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Software Performance Standards Under Article 2 of the Uniform Commercial Code, 9 Computer L.J. 465 (1989)

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SOFTWARE PERFORMANCE STANDARDS UNDER ARTICLE 2 OF THE UNIFORM COMMERCIAL CODE

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I. INTRODUCTION

The commercial software industry is experiencing very rapid growth. In recent years, the personal computer has evolved from a curious novelty into an indispensable tool. Many businesses rely more heavily on data processing and office automation. Meanwhile, computer users are demanding more functional power from their software products. As software developers respond with more sophisticated systems, the likelihood of hidden defects becomes much greater. Ultimately, the increase in user reliance on software, combined with the increase in complexity of the software, will mean greater risk exposure for software developers.

The Microsoft/IBM Presentation Manager component of the OS/2 microcomputer operating system made its debut in November, 1988. Application software developers, both large and small, are creating software packages to be mass-marketed for use with the powerful OS/2 platform. On another front, the struggle for standardization of the UNIX operating system is also capturing the attention of application developers. The competition is fierce and the pace feverish. The temptation to release a software product prematurely is strong; but, what are the risks involved?

Software developers may be held liable for a defective software product under the law of most states; however, the liability contours are not straightforward. Software presents special problems that strain existing legal doctrine. The highly complex and intangible nature of software makes defects difficult to detect, trace, and isolate. The difficulty of isolating and resolving problems is compounded by the trend toward increasing standardization of software functions and interfaces.

As standardization increases, greater numbers of corporate developers, original equipment manufacturers, and value-added resellers will be involved with selling a single software product.

Further, software is diverse in function, design, and marketability. Consumer expectations are equally diverse. Software developers cannot always foresee the multitude of environments and problems their products will encounter. In addition, software is very expensive to develop and test, yet it depreciates quickly and has the potential for causing extensive economic damage.

This Article will address the quality and performance standards required of mass-marketed software goods by the Uniform Commercial Code (U.C.C.).[1] While the U.C.C. has generally had a strong influence with regard to the sale of tangible goods, until recently, it was virtually ignored in deals involving software products. The traditional view held that the U.C.C. did not apply to software for two reasons: (1) software is intangible and therefore is not a "good," and (2) software is licensed and not sold.[2] However, the traditional view of software, especially mass-marketed software, is quickly giving way to a new analysis. For instance, the U.C.C. has been found to apply to transactions of computer products.[3]

The special features of software are representative of a new technology, but not a basis for excluding software from U.C.C. coverage. As software use and distribution increases, software consumers and distributors will use the U.C.C. to force satisfactory performance levels in software products. Unfortunately, the minimum level of performance required by a software product in order to satisfy the U.C.C. is not entirely clear.

Two basic provisions of the U.C.C. govern a software developer's liability for damages caused by a consumer's purchase and use of a defective software product. First, the U.C.C. creates both express and implied warranty obligations for the seller. Second, the U.C.C. provides remedies for a purchaser who wishes to reject or revoke the acceptance of a defective software product.

II. WARRANTY

Warranties are a statutory creation designed to protect both the

1. The Uniform Commercial Code (U.C.C.) serves as the basis for the commercial transaction law of many states. For example, the Washington State Legislature has adopted much of the U.C.C. in the Revised Code of Washington title 62A (appearing in this Article as WASH. REV. CODE ANN. § 62A.x-xxx).

2. Comment, *The Warranty of Merchantability and Computer Software Contracts: A Square Peg Won't Fit in a Round Hole*, 59 WASH. L. REV. 511 (1984).

3. RRX Industries, Inc. v. Lab-Con, Inc., 772 F.2d 543, 546 (9th Cir. 1985).

buyer and the seller of goods from unfair dealing or false expectations. The U.C.C. provides two categories of warranties: express warranties and implied warranties. Express warranties are those created by statements or promises made by the parties to the transaction. Implied warranties are inherent in the goods themselves or in the conduct of the parties.

There are three types of implied warranties: (1) warranty of title, (2) warranty of fitness for a particular purpose, and (3) warranty of merchantability. Warranty of title is clearly important in a software sales transaction. However, since title is not relevant to the quality or performance of the software itself, warranty of title is beyond the scope of this Article. Express warranties, warranties of fitness for a particular purpose, and warranties of merchantability are closely related to software performance. These three warranties are potent weapons against sellers of defective software. Developers and purchasers of software should be aware of the warranty liability contours.

A. EXPRESS WARRANTY

Section 2-313 of the U.C.C. provides that

> (1) Express warranties by the seller are created as follows:
>
> (a) Any affirmation of fact or promise made by the seller to the buyer which relates to the goods and becomes part of the basis of the bargain creates an express warranty that the goods shall conform to the affirmation or promise.
>
> (b) Any description of the goods which is made part of the basis of the bargain creates an express warranty that the whole of the goods shall conform to the description.[4]
>
> . . .

Thus, express warranties may be created by (1) a representation (affirmation of fact, promise or description of goods) related to the goods *and* (2) forming part of the basis of the bargain.

1. *Representation Related to Goods*

An affirmation or promise made by a seller can take the form of sales or licensing agreements, advertisements, technical data sheets or specifications, user or technical reference manuals, oral statements by the seller, or any other medium by which a seller conveys to a buyer the specific performance or functional capabilities of a software product. Ambiguous statements, general commendations of the product (puffery), and opinions of the seller are not classified as representations creating express warranties.[5] The words "guarantee" or "warranty" are

4. U.C.C. § 2-313 (1988).

5. Baughn v. Honda Motor Co. Ltd., 107 Wash. 2d 127, 152, 727 P.2d 655, 669 (1986).

not necessary for an express warranty to apply.[6]

In three-party transactions, each party (developer, distributor, and buyer) is liable only for his own representations. A developer is not held liable for express warranties made by a distributor if the expression by the distributor is beyond the scope of the developer's representations. The developer would be liable, however, if the distributor is merely an agent under the control of the developer. The developer is more likely to be found liable if the software defect causes physical or bodily harm rather than purely economic harm to the buyer's business or property. The Magnuson-Moss Warranty Act[7] specifies the federal guidelines for written warranties for consumer products.

2. *Basis of the Bargain*

An affirmation of fact pertaining to the goods being purchased will only form an express warranty if the affirmation is part of the basis of the bargain. The U.C.C. does not require the affirmation to be the sole basis for the sale, only that it is a factor in the purchase. "The seller's intent to establish a warranty and the buyer's reliance on the affirmation are not determinative as to whether the representation is a basis of the bargain."[8] The buyer does not need to show that the transaction would not have occurred without the affirmation.

