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THE COMPONENTIZATION OF INFORMATION

Kristen Osenga^{*}

The question is not whether we live in an information society; rather, the question is whether and how best to adapt our existing intellectual property regimes to protect the products of today's information age. Although the current laws have been stretched to provide at least partial coverage for information products, there are a number of works that do not fit comfortably within the existing schemes – most notably databases, computer programs, and genetic sequence inventions. The common thread running through each of these problematic works is that information is a vital component of the whole. It is precisely because these works revolve around information that society is not prepared to stretch the law to fully protect them especially in a property-type mode, yet it is this same information component that makes these works most vulnerable to appropriation and market failure in the absence of protection.

*In this article, I first provide a definition for information and explain how databases, computer programs, and genetic sequence inventions are all very similar types of information products. I then explain why information products, particularly those listed above, deserve intellectual property protection in general, discussing arguments both in favor and against protection of information products. Next, I analyze why none of the existing intellectual property regimes, other legal mechanisms, and non-legal means are sufficient to protect information products. Finally, I propose a *sui generis* protection scheme for information products, specifically those where information is a component of the overall product. The proposed scheme works with the commonalities of the seemingly diverse information products (databases, software, and genetic sequence inventions) and uses frameworks from both patent law and copyright law as bases. The proposal has the benefit of protecting these vulnerable information products while also addressing the concerns about propertizing information.*

^{*} Assistant Professor, University of Richmond School of Law. I would like to thank the participants at the Fourth Annual Intellectual Property & Communications Law and Policy Scholars Roundtable at Michigan State University College of Law and at a Faculty Colloquium at the University of Richmond for their comments at the earliest stage of this Article. I am also grateful to B. Wesley Barger, Jr., and Paul T. Nyffeler for their research assistance.

INTRODUCTION

Information is so important in today's society that it has been likened to an essential component of human life.¹ The notion that we are in an information age, some say, has become cliché.² This may seem odd, because certainly there was information around long before modern times, and some of that information was probably even prevalent and readily available. One explanation for current times being an information age is that we actually consider ourselves to be living in an information society.³ Another, more relevant reason may be that today's society places a higher value on intellectual creations and information products.⁴ Information is the currency of the modern economy.⁵

Unlike monetary currency, information is not a scarce good nor is it the sole province of the government.⁶ Some information does indeed come from the government, either directly from agency compilation or indirectly as the fruits of research grants or other subsidies given to data creators and gatherers.⁷ However, much information is also available from the private sector, although the creators and gatherers of this data face difficult market challenges in providing these compilations.⁸

¹ See, e.g., Ronald Reagan, GUARDIAN (June 14, 1989) ("Information is the oxygen of the modern age.").

² See James Boyle, SHAMANS, SOFTWARE, AND SPLEENS: LAW AND THE CONSTRUCTION OF THE INFORMATION SOCIETY 1 (Harvard University Press, 1996) ("The idea that we are moving toward an 'information age' or an 'information society' has now passed from iconoclasm through orthodoxy to cliché.").

³ See Boyle, *supra* at 6.

⁴ See R. Marlin-Bennett, KNOWLEDGE POWER – IP, INFORMATION & PRIVACY 1 (Lynne Reiner Pubs. 2004).

⁵ See Boyle, *supra* at 2.

⁶ See J.H. Reichman & Pamela Samuelson, *Intellectual Property Rights in Data?*, 50 VAND. L. REV. 51, 58 (1997).

⁷ See Reichman & Samuelson, *supra* at 58.

⁸ See Reichman & Samuelson, *supra* at 59 (noting that "commercial compilers of data have long suffered from a risk of market failure owing to the intangible, ubiquitous, and above all, indivisible nature of information goods").

Information has, at times, been considered a scarce good, difficult to obtain or create. Now, regardless of the origin of the information, the volume of available information is plentiful and the barriers to entry in the information products market are low. Computers have made it possible to collect, store, manage, and deliver enormous amounts of data.⁹ Computers, connected via the Internet, allow for rapid production, reproduction, and dissemination of the same.¹⁰ With today's technology, even print compilations can be easily translated into digital form.¹¹ This data is both the building blocks of knowledge¹² as well as a central part of the human experience.¹³

Given its ubiquity and importance, both for everyday life and as the currency of the modern economy, it is not surprising that there has been a long running debate over whether and to what extent information products should be legally protected.¹⁴ On one hand, at some level, much information is in the public domain (or perhaps should be) and thus we are wary about propertizing it and removing it from the public domain. On the other hand, we want to encourage the creation and maintenance of valuable information. Arguably, information has been created through the ages without this incentive, but given its importance in today's economy and the technological ease with which information products can now be appropriated, duplicated, and distributed, some sort of protection may be warranted. In addition to granting the benefit of an artificial lead-time to the creator to attain some reward for his efforts in creating the information product, a protection scheme may also serve as a framework to decrease transaction costs for those wishing to utilize the information.

⁹ See Reichman & Samuelson, *supra* at 64-5.

¹⁰ See Reichman & Samuelson, *supra* at 65.

¹¹ See Reichman & Samuelson, *supra* at 67.

¹² See Reichman & Samuelson, *supra* at 64-5.

¹³ <get cite>

¹⁴ Information products include software, databases, and genetic sequence inventions, as well as other products where the value resides in the information content. See Rochelle Cooper Dreyfuss, *Information Products: A Challenge to Intellectual Property Theory*, 20 N.Y.U.J. INT'L L. & POL. 897, 897 (1988). A more detailed discussion of information products is found in Section I.

Beyond the concern about propertizing information, another problem is that most information products fit uneasily, at best, within the existing intellectual property schemes. Although various *sui generis* schemes have been proposed, none have been adopted in the United States, and so creators of information products have turned to other types of protection, such as contract law or technological safeguards. These alternate mechanisms, however, do not include the safety valves found within intellectual property law that permit for oversight, fair use, and protection of the public domain.¹⁵

In Section I of this article, I provide a definition for information and explain how databases, computer programs, and genetic sequence inventions are all very similar types of information products. In Section II, I explain why information products, and particularly those listed above, deserve intellectual property protection in general. I discuss arguments both in favor and against protection of information products and analyze why the calculus falls in favor of protection. In Section III I explore the current state of protection available for information products, including traditional intellectual property schemes, other legal mechanisms, and non-legal alternatives. I also critique the inability of these means to provide adequate protection without over-protecting. Finally, in Section IV I propose a *sui generis* protection scheme, denominated the componentization of information. This scheme has bases in both copyright and patent law and has the advantage of working with the commonalities of the seemingly diverse information products listed above – databases, software, and genetic sequence information. Moreover, I explain why this system provides the desired incentives and transaction savings, alleviates many previously raised objections to information protection schemes, and discusses the fit of this system within international law.

I. What is information?

To even begin a discussion about protecting information products, it is important to define exactly what information is – a difficult task to be sure. Everyone knows what information is and the term is casually and carelessly used. It seems it can be broadly defined to encompass nearly everything in the world. For example, one very broad definition of information is anything that can be digitized, that is, encoded as a stream of bits,¹⁶ which

¹⁵ See Jacqueline Lipton, *Balancing Private Rights and Public Policies: Reconceptualizing Property in Databases*, 18 BERKELEY TECH. L.J. 773 (2003).

¹⁶ See Shapiro & Varian, *INFORMATION RULES* (Harvard Business Press 1999) 3.

is pretty much anything. In a similar vein, although it is often presumed that information is intangible, Margaret Jane Radin has made compelling arguments that information, in certain circumstances, can even be tangible,¹⁷ opening up the definition even further. Despite the validity of these very broad definitions of information, it is not productive for this discussion to lay such a wide berth.

For this Article, information is defined as data that has been subjected to organization¹⁸ and through that organization has obtained context and value.¹⁹ Alternatively, information can be defined as an interpretation of data that conveys meaning by virtue of its interpretation, formed by giving the data a framework or context.²⁰ Information products are then “products whose information content vastly exceeds in value the cost of the products on which that information is stored.”²¹ Exemplary information products include databases, software, and genetic sequence inventions, each of which will be discussed in more detail below.

Although information products may vary widely, they do share a number of common characteristics. Information products have “extremely high front-end costs, but, once developed, are cheaply reproduced.”²² At the front end, many information goods are the result of efforts by a creative individual and require few inputs beyond the creator’s sweat of the brow.²³ On the back end, in addition to being readily duplicable and transferable,

¹⁷ See generally Margaret Jane Radin, *Information Tangibility*, ECONOMICS, LAW AND INTELLECTUAL PROPERTY (O. Granstrand, ed.) (2003) 395. She also argues that the assimilation of information into tangible items has increased commodification and propertization of information. *See id.* at 397.

¹⁸ See Eli Noam, *Two Cheers for the Commodification of Information*, THE COMMODIFICATION OF INFORMATION (N. Elkin-Koren & N.W. Netanel eds.) (2002) 43, 43 n. 2.

¹⁹ See Marlin-Bennett, *supra* at 8.

²⁰ <get cite>

²¹ See Dreyfuss, *supra* at 897.

²² See Dreyfuss, *supra*, at 898.

