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The Warranty of Merchantability and Computer Software Contracts: A Square Peg Won't Fit in a Round Hole

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THE WARRANTY OF MERCHANTABILITY AND COMPUTER SOFTWARE CONTRACTS: A SQUARE PEG WON'T FIT IN A ROUND HOLE

The explosive growth of the computer industry has outdistanced efforts to adapt legal theories to govern computer-related disputes. Computer software, a detailed set of instructions which tells computer hardware what to do,[1] is an intangible collection of ideas, even though it must be kept and transferred on a tangible medium.[2] Traditional sales law was developed to deal with tangible goods, not intangibles. Consequently, it is particularly difficult to adjudicate software disputes using traditional sales law theories.[3]

Courts have consistently held that Article 2 of the Uniform Commercial Code (U.C.C.) governs transactions involving computer hardware.[4] Treatment of computer software transactions has been less consistent.[5] This Comment contends that computer software, an intangible, is not within the scope of Article 2. It further contends that the warranty of mer-

1. The terms "software" and "hardware" represent, respectively, the intangible and tangible portions of a computer. The player piano provides a simple analogy to the software/hardware distinction. Both a player piano and computer hardware are tangible. A player piano can play many kinds of music: classical, ragtime, pop. Similarly, computer hardware can run many kinds of programs: income tax calculations, space-shot trajectories, word processing. Which roll of music is used determines what type of music the player piano will play. Similarly, which computer software is used determines what type of function the computer hardware will perform.

2. Just as a musical composition to be played on a player piano must be kept and transferred on a music roll, software must be kept and transferred on a physical memory medium: as minute electromagnetic fields on magnetic tapes or disks, as punches on paper cards, or even as written words in a manual or book. But software itself, like the musical composition, is intangible, and should not be confused with the tangible memory medium incidentally necessary to store the ideas.

3. Software presents novel questions in many areas of the law. Is software copyrightable? *See* Apple Computer, Inc. v. Franklin Computer Corp., 714 F.2d 1240 (3d Cir. 1983) (yes). Is software subject to the same taxes as hardware? *See* Comment, *Software Taxation: A Critical Reevaluation of the Notion of Intangibility,* 1980 B.Y.U. L. REV. 859 (jurisdictions vary). Is software patentable? *See* Diamond v. Diehr, 450 U.S. 175 (1981) (a process including software was held patentable).

The need to apply traditional legal theories to software controversies gives courts and commentators an ideal opportunity to reexamine the theoretical underpinnings of traditional legal theories. This can and should lead to the clarification of fundamental concepts that have become muddled over the years.

4. Most courts apply U.C.C. Article 2 provisions to software-hardware transactions—transactions where both software and hardware are sold—without discussing whether software is a good. *See, e.g.,* APLications, Inc. v. Hewlett-Packard Co., 501 F. Supp. 129 (S.D.N.Y. 1980), *aff'd,* 672 F.2d 1076 (2d Cir. 1982); Carl Beasley Ford, Inc. v. Burroughs Corp., 361 F. Supp. 325 (E.D. Pa. 1973), *aff'd mem.,* 493 F.2d 1400 (3d Cir. 1974); Burroughs Corp. v. Joseph Uram Jewelers, Inc., 305 So. 2d 215 (Fla. App. 1974).

In one case, however, both parties agreed that Article 2 did not apply to the software-hardware lease at issue. Applied Data Processing, Inc. v. Burroughs Corp., 394 F. Supp. 504, 505 n.1 (D. Conn. 1975).

5. *See infra* notes 11–18 and accompanying text.

chantability cannot meaningfully be applied by analogy in computer software contracts. Finally, this Comment concludes that existing tort and contract causes of action provide software users with sufficient protection.

I. APPLYING TRADITIONAL SALES LAW TO SOFTWARE TRANSACTIONS

Courts faced with disputes involving software transactions have consistently applied Article 2 provisions, using predominant factor analysis,[6] without adequately considering whether it is appropriate to do so.[7] Since hardware—indisputably a "good"[8]—is considered the 'predominant factor' in a hybrid software-hardware transaction, courts have treated such transactions as sales of goods[9] and applied Article 2 provisions without reaching the question of whether software is also a good.

6. In hybrid transactions involving both goods and nongoods, most courts have applied predominant factor analysis, finding Article 2 applicable if the goods aspect of the transaction predominates. *See, e.g.*, Wells v. 10-X Mfg. Co., 609 F.2d 248 (6th Cir. 1979); Bonebrake v. Cox, 499 F.2d 951, 960 (8th Cir. 1974) (Article 2 covers contracts where "their predominant factor, their thrust, their purpose" is a transaction in goods). *See also* R. DUESENBERG & L. KING, SALES AND BULK TRANSFERS UNDER THE UNIFORM COMMERCIAL CODE § 1.03[1], at 1-22, -23 (1982) [hereinafter cited as DUESENBERG].

Other courts, however, reject predominant factor analysis. Instead, they apply provisions of Article 2 to the portion of the transaction which involves goods, even though services or other nongoods predominate. *See* Foster v. Colorado Radio Corp., 381 F.2d 222, 226 (10th Cir. 1967) (Article 2 provisions applied to the part of the contract involving goods, even though the value of the goods constituted only five to ten percent of the contract price); R. NORDSTROM, HANDBOOK OF THE LAW OF SALES § 21, at 47 (1970).

7. Only two courts have directly addressed the issue of whether software is a good. Triangle Underwriters v. Honeywell, Inc., 457 F. Supp. 765, 769 (E.D.N.Y. 1978), *modified*, 604 F.2d 737 (2d Cir. 1979), discussed *infra* at notes 12–14 and accompanying text; Samuel Black Co. v. Burroughs Corp., No. 78-3077-F (D. Mass. Dec. 18, 1981) (order ruling on summary judgment and other motions) (available on LEXIS), discussed *infra* at notes 15–16 and accompanying text.

No court has refused to apply Article 2 provisions to a hybrid software-hardware transaction. However, a court can use any of three different lines of analysis to apply Article 2 provisions: (1) consider software a "good" and apply Article 2 provisions directly, *see Triangle*, 457 F. Supp. at 769; (2) consider computer hardware to be the "predominant factor" in a hybrid software-hardware transaction and apply Article 2 provisions to the entire contract, *see Triangle*, 604 F.2d at 742–43; or (3) apply Article 2 provisions by analogy, *see Samuel Black Co.*

8. Article 2 of the U.C.C. applies only to "transactions in goods." U.C.C. § 2-102 (1978). Hardware is clearly a good under the Article 2 definition. Indeed, the software/hardware distinction itself is a distinction between the tangible, movable machine (a good) and the intangible software (not a good). *See supra* note 1; Comment, *Liability for Defects in Computer Software*, 53 J. URB. L. 279, 280 (1975).

9. *See, e.g.*, Triangle Underwriters v. Honeywell, Inc., 604 F.2d 737, 742–43 (2d Cir. 1979). In general, hybrid software-hardware contracts have been considered contracts for the sale of goods, with the software considered a hardware component. *See* D. BRANDON & S. SEGELSTEIN, DATA PROCESSING CONTRACTS 76 (1976).

The practice of "bundling" software and programming services with hardware has perpetuated the

Recent developments in the software industry have made this traditional analysis obsolete. In modern software-hardware hybrid transactions, software represents a larger share of the transaction than previously. Moreover, software houses—businesses that produce and sell only software—now compete with software-hardware producers in the expanding software market.[10] With these changes in the industry, transactions in which software is the predominant or sole factor have become commonplace.

Development of legal theories to protect software users has not kept pace with the changes in the software industry. The crucial question—whether Article 2 provisions apply to software transactions—has not been authoritatively answered, and in fact has rarely been addressed.[11] In *Triangle Underwriters v. Honeywell, Inc.*,[12] the district court held that custom-designed software is a "good."[13] The Second Circuit affirmed the district court's holding that Article 2 applied to the transaction, but applied predominant factor analysis in doing so.[14] Because the circuit court found that hardware, a good, predominated, it did not reach the question of whether software is itself a good.