Representations concerning software products can be quite extensive. Since the user and technical documentation and reference manuals make affirmations as to the functional and performance characteristics of the software, care should be taken to accurately and completely describe the product's capabilities. Limitations and known defects should be conspicuously identified. The hardware and operating system support that is required should be clearly specified. Terms of art or computer jargon (i.e., compatible, portable, user friendly) should be fully defined, or avoided, as these terms can be easily misconstrued and may change in meaning over time. Even the product's generic name (i.e., spreadsheet, database, word processor) may present problems if the product does not live up to the expectations of the computer trade under that name.

Express warranties are the most powerful form of warranty protection because they presume the parties have discussed or, at least, been aware of the representation or affirmation in question. Unfortunately, most software transactions are too complex to allow for sufficient discussion or consideration of all of the aspects of the product. The U.C.C.

6. Gladden v. Cadillac Motor Car Div., 83 N.J. 320, 325, 416 A.2d 394, 396 (1980).

7. Pub. L. No. 93-637, 88 Stat. 2183 (1975) (codified as amended at 15 U.S.C. §§ 2301-12 (1982)).

8. Ewers v. Eisenzopf, 88 Wis. 2d 482, 488, 276 N.W.2d 802, 805 (1979).

provides implied warranties to enforce a minimum level of product performance expected by a reasonable buyer or the computer trade as a whole. Two forms of implied warranties accomplish this task: warranty of fitness for a particular purpose and warranty of merchantability.

B. IMPLIED WARRANTY

1. *Implied Warranty of Fitness for a Particular Purpose*

Implied warranty of fitness for a particular purpose is created 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."[9]

For an implied warranty of fitness for a particular purpose to exist, (1) the seller must know of the buyer's particular purpose for the product, (2) the buyer must rely on the seller's skill in selecting goods, and (3) the seller must know of the buyer's reliance.[10] These are questions of fact to be determined by the jury.[11] The U.C.C. section 2-315 warranty of fitness for a particular purpose is based on a special reliance by the buyer on the seller to provide goods that will perform a specific use envisaged and communicated by the buyer.[12] The warranty of fitness for a particular purpose is more narrow and more specific than the warranty of merchantability.[13] The implied warranty of fitness for a particular purpose is also narrower than express warranties since the representation in the case of a warranty of fitness must be shown to have been relied upon by the buyer. No such showing is required for an express warranty.

In the distribution of mass-marketed software, the developer does not normally run afoul of the warranty of fitness. This warranty is strictly limited to cases where the seller knows of a buyer's specific requirements and causes his reliance. The developer's lack of this specific knowledge insulates him from liability under this warranty. For example, one court found that no implied warranty of fitness for a particular purpose is created under U.C.C. section 2-315 when a manufacturer distributes technical data sheets and advertising material.[14] Another court found that no warranty existed where defendants did not rely on plain-

9. U.C.C. § 2-315 (1988).

10. Fiat Auto U.S.A., Inc. v. Hollums, 185 Ga. App. 113, 113-14, 363 S.E.2d 312, 314 (1987).

11. Van Wyk v. Norden Laboratories, 345 N.W.2d 81, 84 (Iowa 1984).

12. Barrington Corp. v. Patrick Lumber Co., 447 So. 2d 785, 787 (Ala. Ct. App. 1984).

13. International Petroleum Servs., Inc. v. S & N Well Serv., Inc., 230 Kan. 452, 461, 639 P.2d 29, 37 (1982).

14. Friendship Heights v. Koubek, 573 F. Supp. 100 (D. Md. 1983).

tiff's skill or judgment to select or furnish a computer (which proved unsatisfactory) for their medical clinic, but chose their particular computer based on one doctor's personal experience using one at another medical clinic.[15]

Software developers should be concerned with the warranty of fitness when structuring their product distribution chain. The individuals most likely to trigger the warranty of fitness are the distributor/seller representatives dealing directly with the public. These individuals often become aware of a buyer's specific purpose for a software product and may cause reliance when they suggest solutions. A developer who sells his own product or maintains control over sales agents may become liable under the warranty of fitness if the sales agents get too involved or are overly zealous in selling the product. To effectively protect himself from the warranty of fitness, a developer may want to create an independent distributor relationship.

2. *Implied Warranty of Merchantability*

Warranty of merchantability differs from warranty of fitness for a particular purpose in that the former envisages ordinary purpose while the latter envisages a specific use by a buyer particular to the nature of his business.[16] One court has stated that the U.C.C. section 2-314 warranty of merchantability is

> based on a purchaser's reasonable expectation that goods purchased from a merchant with respect to goods of that kind will be free of significant defects and will perform in a way that goods of that kind should perform. It presupposes no special relationship of trust or reliance between buyer and seller in contrast to section 2-315.[17]

The warranty of merchantability provides the minimum threshold of warranty liability against a defective product. Unlike express warranties or warranties of fitness for a particular purpose, the warranty of merchantability does not focus on the conduct of the parties to the transaction. Instead, the goods themselves are tested against the minimal standards of performance expected in the relevant trade or industry. There are two elements of the test for merchantability: (1) the seller must be a merchant of the kind of goods involved, and (2) the goods must at least be fit for the purpose for which such goods are ordinarily used.[18]

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15. All-States Leasing Co. v. Ochs, 42 Or. App. 319, 333-34, 600 P.2d 899, 909 (1979).

16. Fiat Auto U.S.A., Inc. v. Hollums, 185 Ga. App. 113, 363 S.E.2d 312 (1987).

17. Van Wyk v. Norden Laboratories, Inc., 345 N.W.2d 81, 85 (Iowa 1984).

18. U.C.C. § 2-314 (1988).

a. Merchant status

"Warranty of merchantability is implied in a sale of goods if the seller is a merchant in that kind of goods."[19] To be considered a merchant under the U.C.C., a person must either (1) deal in goods of the kind in question, or (2) hold himself out as having knowledge or skill particularly related to the goods involved.[20] A person who holds himself out to the public as a professional in computer systems may thus be regarded as a merchant subject to the U.C.C..[21]

Most software developers, distributors, and sellers in the software or computer system business fall within the merchant definition. If software is an ancillary or peripheral part of the business, the question of merchant status may be arguable. However, it seems that in most situations, courts would tend to find that merchant status to be applicable.

b. Fit for ordinary purposes

The second element of merchantability sets the minimal standard of quality goods must meet. To be merchantable, goods must (1) be of high enough quality to "pass without objection in the trade under the contract description,"[22] and (2) be "fit for the ordinary purposes for which such goods are used."[23] Whether products conform to the standard of like products used in the trade is a question of fact to be decided by the jury. A typical method of proof is the use of testimony of persons familiar with industry standards and local practices.[24]

Two questions lead to the determination of merchantability. First, what is the ordinary purpose for which the goods are to be used? Second, were the goods suited for that purpose when they left the manufacturer's control?[25] "The implied warranty of merchantability is not intended to guarantee that the goods be the best or of the highest quality—the standard is measured by the generally acceptable quality under the description used in the contract."[26] Perfection is not required.[27]

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19. Dickerson v. Mountain View Equip. Co., 109 Idaho 711, 714, 710 P.2d 621, 624 (Idaho Ct. App. 1985).