²³ See Bronwyn H. Hall, *On Copyright and Patent Protection for Software and Databases: A Tale of Two Worlds*, ECONOMICS, LAW, & INTELLECTUAL PROPERTY (O. Granstrand, ed.) (2003) 259, 261.

once an information product exists, very little complementary investment is necessary to make it useful.²⁴

Given the broad definitions of information (even as narrowed by this article) and information products, it is clear that many types of works may fit within this purview. One of the advantages of working with a class, such as information products, rather than particular information products, is that any resulting proposal will be more robust. However, I have identified three initial types of information products that deserve protection and do not fit well within current intellectual property schemes – databases, software, and genetic sequence inventions. Although these information products may seem dissimilar, they are actually quite alike in that information is a component of each and that it is the existence of this information component that creates difficulty in crafting adequate protection.²⁵

A. Databases

Databases are probably the easiest type of information products to envision – they are, quite literally, data subject to organization that has context and value because of that organization. The information component, or data, in a database is the set of facts that convey meaning by virtue of the structure, arrangement, and selection process of the database.

Originally a military term, databases were defined as “collections of data shared by end-users of [a] . . . computer system.”²⁶ Now, the term has been expanded to refer to any compilation of data that is typically organized and utilized via a database management system, providing a bridge between the data records and the end user.²⁷ Simply, “a database is an organized and indexed collection of information that allows users to access and organize heterogeneous data in an efficient fashion.”²⁸

²⁴ See Hall, *supra* at 261.

²⁵ See Boyle, *supra* at 7 (noting that regardless of medium, the information content is always at the center of debate).

²⁶ See Dov S. Greenbaum, *Commentary: The Database Debate: In Support of an Inequitable Solution*, 13 ALB. L.J. SCI. & TECH. 431, 441 (2003).

²⁷ See Greenbaum, *supra* at 441.

²⁸ See Greenbaum, *supra* at 441.

B. Software

Software is slightly more difficult to envision as an information product. Software can be described as “a set of instructions, not mere knowledge, but a certain arrangement of matter that makes a computer program perform.”²⁹ The information component is the set of instructions, and the value in the product comes not from the code of the program but rather in how the given arrangement, or framework, makes the computers behave.³⁰ While databases are facts, selected and arranged to provide value, computer programs are typically a set of carefully selected and arranged functional components (or chunks of code), that cause a computer to behave in a certain way.³¹ Further, these functional chunks of code are often used as building blocks in future software programming.³²

One of the difficulties in classifying software as an information product may be that, unlike databases, software can be viewed in multiple ways. Although not a perfect analogy, the Supreme Court recently said the following:

Software, the ‘set of instructions, known as code, that directs a computer to perform specified functions or operations,’ can be conceptualized in (at least) two ways. One can speak of software in the abstract: the instructions themselves detached from any medium. (An analogy: The notes of Beethoven’s Ninth Symphony.) One can alternatively envision a tangible ‘copy’ of software, the instructions encoded on a medium such as a CD-ROM. (Sheet music for Beethoven’s Ninth.)³³

²⁹ See Radin, *supra* at 403.

³⁰ See Pamela Samuelson, et al., *A Manifesto Concerning the Legal Protection of Computer Programs*, 94 COLUM. L. REV. 2308, 2316 (1994).

³¹ See Samuelson, et al., *supra* at 2326.

³² See Samuelson, et al., *supra* at 2340.

³³ See Microsoft Corp. v. AT&T Corp., 550 U.S. ___, ___ (2007) (quoting *Fantasy Sports Properties, Inc. v. Sportsline.com, Inc.*, 287 F.3d 1108, 1118 (Fed. Cir. 2002)).

The software that fits within the type of information product at issue here is the tangible, encoded version of the set of instructions, arranged and ready to cause a computer to behave in a certain way.

C. Genetic Sequence Inventions

Genetic sequence information is probably the most difficult to envision as an information product. Genetic sequence inventions can be thought of as interpretations of DNA data that, given framework and context, have value. In fact, at one level, some genetic sequence inventions could even be considered as a type of database.³⁴ In part, this idea of genetic sequence inventions as information has to do with advancements in technology. DNA sequences identified by high through-put sequencing “look less like new chemical entities and more like new scientific information.”³⁵ Just as the information contained in a database can be considered a building block and the functional chunks of code in a computer program are typically used to advance new software products, “[k]nowing the DNA sequence for the genome of an organism provides valuable scientific information that can open the door to future discoveries.”³⁶

These three types of information products are merely representative of the types of information products that could fall within the scheme proposed below. The salient feature is that the information product must consist of a work that includes information as part of a larger structure or framework, where the structure or framework adds value to the information, the development of the information product is front-loaded, and the costs for subsequent duplication or transfer of the information product is negligible. With these definitions and examples in mind, the next question is whether these works require protection.

³⁴ See Reichman & Samuelson, *supra* at 135 (“Conceivably, . . . genetically engineered life forms could also fall within the broad definition of database in that they are ‘assemblies . . . of . . . materials arranged in a methodical or systematic way.’”).

³⁵ See Rebecca S. Eisenberg, *Patents on DNA Sequences: Molecules and Information*, in THE COMMODIFICATION OF INFORMATION (N. Elkin-Koren & N.W. Netanel, eds.), 2002, at 417.

³⁶ See Eisenberg, *supra* at 418. See also Boyle, *supra*.

II. Does information need to be protected?

Given the general importance of information in today's society, as well as the clear value of the above described information products, it would seem that the question of whether these works should be protected is easily answered. Unfortunately, because information products naturally include information and often are or include building blocks for future innovation, it is not surprising that there is much opposition to providing protection for these works. As can be expected, the stronger the protection given, the more likely it will find opposition. However, in general, the arguments in favor of protection outweigh the arguments against.

A. Arguments in Favor

There are three main reasons to support protection that apply to all types of information products: incentivizing production, discouraging misappropriation, and facilitating transactions.

First, intellectual property regimes are often considered to operate as a general incentive to the creator to produce a work.³⁷ To encourage the creation of these information products, we need to provide a period of artificial lead-time to allow the creators to obtain compensation for their time, effort, and resources spent on development.³⁸ As noted above, the development of these products is often front-loaded; all, or at least the bulk, of the resources that surround the development of an information product occur at the outset. Once the work is developed, few resources are necessary to put the information product into use.

Second, and related to the first, a protection scheme is necessary to discourage misappropriation of the information product. Unlike most commodities of old, information products suffer from being both non-excludable and non-rivalrous, both of which facilitate misappropriation. Information products are non-excludable because once the product is made public, the creator can no longer readily control the product's use.³⁹ Information products are typically non-rivalrous, meaning that one user can

³⁷ *<get cite>*

³⁸ See Lipton, *supra*.

³⁹ See James Gibson, *Re-reifying Data*, 80 NOTRE DAME L. REV 163, 173 (2004).

enjoy the product without depleting another's ability to do so as well.⁴⁰ Innovations in modern digital technology have only served to heighten this problem, as duplication and transmission of misappropriated information products can happen instantly.⁴¹ "Information is expensive to produce but cheap to copy, so left to its own devices the market will fail to yield a socially optimal volume of information goods."⁴² Intellectual property thus attempts to prevent market failure by turning a non-excludable good into a partly excludable good, giving private parties an incentive to produce and disseminate information products and discouraging misappropriation of the work, and thus the public at large benefits from the existence of products that would otherwise not be produced.⁴³

Third, because transactions in information are so much part of today's economy, providing these types of information products some sort of protection can also help to facilitate information flow and reduce the costs of transactions involving information.⁴⁴ Eli Noam argues that commodification of information (including protecting information products) does not deserve the negative connotation it has received.⁴⁵ Rather, this commodification is "an essential part of an environment in which huge amounts of information get created, distributed, processed, and used."⁴⁶ Given the volume of information that is created and exchanged on a daily basis, the only feasible way to manage the information flow is by "decentralizing and decomposing the control into numerous small and automated transactions."⁴⁷ These "nano-transactions," as Noam terms them, rely on the commodification of information.⁴⁸ Intellectual property

⁴⁰ See Gibson, *supra* at 173.

⁴¹ See Charles Brill, *Legal Protection of Collections of Facts*, 1998 COMP. L. REV. & TECH. J. 1, 2.

⁴² See Gibson, *supra* at 164.

⁴³ See Gibson, *supra* at 175.

⁴⁴ See Noam, *supra* at 43.

⁴⁵ See Noam, *supra* at 55.

⁴⁶ See Noam, *supra* at 55.

⁴⁷ See Noam, *supra* at 56.

⁴⁸ See Noam, *supra* at 57.

protection provides this sort of commodification to facilitate transactions in information.

Each of the information products – databases, software, and genetic sequence inventions – share the same common arguments for protection listed above. In fact, “[t]here is little controversy in legal scholarship regarding the validity of the above [arguments as they] pertain[] to information works in general.”⁴⁹ However, each of the types of information products also has independent bases for coverage.

1. Databases

Databases, probably more so than the other two types of information products, bears its know-how on its face; that is, the end product includes information that is readily and immediately extractable.⁵⁰ Because of this, there is no natural lead-time that attaches to the information product.⁵¹ Without some sort of artificial protection of the commercial exploitation of a database, there is no incentive for the database creator; conversely, there is great incentive to wait for another to create a database and simply free-ride on the creator’s investment.⁵² Without this protection, fewer databases than is socially optimum will be created.⁵³

Despite a current lack of protection, the database industry seems healthy, as the number of databases has grown at a phenomenal rate since *Feist*.⁵⁴ However, even though the industry is growing, its market share in the US has dropped (while the western European share has risen).⁵⁵ The decrease could be due to the EU Database Directive or could be due to the

⁴⁹ See Bitton, *supra* at 100.