In contrast, the court in *Samuel Black Co. v. Burroughs Corp.*[15] expressed reservations about whether Article 2 applies to hybrid software-

notion that hardware is the predominant factor in a hybrid software-hardware transaction. A "bundled" transaction is a special type of hybrid transaction. A buyer in a bundled transaction pays the same price for hardware whether he wants software or programming services or not. Thus, hardware is clearly the "predominant factor" in a bundled transaction. *See* Rev. Rul. 71-177, 1971-1 C.B. 5 (software bundled with hardware is treated as part of the hardware for purposes of the Investment Tax Credit and depreciation deductions).

However, bundled transactions have become unpopular because courts usually consider them to be unlawful tying arrangements. Major software-hardware producers no longer enter into bundled transactions. *See, e.g.*, IBM v. Catamore Enters., 548 F.2d 1065, 1069 (1st Cir. 1976) (IBM "unbundled" in June 1969), *cert. denied*, 431 U.S. 960 (1977); Carl Beasley Ford, Inc. v. Burroughs Corp., 361 F. Supp. 325, 328 n.1, 334 & n.5 (E.D. Pa. 1973) (Burroughs Corp. no longer enters into bundled transactions), *aff'd mem.*, 493 F.2d 1400 (3d Cir. 1974). The demise of the bundled transaction is another trend in the software industry that has increased the importance of careful examination and proper treatment of software sales contracts.

10. *See* K. FISHMAN, THE COMPUTER ESTABLISHMENT 276–77 (1981).

11. *See supra* note 7.

12. 457 F. Supp. 765 (E.D.N.Y. 1978), *modified*, 604 F.2d 737 (2d Cir. 1979).

13. The court stated:

> Although the ideas or concepts involved in the custom designed software remained Honeywell's intellectual property, Triangle was purchasing the product of those concepts. That product required efforts to produce, but it was a product nevertheless and, though intangible, is more readily characterized as "goods" than "services." Intangibles may be "goods" within the meaning of U.C.C. § 2-106.

Triangle Underwriters v. Honeywell, Inc., 457 F. Supp. 765, 769 (E.D.N.Y. 1978), *modified*, 604 F.2d 737 (2d Cir. 1979).

14. *Triangle*, 604 F.2d at 742–43.

15. Samuel Black Co. v. Burroughs Corp., No. 78-3077-F (D. Mass. Dec. 18, 1981) (order ruling on summary judgment and other motions) (available on LEXIS).

hardware transactions. The court did not resolve the issue, however, because it was willing to apply Article 2 provisions by analogy even if the transaction was not within the express scope of Article 2.[16]

Both the *Triangle* and *Samuel Black Co.* courts also considered tort causes of action.[17] These courts and others, however, applied Article 2 provisions to computer transactions rather than such tort theories as negligence, malpractice, and misrepresentation. Even if courts were willing to accept these tort theories, the unavailability of damages for economic injury under the most common tort theories—negligence and products liability—makes them unsatisfactory for most software users.[18]

II. U.C.C. SECTION 2-314 SHOULD NOT BE APPLIED TO SOFTWARE TRANSACTIONS

The question of whether Article 2 provisions govern contracts for computer software arises most often when the plaintiff seeks the protection of the Article 2 implied warranty of merchantability, contained in U.C.C. section 2-314.[19] There are two methods a court may use to apply the warranty of merchantability to allow recovery of economic losses caused by defective software. First, if the literal terms of section 2-314 include software transactions within their scope, the warranty may be applied directly. Second, even if Article 2 does not expressly cover software contracts, the warranty may be implied by analogy. Both of these methods of Article 2 application are improper in computer software transactions.

A. *Software Transactions Are Not Within the Literal Scope of U.C.C. Section 2-314*

A warranty of merchantability should not be implied directly in software transactions for two reasons. First, computer software should not be considered "goods" under Article 2 because software is an intangible.

16. The court justified its failure to resolve the issue by stating that "the U.C.C.'s provisions are both helpful and persuasive by analogy" and applying them would not "alter the result in this particular case." *Id.*

17. *See Triangle*, 457 F. Supp. at 769–71 (discussing malpractice and fraud claims); *Triangle*, 604 F.2d at 743–48 (same); *Samuel Black Co.* (discussing tortious misrepresentation claim).

18. Tort theories generally are not available for economic loss. *See infra* note 75. However, the tort action of professional malpractice has been successfully used to recover such damages. *See infra* note 65. Although the professional malpractice cause of action is well suited for application to software disputes, *see infra* Part IIIA*1*, courts have declined to apply it, *see infra* notes 66–69 and accompanying text.

19. U.C.C. § 2-314(1) (1978) provides, in part, that: "Unless excluded or modified (Section 2-316), a warranty that the goods shall be merchantable is implied in a contract for their sale if the seller is a merchant with respect to goods of that kind."

Even though the U.C.C. should be broadly interpreted to promote its underlying policies,[20] the term "goods" should not be stretched to cover intangibles, such as software, that fundamentally differ from traditional goods. Second, most software transactions do not involve a "sale" of the software, which is a prerequisite to coverage under U.C.C. section 2-314.

1. *Software Is Not a Good*

Article 2 of the U.C.C. applies only to "transactions in goods."[21] "Goods" are defined as "all things . . . which are movable."[22] Although Article 2's coverage is not expressly limited to tangibles, the provisions of Article 2 are tailored to govern "items of tangible property . . . which normally flow in commerce."[23]

Software is an intangible.[24] Intangibles are fundamentally different from traditional goods.[25] Consequently, although one court has held to

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20. U.C.C. § 1-102(1) (1978). *See also* J. WHITE & R. SUMMERS, HANDBOOK OF THE LAW UNDER THE UNIFORM COMMERCIAL CODE § 4, at 14–18 (2d ed. 1980) [hereinafter cited as WHITE & SUMMERS].

As noted in the official comments, the U.C.C. was broadly drafted and designed to be liberally construed so that it could be adapted to conform to new areas and practices. *See* U.C.C. § 1-102 official comment 1 (1978). But the scope of application of the U.C.C. should not be perfunctorily expanded. Rather, the U.C.C.'s "interpretation and application [should] be limited to its reason." *Id.*

21. U.C.C. § 2-102 (1978).

22. U.C.C. § 2-105(1) (1978). This movability requirement removes real property from Article 2 coverage. 1 G. GILMORE, SECURITY INTERESTS IN PERSONAL PROPERTY § 12.2, at 369–70 (1965).

Services have also traditionally been excluded from Article 2 coverage. *See, e.g.*, Gerber v. Weinstein, 6 N.J. Misc. 284, 141 A. 3 (Sup. Ct. 1928) (held that a contract for architect's plans was for services, and thus the Uniform Sales Act, which applies only to contracts for goods, was inapplicable); Blottner, Derrico, Weiss & Hoffman, P.C. v. Fier, 101 Misc. 2d 371, 420 N.Y.S.2d 999 (Civ. Ct. 1979) (provisions of Article 2 held inapplicable to contract for rendition of legal services); cases collected in Comment, *Contracts for Services Distinguished From Those to Sell Goods*, 15 FORDHAM L. REV. 92 (1946) (pre-U.C.C. cases).

Courts and commentators have not been clear, however, as to why services are not goods. *See* R. NORDSTROM, *supra* note 6, § 22, at 42–43. The traditional distinction between services and goods does seem to support this Comment's argument that items for which the concept of movability has no meaning are not goods under Article 2. *See infra* text accompanying note 29.

23. R. NORDSTROM, *supra* note 6, § 22, at 46.

24. *See* Triangle Underwriters v. Honeywell, Inc., 457 F. Supp. 765, 769 (E.D.N.Y. 1978), *modified*, 604 F.2d 737 (2d Cir. 1979); Comment, *supra* note 8, at 280; *supra* notes 1–2. *But see* Note, *Computer Programs as Goods Under the U.C.C.*, 77 MICH. L. REV. 1149, 1152 (1979) (distinguishes a computer program copy (a tangible) from the computer program itself (an intangible)).