20. U.C.C. § 2-104(1) (1988). *See also* Moore v. Schinmann, 40 Wash. App. 705, 709, 700 P.2d 754, 756 (1985).

21. Neilson Business Equip. Center v. Italo V. Monteleone, M.D., P.A., 524 A.2d 1172, 1175 n.4 (Del. 1987).

22. U.C.C. § 2-314(2)(a) (1988).

23. *Id.* § 2-314(2)(c). *See also* Royal Typewriter v. Xerographic Supplies Corp., 719 F.2d 1092, 1099 (11th Cir. 1983); Lancaster Glass Corp. v. Philips ECG, Inc., 835 F.2d 652, 661 (6th Cir. 1987); Thomas v. Ruddell Lease-Sales, Inc., 43 Wash. App. 208, 214, 716 P.2d 911, 915 (1986).

24. Pisano v. American Leasing, 146 Cal. App. 3d 194, 198, 194 Cal. Rptr. 77, 80 (1983).

25. Moldex, Inc. v. Ogden Eng'g Corp., 652 F. Supp. 584, 590 (D. Conn. 1987).

26. Dickerson v. Mountain View Equip. Co., 109 Idaho 711, 714, 710 P.2d 621, 624

Further, the goods are not required to precisely fulfill the expectations of the buyer.[28] A breach of implied warranty of merchantability may occur even though the merchant does not know of the defect.[29]

The ordinary purpose standard under the U.C.C. is vague as it relates to the performance of software, and few judicial precedents have shed light on the issue. Nevertheless, the U.C.C. standard is the one courts use to determine liability under an implied warranty of merchantability. With this in mind, software developers can take steps to anticipate and prepare a defense against an action brought under an alleged breach of the warranty of merchantability. First, a quality assurance program should be in place for validating the proper operation of software products and for tracking known problems. While quality assurance may already be a part of most development structures, it is often neglected under deadline pressures. Test plans and test results should be saved and recorded. Out-dated engineering and release versions of software should be archived. Problem reports and status should be tracked. The U.C.C. does not require perfect software, but developers must be able to present convincing evidence that reasonable and professional steps were taken to provide a quality product.

Another way that developers can protect against U.C.C. scrutiny is to keep abreast of competitors and trade developments. Since the U.C.C. uses the relevant trade as the basis for a definition of ordinary purpose, the trade expectations must be identified. Software developers should (1) keep a file of the competitor's advertising and product descriptions, (2) collect articles from periodicals or trade journals, (3) attend conventions and exhibitions, and (4) update business and marketing plans on a regular basis.

Developers are also advised to know who is using their product and how they are using it. "A seller is required to anticipate the environment in which it is reasonable for its product to be used."[30] This may be the source of trouble if a software product is likely to be used in an incompatible or unsupported hardware or operating system environment, or if the product is prone to misuse. If the developer foresees that using the software product in certain applications will lead to

(Idaho Ct. App. 1985) (citing American Fertilizer Specialists, Inc. v. Wood, 635 P.2d 592 (Okla. 1981)).

27. *Id.*; *see also* Pronti v. D.M.L. of Elmira, Inc., 103 A.D.2d 916, 917, 478 N.Y.S.2d 156, 158 (1984); Gross v. Systems Eng'g Corp., 36 U.C.C. Rep. Serv. (Callaghan) 42, 56 (E.D. Pa. 1983).

28. Skelton v. General Motors Corp., 500 F. Supp. 1181, 1191 (D.C.N.D. Ill. 1980).

29. Christenson v. Milde, 402 N.W.2d 610, 613 (Minn. Ct. App. 1987).

30. Delano Growers' Cooperative Winery v. Supreme Wine Co., 393 Mass. 666, 674, 473 N.E.2d 1066, 1072 (1985).

problems, the developer should state these "problem" applications prominently in product advertising or documentation.

Manufacturers and sellers do not owe a duty to warn or instruct experienced product users. They "should be able to presume mastery of basic operations by experts or professionals in the industry."[31] The developer must be able to define the intended and actual ordinary use of the product. This will indirectly identify abnormal or improper uses. Even if plaintiff is harmed, manufacturer may show lack of breach if buyer's use was not ordinary or was abnormal.[32] No warranty of merchantability arises when a system is designed and manufactured by a developer at the buyer's request since the system is unique; such a system has no ordinary purpose.[33]

C. PRIVITY AND THREE-PARTY TRANSACTIONS

Warranty protection does not extend to all buyers or end-users of a product. The judicial interpretation of the U.C.C. limits the reach of warranties to only those parties with whom the developer has a contractual relationship (privity of contract). Absent privity of contract, a manufacturer of goods will not be liable to a buyer of the goods for economic loss resulting from the breach of U.C.C. warranties.[34] This privity requirement is clearly satisfied between the developer and the buyer, without a formal contract of sale, if the buyer buys directly from the developer.[35] However, privity may be a problem in three or more party transactions, such as between a developer, distributor, and buyer. The following issues should be analyzed in determining whether the privity requirement is satisfied: (1) the type of warranty alleged, (2) the type of damage that could have been caused by the product, and (3) the contractual relationship between the developer and the buyer.

1. *Type of Warranty*

Privity of contract is necessary only for implied warranties. Privity of contract is not required to enforce an express warranty in order to recover for purely economic loss.[36] The buyer is allowed to rely on the express affirmations of the developer made in advertising or documentation, even without direct dealings with the developer. A buyer does not automatically benefit from implied warranties unless the buyer has

31. Guaranteed Const. Co. v. Gold Bond Prods., 153 Mich. App. 385, 397, 395 N.W.2d 332, 338 (1986).

32. Peterson v. Bendix Home Systems, 318 N.W.2d 50, 53 (Minn. 1982).

33. Bink Mfg. Co. v. National Presto Indus., 709 F.2d 1109, 1121 (7th Cir. 1983).

34. *See, e.g.*, Flory v. Silvercrest Indus., Inc., 129 Ariz. 574, 579, 633 P.2d 383, 388 (1981).

