

DEFECTIVE SOFTWARE & THE ISSUES OF MALPRACTICE, NEGLIGENCE, FRAUD & MISREPRESENTATION

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ABSTRACT

This investigation uses a qualitative study to explore the issues surrounding instances of defective software involving malpractice, negligence, fraud and misrepresentation. The study collected data from relevant cases filed in either federal or state court during the period of 1990 to 2001, and included both the acquisition of custom and mass-marketed software. Examining the litigation has shed significant insight into the underlying issues as well as suggesting options for managerial intervention.

Keywords : defective software, malpractice, negligence, fraud, misrepresentation

INTRODUCTION

In modern organizations, information technology serves as a backbone to support labor and capital that combine to accomplish organizational goals. The integration of that technology is so complete that even small disruptions to the IT area can result in disastrous effects. For example, in 1990 AT&T lost over \$60 million dollars in revenue when a software error disrupted customer service for a period of a few hours (8).

Although the role information technology plays to the organization is critical, the software industry has not done a very good job is producing an error free product. A 1996 survey estimated that customers placed over 200 million calls for technical support at a cost of \$23 per call and were left on hold for 3 billion minutes (6, 7).

The problem is magnified when ethical issues are complicit in inducing the organization into purchasing defective hardware and software, negligence is present, or even out-right malpractice has occurred. Theoretically, the consumer is protected under a variety of legal theories that should provide remedy in these situations. Kaner (5) classified these as cases involving a breach of contract, a breach of warranty (either express or implied), and those involving strict liability in tort for injury to a person or damage to property. Breach of warranty can involve an express warranty where as breach of implied warranty involves an implied warranty of merchantability and/or a fitness for a particular purpose. Strict liability in tort can involve certainly involve strict product liability, but also conversion, negligence, malpractice, fraud and misrepresentation.

The typical investment in software of a large organization is substantial, and any unethical activities can have a significant impact on the companies' operations especially if it leads to litigation. We felt a study of this area would be valuable in that

- 1) The parties involved felt strongly enough about the issues to seek legal redress;

- 2) The elements and facts are readily available;
- 3) The consequences (injury to trade marks, reputation), economic injury, etc. are significant enough to warrant managerial actions;
- 4) Significant management issues will be exposed that are under managerial control that would have avoided or at least mitigated the consequences that led to the litigation.

STUDY SCOPE:

This study involved both a qualitative and quantitative survey of litigation brought in federal and state courts involving defective software. Our study period involved the years from 1990 to 2001, and includes legal briefs that have been filed in the last 6 months. We examined 129 cases brought in federal and state courts, with 31 of those selected for further analysis.

The thirty-one cases that were selected were examined in detail to identify the qualitative aspects of ethical and managerial behavior that contributed to the case being filed. Although subjective and interpretive, qualitative analysis provides substantial insight into the unexplored issues involved in litigation. The knowledge gained holds practical implications for the software industry, and adds substantial relevance as to what can be done to avoid being placed in a situation where an organization is vulnerable to negligence, fraud and misrepresentation. As Eisenhardt (3) has pointed out, this approach both increases the credibility and the rigor of a study.

Overview of Hypothesis 1:

The legal theories under which litigation can be brought involving defective software involve either contract law or strict liability in tort. The former involves a broken agreement including breach of contract, breach of warranty, or breach of implied warranty (implied warranty of merchantability or implied warranty of fitness for a particular purpose). Strict liability in tort for injury to a person or damage to property involves conversion, negligence, strict product liability, malpractice, fraud and misrepresentation (5). We believe that the study period will demonstrate a progressive increase over time in the number of cases involving strict product liability as

- 1) Contract law often limits remedies to compensatory damages, where-in tort law provides for additional punitive damages.
- 2) Contracts or agreements can fail for a variety of reasons that do not involve blame, and hence make it more difficult to assign damages where-as tort law is very specific.

Overview of Hypothesis 2:

The majority of cases will reflect that clear managerial control was not exercised to protect the organization from negligence. Specifically we would expect to find inadequate or missing software testing procedures, or at least inexperience at executing those methodologies. With adequate testing in place, the ability to discover negligence in early stages would limit economic and other damages.

Overview of Hypothesis 3:

Software can be acquired through customization via the RFP process or the retaining of a consultant. Conversely the acquisition may be pre-packed software that is purchased off the shelf, obtained as shareware, through bulletin boards, etc.