25. For example, traditional goods, which are tangible personal property, can be neatly handled using traditional property law. But software and other intangibles cannot be handled so neatly. Indeed, many fundamental property concepts are almost meaningless when applied to software.

Software cannot be neatly handled under traditional property law because property law is fundamentally based on the concept of possession. The maxim "possession is nine-tenths of the law" the contrary,[26] "goods" should not be construed to include intangibles. The term "movable" is the only express limitation in the definition of goods under Article 2.[27] "Movability" is designed to distinguish be-

illustrates just how fundamental the concept of possession is to property law. But the concept of possession is almost nonsensical when applied to software.

A simple example illustrates the point. If *A* sells a tangible piece of property to *B*, *A* must dispossess herself of the property. But if software is sold instead of property, the situation changes. Software can be reproduced at virtually no cost. Consequently, *A* does not need to dispossess herself of the property in order to sell it to *B*. The same software can be possessed by *A* and *B* at the same time. *See* letter from Thomas Jefferson to Isaac McPherson (Aug. 13, 1813), *reprinted in part in* Prager, *A History of Intellectual Property from 1545 to 1787*, 26 J. PAT. OFF. SOC'Y 711, 759 (1944) ("[N]o one possesses [an idea] the less because every other possesses the whole of it. He who receives an idea from me receives instruction himself without lessening mine, as he who lights his taper at mine receives light without darkening mine."). Such a situation is impossible with tangible personal property. Ideas, therefore, are conceptually different from property. *See id.*

Clearly, the concept of possession as applied to traditional personal property cannot be applied to software. Because the concept of possession is fundamental in property law, it is a necessary concept for such concepts as title and ownership to make sense. Therefore, such concepts are almost meaningless when applied to software. *See* M. WESSEL, FREEDOM'S EDGE: THE COMPUTER THREAT TO SOCIETY 123 (1974). That concepts such as title also underlie sales law indicates that traditional sales law concepts are probably also inapplicable to software. Consequently, software should not be considered to be goods under the U.C.C.

26. Triangle Underwriters v. Honeywell, Inc., 457 F. Supp. 765 (E.D.N.Y. 1978), *modified*, 604 F.2d 737 (2d Cir. 1979). The *Triangle* court stated that "[i]ntangibles may be 'goods' under Article 2 of the U.C.C." 457 F. Supp. at 769. The *Triangle* court supported this assertion by citing Silverman v. Alcoa Plaza Assocs., 37 A.D.2d 166, 323 N.Y.S.2d 39 (1971).

The *Silverman* court did indeed hold that the sale of cooperative apartment stock and proprietary lease was a "transaction in goods" under Article 2 of the U.C.C. However, the *Silverman* court characterized the issue to be whether the sale was one of realty or personalty. 323 N.Y.S.2d at 41. The court did not address the issue of whether the property was tangible or intangible. Since there is no indication that the *Silverman* court considered the stock and lease to be intangible, the *Silverman* decision does not support the *Triangle* court's assertion that intangibles can be goods.

27. "Goods" are defined as "all things (including specially manufactured goods) which are movable at the time of identification to the contract for sale." U.C.C. § 2-105(1) (1978).

"Things," the other key term used in the definition, has no particular legal meaning. It is an all-encompassing term which is not narrowed in its U.C.C. usage. Given the ambiguity of the common definition of "things" and the fact that no attempt is made in Article 2 to define the term, it seems doubtful that use of the term alone is designed to include or exclude intangibles. *But see* Note, *supra* note 24, at 1151 n.11 (apparently interpreting the term "things" to exclude intangibles from the definition of "goods": "The intangible instructions are not a thing and therefore not a good under the U.C.C."). This doubt is reinforced by the fact that the term "things" is also used in the Article 9 definition of goods, and there the drafters felt the need to explicitly exclude general intangibles from the definition. *See infra* notes 32–35 and accompanying text.

"Specially manufactured goods" are expressly included in the Article 2 definition of goods. U.C.C. § 2-105(1) (1978). However, even though other provisions of Article 2 may apply to specially manufactured goods, the warranty of merchantability will typically be inapplicable to such goods. In most cases, there is no standard of merchantability to apply to unique, custom-made goods. *See* Art Press, Ltd. v. Western Printing Mach. Co., No. 82-C-0116 (N.D. Ill. Nov. 18, 1983) (order ruling on summary judgment motion) (available on LEXIS) ("custom-made goods generally have no ordinary purpose"; therefore, the warranty of merchantability is not implied in their sale). *See also infra* note 54.

tween real property and personal property.[28] But other items, such as intangibles and services, are impossible to characterize as movable or immovable.

Movability is a physical, spatial quality. Consequently, it only makes sense in reference to tangibles, which have physical qualities. Intangibles do not have physical characteristics. They are neither movable nor immovable: movability simply has no meaning in the context of intangibles.[29] It is doubtful that use of the term "movable" was meant to include intangibles for which the term has no meaning.

The fact that a tangible, movable "good" is involved in most contracts involving intangibles does not mean that the intangibles themselves are movable goods.[30] For example, when a lawyer fulfills a contract to draw up a will, tangible property (the paper on which the will is written) passes to the buyer. However, the tangible property that passes to the buyer is a minor part of the transaction. The real subject matter of the contract is the thought process of the lawyer. Because the real subject matter of the contract is not a traditional "good," Article 2 provisions are inappropriate and should not be used to govern the contract.[31]

The express distinction between "general intangibles" and "goods" made in Article 9 of the U.C.C. supports the argument that the Article 2

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28. *See supra* note 22.

29. *See* R. NORDSTROM, *supra* note 6, § 22, at 46 ("[t]he drafters were concerned with items of tangible property"); Comment, *supra* note 3, at 868 & n.53; Note, *supra* note 24, at 1150 n.11.

In Article 9 cases, courts have uniformly distinguished intangible ideas from goods. *See, e.g.*, United States v. Antenna Sys., Inc., 251 F. Supp. 1013, 1016 (D.N.H. 1966) (technical drawings and reports are "in reality the visual reproductions on paper of engineering concepts, ideas and principles" and thus are more correctly classified as intangibles than goods). *See infra* notes 31–34 and accompanying text.

30. *But see* Holmes, *Application of Article Two of the Uniform Commercial Code to Computer System Acquisitions*, 9 RUTGERS COMPUTER & TECH. L.J. 1, 25 (1982). Holmes argues that:

> Article Two should always apply to the sale of programs and to the programming services that culminate in a moveable end product. There is no difference between rendering professional photography or printing services that culminate in a portrait or a pamphlet as an Article Two good and making the same judgment about services that result in a moveable disc or tape.

Id. (footnotes omitted). But Holmes' view of movability is overinclusive. It would include most legal services (including particularly the drafting of documents), most architectural services, and all repair services, since all these services culminate in a movable end product. Neither the case law nor Article 2 itself indicates that the distinction between goods and services has been abrogated. Consequently, Holmes' extreme view, which assumes just that, is incorrect.

31. Although no court has addressed the question of whether a will is a good, courts have held that architectural blueprints are not goods. *See* Gerber v. Weinstein, 6 N.J. Misc. 284, 141 A. 3 (Sup. Ct. 1928) (an architect's contract for drawing sketches for an apartment house was not a contract for the sale of goods and thus was not governed by the Uniform Sales Act). *See also* Raffel v. Perley, 14 Mass. App. 242, 437 N.E.2d 1082, 1085 (1982) (surveyor's plan is not a good under Article 2).

In Article 9 cases, courts are equally reluctant to classify architectural and engineering designs as "goods." *See infra* note 34.

definition of "goods" does not include intangibles. Article 9 defines "goods" as "things which are movable."[32] This is virtually the same as the Article 2 definition.[33] "General intangibles" are explicitly excluded from the definition of "goods" in Article 9.[34] The omission of a corresponding express exclusion from the Article 2 definition was simply an oversight.[35] Thus, the general intangibles that are expressly excluded from Article 9 definition of goods should also be excluded from the Article 2 definition.