35. Sheppard v. Revlon, Inc., 267 So. 2d 662, 664 (Fla. Ct. App. 1972).

36. Dravo Equip. Co. v. German, 73 Or. App. 165, 170, 698 P.2d 63, 66 (1985).

given notice or benefit to the developer through some contractual relationship. This is a key difference between the power of express warranties versus implied warranties.

2. *Type of Damage*

With regard to defective computer related items, actions for purely economic loss should be governed by the law of contracts and not by the law of torts.[37] Under contract law, privity is a prerequisite to recovery where a defective product is not inherently dangerous, and the buyer has suffered only economic losses. Thus, a person purchasing a product, that is not inherently dangerous, but is defective, is not entitled to compensation for economic loss under the warranty of fitness and merchantability theories when there is no privity of contract between the purchaser and the seller. Accordingly, one court found that the purchaser of a computer and defective hard disk had no cause of action for economic loss based on breach of warranty of fitness and merchantability against the manufacturer with which he had not dealt.[38] Similarly, a purchaser who had purchased goods through a retailer was found to lack the requisite privity of contract with the manufacturer and had no cause of action for breach of implied warranty against the manufacturer where the damages claimed consisted solely of alleged economic loss as opposed to personal injury or property damage.[39]

It should be noted that privity may not be a prerequisite to warranty liability where a product causes personal or property damage. Software products do not usually cause personal or property damage, so privity is generally required. However, as mass-marketed software is used more to control mechanical or environmental processes, personal injury or property damage proximately caused by defective software is more likely to occur. The foreseeability of the type of damage that might result from defective software products could become a significant issue.

3. *Contractual Relationship*

Since privity of contract is required where a buyer alleges a breach of an implied warranty with resultant economic damage, it must be determined whether the relationship between the developer and the

37. Adkison Corp. v. American Bldg. Co., 39 U.C.C. Rep. Serv. (Callaghan) 98, 101 (Idaho 1984).

38. Professional Lens Plan, Inc. v. Polaris Leasing Corp., 234 Kan. 742, 755, 675 P.2d 887, 898 (1984).

39. Gross v. Systems Eng'g Corp., 36 U.C.C. Rep. Serv. (Callaghan) 42, 54 (E.D. Pa. 1983).

buyer or other plaintiff constitutes privity of contract. In two-party transactions between the developer and the buyer, privity exists merely by virtue of the sale itself. The difficulty usually arises in three-party transactions involving the developer, a distributor or seller, and a buyer. For example, in a case where the plaintiff purchased the allegedly defective product from the defendant manufacturer's distributor, and not from the defendant, a court found there was no privity of contract and properly refused the warranty claim.[40]

In multiple-party distribution chains, the relationship of the developer with the distributor or seller becomes important. Privity will attach, as if the buyer had dealt directly with the developer, where the contractual arrangements between the manufacturer and the dealer create an agency relationship. Agency exists where it is shown that the manufacturer's agents participate significantly in the sale by means of advertising, personal contact with the buyer, purchasing negotiations, repair, or putting his name on the computer.[41] If the distributor is independent from the developer, the distributor may incur liability, himself, for the developer's defective product. Where the seller was more than a mere conduit between the manufacturer and the buyer, "in the absence of an indemnification agreement between a manufacturer and a seller, the seller's express warranty [to buyer] creates joint liability with manufacturer," and the seller is not entitled to indemnity from the manufacturer.[42] A court would also apply "implied warranty principles to a franchisor who causes a product to enter the stream of commerce, engages in extensive advertising to promote the sales of the product, and controls the specifications and requirements of the product."[43] Implied warranty liability also extends to the manufacturer of component parts. However, the "lack of fitness must be found in the component parts before they leave the component parts manufacturer, and not merely in the completed system."[44] Thus, a developer of software drivers, dynamic link libraries, or component software may also be liable under an implied warranty theory.

D. Disclaimer and Limitation of Warranties

1. *Express Warranty Disclaimer and Limitation*

A disclaimer is an express, and usually written, statement made by a seller/developer prior to sale that seeks to limit or negate the seller's liability for a defect in his product. Disclaimers and limitations attempt

40. Davis v. Homasote Co., 281 Or. 383, 386, 574 P.2d 1116, 1117-18 (1978).
41. Ridge Co. v. NCR Corp., 597 F. Supp. 1239, 1242 (N.D. Ind. 1984).
42. Rottinghaus v. Howell, 35 Wash. App. 99, 112, 666 P.2d 899, 907 (1983).
43. Harris v. Aluminum Co. of Am., 550 F. Supp. 1024, 1028 (W.D. Va. 1982).
44. Union Supply Co. v. Pust, 196 Colo. 162, 175, 583 P.2d 276, 285 (1978).

to shift to the buyer part or all of the risk of defect. While the U.C.C. "allows a seller to give warranties and also to limit or exclude them, [d]isclaimers . . . are not favored in the law."[45] Disclaimer of an express warranty is especially disfavored. In the state of Washington, the statute dealing with disclaimer, Revised Code of Washington section 62A.2-316, does not explicitly provide for a disclaimer of express warranties as it does for implied warranties.[46] An express warranty is not disclaimed by the use of a "buyer accepts product as is" clause.[47] The Revised Code of Washington section 62A.2-316(1) provides that an attempted disclaimer of an express warranty is inoperative when such negation or limitation is inconsistent with the language creating the express warranty.[48] The express warranty arguably takes precedence over an inconsistent disclaimer. A general disclaimer purporting to disclaim "all warranties, express or implied" is inoperative as to express warranties contained in advertising material and owner's manuals.[49]

Express warranties are very difficult, if not impossible, to disclaim in Washington. If the software product cannot perform as described in advertisements or documentation, a developer risks express warranty liability.

Limitations of express warranties are more enforceable than flat disclaimers. Time limitations, such as those limiting a warranty to a 60 or 90 day period, have been successful for computer hardware products. It is a "custom of the computer industry to limit a purchaser's warranties and remedies to a 60 or 90 day period since hardware problems in existence at the time of delivery of a computer manifest themselves [during] that period."[50] This custom becomes part of the contract between purchaser of computer and manufacturer.[51]

The theory that most hardware defects manifest themselves within the 60 or 90 day period may not be validly extended to software. The latency of defects in software will increase as software complexity increases. A buyer may effectively argue that 90 days is not a sufficient time period to exercise the complete functionality of a software product. In fact, a buyer may not have the required support hardware or

45. Hartwig Farms, Inc. v. Pacific Gamble Robinson Co., 28 Wash. App. 539, 541-42, 625 P.2d 171, 173 (1981).

46. WASH. REV. CODE ANN. § 62A.2-316 (1965 & Supp. 1989).

47. Shelton v. Farkas, 30 Wash. App. 549, 554 n.8, 635 P.2d 1109, 1113 n.8 (1981) (citing WASH. REV. CODE ANN. § 62A.2-316(3)(a)).

