Computer software protection law—technical expertise needed

by Senator Charles McC. Mathias, Jr.

The pages of recent issues of *IEEE Micro* have included a detailed proposal for a new federal law to protect proprietary rights in computer software. The editors of *IEEE Micro* have solicited criticisms, comments, and suggestions from the computer science community on this and similar proposals.

As chairman of the Senate Subcommittee on Patents, Copyrights, and Trademarks, I commend *IEEE Micro* for stimulating dialogue on this important topic. The ensuing discussion should help to sharpen the focus of *IEEE Micro*’s readership on the knotty problems of software protection. But this dialogue should bring another benefit as well: it can help your elected representatives in Congress to carry out more effectively one of their responsibilities under our Constitution. That responsibility is to provide appropriate incentives for creativity and invention, and appropriate protection for the fruits of intellectual labor.

The power of the Congress to enact intellectual property laws is set forth in the Constitution in terse yet elegant prose:

The Congress shall have Power . . . To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.

These words of Article I, Section 8, Clause 8 of the Constitution recognize a distinction between two different types of intellectual property: “Writings” and “Discoveries.” From the earliest days of our Republic, this distinction has been preserved in legislation enacted pursuant to this clause. For nearly two hundred years, we have had two parallel systems of intellectual property protection. The copyright system secures the exclusive rights of “Authors” to control the copying and distribution of their “Writings,” while the patent system guarantees to “Inventors” the exclusive right to exploit their “Discoveries.”

For two centuries, these distinctions have served us well. The concepts underlying the copyright and patent systems have so far been flexible enough to adapt to technological change.

To be sure, the framers of the Constitution could not have dreamed of the day when films, television broadcasts, and sound recordings would be encompassed within the term “Writings.” They could never have predicted that the synthesis of a living organism would be considered a patentable “Discovery.” But, while they may have lagged behind at some points, our intellectual property laws have, on the whole, been able to keep pace with new technology. These laws have, for the most part, been successful in stimulating creative activity, by rewarding authors and inventors with exclusive rights in their creations. At the same time, the copyright and patent systems have encouraged a vigorous commerce in ideas, expressions, and technological innovations. Our country is, today, a pacesetter in science, a leader in technology, and a haven for artistic and creative achievement. A good deal of the credit for this must go to our intellectual property system.

However, as we near the bicentennial of the inception of this system, it is beginning to show some signs of strain. Our copyright and patent laws are facing unprecedented challenges. An explosion of new technology is forcing us to rethink some of the basic assumptions upon which our intellectual property laws rest.

Several technological developments serve to illustrate this new challenge. The proliferation of cheap, convenient, accessible copying technology—the photocopier, the videocassette recorder—confronts us with the problem of adjusting the balance between the copyright proprietor and a world in which literally hundreds of millions of people are ready, willing, and able to copy protected works. The advent of the automated database and the promise of the “book on a chip” compel us to consider the legal consequences when familiar forms of intellectual property are fixed in a new way.
when old wine is poured into new bottles. Other examples of new technology abound which will test the flexibility and resilience of our current laws.

But the issue of software protection—the issue now being debated in the pages of *IEEE Micro*—poses a particularly difficult challenge. It raises intriguing problems which call into question some of our familiar ways of thinking about intellectual property. To give just one example, the distinction between expressions and utilitarian objects has always been fundamental to the separation of patent and copyright. Does that line of demarcation, which has become blurred in recent years, vanish altogether when we ponder the status of a creation such as object code embodied in a disk or ROM? Isn’t this new creation neither fish nor fowl? And if so, where does it fit into a coherent intellectual property protection scheme?

Some of the specific questions which arise from the application of today’s intellectual property laws to tomorrow’s technology will be resolved in the courts. But if we want the law to develop in a consistent, predictable manner, we must think in terms of legislation, rather than litigation. Only the Congress has the power and the responsibility to make whatever changes are needed, to enhance our ability “To promote the Progress of Science and useful Arts.”

I want to make sure that the voices of the creators, discoverers, inventors, and adapters of this dazzling new technology are heard as well.

That’s where the readers of *IEEE Micro* come in. If our intellectual property laws are to be updated, we in the Congress need all the help we can get. We need the expert advice of copyright and patent lawyers, of economists, of scholars and business people. (In light of some of the arcane controversies we’ll be grappling with, such as the expression/object distinction, we may have need of a philosopher or two as well.) But perhaps most importantly, we need the views of scientists, engineers, and technical specialists. A chorus of interests is clamoring for change in our patent and copyright laws. I want to make sure that the voices of the creators, discoverers, inventors, and adapters of this dazzling new technology are heard as well.

Let me suggest two areas in which the contributions of *IEEE Micro*’s readership may be particularly important.

First, while the frontier legal issues in this area make for fascinating intellectual exercises, they are far more than that. High-technology industries are becoming increasingly dominant in our economy. The sector which some call telematics—enterprises based upon telecommunications and computer technology—is particularly vital. Furthermore, in a world economy which is increasingly interdependent, our country’s leadership in telematics and other high-tech fields is one of our most valuable national resources.

As I suggested earlier, the intellectual property system is a key ingredient in the recipe for competitive success in the world economy. But if we’re going to improve on that recipe, we need some very practical input from people with hands-on experience in the kitchen. The people who work with this technology day in and day out—who develop it, who adapt it, who buy, sell, and trade it—have a great deal to contribute to the answers to the questions we are facing: What technology should be protected? How broad should the protection be? What rights to the technology should be exclusive? What rights should users, or the general public, have? Finally, how can we best reward innovators while encouraging further innovation? We can’t hope to find the right answers to these questions unless we ask the innovators themselves.

Second, *IEEE Micro*’s readership can help us to take the long view. We all know that the pace of technological change is accelerating. I wish that I could report that the tempo of the legislative process is keeping step, but I’m afraid just the opposite is true. As lawmakers are faced with more issues of greater complexity, it often takes longer to enact effective legislation. Accordingly, we must try to find solutions which not only address the challenges of today’s new technology but also anticipate tomorrow’s needs as well. And who can better advise us on what the future may hold than those who, through their vision and hard work, will make that future come to pass?

I look forward to following the discussion of software protection in the pages of *IEEE Micro*. I’m confident that your debates will help us to solve some of the perplexing questions posed by the dizzying pace of technological advance. I am optimistic that, with your help, we will be able to come up with good answers.

The ingenuity of an age that has produced tools as remarkable as today’s computer software should be able to devise laws adequate to protect it. As Thomas Jefferson so wisely observed in our nation’s infancy:

> . . . (L)aws and institutions must go hand in hand with the progress of the human mind . . . As new discoveries are made . . . institutions must advance also, and keep pace with the times.

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