⁵⁰ See Bitton, *supra* at 99-100 (citing Jerome Reichman, *Legal Hybrids Between the Patent and Copyright Paradigms*, 94 COLUM. L. REV. 2432, 2511-20 (1994)).

⁵¹ See *id.*

⁵² See *id.*

⁵³ See *id.*

⁵⁴ See Greenbaum, *supra* at 480. For more details on *Feist*, see below.

⁵⁵ See Greenbaum, *supra* at 480.

decrease in government-sponsored databases.⁵⁶ In any case, the database industry does need additional protection in order to avert market failure.⁵⁷

2. Software

Not unlike databases, the software industry has fared well during times of uncertain protection for its information products. Currently, however, there are renewed calls to deny computer programs legal protection, at the same time that technological measures are making software piracy and redistribution of misappropriated software almost child's play. Another unique feature of software is the understanding, or perhaps even expectation, that software code (the set of instructions that is selected and arranged to make a computer behave a certain way) is written in recyclable functional chunks, where a significant portion of software can be misappropriated and reused in an undetectable fashion.

3. Genetic Sequence Inventions

The unique concern with genetic sequence information is again similar to that of databases – the know-how of the invention is apparent on its face. With early genetic sequence inventions, the commercial aspect was not the informational value of the sequence, but rather, the ability to use the molecules in recombinant production facilities.⁵⁸ For these early inventions, the information component could be released to the public because the commercial aspect (the use of the molecules in recombinant technology) could be protected using traditional intellectual property regimes, and further, there was a natural lead-time inherent in the technology lag. Now, however, “there is immediate commercial value in knowing what a sequence is, while the commercial value of using particular portions of the sequence as tangible templates for protein production is remote and speculative.”⁵⁹

An additional twist for this particular type of information product is that high through-put DNA sequencing information yields both information about sequences for which the corresponding functions are not yet known

⁵⁶ See Greenbaum, *supra* at 480-81.

⁵⁷ See Reichman & Samuelson, *supra* at 137.

⁵⁸ See Eisenberg, *supra* at 420.

⁵⁹ See Eisenberg, *supra* at 420.

and a considerable amount of “chaff” that will end up being ultimately useless.⁶⁰ Given that a number of information products may need to be created before a valuable product is found, a protection scheme is required to allow the creator to recoup the investments put into non-valuable, as well as valuable, inventions.

B. Arguments Against

The first, and most general, argument against providing protection for information products is that information should be free. Courts have long held that information is presumptively free for use by any individual, so long as the individual has acquired the information fairly.⁶¹ In fact, limitations on the use of information must overcome the extraordinary protection provided by the First Amendment.⁶² A large portion of information is believed to be in the public domain, which people can access, use, and transfer freely; knowledge can be considered a “general fund, of which we all have a right to participate: it is a capital which has the peculiar property of increasing its stores in proportion as they are used. We are entitled to pursue every justifiable method of increasing our perceptions and invigorating our faculties. We are equally entitled to communicate our information to others.”⁶³ The conflict between information as part of the public domain and the protection (and propertization) of information is a well-worn path in legal history, dating back to Locke and before.⁶⁴

Many specific arguments against protecting information products flow from the idea that information is free. One argument is based on the idea that “[i]nformation forms the building block of knowledge and is a cardinal element in securing competition in a free market economy.”⁶⁵ In propertizing or otherwise restricting access to information, there is a risk of

⁶⁰ See Eisenberg, *supra* at 420.

⁶¹ See Diane Leenheer Zimmerman, *Information as Speech, Information as Goods: Some Thoughts on Marketplaces and the Bill of Rights*, 33 WM. AND MARY L. REV. 665, 665 (1992).

⁶² See Zimmerman, *supra*, at 665; U.S. Const. amend. I.

⁶³ Tunis Wortman, A TREATISE CONCERNING POLITICAL ENQUIRY AND THE LIBERTY OF THE PRESS 140-141 (Da Capo Press 1970) (1800) (cited in Zimmerman, *supra* at 680).

⁶⁴ See Zimmerman, *supra*, at 673-677.

⁶⁵ See Bitton, *supra* at 100.

stifling further research or innovation that flows from the information.⁶⁶ A second argument is not so much concerned with further innovation, but rather generally with access – both the access to the information to those who have a legitimate interest and the ability to limit the access of those who do not.⁶⁷

Another argument against is that the information product industry is flourishing even in the absence of domestic legal protection.⁶⁸ Some commentators argue that, even if we accept that intellectual property law (specifically patents) are important in motivating innovation in tangible goods (such as pharmaceuticals), it is at best speculative to presume that protection is required to encourage the creation of information products.⁶⁹ Proponents of this argument point to the great amount of digital property generated in the 1980s, 1990s, and early 2000s, some of this property being, for example, databases.⁷⁰ Similar evidence is available in the software arena, where the “most important space for innovation in our time,” the Internet, was built on a free platform.⁷¹ Of course, in many respects, the same argument can be made for many sectors (beyond information products); most production in our society occurs without any guarantee of government protection.⁷²

The specific arguments for the information products in question track these overarching reasons. For example, the software industry was born and grew rather well, even before patents (and copyright protections) were thought to extend to computer programs.⁷³ The main argument against

⁶⁶ See Hall, *supra* at 260.

⁶⁷ See Jacqueline Lipton, *Information Property: Rights & Responsibilities*, 56 FLA. L. REV. 135, 136 (2004).

⁶⁸ See Bitton, *supra* at 119.

⁶⁹ See Eisenberg, *supra* at 430.

⁷⁰ See Bitton, *supra* at 119. This evidence may be misleading. Many databases are produced by sole sources and the market for these databases does not support multiple sources. In the absence of competition, the chances of market failure due to lack of protection are minimized. *See id.* at 121.

⁷¹ See Lessig, *supra* at 57.

⁷² See Lessig, *supra* at 70.

⁷³ <get cite>

protection for genetic sequence inventions is the concern about stifling downstream innovation.⁷⁴ Databases, because they are literally a compilation of information, have even raised Constitutional concerns because there is limited or no original authorship or invention.⁷⁵

C. Cost-Benefit Analysis

The question then becomes whether the above listed arguments in favor of protecting information products outweigh the arguments against. The bottom line has to be in favor of the flow of information: "No great benefit is derived from congratulating ourselves on building or maintaining a public domain unless that public domain results in optimizing information flows."⁷⁶ But it is not simply enough to say that information flows better in the absence of protection schemes.

There are at least two reasons that providing protection can assist with information transmission (beyond the incentive basis and the facilitation of transactions). First, in the absence of a structured protection mechanism, creators will resort to other means to protect their investments in the development of the information products.⁷⁷ It is not realistic to assume that non-protected information will be free. Second, and related to the first, if the creators resort to these other means, such as contract law or technological mechanisms and others that will be described below, there exist none of the oversight and safety valves that can be implemented in a protection regime.⁷⁸ By providing an intellectual property scheme for information products, the pros and cons of propertizing the information can be controlled to minimize any sort of harm to the public domain. Thus, it is preferable to provide some sort of intellectual property regime to protect information products. The question is whether existing legal (or even non-legal) mechanisms are sufficient or whether a *sui generis* approach is required.

⁷⁴ <get cite>

⁷⁵ See Gibson, *supra* at 187-88.

⁷⁶ See Mark Davison, *Database Protection: The Commodification of Information*, THE FUTURE OF THE PUBLIC DOMAIN (L. Guibault & P.B. Hugenholtz eds.) (2006) 167, 184.

⁷⁷ See Lipton, *supra*.

⁷⁸ See Lipton, *supra*.

III. What is the current state of protection (& why it doesn't work)

Even while the debate rages over whether information products should be provided some sort of protection, creators of these works are creatively trying to find ways to cover their products. Naturally, the first place to look would be in the existing intellectual property regimes – patent, copyright, and trademark law. However, as discussed below, none of these adequately cover information products. In the alternative, creators are seeking out both legal (such as contract or trade secret law) and non-legal mechanisms (such as market differentiation and technological measures). In addition to having the detriment of not providing oversight and safety valves, as mentioned above, these means of protection also have their own flaws. Further, on the international stage and in scholarship, other options have been raised. Some of these options are adaptations of existing regimes, while others are *sui generis*-type proposals. The problem with all of these measures is that information products are either over-protected or under-protected.

A. Existing Intellectual Property Regimes

The traditional intellectual property regimes are patent law, copyright law, and trademark law. None of these three regimes cover information products well and actually exclude most information from coverage. This section will highlight some of the relevant portions of each type of regime and describe how information products fare under each of the laws.

1. Patent Law

A patent provides the inventor an exclusive right over his invention for a period of twenty years from the filing of an application for patent. For a patent to be granted, the patent application must describe a new, useful, and non-obvious invention in sufficient detail to permit a person of ordinary skill in the art to practice the invention based on that description. Patents are granted on a wide range of inventions, and statutory subject matter for patenting includes processes, machines, manufactures, or compositions of matter. While these categories are broad enough to cover nearly every invention, there are some judicially-created exceptions to these categories. Abstract ideas, laws of nature, and natural phenomena may not be patented. However, neither the statute nor the case law interpreting it explicitly excludes information.⁷⁹

⁷⁹ See Eisenberg, *supra* at 419.