2. *Computer Software Transactions Are Not Sales*

The scope of section 2-314 is limited to the "sale" of goods,[36] rather than the broader "transactions in goods," which is the general scope of Article 2.[37] A "sale" is defined as "the passing of title from the seller to the buyer for a price."[38] Software contracts rarely involve the passage of title to software. Instead, the "purchaser" usually gets a license to use the software.[39] This license typically is a nonexclusive right to make a limited number of copies of a program for internal use. The "purchaser" has no right to make copies of the program to sell or give to others, although ordinarily he can sell or give away the copy he purchased.[40] The

32. U.C.C. § 9-105(1)(h) (1978).

33. *See supra* note 27.

34. U.C.C. § 9-105(1)(h) (1978). "General intangibles" include personal property "other than goods, accounts, chattel paper, documents, instruments, and money." U.C.C. § 9-106 (1978). Case law has interpreted the term "general intangibles" to include such items as technical blueprints and drawings. *See, e.g.*, United States v. Antenna Sys., Inc., 251 F. Supp. 1013, 1016 (D.N.H. 1966). Therefore, items such as technical blueprints and drawings are not Article 9 goods. Just as technical blueprints and drawings are intangibles rather than goods, so too is software. *See* IBM v. Catamore Enters., 548 F.2d 1065, 1068 & nn.4–5 (1st Cir. 1976) (analogizing software to architectural blueprints), *cert. denied*, 431 U.S. 960 (1977).

35. Grant Gilmore, a principal drafter of Article 9, stated that there is no good reason why the Article 2 and Article 9 definitions of goods are not identical; it was just a loose end that never got tidied up. G. GILMORE, *supra* note 22, § 12.2, at 368. He also noted that both definitions exclude intangibles, and that the exclusions amount to the same thing in both definitions. *Id.* at 370.

36. *See* U.C.C. § 2-314(1) (1978) ("a warranty that the goods shall be merchantable is implied in a contract for their *sale*" (emphasis added)).

37. U.C.C. § 2-102 (1978).

38. *Id.* § 2-106(1).

39. R. BIGELOW & S. NYCUM, YOUR COMPUTER AND THE LAW 117 (1975); R. BERNACCHI & G. LARSEN, DATA PROCESSING CONTRACTS AND THE LAW 368–69 (1974) (license of software most common; outright sale uncommon); D. BRANDON & S. SEGELSTEIN, DATA PROCESSING CONTRACTS 109–10 (1976) (the fact that the user does not buy title or ownership makes applicability of Article 2 questionable); J. AVER & C. HARRIS, COMPUTER CONTRACT NEGOTIATIONS 290–91 (1981) (programs are usually licensed rather than sold, so the vendor retains control). *See also* IBM Corp., License Agreement for IBM Program Products, *reprinted in* R. FREED, COMPUTERS AND LAW 175 (5th ed. 1976).

40. The Radio Shack software license agreement is typical:

A. Radio Shack grants to CUSTOMER a non-exclusive, paid up license to use on CUSpurchaser thus does not receive all rights (i.e., title) to the software. Therefore, no "sale" occurs.[41]

Courts have not hesitated to ignore the fact that a transaction is a lease or bailment in applying U.C.C. warranties if the transaction is analogous to a sale.[42] However, courts should not treat transactions as sales when they fundamentally differ from sales.[43] Because all rights do not pass to

TOMER'S computer the Radio Shack computer software received. Title to the media on which the software is recorded (cassette and/or disk) or stored (ROM) is transferred to the CUSTOMER, but not title to the software.

B. In consideration for this license, CUSTOMER shall not reproduce copies of Radio Shack software except to reproduce the number of copies required for use on CUSTOMER'S computer (if the software allows a backup copy to be made), and shall include Radio Shack's copyright notice on all copies of software reproduced in whole or in part.

C. CUSTOMER may resell Radio Shack's system and applications software (modified or not, in whole or in part), provided CUSTOMER has purchased one copy of the software for each one resold. The provisions of this software License (paragraphs A, B, and C) shall also be applicable to third parties purchasing such software from CUSTOMER.

41. Passage of title is necessary to effect a sale under Article 2. U.C.C. § 2-106(1) (1978). Once title has passed to the buyer, the seller has little or no control over its destiny or the conditions of its resale. Thus an Article 2 sale leaves the seller no control over its product.

A computer software seller must maintain tight control over his program to preserve its commercial value. Because copyright and patent protection is limited and uncertain, almost all software sellers use some form of a limited-use agreement, usually a license, to market their software. *See* R. BERNACCHI & G. LARSEN, *supra* note 39, at 368–69. Otherwise, unauthorized copies of the software tend to proliferate and the seller finds that he has lost his basic market. *See id.;* W. BOWMAN, PATENT AND ANTITRUST LAW 24 (1973) (information, because it can be reproduced at no cost, cannot be marketed in the same way as goods). Thus, sales are impractical and uncommon in computer software contracts.

42. Sales are often disguised as leases to get favorable tax treatment or to retain a security interest in the item without complying with Article 9 requirements. Or a transaction may be financed as a lease rather than a sale, even though the lessee has all indicia of ownership. In such cases, courts and parties have usually ignored the fact that the "sale" is technically a lease and have applied Article 2 as though it were a sale. *See, e.g.*, Office Supply Co. v. Basic/Four Corp., 538 F. Supp. 776, 778 n.1 (E.D. Wis. 1982); Hertz Commercial Leasing Corp. v. Transportation Credit Clearing House, 59 Misc. 2d 226, 298 N.Y.S.2d 392, 395 (Civ. Ct. 1969) ("commercial transactions which tend to the identical economic result" as sales should be treated as sales), *rev'd on other grounds*, 64 Misc. 2d 910, 316 N.Y.S.2d 585 (App. Term 1970); *see also* DUESENBERG, *supra* note 6, § 1.03[4], at 1-36 to -42; Earmon Oil Co. v. Burroughs Corp., 625 F.2d 1291, 1295-98 (5th Cir. 1980).

43. Unfortunately, many courts are unwilling to distinguish between a sale and a nonsale transaction whether or not the nonsale transaction is analogous to a sale. *See, e.g.*, Baker v. City of Seattle, 79 Wn. 2d 198, 201, 484 P.2d 405, 407 (1971). There does seem to be indirect support for such a position. *See* U.C.C. § 2-313 official comment 2 (1978) ("the warranty sections of this Article are not designed in any way to disturb those lines of case law growth which have recognized that warranties need not be confined . . . to sales contracts . . . [but] may arise in other appropriate circumstances"). However, this language merely states that courts should not feel that Article 2 robs them of the power to extend warranties where appropriate; it does not by itself support such an extension. Indeed, the fact that Article 2 expressly limits warranties to sales is evidence that the warranties are not appropriate in every transaction.

Because Article 2 expressly limits the scope of its warranties to sales, they should be applied in nonsales transactions only by analogy. *See* WHITE & SUMMERS, *supra* note 20, § 9-6, at 346 & n.73, 349; R. NORDSTROM, *supra* note 6, § 21, at 42–44. *See also* Murray, *Under the Spreading Analogy of Article 2 of the Uniform Commercial Code*, 39 FORDHAM L. REV. 447, 449–54 (1971). *But see* R.

the "buyer" in a typical software license, the difference between it and a sale is not just semantic.

The commercial context of sales differs significantly from that of licenses. Licenses restrict and impede the flow of goods in commerce. Sales, on the other hand, allow goods to flow freely and unimpeded in commerce. Indeed, almost all software producers choose to license their software rather than sell it precisely because they want to restrain competition. Licensing their software rather than selling it gives them great power to control distribution of their software, greater than that provided by copyright protection alone. Software producers can and do use this power to prevent or delay the sale of comparable software by a different producer. Thus, lack of competition distinguishes a license-only market from a sales and license market.

