differently under each proposal. A database will be considered original under the Proposed Directive if there is a personal choice on behalf of the author. This appears as if it will be a less stringent requirement than the "modicum of creativity" test which will be prevalent under the NAFTA.

Both proposals allow the author of a database to be either a natural person or a legal entity. Similarly, both proposals are deferential to domestic legislation in the area of co-authorship. The lone exception is in the area of joint authorship where the Proposed Directive provides for joint ownership of the copyright, but requires a contractual agreement in order for a joint author to exercise this copyright.

Probably the area in which the two proposals are most similar is in defining those acts which will infringe a database. Even though the two proposals used different means to define the infringing acts, the end result is the near identity of infringing acts under both proposals. The Proposed Directive explicitly lists those acts which will infringe the copyright whereas the NAFTA defers to the Berne Convention. However, the only substantive difference between the two agreements occurs in the exhaustion to the right of first public distribution. Here, the Proposed Directive provides that the author's rights in the database will not
be exhausted, even after first public distribution, in regards to subsequent rentals of the database. In contrast, under the NAFTA the author’s rights would be exhausted in this case.

The final area of considerable difference in the copyright protection under the two proposals is in the duration of the copyright itself. The NAFTA provides a static term of fifty years; the result is high predictability. This allows for both consumers and manufacturers to plan their course of action from the outset. The Proposed Directive fails to match up to the standard of predictability set by the NAFTA. The Proposed Directive allows each Member State to set the duration of the copyright equal to that granted literary works. This undesirable approach by the European Commission is, however, likely to be rectified by the standardization of copyright duration to the author’s life plus seventy years.

Although there are several variations between the forms of copyright protection granted under each proposal, the most substantial difference between the two proposals lies outside of copyright. The right to prevent unfair extraction is a *sui generis* form of protection, available under the Proposed Directive, which has heretofore been attempted only on a limited scale. It is this form of protection which truly makes the Proposed Directive a novel proposal which stands above any other proposal for legal protection of databases on the international agenda.

Although both proposals make a concerted effort to protect databases, the Proposed Directive, with its right to prevent unfair extraction, is clearly the superior of the two. This is not to suggest that the NAFTA will prove ineffective in the battle against database piracy. However, the Proposed Directive is much more likely to achieve effective protection of computerized databases.