We expect the nature of the software acquisition to influence the potential for negligence. The very act of creating custom software whether through hiring a consultant or through the RFP process lends itself to greater managerial control. The presence of a well-defined requirement statement identifying a list of required features, performance issues, etc. would reduce the ambiguity in proving fraud. In other words, the absence of a clear set of requirements lends itself to exaggerated claims, and nebulous performance criteria opening the door to unethical conduct.

Overview of Hypothesis 4:

In those instances where performance issues are clearly stated as mtbf, mttr, turnaround time, and throughput will result in fewer claims.

RESULTS AND DISCUSSION

The rise in the number of cases alleging misrepresentation, negligence and fraud strongly supported hypothesis 1. The increase in case filings was sharp with a three-fold increase for the years 1995-2001 vs. the preceding five years.

Despite the rise in these cases we would describe few as successful. In the 129 cases that we surveyed, we identified very few suits brought against the developers of defective software that resulted in awards for the plaintiff. As such, our results strongly support Peter Alces's (1) suggestion that an implied warrant of merchantability may not be a relevant standard in providing protection in cases where even mass marketed software is relatively unique. Furthermore, he points out that the nature of software development may also make it difficult to talk about fitness for an ordinary purpose. The area is difficult to frame since the purpose of software is intimately tied to the means, the hardware platform and operating system, all designed and implemented in an environment where standards of quality and care are poorly defined.

Similarly express warranties often failed to provide adequate protection. Many shrink-wrap warranties are designed to limit the developer's liability to any combination of express warranty or negligent misrepresentation claims. Both of these limitations were clearly demonstrated in *Ritchie Enterprises v. Honeywell Bull, Inc.* In this case, "the court concludes the plaintiff's negligent misrepresentation claim is not valid. The Basic Agreement contains an integration clause stating that it represents the parties' entire agreement and 'supersedes all prior oral and written proposals and communication.' Similar to *Burroughs*, the Basic Agreement effectively disclaims all express and limited warranties."

The problem of relying on oral or even written statements is further demonstrated in the case of *Apollo Group v. Avnet, Inc.* In this situation, Apollo purchased Oracle Financials and their database engine, and then intended to purchase an appropriate hardware package to support the software. In the end, Apollo was dissatisfied with the performance of the configuration, and sued the hardware provider. Whether this case is a hardware or software problem is not as relevant as

the findings of the court. The court determined that the money paid to Avnet was for their services as a “hardware distributor, and not as a consultant” and that “money paid by Apollo to Avnet was related to the purchase of hardware [not consulting].”

Other cases involving negligence and malpractice have faced similar fates. In the latter, malpractice requires a negligent breach of duty that is owed to an individual or organization. This duty is based on a clear standard of conduct that is held and enforced for the profession. Unfortunately most courts apparently feel that the software industry has no generally accepted standards comparable to those in the engineering or the medical field. The case of Hospital Computer Systems v. Staten Island Hospital demonstrated this with a ruling that stated “When no such higher code of ethics binds a person, such a trust is unwarranted. Hence no duties independent of those created by contract or ... are imposed on them.”

An important element to tort recovery is proving that actual property damage has occurred to property other than that purchased, and that damages are not limited to pure economic loss. Theoretically this could include the loss of data, however, even this is difficult to prove. In the case of Rockport Pharmacy v. Digital Simplistics, the courts concluded that in the matter of the loss of data that “such losses represent nothing more than ‘commercial loss of inadequate value and consequent loss of profits’ ... damage to components integrated into computer system is not considered damage to other property.”

So what does work? Clearly this environment creates an opportunity for fraud, misrepresentation, and simple negligence to flourish. In the absence of a reasonable probability of success, coupled with the high costs involved in litigation, managerial intervention becomes extremely important.

Hypotheses 2, 3, & 4 were well supported by the qualitative analysis of the cases that we studied. A simple “What is Missing List” would demonstrate that in the cases that we studied that

- 1) Software testing procedures weren’t just inadequate, but were often altogether missing – if negligence, fraud, etc were evident, discovery occurred after the software was put into production. The importance of acceptance and systems testing may as such be even more important in mass-marketed software than in customized software;
- 2) Clear communications of performance objectives were absent. Complaints were stated as this software is slow vs. as transactions per second. The difference is significant in that in the former becomes a case of an unhappy customer. In the latter, the case potentially involves a breach of contract;
- 3) Very limited use of RFPs;
- 4) Very few instances of customized software made it to court compared with the purchase of pre-packaged software;

As previously stated, we suspect that management exercises a greater degree of control in the custom development of the software, thus minimizing the opportunity for fraud, misrepresentation, etc. Managerial inaction greatly contributed to the potential of the organization becoming vulnerable to misrepresentation and/or the distribution of defective or poorly designed software.

