Draft III

MANAGING COMPUTER RELATED INTELLECTUAL PROPERTY AT INSTITUTIONS OF HIGHER EDUCATION

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January 1979

There are new forms of intellectual property being generated in our educational institutions that can potentially affect the structure of the total compensation packages being offered to the faculty of public and private colleges and universities of our country. These new forms of intellectual property take on various names but raise the same issues of ownership and profiting from innovation as did the older forms of property such as books and patents. This paper discusses functions of a hypothetical office of Intellectual Property Management by building around the model of the patent office as it exists in some research oriented universities.

The fact that intellectual property is one of the main (though by no means the only) "output" being generated in our institutions of higher education naturally makes this subject an important management issue in this era of accountability, lid bills and other issues concerning faculty rights. Newer forms of intellectual property such as computer programs, T V films, musical scores, etc. re-open the whole issue of alternative strategies of management that can be used in this policy area. The climate in a university or college is supportive of and conducive to innovation by individual faculty members and students. A policy, procedure and management climate may need to be created so that our educational institutions can maintain an open policy of information discovery and dissemination.

In this paper we will examine four new forms of property all of which relate to the computer -- Software, Courseware, Data Bases and Hardware. We will first discuss what these properties are, how they can be protected for the owner, what representative problems and opportunities have presented themselves in this area to date. We will then examine the traditional evolution of a patent management activity in a college or university and

compare what might have to take place if a more general intellectual property management function were to be created and how this office might operate.

When we speak of software, we are talking about programs that are being generated by faculty, staff and students on our campuses using the computing hardware, operating system, software and staff that is funded by the college or university. Some of these created programs can, if properly documented and described, have commercial value. The second form of intellectual property is known as courseware. Courseware is made up of a number of components. The computer component is a program (i. e., software) written to instruct students in certain subject matter areas. For example, there are a number of commercially available courseware products that teach certain aspects of the subject of chemistry, accounting, law, etc. Other components to the total courseware package, other than the computer component, include audio material, television material, textbook material, etc. The programming component is different from the first form of software in that it also has subject matter, expertise and pedagogical principles built into the logic of the coding. The third new form of intellectual property is known as a data base. Data Bases are machine readable versions of numeric or alphanumeric data that have been collected and organized in such a way that they have potential commercial value. Examples of data bases that may have commercial value are a name and address file of students and faculty or a local extrapolation of the 1970 Census data describing the current characteristics of the local population merged with and inferred from external data from national commercial data bases. In the case of hardware, we are talking about electronic components themselves.

These devices are taking on fancy new names such as integrated circuit board, microprocessor, etc. Some of these devices can be created ("burned in") within the labs of our University to accomplish much the same task that a computer program can do in software. Major universities have long recognized the role of the computer scientist or electronic engineer in the generation of potentially marketable versions of computer hardware. Forty years ago Professor Howard Aiken at Harvard constructed a computing device which he called MARK I which was subsequently modified and evolved into a computer known as MARK IV. Work of Professor Aiken was jointly sponsored by Harvard and IBM. Dr. John V. Atansoff while at Iowa State University also did a considerable amount of early and unique work in the origin of digital computers. Unfortunately, Iowa State was not able to financially capitalize on this early pioneering work.

With the advent of mini-computers and microprocessors components costing in the hundred dollar range, once again professors and students are applying their expertise to the generation of potentially commercial hardware products, many having software or even courseware components.

Because of the relative novelty and special peculiarities of computer products, it is not at all clear what the appropriate protection mechanism should be for each and every piece of computer related intellectual property. This is true regardless of whether the property is being protected for an individual (the faculty member) or the institution.

Four traditional forms of protecting include the patent, copyright, trademark and trade secret. Most universities, if they are concerned at all with intellectual property, are mainly concerned with patents. Since the issue of protection concerning these computer related products within

an educational institution is an emerging one, no national organization has yet taken a position to help set policy in the area. The Society of University Patent Administrators (SUPA) has a sub-committee studying the area but they are generally concerned only with the patentable inventions.

Admitting then, that newer technologies have given rise to new forms of intellectual properties, we also must recognize that new laws (the new Copyright Law, Human Subjects Research Law) give rise to the need for new or revised policy in many organizations. This need for policy, is beginning to be felt in our colleges and universities. Colleges and universities need to make a decision concerning how and to what degree they wish to manage the intellectual property which is being generated within its environs. Of course, the option is open to not manage the property at all. That position too is a management decision which can be made simply by delaying or doing nothing.