48. WASH. REV. CODE ANN. § 62A.2-316(1) (1965).

49. Jensen v. Seigel Mobile Homes Group, 105 Idaho 189, 195, 668 P.2d 65, 71-72 (1983).

50. Gross v. Systems Eng'g Corp., 36 U.C.C. Rep. Serv. (Callaghan) 42, 54 (E.D. Pa. 1983).

51. *Id.*

software that allows full use of the product. Although including a limitation clause in a sales agreement will not be detrimental, the effectiveness of express warranty limitations relating to software is less certain than with the same type of limitations relating to hardware.

2. *Implied Warranty Disclaimer and Limitation*

While disclaimer of express warranties is usually ineffective, disclaimer of implied warranties is generally enforced. Disclaimer of warranty is an affirmative defense, and the burden of establishing it rests with the seller.[52]

There are several conditions required before a disclaimer or limitation will be enforceable. A disclaimer or limitation of implied warranties "must be clear, conspicuous, conscionable, and consciously bargained for, and, in the case of an implied warranty of fitness for a particular purpose, the disclaimer must be in writing."[53] In addition, a disclaimer of warranties "must be explicitly negotiated and bargained for and it must set forth with particularity the qualities and characteristics being disclaimed."[54] In order to disclaim a warranty of merchantability, the disclaimer must include the term "merchantability".[55] Disclaimer of implied warranties concerning consumer goods (not for commercial business use) require specific definition of the characteristics and qualities not being warranted.[56]

a. Clear and specific

A disclaimer of implied warranties as to non-consumer goods can be as simple as the following: "Manufacturer disclaims all warranties express or implied including but not limited to the implied warranties of merchantability and fitness for a particular purpose." A disclaimer for consumer goods must be more specific. The disclaimer should mention the time period covered by the warranty, the features or performance of the software not warranted, the remedies available to the buyer, and a repair or replace limitation or a return for purchase price policy. Disclaimers that predominantly favor the developer, while leaving the buyer without a fair remedy, may be held to be unconscionable and therefore void.

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52. De Coria v. Red's Trailer Mart, 5 Wash. App. 892, 896, 491 P.2d 241, 244 (1971).

53. Royal Business Machs., Inc. v. Lorraine Corp., 633 F.2d 34, 46 (7th Cir. 1980).

54. Rottinghaus v. Howell, 35 Wash. App. 99, 103, 666 P.2d 899, 903 (1983).

55. Butcher v. Garrett-Enumclaw Co., 20 Wash. App. 2d 361, 370, 581 P.2d 1352, 1359 (1978).

56. WASH. REV. CODE ANN. § 62A.2-316(4) (Supp. 1989).

b. Conspicuous and negotiated

The requirement that disclaimers be conspicuous and bargained for is largely an issue of notice. If a buyer is unaware of a potential disclaimer, he cannot effectively bargain for it. The buyer must be aware of the scope of the developer's warranties to prevent unexpected limitations and also to ensure that the buyer's decision to purchase is an informed decision.

Italicized disclaimers, that appeared on the reverse sides of the first two pages of the contract, far from the location of the buyer's signature and without headings noting the disclaimers, were held to be inconspicuous.[57] A disclaimer printed in boldface type twice as large as the other terms of the agreement was held to be conspicuous.[58] Conspicuousness is a question of fact decided by the jury.

Even if the disclaimer is conspicuous, or the buyer has actual knowledge of it, no disclaimer can be effective without negotiation and agreement. There must be assent as well as knowledge.[59] The shrink wrap agreements commonly used in mass-marketed software imply assent from the removal of the wrapper.[60] The shrink wrap methodology has been widely used, but the negotiation component is weak. The product is usually purchased and delivered before the shrink wrap agreement surfaces.[61] Buyers excited about trying their new purchase are hardly in a frame of mind to read and comprehend legal agreements.

A better way to ensure knowledge and assent is to have the buyer read an easily understood sales agreement before he purchases the product, and then place his initials near any warranty disclaimers. This is especially important for pre-printed sales or licensing contracts.

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57. Office Supply Co. v. Basic/Four Corp., 538 F. Supp. 776 (E.D. Wis. 1982).

58. A & M Produce Co. v. F.M.C. Corp., 135 Cal. App. 3d 473, 186 Cal. Rptr. 114 (1982).

59. Hartwig Farms, Inc. v. Pacific Gamble Robinson Co., 28 Wash. App. 539, 540, 625 P.2d 171 (1981).

60. For example, the envelope containing WordPerfect's Overdrive™ software diskette, version 1.10, is sealed with a sticker that reads:

> STOP!
> BEFORE YOU OPEN THIS PACKAGE
> carefully read the license and copy procedure in the USER'S MANUAL.
> Opening this package indicates that you agree to abide by the license. If you do not agree with it, promptly return the software with this package unopened and your money will be refunded.

61. The Overdrive ™ envelope is inside the backcover of the software manual, and the manual is enclosed in shrink-wrap while on the sales' shelf. Therefore, a purchaser has no reason to know of the agreement's existence—much less a chance to read the agreement before purchasing the program.

III. REJECTION OR REVOCATION OF ACCEPTANCE

Warranties are one form of buyer protection offered by the U.C.C.. The other form of protection against defective software is a standard by which a buyer may (1) reject the delivery or acceptance of a product found to be defective, or (2) revoke the acceptance of purchased but defective goods. The rejection/revocation standard differs from warranties in two important ways. First, the analysis performed and the standard applied by the court under a warranty theory is different than the standard applied under a rejection/revocation theory; thus, the liability threshold is different. Second, the remedies offered for a breach of warranty differ from the remedies for rejection or revocation of acceptance. Warranty remedies only provide compensation for the reduced value of the product and not for the return of the entire purchase price.

The fundamental difference between warranty and rejection/revocation standards stem from the issue of acceptance. If a buyer accepts a sales or licensing agreement without revocation, the transaction remains intact and only warranty remedies are available. Under a rejection/revocation theory, the buyer seeks to void the transaction because of some substantial defect in the product. The rejection/revocation remedies are more comprehensive than warranty remedies. Developers risk greater liability if the buyer is successful in voiding the sale. The rejection/revocation theory and associated remedies are discussed below.

