

BITS OF OWNERSHIP

Growing computer software sales are forcing universities to rethink their copyright and patent policies

By IVARS PETERSON

Item: As a course assignment and using a university's sophisticated computer graphics system, three students create a short animated film. The film wins a prestigious international award, and the students receive lucrative offers from various movie companies. But the question of who holds the film's copyright — the students or the university — stalls possible deals.

Item: A computer science professor develops a clever computer program that a French company wants to use for research purposes. University officials claim that the professor has no right to sell or even give the software to the company without permission from the university.

Item: A graduate student writes a computer program as part of a large, ongoing research project. He copyrights the program and refuses to let other researchers in the department run the software until they agree to pay him a fee for its use.

Item: A team of faculty members and staff programmers puts together a computer program for handling library loans and other functions. The program is so successful that several dozen copies are sold to other libraries. Thousands of dollars accumulate in a bank account while the university tries to establish a policy for handling the twin questions of computer software ownership and the division of royalties.

These incidents, all of which have actually occurred at universities in the United States, reflect some of the sticky copyright issues now befuddling university administrators, faculty, staff and students. Universities are starting to review their "intellectual-property" policies, covering everything from copyrighted textbooks to patented inventions, to see where computer software fits in.

The real issue is money. Traditionally, universities have allowed faculty members who write books and create works of art to hold the copyright and keep any money earned from sales. On the other hand, most universities already enforce patent policies that call for a share of income from inventions.

The debate stems from a 1980 federal law that says computer software should be protected by copyright rather than by patent. Many university administrators, noting the increasing potential commercial value of software developed at universities, want to treat computer programs like inventions. In opposition, some professors argue that software, like any other copyrightable material, should belong to the creator.

Most universities don't yet have a comprehensive copyright policy, says Brian L. Hawkins of Drexel University in Philadelphia. "From the university's perspective, there's been money in patent policy," he says. "But copyrights, until software emerged as a copyrightable entity, didn't matter. Historically, there wasn't much money in them."

Now, universities are scrambling to catch up with technology. The issues surfaced early at places like Stanford University, the California Institute of Technology in Pasadena, Carnegie-Mellon University (CMU) in Pittsburgh and the University of Illinois at Urbana-Champaign, where software development has a long history. These and a few other institutions already have policies in place or are about to implement new policies. In many cases, the policies took years to develop. Bitter arguments often punctuated discussions.

One of the more contentious issues is the concept of "work for hire." Employees of a business usually must agree as a condition of employment to assign to the company all copyrights and patents. Even without a signed agreement, companies automatically own the copyright if the work is done on company time and with company resources.

The response of universities to this issue has been mixed. Some university officials argue that everything that takes place at a university is properly "work for hire" and really belongs to the institution. At a few universities, officials see the software copyright debate as a chance to gain greater control over everything that faculty and staff produce.

Others contend that universities are not like businesses. They say that a university's mission is the generation and dissemination of knowledge. A greedy administration and an overly restrictive copyright or patent policy can impede this function. It can also poison the atmo-

sphere on a university campus.

Several universities are actually heading completely away from the work-for-hire concept. Some policies allow not only faculty but even staff hired to write specific computer programs to collect as much as 60 percent of the income from marketed software, although the university holds the copyright.

"There are arguments on both sides of that issue," says Thomas K. Wunderlich, associate dean of research at Brown University in Providence, R.I. "We're leaning toward a nondiscriminatory policy that says we'll treat faculty, staff and students alike. If there's going to be money made, then there will be sharing whether within the computer science department or within the computer center itself."

"This is a new form of incentive within the academic institution," says Hawkins, "where a different sense of community can be created."