Free competition between producers of comparable goods is a prerequisite to the development of a merchantability standard. Prospective purchasers of traditional goods weigh quality against cost in choosing between comparable, competing goods. From this normal operation of the marketplace, a quality standard, as well as a fair price standard, emerges. But the unimpeded availability of comparable units is necessary for the forces of supply and demand to yield a minimum quality standard. Sales generally provide this unimpeded availability; licenses generally do not. Thus, a standard of merchantability will not develop in a license-only marketplace. The fact that sales are commercially infeasible in the software industry[44] clearly indicates that comparable software will not flow freely in commerce. Consequently, the standard of merchantability cannot develop in the software marketplace.[45]

BERNACCHI & S. LARSEN, *supra* note 39, at 138–39. Further, application by analogy is appropriate only after carefully weighing the policies involved. *See* U.C.C. § 2-105 official comment 1 (1978) (express exclusion of investment securities from Article 2 coverage should not "prevent the application of a particular section of this Article *by analogy* to securities . . . *when the reason of that section makes such application sensible*" (emphasis added)). The express limitation of the warranties to sales should not be lightly dismissed as verbiage by courts overly zealous to protect consumers at the expense of twisting a carefully devised and clearly expressed statutory scheme. *See* WHITE & SUMMERS, *supra* note 20, § 12-12, at 485 (questioning the wisdom of disregarding the literal meaning of the U.C.C.).

44. *See supra* note 41.

45. In almost all cases, the standard of merchantability can develop where sales of goods occur. Thus, the warranty of merchantability is expressly implied in sales contracts. In some instances, the standard may develop where the transaction is not a sale or where the items sold are not goods. The software industry, however, is not one of those instances. *See infra* Part II*B1*.

B. *The Warranty of Merchantability Should Not Be Applied by Analogy to Software Transactions*

The drafters of the U.C.C. expressly limited its overall scope, and many provisions contain further limitations. Certainly the drafters did not include these express limitations only to have them completely read out of the U.C.C. by the courts. Some U.C.C. provisions, however, can be usefully applied even in circumstances not falling within their expressly defined scope. In such cases, the U.C.C. provides a uniform, consistent, and well-reasoned source of contract law, and appropriate provisions should be applied by analogy.[46]

Courts must be careful to examine the underlying policy and purpose of a U.C.C. provision before applying it by analogy. Courts should not apply a U.C.C. provision by analogy unless they can do so usefully. The warranty of merchantability cannot usefully be applied by analogy to computer software transactions for two reasons. First, the standard of "merchantability" cannot be determined for most, if not all, computer software. Second, the software industry must be encouraged to develop rather than burdened with an unreasonably high quality standard which, in practice, its products cannot meet.

1. *The Standard of Merchantability Cannot Meaningfully Be Applied to Software*

The underlying concept of merchantability is that "merchantable goods must . . . be 'honestly' resalable in the normal course of business because they are what they purport to be."[47] Of the minimum requirements of merchantability,[48] only two apply to computer software. To be

46. *See generally* Murray, *supra* note 43.

Three factors encourage courts to apply Article 2 by analogy. First, Article 2 serves as a "relatively simple, quickly available source of law." *Id.* at 480. Second, Article 2 and contract common law are interwoven: they share many of the same concepts. Consequently, many U.C.C. principles will be applied to contracts common law by the same experts who developed them for the U.C.C. *Id.* Third, Article 2 can lend an "aura of authority" to judicial innovation. *Id.*

47. U.C.C. § 2-314 official comment 8 (1978), which discusses how merchantability warranty protection extends to middlemen.

48. Section 2-314(2) (1978) of the U.C.C. sets forth minimum requirements for merchantability:

Goods to be merchantable must be at least such as

(a) pass without objection in the trade under the contract description; and

(b) in the case of fungible goods, are of fair average quality within the description; and

(c) are fit for the ordinary purposes for which such goods are used; and

(d) run, within the variations permitted by the agreement, of even kind, quality and quantity within each unit and among all units involved; and

(e) are adequately contained, packaged, and labeled as the agreement may require; and

(f) conform to the promises or affirmations of fact made on the container or label if any.

For an excellent history of the development of the warranty of merchantability, including the origin merchantable, goods must, *inter alia,* "pass without objection in the trade under the contract description,"[49] and be "fit for the ordinary purposes for which such goods are used."[50]

These measures of merchantability are not useful when applied to software because they can be determined only by comparing the quality of similar goods. Computer programs are so diverse that generic names that can be used in the "contract description" have not appeared. The generic name "word processor," for instance, does not connote a certain quality of "goods," as does a generic name such as "top grade cotton" or "number one potatoes." The "contract description" of computer software does not normally tell the user what identifiable characteristics or minimum functions the program can be expected to meet.[51] Instead, a user can demand that a program do only what it is represented as being able to do, and those representations are express warranties rather than the minimum quality requirements of the warranty of merchantability.

Similarly, the "ordinary purposes for which such goods are used" cannot be determined for most computer programs. A word-processing program, for example, clearly has a different purpose than a NASA program used to calculate space-shot trajectories. Thus, no ordinary purpose exists for a broad category such as "software." But to draw any narrower classifications in a meaningful way is impossible. In order to define the ordinary purposes for which goods are used, similar goods must be grouped together. In order to make a group of "similar" programs, the programs must be compared, and those with similar characteristics put in the same group.

However, qualitative comparison between different computer pro-

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of these requirements, see Llewellyn, *On Warranty of Quality, and Society* (pts. 1 & 2), 36 COLUM. L. REV. 699 (1936), 37 COLUM. L. REV. 341 (1937) (Karl Llewellyn was principal draftsman of U.C.C. Article 2).

49. U.C.C. § 2-314(2)(a) (1978).

50. *Id.* § 2-314(2)(c).

51. As competition in the software industry intensifies, instances may arise where producers of similar programs directly compete with one another and offer the buyer software that is so similar that comparison of the software may be made. If this occurs, contract descriptions may develop that can serve as bases for a standard of merchantability. One such instance may be word-processing programs, which may become sufficiently standardized to give rise to a minimum standard of quality applicable to all such programs. Currently, however, the contract description "word processor" does not connote any minimum function or identifiable characteristic that could form the basis for a merchantability standard.

In the majority of cases, meaningful comparisons cannot be made even between two programs in the same product market. Comparing the quality of two video games, for example, is virtually impossible. Is Pac-Man of better quality than Donkey Kong? There simply are no identifiable characteristics or minimum functions that can be used as a basis for comparing two such video games. Consequently, the contract description "video game" carries with it no particular connotations of quality and cannot be used as a merchantability standard.

grams is difficult. Different computer programs are essentially different ideas, and ideas cover such a broad spectrum that it is virtually impossible to compare them.[52] In that respect, software is much like services. Qualitative comparison cannot be made for services as it is for goods, since the "product" of a service is usually unique and not resalable.[53] Consequently, no equivalence exists among performed services which one may use to determine whether a performed service is average in the trade or whether it can be used for the ordinary purposes for which similar services are used.

In short, because quality comparisons of software cannot be made, the warranty of merchantability cannot meaningfully be implied in computer software contracts. The standard of merchantability would have to be determined by comparing similar programs in order to determine identifying characteristics and minimum functions of that type of program. This cannot be done.[54] Consequently, no minimum quality standard will emerge, and courts will have to apply an indeterminable standard.

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52. Although a book merchant impliedly warrants the tangible, physical properties (such as printing and binding) of the books it sells, the thoughts and ideas conveyed by the book are not warranted. Cardozo v. True, 342 So. 2d 1053, 1056 (Fla. Dist. Ct. App. 1977) (holding that a recipe calling for poisonous mushrooms was not impliedly warranted to be merchantable), *cert. denied,* 353 So. 2d 674 (Fla. 1977). The *Cardozo* court noted that "ideas . . . are not equivalent to commercial products." *Id. See also* Haralampopoulos v. Capital News Agency, Inc., 70 Ill. App. 2d 17, 217 N.E.2d 366 (1966) (court rejected magazine retailer's claim that magazines sold to him, which were legally obscene and thus not fit for resale, were unmerchantable).