Why can't information products be covered by patent law? In some cases they are. Although databases have not typically fallen under patent law's purview, software and genetic sequence inventions have been patented. In the case of software, it was long thought to be unpatentable under a number of theories, which have since been quashed. However recent activity in the courts and Patent Office is again calling into question whether patents should be granted on software. Similarly, despite the fact that traditional patent law has typically been applied to genetic sequence inventions, the patent system is still struggling to clarify the rules for patenting these inventions.⁸⁰ Even where patent protection is available, the coverage is imperfect.

Despite the coverage provided by patents for some information products, information is generally excluded from protection under patent law for a few different reasons. First, information products may not fit comfortably within one of the enumerated statutory categories (process, machine, manufacture, or article of composition). For example, a database does not seem to fit within any of these categories. Second, information often does fall within the judicially-created exceptions to patent eligible subject matter – abstract idea, law of nature, and natural phenomena. Software has been, at times, considered an abstract idea, and at others, because software may contain an algorithm or equation that describes the natural world, has been considered to fall within a law of nature. Similarly, genetic sequence inventions also run near the boundary of unpatentable natural phenomena. Finally, there is a clear policy argument against the patenting of information. Patents are granted on the basis of a bargain between the patentee and the public, granting the inventor a limited-time exclusionary right in a tangible application of an invention in exchange for free disclosure of information to the public about the invention.⁸¹ In the case of information products, the patent bargain becomes less attractive to the public.⁸²

⁸⁰ See Eisenberg, *supra* at 416.

⁸¹ See Eisenberg, *supra* at 425.

⁸² See Eisenberg, *supra* at 427.

2. Copyright Law

Copyright law grants a number of exclusive rights to creators of a wide range of expressive creations, including literary works, musical works, dramatic works, choreographic works, graphic or sculptural works, motion pictures and other audiovisual works, sound recordings, and architectural works.⁸³ Copyright protection generally attaches when the work is created and lasts for a period of the life of the author plus seventy years.⁸⁴ Copyright law is structured to protect not ideas, but new and original expression.⁸⁵ While some information products may fit within one of the statutory categories of protected works, information itself is squarely excluded from copyright protection based on the idea/expression dichotomy, codified at § 102(b) of the Copyright Act: “[I]n no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle or discovery.”⁸⁶ Related to the idea/expression dichotomy is the merger doctrine, which prohibits copyright protection for ideas that can be expressed only in one or a few limited ways.⁸⁷

Of course, this line is drawn between copyrightable expression and non-copyrightable ideas or facts to protect the public domain and permit others to use facts and ideas to innovate for themselves. As discussed above, any sort of intellectual property protection must craft a balance between the public’s interest in encouraging creativity by rewarding the author and the public’s interest in access to information.⁸⁸ The idea/expression dichotomy facilitates this balance and resolves the tension between public and private goods by permitting partial property rights.⁸⁹

⁸³ 17 U.S.C. §§ 102(a), 106.

⁸⁴ 17 U.S.C. § 302(a).

⁸⁵ See Dreyfuss, *supra*, at 903.

⁸⁶ 17 U.S.C. § 102(b).

⁸⁷ See Miriam Bitton, *Trends in Protection for Informational Works Under Copyright Law During the 19th and 20th Centuries*, 13 MICH. TELECOMM. TECH. L. REV. 115, 139 (2006) (Bitton II).

⁸⁸ See Bitton II, *supra* at 164.

⁸⁹ See Boyle, *supra* at 56-57.

Copyright, despite its ability to propertize information, is completely consistent with the First Amendment, because it only extends to the “form in which the author has chosen to cast her thoughts or concepts and not to the thoughts or concepts themselves.”⁹⁰ The difficulty comes in the categorization of information, as some is considered free speech, while other speech may be propertized.⁹¹ “Efforts to control the use of information or ideas by others will generally be doomed from the outset if the claim is classified as an attempt to interfere with freedom of speech. If, however, a claimant can march the same basic dispute onto the field and successfully raise the standard of property rights, her likelihood of success will improve markedly.”⁹²

Further, copyright also includes a number of exclusions to the exclusive rights, the most relevant of which is the fair use doctrine. Fair use is most often defined as a “privilege in others than the owner of a copyright to use the copyrighted material in a reasonable manner without his consent, notwithstanding the monopoly granted to the owner by the copyright.”⁹³ Although it began as a judicially created doctrine, it is now codified and applies to all copyright works.⁹⁴ The determination of fair use relies on four non-determinative factors: 1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes; 2) the nature of the copyrighted work; 3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and 4) the effect of the use upon the potential market for or value of the copyrighted work.

In many cases, the line between idea and expression is easy to draw – either the expression is the whole creation, such as in the case of a fiction novel, or the expression can be distinguished clearly from the idea, such as in the case of a household ornament.⁹⁵ The problem comes with

⁹⁰ See Zimmerman, *supra*, at 666.

⁹¹ See Zimmerman, *supra*, at 668-69.

⁹² See Zimmerman, *supra*, at 669.

⁹³ See Robert C. Denicola, *Copyright in Collections of Facts: A Theory for the Protection of Nonfiction Literary Works*, 81 COLUM. L. REV. 516, 524 (1981).

⁹⁴ See Brill, *supra* at 8.

⁹⁵ See Dreyfuss, *supra*, at 903.

information products – the line is not easy to draw and it is often the non-protectible facts that represent the creator's greatest investment.⁹⁶ Two cases are relevant to the discussion of where the idea/expression line is drawn for information products – *Feist* and *Altai*. In *Feist Publications v. Rural Telephone Service Co.*, the Supreme Court abolished the sweat-of-the-brow doctrine that some courts were still using to provide protection to databases and is the Court's first attempt to bring order to the idea of copyright in information products.⁹⁷ Rural Telephone Service held a monopoly franchise on telephone service to a number of communities in Kansas. Pursuant to state law, Rural produced an annually updated telephone directory that contained a typical white pages section. Feist produced an area-wide telephone director covering eleven different service areas, overlapping with a portion of the area that Rural serviced. In preparing its directory, Feist licensed the use of the white pages of ten of the eleven companies whose listings it wished to duplicate; Rural refused to license its listings. In light of the refusal, Feist simply took and incorporated Rural's listings. Rural sued Feist for copyright infringement, the district court found Feist liable, and the Tenth Circuit affirmed. Feist appealed to the Supreme Court, which granted cert presumably to solve the circuit split involving the sweat-of-the-brow doctrine. The Court found that Congress had overruled sweat-of-the-brow and that originality was explicitly required. The three main components of *Feist* are this: First, compilations are not copyrightable solely because of the time and effort required to create them. Second, a second compiler does not infringe a copyright when using facts gathered by a first compiler. Third, a minimum amount of originality or creativity is required to be eligible for copyright protection.

Creators have tried to protect both databases and computer programs using copyright law. With respect to databases, attempting to obtain copyright protection is causing a potential decrease in the product's utility because creators are injecting arbitrary creativity in selection and arrangement into their databases in order to overcome *Feist*.⁹⁸ Protecting software is also tricky under copyright law. While the graphical portions of computer programs fit easily, the actual software itself is more difficult

⁹⁶ See Dreyfuss, *supra*, at 904.

⁹⁷ See Bitton II, *supra* at 167-176 (for whole *Feist* discussion).

⁹⁸ See Gibson, *supra* at 181.

because it does not fit squarely into categories that we currently know and understand; that is, the answer to the question of whether software is a copyrightable expression or a patentable process is both.⁹⁹ One early study concluded that while copyright law provided coverage for some aspects of computer programs, the functional behavior of software was (at that time) largely unprotected.¹⁰⁰ Of course, there have been shifts in the law that have allowed the functional aspects of computer programs to be covered by patent law, there is a tide turning once again against this protection, and further, as shown by *Altai*, the line between functional and expressive is difficult to draw.

3. Trademark Law

Trademark law is an unusual type of intellectual property in that its express purpose is to convey information. Although this is potentially true for all types of intellectual property, to some extent, the notion of lowering information search costs and reducing customer confusion based on accurate information is specifically and directly the point of trademark law. Because of this, it is difficult to look at trademark law as a means for protecting information products.

B. Alternative Protection Mechanisms

Because the traditional intellectual property schemes have failed to provide adequate protection for information products, creators have turned to other means (both legal and otherwise) to protect their works. Various legal theories offered include trade secret, misappropriation, contract, and trespass, among others. Other options include using technological or business mechanisms to provide some sort of protection for the creator.¹⁰¹ As will be discussed below, none of these provide sufficient coverage and, in fact, may be worse overall because they lack oversight and safety valves such as fair use.

⁹⁹ See Michael J. Madison, *Law as Design: Objects, Concepts, and Digital Things*, 56 CASE W. RES. 381, 414 (2005)

¹⁰⁰ See Samuelson, et al., *supra* at 2310.

¹⁰¹ See, e.g., generally, Greenbaum, *supra*.

1. Trade secret and know-how protection

One protection scheme that is naturally considered when protecting information is trade secret law. Trade secret law, a state law mechanism, generally protects valuable or commercial information to the extent the information is kept secret. However, the value of many information products comes from public use, and thus trade secret protection is not viable. Trade secret law may also vary slightly by state, which may make enforcement difficult. Know-how protection, a contractual agreement to share information, is similar in that it relies on the secrecy value of the information. It suffers from similar problems as trade secret, and in both cases, the layer of protection is thin, at best.