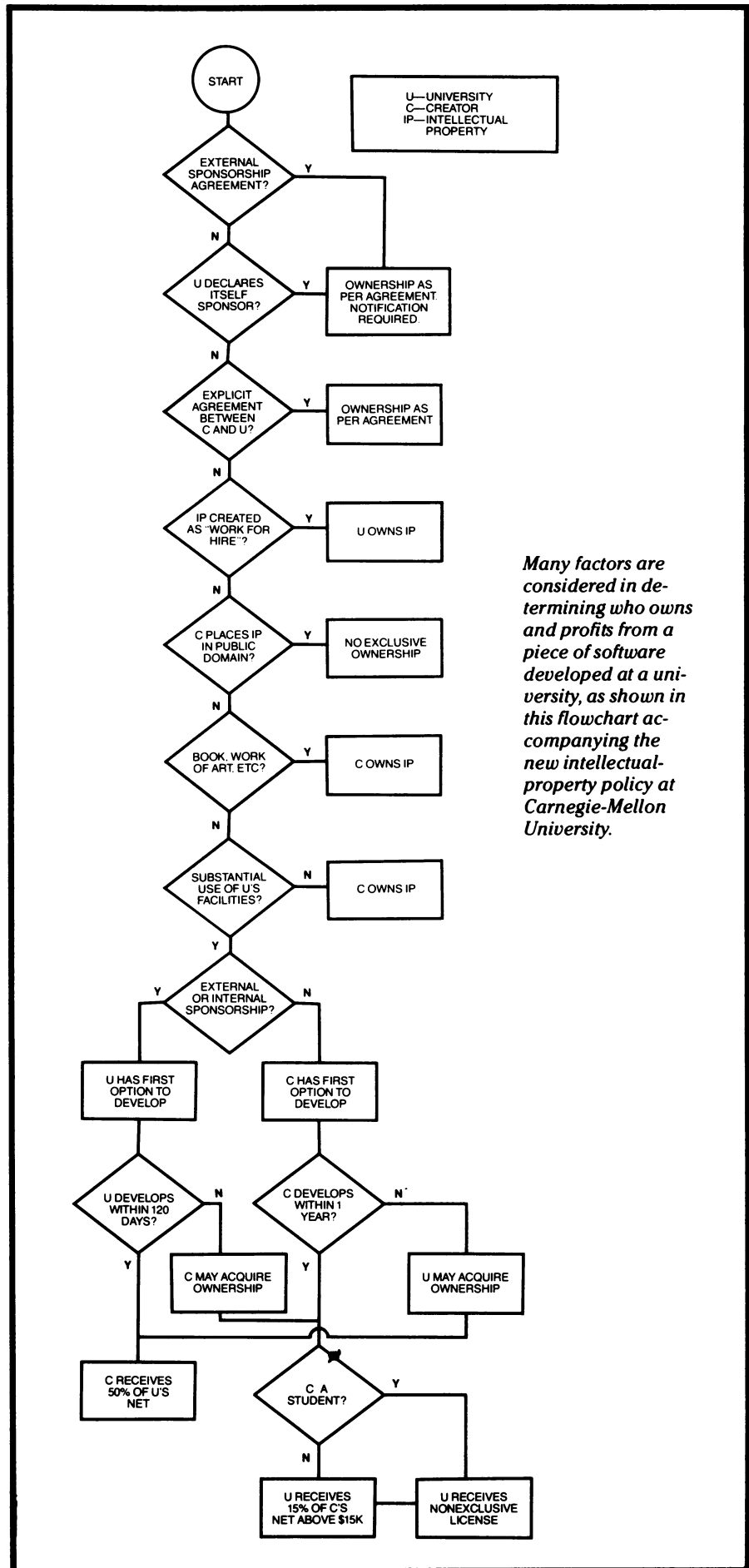
Most university software policies, however, don't go this far. More often, if faculty or staff are hired or assigned time to write a program for a specific purpose, then the university holds the copyright and the creators involved usually don't share in any income from marketing the software.

But establishing ownership can get complicated. "There are so many different scenarios under which creators can develop something," says CMU's Richard M. Stern. The CMU document includes an intricate flowchart showing all the different possibilities.