A. REJECTION OF GOODS NOT ACCEPTED

A buyer accepts goods whenever he performs the acts necessary to complete the transaction. These acts include paying the purchase price, signing a promissory note, or signing a licensing agreement. Prior to that time, the buyer may reject the goods if they do not conform to the description and specifications of the product relied upon by the buyer.

Rejection of a mass-marketed software product is unlikely to occur in most consumer transactions. The sale is usually completed before the buyer leaves the store. Rejection is more likely to occur between a developer and an original equipment manufacturer (OEM) or a value-added reseller (VAR). OEMs and VARs often receive pre-release or engineering versions of software that may not be completely tested. Further, frequent transactions with a developer may foster sloppy accounting and quality assurance practices. Rejection may be a practical way to abruptly draw the developer's attention to quality problems.

B. REVOCATION OF ACCEPTANCE

Rejection is allowed up to the point where the buyer manifests ac-

ceptance of the goods. Although the events that trigger acceptance are not always clear, rejection usually occurs early in the transaction before long-term damage develops. More significant problems arise when defects in the software appear after the transaction has been completed and the goods accepted. This is, by far, the most common scenario with respect to software products. Defects or limitations are inherently latent in complex software packages. Months or years may elapse before flaws are detected. Lay users may be unable to isolate problems quickly. Software may be ill-suited to handle different hardware configurations or throughput loads even though the developer gave assurances at the time of the sale. Software compatibility with other hardware or software often falls short of expectations once tested. Without a remedy, purchasers would be required to assume all of the risk for an intangible product that is too complex to thoroughly test prior to acceptance.

The U.C.C. provides a method for shifting some of the burden back to the developer even after acceptance of the product has occurred. Under certain conditions, the buyer may revoke the acceptance of the product and thereby qualify for return of the purchase price plus costs. The rights and duties of the buyer are the same for both rejection and revocation of acceptance.[62]

In order to revoke acceptance, the buyer must establish five elements: (1) nonconformity substantially impairs the value of the product; (2) acceptance of the goods was caused by the reasonable assumption that the nonconformity would be cured, due to the difficulty of discovering the nonconformity, or the seller's assurances; (3) revocation occurred a reasonable time after the buyer discovered or should have discovered the grounds for it; (4) revocation occurred before any substantial change in the condition of the goods which was not caused by their own defects; and (5) he has given notice to the seller.[63]

The revocation elements of greatest interest to the software community are the first and third—the requirement of substantial impairment of value and revocation within a reasonable time. The second element of the revocation test is usually easy to show, since software defects are very difficult to detect, and thus the purchaser can expect that any nonconformities will be cured. The fourth element may be a concern if the software is sold to a third party or modified in some way, and, if so, this element is somewhat analogous to the privity requirement under warranty. The fifth element, notice, is closely tied to the requirement of revocation after a reasonable time.

62. U.C.C. § 2-601 (1988) (rejection); *Id.* § 2-608 (revocation); Cardwell v. International Housing, Inc., 282 Pa. Super. 498, 423 A.2d 355 (1980).

63. Eaton Corp. v. Magnavox Co., 581 F. Supp. 1514, 1529 (E.D. Mich. 1984).

1. *Substantial Impaired Value*

The issue of substantial impaired value is at the heart of the legal standard for software performance. Although prior to acceptance, a buyer may reject goods for any nonconformity, whether curable or not, after acceptance the buyer may revoke acceptance only if the nonconformity substantially impairs the value of the goods to him. This provision protects the seller from revocation for trivial defects. It also prevents the buyer from taking undue advantage of the seller by allowing goods to depreciate and then returning them because of asserted minor defects.[64] The return of a software product to the developer is particularly unsavory because of the ease with which software can be copied.

The problem for a court is how to determine when software is substantially impaired. How many flaws or limitations in a software product are necessary before the sale is voidable? The answer to this question will never be definitive; yet, the court uses a definite method of analysis to determine if a software product is substantially impaired or does not conform to the product description and specifications. Developers and purchasers can minimize their risk of liability or loss if they are aware of this analysis structure and take appropriate action before and after the sale.

Courts use two standards to determine whether substantiality of impairment is sufficient to revoke acceptance of goods under section 2-608. The first is a subjective standard measured by the buyer's needs, circumstances, and reaction to the nonconformity. The second is an objective standard measured by such considerations as market or commercial value, reliability, safety, usefulness for purposes for which similar goods are generally used, and the seller's ability or willingness to seasonably cure the non-conformity.[65]

a. Subjective component

The first step in measuring substantial conformity within the meaning of section 2-608 is to determine the degree to which the goods were able to meet the expectations of the plaintiff/buyer. That inquiry is subjective since it considers the needs and circumstances of the particular, not the average, buyer.[66] The particular circumstances of the buyer are considered even though the seller may have no advance knowledge of those needs and even though those needs may change af-

64. Ramirez v. Autosport, 88 N.J. 277, 286, 440 A.2d 1345, 1350 (1982).

65. Wright v. O'Neal Motors, Inc., 57 N.C. App. 49, 51-52, 291 S.E.2d 165, 167 (1982).

66. Fullerton Aircraft Sales & Rentals, Inc. v. Page Airjet Corp., 3 U.C.C. Rep. Serv. 2d (Callaghan) 1393, 1396 (4th Cir. 1987).

ter acceptance.[67] The subjective component encourages developers to consider the circumstances of the foreseeable users of their products. This is more difficult with software products since the user community can be very diverse. A spreadsheet product, for instance, may be used (1) in inventory control at a grocery store, (2) for financial analysis of stock by a brokerage firm, or (3) to track chemical reactions in a research lab. The situation is exacerbated by the endless variation of hardware configurations typical in the end user market. Developers are required by the subjective component to analyze their market, design software to accommodate the user, and test their products for the range of foreseeable situations.

b. Objective component

The second inquiry is whether the nonconformity, in fact, substantially impairs the value of the goods to that particular buyer. This determination requires evidence beyond the plaintiff's assertion that the value was impaired; objective proof is needed.[68] Whether the nonconformity of a particular good substantially impairs its value is determined objectively with reference to the buyer's particular circumstances, and not by his or her unarticulated subjective desires. Substantial impairment is a factual question decided by the jury.[69]

The objective component is similar to the ordinary purpose test of merchantability under a warranty theory. The expectations of the computer trade influence this determination. As the computer sophistication of the general public increases, software products will be expected to perform at higher levels of functionality and reliability. For this reason, developers must track industry trends, research competitors, and formulate long range marketing plans.

c. Examples of substantially impaired software products

Buyer purchased a computer system, and as soon as he began to use it, he discovered that the software program did not conform to what he had been promised; he complained to Seller immediately. Seller assured Buyer that the problems could be corrected. For six months, Seller tried to fix the system, to no avail; the problems were not corrected. Buyer demanded that if the system could not be fixed, he wanted it removed and his money returned. A court held that Buyer's actions did not constitute "acceptance" under the Code; thus, Buyer was not limited to damages for breach of warranty of accepted goods under

67. Rester v. Morrow, 491 So. 2d 204, 211 (Miss. 1986).

68. *Fullerton Aircraft*, 3 U.C.C. Rep. Serv. 2d (Callaghan) at 1394.