Just as a bookseller warrants the quality of the binding of the book but not the quality of the ideas in the book, a distributor of computer programs impliedly warrants the tangible, physical properties of the movable item in the transaction (usually the storage medium, *see supra* note 2), but not the thoughts and ideas sold. The separation of transactions into goods and nongoods portions, and the application of Article 2 concepts only to the goods portion of the transaction, is not a novel idea. *See supra* note 6.

Hybrid software-hardware transactions should also be divided into goods and nongoods portions. Even though most software-hardware producers no longer "bundle" software into hardware transactions, *see supra* note 9, hybrid software-hardware transactions are not uncommon. In hybrid transactions courts should divide the transaction into goods and nongoods portions. The warranty of merchantability should be applied to the goods portion (*see supra* note 6; Holmes, *supra* note 30, at 18–23), and professional negligence theory should be applied to the nongoods portion (*see infra* Part IIIA*1*). In some instances, the hardware may consist of unique goods, however, and the warranty of merchantability should not be applied to any part of the transaction. *See infra* note 54.

53. For example, each patient who receives a heart transplant receives a unique, incomparable "product," since each patient receives a transplant tailored to his unique medical needs. Additionally, the recipient of a heart transplant is unable to sell his transplant, and is thus unable to see if it meets the standards of the marketplace.

54. Even when traditional goods are involved, the warranty of merchantability has not been implied where goods could not be compared with other similar goods.

> [B]ecause the machines were "semi-experimental" prototypes they had no record of past use on which to base a determination of their ordinary purpose. There was no showing that the machines were not "such as pass without objection in the trade under the contract description," UCC § 2-314(2)(a), for there was no trade in goods of the same kind.

Axion Corp. v. G.D.C. Leasing Corp., 359 Mass. 474, 269 N.E.2d 664, 670 (1971) (opinion by

2. *The U.C.C. Approach Discourages Development of New Ideas*

Imposing a warranty of merchantability upon software producers discourages innovation and development in the software industry. Where a meaningful standard of merchantability cannot be determined, as in the case of computer software, courts will tend to allow recovery for any damages, including economic loss, caused by any defect.[55] The standard of merchantability will thereby become one of virtual perfection, and computer software producers will become insurers that their product will perform perfectly.[56]

Justice Braucher, who had formerly been Reporter for the RESTATEMENT (SECOND) OF CONTRACTS). *See also* Binks Mfg. Co. v. National Presto Indus., Inc., 709 F.2d 1109, 1121–22 (7th Cir. 1983); Price Bros. Co. v. Philadelphia Gear Corp., 649 F.2d 416, 424 (6th Cir.) (where "no average or usual standards for determining ordinary performance or quality for the components can be determined, . . . no warranty of merchantability arises from the transaction"), *cert. denied*, 454 U.S. 1099 (1981); Art Press, Ltd. v. Western Printing Mach. Co., No. 82-C-0116 (N.D. Ill. Nov. 18, 1983) (order ruling on summary judgment motion) (available on LEXIS).

55. Goods can be merchantable and yet be considerably short of perfection. WHITE & SUMMERS, *supra* note 20, § 9-7, at 353. *See also* Clark v. DeLaval Separator Corp., 639 F.2d 1320, 1326 (5th Cir. 1981); Special Project, *Article Two Warranties in Commercial Transactions*, 64 CORNELL L. REV. 30, 76 (1978) (the standard of merchantability "is a relativistic standard defined in large part by the norms of the marketplace rather than by notions of perfection").

Without the ability to develop an appropriate standard of merchantability, courts will be forced to choose between being too lenient (no recovery if the software works at all), being too strict (allowing recovery unless the software works perfectly), or applying an arbitrary and unpredictable standard. Given this choice, most courts will probably follow the trend, which has culminated in products liability, of protecting consumers. If that trend is followed, courts will allow recovery for any injury that resulted from using the software.

56. Products liability theory is based on tort principles: it effectively makes manufacturers insurers of the safety of their products. Warranty theory, on the other hand, is based on contract principles: it requires sellers to live up to their contractual obligations. Because the two theories have different underlying bases and are designed to accomplish different purposes, they are not interchangeable.

Before the development of products liability, warranty theory was the only accepted legal theory that courts could use to make manufacturers insurers of the safety of their products. Although warranty theory was ill-suited to this task, it was all that was available. The development of products liability, however, freed the warranty of merchantability from the task of protecting consumers from unreasonably dangerous products. *See* Seely v. White Motor Co., 63 Cal. 2d 9, 403 P.2d 145, 149, 45 Cal. Rptr. 17, 21 (1965); Prosser, *The Assault Upon the Citadel: Strict Liability to the Consumer*, 69 YALE L.J. 1099, 1134 (1960).

There is no longer any need to intermix warranty theory and products liability theory. Because they are analytically distinct, they should be kept separate. Justice Traynor outlined the analytical differences between the two theories:

> The distinction that the law has drawn between tort recovery for physical injuries and warranty recovery for economic loss is not arbitrary and does not rest on the "luck" of one plaintiff in having an accident causing physical injury. The distinction rests, rather, on an understanding of the nature of the responsibility a manufacturer must undertake in distributing his products. He can appropriately be held liable for physical injuries caused by defects by requiring his goods to match a standard of safety defined in terms of conditions that create unreasonable risks of harm. He cannot be held for the level of performance of his products in the consumer's business unless he agrees that the product was designed to meet the consumer's demands. A consumer should not be charged at the will of the manufacturer with bearing the risk of physical injury when he

Imposing such a burden on software producers will unreasonably discourage the development of the software industry. Rather than encouraging experimentation and the development of innovative products, the enormous potential liability which software producers will face as insurers of the perfection of their products will discourage them from putting products on the market.

Research and development of new ideas in the computer industry is vitally important to our nation's economic growth, particularly with the current intense international competition in high-technology fields. Because computers can be used in almost any field, new applications are constantly being developed. If software producers developing new applications are forced to act as insurers of the perfection of their product, the development of new applications will be discouraged. Courts should not impose a restrictive and economically unworkable standard on software producers. Instead, they should apply a workable, fair standard in order to encourage innovation and experimentation.[57]

III. EXISTING THEORIES SHOULD BE APPLIED TO SOFTWARE TRANSACTIONS

Workable alternatives to the warranty of merchantability exist to compensate injured parties. Rather than distorting the express provisions of Article 2, courts should apply these existing theories to software transactions.

> buys a product on the market. He can, however, be fairly charged with the risk that the product will not match his economic expectations unless the manufacturer agrees that it will. Even in actions for negligence, a manufacturer's liability is limited to damages for physical injuries and there is no recovery for economic loss alone.

Seely, 403 P.2d at 151, 45 Cal. Rptr. at 23. Unfortunately, some courts and commentators continue to intermix warranty theory and products liability theory. *See, e.g.*, Greenfield, *Consumer Protection in Service Transactions—Implied Warranty and Strict Liability in Tort*, 1974 UTAH L. REV. 661, 688–96 (assumes that the policies underlying implied warranty theory are the same as those underlying products liability). They are based on distinctly different policies, however, and they should be kept distinct.

57. The software user's need for some minimum level of protection must also be considered. The proper standard must strike a balance between protecting the software user by guaranteeing him a minimally adequate product and protecting the software producer by not requiring her to meet an improperly high standard. This proper balance can be struck by using the professional negligence standard. *See infra* Part IIIA1.

Reliance on a theory other than the implied warranty of merchantability will probably lead to greater protection for software users. Major software producers invariably disclaim the implied warranties. *See, e.g.*, Samuel Black Co. v. Burroughs Corp., No. 78-3077-F (D. Mass. Dec. 18, 1981) (order ruling on summary judgment and other motions) (available on LEXIS); *see also* Gemignani, *Product Liability and Software*, 8 RUTGERS COMPUTER & TECH. L.J. 173, 177 n.16 (1981). By not requiring software producers to choose between meeting an impossible standard or disclaiming it, competition to provide more meaningful warranties would be encouraged to develop among these producers.