Software itself also covers a broad spectrum of creations — from "computer courseware," which is often little more than a video textbook, to programs that run scientific instruments and collect data. Also included are operating systems for computers and microcode, which converts commands in a programming language into instructions in a microprocessor chip. Some universities have chosen to divide software into two or more categories, depending on whether the software is more like a book or a patentable invention.

Another sticking point is the definition of "substantial use of university resources" in deciding whether a university holds a copyright. Brown University, in its proposed policy, takes a liberal approach. In general, unless the university's large "mainframe" computer is used extensively, the programmer holds the copyright. Exceptions would occur when research is sponsored by a government agency, industry or foundation and the contract specifically requires the university to claim ownership of any software produced for the project.

"There are concerns about use of university facilities," says Wunderlich, "but you can't police everything." The task becomes overwhelming with the proliferation of computers on campuses. "People use computers the way they would turn on a light switch," says Henry A. Scarton, a



Many factors are considered in determining who owns and profits from a piece of software developed at a university, as shown in this flowchart accompanying the new intellectual-property policy at Carnegie-Mellon University.

mechanical engineer at Rensselaer Polytechnic Institute in Troy, N.Y. "Using a computer is like having a pencil."

Nevertheless, CMU, in a quest for precision, is one university that has tried to put a dollar figure on "substantial use." In CMU's policy, "extensive" use of university facilities means that the programmer would have had to spend more than \$5,000 to buy or lease equipment and services similar to those used at the university.

Wary of potential accounting problems, other schools have included a "substantial use" clause but have chosen to leave it undefined. At the Virginia Polytechnic Institute and State University (VPI) in Blacksburg, a special committee settles the matter.

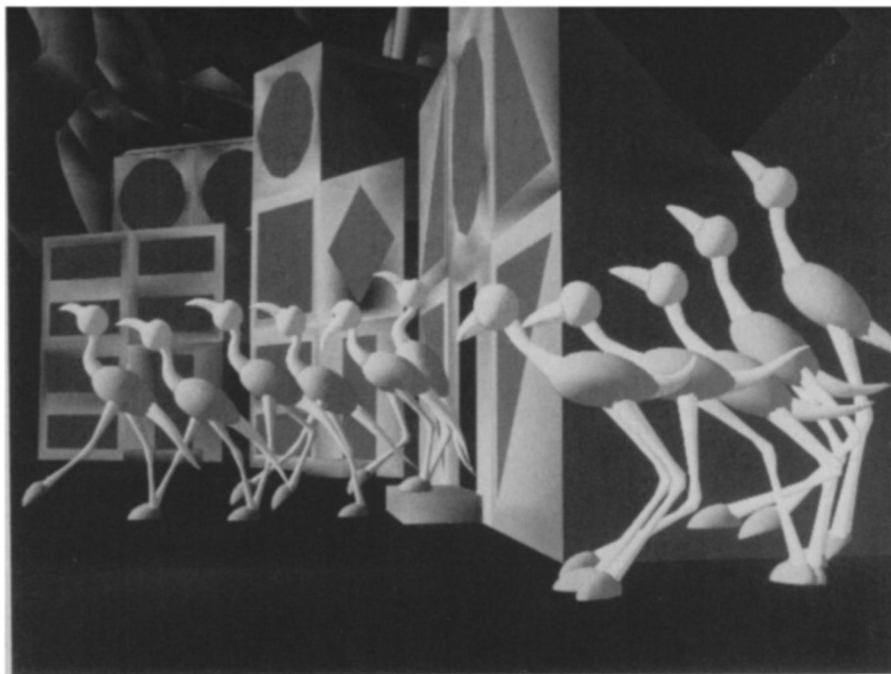
Another touchy issue concerns the role of graduate and undergraduate students. At places like Ohio State University (OSU) in Columbus, the school has strongly championed students' rights by encouraging students to copyright their work, including class assignments and dissertations. In general, a student's work belongs to the student, unless the student has been hired for a specific project or makes extensive use of university facilities.