69. Aubrey's R.V. Center, Inc. v. Tandy Corp., 46 Wash. App. 595, 731 P.2d 1124 (1987).

section 2-714(2). Instead, the trial court awarded damages to Buyer equal to the purchase price plus costs, pursuant to section 2-711(1).[70]

The evidence supported the finding that the computer software's defects substantially impaired its value to the buyer. Where the principal reason for purchase of the software was to perform point-of-sale/inventory control and retail sales computation functions, the software did not function as represented. Although the hardware and some minor portions of the software performed as represented, the system as an integrated whole, did not.[71]

2. *Reasonable Time*

Revocation of acceptance is allowed only if the buyer notifies the developer of the problem within a reasonable time after the sale. A notice of revocation is not required to be in any particular form and may be implied from conduct. Reasonable time in which to give notice is a question of fact to be determined from the particular circumstances of the case.[72]

Software depreciates rapidly. Therefore, a reasonable time with regard to software products is bound to be shorter than with other types of products. This is especially true if a better product entered the market prior to the revocation. For these reasons, the buyer should (1) take delivery only when the software is ready for use, (2) make every effort to fully test the product upon its delivery, and (3) notify the seller or developer quickly and fully of any problems encountered.

The lapse of nine months between acceptance of a computer system and buyer's letter asking for rescission was found to be reasonable where the seller had been attempting to cure or repair the problems during most of the period without success.[73] An attempted revocation of acceptance of a computer system approximately one year after acceptance was held to be unavailable where the delay was not excused by lessee's reasonable assumption that the lessor would cure the nonconformity. Revocation was unavailable even though lessee failed to discover the nonconformity before the acceptance because of difficulty of discovery or because of lessor's reassurances. A delay of more than one year, with no indication to lessor that there was a problem, made the revocation untimely as a matter of law.[74]

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70. Hollingsworth v. The Software House, Inc., 32 Ohio App. 3d 61, 513 N.E.2d 1372 (1986).

71. *Aubrey's R.V. Center*, 46 Wash. App. at 602, 731 P.2d at 1131.

72. *Id.* at 602-03, 731 P.2d at 1132.

73. *Id.* at 603-04, 731 P.2d at 1132-33.

74. Pacific Am. Leasing Corp. v. S.P.E. Bldg. Sys., Inc., 152 Ariz. 96, 101, 730 P.2d 273, 278 (Ariz. Ct. App. 1986).

While the mere passage of time did not prevent the buyer from revoking its acceptance, acts inconsistent with revocation or inconsistent with seller's ownership, such as the intervening sale of the goods, installation, and use of the goods, constituted a substantial change in condition of the goods which was not caused by any defect in the goods. The buyer was, therefore, precluded from subsequently revoking acceptance.[75] A buyer may use and possess goods after revocation of acceptance where there have been numerous unsuccessful attempts at repair. Where the seller was either promising or attempting to repair a defective computer system constantly for some six years until a final report of an independent expert was made, a question of fact precluding summary judgment was raised as to whether plaintiff acted reasonably in possessing and using the goods until that time.[76] "[C]ase law uniformly recognizes that complicated machinery and systems may have relatively long ironing out periods during which the buyer in good faith continuously attempts to have the seller cure or repair complicated problems."[77]

IV. REMEDIES

The U.C.C. remedies or damages available to an aggrieved buyer fall into six categories: (1) rejection/revocation of acceptance remedies,[78] (2) warranty remedies,[79] (3) incidental damages,[80] (4) consequential damages,[81] (5) liquidated damages,[82] and (6) attorney fees.[83] In addition, other non-U.C.C. tort remedies are available. The following sections describe each of the types of damages.

A. REJECTION/REVOCATION OF ACCEPTANCE REMEDIES

The measure of damages for justified rejection or revocation of acceptance is the difference between the market price at the time when the buyer learned of the breach and the contract price. This difference is combined with any incidental or consequential damages, but less any expenses saved as a consequence of the breach.[84] In general, market

75. Eaton Corp. v. Magnavox Co., 581 F. Supp. 1514, 1529-30 (E.D. Mich. 1984).

76. Sierra Diesel Injection Serv. v. Burroughs Corp., 651 F. Supp. 1371, 1378 (D. Nev. 1987).

77. Fargo Mach. & Tool Co. v. Kearney & Trecker Corp., 428 F. Supp. 364, 379 (E.D. Mich. 1977).

78. U.C.C. § 2-713 (1988).

79. *Id.* § 2-714.

80. *Id.* § 2-715.

81. *Id.*

82. *Id.* § 2-718.

83. *Id.* § 2-715.

84. *Id.* § 2-713.

price may be proven by reference to trade journals or periodicals of general circulation.[85] However, after successfully proving that the software product is significantly flawed, the market for the product is likely to dry up very quickly. Therefore, the most common remedy for rejection or revocation is the refund of contract or sales monies already paid, plus incidental and consequential damages.

B. WARRANTY REMEDIES

The measure of damages for breach of warranty is the difference, at the time and place of acceptance [sale], between the value of the goods accepted and the value of the goods had they been in the condition warranted, together with any incidental and consequential damages.[86] The warranty measure of damage is less advantageous for the buyer than rejection/revocation remedies. The developer is allowed to reduce his liability by showing the value of the non-defective portion of his product. Further, there are significant difficulties in proving the value of a defective software product. The burden of proof is on the buyer to show revocation or breach of warranty damage.