Where defective software causes injury to person or property,[58] relief may be appropriate under products liability theory. Where economic injury is alleged (and thus products liability theory is inapplicable), claims under professional negligence theory are appropriate. Moreover, contractual theories such as express warranty, the implied warranty of fitness for a particular purpose,[59] and recovery for breach of an express contract term can provide the basis for relief in appropriate cases.

A. *Tort Theories*

1. *Professional Negligence*

The professional must "exercise reasonable care and the measure of skill and knowledge ordinarily possessed by members in good standing of his profession."[60] The *Restatement (Second) of Torts* applies this standard to anyone "who undertakes to render *services* in the practice of a profession or trade."[61] Software and other intangibles are conceptually similar to services.[62] The standard of conduct required of professionals and skilled tradespeople who render services should also be required of software producers. The professional negligence standard—requiring the use of the knowledge and level of skill typically used in the software industry—would be determined by expert testimony of the software producer's peers,[63] just as it is now in the case of doctors and lawyers.[64] Buyers would be compensated for economic harm only if the producer failed to meet this minimum professional negligence standard.[65]

58. Defective software can injure persons and property. *See* Comment, *Computer Software and Strict Products Liability*, 20 SAN DIEGO L. REV. 439, 440 (1983) (discussing how defective software is suspected of causing personal injuries in the aeronautical and medical fields).

59. U.C.C. § 2-315 (1978).

60. Comment, *Professional Negligence*, 121 U. PA. L. REV. 627, 633 (1973).

61. RESTATEMENT (SECOND) OF TORTS § 299A (1964) (emphasis added).

62. *See supra* note 53 and accompanying text.

63. Involving disinterested computer experts as expert witnesses in the trial process will have an indirect beneficial effect. Courts often seem to have difficulty dealing with scientific and technological concepts. *See generally* Bazelon, *Coping with Technology Through the Legal Process*, 62 CORNELL L. REV. 817 (1977). Testimony from computer professionals who have no stake in the outcome of the litigation will undoubtedly help eliminate judicial confusion with fundamental computer concepts.

64. *See, e.g.*, Robbins v. Footer, 553 F.2d 123, 126–27 (D.C. Cir. 1977) (noting that testimony from expert witnesses is essential in almost all medical malpractice cases).

65. A tort cause of action is usually inappropriate if the only loss is economic. *See infra* note 75. However, economic injury can be compensated under the professional negligence standard. *See* U.S. Fibres, Inc. v. Proctor & Schwartz, Inc., 358 F. Supp. 449, 464 (E.D. Mich. 1972), *aff'd*, 509 F.2d 1043 (6th Cir. 1975). Thus, economic injury can be compensated under either a contract or professional negligence theory; personal or property injury can be compensated under either of those theories as well as other tort theories.

Even though the professional negligence standard seems ideally suited for application to software producers, the court in *Chatlos Systems v. National Cash Register Corp.*[66] "decline[d] the invitation to create" the "new tort" of "computer malpractice."[67] The *Chatlos* court was, however, needlessly and mistakenly concerned that allowing a computer malpractice action would demand "elevated responsibility" of software producers or expose them to "greater potential liability" than would be the case if the action were disallowed.[68] In fact, the opposite is true, since negligence must be proved in a malpractice action, while contract liability is absolute. Thus, greater potential liability will result if the warranty of merchantability is implied than if the tort of computer malpractice is developed.[69]

The professional negligence standard requires only a minimum level of competence, not perfection.[70] Skilled and highly trained people are subject to a higher standard than the lay "reasonable person."[71] Certainly

66. 479 F. Supp. 738 (D.N.J. 1979), *aff'd*, 635 F.2d 1081 (3d Cir. 1980).

67. The *Chatlos* court reasoned that

> The novel concept of a new tort called "computer malpractice" is premised upon a theory of elevated responsibility on the part of those who render computer sales and service. Plaintiff equates the sale and servicing of computer systems with established theories of professional malpractice. Simply because an activity is technically complex and important to the business community does not mean that greater potential liability must attach. In the absence of sound precedential authority, the Court declines the invitation to create a new tort.

Id. at 741 n.1.

The court in Triangle Underwriters, Inc. v. Honeywell, Inc., 604 F.2d 737 (2d Cir. 1979), also tacitly seemed to decline to apply the tort of computer malpractice. However, the *Triangle* court addressed only the question of whether the "continuous treatment" doctrine—that the statute of limitations begins to run only after the last in a continuous series of treatments—applies to computer software-hardware producers, and held that it does not. *Id.* at 744–46. Since the court decided only that limited question, *Triangle* does not indicate that computer malpractice is an unacceptable theory.

68. *Chatlos*, 479 F. Supp. at 741 n.1.

69. The seller's responsibility is greater in a contract action than in a negligence action. In the former, the seller is liable for any breach of express contract terms or of express or implied warranties; the complaining buyer need not prove negligence. *See* Miller, *The Contractual Liability of Physicians and Surgeons*, 1953 WASH. U.L.Q. 413, 417 (noting that the burden on a plaintiff is "immeasurably lighter" in a breach of contract claim than a medical malpractice claim). Thus, the *Chatlos* court's approach—applying Article 2 and its warranty provisions—resulted in broader liability than a negligence approach.

70. The professional negligence "average" standard, *see* RESTATEMENT (SECOND) OF TORTS § 299A (1964), is analogous to the "average" standard of merchantability, *see supra* note 55. Neither demands perfection.

71. *See, e.g.*, Todd Shipyards Corp. v. Turbine Serv., Inc., 467 F. Supp. 1257, 1288 (E.D. La. 1978) (applying the reasonable skill and care of the trade standard to turbine technician), *modified*, 674 F.2d 401 (5th Cir.), *cert. denied*, 103 S. Ct. 448 (1982); U.S. Fibres, Inc. v. Proctor & Schwartz, Inc., 358 F. Supp. 449, 464 (E.D. Mich. 1972) (applying the normal skill and knowledge of the trade standard to product designer and manufacturer); Chambers v. Western Ariz. CATV, 130 Ariz. 605, 638 P.2d 219, 221 (1981) (applying the normal skill and knowledge of the trade standard to TV cable installer); City of Eveleth v. Ruble, 302 Minn. 249, 225 N.W.2d 521, 524–25 (1974) (applying the professional negligence standard to design engineers); Garcia v. Color Tile Distrib.

software producers are skilled and highly trained. There is no reason why they cannot be expected to use their skill and knowledge in a "reasonably competent" manner.[72]

Just as the standard of merchantability has developed into a useful standard by which to judge goods, the 'standard of minimum professionally acceptable conduct'[73] has developed into a useful standard by which to judge services and analogous intangibles. Thus, the tort of computer malpractice requires only a minimum, reasonable standard analogous to the "average" standard of merchantability, not an improperly elevated standard.

2. *Products Liability*

Products liability theory is designed to protect the consumer by requiring the product distributor to pay the cost of injuries and property damage caused by his defective products. Distributors typically have "deeper pockets" than the consumer and are better able to prevent dangerous product defects.[74] But products liability theory has two limitations which make it unsatisfactory to software users.

First, economic damages usually cannot be recovered under products liability theory.[75] Because most disgruntled software users have suffered economic rather than personal or property injury, they are unable to recover under products liability theory.[76]

Co., 75 N.M. 570, 408 P.2d 145, 148 (1965) (applying the skilled tradesperson standard to flooring installers).

72. Nivins v. Sievers Hauling Corp., 424 F. Supp. 82, 89 n.7 (D.N.J. 1976) (applying the reasonably competent standard to crane operator).

73. Banner v. Town of Dayton, 474 P.2d 300, 308 (Wyo. 1970) (applying the standard of minimum professionally acceptable conduct to an engineer).