Additionally, many warranties were being created on the fly by purchasers in effect relying on the statements of vendors/sales personnel with little technical knowledge of the software. In the absence of a legal defense residing in the implied warranty of merchantability, even cases that attempted to formulate a Breach of Contract defense that often failed because of a variety of express warranty disclaimers.

Based on the results of our findings we formulated twelve steps to curb an organization's vulnerability to misrepresentation, fraud, etc. These include...

1. Read the fine print, as dull as it may seem. Many of the court cases turned on the presence of an "express warranty disclaimer".
2. Ensure that relevant documentation is retained. The difficulty of enforcing an implied merchantability of fitness has created the warranty of documentation. Use it.
3. Avoid creating warranties through the creation of false claims, and conversely, be very careful about relying on such claims.
4. Where costs are justified, insist on a public demonstration of the software on the hardware platform that you wish to use, and make sure that you are in control.
5. For the purchaser, send a letter of understanding back acknowledging relevant verbal statements that are being relied upon as conditions of the sale.
6. Use a single contact point in working with a vendor.
7. Performance issues should be clearly stated in the contract. Cases with predefined performance criteria were very scarce.
8. Have an acceptance plan... and execute it.
9. Consider mediation and arbitration clauses in the contract --- it's not likely that you're not going to win a legal case --- and arbitration may be an attractive alternative.
10. Develop a clear set of requirements, use it, and include the document in the contract.
11. Perform a risk assessment so that everyone is clearly aware of the consequences of IT failure. If warranted, put a responsible disaster recovery plan in place.
12. Contact others who purchased and installed the software. Our experience is other professionals are often happy to share their experiences.

SUMMARY AND CONCLUSION

Regretfully, our findings suggest that the software industry has won the warranty war when it comes to product liability involving defective software. The cost of litigation and the small probability of success means that management must exercise due care of its own in entering into any software acquisitions. Exercising managerial control, clearly communicating and documenting system requirements, especially functional and performance criteria, can substantially reduce financial vulnerability to fraud, misrepresentation, and outright negligence.

REFERENCES

1. Alces, Peter. (1999). W(h)ither Warranty: The B(l)oom of Products Liability Theory in Cases of Deficient Software Design. *California Law Review* (87:1), 271-304.

2. Apollo Group v. Avnet, Inc. No. 93-16131, United States Court of Appeals for the Ninth Circuit, 58 F.3d 477; 1995 U.S. App. LEXIS 15904; 26 U.C.C. Rep. Serv. 2d (Callaghan) 1099; CCH Prod. Liab. Rep. P14,249; 95 Cal. Daily Op. Service 4921; 95 Daily Journal DAR 8478, February 16, 1995, Argued and Submitted, San Francisco, California, June 28, 1995, Filed
3. Eisenhardt, K.M. (1989). Building theories from case study research. *Academy of Management Review* (14: 4), 532-550.
4. Hospital Computer Systems v. Staten Island Hospital. , Civil Action No. 89-2305, United States District Court for the District of New Jersey, 788 F. Supp. 1351; 1992 U.S. Dist. LEXIS 4042; 18 U.C.C. Rep. Serv. 2d (Callaghan) 140, March 31, 1992, Decided, April 1, 1992, Filed
5. Kaner, C., Falk, J., & Nguyen, H. Q. (1993). *Testing Computer Software*. New York: Van Nostrand Reinhold.
6. Kaner, C. & Pels, D. (1997). Article 2B and Software Customer Dissatisfaction (May 30, 1997). www.badsoftware.com/stats.htm
7. Kaner, C. (1999). Software Engineering and UCITA. *Journal of Computer and Information Law* (18:2), 1-75.
8. Peterson, I. (1991). Finding Fault. *Science News* (139:7), 104- 107.
9. Ritchie Enterprises v. Honeywell Bull, Inc. No. 86-1394-C, United States District Court for the District of Kansas, 730 F. Supp. 1041; 1990 U.S. Dist. LEXIS 458; 11 U.C.C. Rep. Serv. 2d (Callaghan) 1170, January 17, 1990, Decided, January 17, 1990, Filed.
10. Rockport Pharmacy v. Digital Simplistics. No. 94-2548, United States Court of Appeals for the Eighth Circuit, 53 F.3d 195; 1995 U.S. App. LEXIS 9038; 32 Fed. R. Serv. 3d (Callaghan) 432; CCH Prod. Liab. Rep. P14,209, March 13, 1995, Submitted, April 21, 1995, Filed.