2. Misappropriation

Information products have also been protected under the misappropriation doctrine, which prohibits passing off another's goods as your own.¹⁰² This legal doctrine was first analyzed in *International News Service v. The Associated Press*.¹⁰³ In this case, INS was obtaining news stories over the news wire that had been gathered and prepared by AP. INS then published the stories in its own publications, often times before AP could publish the same stories.¹⁰⁴ The Court upheld an injunction against INS, prohibiting it from using AP's news bulletins, although the bulletins were not subject to any particular intellectual property protection.¹⁰⁵ The court would not credit AP with ownership of the news, simply because AP happened to report it, nor could AP claim copyright because INS was not simply taking AP's expression, but rather using the unprotectible facts.¹⁰⁶ Similarly, the news stories were not subject to trade secret protection, because the stories were not secret.¹⁰⁷ Rather, the Court held that INS had wrongfully appropriated the fruits of AP's labor, although the limitation of the

¹⁰² See Brill, *supra* at 20.

¹⁰³ 284 U.S. 215 (1918).

¹⁰⁴ See *id.*

¹⁰⁵ See *id.* at 245-46.

¹⁰⁶ See *id.* at 234-37.

¹⁰⁷ See *id.*

holding to “fresh news” may have signaled a discomfort with the result.¹⁰⁸ More recent cases applying a misappropriation doctrine have reinforced the “hot news” limitation. Existing misappropriation law will not protect most information products because of this emphasis on timeliness.

3. Contract

In the absence of sufficient coverage by intellectual property regimes, some creators of information products have resorted to seeking contractual limitations on the use (or misuse) of their works. Databases and software are the information products most often covered via contract, and have been subject to both negotiated and shrink-wrap licenses.¹⁰⁹ Shrinkwrap licenses typically go into force when the customer opens the packaging that encloses the product, even though the customer may not actually get to review the terms of the license until after it has already been entered.¹¹⁰ While contractual protection may be useful for information products used by a small number of consumers, it becomes unwieldy as the number of users grows.¹¹¹ Moreover, contractual protection only covers persons in privity; once the information product is released to a third party (that is, not the owner or the licensor), there is no recourse against that third party who was not privy to the contract.¹¹² Contract law is also not uniform, as it is a state law creation, and contracts are difficult, if not impossible, to enforce globally.¹¹³

An exemplary case where contract law was used to protect an information product is in the *ProCD* case.¹¹⁴ In this case, the plaintiff digitized and combined the contents of phone books from across the United States, creating a single electronic database.¹¹⁵ This type of database,

¹⁰⁸ See *id.* at 245-46; Zimmerman, *supra* at 721.

¹⁰⁹ See Brill, *supra* at 24.

¹¹⁰ See Brill, *supra* at 24.

¹¹¹ See Brill, *supra* at 25.

¹¹² See Brill, *supra* at 25.

¹¹³ See Bitton, *supra* at 160.

¹¹⁴ See Madison, *supra* at 444.

¹¹⁵ See Madison, *supra* at 444.

because of its lack of originality in selection or arrangement, would not be eligible for copyright protection after *Feist*, so instead ProCD used a contract that prohibited reposting the contents of the database on the Internet, thereby protecting the data (that is, the collection of phone numbers) included in the database.¹¹⁶

4. Trespass to Chattels

Although trade secret, misappropriation, and contract law have been the primary legal avenues used to protect information products, some courts have taken creative approaches to attempt to craft a fair resolution in the case of misappropriation of information products, such as databases. One of these approaches is trespass to chattels.¹¹⁷ Trespass to chattels is the unauthorized interference with or use of someone else's personal property.¹¹⁸ However, this has problems in its own right.¹¹⁹ Generally, a plaintiff claiming trespass to chattels, or cyber-trespass in these contexts, must show server or network damage.¹²⁰

5. Other Legal Protection

In limited circumstances, other legal theories have been used to protect information products. However, these theories are available only in limited, specialized circumstances and do not provide broad or certain coverage. For example, criminal law may be used to protect many features of databases, based on computer crime and anti-hacking statutes.¹²¹ Privacy and confidentiality laws may provide some protection for databases that contain certain types of personal data.¹²²

¹¹⁶ See Madison, *supra* at 444.

¹¹⁷ See Radin, *supra* at 403; eBay v. Bidder's Edge, 100 F.Supp.2d 1058 (2000).

¹¹⁸ See Bitton, *supra* at 166.

¹¹⁹ See Radin, *supra* at 403-405.

¹²⁰ See Bitton, *supra* at 167.

¹²¹ See Bitton, *supra* at 148.

¹²² See Bitton, *supra* at 149.

6. Partial Legal Coverage

Although legal coverage, either intellectual property or otherwise, is generally problematic to cover information products, it may often be used to provide at least partial coverage or coverage of certain aspects of the work. One example of this method is when a creator tries prevent the copying of underlying data in his information product by asserting intellectual property rights in whatever protectible features can be built into the information product.¹²³ Legal databases, such as those maintained by LEXIS and Westlaw, add copyrightable text to non-copyrightable documents in their database (in the format of case summaries and headnotes) and each of these databases maintains proprietary interface software and search algorithms.¹²⁴

7. Non-legal Mechanisms

Even given the variety of legal means that have been applied to cases involving information products, the level of coverage for these works remains sketchy at best. For this reason, creators of information products have also explored non-legal mechanisms, such as technological measures and creative business schemes, to try and protect their investment in the creation of the works.

a. Technological Mechanisms

The most popular non-legal mechanism for protecting information products is the use of technological safeguards to prevent against unauthorized use and appropriation of these products.¹²⁵ Digital rights management (DRM) tools can be used to prevent unauthorized use of software or databases. Anti-circumvention laws, which prohibit the disabling or hacking of the DRM tools, then provides a layer of legal protection as well.¹²⁶ In addition to DRM technology, the way in which databases are naturally set up provides an additional technological safeguard. Database management systems are set up so that the access of the entirety (or even a substantial portion) of the contained database is

¹²³ See Bitton, *supra* at 136.

¹²⁴ See Bitton, *supra* at 136.

¹²⁵ See Bitton, *supra* at 141.

¹²⁶ See Bitton, *supra* at 150.

difficult, if not impossible.¹²⁷ Moreover, access rights set by the information product provider can be even less yielding.¹²⁸ In all cases, there is also the idea of technological Darwinism, or the inability to keep up with the fast pace of technology that renders the information products obsolete.¹²⁹

b. Business Schemes

One of the main reasons behind providing a protection scheme for information products is to permit the creator of the work to receive some level of compensation for his efforts. As discussed above, this is particularly critical for information products, as the cost of development is front-end loaded and the end-product is easily duplicable and transferable. While legal schemes and technological measures provide an artificial lead-time in order for the creator to recoup his investment, business schemes have also been used to give the creator an edge over his competition. Some business schemes include provision of complementary services, bundling of products, and differentiated market pricing.

One general characteristic of at least databases and software is that the provision of the information product can also be tied to the provision of a service. Data pirates, on the other hand, will be uninterested or incapable of providing this panel of complementary services.¹³⁰ If it is the service element that is most attractive to information product users, there may be no need to provide additional protection of the data through legal schemes, *sui generis* or otherwise.¹³¹ Database providers can also provide services that may be, in fact, more valuable than the underlying data in the database, such as possession of the infrastructure for service, ongoing enhancement, and maintenance.¹³²

¹²⁷ See Bitton, *supra* at 142.

¹²⁸ See Bitton, *supra* at 142.

¹²⁹ See Bitton, *supra* at 144.

¹³⁰ See Bitton, *supra* at 128.

¹³¹ See Bitton, *supra* at 131.

¹³² See Bitton, *supra* at 127.

Other bundling may be including powerful (and copyrightable?) software search engines with their databases.¹³³

Differentiated pricing schemes may provide additional opportunities for the creator of information products to recoup their investment in the creation of the information product.¹³⁴ Bronwyn Hall applies an economic-driven model with respect to software and database production where there are high, fixed initial costs, followed by low marginal costs for any additional copies.¹³⁵ In this case, price discrimination becomes advantageous if the inventor can segment the market.¹³⁶ In particular, “[i]f he is able to segment the market into commercial and academic sectors successfully, and if the demand in the academic sector is more price-sensitive than in the commercial sector, we will obtain the outcome which prevails in several disciplines: provision of the good at two widely differing prices, often differentiated in a variety of ways to ensure that the markets remain segmented.”¹³⁷ This is simple economic theory: “if society benefits from researchers having access to some forms of information at low cost, and there exists private sector willingness to pay for that information, then subsidies to the researchers so that they can acquire that information would be socially beneficial, and at the same time, would leave the incentives to produce the information intact.”¹³⁸

C. International and Proposed Schemes

Based on the above discussion, neither intellectual property nor alternative schemes are adequate to protect information products. Moving towards a proposed solution, it is helpful to consider how other countries have attempted to cover information products, as well as how some legislators and commentators have proposed to adapt the existing schemes or add new regimes in order to protect these works. The most notable

¹³³ See Greenbaum, *supra* at 483-84.

¹³⁴ See Bitton, *supra* at 136.

¹³⁵ See Hall, *supra* at 270.