Many in a university may be ill at ease with the term intellectual property management because of the potential interaction with academic freedom issues. It is precisely this activity, namely the management of intellectual property, which is at the core of the ethical and economic concerns that are the subject of a University of Southern California project sponsored by the Carnegie Corporation of New York.

Most universities, indeed all universities, and all other forms of organizations in our society recognize their managerial responsibility for the management of real tangible property. They realize the necessity of plotting land that they own and assuring that the title to this property is legal, that any building sitting on that property has appropriate architectural drawing and specifications before, during and after the building is constructed. They realize that the property needs to be

insured against loss due to fire, wind, etc. They realize that insurance needs to be available for protecting the property owner against suit due to injury of a party using that property. Many universities and university foundations recognize their responsibility for the management of stocks and bonds. All of us realize that some research universities have reaped considerable profits from patents appropriately managed and licensed. The computer provides us with a new form of intellectual property that may need managerial attention.

The State of Virginia has recently passed a bill which declares that computer time is defined as property. The 1978 cumulative supplement of the Code of Virginia at Section 18.2-98.1 reads as follows:

> "Computer time or services or data processing services or information and data stored in connection therewith is hereby defined to be property which may be the subject of larceny . . ."

Assuming then for the moment that the organization recognizes the value of policy and does not know if they wish to manage this property, what situations might management have to face that could bring the issue into proper focus?

- Professor X develops a management game on university computing facilities and finds that there is an open market to both sell the game directly to other universities, companies, individuals, as well as to market the game through the continuing education arm of his university in various courses that might use the game.
- Professor Y combines the Security and Exchange Commission data base on banking institutions in his state with appropriate Census data relative to markets that those banks serve and find he has a research tool for his

students as well as a marketable data base for use by the banks of the state in question.

- Professor Z develops a multi-media course which has a computer based education component to teach calculus and finds that a major publisher is interested in marketing this multi-media approach to calculus. The university recognizes the author's rights to the copyrighted book but feels that its contribution to the development of the computer-based education component deserves reimbursing.
- Professor W consults with Company A and uses the university computer to solve certain probelms related to his consulting. In the process of this consulting he develops a process which has a computer generated component which is patentable.
- Computer Center staff member develops a CAI course to teach medical technology from a small portable mini-computer and sells it to Physician's Assistance Program in university medical colleges around the country.
- Administrator X develops a computer-based education multi-media approach to teaching and using the NCHEMS products and sells this multi-media approach to understanding NCHEMS.
- Research Physicist X develops a microprocessor programmed to simulate black jack on the home television set and sells it to Company B.

To continue to come to grips with this problem, let's postulate what responsibilities might fall within an office of Intellectual Property Management (OIPM). In order to envision this office and its function better, let us look at the work of the patent office of a research university.

It is our best representative model of this effort and is a rather mature concept by now and yet still provides most of the structures we need to continue the discussion.

That office traditionally --

1) Established college or university policy concerning the rights of ownership of patents and the subsequent distribution of any royalties received.
2) Shepherded the policy and its modification and updates through appropriate faculty, administrators, regents and legislative entities until the policy and codification was approved.
3) Developed forms permitting faculty to sign over their right to a potentially patentable invention in turn for an agreed upon royalty.
4) Pursued the necessary patent searching and filing in order to secure the invention for the organization.
5) Establishing a mechanism to protect the individual and the university from liability situations arising out of the marketing of the patent.

At this point two new situations arise; the one internal, the other external.

Internally, the office had to decide how to advertise its expertise and to continuously alert the faculty concerning the need for accurate recordkeeping, early reporting, etc.

Externally, the office was concerned with this problem: Given a collection of patents, how and what patents are marketed so that the office

pays for the patenting process itself and hopefully for some of the research behind the projects involved.

Of course if the office is successful in their endeavors, newer challenges relating to the investment of income, distribution of excess revenue and general encouragement of research become realistic problems and opportunities.

Obviously, we cannot cover all the subtle (and sometimes indecent activities) in which our legal colleagues engaged in while working in this fascinating arena. We only mention the high points so that we might proceed on by analogy to look at how this OIPM might also manage these new forms of intellectual property.