There is, however, one definite advantage to the warranty remedy. Recovery is available under section 2-714 for any nonconformity, and not merely for substantial ones. Substantial nonconformity is required for revocation remedies under section 2-608.[87] Also, the failure to adequately reject nonconforming goods does not impair remedies for breach of warranty.[88]

C. INCIDENTAL DAMAGES

"Incidental damages resulting from the seller's breach include the expenses reasonably incurred in inspection, . . . commercially reasonable charges, . . . and any other reasonable expense incident to the delay or other breach."[89] These damages would include the cost of locating the software defect, which includes the cost of any necessary labor, testing equipment, consultants, phone calls, etc. Expenses incurred in using alternate means to complete the work that the software was supposed to do would also be incidental expenses.

D. CONSEQUENTIAL DAMAGES

The U.C.C. defines consequential damages as follows:

Consequential damages resulting from seller's breach include a) any

85. *Id.* § 2-723, -724.
86. *Id.* § 2-714.
87. McClure Oil Corp. v. Murray Equip., Inc., 515 N.E.2d 546, 553 (Ind. Ct. App. 1987).
88. Nyquist v. Randall, 819 F.2d 1014, 1020 (11th Cir. 1987).
89. U.C.C. § 2-715 (1988).

> loss resulting from general or particular requirements and needs of which the seller at the time of contracting had reason to know and which could not reasonably be prevented by cover or otherwise; and
>
> b) injury to person or property proximately resulting from any breach of warranty.[90]

In awarding damages for breach of warranty, the court need not find that the defendant foresaw the specific injury or amount of harm, but only that a reasonable person in defendant's position would foresee the damages that could result from the breach.[91]

Lost profits may be a proper form of consequential damages under section 2-715.[92] The loss must be proved with reasonable certainty. "Evidence of the loss is sufficient if it is the best evidence available and 'affords a reasonable basis for computation.' "[93]

While a buyer seeking damages for breach of warranty is not entitled to recover consequential damages for finance charges or interest payments, the same limitations are not applicable to a buyer who justifiably revokes acceptance. On revocation of acceptance, the buyer is entitled not only to return of the purchase price but also to recover any expenses incurred in reasonable reliance upon the contract, plus incidental and consequential damages arising from the breach, including finance charges less the amount saved.[94]

In one case, interest paid for financing the purchase price of a typesetter was excluded from the value of the goods as warranted. The interest was merely the cost of money borrowed to buy the goods since capital was unavailable to the purchaser. The interest on the money borrowed to purchase the machine would have been incurred by plaintiffs whether the machine conformed or was defective. Consequently, the interest charges did not arise from defendant's breach and were not recoverable.[95]

E. LIQUIDATED DAMAGES

A sales or licensing contract may provide for a liquidated damage remedy in the event of a breach of warranty or significant impairment of the product. The liquidated damage remedy, if allowed, provides the

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90. *Id.* § 2-715.

91. Barnard v. Compugraphic Corp., 35 Wash. App. 2d 414, 418, 667 P.2d 117, 119 (1983).

92. Lewis Refrigeration Co. v. Sawyer Fruit, Vegetable and Cold Storage Co., 709 F.2d 427, 432-33 (6th Cir. 1983).

93. Harper & Assoc. v. Printers, Inc., 46 Wash. App. 417, 424, 730 P.2d 733, 737 (1986).

94. Aubrey's R.V. Center v. Tandy Corp., 46 Wash. App. 595, 599, 731 P.2d 1124, 1131 (1987).

95. *Barnard*, 35 Wash. App. 2d at 420-21, 667 P.2d at 121 (1983).

sole recovery for the buyer to the exclusion of all other claims. The liquidated damage clause allows both the buyer and seller to quantify their respective risk exposures at the time of contracting.

The U.C.C. provides that three requirements be satisfied before a liquidated damage claim will be enforced by a court.[96] First, the amount of the liquidated damage claim must be reasonable in light of the anticipated harm. The claim cannot operate as a penalty upon either party. Second, it must be difficult to prove the *actual* loss. This is especially true if the buyer may be subject to lost profits when the software fails to meet his expectations. Third, other remedies must be inadequate. This may be true if substitute software would be unavailable.

F. ATTORNEY FEES

Section 2-715 confers discretion on the trial judge to award attorney fees as an element of the damages incurred from a breach of warranty.[97] Thus, attorney fees may also be a part of either party's risk exposure.

G. STATUTE OF LIMITATIONS UNDER THE U.C.C.

An action for breach of any contract for sale must be commenced within four years after the date the action accrued. The action accrues when the buyer knows or should have known that he had an actionable claim against the seller.

H. NON-U.C.C. REMEDIES

The remedies discussed above represent only those provided by the U.C.C.. Other common law remedies exist as well. Tort remedies, such as fraud, misrepresentation, negligence, and product liability, may also be used to recover damages caused by a defective software package. Equitable remedies, such as rescission and restitution may also be available.

V. CONCLUSION

The U.C.C. provides two forms of protection for buyers against defective software products: warranty and rejection/revocation of acceptance. Although these two theories use different standards and remedies, common themes run through both forms of protection.

First, the U.C.C. express warranty doctrine requires developers to

96. U.C.C. § 2-718(1) (1988).

97. Kelynack v. Yamaha Motor Corp., 152 Mich. App 105, 114, 394 N.W.2d 17, 21 (1986).

accurately and fully express the performance and functional capabilities of their products. The doctrine of caveat emptor has been steadily giving way to a more balanced approach between buyer and seller, especially for highly complex systems like software. Expressions made by a developer/seller concerning a product must not misrepresent or exaggerate capabilities. Known defects and limitations should be expressed prior to the sale. The buyer should be provided with accurate and sufficient information about the product in order to make an informed buying decision.

The second common theme surfaces in the warranty of fitness for a particular purpose and the subjective test under the substantial impairment doctrine. Developers must know their customers and they must listen to their problems. A court hearing a case concerning defective software will consider the particular circumstances of the aggrieved buyer. The developer must be prepared to present evidence that he acted reasonably in providing a software solution for the buyer's specific problem. Developers should be able to show an organized problem tracking and resolution system. Sales personnel should be educated in dealing with the buyer's specific needs and in proposing appropriate solutions.

The third common theme concerns the relation of the software product to the computer trade in general. The warranty of merchantability and the substantial impairment objective test compare the performance of the software product with the performance of like products in the software industry. Developers must track competitor products and industry trends. They must be prepared to explain the design decisions that may have led to a shortfall between their product's performance and the industry expectations. Developers must anticipate the needs and expectations of the user community as they evolve.

Due, in part, to the burgeoning personal computer market, the software industry is rapidly growing. Vendor and industry credibility, however, are still being established. Developers who resist the temptation to disseminate flawed or insufficiently tested software products will serve not only their own corporate interests, but also the continued expansion of the software marketplace.