¹³⁶ See *id.*

¹³⁷ See *id.*

¹³⁸ See *id.* at 273.

examples are the Database Directive of the European Union and the multiple proposals that have failed to pass in the United States.

1. International Protection

The most visible international protection for any form of information product is found in the European Union (EU) Directive on the protection of databases (Database Directive).¹³⁹ The Database Directive was crafted in “response to perceived needs to harmonize protection within the EU and to provide greater protection for the investment in the creation and maintenance of databases.”¹⁴⁰ The Database Directive provides two prongs for protection: first, the Database Directive harmonizes copyright protection for databases in the member countries, basing protection on original selection or arrangement of the data, and second, the Database Directive creates a *sui generis* right for the protection of databases where a substantial investment, either qualitative or quantitative, has been made in obtaining, verifying, or presenting the contents of a database.¹⁴¹ The *sui generis* right lasts for 15 years, but can be extended (theoretically, into perpetuity) if the database is updated. This right is infringed where a substantial portion of the database is taken without authorization. The exceptions are quite limited, and the Database Directive only allows extraction for teaching or scientific use (not re-utilization).¹⁴² The Database Directive also includes a reciprocity provision for the *sui generis* right.¹⁴³

The Database Directive defines “database” as “a collection of independent works, data or other materials arranged in a systematic or methodical way and individually accessible by electronic or other means.”¹⁴⁴ However, computer programs “used in the making or operation of databases accessible by electronic means” are expressly excluded from

¹³⁹ Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases, OJ 1996 L 077/20 (Directive).

¹⁴⁰ See Davison, *supra* at 168.

¹⁴¹ See Articles 3(1), 7(1) of the Directive.

¹⁴² See Davison, *supra* at 169-170 (for this entire discussion).

¹⁴³ See Brill, *supra* at 33. No comparable provision is needed or included in the copyright section of the Database Directive because of existing international treaty provisions governing national treatment.

¹⁴⁴ See Directive.

protection under the Database Directive,¹⁴⁵ and the Database Directive is silent on the extent of coverage for computer programs that themselves contain database elements.¹⁴⁶

The EU Database Directive also includes a fair use provision, permitting Member States implementing the Directive “the option of providing for limitations on the [database right]” in four circumstances: 1) reproduction for private purposes of a non-electronic database; 2) for the sole purpose of illustration for teaching and scientific research, as long as the source is indicated and only to the extent justified; 3) where the use is for purposes of public security or for administrative or judicial procedures; and 4) where other exceptions to copyright law are generally authorized.¹⁴⁷

The initial proposals for the Database Directive were based on unfair competition (liability rules) and included a more narrow scope of *sui generis* rights.¹⁴⁸ Many commentators have remarked on how interesting this flipping of theory is.¹⁴⁹

On December 12, 2005, the Directorate General for the Internal Market and Services released a working paper entitled “First evaluation of Directive 96/9/EC on the legal protection of databases, finding that “[t]he economic impact of the ‘*sui generis*’ right on database protection is unproven. Introduced to stimulate the production of databases in Europe, the new instrument has had no proven impact on the production of database.”¹⁵⁰ However, the report also indicates that the database industries claimed that the *sui generis* protection was crucial for the continued success of their activities.¹⁵¹ Because the effect of the *sui generis* right is at best unclear, the working paper suggested four options: repeating the Database

¹⁴⁵ See Directive.

¹⁴⁶ See Brill, *supra* at 28.

¹⁴⁷ See Lipton, *supra* at 154-55.

¹⁴⁸ See Davison, *supra* at 173.

¹⁴⁹ See Davison, Brill, Bitton, *supra*.

¹⁵⁰ See Davison, *supra* at 188, citing Working Paper at 1.4. Davison also offers reports on litigation stemming from the Directive. *See id.*

¹⁵¹ See Bitton, *supra* at 113, citing Working Paper.

Directive, withdrawal of the *sui generis* rights provisions, amending the *sui generis* provisions, and maintaining the status quo.¹⁵²

2. Proposed Legislation

Beyond protection for information products provided by other nations, another excellent resource when seeking to adapt or amend the current regime is to consider previous attempts to similarly adapt or amend the laws, whether fruitful or not. American lawmakers have debated some form of protection for databases for at least the last decade.¹⁵³ “The Americans started where the EU finished and they will probably finish where the EU started.”¹⁵⁴ However, as of yet, no special protection for databases, or any information product, has been passed.

In addition to simple amendments to US law, the United States had also submitted a database protection treaty proposal to WIPO that was similar to the EU Database Directive, but arguably provides stronger protection to database compilers.¹⁵⁵ It protects substantial investment in databases, but permitted a broad range of exclusions (as determined by each country, so long as the limitations “do not unreasonably conflict with a normal exploitation of the database and do not unreasonably prejudice the legitimate interests of the rightholder.”¹⁵⁶ The proposed term of protection was 25-years, which can be renewed whenever substantial changes have been made to the database.¹⁵⁷ The proposal also contained a digital rights management (DRM) provision, that prohibit the “import, manufacture, or distribu[tion of] any . . . product, or offer to perform any service, [whose] primary purpose” is to defeat any means of preventing infringement of this *sui generis* right.¹⁵⁸

¹⁵² See Bitton, *supra* at 117-118, citing Working Paper.

¹⁵³ See Davison, *supra* at 174.

¹⁵⁴ See Davison, *supra* at 174.

¹⁵⁵ See Brill, *supra* at 35. WIPO had also proposed an independent database treaty. *See id.*

¹⁵⁶ See Brill, *supra* at 36.

¹⁵⁷ See Brill, *supra* at 36.

¹⁵⁸ See Brill, *supra* at 37.

Simultaneous with the proposal submitted to WIPO, a bill was also introduced in the 104th US Congress. The “Database Investment and Intellectual Property Act of 1996,” HR 3531 was fully consistent with the treaty proposal, but was widely opposed and failed to move out of the Judiciary Committee.¹⁵⁹

Database protection was next introduced in 1998 as the Collections of Information Antiprivacy Act, HR 2652 (105th Congress), which passed the floor of the house twice, once on its own¹⁶⁰ and once as part of the Digital Millenium Copyright Act,¹⁶¹ but did not make it to the Senate Floor.

The 106th Congress took up the Collections of Information Antipiracy Act, HR 354 (1999), which reached the full House but no further action was taken.

The above bills were largely property rule bills (creating a *sui generis* right, not unlike the EU Database Directive), which were met with opposition and did not garner much support. The bills that followed, however, were liability-rule type laws; these also did not pass.

The 108th Congress took up the issue again, proposing the Database and Collections of Information Misappropriation Act (108 HR 3261).¹⁶² The key feature of this bill was its basis in misappropriation law.¹⁶³ Infringement would have consisted of making available, in commerce, a quantitatively substantial portion of the information contained in a database, if 1) the database was generated, gathered, or maintained through a substantial expenditure of time or resources, 2) the unauthorized making available in commerce occurred in a time sensitive manner and inflicted injury on the database or related products or services, and 3) the ability to free ride would lessen the incentive to create the database initially.¹⁶⁴

¹⁵⁹ See Brill, *supra* at 41.

¹⁶⁰ See 144 Cong. Rec. 9,681 (1998).

¹⁶¹ See 144 Cong. Rec. 18,783 (1998).

¹⁶² Database and Collections of Information Misappropriation Act, H.R. 3261, 108th Congress, 1st Session, 8 October 2003.

¹⁶³ See Davison, *supra* at 175.

¹⁶⁴ See Davison, *supra* at 175-176.

These elements are not unlike the elements created in the *INS v. AP* case described above – again with the focus on the time-sensitive nature of the included data. The bill also included significant exceptions, similar to fair use.¹⁶⁵

The 108th Congress also proposed the Consumer Access to Information Act of 2004, HR 3872 (2004), which followed a “hot news” type model of misappropriation. Neither bill in the 108th Congress made it out of committee.

3. Commentator Proposals

Given the general failure of existing legal mechanisms to cover information products, it is not surprising that many commentators have taken on the task of either proposing new solutions or, if not providing a solution, at least discussing the factors of a successful proposal. A number of these proposals or comments will be discussed below. The interesting thing to note, and the problem as I see it, is that each of these commentators is taking on the law with respect to a particular type of information product – databases or software or genetic sequence information; no proposal or comment is addressed to information products as a category.

Jim Gibson argues that any proposed solution must take into account the technological architecture surrounding databases.¹⁶⁶ He argues that developers can impose architectural restraints that limit access, which can be buttressed by “technolegical” measures.¹⁶⁷

Dov Greenbaum suggests an alternate structure – the databank.¹⁶⁸ Databanks are simple depositories of information, which could be used for holding data required for scientific research, whereas databases are highly organized data structures that provide tools for analyzing the data.¹⁶⁹

¹⁶⁵ See Davison, *supra* at 176.

¹⁶⁶ See Gibson, *supra* at 189.

¹⁶⁷ See *id.* at 190.

¹⁶⁸ See Greenbaum, *supra* at 500.