74. *See* Escola v. Coca Cola Bottling Co., 24 Cal. 2d 453, 150 P.2d 436, 440–41 (1944) (Traynor, J., concurring); RESTATEMENT (SECOND) OF TORTS § 402A comment c (1964). These are tort principles, clearly distinguishable from the contract principles underlying the warranty of merchantability: ensuring that the buyer gets what he agreed to pay for. *See* Seely v. White Motor Co., 63 Cal. 2d 9, 403 P.2d 145, 45 Cal. Rptr. 17 (1965) (Traynor, J.) (discussing and contrasting the policy justifications underlying warranty and products liability). Comparing Justice Traynor's opinions in *Escola* (1944) and *Seely* (1965) gives one a sense of how products liability grew more and more distinct from warranty as it evolved.

75. *See generally* W.P. KEETON, D. OWEN & J. MONTGOMERY, PRODUCTS LIABILITY AND SAFETY 920–33 (1980) (majority view is that economic injury cannot be compensated under tort theories). *See also* RESTATEMENT (SECOND) OF TORTS § 402A(1) (1964) (limiting products liability to physical harm to person or property).

76. *See, e.g.*, APLications, Inc. v. Hewlett-Packard Co., 501 F. Supp. 129 (S.D.N.Y. 1980), *aff'd*, 672 F.2d 1076 (2d Cir. 1982); Applied Data Processing, Inc. v. Burroughs Corp., 394 F. Supp. 504 (D. Conn. 1975).

The principle of Hadley v. Baxendale, 9 Ex. 341, 156 Eng. Rep. 145 (1854), limits the liability of software sellers for consequential damages to those reasonably foreseeable. This limitation on business risk is codified in U.C.C. § 2-715(2)(a) (1978). In the typical software case, at least some

Second, the policies underlying products liability theory do not support extending liability in the case of custom-made software.[77] Thus, only plaintiffs who have suffered either personal or property injury due to an unreasonably dangerous defect in mass-distributed software will be able to recover under products liability theory.

B. Contract Theories: Implied Warranty of Fitness for a Particular Purpose and Express Warranties

The implied warranty of fitness for a particular purpose has also been limited historically to transactions in goods.[78] However, courts have indicated a willingness to extend the scope of the implied warranty of fitness to services, such as architectural designs.[79] The warranty of fitness can also be usefully applied by analogy to many computer software transactions.

In contrast to the implied warranty of merchantability, which is implied in almost all sales of goods, the warranty of fitness for a particular purpose is implied only in the few cases which meet its unique require-

economic damages will be reasonably foreseeable, and the *Hadley v. Baxendale* principle will simply cut off some claims—those for unforeseeable consequential damages—rather than cut off all liability.

77. The policy justifications underlying products liability theory support liability for mass-produced and mass-distributed software, but not for custom-made software. *See* Note, *Negligence: Liability for Defective Software,* 33 OKLA. L. REV. 848 (1980). *See also* Halstead v. United States, 535 F. Supp. 782, 789–91 (D. Conn. 1982) (products liability is incurred for mass-produced maps that contain inaccurate information, but not for defective maps that are custom-made); K-Mart Corp. v. Midcon Realty Group, Ltd., 489 F. Supp. 813, 816–20 (D. Conn. 1980) (products liability doctrine applies only to mass-produced architectural designs, not custom-made designs).

Because the policies underlying warranty and products liability theories differ, it would not be helpful to make a similar distinction between mass-produced and custom-made products in the implied warranty context. Products liability theory is designed to put the burden of injury on the manufacturer in order to spread the risk of injuries and encourage prevention of injuries. This underlying policy supports products liability for mass-produced products, but not custom-made products. There is no analogous policy underlying warranty theory. Consequently, there is no policy reason to distinguish between mass-produced and custom-made products in warranty theory. Although there are no benefits to such an approach, there are costs. To make such a distinction would be to inject "substantive ambiguity into the law of professional malpractice without a favorable trade-off in procedural expedience." City of Mounds View v. Walijarvi, 263 N.W.2d 420, 425 (Minn. 1978).

78. The implied warranty of fitness for a particular purpose is contained in U.C.C. § 2-315 (1978), which provides:

> Where the seller at the time of contracting has reason to know any particular purpose for which the goods are required and that the buyer is relying on the seller's skill or judgment to select or furnish suitable goods, there is unless excluded or modified under the next section an implied warranty that the goods shall be fit for such purpose.

79. Bloomsburg Mills, Inc. v. Sordoni Constr. Co., 401 Pa. 358, 164 A.2d 201, 203 (1960) (an architect impliedly warrants that a structure's design will be reasonably fit for its intended purpose); *see also* Department of Transp. v. Bethlehem Steel Corp., 28 Pa. Commw. 214, 368 A.2d 888, 897 (1977) (Article 2 implied warranties held inapplicable to sale of bridge design plans, but a common law warranty of fitness for a particular purpose is implied).

ments.[80] The warranty requires (1) that the seller know the particular purpose for which the buyer wants the goods, and (2) that the buyer rely on the seller to furnish goods that will accomplish that purpose.[81]

The policy promoted by the warranty justifies courts in extending the scope of the implied warranty of fitness to software transactions. The policy underlying the warranty of fitness is to prevent conduct bordering on the deceptive and the fraudulent. By requiring that the seller know the particular purpose for which the buyer wants the program, the warranty would not be implied except when the seller knows that the buyer expects software of a certain quality. Thus, the underlying policy is similar to that of express warranty, which will be enforced in all transactions.[82] This is reasonable, because the buyer's reliance on the seller to provide software that produces certain results closely approximates a similar reliance on an express statement that it will produce those results.

The Article 2 warranty of fitness applies only to sales.[83] Therefore, before the warranty is implied in the typical software transaction, which is not a sale,[84] the circumstances of the transaction should be carefully examined to see if the warranty can be meaningfully implied.[85] The standards of deception and fraud are similar in all transactions, as opposed to the standard of merchantability which cannot be determined in software transactions. Therefore, the warranty of fitness for a particular purpose should be applicable in the majority of software transactions.

In many cases, there will be no need to determine a negligence standard.[86] In addition to the implied warranty of fitness, the express warranties made by the producer and the express terms of the contract must be

80. Unlike the warranty of merchantability, which is "by far the most important warranty in the Code," WHITE & SUMMERS, *supra* note 20, § 9-5, at 343, the warranty of fitness for a particular purpose has only a "modest place in our jurisprudence" that "has been carefully carved out for it by the drafters and the case law," *id.* § 9-10, at 360.

81. U.C.C. § 2-314 (1978).

82. Express warranties are enforced in all contracts, including those solely for services. *See, e.g.*, Hawkins v. McGee, 84 N.H. 114, 146 A. 641 (1929); Miller, *supra* note 69, at 416–23 ("It seems to be clear law in many jurisdictions that a physician is free to contract as he chooses and will be held to his promises.").

83. The warranty of fitness is implied only between a "buyer" and a "seller." *See* U.C.C. § 2-315 (1978).

84. *See supra* note 39.

85. *See supra* note 43.

As discussed *supra* in Part IIA, Article 2 does not expressly include software within its scope. However, Article 2 provisions can be applied to computer software contracts by analogy where they are meaningful and helpful. Although the warranty of merchantability cannot meaningfully be implied, *see supra* Part IIB, the warranty of fitness can be. It is basically similar to express warranty theory, which is similar in both the goods (U.C.C. § 2-313) (1978) and services (*e.g.*, Hawkins v. McGee, 84 N.H. 114, 146 A. 641 (1929)) areas.

86. *See* Chatlos Sys. v. National Cash Register Corp., 479 F. Supp. 738, 743 n.3 (D.N.J. 1979), *aff'd*, 635 F.2d 1081 (3d Cir. 1980).

honored. Prudent software users will be careful to specify what they expect to receive, and make sure, by requiring compliance with contract terms, express warranties, and the implied warranty of fitness, that they get it.

IV. CONCLUSION

The implied warranty of merchantability has developed into a valuable tool courts can use to protect consumers. However, the warranty of merchantability should only be implied where the standard of merchantability has meaning, and it cannot meaningfully be implied in computer software transactions. Injured parties should look instead to appropriate theories such as professional malpractice, express warranties, and the implied warranty of fitness in seeking compensation for harm caused by defective software.

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