To begin with —

1) Once again the office would have to establish college and university policy concerning the ownership of the computer products and the subsequent distribution of any royalties received from sale thereof. Because a computer program can be copyrighted, (this does not imply that this action provides any real protection for the author of the program or the institution involved), the professor or staff member may argue against institutional ownership rights. They might well argue from the traditional textbook policy of many colleges and universities which allows faculty to personally own their copyrighted books. However, there are other reasonable policies that have been developed covering these new kinds of products. They are generlaly known as University Sponsored Educational Material (USEM) policies. Though many of these are general, they do seem to provide a step in the right direction. Most acknowledge the traditional "textbook

policy." They then go on to point out that because of the source and the amount of resources consumed in operating computer centers, television studios etc., a shared ownership is the more reasonable approach.

2) In the second step we find the need to spearhead the policy through the appropriate faculty, administrator, regents, etc. This spearheading may get to be a sticky wicket. Not only will one undoubtedly run into the traditional textbook policy argument mentioned above, but also you may find that state law has already been written which upholds one side or the other's claim to ownership.

   As in the case of many inventors and their inventions, individuals authoring programs are going to have a great deal to say about the structure of policy in the area. Not only are we all more mature in the area of property management, but also there are really more authors than there were inventors. As was found in patents, there will be some faculty who are willing to turn over their programs in their entirety without any thought of compensation from the institution and believe their colleagues should do likewise; others will place unduly high value on the product of their labors and wish to protect it for themselves at all expense. Both extremes believe in their ethical right to that perspective.

3) Develop forms that permit faculty to sign over their rights to their computer products in turn for an agreed upon royalty. The forms should also allow for faculty review of material

on a regular basis, both to correct errors and update content.

The forms signing procedure necessary to have faculty turn over their rights to the University seem to be needed even before a faculty member begins programming. Most colleges and universities have a project authorization form which sets up the initial computer accounts. It appears that this form could be modified to include such provisions if an institution wishes to avoid complications later on.

The fourth point in our efforts to manage this form of property is a bit more difficult. It is not sufficient to do a search of existing computer programming directories in order to "protect" the property. It appears at this stage of law in the U S that few computer programs are patentable and, though all are copyrightable, this latter mechanism for protection is almost meaningless.

Iowa State University somewhat resolved this difficulty with the following policy statement:

> "Trade secrets are in an area of intellectual property law which is enforced through Iowa common law. A trade secret is a secret. It can be protected indefinitely from people who would improperly take it, until someone comes up with it independently or the secret is no longer kept. Trade secrets are probably inconsistent with the University's goal to communicate its data. Particularly in the field of computer programs, trade secret protection may have to be resorted to until Congress can provide a means for adequate control of abuses. Computer programs would then have to be used in connection with consulting services rather than being distributed."

The fifth point concerning the liability situation can undoubtedly be handled in much the same way as the patent situation is handled.

We now turn to the internal and external analogies of the problem/opportunities mentioned with regard to patents.

As with most inventions, it is well known that it is a long path from the concept of an idea to a profitable marketplace. This is also very true of computer programs. While the program itself may be very useful and

and ingenious, there is usually a considerable amount of work that must be engaged in before the product can be offered in the marketplace. Very often entire sections of the program have to be re-written by professional programmers rather than the subject matter specialists. Documentation at several different levels of program use, maintenance and modification must also take place.

IBM often accepts programs from users and acts as the marketing agent for that program with its customers. These programs are called IUP's (Installed User Programs). Before the program is accepted, users have to go through quite an elaborate quality control procedure as well as be certain that various kinds and quantities of documentation are available. Since these standards are often difficult to generate if a faculty member already believes they have a "working" program, it is obviously better to have the standards understood before the work begins.

Other distributors require approximately the same procedures to be followed as IBM. They require this before taking on the task of marketing a software product to the public.

Accomplishing the external work of finding a buyer is probably very similar to the patent field. If one has an obviously valuable software product, the buyers will be easily found. If, however, the value of the software is illusive or obscure, it may be difficult for someone in the Intellectual Property Office to appropriately exploit the product.

Conclusion

It seems clear that much of the work done in a traditional research university's patent office need only be modified and extended if an office of intellectual property management is to be created. It should be noted, however, that many colleges and univerisities heretofore not concerned with

patent management may now be faced with developing policy, procedure and practice in these new areas.

The public or private charter under which an institution operates along with a basic review of the rights and responsibilities of faculty and staff will need a thorough evaluation and review before reasonable decisions on how to proceed can be made.