¹⁶⁹ See *id.*

Jacqueline Lipton proposes reconceptualizing the protection of information products as a system of property rights and responsibilities.¹⁷⁰ Although Lipton draws from copyright's fair use doctrine, she argues that her idea is more fundamental and could "create a model for all valuable information property rights that balances those rights against various other interests in information and ideas" and encompass not just typical fair use ideas (such as education, research & private use) but also other interests like privacy interests in personal information, moral rights, and cultural rights.¹⁷¹ Her system envisions the imposition of significant legal duties on information property rights holders to balance the competing interests.¹⁷² Obligations may include things like facilitating scientific, technical, or educational use of the information; ensuring the accuracy and accessibility of personal information; and protecting cultural rights.¹⁷³ These responsibilities are not unlike duties imposed on land owners.¹⁷⁴

Jerome Reichman and Pamela Samuelson offer two potential regimes. The first is a modified liability approach that, instead of granting property rights, would provide an artificial lead-time to those who invest in the creation, with a "menu of users' fees that sensibly allocates contributions to the costs of research and development among members of the relevant" community.¹⁷⁵ This could be accomplished by providing a blocking period to permit the provider a time for exclusive distribution during which time no second comer could appropriate a substantial portion of the contents, and during which time the provider would freely determine the rates charged for other uses.¹⁷⁶ Second, there could be an automatic license built into the right.¹⁷⁷

¹⁷⁰ See Lipton, *supra* at 165.

¹⁷¹ See *id.* at 167.

¹⁷² See *id.* at 170.

¹⁷³ See *id.* at 172-3.

¹⁷⁴ See *id.* at 174.

¹⁷⁵ See Reichman & Samuelson, *supra* at 145.

¹⁷⁶ See *id.* at 145-6.

¹⁷⁷ See *id.*

D. Specific Issues

Although this Article suggests that the appropriate manner to cover information products is to consider them as a whole category, some commentators have raised questions about coverage of specific or generalized protection that should be considered. Some commentators have argued that databases may be sufficiently protected by existing and *de facto* mechanisms, such that *sui generis* protection is not required.¹⁷⁸ Software is another question altogether – currently, software is presumed to be covered under a mish-mash of copyright and patent law put together, however, the courts are signaling that even this coverage may be in jeopardy. Recent opinions require something “more” than simply software to warrant protection, leading to the conclusion that software, at its base, is a set of 0’s and 1’s that get interpreted to perform a function. However, software is also, on its own, a holder of information. Commentators noted that perhaps covering computer programs and databases in the same way is not a good idea: “Those who invest in developing both computer programs and databases arguably do need a new form of intellectual property protection that would protect the industrial compilations of applied know-how embodied in these products against market destructive appropriations that existing legal regimes are ill-suited to remedy. It would be imprudent, however, to apply current database protection schemes to aspects of computer programs that copyright law cannot protect. If anything, database protection schemes would overprotect software developers as much as they would overprotect database developers, with the same baleful consequences for competition in the market for follow-on products and services.”¹⁷⁹

E. Why Nothing Works

Protective schemes developed for information products fail, in part, because they are typically centered on a property-based scheme. But because information is not tangible, applying typical property laws does not provide an easy fit.¹⁸⁰ In fact, the problem is not just that information products are not properly categorized as property, rather “these new information products present difficult conceptual problems that render them

¹⁷⁸ See generally Bitton, *supra*.

¹⁷⁹ See Reichman & Samuelson, *supra* at 134.

¹⁸⁰ See Dreyfuss, *supra*, at 898.

unamenable to intellectual property protection under traditional regimes.”¹⁸¹ In any case, there is a greater need for a generous international protection scheme because the intangible nature of information products allows them to flow seamlessly and undetected across national borders.¹⁸²

Moving from a property regime to more of a liability regime would be an improvement when considering the protection of information products. One of the biggest concerns is about scientific and educational access to information products. These users “would arguably fare better either under a simple unfair competition law that prohibited gross copying or under a *sui generis* regime built on more refined liability principles than under the regimes based on exclusive property rights. A liability model would create no legal barriers to entry in its own right, nor need it significantly strengthen the sole-source data provider’s market power. On the contrary, a properly crafted liability regime stimulates competition both through lead-time incentives to invest and through an automatic license.”¹⁸³

Despite the efforts of legislators and commentators to propose amendments to existing regimes, some of which appearing to be liability-type, these too fail, because they are isolated to a particular type of product, do not focus on the commerce/transaction aspects, and do not address the information/value component. As to the particular type of product, some commentators have proposed *sui generis* protection (both property-type and liability-type) for software, others for databases. The problem is that none of these *sui generis* proposals recognize that the issues between various information types are largely the same and a more robust form of protection can be developed if we work with information products as a whole, rather than to piecemeal fix software here, databases there, and so on.

IV. My proposal

Much of the focus and concern in protecting information is based on the idea that the information is the “thing” – this is the heart of propertization or commodification of information. My proposal instead seeks to provide the protection that information products deserve while being conscious of the

¹⁸¹ See Dreyfuss, *supra*, at 898.

¹⁸² See Dreyfuss, *supra* at 898. See also, Ronald Reagan, GUARDIAN (June 14, 1989) (“[Information] seeps through the walls topped by barbed wire, it wafts across electrified borders.”).

¹⁸³ See Reichman & Samuelson, *supra* at 154.

concerns that are raised when information is propertized. The main tenet of my proposal is that information should be protected not as the “thing,” but rather as a component of the “thing.” This provides a few important starting points: First, because it is not simply information that is being covered, but rather a “thing” of which information is merely a part (denominate the “thing” as “information plus”), there is less concern that the public domain is being robbed and that information is becoming too commodified. In fact, society can be benefited by the introduction of the “information plus.” Second, it is still clear that, regardless of the medium (the nature of the “information plus”), it is the information content that raises the concern so it makes sense to consider information products as a whole.¹⁸⁴

Although this scheme finds some basis in patent law, which permits protection for a system of components, this proposal is for a *sui generis*, liability-type regime, and takes relevant cues from patent law, copyright law, and misappropriation law. It is applicable to the three types of information products discussed above, but is also able to cover other types of information products where the information is a part or component of something larger. I call this protection scheme the componentization of information.

A. What is Componentization?

A component is commonly defined as “a constituent part.”¹⁸⁵ In the technical arts, componentization is defined as breaking a system into interchangeable parts, each of which encapsulate a portion of functionality. The software realm is where these terms are typically used. As I will be using the term, componentization is when an invention includes an information portion and a structural or physical portion. Simple information about a tangible item or information resulting from a process would be unlikely to fall into the category of information product to be protected under this scheme. Instead, examples of information products that would be appropriately placed under this scheme include computer programs, where there is the information component (software) and a physical component (the computer system on which the software runs),

¹⁸⁴ See Boyle, *supra*.

¹⁸⁵ See Microsoft Corp. v. AT&T Corp., 550 U.S. ___, ___ n 11 (2007) (citing Webster’s Third New International Dictionary of the English Language 466 (1981)).

databases (information = data, record structure = physical component), and genetic sequence inventions.

The definition of protectable information products, although broad, does not cover anything under the sun. Certain types of information do not fit within the componentization scheme; in order to classify as a covered type of information product, the information would need to be “combinable.”¹⁸⁶ For example, simple information such as instructions for building a device would not be the type of information that could be covered.¹⁸⁷

Patent law has long protected inventions that include components. For example, any machine or system is made up of a number of components, and these components can be identical or similar to each other or quite different. Although sometimes considered elements in patent claims, each distinct part of a patented invention can, in fact, be considered a component. There are even tenets of patent law that explicitly deal with components of an invention, such as contributory infringement and extraterritorial infringement.¹⁸⁸ But patent law does not permit the protection of information *per se*. On the other hand, patent law does, at least currently, cover many types of information products, where the information is but one component – such as in the case of software and genetic sequence information, so long as there is something more (an “information plus”). Although software is potentially covered without more, there is a move to require some sort of physicality or tangibility for software patents, and early software patents were required to be part of a physical media (*Beauregard* claims). A concern that is echoed in using patent law as a framework, however, is that patent law (unlike copyright particularly and trademark to a lesser extent) has very few safety valves built into the system.¹⁸⁹ For example, these safety valves include fair use (copyright), independent

¹⁸⁶ See Microsoft Corp. v. AT&T Corp., 550 U.S. __, __ (2007) (discussing the difference between simple information, such as a blueprint, and information which can be combined with other components, such as software).

¹⁸⁷ See Microsoft Corp. v. AT&T Corp., 550 U.S. __, __ (2007).

¹⁸⁸ See, e.g., 35 U.S.C. § 271(c), (f). § 271(f) provides that a party will be liable for infringement if it “supplies . . . from the United States,” for “combination abroad, a patented invention’s components.” See also, Microsoft Corp. v. AT&T Corp., 550 U.S. __, __ (2007). The issues in the *Microsoft* case were whether, and when, software could qualify as a component under the statute, and whether the software, as a component, was supplied from the United States. See *id.* at III.A.

¹⁸⁹ See Eisenberg, *supra* at 427.

creation (copyright), reverse-engineering (trade secret), but patent law does have an incredibly narrow research exemption.¹⁹⁰ For this reason, I am not suggesting that we simply adapt patent law to cover information products. Rather, I think that software and genetic sequence inventions fit uneasily at best into the current patent law regime and it would be better to co-opt some of the patent law framework when designing a *sui generis* protection scheme.

Thus, for an information product to be covered under my componentization scheme, it would need to be able to be decomposed into at least two parts – the information portion and the non-information, structural or framework portion. The information portion is thus componentized and the work that is protected is the “information plus.”