Not all universities follow this approach, partly because of differences in state laws governing contracts and related matters. VPI lawyers recently studied the question as it applies in Virginia and concluded that a submitted class assignment, for instance, becomes the property of the professor involved. Students also cannot claim a share in any university software they helped to develop unless the professor, in a written agreement, decides to give them a percentage of any royalties.

The ownership of work done by students is a tricky question, says OSU's Gary L. Kinzel, who discussed the problem at a recent meeting in Boston on computers in engineering. "Students rarely work on a significant piece of software without major supervision from a faculty member," he says, "although the faculty member may or may not actually write part of the code."

In his paper, Kinzel gives an example of what could happen: "An adviser works with a student for several years and provides many of the ideas for a software package. The adviser may also arrange for computer support, financial support through a teaching assistantship and advice on the program development. At the end of the project, the student may decide he would like to start a company based on the program. He can then copyright the program and deny the university access to the source code. Technically, the student is within his rights because he alone did most of the actual programming."

Of course, because a copyright covers only the expression of an idea and not the idea itself, the professor is free to work with another student to redo the program from scratch. "However, with research that is highly associated with computer



OSU/Computer Graphics Research Group

Three students at Ohio State University last year won several top international awards for their three-minute, computer-animated film "Snoot and Muttly." However, determining who owns the software that generated the images and who benefits from any proceeds from its sale turns out to be a very difficult question to resolve. Now OSU has a copyright policy that in the future may help settle such disputes.

programming," says Kinzel, "the inability to be assured access to programs for future development has a significant dampening effect."

Several new and proposed intellectual-property policies now try to circumvent such problems. At Illinois, for example, users, to get access to major university facilities, in effect agree to give the university a royalty-free license to use, within the university, any software developed using the facilities.

However, the best way to overcome these and other potential copyright problems is to come to some agreement before a project starts. "Contrary to all the good old academic traditions," says Dillon E. Mapother, associate vice chancellor for research at Illinois, "there are certain areas where you've got to put things in writing if you want to avoid trouble."

"Potential conflicts can be avoided if reasonable written agreements are made with students prior to any software development effort," says Kinzel. "Presumably, an important aspect of any such agreement would be that the university should have use of any software developed and this use should include the right to modify the source code."

More and more faculty members are taking this approach, not only with students but also in dealing with a university's administration. The CMU policy, in fact, states that because "it is frequently difficult to meaningfully assess risks, resources and potential rewards, negotiated agreements are to be encouraged whenever possible."

"The purpose of a policy is to establish the ground rules and to set the defaults—in a sense, the starting point for negotiations," says CMU's Stern. "We never really attempted to consider every possible

scenario in detail." He adds, "I think it would be foolish to try to do something like that."

Although a few universities have intellectual-property policies that include computer software, most are just starting to wrestle with the problem. And new issues keep coming up.

"I don't think the debate on this is over," says Scarton. "If anything, it's only beginning." Rensselaer Polytechnic Institute started debating the issue several years ago but still has no policy. Now, a faculty committee has proposed that a modified version of CMU's policy be implemented. "CMU did a very nice job," says Scarton, "but their policy is a little bulky. We tried to streamline it a little bit."

Although policies like those at CMU and Stanford University are being used as models, the issues are complicated enough that universities are generally taking somewhat different approaches. "There's not a right way or a wrong way," says Brown's Wunderlich. You need to look for "a path of least resistance" to get a policy through at any particular university, he says.

Even universities that have policies see that changes are needed. Both the Massachusetts Institute of Technology and Stanford, which have had patent and copyright policies for years, are tinkering with their schemes. Commenting on OSU's recently adopted "interim policy," James B. Wilkens of OSU's patent and copyright office says, "This field is sufficiently complex that in two years we probably will find that we want to make a few changes."

"The main point is that if you adopt a policy that alienates the original authors [of a copyrightable piece of work]," says Mapother, "the property that you claim is largely without value." □