B. What Would Componentization Look Like?

The coverage of information products under my componentization scheme would work as follows. First, there is no coverage for the information portion of the product on its own. Rather, only the whole invention is covered, the “information plus.” Thus, infringement would lie if you co-opted an entire computer system or appropriated an entire database. This action would be taking of the whole “information plus,” both the information component and the physical/structural component. On the other end of the spectrum, if the information component alone is reverse-engineered, there is no prohibition on its use. That is, someone can collect, select, and arrange, independently, all of the information contained in a database and this is not infringement. The real question is in the grey areas in between...what if someone “gathers” data by looking at an existing database and entering it into their own database structure? Does it matter if they only take some data or all of the data? What if someone copies many of the functional sub-routines of a computer program and inserts them into another program?

For these situations, the answer lies in moving towards a liability-type regime, as noted above. Most proposals are centered, as existing intellectual property regimes are, on a property-based model. This is where my proposal differs, in that, after starting from a patent-law framework for defining the types of products to be protected, I move to a liability-type regime for coverage.

¹⁹⁰ See Eisenberg, *supra* at 428.

There are essentially two ways in which information can be protected – either under a property rule or under a liability rule.¹⁹¹ Generally, property rules provide for injunctive relief and liability rules provide for payment of money damages for non-consensual access.¹⁹² Mark Lemley and Philip Weiser have determined which remedial scheme is appropriate by considering whether injunctive relief against an infringer would overcompensate the plaintiff and over-deter the defendants; if so, the protection should follow a liability scheme.¹⁹³ (Where a court cannot easily tailor an injunction (property rule) to forbid only the prohibited conduct, injunctive relief can systematically overcompensate plaintiffs and overdeter defendants with significant negative consequences.)¹⁹⁴ This will nearly always be so in the case of information products, because the scope of the property right is unclear, leading to an inability to craft an injunction of the correct scope.¹⁹⁵

Other bases for adopting a liability regime include that information does not have the appropriate attributes of property – namely, that it is a public good (non-rivalrous, non-excludable).¹⁹⁶ Public goods are non-excludable, meaning that once the product is made public, the creator cannot readily control the product's use.¹⁹⁷ Public goods are also non-rivalrous, meaning that one user can enjoy the product without depleting another's ability to do so as well.¹⁹⁸ Liability regimes are also more flexible and palatable than property schemes. Also, by awarding a property right for an intangible product, we are creating a scarcity and excludability that did not previously exist.¹⁹⁹ As far as feasibility, Congress has already approved limited use of

¹⁹¹ Mark A. Lemley & Philip J. Weiser, *Should Property or Liability Rules Govern Information?*, 85 TEX. L. REV. 783, 783-84 (2007).

¹⁹² See Lemley & Weiser, *supra* at 786.

¹⁹³ See Lemley & Weiser, *supra* at 784.

¹⁹⁴ See Lemley & Weiser, *supra* at 785.

¹⁹⁵ See Lemley & Weiser, *supra* at 794.

¹⁹⁶ See Lipton, *supra* at 140-41.

¹⁹⁷ See Gibson, *supra* at 173.

¹⁹⁸ See Gibson, *supra* at 173.

¹⁹⁹ See Marlin-Bennett, *supra* at 13.

liability rules in intellectual property, for example the use of compulsory licenses in copyright law.²⁰⁰

Of course, adopting a liability-type regime does not come without difficulties. The effectiveness of any liability rule will depend on the complexity of that rule, based on at least three factors: “1) Can multiple parties have access to the resource without interference? 2) Second, will the information necessary to design effective access arrangements be readily available and apparent to a regulator or court? 3) How dynamic is the set of relationships and technology in question?”²⁰¹ Further, the liability rules must be clearly defined and appropriately limited so that the underlying incentives are not undermined.²⁰² Lemley and Weiser draw from copyright law’s compulsory licensing the following characteristics of a good liability regime: “1) minimize the opportunity for rent-seeking behavior; 2) avoid technology-based distinctions that will lead to artificial categories and distort the marketplace; 3) encourage private bargaining even in the face of an established liability rule; and 4) ensure that the liability rule is set based on a true benchmark.”²⁰³

The componentization of information, as a liability scheme must adopt these characteristics. Additionally, the scheme must further the advantages for protecting information – namely incentivizing creation and distribution and facilitating transactions. Beyond these characteristics, the scheme should adopt two of the existing limitations built into intellectual property rights that address some of the concerns about protecting information – fair use and scope.²⁰⁴ One aspect where the scope of protection for information products can be effective is in the duration of the protection. While patent law offers twenty years, and copyright is generally life of the author plus seventy-five, this length of protection is generally not needed for information products, whose obsolescence will occur more rapidly and for which that long of a lead time is unnecessary to allow recouping of

²⁰⁰ See Lemley & Weiser, *supra* at 825.

²⁰¹ See Lemley & Weiser, *supra* at 809.

²⁰² See Lemley & Weiser, *supra* at 813.

²⁰³ See Lemley & Weiser, *supra* at 829. See also Davison, *supra* for features required for effective database protection; Samuelson, et al., *supra* for features required for effective software protection.

²⁰⁴ See Lipton, *supra* at 151.

investment in development. The main disadvantage to relying on scope to balance interests is that it is “not specifically tailored to the precise interests that may be implicated by a particular property right.”²⁰⁵ The other limitation, fair use, has served as a fairly effective means for allowing academic and scientific access to information, at least in the copyright regime. Thus, an extensive set of fair use exceptions is critical to an information products protection scheme.

C. Why is This Scheme Better?

The componentization scheme provides more effective protection for information products while at the same time providing some safety net against the harms that propertizing information is supposed to cause. Some benefits arise from the fact that the scheme is a *sui generis* proposal, not simply a bending of existing regimes to cause information products to fit. *Sui generis* legislation has been used before for new technology that resides at the boundaries of traditional technology and does not fit comfortably within traditional intellectual property regimes, most notably in the Semiconductor Chip Protection Act of 1984.²⁰⁶ The Chip Act blended elements of patent law and copyright law to more fully cover semiconductor advances, while also being cognizant of some of the major concerns about protecting innovation, such as protecting the public domain and permitting reverse-engineering.²⁰⁷ The Chip Act also rejects compulsory licensing and protects innocent infringers.²⁰⁸ Similarly, other special purpose intellectual property laws have been enacted to protect industrial designs and plant varieties, as well as other creations that do not fit well within either the patent or copyright regime.²⁰⁹

Beyond being more effective because the protection is only taking the positive bits and pieces from existing regimes, rather than adopting wholesale and modifying, the componentization of information provides extensive safety nets against over-propertization of information in the form of limited scope and extensive fair use, which are not fully present in existing regimes

²⁰⁵ See Lipton, *supra* at 163.

²⁰⁶ 17 U.S.C. §§ 901-914 (Supp. II 1984).

²⁰⁷ See Dreyfuss, *supra*, at 906-07.

²⁰⁸ See Dreyfuss, *supra*, at 911.

²⁰⁹ See Reichman & Samuelson, *supra* at 53.

or even commentator proposals. The inventor or creator of the work is also required to give something back, in the form of a structure or framework to the information, which may prove beneficial for followers.

Finally, this scheme is attractive in its breadth and flexibility in being able to cover multiple types of information products and not being a knee-jerk reaction to a problem with coverage of one type of information product or another.

D. What are the Problems with this Scheme?

Of course, no proposed scheme is without problems. The main problems with the componentization of information are that 1) information is still, in some sort, being propertized; 2) *sui generis* protection raises concerns for transaction costs and in the international arena; and 3) whenever a product can be broken into components, there are potential problems with extraterritorial application and divided infringement.

Generally, the creation of *sui generis* protection can introduce new and increased transaction costs.²¹⁰ Second, “there is a more insidious difficulty associated with expanding private intellectual property rights when there is no justification for doing so.”²¹¹ Finally, the “introduction of the *sui generis* right involved a privatization of part of the public domain without any payment being made to the government in return for that privatization.”²¹²

Sui generis protection also raises difficulties in the international arena. One issue is that *sui generis* protection (that is, not copyright or patent-based) is not covered under the international treaties that provide national coverage.²¹³ This could be a benefit or a detriment – a benefit in that it allows leveraging based on reciprocity with various countries, a detriment in that all negotiations occur outside the confines of these international agreements (and incur additional transaction costs because of this).²¹⁴ An

²¹⁰ See Davison, *supra* at 179.

²¹¹ See Davison, *supra* at 179.

²¹² See Davison, *supra* at 180.

²¹³ See Dreyfuss, *supra* at 912-13.

²¹⁴ See Dreyfuss, *supra* at 914.

additional treaty may be the solution to this problem. An additional angle that arises with *sui generis* protection in the international context is that these increased costs will drive the information product industry to relocate in the many countries that will not adopt *sui generis* protections for information products.²¹⁵

The problem with extraterritorial and divided infringement comes when the whole system (the information plus) is necessarily broken up. This problem is acutely found in patent law, where many of the inventions are combinations of components. Patent law has developed to handle situations, for example, where all or some of the components are made in the United States, but are shipped elsewhere to be assembled and used as an infringing device. This could similarly happen with componentization coverage, if the information is co-opted in the United States but then shipped abroad to be combined with a structural component. Similarly, divided infringement occurs when no single party infringes all of the components of the invention, but a countable number of infringers put together do infringe all of the components.

CONCLUSION



²¹⁵ See Bitton, *supra* at 105.